

**FINAL
ENVIRONMENTAL ASSESSMENT
FOR THE
AIR PRODUCTS AND CHEMICALS,
INC. WASTE ENERGY PROJECT AT
THE AK STEEL CORPORATION
MIDDLETOWN WORKS,
MIDDLETOWN, OHIO**

**U.S. Department of Energy
National Energy Technology Laboratory**



July 2010

**FINAL
ENVIRONMENTAL ASSESSMENT
FOR THE
AIR PRODUCTS AND CHEMICALS,
INC. WASTE ENERGY PROJECT AT
THE AK STEEL CORPORATION
MIDDLETOWN WORKS,
MIDDLETOWN, OHIO**

**U.S. Department of Energy
National Energy Technology Laboratory**



July 2010

COVER SHEET

Responsible Agency: U.S. Department of Energy (DOE)

Title: *Final Environmental Assessment for the Air Products and Chemicals, Inc. Waste Energy Project at the AK Steel Corporation Middletown Works, Middletown, Ohio*

Contact: For additional copies or more information about this environmental assessment (EA), please contact:

Mr. Mark W. Lusk
U.S. Department of Energy
National Energy Technology Laboratory
P.O. Box 880, MS B07
3610 Collins Ferry Road
Morgantown, West Virginia 26507-0880
Facsimile: (304) 285-4403
E-mail: mark.lusk@netl.doe.gov

Abstract: DOE prepared this EA to evaluate the potential environmental consequences of providing an American Recovery and Reinvestment Act of 2009 (Recovery Act; Public Law 111-5, 123 Stat. 115) financial assistance grant to Air Products and Chemicals, Inc. (Air Products) to facilitate construction and operation of a plant to recover waste energy at the AK Steel Corporation (AK Steel) Middletown Works in Middletown, Ohio.

DOE's Proposed Action would provide \$30 million in financial assistance in a cost-sharing arrangement with the project proponent, Air Products. The total cost of the proposed project would be about \$315 million. Air Products' proposed project would construct and operate a combined-cycle power generation plant that would capture and process blast furnace gas to produce electricity and process steam. Air Products would build the plant on AK Steel's existing Middletown Works site, which manufactures cold-rolled steel products.

This EA evaluates 14 resource areas and identifies no significant adverse environmental impacts for the proposed project. The proposed project could result in beneficial impacts to the nation's energy efficiency and the local economy and air quality. In addition to adding and retaining jobs in the Middletown area, the project would convert waste energy from blast furnace gas, half of which is currently burned and released to the atmosphere, to generate electricity and process steam. The generated electricity could replace the same amount of electricity AK Steel purchases from conventional power generating sources such as coal-fired power plants.

Availability: The EA is available on DOE's National Energy Technology Laboratory website at <http://www.netl.doe.gov/publications/others/nepa/ea.html>.

ACRONYMS AND ABBREVIATIONS

CFR	<i>Code of Federal Regulations</i>
DOE	U.S. Department of Energy
EA	environmental assessment
EPA	U.S. Environmental Protection Agency
FR	<i>Federal Register</i>
NEPA	National Environmental Policy Act of 1969, as amended
PM ₁₀	particulate matter with median aerodynamic diameter of 10 micrometers or less
PM _{2.5}	particulate matter with median aerodynamic diameter of 2.5 micrometers or less
Stat.	<i>United States Statutes at Large</i>
U.S.C.	<i>United States Code</i>

Note: Numbers in this EA generally have been rounded to two or three significant figures. Therefore, some total values might not equal the actual sums of the values.

CONTENTS

<u>Section</u>	<u>Page</u>
Summary	vii
1. Introduction	1
1.1 National Environmental Policy Act and Related Regulations	1
1.2 Background of the Industrial Technologies Program.....	2
1.3 Purpose and Need for DOE Action	3
1.4 Environmental Resources Not Carried Forward	4
1.5 Consultations and Public Comment Response Process.....	7
1.5.1 Consultations	7
1.5.2 Comment-Response Process	7
2. DOE Proposed Action and Alternatives.....	10
2.1 DOE’s Proposed Action	10
2.2 Air Products’ Proposed Project	10
2.3 No-Action Alternative.....	14
2.4 DOE Alternative Actions	14
3. Affected Environment and Environmental Consequences.....	17
3.1 Air Quality.....	17
3.1.1 Affected Environment	17
3.1.2 Environmental Consequences	19
3.1.2.1 Proposed Project.....	19
3.1.2.2 No-Action Alternative.....	22
3.2 Water Resources.....	22
3.2.1 Affected Environment	22
3.2.1.1 Surface Water	22
3.2.1.2 Groundwater.....	23
3.2.1.3 Floodplains and Wetlands	23
3.2.2 Environmental Consequences	23
3.2.2.1 Proposed Project.....	23
3.2.2.2 No-Action Alternative.....	25
3.3 Waste.....	25
3.3.1 Affected Environment	25
3.3.2 Environmental Consequences	26
3.3.2.1 Proposed Project.....	26
3.3.2.2 No-Action Alternative.....	27
3.4 Socioeconomics.....	27
3.4.1 Affected Environment	27
3.4.2 Environmental Consequences	27
3.4.2.1 Proposed Project.....	28
3.4.2.2 No-Action Alternative.....	29
3.5 Occupational Health and Safety.....	29

3.5.1	Affected Environment	29
3.5.2	Environmental Consequences	30
3.5.2.1	Proposed Project.....	30
3.5.2.2	No-Action Alternative.....	31
3.6	Resource Commitments	31
3.6.1	Relationship between Short-Term Uses of the Environment and the Maintenance and Enhancement of Long-Term Productivity	31
3.6.2	Irreversible and Irretrievable Commitments of Resources.....	31
3.6.3	Unavoidable Adverse Impacts.....	32
4.	Cumulative Impacts.....	33
4.1	Present Actions.....	33
4.2	Reasonably Foreseeable Actions.....	34
5.	Conclusions	36
6.	References	39

LIST OF TABLES

<u>Table</u>	<u>Page</u>	
1-1	Environmental resource areas with no, small, or temporary impacts	5
3-1	Primary National Ambient Air Quality Standards and 2008 Butler County air quality data.....	18
3-2	Current Middletown Works air emissions	19
3-3	Existing Middletown Works emissions and combined Air Products and Works emissions estimates.....	20
3-4	Current Middletown Works industrial waste.....	25
3-5	New direct and indirect jobs and earnings effects	29
3-6	Estimated number of injuries during construction.....	30
3-7	Estimated number of injuries during operations.....	31

LIST OF FIGURES

<u>Figure</u>	<u>Page</u>	
2-1	General location of Middletown, Ohio	10
2-2	Satellite view of the Middletown Works and vicinity showing the site boundary and location of the proposed project.....	12
2-3	Aerial photograph showing existing facilities and proposed project areas.....	13
2-4	Simplified schematic showing existing and proposed facilities and processes	15
3-1	Middletown Works wind rose.....	18

APPENDIXES

Appendix A.	Distribution List.....	A-1
Appendix B.	Consultations.....	B-1

SUMMARY

The U.S. Department of Energy (DOE or the Department) proposes to award an American Recovery and Reinvestment Act of 2009 (Recovery Act) financial assistance grant to Air Products and Chemicals, Inc. (Air Products) for its proposed project to construct and operate a combined-cycle power generation plant at the AK Steel Corporation (AK Steel) Middletown Works in Middletown, Ohio. The Middletown Works site occupies about 2,800 acres. DOE's Proposed Action would provide Air Products with \$30 million grant in a cost-sharing arrangement. Air Products estimates the total cost of the proposed project would be about \$315 million.

At present, AK Steel burns about half of the generated gas from the Middletown Works blast furnace before releasing it to the atmosphere through an exhaust stack, a process called *flaring*. The plant uses the remainder of the gas in other operations. The proposed project would result in reductions in the gas flaring. Air Products would capture 75 percent of the blast furnace gas to produce an average of 105 megawatts of electricity as well as process steam. The Middletown Works currently buys all of its electricity, about 200 megawatts, from Duke Energy and generates steam internally from byproduct gases and natural gas.

DOE evaluated 14 environmental resource categories and identified no significant adverse impacts from the proposed project. For nine of the resource categories DOE determined there would be no impacts or the potential impacts would be small, temporary, or both and therefore did not carry these forward for additional analysis. DOE focused its analyses on those resources that could require new or amended permits, have the potential for significant impacts or controversy, or typically interest the public, such as socioeconomics and occupational health and safety. DOE performed more detailed analyses of potential impacts to air quality, water resources, waste, socioeconomics, and occupational health and safety. The following paragraphs summarize the analyses.

Air Quality. The proposed project would have the beneficial impact of recovering waste energy and converting it into process steam and electricity for use at the plant. The startup of the proposed facility would allow AK Steel to shut down four steam boilers. Gas flaring would then occur only intermittently, generally when a facility required maintenance. Air emissions from the proposed project at the Middletown Works would remain about the same as current emissions, with the exception of a reduction in nitrogen oxides. The proposed project would generate about 105 megawatts of electricity (enough to serve about 80,000 households), and there would be no increase in greenhouse gas emissions because the plant would use existing waste energy for generation unlike conventional electricity plants such as those that burn fossil fuels.

Water Resources. The Middletown Works is in the Great Miami River watershed and discharges wastewater to North Branch Dicks Creek, Dicks Creek, and the Great Miami River. The North Branch flows to Dicks Creek, and Dicks Creek flows to the Great Miami River. The proposed project would have a small impact (less than a 10-percent increase) on the quantity of wastewater the Works discharges to the Great Miami River, and there would be no change in the quality of that

wastewater. Air Products proposed project would not involve discharges to Dicks Creek or the North Branch. The flow of the Great Miami River is about 50 times higher than the discharge would be under combined AK Steel and Air Products operations. The current Middletown Works National Pollutant Discharge Elimination System permit would require modification for quantity but not quality.

Air Products would not use groundwater for operations and there would be no underground storage tanks for the proposed project. Therefore, impacts to groundwater availability and quality would be unlikely from normal operations. Air Products would prevent or mitigate potential impacts from accidental spills of contaminants by developing and following a spill prevention and mitigation plan.

None of the proposed construction activities would occur in a 100-year floodplain, and the proposed project would not disturb the existing wetland within the plant boundary.

Waste. Construction for the proposed project would generate construction-related debris such as wood, metal, and concrete. Air Products would ship construction waste to a licensed commercial landfill or recycling facility. During normal operations, Air Products would generate nonhazardous and municipal waste in small quantities that would not affect regional landfills or treatment plants. The only source of routine hazardous waste during operations would be the disposal of spent catalyst for the selective catalytic reduction unit. The company would dispose of and replace about 1,000 cubic feet of spent catalyst every 5 years. Although hazardous waste generation would be very small, Air Products would send all hazardous waste to a certified treatment, storage, or disposal facility in compliance with the Resource Conservation and Recovery Act.

Socioeconomics. The proposed project would have the beneficial impact of creating new direct and indirect jobs during construction and operations, aiding in the retention of jobs in a critical manufacturing process and stimulating the economic base of the local community. DOE expects that members of the community's existing labor force would fill the new jobs. DOE does not expect adverse impacts to the existing infrastructure or social services.

Occupational Health and Safety. Air Products maintains a comprehensive health and safety management system at each of its facilities that would include the proposed plant at the Middletown Works. DOE expects that the workplace accident rates during the construction period would be typical of industry averages. The proposed project when completed would be similar to other existing Air Products operations from a health and safety perspective. The proposed project is unlikely to result in a deviation from Air Products' health and safety record. Air Products' total recordable injury rate has been consistently below the industry average.

Cumulative impact considerations included the operations of the Middletown Works and activities of a proposed coke-making plant that Middletown Coke Company would construct on a 157-acre parcel of land near the Middletown Works. That project would include a conveyor between the Middletown Coke Company facility and the Works. Because of the conclusions of the impact

analyses above, DOE determined there would be no or minimal cumulative effects from these projects.

1. INTRODUCTION

As part of the American Recovery and Reinvestment Act of 2009 (the Recovery Act; Public Law 111-5, 123 Stat. 115), the U.S. Department of Energy (DOE or the Department) National Energy Technology Laboratory, on behalf of the Office of Energy Efficiency and Renewable Energy's Industrial Technologies Program, is providing up to \$156 million in federal funding for competitively awarded grants for the deployment of projects for district energy systems, combined heat and power systems, waste energy recovery systems, and energy-efficient industrial equipment and processes at single or multiple installations and sites. The funding of the selected projects requires compliance with the National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. 4321 et seq.), Council on Environmental Quality regulations (40 CFR Parts 1500 to 1508), and DOE NEPA implementing procedures (10 CFR Part 1021).

To comply with NEPA, DOE prepared this *Final Environmental Assessment for the Air Products and Chemicals, Inc. Waste Energy Project at the AK Steel Corporation Middletown Works, Middletown, Ohio* (EA). This EA examines the potential environmental consequences of DOE's Proposed Action—providing a financial assistance grant—and the Air Products and Chemicals, Inc. (Air Products) proposed project—construction and operation of a combined-cycle power generation plant at the AK Steel Corporation (AK Steel) Middletown Works in Middletown, Ohio. Middletown is in Butler County. The proposed Air Products plant would capture and process 75 percent of the gas from a blast furnace to produce electricity and process steam to drive some plant operations. The EA also examines the No-Action Alternative, under which DOE assumes that, as a consequence of DOE's denial of financial assistance, Air Products would not proceed with the project.

This chapter explains NEPA and related regulations (Section 1.1), the background of the Industrial Technologies Program (Section 1.2), the Department's purpose and need for action (Section 1.3), and the environmental resources DOE did not carry forward to detailed analysis (Section 1.4). Chapter 2 discusses DOE's Proposed Action, Air Product's proposed project, the No-Action Alternative, and DOE's Alternative Actions. Chapter 3 details the affected environment and the potential environmental consequences of the proposed project and of the No-Action Alternative and considers resource commitments. Chapter 4 addresses cumulative impacts, and Chapter 5 provides DOE's conclusions from the analyses. Chapter 6 lists the references for this document. Appendix A contains the distribution list, and Appendix B contains correspondence between DOE and the Ohio State Historic Preservation Office.

1.1 National Environmental Policy Act and Related Regulations

In accordance with the DOE NEPA implementing procedures, DOE must evaluate the potential environmental impacts of its proposed actions, including funding decisions, that may have a significant impact on human health or the environment. In compliance with these regulations and DOE's procedures, this EA:

- Examines the potential environmental impacts of the Proposed Action and the No-Action Alternative;
- Identifies unavoidable adverse environmental impacts of the Proposed Action;
- Describes the relationship between local short-term uses of the environment and the maintenance and enhancement of long-term productivity; and
- Characterizes any irreversible and irretrievable commitments of resources that would be involved should DOE decide to implement its Proposed Action.

DOE must meet these requirements of NEPA before it can make a final decision to proceed with a proposed federal action that could cause adverse impacts to human health or the environment. This EA fulfills DOE's obligations under NEPA and provides DOE with the information necessary to make an informed decision about the construction and operation of a combined-cycle generation plant that would produce electricity and process steam through the recovery of waste energy in blast furnace gas.

This EA evaluates the potential individual and cumulative impacts of Air Product's proposed project. No other action alternatives are analyzed. For purposes of comparison, this EA also evaluates the impacts that could occur if DOE did not provide funding (the No-Action Alternative), under which DOE assumes that Air Products would not proceed with the project. This assumption may be incorrect—that is, Air Products might proceed without federal assistance. However, this assumption allows DOE to compare the impacts of an alternative in which the project occurs with one in which it does not.

1.2 Background of the Industrial Technologies Program

The DOE's National Energy Technology Laboratory manages the research and development portfolio of the Industrial Technologies Program for the Office of Energy Efficiency and Renewable Energy. The mission of the Industrial Technologies Program is to establish U.S. industry as a world leader in energy efficiency and productivity. The program leads the national effort to reduce industrial energy intensity and carbon emissions, and strives to transform the way U.S. industry uses energy by supporting cost-shared research and development that addresses the top energy challenges facing industry. In addition, the Industrial Technologies Program fosters the adoption of advanced technologies and energy management best practices to produce meaningful progress in reducing industrial energy intensity.

