Environmental Assessment

for the

Construction and Operation of a Proposed Cellulosic Biorefinery, Alpena Prototype Biorefinery, Alpena, Michigan

DOE/EA-1789

Prepared for:

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Energy Efficiency and Renewable Energy

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ACRONYMS AND ABBREVIATIONS

APB	Alpena Prototype Biorefinery
API	American Process Incorporated
BMP	Best Management Practice
BOD	biochemical oxygen demand
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	carbon monoxide
CO_2	carbon dioxide
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
DPI	Decorative Panels International, Inc.
E-70	70 percent ethanol / 30% gasoline fuel
EA	Environmental Assessment
EPA	U.S. Environmental Protection Agency
EPAct 2005	Energy Policy Act of 2005
ERP	emergency response plan
°F	degrees Fahrenheit
FOA	Funding Opportunity Announcement
ft	feet
gal	gallon
gpm	gallons per minute
HAP	Hazardous Air Pollutant
hr	hour
ISO	International Organization for Standardization
lb	pound
LCA	Life Cycle Assessment
m	meter
MDNRE	Michigan Department of Natural Resources and Environment
MDOT	Michigan Department of Transportation
MichCon	Michigan Consolidated Gas Company
MOASWMA	Montmorency-Oscoda-Alpena Solid Waste Management Authority
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NO_X	Nitrogen Oxides
NPDES	National Pollutant Discharge Elimination System
NHRP	National Register of Historic Places

PM	particulate matter
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
ppm	parts per million
RFS2	Renewable Fuels Standard (revised for 2010)
RVP	Reid vapor pressure
SESC	Soil Erosion and Sedimentation Control
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
SOP	Standard Operating Procedure
SPCC	Spill Prevention, Control, and Countermeasure
SWPPP	Storm Water Pollution Prevention Plan
TAC	Toxic Air Contaminant
TPD	Ton per day
TSCA	Toxic Substances Control Act
U.S.C.	United States Code
USFWS	U.S. Fish and Wildlife Service
VCE	vapor compression evaporator
VOC	Volatile Organic Compound
WWTP	Waste Water Treatment Plant
µg	microgram

1. INTRODUCTION AND PURPOSE AND NEED

The U.S. Department of Energy (DOE or the Department) is proposing to provide $18 million of federal cost share funding to American Process, Inc. (API) to support the final design, construction, and start-up of a cellulose to ethanol biorefinery that would be located on property purchased from Decorative Panels International (DPI) in Alpena, Michigan (hereafter referred to as the Alpena Prototype Biorefinery (APB), the APB project or proposed project). API would purchase approximately 28 acres from DPI for the proposed project, including 1 acre of primarily unpaved industrial land adjacent to the DPI wastewater treatment plant (WWTP) on which it would construct the biorefinery. The remaining 27 acres of the project site includes the existing wastewater treatment plant and associated lagoons.

DOE competitively selected the APB proposed project under Recovery Act – Demonstration of Integrated Biorefinery Operations FOA-0000096, which is funded by the *American Recovery and Reinvestment Act of 2009* (Recovery Act). The total anticipated cost of the proposed project is approximately $25 million, and if DOE authorizes the expenditure of the $18 million of federal cost share, API would be responsible for the remaining project costs.

The APB project would convert hemicellulose, in this case wood sugars from an adjacent hardwood manufacturing plant, into ethanol, a biofuel. The APB project would produce approximately 900,000 gallons of anhydrous ethanol per year. With the addition of a denaturant (gasoline), APB would produce up to 945,000 gallons of standard denatured ethanol (5 percent denaturant).

The funding of projects under the Recovery Act requires compliance with the *National Environmental Policy Act of 1969*, as amended (NEPA; 42 U.S.C. 4321 et seq.); Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500 to 1508); and DOE NEPA implementing procedures (10 CFR Part 1021). Thus, DOE prepared this environmental assessment (EA) to evaluate the potential environmental consequences of DOE authorizing expenditure of Recovery Act funds. In compliance with NEPA and its implementing procedures, this EA examines the potential environmental consequences of DOE's Proposed Action (that is, authorizing API to expend Recover Act funding), the project, and the No Action Alternative (under which it is assumed that, as a consequence of DOE's denial of financial assistance, API would not proceed with the project). The EA's purpose is to inform DOE decision-making of the potential environmental consequences of the proposed project and alternatives and to allow the public to provide comments.