Congress appropriated significant funding for the Industrial Technologies Program in the Recovery Act to stimulate the economy and reduce unemployment in addition to furthering the objectives of the existing program. DOE solicited applications for this funding by issuing a competitive Funding Opportunity Announcement (DE-FOA-0000044), *Recovery Act: Deployment of Combined Heat and Power (CHP) Systems, District Energy Systems, Waste*

Energy Recovery Systems, and Efficient Industrial Equipment, in June 2009. The announcement invited applications in four areas of interest:

- Area of Interest 1 – Combined Heat and Power; the generation of electric energy and heat in a single, integrated system, with an overall thermal efficiency of 60 percent or greater on a higher-heating-value basis.
- Area of Interest 2 – District Energy Systems; systems providing thermal energy from a renewable energy source, thermal energy source, or highly efficient technology to more than one building or fixed energy-consuming use from one or more thermal energy production facilities through pipes or other means to provide space heating, space conditioning, hot water, steam, compression, process energy, or other end uses.
- Area of Interest 3 – Industrial Waste Energy Recovery; the collection and reuse of energy from sources such as exhaust heat or flared gas from any industrial process; waste gas or industrial tail gas that would otherwise be flared, incinerated, or vented; or a pressure drop in any gas, excluding any pressure drop to a condenser that subsequently vents the resulting heat.
- Area of Interest 4 – Efficient Industrial Equipment; any proven commercially available technology that can provide a minimum 25-percent efficiency improvement to the industrial sector.

DOE announced its selections on November 3, 2009, with multiple awards in three of the four areas of interest. DOE selected nine projects based on the evaluation criteria in the funding opportunity announcement and gave special consideration to projects that promoted the objectives of the Recovery Act, specifically job preservation or creation and economic recovery in an expeditious manner.

The proposed project this EA considers, the construction and operation of a combined-cycle power generation plant at the Middletown Works in Middletown, Ohio, was one of the nine projects DOE selected for funding. DOE's Proposed Action would provide a \$30-million financial assistance grant under a cost-sharing arrangement with Air Products. Air Products estimates the total cost of the proposed project would be about \$315 million (Bates 2010a).

1.3 Purpose and Need for DOE Action

The purpose of the Proposed Action is to support the mission of DOE's Industrial Technologies Program and the goals of the Recovery Act. The mission of the Industrial Technologies Program is to have U.S. industry lead the world in energy efficiency and productivity. The Program leads the national effort to reduce industrial energy intensity and carbon emissions, and strives to transform the way U.S. industry uses energy by supporting cost-shared research and development that addresses the top energy challenges facing industry. In addition, the Program

fosters the adoption of today's advanced technologies and energy management best practices to produce meaningful progress in reducing industrial energy intensity.

The Industrial Technologies Program's three-part strategy pursues this mission by:

- Sponsoring research, development, and demonstration of industry-specific and crosscutting technologies to reduce energy and carbon intensity;
- Conducting technology delivery activities to help plants access today's technology and management practices; and
- Promoting a corporate culture of energy efficiency and carbon management within industry.

To align with its mission, the program has established a goal of achieving a 25-percent reduction in industrial energy intensity by 2017, guided by the *Energy Policy Act of 2005*. The strategy also calls for an 18-percent reduction in U.S. carbon intensity by 2012. The Department seeks to identify projects and technologies that it can fund to meet this goal.

In June 2009, DOE initiated a process to identify suitable projects by issuing Funding Opportunity Announcement DE-FOA-00000044, *Recovery Act: Deployment of Combined Heat and Power (CHP) Systems, District Energy Systems, Waste Energy Recovery Systems, and Efficient Industrial Equipment*. This Funding Opportunity Announcement is funded by the Recovery Act.

The Recovery Act seeks to create jobs, restore economic growth, and strengthen America's middle class through measures that modernize the nation's infrastructure, enhance America's energy independence, expand educational opportunities, preserve and improve affordable health care, provide tax relief, and protect those in greatest need. Provision of funds under this announcement would achieve these objectives.

The capital cost of new equipment is often a roadblock for use of more efficient equipment and processes. Although the newer technologies would provide lower energy requirements and operating costs, the payback period for some technologies does not meet internal business goals. DOE's provision of financial assistance allows companies to reduce the payback period, making these new technologies an acceptable option for them.

1.4 Environmental Resources Not Carried Forward

Chapter 3 of this EA describes the affected environment and examines the potential environmental impacts of the proposed project and the No-Action Alternative for the following resource areas:

- Air quality,

- Water resources,
- Waste,
- Socioeconomics, and
- Occupational health and safety.

DOE EAs also commonly address the environmental resource areas listed in Table 1-1. However, in an effort to streamline the NEPA process and enable a timely award to the selected project, DOE did not examine the resource areas in the table at the same level of detail as the above-mentioned five areas. Table 1-1 describes the Department’s evaluation of these resource areas. In each case, there would be no impacts or the potential impacts would be small or temporary in nature, or both. Therefore, DOE determined that further analysis is unnecessary. In terms of the No-Action Alternative, the impacts Table 1-1 lists would not occur because DOE assumes the proposed project would not proceed.

The focus of the more detailed analyses in Chapter 3 is on those resources that could require new or amended permits, have the potential for significant impacts or controversy, or typically interest the public, such as socioeconomics and occupational health and safety.

Table 1-1. Environmental resource areas with no, small, or temporary impacts.

Environmental resource area	Impact consideration and conclusions
Geology and soils	The Middletown Works site has operated as a heavy industrial facility for about 100 years. There are no records of geologic events or site stability issues. The proposed project would occur on previously disturbed lands near AK Steel’s blast furnace. The project would require demolition and removal of a few small foundations (Bates 2010b) and other minimal site preparation. Air Products would design the drainage system to direct runoff to the existing storm water system that AK Steel uses (Joyce 2009).
Land use	Construction and operation of the proposed project would occur within the boundaries of the 2,800-acre Middletown Works site. There would be no changes to adjacent land uses, and the onsite land use for the proposed project would be consistent with ongoing Works operations. The proposed project would involve two previously disturbed parcels of land totaling about 10 acres (Joyce 2009).
Aesthetics and visual resources	The proposed facilities would be similar in appearance to existing Middletown Works structures and facilities (such as boilers, turbines, exhaust stacks, and cooling towers). The proposed structures and facilities would not alter or result in major changes to the types of views on and near the site.

Table 1-1. Environmental resource areas with no, small, or temporary impacts.

Environmental resource area	Impact consideration and conclusions
Noise	<p>The gas turbine has a design average sound level of 90 A-weighted decibels at 3 feet away from its sound enclosure, and the nearest receptor would be about 500 feet away with a public road and active railroad tracks between (Bates 2010c). Because of this DOE does not expect noise levels from construction and operation to exceed the existing noise levels from current Works operations, which include trains routinely moving materials around the site.</p> <p>Air Products requires workers to wear ear protection in appropriate situations and to adhere to its occupational health and safety plans.</p>
Biological resources	<p>There would be small but temporary impacts to wildlife on or near the proposed site during construction. Wildlife could avoid the area and in some circumstances could be killed by cars and construction equipment. Similar small impacts could occur during the operation of the plant.</p> <p>DOE reviewed the list of threatened and endangered species on the U.S. Fish and Wildlife Service’s website (FWS 2009). One endangered species occurs in Butler County, the Indiana Bat (<i>Myotis sodalists</i>). DOE compared the habitat requirements for the bat with the habitat available at Middletown Works and concluded that no suitable habitat for this species occurs on the site. Therefore, there would be no effects on threatened or endangered species. Section 1.5 discusses a comment letter the service sent.</p>
Historic and cultural resources	<p>Appendix B contains correspondence between DOE and the Ohio State Historic Preservation Office. DOE reviewed the <i>National Register of Historic Places</i> for listed properties in the Middletown area in Butler County, Ohio. Because construction for the proposed project would occur on previously disturbed land well within the existing 2,800-acre site, DOE determined there would be no impacts to historic properties. The State Historic Preservation Office agreed with DOE’s determination in its reply.</p>
Environmental justice	<p>Executive Order 12898, “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,” directs federal agencies to address environmental and human health conditions in minority and low-income communities. The evaluation of impacts to environmental justice is dependent on determining if high and adverse impacts from the proposed project would disproportionately affect any low-income or minority group in the affected community. DOE determined that no high and adverse impacts would occur to any member of the community. Therefore, DOE determined there would be no adverse and disproportionate impacts to minority or low-income populations. Section 3.4.1 presents demographic information for the area.</p>
Transportation	<p>Small temporary increases in daily traffic to and from Middletown Works could occur during construction for the proposed project. Operation of the plant would require only a small staff, so there would be no long-term permanent increase in traffic. Existing public roads are sufficient for access to the Works, and the existing onsite roads are sufficient for accessing the proposed project area (Bates 2010d).</p>

Table 1-1. Environmental resource areas with no, small, or temporary impacts.

Environmental resource area	Impact consideration and conclusions
Utilities, energy, and materials	Production of 105 megawatts of electricity by the combined-cycle power generation plant in addition to process steam would result in small reductions in the use of electricity and natural gas by the Works in comparison with current use. DOE reviewed the local capacities for water, sewer, electricity, and natural gas and found them to be sufficient to support the needs for construction and operation of the proposed plant. There are no unique materials necessary to manufacture, install, or operate the proposed plant.

1.5 Consultations and Public Comment Response Process

DOE issued the Draft EA for comment on May 9, 2010, and advertised its release in the *Middletown Journal* on May 9, 10, and 11. In addition, the Department sent a copy for public review to the Middletown Public Library. The Department established a 15-day public comment period that began May 9, 2010, and ended May 23, 2010, and announced it would accept comments by mail, e-mail, or facsimile. Before the release of the EA for public comment, DOE sent project information to the Ohio State Historic Preservation Office for their consideration, as discussed below.

1.5.1 CONSULTATIONS

Ohio State Historic Preservation Office

On March 17, 2010, DOE sent a formal consultation letter to the Ohio State Historic Preservation Office in accordance with the review requirements of Section 106 of the National Historic Preservation Act, as amended (16 U.S.C. 470 et seq.), and implementing regulations at 36 CFR 800, that detailed DOE's investigation of nearby historic properties. DOE concluded from that investigation that no historic properties would be affected by the proposed project.

The Historic Preservation Office responded on May 27, 2010, and concurred with DOE's finding. Appendix B contains copies of both letters.

1.5.2 COMMENT-RESPONSE PROCESS

DOE received two comment letters as follows; Appendix B contains copies.

Ohio Environmental Protection Agency

Bonnie B. Buthker, Assistant Chief, Southwest District

Comment. "On page 27, Section 3.5.2.1.1, "Construction," it states that the removal of small existing foundation elements and concrete pads will be completed as part of site preparation activities. It also states on page 29 that the proposed plant will be located in an area termed the "Melt Plant area." ... The EA does not identify what activities were conducted in the former

buildings at the proposed plant location. Though the proposed plant area may not be identified as an Area of Concern, the Melt Plant area is under investigation as part of the corrective action requirements under the Resource Conservation and Recovery Act and a federal consent decree. If, during site preparation or construction activities, contaminated areas are found, they will have to be addressed before construction on the plant can proceed.”

Response. If Air Products discovered contaminated material during site preparation and construction activities, the company would immediately halt ongoing work. Air Products would notify AK Steel, who would make required notifications to the Ohio Environmental Protection Agency under the federal consent decree. Resumption of construction activities would only occur after investigation of the contaminated areas and identification of appropriate corrective actions consistent with the Resource Conservation and Recovery Act of 1986, as amended (42 U.S.C. 6901 et seq.), and the AK Steel federal consent decree (Section 4.1). DOE has updated the Section 3.5 discussion and the Section 4.1 discussion of legacy contamination appropriately.

U.S. Fish and Wildlife Service

Mary M. Knapp, Field Supervisor, Ecological Services, Columbus, Ohio

Comment. “During winter, Indiana bats hibernate in caves and abandoned mines. Summer habitat requirements for the species are not well defined but the following are considered important:

“(1) dead or live trees and snags with peeling or exfoliating bark, split tree trunk and/or branches, or cavities, which may be used as maternity roost areas;

“(2) live trees (such as shagbark hickory and oaks) which have exfoliating bark;

“(3) stream corridors, riparian areas, and upland woodlots which provide forage sites.

“Should the proposed site contain trees or associated habitats exhibiting any of the characteristics listed above, we recommend that the habitat and surrounding trees be saved wherever possible. If the trees must be cut, further coordination with this office is requested to determine if surveys are warranted. Any survey should be designed and conducted in coordination with the Endangered Species Coordinator for this office.”

Response. As Table 1-1 notes, DOE compared the habitat requirements for the Indiana bat with the habitat available at Middletown Works and concluded that no suitable habitat for this species occurs on the site. The proposed project would not require the removal of trees that meet the above descriptions. Therefore, there would be no effects on the Indiana bat.

Comment. “The project area lies within the range of the bald eagle (*Haliaeetus leucocephalus*). The bald eagle has been removed from the Federal list of endangered and threatened species due

to recovery. This species continues to be afforded protection by the Bald and Golden Eagle Protection Act and Migratory Bird Protection Act.”

“We recommend that you contact the Ohio Department of Natural Resources, Division of Wildlife for the location(s) of the eagle nest(s) in the county. If any active nests are located within ½ mile of the project site, we recommend that work at the site be restricted from mid-January through July to allow pre-nesting activities, incubation, and raising of the young.”

Response. In response to the FWS's suggestion, DOE contacted the Ohio Division of Wildlife on June 7, 2010. The State responded on June 8 with current information on eagle nests in the region. The nearest nest to the proposed project site is about 15 miles to the southeast (Tribbles 2010). Therefore, the Department has determined there would be no effects on bald eagles.

2. DOE PROPOSED ACTION AND ALTERNATIVES

This chapter describes DOE's Proposed Action (Section 2.1), Air Products' proposed project (Section 2.2), the No-Action Alternative (Section 2.3), and DOE Alternative Actions (Section 2.4).

2.1 DOE's Proposed Action

DOE's Proposed Action would provide a financial assistance grant to facilitate the construction and operation of a combined-cycle power generation plant that would capture and process waste blast furnace gas to produce electricity and process steam at the Middletown Works. DOE would provide a \$30 million financial assistance grant in a cost-sharing arrangement with Air Products. Air Products estimates the total cost of the proposed project would be about \$315 million (Bates 2010a).

2.2 Air Products' Proposed Project

Air Products' proposed project would construct and operate a combined-cycle power generation plant near AK Steel's blast furnace at its Middletown Works in Middletown, Ohio. The plant would capture and process waste blast furnace gas to produce electricity and process steam for use at the Middletown Works. This project would be the first deployment in North America using steel mill blast furnace gas to generate both electricity and process steam using a combined-cycle gas turbine technology. Figure 2-1 shows the approximate location of Middletown, Ohio.



Figure 2-1. General location of Middletown, Ohio.

At present, the Middletown Works burns about half of the waste blast furnace gas before releasing it to the atmosphere through an exhaust stack, a process called *flaring*. The flared gas is called *waste gas*. The proposed project would result in a substantial reduction in gas flaring; Air Products would capture the blast furnace gas to produce an average of 105 megawatts of electricity as well as process steam. Once the proposed plant became operational, gas flaring would occur only intermittently, generally when the facility required maintenance. During those times, Air Products would purchase small amounts of natural gas to fire the boilers. The Middletown Works currently purchases all of its electricity, about 200 megawatts, from the local electricity supplier, Duke Energy, and generates all the steam it needs internally from byproduct and blast furnace gases. The company purchases small amounts of natural gas under rare circumstances when there is not enough blast furnace gas to power the steam boilers.

Air Products' proposed project would include:

1. Minimal preparation and removal of small foundations on two previously disturbed sites on the Middletown Works site,
2. Construction of a combined-cycle power generation plant,
3. Construction of a gas management system for the blast furnace gas, and
4. Production of process steam and electricity.

Air Products would build the proposed facilities near the ongoing blast furnace operations at the Middletown Works, where AK Steel produces flat-rolled carbon-steel products. The Middletown Works occupies almost 2,800 acres. The major existing AK Steel production facilities at this location include (AK Steel undated):

- Coke ovens,
- Blast furnace,
- Oxygen furnaces,
- Vacuum degasser,
- Dual-strand slab caster,
- Hot strip mill,
- Pickling lines,
- Five-stand cold mill,
- Electro-galvanizing line,
- Hot-dip galvanizing line,
- Box annealing furnaces,
- Temper mills, and
- Hot-dip carbon and stainless aluminizing.

The proposed project would construct and operate a combined-cycle power generation plant on two parcels totaling about 10 acres within the Middletown Works site. Air Products would use about 80 percent of the land for the power generation equipment, piping, and other support structures. Figure 2-2 provides a satellite image of the Middletown Works area showing the locations of the proposed facilities and the Middletown Works site boundary. Figure 2-3 provide an aerial view of the proposed project area and adjacent existing facilities.



Figure 2-2. Satellite view of the Middletown Works and vicinity showing the site boundary and location of the proposed project.



Figure 2-3. Aerial photograph showing existing facilities and proposed project areas.

Figure 2-4 provides a simplified process diagram of current operations and the process after installation of the proposed combined-cycle power generation plant. Air Products would construct a gas management system to recover the waste blast furnace gas and prepare it for use in the power plant. A wet electrostatic precipitator would remove fine particulates from the gas, and a fuel gas compressor would raise the pressure for use in the gas turbine. The plant would use a gas turbine rated at over 100 megawatts and an unfired heat recovery boiler to generate steam for use in a 70-megawatt steam turbine generator. Some of the gas would power two auxiliary steam boilers to provide backup steam to the Middletown Works and to the steam turbine. The two generators together would produce about 105 megawatts of electricity when in operation.

The gas turbine exhaust gases would pass through a selective catalytic reduction system to reduce nitrogen oxide emissions to levels that would be below regulatory standards before release to the atmosphere through a stack. The selective catalytic reduction system would use aqueous ammonia, which Air Products would store in a 5,000-gallon aboveground tank with secondary containment.

2.3 No-Action Alternative

Under the No-Action Alternative, DOE would not provide financial assistance for the proposed project. As a result, the project would be delayed as Air Products sought other funding sources to meet its needs or abandoned if other funding sources could not be obtained. As a result, DOE's ability to achieve its objectives under the Industrial Technologies Program and the Recovery Act would be impaired.

Although this and other selected projects might proceed if DOE decided not to provide financial assistance, the Department assumes for purposes of this environmental analysis that the project would not proceed without its assistance. If Air Products did proceed without DOE's financial assistance, the potential impacts would be essentially identical to those if the Department provided the funding. To allow a comparison between the potential impacts of a project as implemented and the impacts of not proceeding with a project, DOE assumes that, if it were to decide to withhold assistance from a project, the project would not proceed.

2.4 DOE Alternative Actions

DOE's alternatives to this project consist of the nine technically acceptable applications it received in response to the Funding Opportunity Announcement, *Recovery Act: Deployment of Combined Heat and Power (CHP) Systems, District Energy Systems, Waste Energy Recovery Systems, and Efficient Industrial Equipment* (DE-FOA-0000044). Before selection, DOE made preliminary determinations about the level of review under NEPA based on potentially significant impacts identified during review of the technically acceptable applications. DOE conducted these preliminary reviews pursuant to 10 CFR 1021.216 and a variance to certain requirements in the regulation granted by the Department's General Counsel (74 FR 41963;

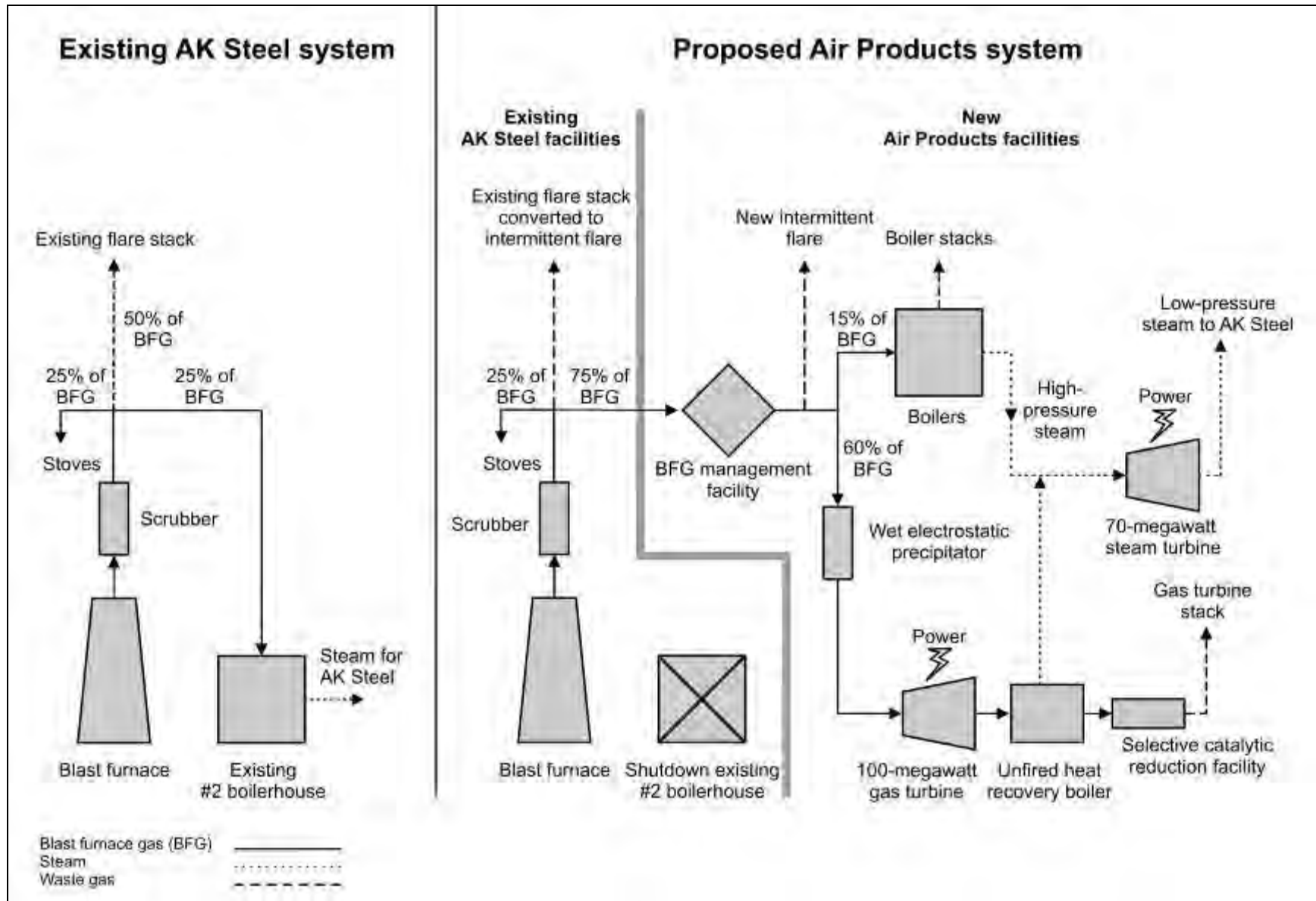


Figure 2-4. Simplified schematic showing existing and proposed facilities and processes.

August 18, 2009). The selection official was provided with these preliminary NEPA determinations and reviews for consideration during the selection process.

Because DOE's Proposed Action is limited to providing financial assistance in cost-sharing arrangements to selected applicants in response to a competitive funding opportunity, DOE's decision is limited to either accepting or rejecting the project as proposed by the proponent, including its proposed technology and selected sites. DOE's consideration of reasonable alternatives is therefore limited to the technically acceptable applications and the No-Action Alternative for each selected project.

3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

Sections 3.1 to 3.5 detail the affected environment and potential environmental consequences for the proposed project and the No-Action Alternative. The sections discuss air quality, water resources, waste, socioeconomics, and occupational health and safety, respectively. Section 3.6 discusses resource commitments.

3.1 Air Quality

Section 3.1.1 discusses the regional air quality and AK Steel's contributions to the existing baseline conditions. Section 3.1.2 provides a comparison of emissions estimates from current AK Steel blast furnace operations with those for Air Products' proposed project.

3.1.1 AFFECTED ENVIRONMENT

The ambient air quality in an area can be characterized in terms of whether it complies with the primary and secondary National Ambient Air Quality Standards. The Clean Air Act (42 U.S.C. 7401 et seq.) requires the U.S. Environmental Protection Agency (EPA) to set national standards for pollutants that are considered harmful to public health and the environment. The EPA established standards for six criteria pollutants: carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter [both with a median aerodynamic diameter of less than or equal to 10 micrometers (PM₁₀) and less than or equal to 2.5 micrometers (PM_{2.5})], and sulfur dioxide. Primary standards define levels of air quality for each of the six criteria pollutants that would provide an adequate margin of safety to protect public health including the health of sensitive populations such as children and the elderly. Secondary standards define levels of air quality that are deemed necessary to protect the public welfare including protection against decreased visibility and damage to animals, crops, vegetation, and buildings.

Table 3-1 lists the primary National Ambient Air Quality Standards for each criteria pollutant and the 2008 values for Butler County. EPA designates regions that do not meet the standards as nonattainment areas.

Figure 3-1 illustrates the general directions and average wind speeds at the Middletown Works site in wind rose format. The prevailing winds are from the southwest. The average regional annual rainfall is just over 40 inches a year.

The Middletown Works is located in Butler County, Ohio, which EPA has designated as an attainment area for all criteria pollutants except 8-hour ozone levels and PM_{2.5}. The Middletown Works meets the definition for a major stationary source under Title V of the Clean Air Act (42 U.S.C. 7401 et seq.). The Ohio Environmental Protection Agency issued the latest Title V permit for the plant in 2005, and the plant operates below the permitted air emission levels.

Table 3-1. Primary National Ambient Air Quality Standards and 2008 Butler County air quality data.

Pollutant	Averaging period	Primary standard	Butler County 2008
Carbon monoxide	8 hours	9 ppm	NA ^a
	1 hour	35 ppm	NA ^a
Lead	Quarterly	1.5 µg/m ³	0.02 µg/m ³
Nitrogen dioxide	Annual	0.053 ppm	NA ^a
Ozone	8 hours	0.075 ppm	0.079 ppm
PM ₁₀	24 hours	150 µg/m ³	26 µg/m ³
PM _{2.5}	Annual	15.0 µg/m ³	14.11 µg/m ³
	24 hour	35 µg/m ³	38.1 µg/m ³
Sulfur dioxide	Annual	0.03 ppm	0.012 ppm
	24 hours	0.14 ppm	0.003 ppm

Source: EPA 2009.

a. Air quality data for carbon monoxide and nitrogen dioxide were not available from the EPA. These pollutants have been determined to be in attainment.

µg/m³ = micrograms per cubic meter.

ppm = parts per million.

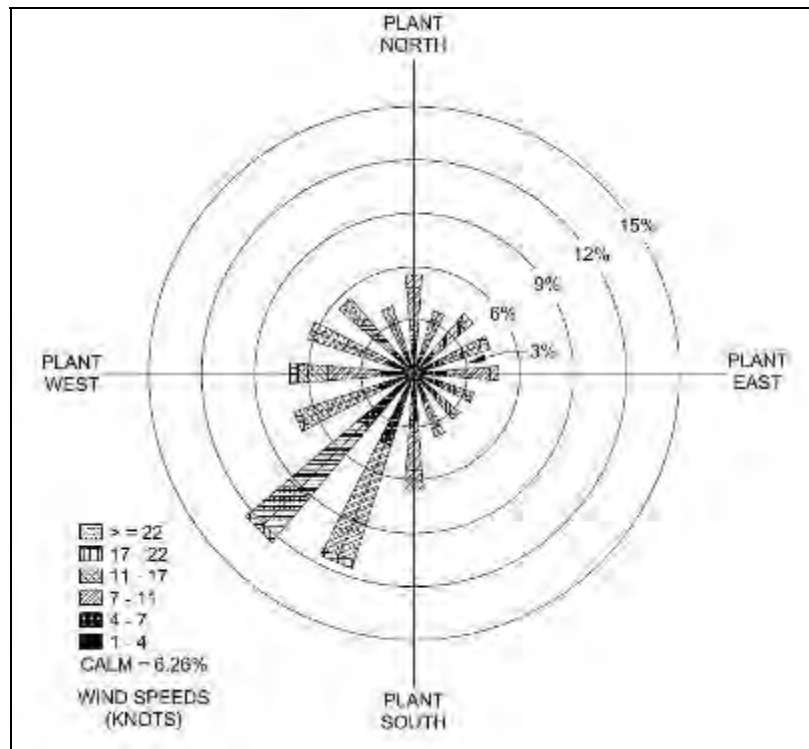


Figure 3-1. Middletown Works wind rose.

The majority of air emissions from current Middletown Works operations result from its existing onsite coke plant, blast furnace, and two oxygen furnaces for the manufacturing process. At present, the Middletown Works uses 25 percent of the blast furnace gas in a boilerhouse to power four boilers and 25 percent to power stoves, which preheat the combustion air for the blast furnace. The remaining 50 percent is flared to the atmosphere. Table 3-2 summarizes emissions

of PM₁₀, nitrogen oxides, carbon monoxide, sulfur dioxide, and volatile organic compounds from combustion from the current production rate.

Table 3-2. Current Middletown Works air emissions.

Pollutant	Total emissions (tons per year)
PM ₁₀	800
Nitrogen oxides	2,100
Carbon monoxide	18,000
Sulfur dioxide	2,100
Volatile organic compounds	950

Source: Bates 2010e.

PM₁₀ = particulate matter with median aerodynamic diameter of 10 micrometers or less.

3.1.2 ENVIRONMENTAL CONSEQUENCES

3.1.2.1 Proposed Project

3.1.2.1.1 Construction Impacts

Air emissions from construction activities for Air Products' proposed project would include combustion emissions from vehicles and heavy-duty equipment Air Products would use during construction of new facilities and fugitive dust from site preparation activities. These emissions would have short-term adverse impacts that Air Products could mitigate through best management practices such as soil stabilization and watering of exposed soils. Fugitive dust emissions would end on completion of construction, so long-term impacts would be negligible.

3.1.2.1.2 Operations Impacts

The proposed project would capture waste blast furnace gas from current iron-making processes and use it to generate electricity and process steam. At present, the Middletown Works uses 25 percent of the gas in a boilerhouse to power four boilers and 25 percent to power stoves. The remaining 50 percent is flared before release to the atmosphere. Under the proposed project, the Works would continue to use 25 percent of the gas for stoves but would shut down the boilerhouse. Air Products would then capture 75 percent of the blast furnace gas to generate the electricity and steam.

The proposed electricity generating system would include:

1. Capturing the blast furnace gas and feeding it to a gas management system to prepare it for downstream use,
2. Using a wet electrostatic precipitator to remove fine particulates,
3. Using a fuel-gas compressor to increase pressure to the necessary level for use in a gas turbine,

4. Feeding the gas to the combined-cycle power plant with a 100-megawatt gas turbine, and
5. Using the hot turbine exhaust gas in an unfired heat recovery boiler to generate steam for use in the 70-megawatt steam turbine generator.

In addition, some of the blast furnace gas would power two auxiliary steam boilers to provide backup steam to the Middletown Works and additional steam to the 70-megawatt steam turbine. The gas turbine exhaust would pass through a selective catalytic reduction unit to reduce nitrogen oxide emissions. The project would retire four steam boilers and reduce existing flared emissions.