1.1 Purpose and Need

The *Energy Policy Act of 2005* (EPAct 2005), Section 932, directed the Secretary of Energy (the Secretary) to conduct a program of research, development, demonstration, and commercial application for bioenergy, including integrated biorefineries that could produce biopower, biofuels, and bioproducts. In carrying out a program to demonstrate the commercial application of integrated biorefineries, EPAct 2005 authorized the Secretary to carry out a program to demonstrate the commercial application of integrated biorefinery demonstration projects that demonstrate (1) the efficacy of producing biofuels from a wide variety of lignocellulosic feedstock; (2) the commercial application of biomass technologies for a variety of uses, including the development of biofuels, bio-based chemicals, substitutes for petroleum-based feedstock and products, and electricity or useful heat; and (3) the collection and treatment of a variety of biomass feedstock.

The *Energy Independence and Security Act of 2007* (EISA) amended the EPAct 2005 to increase the authorized funding levels for renewable energy research and development, including a Renewable Fuel Standard that requires the production of 36 billion gallons (136 billion liters) per year of biofuels by 2022,

and including specific provisions for advanced biofuels, such as cellulosic ethanol and biomass-based diesel fuels.

As part of the Recovery Act, DOE's Office of Energy Efficiency and Renewable Energy (EERE) is providing up to $564 million in funds to accelerate the construction and operation of pilot, demonstration, and commercial-scale integrated biorefinery facilities. The projects would be designed to validate refining technologies and help lay the foundation for full commercial-scale development of the biomass industry in the United States. The projects would produce advanced biofuels, biopower, and bioproducts using biomass feedstock.

Accordingly, DOE is implementing Section 932 of EPAct 2005 and Section 231 of the EISA and is supporting biofuel production pursuant to the Renewable Fuel Standard established by EISA. In December 2009, the Secretary announced the selection of 19 integrated biorefinery projects to receive competitively awarded federal funds. The projects selected were part of an ongoing effort to reduce U.S. dependence on foreign oil, spur the creation of the domestic bio-industry, and provide new jobs in many rural areas of the country. The biofuels and bioproducts produced through these projects would displace petroleum products and accelerate the industry's ability to achieve production targets mandated by the federal Renewable Fuel Standard. The API proposed project was one of the 19 competitively selected projects.

The purpose of the DOE Proposed Action is to support the objectives of EPAct 2005, EISA, and the Recovery Act. Specifically, the APB project would help to support the Recovery Act's goals by creating new jobs. Further, providing federal funding to the ABP project would:

- Accelerate the construction and operation of pilot biorefinery facilities
- Validate refining technologies and help lay the foundation for full commercial-scale development of the biomass industry in the U.S.
- Reduce U.S. dependence on foreign oil.

1.2 National Environmental Policy Act and Related Procedures

NEPA requires federal agencies to take into account the potential consequences of their actions on both the natural and human environments as part of their planning and decision-making processes. For this project DOE is the federal agency for evaluating potential impacts under NEPA and must determine whether to provide funding. DOE is the only federal agency with responsibility to approve or deny the federal funding for the APB project, and therefore, is the lead agency responsible for the preparation of this EA. DOE prepared this EA to provide the public and responsible agencies with information about the APB project and its potential effects on the local and regional environment. This EA fulfills DOE's obligations under NEPA and provides DOE with the information needed to make an informed decision whether to authorize the expenditure of federal cost share funds to be applied to the final design, construction, and start-up of the APB project.

This EA analyzes the potential environmental and socioeconomic impacts that would result from implementation of the Proposed Action (with DOE funding) and the No Action Alternative (without DOE funding), and evaluates the potential individual and cumulative effects of the Proposed Action. While it is possible that the project could be implemented without DOE financial assistance, that scenario would not provide for a meaningful No Action Alternative analysis, as it would be identical to the Proposed Action. For purposes of this assessment, the EA therefore evaluates, as the No Action Alternative, the

potential impacts that would occur if the APB project were not built and operated. No other action alternatives are analyzed.