Air Products is currently finalizing the design of the proposed project, completing operating scenarios, and obtaining estimates of emissions levels for the air permitting process. Based on the currently available information, DOE estimated emissions using emission factors for combustion of blast furnace gas. Air Products' proposed emissions control technologies would include a wet electrostatic precipitator that would remove about 99 percent of particulate matter from the gas before sending it to the gas turbine. The selective catalytic reduction unit would remove about 90 percent of the nitrogen oxides from the gas turbine exhaust. Once the system used up the majority of the waste energy in the blast furnace gas, it would flare any remaining waste gas, which would remove about 98 percent of volatile organic compounds and carbon monoxide. Flaring would only occur intermittently, typically during startup of the blast furnace, gas turbine, and boilers; shutdown of the gas turbine; and process transitions. The conversion of waste energy to produce electricity and steam would allow AK Steel to reduce its consumption of electricity from the regional grid, which would result in a reduction in emissions of air pollutants from regional power plants. Table 3-3 lists current emissions estimates for the flare and the boilers, which AK Steel would shut down, along with emissions estimates for the proposed project.

Table 3-3. Existing Middletown Works emissions^{a,b} and combined Air Products and Works emissions estimates (tons per year).

Pollutant	Current Works emissions	Combined emissions	Change in emissions
	from flare and boilers only	from proposed project and the Works	
PM ₁₀	170	170	0
Nitrogen oxides	1,400	630	-770
Carbon monoxide	820	820	0
Sulfur dioxide	570	570	0

Source: Joseph 2010, EPA 2010.

a. Emissions only from the flare that Air Products would capture and the boilers that AK Steel would shut down.

b. The EPA does not provide applicable emission factors for volatile organic compounds. The estimated reduction in nitrogen oxide emissions would result from the addition of the selective catalytic reduction unit.

These estimates do not, however, take into account reductions other control technologies would provide.

PM₁₀ = particulate matter with median aerodynamic diameter of 10 micrometers or less.

The Clean Air Act requires that major air pollution sources undergoing construction or modification comply with all applicable Prevention of Significant Deterioration provisions (40 CFR 52.21) and nonattainment area New Source Review requirements. The State of Ohio has a fully approved regulatory structure to implement these requirements. The Prevention of Significant Deterioration and nonattainment area New Source Review rules require certain analyses before a facility can obtain a permit to begin construction. Air Products would comply with any applicable emissions limits. The Prevention of Significant Deterioration provisions apply to new major sources or major modifications at existing sources for pollutants in attainment areas for a criteria pollutant. The Prevention of Significant Deterioration regulations require the use of the best available control technology to minimize emissions of pollutants. New Source Review requires companies to obtain permits for new stationary sources of air pollution before beginning construction. New Source Review is also referred to as construction permitting or preconstruction permitting. Air Products would obtain a permit to begin construction and would comply with any applicable emissions limits.

Section 176(c)(1) of the Clean Air Act requires federal agencies to ensure that their actions conform to applicable implementation plans for the achievement and maintenance of the National Ambient Air Quality Standards for criteria pollutants (DOE 2000). To achieve conformity, a federal action must not contribute to new violations of standards for ambient air quality, increase the frequency or severity of existing violations, or delay timely attainment of standards in the area of concern. The EPA general conformity regulations (40 CFR Part 93, Subpart B) contain guidance for determining if a proposed federal action would cause emissions to be above specified levels in nonattainment or maintenance areas.

The Air Products plant would operate as an emissions source in accordance with State of Ohio regulations for individual point source emissions. The plant is located in a nonattainment area for 8-hour ozone and 24-hour PM_{2.5} levels. However, the proposed project would not exceed the threshold emission rate for those pollutants and would not represent 10 percent or more of the area's emissions inventory for those pollutants. Therefore, no conformity determination under the Clean Air Act would be necessary (DOE 2000).

Greenhouse Gas Emissions

The burning of fossil fuels, such as diesel and gasoline, emits carbon dioxide, which is a greenhouse gas. Greenhouse gases can trap heat in the atmosphere and have been associated with global climate change. The Intergovernmental Panel on Climate Change, in *Climate Change 2007: Synthesis Report, Summary for Policy Makers*, stated that warming of the earth's climate system is unequivocal, and that most of the observed increase in globally averaged temperatures since the mid-20th century is very likely due to the observed increase in concentrations of greenhouse gases from human activities (IPCC 2007). Greenhouse gases are well mixed throughout the lower atmosphere, such that any emissions would add to cumulative regional and global concentrations of carbon dioxide.

Because the proposed project would use waste energy rather than combustion of fossil fuels to generate about 100 megawatts per year of electricity (enough to serve about 80,000 households), there would be no increase in greenhouse gas emissions and no cumulative carbon impacts. The conversion of the blast furnace gas to steam to produce electricity would allow AK Steel (through the proposed Air Products project) to reduce its consumption of electricity from regional electric companies, which would result in a reduction in greenhouse gas emissions from regional power plants.

3.1.2.2 No-Action Alternative

Under the No-Action Alternative, DOE would not provide funding to Air Products for the proposed combined-cycle power generation plant, and DOE assumed for this EA that the project would not proceed without this assistance. There would be no increase in emissions of pollutants from the Air Products plant. However, there would be no beneficial decrease in regional emissions of pollutants from the use of the energy-efficient combined-cycle power generation plant.

3.2 Water Resources

Section 3.2.1 describes current conditions for groundwater, surface water, and wetlands and discusses the Middletown Works' use of water and subsequent discharge of wastewater. These form a basis of comparison for the impacts of Air Product's project in Section 3.2.2.

3.2.1 AFFECTED ENVIRONMENT

3.2.1.1 Surface Water

The Middletown Works is located within the Great Miami River watershed. The Great Miami River is about 1.5 miles west of the site boundary, and Dicks Creek is approximately 0.2 mile from the southern boundary of the Works.

The Middletown Works uses water for various purposes in the making of steel such as contact and noncontact cooling water, steam production, process gas scrubbing water, and rinse water. Overall, the Works uses about 16 million gallons of river water a day. The Works treats and disposes of its wastewater, including site storm water runoff, under a National Pollutant Discharge Elimination System permit to the Great Miami River at a rate of about 10 million gallons per day and to Dicks Creek at a rate of about 7 million gallons per day (AK Steel 2007). The Works currently has seven permitted wastewater discharge outfalls: five discharges to Dicks Creek, one discharge to North Branch Dicks Creek, and one discharge to the Great Miami River (Powell 2008).

The Ohio Environmental Protection Agency designated the Great Miami River for the following uses: warmwater habitat, agricultural water supply, industrial water supply, and primary contact recreation. The agency has designated Dicks Creek as modified warmwater habitat from river

mile 5.4 (Cincinnati-Dayton Road) to river mile 2.4 (Yankee Road); the remainder of Dicks Creek is designated as warmwater habitat. The entire length of Dicks Creek is designated for agricultural water supply, industrial water supply, and primary contact recreation. The North Branch of Dicks Creek is designated warmwater habitat from the headwaters to river mile 1.0 (Breiel Boulevard), and modified warmwater habitat from river mile 1.0 to the mouth. The entire length of North Branch is designated agricultural water supply, industrial water supply, and primary contact recreation. The State of Ohio lists portions of the Great Miami River on its list of impaired waters (Section 303(d) of the Clean Water Act). These segments do not meet the standards for their designated uses. Dicks Creek is not on the list of impaired waters.

Dicks Creek is part of an ongoing corrective action consent decree under the Resource Conservation and Recovery Act. The agreement committed AK Steel to specific actions to address polychlorinated biphenyl issues in Dicks Creek, which is south of Oxford State Road and flows into the Great Miami River. Remediation actions are ongoing. Chapter 4 further discusses the consent decree.

3.2.1.2 Groundwater

AK Steel currently withdraws about 2.5 million gallons of water a day from the Great Miami Buried Valley Aquifer for process water to supplement withdrawals from the Great Miami River; the plant does not use the aquifer as source for drinking water. The depth from the surface to the groundwater is about 20 feet, which makes it susceptible to surface contamination. The EPA designated this aquifer as a sole-source aquifer, and it is the principal source of drinking water for 1.6 million people. The aquifer consistently meets national standards for drinking water. The aquifer typically provides up to 200 million gallons a day for residents of nine counties including Butler, Warren, Hamilton, and Montgomery (USGS 2010).

3.2.1.3 Floodplains and Wetlands

The plant is not in a 100-year floodplain, which the Federal Emergency Management Agency designates. There is a small wetland on the western portion of the site classified by the National Wetland Inventory as palustrine, unconsolidated bottom, intermittently exposed, and excavated. The wetland covers about 3 acres and is located about 800 feet west of the edge of the proposed construction area (HUD 1979).

3.2.2 ENVIRONMENTAL CONSEQUENCES

3.2.2.1 Proposed Project

3.2.2.1.1 Construction Impacts

The two primary water resource concerns in relation to new construction at the Middletown Works would be soil erosion and storm water runoff. Ground-disturbing activities would include demolition of existing foundations and construction of new buildings and structures with impermeable surfaces. Because exposed soils are subject to erosion, increased runoff could

carry sediment into local waterways during precipitation events. Increased sedimentation in culverts, drainage systems, and waterways could impede surface water drainage from the site and increase the risk of flooding. However, Air Products would use appropriate erosion control and storm water management measures to reduce the impacts of erosion and increased runoff under the Middletown Work's current State of Ohio General Construction Storm Water Permit.

3.2.2.1.2 Operations Impacts

Surface Water

Air Products would use the Great Miami River as the main source of process water for the proposed project. The project would use somewhat over 1 million gallons a day, an increase of less than 10 percent over the existing plant's water use.

Wastewater from the proposed project would go to the Middletown Works onsite secondary treatment plant. After treatment, it would mix with noncontact cooling water and go to the Works discharge system (noncontact cooling water does not come into contact with contaminants). Sanitary wastewater would go to the Works sanitary treatment system. During operations, the Works would discharge about an additional 1 million gallons per day of wastewater under its existing permit to the Great Miami River. This small increase would be less than 10 percent of the quantity of wastewater the Works currently discharges into this river. There would be no change to the quality of the wastewater. The average flow of the Great Miami River is about 50 times more than the anticipated combined Air Products and AK Steel discharge. AK Steel would need a modified permit for the increase in quantity but not for water quality because the increased use would not result in a change in water quality.

Groundwater

The proposed project would not use groundwater for operations and would not use underground storage tanks. Therefore, impacts to groundwater availability and quality would be unlikely from normal operations. Air Products would develop a spill prevention and mitigation plan to prevent or mitigate the potential for and effects from accidental spills of contaminants under 40 CFR Part 112. Where appropriate, aboveground storage tanks would include secondary containment systems designed to contain spills or releases to minimize potential impacts.

Floodplains and Wetlands

None of the proposed construction activities would occur in a 100-year floodplain. The proposed project would not disturb the existing wetland within the plant boundary. Therefore, there would be no impacts on floodplains or wetlands from construction or operation of the proposed project.

3.2.2.2 No-Action Alternative

Under the No-Action Alternative, water use and wastewater generation would not increase. DOE does not expect impacts to surface water, groundwater, floodplains, or wetlands.

3.3 Waste

Section 3.3.1 provides waste generation estimates for current Middletown Works operations as a basis of comparison for the estimated amounts of waste Air Products would generate in Section 3.3.2.

3.3.1 AFFECTED ENVIRONMENT

The Middletown Works generates various solid wastes in the making of steel, including wastes from six onsite wastewater treatment plants. The treatment plants settle solids from Works operations including the blast furnace, hot strip mill, picklers, and the coating lines. (Section 3.2 discusses wastewater.)

The existing plant includes both aboveground and underground tanks to store products necessary for the manufacturing processes. The aboveground tanks store oil, acids, and other products. These tank systems include secondary containment to reduce air and water impacts from potential leaks or spills. The underground storage tanks store gasoline and kerosene. The Works does not store wastes that are subject to the Resource Conservation and Recovery Act in the underground storage tanks. Table 3-4 lists the types and amounts of industrial waste the Middletown Works currently generates.

Table 3-4. Current Middletown Works industrial waste.

Type	Amount
Recycled plant scrap (tons per year)	750,000
Hazardous waste (tons per year)	13,000
Solid waste to landfills (tons per year)	260,000
Waste injected underground (tons per year)	12,000

Source: Bates 2010f.

The Works operates two onsite Class I hazardous waste underground injection wells. The company uses these wells, which began operation in 1969, to dispose of spent pickle liquor, which consists of hydrochloric acid, iron salts, and water. The Works injects these waste streams into the lower Eau Claire Formation, the Mount Simon Sandstone Formation, and the Middle Run Formation at depths of over 2,900 feet underground (OEPA 2009), which is significantly below the depth of the Great Miami Buried Valley Aquifer.

3.3.2 ENVIRONMENTAL CONSEQUENCES

3.3.2.1 Proposed Project

3.3.2.1.1 Construction Impacts

Construction of the new Air Products power facilities would generate about 6,800 cubic yards of construction-related debris such as wood, metal, and concrete (Bates 2010g). Air Products would ship construction waste to the Stony Hollow Landfill in Dayton, Ohio (Bates 2010h). The amount of construction waste would not be large enough to impact the existing capacity of the landfill. AK Steel would shut down the boilerhouse but has not determined if it will demolish the facility.

3.3.2.1.2 Operations Impacts

The characteristics of the waste from the proposed project would be the similar to those the Works currently generates. During operations, Air Products would generate the following estimated amounts nonhazardous and municipal waste:

- 900 cubic yards per year of municipal waste,
- 1,600 to 2,000 gallons per year of used oil,
- 500 to 800 pounds per year of used oil filters, and
- 600 to 1,000 pounds per year of absorbents and rags (Bates 2010g).

Air Products would send all but the municipal waste to recycling facilities. The municipal waste would go to the Stony Hollow Landfill.

Under the proposed project, Air Products would use several hazardous chemicals on a regular basis including the following:

- Aqueous ammonia (about 25 percent ammonia and 75 percent water) stored in a 5,000-gallon aboveground storage tank (Bates 2010i),
- 300,000 gallons a year of chemicals for cooling tower treatment (Bates 2010j), and
- 200 cubic feet a year of metal catalyst for the selective catalytic reduction unit (Bates 2010g).

The only source of routine hazardous waste generation during operations would be the disposal of the used catalyst. Air Products would dispose of about 1,000 cubic feet of used catalyst every 5 years.

Although the amounts of hazardous waste from the project would be very small and the Air Products plant would likely qualify as a conditionally exempt small-quantity generator, Air

Products would ship all hazardous waste to one or more treatment, storage, or disposal facilities permitted under the Resource Conservation and Recovery Act.

The Air Products plant would not affect the Works' waste disposal programs. The Works would continue to send hazardous waste off the site for treatment or disposal.

3.3.2.2 No-Action Alternative

Under the No-Action Alternative, waste generation would not increase. Waste levels would remain about the same as those of current operations.

3.4 Socioeconomics

3.4.1 AFFECTED ENVIRONMENT

Middletown is in Butler County, Ohio. Butler County is part of the Bureau of the Census's Metro/Micro Area 17140, the Cincinnati-Middletown, OH-KY-IN Metropolitan Statistical Area. Butler County's estimated population of about 360,000 persons in 2008 reflects an 8.4 percent growth since 2000 (Bureau of the Census 2010). In 2008, the Butler County population was 89.4 percent white, 7.0 percent black, 2.1 percent Asian, and 0.2 percent American Indian or Alaskan Native. About 1.3 percent of the population reported themselves as being of two or more races. Persons of Hispanic or Latino origin made up 2.7 percent of the population (Bureau of the Census 2010).

The county's employment figures reflect the urban nature of the community; the county hosted about 190,000 nonfarming jobs in 2007 of which about 21,000 jobs (11 percent) were in manufacturing (BEA 2009a). In 2000, Butler County residents held about 68 percent of the total jobs. People who lived elsewhere in the 15-county metropolitan statistical area held about 26 percent, and people who lived outside that area held the remainder (Bureau of the Census 2008). The county's December 2009 labor force had an unemployment rate of 9.9 percent, which was slightly less than the state's rate of nearly 11 percent that month (BLS 2010).

The 2007 per capita income in Butler County of about \$34,000 was 98 percent of the State of Ohio per capita income (BEA 2009b). In 2008, about 12 percent of County residents and 13 percent of Ohio residents were living in poverty (Bureau of the Census 2010).

3.4.2 ENVIRONMENTAL CONSEQUENCES

The proposed project would create direct jobs at the AK Steel Middletown Works facility during both construction and operations. These new jobs would create indirect jobs via the multiplier effect, in which the wages workers spend create the need for additional jobs (BEA 2009). Indirect jobs include professional, skilled, and unskilled positions; they would occur among suppliers of goods and services and for the vendors of materials those suppliers would use to fashion goods and services. Earnings by workers in these direct and indirect jobs would generate

wages the local, state, and federal governments would tax. In addition, these wages would lead to an increase in banking deposits, which would increase the community lending base, and to local spending on consumable and durable goods and services. The increase in jobs and wages in the community would have a small positive impact.

The current level of employment at the Middletown Works is lower than historical job levels. While short-term construction of facilities and the installation of equipment for the proposed project would result in a small increase in jobs, the total workforce in Butler County would remain below previous levels. Therefore, DOE expects that all workers in new positions would be part of the existing labor force in the Cincinnati-Middletown OH-KY-IN Metropolitan Statistical Area. It is unlikely the additional jobs would cause a noticeable increase in the local population from workers moving into the area. Therefore, impacts to the existing infrastructure, housing, medical care, social services, police and fire protection, schools, or other community services would be unlikely, and DOE does not address these resources further.

3.4.2.1 Proposed Project

3.4.2.1.1 Construction Impacts

To launch this proposed project, Air Products directly employed 59 new workers (Bates 2010k) over 8 months to complete the preliminary field, environmental, design, and engineering work. These positions supported about 52 additional indirect jobs via the multiplier effect. Therefore, about 111 positions are attributable to the preconstruction phase of this proposed project.

The procurement of materials, construction of facilities, installation of equipment, and project startup at the Middletown Works would take about 33 months (Bates 2010k). Construction would require an annual average of about 338 directly employed workers (Bates 2010k). These positions would create about 315 additional indirect jobs. Therefore, the Butler County area would have about 653 new jobs (338 direct and 315 indirect) during each year of construction activities. The 653 jobs would represent about 0.34 percent of the nonfarm employment in Butler County in 2007 (BEA 2009a). The short duration of these positions would result in a smaller indirect effect than that during operations.

Air Products estimates the cost of procurement, construction, and startup would be about \$315 million (Bates 2010a). The estimated total earnings effect of the expenditure by the applicant would be about \$570 million in the region. Much of the construction-related spending would directly benefit the suppliers of equipment for the plant and the vendors who would provide materials and services for manufacture of the equipment. The 653 indirect jobs would include employees these companies would retain or hire.

3.4.2.1.2 Operations Impacts

DOE assumed that all directly created jobs for the proposed project would be new jobs. That is, DOE assumed Air Products would hire new workers to operate the plant. The proposed project

would create 14 direct jobs at the plant during operations (Bates 2010k). In turn, these jobs would generate about 33 indirect jobs for a total of 47 new jobs. The direct and indirect jobs would include positions for professional, skilled, and unskilled individuals. The 47 jobs would represent about 0.02 percent of the nonfarm employment in Butler County in 2007 (BEA 2009a). The aggregate number of jobs would have a small positive impact on the labor force by creating job opportunities that could reduce unemployment and increase labor participation. DOE expects that residents of Butler County would fill most of the direct and indirect jobs.

In addition, the benefits of the proposed project would extend to current Middletown Works jobs. The anticipated reduction of overhead, maintenance, and fuel expenses at the Works would improve the company’s financial position, which would help to preserve about 2,000 skilled jobs in the community’s steel industry (Bates 2010k).

In summary, the proposed project would create new direct and indirect jobs, aid in the retention of jobs in a critical manufacturing process, and stimulate the economic base of the community. Table 3-5 summarizes this information.

Table 3-5. New direct and indirect jobs and earnings effects.

Project period	Direct jobs ^a	Indirect jobs ^b	Total jobs
Preconstruction	59	52	111
Construction	338	315	653
Operations	14	33	47
Totals	411	400	811
Earnings effects			
Direct community infusion \$315 million	Indirect community infusion \$255 million	Total community infusion \$570 million	

Source: Bates 2010a,k.

a. Air Products jobs.

b. Jobs in the general community.

3.4.2.2 No-Action Alternative

The No-Action Alternative would result in no Recovery Act grant and the potential environmental impacts of using the Recovery Act funding for the capture and conversion of blast furnace gas into usable energy (steam and electricity) at the Middletown Works would not occur. In addition, the potential positive benefits of the proposed project, including the creation of direct and indirect jobs, would not occur.

3.5 Occupational Health and Safety

3.5.1 AFFECTED ENVIRONMENT

Air Products maintains a comprehensive health and safety management system at each of its facilities and would apply the same type of system at the Middletown Works. Engineering controls would be in place to prevent injuries and to control employee exposure to hazards in the workplace. The company would provide comprehensive safety training to new employees and

additional periodic training for current workers. Air Products would maintain safety professionals to provide support and direction to plant employees and management (Air Products 2008).

3.5.2 ENVIRONMENTAL CONSEQUENCES

3.5.2.1 Proposed Project

3.5.2.1.1 Construction

Air Products would conduct minimal site preparation activities including the removal of small existing foundation elements and concrete pads. The proposed structures and buildings would cover about 80 percent of the site.

The total recordable cases incidence rate in 2008 for nonresidential building construction jobs was 4.4 injuries per 100 full-time employees, and the incidence rate for days away from work, days of restricted work activity, or job transfer was 2.2 injuries per 100 full-time employees (BLS 2009). The estimated construction workforce for this project would be about 338 employees (Section 3.4.2). DOE expects workplace accident rates would be typical of industry averages. Table 3-6 lists estimated numbers of injuries during construction.

Table 3-6. Estimated number of injuries during construction.

Injury category	Estimated annual injuries
On-duty injuries ^a	14.9
Off-duty or restricted-duty injuries ^{a,b}	7.4

a. Based on 2008 nonresidential building construction industry average of 4.4 on-duty worker injuries per 100 full-time workers.

b. Includes worker injury incidence rate for day away from work and on job transfers; based on 2008 nonresidential building construction industry average of 2.2 off-duty worker injuries per 100 full-time workers.

In addition, if Air Products discovered contaminated material during site preparation and construction activities, the company would immediately halt ongoing work for the safety of its workers and to prevent the spread of contamination. Air Products would notify AK Steel, who would make required notifications to the Ohio Environmental Protection Agency under the federal consent decree (see Chapter 4). Resumption of construction activities would only occur following the investigation of the contaminated areas and the identification of appropriate corrective actions consistent with the requirements of the Resource Conservation and Recovery Act and the AK Steel federal consent decree.

3.5.2.1.2 Operations

From a health and safety perspective, the proposed operations would be similar to existing operations in other Air Products locations. It is unlikely that the proposed project would result in a deviation from Air Products' health and safety record. The company maintains and tracks health and safety information on its employees on a regular basis. Air Products' total

Occupational Safety and Health Administration recordable injury rate for 2009 was 0.72 per 200,000 work hours, which was down from 1.07 in 2007; the industry rate in 2007 (the latest available data) was 3.10. The proposed project would require 14 full-time operational employees. Table 3-7 lists estimated numbers of injuries during operations.

Table 3-7. Estimated number of injuries during operations.

Injury category	Estimated annual injuries
On-duty injuries based on 2009 Air Products ^a	0.15
On-duty injuries based on 2007 Air Products injury rate ^b	0.10
On-duty injuries based on industry-wide injury rate ^c	0.43

- a. Air Products experienced 0.72 injuries per 200,000 worker-hours in 2009.
- b. Air Products experienced 1.07 injuries per 200,000 worker-hours in 2007.
- c. The industry-wide average was 3.1 injuries per 200,000 worker-hours in 2007.

Since 2007, the Occupational Safety and Health Administration has conducted audits at eight of Air Products’ facilities and identified three violations. Air Products addressed those violations and the Administration has closed them.

3.5.2.2 No-Action Alternative

Under the No-Action Alternative, the proposed project would not occur and Air Products would not hire new employees for construction or operations at the Middletown Works. Therefore, there would be no impacts to health and safety from the proposed project.

3.6 Resource Commitments

3.6.1 RELATIONSHIP BETWEEN SHORT-TERM USES OF THE ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

The construction and operation of a combined-cycle power generation plant at the Middletown Works would result in short-term uses of land. In this context, short-term use of resources means the operating life of the plant and long-term productivity refers to the period after the plant has ceased operation and undergone decommissioning and demolition. At that time, the land could be occupied and used for other industrial purposes, or it could be reclaimed and revegetated to resemble predisturbance conditions.

3.6.2 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

The use of land as a resource to support the construction and operation of the proposed plant would be irretrievable in the short-term. Some unrecyclable construction materials and the fuel for plant construction and operation would be irreversible and irretrievable commitments of resources.

3.6.3 UNAVOIDABLE ADVERSE IMPACTS

The proposed plant would result in the unavoidable small adverse impacts of generating air pollutants and small quantities of wastewater. The small unavoidable impacts would be offset by the positive impacts of reducing nitrogen oxide emissions and the conversion of blast furnace waste gas to electricity. This could result in reduced emissions from conventional fossil-fuel generating facilities.

4. CUMULATIVE IMPACTS

Cumulative impacts result from the incremental effects the proposed project could have in combination with the impacts of past, present, and reasonably foreseeable actions. The proposed project would construct and operate a combined-cycle facility within AK Steel's existing Middletown Works, which occupies about 2,800 acres of land in Middletown, Ohio. The Works site has been in use for heavy industry for about 100 years. The affected environment descriptions, which form the existing baseline conditions for comparison to the proposed project, include Works operational air emissions (Section 3.1), water use (Section 3.2), and waste generation (Section 3.3). Air Products would construct the plant on two previously disturbed parcels totaling about 10 acres within the Middletown Works site boundary. The proposed site offers sufficient access, onsite roads, and infrastructure to accommodate the new plant.

4.1 Present Actions

Current Operations. Past environmental impacts from historical Middletown Works operations have already passed through the environment or are captured as part of the existing baseline conditions as noted above. For most environmental resource areas, there would be no incremental impacts or the impacts would be small, temporary, or both (Section 1.4).

Legacy Contamination. At present, the Middletown Works operates under a consent decree from the EPA pursuant to the corrective action requirements under the Resource Conservation and Recovery Act. In April 2006, AK Steel entered into the consent decree with the United States of America, the State of Ohio, the Sierra Club, and the National Resource Defense Council that should result in environmental improvements in and around the Middletown Works site. The agreement committed AK Steel to specific actions to address polychlorinated biphenyl issues in Dicks Creek, which is south of Oxford State Road and flows into the Great Miami River. Remediation activities are ongoing. The agreement included the implementation of several environmental studies and testing of soils, groundwater, and other media on and off the site as well as a corrective measures study to evaluate alternative cleanup methods. AK Steel instituted interim measures for Dicks Creek during the environmental evaluation process to remove sediment contaminated with polychlorinated biphenyls from a 2.5-mile stretch of Dicks Creek and the last 0.7 mile of Monroe Ditch, and to remove contaminated soil in the Dicks Creek floodplain. Monroe Ditch is a tributary to Dicks Creek that runs through a slag processing area near the plant. AK Steel issues periodic fact sheets on current progress and status under the consent decree (AK Steel 2006); completion of remediation is dependent on the successful achievement of specific contaminant removal. DOE does not expect that the proposed construction and operation of a combined-cycle power generation plant on the Middletown Works site would contribute to or alter the legacy contamination issues on the site.

AK Steel is undertaking a facility investigation and corrective measures study at the Middletown Works. The preliminary list of areas of interest identified 13 solid waste management units and 8 areas of concern. Air Products would locate the proposed plant in a Middletown Works area

termed the Melt Plant area. There have been no investigative studies of the proposed Air Products plant site, but AK Steel believes the area to be free of contamination. The nearest area of concern is the site of a polychlorinated biphenyl transformer building about 2,000 feet north of the proposed site (Weber 2006). If Air Products discovered contaminated material during site preparation and construction activities, the company would immediately halt ongoing work for the safety of its workers and to prevent the spread of contamination. Air Products would notify AK Steel, who would make required notifications to the Ohio Environmental Protection Agency under the federal consent decree. Resumption of construction activities would only occur following the investigation of the contaminated areas and the identification of appropriate corrective actions consistent with the requirements of the Resource Conservation and Recovery Act and the AK Steel federal consent decree.

4.2 Reasonably Foreseeable Actions

Middletown Coke Company Plant. The Middletown Coke Company received a final air permit from the Ohio Environmental Protection Agency for its plan to operate a heat recovery coke-making facility near the Middletown Works site (Korleski 2010). The permit was issued under the Prevention of Significant Deterioration provisions and nonattainment area New Source Review requirements. Middletown Coke Company expects the plant would operate below the applicable standard because it based its future emissions estimates on maximum potential emissions.

The plant would provide coke to the Works for use in steel making. The operation would include coal handling, charging, heat recovery coking, pushing, quenching, coke handling, and coke storage. Middletown Coke Company would construct the plant on a 157-acre site off Yankee Road less than a mile from the Middletown Works.

At design capacity, the facility would coke as much as 910,000 tons per year of coal and produce as much as 614,000 tons per year of furnace coke. The plant would produce about 52 megawatts of electricity that Middletown Coke Company would sell to electric companies (Korleski 2010).

American Indian Artifacts. American Indian artifacts from the Archaic and Woodland periods, between 10,000 and 800 years ago, were discovered during preliminary work at the site of the proposed Middletown Coke Company plant. The company hired an archaeological firm to complete excavation. Several hundred prehistoric artifacts were recovered, mostly evidence of stone tool-making and fragments from arrow and spear heads. The area is believed to have been used for tool maintenance and not as a settlement. The Ohio State Historic Preservation Office indicated that Middletown Coke Company complied with all of the procedures of the National Historic Preservation Act (16 U.S.C. 470 et seq.) (Heffner 2009b).

AK Steel Coke Conveyor. AK Steel has applied to the Ohio Environmental Protection Agency for a construction air permit to construct an aboveground conveyor system that would transport coke from the proposed Middletown Coke Company plant to the Works (Ahern 2009). The

conveyor system would connect to Middletown Coke Company's own 400-foot section and then transport coke another one-third mile to a loading station at the Works (Heffner 2009c).

Cumulative impact considerations, as noted above, include the Middletown Works operations and those of the proposed coke-making plant near the Works. AK Steel would construct a conveyor between the new plant and the Works. Given the potential impacts of the above-listed actions and the potential impacts of the proposed Air Products project (see Chapter 5), DOE has determined there would be no or minimal cumulative effects from combination of these projects.

5. CONCLUSIONS

Air Products' proposed project would construct and operate a combined-cycle power generation plant on AK Steel's existing Middletown Works site in Middletown, Ohio, which occupies about 2,800 acres. The proposed project would occupy two parcels of previously disturbed land totaling about 10 acres. The buildings and structures for the project would cover about 80 percent of the 10 acres.

In this EA, DOE considered (1) the Proposed Action of providing a Recovery Act financial assistance grant in a cost-sharing arrangement with Air Products, (2) Air Products' proposed project to capture blast furnace flare gas and process the waste energy into process steam and electricity, and (3) the No-Action Alternative.

The analyses for this EA considered all the environmental resource areas DOE typically includes in NEPA documents. Nine of the 14 environmental resource areas were not carried forward for additional analysis because DOE determined there would be no impacts or the potential impacts would be small or temporary in nature, or both. As a consequence, DOE focused its analyses on those resource areas that could require new or amended permits, have the potential for significant impacts or controversy, or typically interest the public, such as socioeconomics and occupational health and safety. These resource areas are:

- Air quality,
- Water resources,
- Waste,
- Socioeconomics, and
- Occupational health and safety.

In addition, DOE consulted with the Ohio State Historic Preservation Office and determined that the proposed project would have no impact on historic properties.

DOE also reviewed the list of federally threatened and endangered species and their habitat requirements in Butler County, Ohio, and determined there would be no impacts to threatened or endangered species.