1.3 Public Involvement

In accordance with applicable regulations and policies, DOE sent scoping letters to potentially interested local, state, and federal agencies, including the U.S. Fish and Wildlife Service (USFWS), the Michigan Department of Natural Resources and Environment (MDNRE), the Michigan Department of Transportation (MDOT), and the Michigan State Historic Preservation Office. DOE also sent scoping letters to other potentially interested individuals and organizations, including the sovereign nations of the Sault Tribe of Chippewa Indians and the Little Traverse Bay Bands of Odawa Indians and the Inter-Tribal Council of Michigan, Inc. DOE published the scoping letter on line at the Reading Room of its Golden, Colorado, Field Office. The scoping letter described the Proposed Action and requested assistance in identifying issues the EA might evaluate. Appendix A contains a copy of the scoping letter distribution list and Notice of Scoping. No comments were received during the public scoping period.

DOE published the Draft EA on line at the Reading Room and sent Notices of Availability (NOA) to interested agencies and individuals. No comments were received during the draft EA comment period. , Appendix A also contains the NOA and the NOA Distribution List.

In addition, DOE initiated consultation with USFWS, MDNRE, and the Michigan State Historic Preservation Office, members of the Inter-Tribal Council of Michigan, Inc., and the sovereign nations of the Sault Tribe of Chippewa Indians and the Little Traverse Bay Bands of Odawa Indians. Appendix B contains a copy of the consultation letters and responses.

1.4 Content and Environmental Resources Not Carried Forward

Chapter 2 of the EA discusses the DOE Proposed Action, details of the proposed project, and the No-Action Alternative. Chapter 3 details the affected environment and potential environmental consequences of the Proposed Action and the No-Action Alternative, and Chapter 4 addresses cumulative impacts. Chapter 5 lists the references for this document. .

Chapter 3 examines the following environmental resource areas:

- Land use
- Water resources
- Air quality
- Safety and occupational health
- Waste management and hazardous materials handling
- Utilities
- Traffic
- Socioeconomics and environmental justice

In addition, DOE EAs commonly address the environmental resource areas listed in Table 1-1. Table 1-1 lists the Department's screening evaluation of these other resource areas. DOE did not examine the areas in the table at the same level of detail as the above-mentioned disciplines because DOE anticipates limited to no impacts for the resource areas listed in Table 1-1 and further analysis is unnecessary. In terms of the No-Action Alternative, the impacts would not occur because DOE assumes the proposed project would not proceed.

Table 1-1. Environmental resource areas not carried forward.

Environmental resource area	Impact consideration and conclusions
Noise	The proposed biorefinery would be on a developed industrial property. Construction noise would be temporary and during daylight hours. All operational noise sources except truck traffic would be inside buildings. Expected noise levels from the APB project should be less than those from a conventional ethanol plant because the project would not have a cooling tower or outdoor conveyor systems. The nearest sensitive area is 950 feet away from the proposed APB location. However, this location is on the other side of the DPI main plant building. The nearest sensitive area that has a direct line of sight to the proposed APB location is 2200 feet away. Noise volume is unlikely to change in relation to the nearest sensitive area as a result of the Proposed Action.
Visual and Aesthetic Resources	The proposed biorefinery would be on a developed industrial property comprised of DPI industrial buildings and structures. The tallest stack at DPI is 135 feet tall. The tallest APB project structure would be 80 feet tall. Other APB structures would be similar in height and appearance to the DPI structures currently in place. DPI currently has lighting for their building and plant yard. The APB project would have similar lighting for their building. Therefore, the APB would cause negligible visual impact to the surrounding area.
Geology and Soils	Onsite soils are suitable for construction. There should be no actions that would result in impacts to geology or that would be unduly affected by geological instabilities. The APB project would not result in major change to the topography of the site, although API would perform clearing and grading to prepare for foundation construction, drainage control, and paving activities. Construction would require the removal of approximately 4,500 cubic yards of soil unsuitable for use as backfill. API would import approximately 7,500 cubic yards of fill material from an offsite source for foundation backfill and finish grading. The 1-acre site is relatively flat and is in an active industrial area.
Biological Resources, including Wetlands	The US Fish and Wildlife Service (USFWS) National Wetland Inventory Database shows one of the three waste water treatment lagoons with the designation of palustrine unconsolidated bottom – permanently flooded (PUBH). This is a common designation for permanent water bodies including ponds, lakes and waste water treatment lagoons. Construction and operation of the biorefinery would occur on 1 acre of treeless developed industrial land. The 1-acre site where the proposed biorefinery will be constructed has no identified wetlands present. DOE determined that the proposed project would have no effect on federal or state threatened, endangered, or special concern plant or animal species through consultation with the USFWS. Appendix B contains consultation correspondence. According to the Decision Process for "No Effect" Determinations, a No Effect determination is appropriate for the project because the proposed site meets the following criteria: • Is in a Developed Area (an area that is already paved or supports structures and the only vegetation is limited to frequently mowed grass or conventional landscaping), and • Is not in or adjacent to any unlandscaped areas that support native vegetation (trees, shrubs, or grasses). The No Effect Determination was documented with a form provided on the USFWS website. Appendix B contains a copy of the completed No Effect document.