The proposed project would have the beneficial impact of recovering waste energy and converting it into process steam and electricity for use at the plant. The startup of the proposed facility would allow AK Steel to shut down four steam boilers. Gas flaring would then occur only intermittently, generally when a facility required maintenance. Air emissions from the proposed project at the Middletown Works would remain about the same as current emissions, with the exception of a reduction in nitrogen oxides. The proposed project would generate about 105 megawatts of electricity (enough to serve about 80,000 households), and there would be no increase in greenhouse gas emissions because the plant would use existing waste energy for generation unlike conventional electricity plants such as those that burn fossil fuels.

The Middletown Works is located in the Great Miami River watershed and discharges wastewater to North Branch Dicks Creek, Dicks Creek, and the Great Miami River. The North Branch flows to Dicks Creek, and Dicks Creek flows to the Great Miami River. The proposed project would have a small impact (less than a 10-percent increase) on the quantity of wastewater the Works discharges to the Great Miami River, and there would be no change in the quality of that wastewater. Air Products proposed project would not involve discharges to Dicks Creek or the North Branch. The flow of the Great Miami River is about 50 times higher than the discharge would be under combined AK Steel and Air Products operations. The current Middletown Works National Pollutant Discharge Elimination System permit would require modification for quantity but not quality.

Air Products would not use groundwater for operations and there would be no underground storage tanks for the proposed project. Therefore, impacts to groundwater availability and quality would be unlikely from normal operations. Air Products would prevent or mitigate potential impacts from accidental spills of contaminants by developing and following a spill prevention and mitigation plan.

None of the proposed construction activities would occur in a 100-year floodplain, and the proposed project would not disturb the existing wetland within the AK Steel plant boundary.

Construction for the proposed project would generate construction-related debris such as wood, metal, and concrete. Air Products would ship construction waste to a licensed commercial landfill or recycling facility. During normal operations, Air Products would generate nonhazardous and municipal waste in small quantities that would not affect regional landfills or treatment plants. The only source of routine hazardous waste during operations would be the disposal of spent catalyst from the selective catalytic reduction unit. The company would dispose of and replace about 1,000 cubic feet of spent catalyst every 5 years. Although hazardous waste generation would be very small, Air Products would send all hazardous waste to a certified treatment, storage, or disposal facility in compliance with the Resource Conservation and Recovery Act.

The proposed project would have the beneficial impact of creating new direct and indirect jobs during construction and operations, aiding in the retention of jobs in a critical manufacturing process and stimulating the economic base of the local community. DOE expects that members of the community's existing labor force would fill the new jobs. DOE does not expect adverse impacts to the existing infrastructure or social services.

Air Products maintains a comprehensive health and safety management system at each of its facilities that would include the proposed plant at the Middletown Works. DOE expects that the workplace accident rates during the construction period would be typical of industry averages. The proposed project when completed would be similar to other Air Products existing operations from a health and safety perspective. The proposed project would be unlikely to result in a

deviation from Air Products' health and safety record. Air Products' total recordable injury rate has been consistently below the industry average.

Cumulative impact considerations included the operations of the Middletown Works and activities of a proposed coke-making plant that Middletown Coke Company would construct on a 157-acre parcel of land near the Middletown Works. That project would include a conveyor between the Middletown Coke Company facility and the Works. Because of the conclusions of the impact analyses above, DOE determined there would be no or minimal cumulative effects from these projects.

6. REFERENCES

- Ahern, M. W., 2009, "Draft Air Pollution Permit-To-Install," letter to S. Francis (AK Steel Corporation), Ohio Environmental Protection Agency, Columbus, Ohio, June 1.
- Air Products (Air Products and Chemicals), 2008, *Occupational Health and Safety Management System*, 25-010130, Allentown, Pennsylvania, May 13.
- AK Steel (AK Steel Corporation), 2006, *Environmental Consent Decree*, Middletown, Ohio, October.
- AK Steel (AK Steel Corporation), 2007, *National Pollutant Discharge Elimination System (NPDES) Permit Program Factsheet Regarding an NPDES Permit To Discharge to Waters of the State of Ohio for AK Steel Corporation*, Middletown, Ohio, October 16.
- AK Steel (AK Steel Corporation), undated, "AK Steel, Middletown Works," Middletown, Ohio, accessed April 13, 2010. http://www.aksteel.com/production_facilities/fac_pop_mid.html
- Bates, D. E., 2010a, "Middletown CoGen Project," memorandum to B. Craig (Dade Moeller & Associates), Air Products and Chemicals, Allentown, Pennsylvania, March 8.
- Bates, D. E., 2010b, "RE: SHPO Letter," e-mail to B. Craig (Dade Moeller & Associates), Air Products and Chemicals, Allentown, Pennsylvania, March 4.
- Bates, D. E., 2010c, "Middletown Energy Recovery - Noise," e-mail to B. Craig (Dade Moeller & Associates), Air Products and Chemicals, Allentown, Pennsylvania, March 29.
- Bates, D. E., 2010d, "Middletown Waste Energy Recovery Project - Access Roads," e-mail to B. Craig (Dade Moeller & Associates), Air Products and Chemicals, Allentown, Pennsylvania, April 12.
- Bates, D. E., 2010e, "Bates Comments on Air Quality Section for Middletown CoGen," e-mail to B. Craig (Dade Moeller & Associates), Air Products and Chemicals, Allentown, Pennsylvania, March 24.
- Bates, D. E., 2010f, "Middletown CoGen Waste and Water Sections and a newspaper," e-mail to B. Craig (Dade Moeller & Associates), Air Products and Chemicals, Allentown, Pennsylvania, March 24.
- Bates, D. E., 2010g, "Municipal/Solid Waste Generation for Middletown CoGen," e-mail to B. Craig (Dade Moeller & Associates), Air Products and Chemicals, Allentown, Pennsylvania, March 14.

Bates, D. E., 2010h, "Middletown Energy Recovery Project - Non-hazardous Waste Disposal," e-mail to B. Craig (Dade Moeller & Associates), Air Products and Chemicals, Allentown, Pennsylvania, March 29.

Bates, D. E., 2010i, "RE: Bates Comments on Air Quality Section for Middletown CoGen," e-mail to B. Craig (Dade Moeller & Associates), Air Products and Chemicals, Allentown, Pennsylvania, March 24.

Bates, D. E., 2010j, "RE: Followup DOE Questions on Middletown Waste Energy Recovery Project," e-mail to B. Craig (Dade Moeller & Associates), Air Products and Chemicals, Allentown, Pennsylvania, April 7.

Bates, D. E., 2010k, "Middletown Energy Recovery Project - Socioeconomic Background," e-mail to B. Craig (Dade Moeller & Associates), Air Products and Chemicals, Allentown, Pennsylvania, March 29.

BEA (Bureau of Economic Analysis), 2009a, "Table CA25N-Total full-time and part-time employment by NAICS industry, Butler County," U.S. Department of Commerce, Washington, D.C., December 21, accessed March 2, 2010. <http://www.bea.gov/>

BEA (Bureau of Economic Analysis), 2009b, "Table CA1-3 Per capita personal income, Counties in Ohio," U.S. Department of Commerce, Washington, D.C., accessed March 2, 2010. <http://www.bea.gov/>

BLS (Bureau of Labor Statistics), 2009, "Table 1: Incidence Rates - Detailed Industry Level - 2008," U. S. Department of Labor, Washington, D.C., October 29, accessed March 29, 2010. <http://www.bls.gov/iif/oshwc/osh/os/ostb2071.txt> OS TB 10/29/2009

BLS (Bureau of Labor Statistics), 2010, "Local Area Unemployment Statistics, Ohio, Butler County, and Cincinnati-Middletown, OH-KY-IN MSA," U.S. Department of Commerce, Washington, D.C., accessed February 24, 2010. <http://data.bls.gov/>

Bureau of the Census, 2008, "Residence County to Workplace County Flows for Ohio: Sorted by Workplace State and County, Ohio," U.S. Department of Commerce, Washington, D.C., accessed March 2, 2010. http://www.census.gov/population/www/cen2000/commuting/files/2KWRKCO_OH.xls.

Bureau of the Census, 2010, "State and County QuickFacts, Butler, Ohio," U.S. Department of Commerce, Washington, D.C., February 23, accessed March 24, 2010. <http://quickfacts.census.gov/qfd/states/39/39017.html>

DOE (U.S. Department of Energy), 2000, *Clean Air Act General Conformity Requirements and the National Environmental Policy Act Process*, Office of Environment, Safety and Health, Washington, D.C., April.

EPA (U.S. Environmental Protection Agency), 2009, "County Air Quality Report – Criteria Air Pollutants," Washington, D.C., accessed May 25, 2010. <http://www.epa.gov/air/data/geosel.html>

EPA (U.S. Environmental Protection Agency), 2010, "Technology Transfer Network, Clearinghouse for Inventories & Emissions Factors," accessed May 24, 2010. <http://cfpub.epa.gov/webfire/>

FWS (U.S. Fish and Wildlife Service), 2009, *County Distribution of Ohio's Federally Threatened, Endangered, Proposed and Candidate Species*, Ohio Field Office, Columbus, Ohio, November.

Heffner, J., 2009a, "First-Ever Bald Eagle's Nest Found in Butler County," *Dayton Daily News*, Dayton, Ohio, February 11.

Heffner, J., 2009b, "American Indian Artifacts Unearthed on Coke Plant Site," *Middletown Journal*, Middletown, Ohio, December 30.

Heffner, J., 2009c, "Residents Concerned About Coke Conveyer Emissions," *Middletown Journal*, Middletown, Ohio, July 6.

HUD (U.S. Department of Housing and Urban Development), 1979, "FIRM, Flood Insurance Rate Map, City of Middletown, Ohio, Butler County," Community - Panel Number 390040 0002 B, Federal Insurance Administration, Washington, D.C., March 2, accessed May 24, 2010. <http://msc.fema.gov>

IPCC (Intergovernmental Panel on Climate Change), 2007, *Climate Change 2007: Synthesis Report, Summary for Policy Makers*, Geneva, Switzerland.

Joseph, J., 2010, "Estimate of Emissions from Middletown CoGeneration Project," memorandum to B. Bates (Air Products and Chemicals), URS Corporation, San Francisco, California, March 22.

Joyce, J., R., 2009, "U.S. Department of Energy Environmental Questionnaire," Air Products and Chemicals, Allentown, Pennsylvania, July 13.

Korleski, C., 2010, "Final Air Pollution Permit-To-Install," letter to D. Pack (Middletown Coke Company), Ohio Environmental Protection Agency, Columbus, Ohio, February 9.

OEPA (Ohio Environmental Protection Agency), 2009, *Ohio Environmental Protection Agency Division of Drinking and Ground Waters Underground Injection Control Fact Sheet*, Division of Drinking and Ground Waters, Columbus Ohio, March 2.

Powell, L. H., 2008, *Ohio Environmental Protection Agency Authorization to Discharge Under the National Pollutant Discharge Elimination System*, Ohio Environmental Protection Agency, Assistant Director, Columbus, Ohio, October 3.

References

Tibells, A. L., 2010, "RE: Bald Eagles in Butler County," e-mail to B. Craig (Dade Moeller & Associates), Ohio Environmental Protection Agency, Ohio Division of Wildlife, Oak Harbor, Ohio, June 8.

USGS (U.S. Geological Survey), 2010, "National Water-Quality Assessment Program: Great and Little Miami River Basins," U.S. Department of the Interior, Washington, D.C., accessed May 24, 2010. <http://oh.water.usgs.gov/miam/Background.html>

Weber, H. J., 2006, "Attachment 2, RCRA Facility Investigation/Corrective Measures Study Scope of Work," Case 1:00-cv-00530-HJW, Document 369, U.S. District Court for the Southern District of Ohio, Western Division.

APPENDIX A DISTRIBUTION LIST

Mr. David E. Bates
Air Products and Chemicals, Inc.
7201 Hamilton Boulevard
Allentown, Pennsylvania 18195

Mr. Michael Brune
Executive Director
Sierra Club National Headquarters
85 Second Street, 2nd Floor
San Francisco, California 94105

Mr. Dale Bryk
Air and Energy Program Director
Natural Resources Defense Council
40 West 20th Street
New York, New York 10011

Mr. Mark Epstein
Ohio Historic Preservation Office
1982 Velma Avenue
Columbus, Ohio 43211-2497

Mr. Ned Ford
Consultant for Statewide Energy Efficiency and Utility Initiatives
The Sierra Club Ohio Chapter
131 North High Street, Suite 605
Columbus, Ohio 43215

Mr. Kevin Haggerty
U.S. Department of Energy
Freedom of Information Act Reading Room
1000 Independence Avenue, SW, 1-G-033
Washington, DC 20585

Dr. Mary Knapp
U.S. Fish and Wildlife Service
Ohio Ecological Services
4625 Morse Road, Suite 104
Columbus, Ohio 43230

The Honorable Larry Mulligan, Jr.
Mayor of Middletown
One Donham Plaza
Middletown, Ohio 45042-1901

Ohio Power Siting Board
180 East Broad Street
Columbus, Ohio 43215-3707

Mr. Larry Schutte
Middletown Works Project Manager
AK Steel Corporation
703 Curtis Street
Middletown, Ohio 45044

Ms. Laurie Stevenson
Ohio Environmental Protection Agency
Deputy Director for Business Relations
50 West Town Street, Suite 700
Columbus, Ohio 43216-1049

The Honorable Ted Strickland
Governor of Ohio
77 South High Street, 30th Floor
Columbus, Ohio 43215-6108

Middletown Coke Company
Parkside Plaza
11400 Parkside Drive
Knoxville, Tennessee 37934

Mr. Ken Westlake
U.S. Environmental Protection Agency
NEPA Implementation Office of Compliance and Assurance
77 West Jackson Boulevard, Mail Code E-19J
Chicago, Illinois 60604-3590

Mr. Tom Winston
Chief, Office of Federal Facility Oversight
Ohio Environmental Protection Agency
401 East Fifth Street
Dayton, Ohio 45402-2911

Ms. Jo Ann Yuill
U.S. Department of Energy
National Environmental Technology Laboratory Reading Room
P.O. Box 10940
Pittsburgh, Pennsylvania 15236

APPENDIX B CONSULTATIONS AND COMMENTS

This appendix contains a copy of the consultation letter from DOE to the Ohio State Historic Preservation Office (page B-1) and that office's response (page B-16). In addition, it contains copies of the comment letters DOE received from the Ohio Environmental Protection Agency (page B-17) and the U.S. Fish and Wildlife Service (page B-19).



NATIONAL ENERGY TECHNOLOGY LABORATORY
 Albany, OR • Morgantown, WV • Pittsburgh, PA



March 17, 2010

Mr. Mark J. Epstein
 Department Head
 Ohio Historic Preservation Office
 Resource Protection and Review
 1982 Velma Avenue
 Columbus, Ohio 43211-2497

Dear Mr. Epstein:

The U.S. Department of Energy (DOE or the Department) is proposing to provide a financial grant to Air Products & Chemicals, Inc. (Air Products), as part of the Industrial Technologies Program, funded through the *American Recovery and Reinvestment Act of 2009* (Recovery Act). If funded, Air Products would construct and operate a 110 megawatt combined cycle power generation plant that would capture and process the blast furnace topgas from AK Steel's Middletown, Ohio, Middletown Works facility (the proposed undertaking). The new power generating plant would be collocated on AK Steel's Middletown Works site and would involve approximately 10 acres of land previously disturbed by concrete pads and graveled areas. The existing 2,791-acre Middletown Works site is located at 1801 Crawford Street, Middletown, Butler County, Ohio.

The Department has attached a completed *Ohio Historic Preservation Office: Resource Protection and Review – Section 106 Review – Project Summary Form* to assist your review of this proposed project. Also included is an attachment providing the additional information requested in the form, as well as maps, and a photograph.

Based on internal scoping consistent with Section 3 of the form (Identification of Historic Properties), DOE has identified the following *National Register of Historic Places* properties listed within Middletown, Butler County, Ohio.

Name	Address	Reference No.	City	County
Great Mound	Address Restricted	71000633	Middletown	Butler
Hughes Manor	5894 Hamilton-Lebanon Road	94000242	Middletown	Butler
South Main Street District	South Main Street	78002015	Middletown	Butler
John B. Tylus House	300 South Main Street	75001335	Middletown	Butler

Reference numbers are from the National Register database at <http://www.nps.gov/nr/research/index.htm>.

With regard to buildings over 50 years old, there are no buildings of any kind on the proposed 10-acre construction site (the area of potential impact). Regarding buildings on the larger host site, Middletown Works, AK Steel believes there are buildings 50 or more years old but has not conducted a building inventory or survey. All buildings have been used in a heavy-industry environment since their construction and have no remarkable architectural features. The site has hosted industrial operations for about 100 years. No existing buildings would be directly affected by the construction and operation of the proposed project.

3610 Galins Ferry Road, P.O. Box 680, Morgantown, WV 26507

Concerning indirect impacts, as noted in the attachment to this letter, potential construction noise would be temporary, and additional noise from plant operations would not increase ambient noise beyond existing levels. From a visual resources standpoint, views from within the host site, or from outside the site boundary, would not result in major changes to the existing visual characteristics of the site.

Based on DOE's analysis as documented in this letter and its attachments, DOE has determined that no historic properties will be affected by this proposed project. In compliance with 36 CFR Part 800.4(d) (1), the Department asks the Ohio Historic Preservation Office's for its concurrence of this finding.

DOE's National Energy Technology Laboratory is preparing a draft environmental assessment (EA) for this project. DOE will include correspondence with your office in an appendix to the EA. DOE will send you a copy of the draft EA and respond to any specific comments you may have. At this time, we anticipate implementing a 15-day public comment period for this proposed project.

Please forward the results of your review and any requests for additional information to Mark Lusk of the Department's National Energy Technology Laboratory using the contact information provided in the attached form. Since this is a Recovery Act project, we would appreciate a quick response to our request for consultation. If you have any questions or require clarification, please contact me at (301) 285-4145 or at mark.lusk@nrel.doe.gov. Thank you in advance for your consideration.

Sincerely,



Mark Lusk
NEPA Document Manager

Attachments



**OHIO HISTORIC PRESERVATION OFFICE:
RESOURCE PROTECTION AND REVIEW**

Section 106 Review - Project Summary Form

For projects requiring a license from the Federal Communications Commission, please use FCC Forms 620 or 621. DO NOT USE THIS FORM.

SECTION 1: GENERAL PROJECT INFORMATION

All contact information provided must include the name, address and phone number of the person listed. Email addresses should also be included, if available. Please refer to the instructions or contact an OHPO reviewer (mailto:Section106@ohiohistory.org) if you need help completing this Form. Unless otherwise requested, we will contact the person submitting this Form with questions or comments about this project.

Date: **March 15, 2010**

Name/Affiliation of person submitting form: **Mark W. Lusk, U.S. Department of Energy (DOE)**

Mailing Address: **3610 Collins Ferry Road, P.O. Box 880 MS B07, Morgantown, WV 26507-0880**

Phone/Fax/Email: **304-285-4145 mark.lusk@netl.doe.gov**

A. Project Info:

1. This Form provides information about:

New Project Submittal:

YES NO

Additional information relating to previously submitted project:

YES NO

OHPO/RPR Serial Number from previous submission:

2. Project Name (if applicable):

**Waste Energy Recovery Project at the AK Steel Corporation
Middletown Works, Middletown, Ohio**

3. Internal tracking or reference number used by Federal Agency, consultant, and/or applicant to identify this project (if applicable):

DOE/EA-1743

- B. Project Address or vicinity:
1801 Crawford Street
- C. City/Township:
Middletown
- D. County:
Butler
- E. Federal Agency and Agency Contact. *If you do not know the federal agency involved in your project, please contact the party asking you to apply for Section 106 Review, not OHPO, for this information. HUD Entitlement Communities acting under delegated environmental review authority should list their own contact information.*
U.S. Department of Energy; Mr. Mark W. Lusk. See Section 1 for contact information.
- F. Type of Federal Assistance. *List all known federal sources of federal funding, approvals, and permits to avoid repeated reviews.*
American Recovery and Reinvestment Act of 2009
- G. State Agency and Contact Person (if applicable):
- H. Type of State Assistance:
- I. Is this project being submitted at the direction of a state agency solely under Ohio Revised Code 149.53 or at the direction of a State Agency? *Answering yes to this question means that you are sure that no federal funding, permits or approvals will be used for any part of your project, and that you are seeking comments only under ORC 149.53.*
YES NO
- J. Public Involvement- Describe how the public has been/will be informed about this project and its potential to affect historic properties. Please summarize how they will have an opportunity to provide comments about any effects to historic properties. (This step is required for all projects under 36 CFR § 800.2):
See attachment
- K. Please list other consulting parties that you have contacted/will contact about this project, such as Indian Tribes, Certified Local Governments, local officials, property owners, or preservation groups. (See 36 CFR § 800.2 for more information about involving other consulting parties). Please summarize how they will have an opportunity to provide comments:
See attachment

SECTION 2: PROJECT DESCRIPTION AND AREA OF POTENTIAL EFFECTS (APE)

Provide a description of your project, its site, and geographical information. You will also describe your project's Area of Potential Effects (APE). Please refer to the Instructions or contact an OHPO reviewer if you need help with developing the APE or completing this form.

For challenging projects, provide as much information as possible in all sections, and then check the box in Section 5.A. to ask OHPO to offer preliminary comments or make recommendations about how to proceed with your project consultation. This is recommended if your project involves effects to significant historic properties or if there may be challenging procedural issues related to your project. Please note that providing information to complete all Sections will still be required and that asking OHPO for preliminary comments may tend to delay completion of the review process for some projects.

A. Does this project involve any Ground-Disturbing activity: YES NO

(If Yes, you must complete all of Section 2.A. If No, proceed directly to Section 2. B.)

1. General description of width, length and depth of proposed ground disturbing activity:

The proposed project would involve a 10-acre parcel of land within the boundaries of Middletown Works. Engineering design is preliminary with a number of details still unknown at this time. Of the 10-acre site, after construction, about 80 percent of the site would be comprised of energy generating equipment (turbine and boilers to a height of 2 stories) and other support structures.

2. Narrative description of previous land use and past ground disturbances, if known:

The proposed site would be located within the 2,791 acre Middletown Works site. The site has been previously disturbed and currently graveled with several concrete pads that would be removed during construction. The property has been used for heavy industry for about 100 years.

3. Narrative description of current land use and conditions:

Middletown Works is an existing large heavy industrial facility. It has blast furnances, rail track, and other structures that support the production of steel and iron.

4. Does the landowner know of any archaeological resources found on the property?

YES NO If yes, please describe:

B. Submit the exact project site location on a USGS 7.5-minute topographic quadrangle map for all projects. Map sections, photocopies of map sections, and online versions of USGS maps are acceptable as long as the location is clearly marked. Show the project's Area of Potential Effects (APE). It should be clearly distinguished from other features shown on the map:

1. USGS Quad Map Name:

**Middletown, Ohio Quad (1981) - project location: 39.476944
-84.381667**

2. Township/City/Village Name:

Middletown

C. Provide a street-level map indicating the location of the project site; road names must be identified and legible. Your map must show the exact location of the boundaries for the project site. Show the project's Area of Potential Effects (APE). It should be clearly distinguished from other features shown on the map:

- D. Provide a verbal description of the APE, including a discussion of how the APE will include areas with the potential for direct and indirect effects from the project. Explain the steps taken to identify the project's APE, and your justification for the specific boundaries chosen:

See attached figures 1 & 2 for 2.C; See attachment for 2.D.

- E. Provide a detailed description of the project. This is a critical part of your submission. Your description should be prepared for a cold reader who may not be an expert in this type of project. The information provided must help support your analysis of effects to historic properties, not other types of project impacts. Do not simply include copies of environmental documents or other types of specialized project reports. If there are multiple project alternatives, you should include information about all alternatives that are still under active consideration:

See attachment

SECTION 3: IDENTIFICATION OF HISTORIC PROPERTIES

Describe whether there are historic properties located within your project APE. To make that determination, use information generated from your own Background Research and Field Survey. Then choose one of the following options to report your findings. Please refer to the instructions and/or contact an OHPO reviewer if you are unsure about how to identify historic properties for your project.

If you read the Instructions and you're still confused as to which reporting option best fits your project, or you are not sure if your project needs a survey, you may choose to skip this section, but provide as much supporting documentation as possible in all other Sections, then check the box in Section 5.A, to request preliminary comments from OHPO. After reviewing the information provided, OHPO will then offer comments as to which reporting option is best suited to document historic properties for your project. Please note that providing information to complete this Section will still be required and that asking OHPO for preliminary comments may tend to delay completion of the review process for some projects.

Recording the Results of Background Research and Field Survey:

- A. **Summary of discussions and/or consultation with OHPO** about this project that demonstrates how the Agency Official and OHPO have agreed that no Field Survey was necessary for this project (typically due to extreme ground disturbance or other special circumstances). Please **attach copies** of emails/correspondence that document this agreement. You must explain how the project's potential to affect both archaeological and historic resources were considered.
- B. **A table that includes the minimum information** listed in the OHPO Section 106 Documentation Table (which is generally equivalent to the information found on an inventory form). This information must be printed and mailed with the Project Summary Form. To provide sufficient information to complete this Section, you must also include summary observations from your field survey, background research and eligibility determinations for each property that was evaluated in the project APE.
- C. **OHI (Ohio Historic Inventory) or OAI (Ohio Archaeological Inventory) forms-** New or updated inventory forms may be prepared using the OHI pdf form with data population capabilities, the Internet IForm, or typed on archival quality inventory forms. To provide sufficient information to complete this Section, you must include summary observations from your field survey and background research. You must also include eligibility determinations for each property that was evaluated in the project APE.
- D. **A historic or archaeological survey report** prepared by a qualified consultant that meets professional standards. The survey report should meet the Secretary of the Interior's

Standards and Guidelines for Identification and OHPO Archaeological Guidelines. You may also include new inventory forms with your survey, or update previous inventory forms. To complete this section, your survey report must include summary observations from your field survey, background research and eligibility determinations for each property that was evaluated within the APE.

E. Project Findings. Based on the conclusions you reached in completing Section 3, please choose one finding for your project. There are (mark one):

- Historic Properties Present in the APE:
- No Historic Properties Present in the APE:

SECTION 4: SUPPORTING DOCUMENTATION

This information must be provided for all projects.

- A. Photographs must be keyed to a street-level map, and should be included as attachments to this application. Please label all forms, tables and CDs with the date of your submission and project name, as identified in Section 1. You must present enough documentation to clearly show existing conditions at your project site and convey details about the buildings, structures or sites that are described in your submission. Faxed or photocopied photographs are not acceptable. See Instructions for more info about photo submissions or 36 CFR § 800.11 for federal documentation standards.
 - 1. Provide photos of the entire project site and take photos to/from historic properties from/towards your project site to support your determination of effect in Section 5.
 - 2. Provide current photos of all buildings/structures/sites described.
- B. Project plan, specifications, site drawings and any other media presentation that conveys detailed information about your project and its potential to affect historic properties.
- C. Copies or summaries of any comments provided by consulting parties or the public.

SECTION 5: DETERMINATION OF EFFECT

A. **Request Preliminary Comments.** For challenging projects, provide as much information as possible in previous sections and ask OHPO to offer preliminary comments or make recommendations about how to proceed with your project consultation. This is recommended if your project involves effects to significant historic properties, if the public has concerns about your project's potential to affect historic properties, or if there may be challenging procedural issues related to your project. Please be aware that providing information in all Sections will still be required and that asking OHPO for preliminary comments may tend to delay completion of the review process for some projects.

- 1. We request preliminary comments from OHPO about this project:
YES NO
- 2. Please specify as clearly as possible the particular issues that you would like OHPO to examine for your project (for example- help with developing an APE, addressing the concerns of consulting parties, survey methodology, etc.):

B. Determination of Effect. If you believe that you have gathered enough information to conclude the Section 106 process, you may be ready to make a determination of effect and ask OHPO for concurrence, while considering public comments. Please select and mark one of the following determinations, then explain the basis for your decision on an attached sheet of paper:

No historic properties will be affected based on 36 CFR § 800.4(d) (1).
Please explain how you made this determination:

No Adverse Effect [36 CFR § 800.5(b)] on historic properties. This finding cannot be used if there are no historic properties present in your project APE. Please explain why the Criteria of Adverse Effect, [36 CFR Part 800.5(a) (1)], were found not to be applicable for your project:

Adverse Effect [36 CFR § 800.5(d) (2)] on historic properties. Please explain why the criteria of adverse effect, [36 CFR Part 800.5(a) (1)], were found to be applicable to your project. You may also include an explanation of how these adverse effects might be avoided, reduced or mitigated:

Please print and mail completed form and supporting documentation to:

*Ohio Historic Preservation Office
Attn: Mark J. Epstein, Department Head
Resource Protection and Review
1982 Velma Avenue
Columbus, OH 43211-2497*

Attachment

U.S. Department of Energy Proposed Funding to Air Products and Chemicals, Inc. For a Waste Energy Recovery Project at the AK Steel Corporation Middletown Works, Middletown, Ohio

Submitted to the Ohio Preservation Office for Section 106 Review

Section 1: General Project Information.

1.J. DOE is preparing an Environmental Assessment (EA); the availability of the Draft EA will be announced in the local newspaper of record and a copy placed in the local library. DOE will solicit and accept comments by mail, facsimile, or e-mail during the public comment period which will be announced in the EA availability notice.

1.K. At this time, DOE has no plans to formally consult with any other federal or state agency or American Indian tribe. However, DOE is developing a distribution list for the EA. The distribution list will include appropriate local, state, and other federal agencies, members of the public that have expressed an interest in the project, and any interested environmental or historical preservation groups.

Section 2: Project Description and Area of Potential Effects (APE).

2.D. The area of potential effect is a 10-acre parcel of land within the 2,791-acre Middletown Works site (Figure 3). The construction would occur on previously disturbed lands. DOE anticipates that potential direct, indirect, and cumulative environmental impacts would be temporary and/or small.

The proposed project would be similar in appearance to existing Middletown Works' buildings and support structures and would not alter or result in major changes or variations to the types of views seen from within the site or at locations adjacent to the site. The new facility would have stacks and a cooling tower. At this time engineering decisions for the stacks or the type of the technology the cooling tower would use have not yet been made. The main structures to be installed (the gas turbine and boilers) would have a height of two stories.

The proposed project is not close to the site boundary, so noise levels from the construction and operation of the proposed project would not be expected to exceed existing noise levels associated with current AK Steel operations. AK Steel uses trains routinely within the property to move materials. There would be no need to modify or construct new access roads, transmission lines, or other types of infrastructure.

2.E The proposed project would construct and operate a 110 megawatt combined cycle power generation plant on a ten-acre site within the Middletown Works site (80% of the 10 acres would be used by the power generation equipment and other support structures).

This project would be the first demonstration in North America of combined cycle gas turbine technology consuming steel mill off-gases for electricity and steam generation. The off-gas would be recovered by installation of a gas management system to prepare the off-gas for downstream use in the combined cycle power generation plant. A wet electrostatic precipitator would be used to remove the fine particulates from the gas. A fuel gas compressor would be used to raise the pressure as required for use in the gas turbine. The plant would employ a gas turbine rated at over 100 megawatts and a waste heat boiler to

generate steam for use in a 70-megawatt steam turbine generator. Excess off-gas would also power two auxiliary steam boilers to provide backup steam to the mill and additional steam to a 70-megawatt steam turbine. The gas turbine exhaust gases would pass through a selective catalytic reduction system to reduce nitrogen oxide emissions to below regulatory standards.

Currently over 50 percent of the off-gas is being flared to the atmosphere. As a result of the proposed plant, the off-gas flaring would cease with the recovered gas producing an annual average of 105 megawatts of electrical power, as well as process-related steam.

Figure 1. General street map showing the location of AK Steel's Middletown Works.