Environmental resource area	Impact consideration and conclusions
Cultural Resources	No *National Register of Historic Places* (NRHP) sites are on the proposed project site. There are five listed sites in Alpena County. The nearest is the Alpena Light, approximately 0.3 mile southeast of the project site. The Thunder Bay National Marine Sanctuary was established to protect a nationally significant collection of more than 100 shipwrecks, the nearest of which is within 0.5 mile of the project site. Alpena Light and the Thunder Bay National Marine Sanctuary are outside the area of potential effect. DOE in consultation with the State Historic Preservation Office has determined that the Proposed Action would have no effect on any NRHP site or the shipwreck sanctuary.

2. PROPOSED ACTION AND ALTERNATIVES

This section describes the DOE Proposed Action (Section 2.1), and the No-Action Alternative (Section 2.2.

2.1 Proposed Action

The DOE Proposed Action is to authorize API to expend Recovery Act funding for the final design, construction, and operation of the APB project. Cellulose is one of many polymers in nature. Wood, paper, and cotton all contain cellulose. The proposed project would convert washwater rich in wood sugars from an adjacent hardwood manufacturing plant to a biofuel (cellulosic ethanol).

API would construct the biorefinery in an active 91-acre industrial facility, the Decorative Panels International (DPI) hardwood manufacturing plant in Alpena, Michigan. API would purchase approximately 28 acres from DPI for the proposed project, including 1 acre of primarily unpaved industrial land adjacent to the DPI wastewater treatment plant (WWTP) on which it would construct the biorefinery and about 27 acres that include the existing wastewater treatment plant and associated lagoons.

API would use washwater rich in wood sugars from the DPI manufacturing process as the feedstock for the biorefinery. At present, a portion of the washwater is recycled for the DPI manufacturing process and a portion (approximately 450 gallons per minute) is sent to the DPI wastewater treatment plant, where it is treated and discharged to Lake Huron. If API built the APB project, it would use the 450 gallons per minute of sugar-rich washwater as the biorefinery feedstock. The APB project would concentrate the wood sugars, use acid to hydrolyze them and lime to neutralize them. The sugars would then be fermented into ethanol which would then be distilled and purified. The resulting ethanol would be stored and denatured with gasoline during loadout for offsite sale. The anticipated maximum production of the cellulosic ethanol facility would be 900,000 gallons per year of anhydrous (200-proof) ethanol. With the addition of gasoline denaturant, APB would produce up to 945,000 gallons of standard denatured ethanol (5 percent denaturant) or up to 1.2 million gallons per year of 70-percent ethanol (E-70). This fuel would contribute to the cellulosic biofuel mandates under the 2010 revision to the federal renewable fuel standard (RFS2), starting at 6.5 million gallons per year by 2010 and escalating to 16 billion gallons per year by 2022. In addition, the APB project would produce approximately 700,000 gallons per year of an aqueous potassium acetate (50 percent by weight) coproduct that API would sell off site.

API is currently evaluating an option to produce aqueous acetic acid, a common chemical used as a component in the manufacture of plastics, glues, and other industrial materials, for sale rather than potassium acetate based on newly available RO membranes capable of economically separating the small acetic acid molecule from water. Acetic acid production would be otherwise similar to the potassium acetate process.