Figure 2. Satellite image showing the AK Steel site and the proposed areas of the undertaking (white boxes).



Site boundary is approximate.

Figure 3. Photograph of area of proposed undertaking.





May 27, 2010

Mr. Mark W. Lusk
National Energy Technology Laboratory
P.O. Box 880, MS B07
3610 Collins Ferry Road
Morgantown, WV 26507

Re: Draft EA: DOE/EA-1743D
Draft Environmental Assessment for the Air Products and Chemicals, Inc.
Waste Energy Project at the AK Steel Corporation Middletown Works
Middletown, Butler County, Ohio

Dear Mr. Lusk,

In response to correspondence dated March 17, 2010 (received March 19) regarding the above referenced project. In addition, we received the draft environmental assessment with correspondence dated May 7, 2010. We offer our comments pursuant to provisions of the National Historic Preservation Act of 1966, as amended (16 U.S.C. 470) and implementing regulations at 36 CFR 800).

The correspondence provides a completed Project Summary Form. It appears to us that the proposed project is part of a larger expansion of the Middletown Works. As evidenced in photographs of this area, there has been a great deal of severe disturbance in this portion of the Middletown Works. We agree with the delineation of the APE to encompass the 10 acre construction zone. The project is located at some distance from older buildings located outside of the Middletown Works. We agree that these are well beyond the APE for this undertaking. Based on the information presented we concur with your finding of No Historic Properties Affected.

Any questions concerning this matter should be addressed to David Snyder at (614) 298-2000. Thank you for your cooperation.

Sincerely,

David Snyder, Ph.D., RPA, Archaeology Reviews Manager
Resource Protection and Review

DMS:ds (OHIO Project ID No. 2010-BUT-11215)

OHIO HISTORICAL SOCIETY

Ohio Historic Preservation Office

300 West Gay Street, Columbus, Ohio 43215-2002 (614) 298-2000
www.ohiohistory.org



**Environmental
Protection Agency**

Administrator, Governor
Assistant Administrator, Lt. Governor
Regional Administrator, Director

May 20, 2010

Mark W. Lusk
U.S. Department of Energy
National Energy Technology Laboratory
3610 Collins Ferry Road
P.O. Box 880
MS B07
Morgantown, WV 26501-0880

RE: Ohio EPA Comments on Air Products Draft Environmental Assessment (EA)

Dear Mr. Lusk:

Ohio EPA has completed our review of the *U.S. Department of Energy's Draft EA for the Air Products and Chemicals Inc. Waste Energy Project at the AK Steel Corporation Middletown Works, Middletown, Ohio* (Draft EA: DOE/EA-1743D), which was received on May 10, 2010. The information provided in the draft EA is consistent with that provided to Ohio EPA by Air Products and AK Steel Corporation during an April 27, 2010 meeting.

Air Products and AK Steel requested the April 27, 2010 meeting to brief Ohio EPA on this project and discuss coordination on permitting issues before finalizing the design for this project. Due to the complexities of the air pollution regulations, both the Hamilton County Department of Environmental Services, a local air agency, and Ohio EPA's Division of Air Pollution Control have been participating in weekly conference calls with Air Products since the April 27, 2010 meeting. We are appreciative of the amount of coordination Air Products is doing for this project. Due to the accelerated project timeline, we encourage Air Products to continue to work with us to ensure complex permitting issues can be addressed in a timely manner.

Ohio EPA has only one comment on the draft EA. On page 27, Section 3.5.2.1.1, "Construction," it states that the removal of small existing foundation elements and concrete pads will be completed as part of site preparation activities. It also states on page 29 that the proposed plant will be located in an area termed the "Melt Plant area"

Southwest District Office
401 East Fifth Street
Dayton, OH 45402-2911

937 | 285 6357
937 | 285 6249 (fax)
www.epa.ohio.gov

Mark W. Lusk
May 20, 2010
Page 2

The EA does not identify what activities were conducted in the former buildings at the proposed plant location. Though the proposed plant area may not be identified as an Area of Concern, the Melt Plant area is under investigation as part of the corrective action requirements under the Resource Conservation and Recovery Act and a federal consent decree. If, during site preparation or construction activities, contaminated areas are found, they will have to be addressed before construction on the plant can proceed.

Thank you for the opportunity to review the draft EA. If you have any questions, please contact me at (937) 285-6469.

Sincerely,



Bonnie B. Buthker
Assistant Chief, Southwest District



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
4625 Morse Road, Suite 104
Columbus, Ohio 43230
(614) 416-8993 / FAX (614) 416-8994

May 18, 2010

Mr. Mark W. Lusk
U.S. Department of Energy
National Energy Technology Laboratory
3610 Collins Ferry Road
P.O. Box 880
MS B07
Morgantown, WV 26507-0880

Dear Mr. Lusk:

TAILS #: 31420-2010-TA-0596

This is in response to the U.S. Department of Energy, National Energy Technology Laboratory's Draft Environmental Assessment (EA) for the Air Projects and chemicals, Inc. Waste Energy Project at the AK Steel Corporation's Middletown Works in Middletown, Butler County, Ohio.

There are no Federal wilderness areas, wildlife refuges, or designated Critical Habitat within the vicinity of the proposed site.

ENDANGERED SPECIES COMMENTS: The proposed project lies within the range of the **Indiana bat** (*Myotis sodalis*), a federally listed endangered species. Since first listed as endangered in 1967, their population has declined by nearly 60%. Several factors have contributed to the decline of the Indiana bat, including the loss and degradation of suitable hibernacula, human disturbance during hibernation, pesticides, and the loss and degradation of forested habitat, particularly stands of large, mature trees. Fragmentation of forest habitat may also contribute to declines. During winter, Indiana bats hibernate in caves and abandoned mines. Summer habitat requirements for the species are not well defined but the following are considered important:

- (1) dead or live trees and snags with peeling or exfoliating bark, split tree trunk and/or branches, or cavities, which may be used as maternity roost areas;
- (2) live trees (such as shagbark hickory and oaks) which have exfoliating bark;
- (3) stream corridors, riparian areas, and upland woodlots which provide forage sites.

Should the proposed site contain trees or associated habitats exhibiting any of the characteristics listed above, we recommend that the habitat and surrounding trees be saved wherever possible. If the trees must be cut, further coordination with this office is requested to determine if surveys are warranted. Any survey should be designed and conducted in coordination with the

Endangered Species Coordinator for this office.

The project area lies within the range of the **bald eagle** (*Haliaeetus leucocephalus*). The bald eagle has been removed from the Federal list of endangered and threatened species due to recovery. This species continues to be afforded protection by the Bald and Golden Eagle Protection Act and Migratory Bird Protection Act.

We recommend that you contact the Ohio Department of Natural Resources, Division of Wildlife, (419) 898-0960, for the location(s) of the eagle nest(s) in the county. If any active nests are located within ½ mile of the project site, we recommend that work at the site be restricted from mid-January through July to allow pre-nesting activities, incubation, and raising of the young.

These comments have been prepared under the authority of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), the Endangered Species Act of 1973 (ESA), as amended, and are consistent with the intent of the National Environmental Policy Act of 1969 and the U. S. Fish and Wildlife Service's Mitigation Policy.

If you have questions, or if we may be of further assistance in this matter, please contact Angela Boyer at extension 22 in this office.

Sincerely,



for Mary M. Knapp, Ph.D.
Field Supervisor

cc: ODNR, DOW, SCEA Unit, Columbus, Ohio

**FINDING OF NO SIGNIFICANT IMPACT
FOR THE
AIR PRODUCTS AND CHEMICALS, INC. WASTE ENERGY PROJECT
AT THE AK STEEL CORPORATION MIDDLETOWN WORKS,
MIDDLETOWN, OHIO**

RESPONSIBLE AGENCY: U.S. Department of Energy (DOE)

ACTION: Finding of No Significant Impact (FONSI)

SUMMARY: DOE completed the *Final Environmental Assessment for the Air Products and Chemicals, Inc. Waste Energy Project at the AK Steel Corporation Middletown Works, Middletown, Ohio* (DOE/EA-1743). Based on the analyses in the Environmental Assessment (EA), DOE determined that its proposed action - awarding a federal grant to Air Products and Chemicals, Inc. (Air Products) to facilitate construction and operation of a waste energy recovery plant at the AK Steel Corporation (AK Steel) Middletown Works - would result in no significant adverse impacts. DOE further determined that the proposed project would have potential beneficial impacts to the nation's energy efficiency and local air quality. Additionally, beneficial local socioeconomic impacts could occur as a result of increased employment opportunities and spending in the project area.

BACKGROUND: As part of the *American Recovery and Reinvestment Act of 2009* (Recovery Act; Public Law 111-5, 123 Stat. 115), DOE's National Energy Technology Laboratory (NETL), on behalf of the Office of Energy Efficiency and Renewable Energy's Industrial Technologies Program, is providing up to \$156 million in federal funding for competitively awarded agreements to facilitate the deployment of district energy systems, combined heat and power systems, waste energy recovery systems, and energy-efficient industrial equipment and processes at single or multiple installations and sites.

The federal action of providing funding for these Industrial Technologies Program projects requires compliance with the *National Environmental Policy Act of 1969* (NEPA) (NEPA; 42 U.S.C. 4321 et seq.), the Council on Environmental Quality regulations (40 CFR Parts 1500 to 1508) and DOE's NEPA implementing procedures (10 CFR Part 1021). DOE prepared an EA to evaluate the potential environmental consequences of providing a grant for this proposed project under the Industrial Technologies Program.

PURPOSE AND NEED: The overall purpose and need for DOE action pursuant to the Industrial Technologies Program and the funding opportunity under the Recovery Act is to set up U.S. industry as the world leader in energy efficiency and productivity. The program's goal is to facilitate a 25-percent reduction in industrial energy intensity by 2017. The Industrial Technologies Program's three-part strategy intends to achieve this objective by:

- Sponsoring research, development, and demonstration of industry-specific and crosscutting technologies to reduce energy and carbon intensity;

- Conducting technology delivery activities to help plants access today's technology and management practices; and
- Promoting a culture of energy efficiency and carbon management within industry.

The strategy also calls for an 18-percent reduction in U.S. carbon intensity by 2012. DOE seeks to identify projects and suitable technologies that it can fund to meet this goal. Air Products' proposed project at AK Steel's Middletown Works would also contribute to the nation's economic recovery by creating or helping to retain manufacturing jobs in the United States in accordance with the objectives of the Recovery Act.

DESCRIPTION OF THE PROPOSED ACTION: DOE's proposed action is to provide a grant to partially fund Air Product's proposed project - construction and operation of a waste energy recovery plant at AK Steel's Middletown Works. The project would include: (1) minimal site preparation and removal of small foundations on two previously disturbed sites at the Middletown Works; (2) construction of a combined-cycle power generation plant and a management system for the blast furnace gas; and (3) production of steam and electricity from previously flared waste blast furnace gases. DOE would provide a \$30 million financial assistance grant in a cost-sharing arrangement in order to facilitate construction and operation of the project. The total cost of the project is estimated at \$315 million.

ALTERNATIVES CONSIDERED: In addition to the proposed action, DOE considered the No-Action Alternative as required under NEPA. Under the No-Action Alternative, DOE would not provide funds for the proposed project. For the purposes of the EA, DOE assumed that the project would not proceed without DOE funding. This assumption established a baseline against which the potential environmental impacts of the proposed project were compared.

ENVIRONMENTAL CONSEQUENCES: DOE evaluated the potential environmental consequences of the proposed project and the No-Action Alternative. DOE considered 14 environmental resource areas in the EA. However, not all areas were evaluated at the same level of detail. For nine of the resource areas, DOE determined there would be no impacts or the potential impacts would be small, temporary, or both, and therefore did not carry these areas forward for additional analysis. DOE focused its more detailed analyses on those resources that could require new or amended permits, have the potential for significant impacts or controversy, or interest the public, such as socioeconomics and occupational health and safety.

DOE focused its more detailed analyses of potential impacts on the following resources areas: air quality, water resources, wastes, socioeconomics, and occupational health and safety. For these areas, DOE determined that potential environmental impacts would be small, temporary, or both. Air emission and water use permits would require minor amendments to existing permits. Air emissions from the proposed project would remain at levels similar to current Middletown Works emissions, with the exception of a reduction in nitrogen oxides. The proposed project would generate enough electricity to serve about 80,000 households with no increase in greenhouse gas emissions because the plant would use existing waste gases to generate electricity, unlike conventional electricity generation plants that burn fossil fuels.

DOE also evaluated socioeconomic factors to determine the potential benefits of the proposed project on the surrounding communities. The project is anticipated to result in small increases in local employment and local spending, potentially providing a minor beneficial impact to the local communities.

The other environmental resource areas DOE evaluated for potential impacts were geology and soils; land use; aesthetics and visual resources; noise; biological resources; historic and cultural resources; environmental justice; transportation and utilities; and energy and materials. DOE determined that there would be no adverse impacts for these resource areas, or that the impacts would be small, temporary, or both. The EA provides more detail on the reasons DOE did not conduct more detailed evaluations of these areas.

Under the No-Action Alternative, DOE assumed the project would either be delayed, as Air Products sought other funding sources, or abandoned altogether. The potential environmental consequences, if the project were delayed, could be different if the project were modified. If abandoned, the potential environmental consequences would not occur. Furthermore, the potential beneficial impacts would change or not occur.

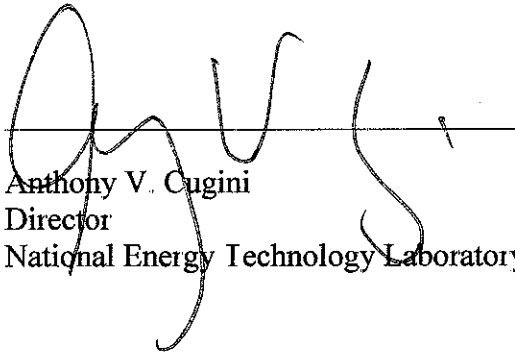
PUBLIC AVAILABILITY: DOE issued the Draft EA on May 9, 2010, and advertised its availability in the *Middletown Journal* on May 9, 10, and 11. In addition, DOE sent a copy of the Draft EA for public review to the Middletown Public Library. DOE established a 15-day public comment period that began May 9, 2010, and ended May 23, 2010 and announced it would accept comments by mail, e-mail, and facsimile. Copies of the Final EA and this FONSI are available at DOE's National Energy Technology Laboratory web site at www.netl.doe.gov/publications/others/nepa/ea.html.

The Draft EA was distributed to various federal, state, and local agencies with jurisdiction or special expertise. DOE conducted formal consultations by mail with the responsible U.S. Fish and Wildlife Service (USFWS) field office, the Ohio Environmental Protection Agency (OEPA), State Historic Preservation Office (SHPO), and Tribal contacts in Ohio. The USFWS commented that the project would occur within the range of the Indiana Bat, an endangered species, and listed its habitat requirements. However, DOE determined that the proposed site does not contain suitable habitat for the Indiana bat. The USFWS also recommended that DOE contact the Ohio Department of Natural Resources to determine whether any active bald eagle nests are near site. The state agency informed DOE that the closest nest is more than fifteen miles southeast of the project site. The OEPA commented that it is actively involved in discussions regarding air permitting for the project. OEPA also identified a section of the Middletown Works that is undertaking a Resource Conservation and Recovery Act (RCRA) corrective action, which could impact activities at the project site. The SHPO concurred with the Department's determination of no historic properties would be affected.

DETERMINATION: On the basis of the evaluations in the Final EA, DOE determined that its proposed action, to provide a \$30 million financial assistance grant, and Air Products' proposed project, construction and operation of a plant to recover waste energy, would have no significant impact on the human environment. Although the proposed project would require amendments to existing air and water permits, the waste energy recovery operations would comply with and operate within all amended permit requirements. All other potential environmental impacts DOE

identified and analyzed in the EA would be small, temporary or both. Therefore, preparation of an environmental impact statement is not required and DOE is issuing this Finding of No Significant Impact.

Issued in Pittsburgh, Pennsylvania, this 13th day of July 2010.



Anthony V. Cugini
Director
National Energy Technology Laboratory