The estimated total project cost would be approximately $25 million. API would employ approximately 10 to 20 people at the biorefinery. There would be additional jobs for local and regional businesses that would transport the ethanol and potassium acetate to market and provide chemicals to the biorefinery.

2.1.1 Project Objectives

The objectives of the APB pilot project are to operate the biorefinery systems to:

- Validate the technology at commercial scale;
- Validate the economics at commercial scale; and
- Enable replication of the technology at other locations.

2.1.2 Project Location and Site Plan

API would build the proposed APB project on existing industrial property at 412 Ford Avenue, City of Alpena, Alpena County, Michigan. The site is in the southwest quarter of Section 23, Township 31 North, Range 8 East, Alpena County, Michigan, at the mouth of the Thunder Bay River along Thunder Bay of Lake Huron. The property is zoned for general industry. Figure 2-1 is an overview of the general property and access to area roads.

As noted above, API would build the proposed APB project on approximately 1 acre of the 28 acres it would purchase from DPI. Figure 2-2 shows the location and layout of the proposed biorefinery. Figure 2-2 also shows the features currently on the proposed site. As shown, DPI uses the property for general industry purposes associated with its wastewater treatment plant.

2.1.3 Process Description

The APB project would use a number of different unit operations to produce ethanol and potassium acetate. The basic components of the process would be as follows:

- Feedstock Pretreatment/Hydrolysis
- Fermentation
- Distillation
- Membrane Separation of Potassium Acetate
- Materials Handling
- Spent Material Handling
- Wastewater Handling
- Supporting Infrastructure (Utilities)
- Startup, Shutdown, Maintenance, and Emergency Processes

2.1.3.1 Feedstock Pretreatment/Hydrolysis

The following sections explain the components of the different operation units to produce ethanol and potassium acetate.

Feedstock for the APB project would be sugar-rich washwater generated by the DPI hardboard manufacturing plant. DPI processes commercial mixed hardwood and aspen with approximately 8 percent bark content. It processes 315 bone dry tons per day of hardwood chips in four batch digesters using steam extraction. Pulping yield from the digesters is approximately 90 percent (that is, 90 percent of the bone dry wood chips become pulp). The remaining 10 percent is extracted as a mixture of wood sugars, lignin, and other organic compounds such as acetic acid. The mixture is washed with water to separate the wood pulp and is collected in a holding tank in the DPI mill. The majority of the washwater in the holding tank is reused in the hardboard manufacturing process. At present, DPI sends the excess washwater (approximately 450 gallons per minute) to the wastewater treatment plant. API would use this

[Figure placeholder]

[Figure placeholder]

excess washwater as the feedstock for the biorefinery. Pretreatment and hydrolysis of the washwater at the APB would consist of the following steps:

1. Pumping the filtered sugar- rich washwater to a vapor compression evaporator (VCE), which would raise the concentration of sugars. In addition, the VCE would remove most of the acetic acid from the feed stream as condensate. The condensate would be processed into potassium acetate as described in Section 2.1.3.4.

2. Sending the concentrated sugar stream from Step 1, which is rich in hemicelluloses, to a hydrolysis system where heat and sulfuric acid would break down sugars to their monomeric sugars at high temperature. The pH of the resulting stream would be approximately 1. Hydrolysis would release hemicellulose acetyl groups, generating acetic acid. The lignin would condense and precipitate. Immediately following hydrolysis, the stream would be neutralized using calcium oxide (lime); this would precipitate the sulfate ion as calcium sulfate (gypsum).

3. Sending the hydrolyzed monomeric sugar stream to another VCE for further concentration. This high-solids VCE would remove approximately 74 percent of the acetic acid in the inlet stream to the condensate. The VCE condensate containing the acetic acid would be further processed into potassium acetate as described in Section 2.1.3.4.

2.1.3.2 Fermentation

Sugar fermentation would occur in continuous process using the genetically engineered Ho-Purdue yeast (recombinant *Saccharomyces cerevisae* yeast containing two genes from the *Pichia stipitis* yeast). The introduced genes are stably integrated in the Ho-Purdue yeast.

Several fermenters would operate in series with the yeast being continuously recycled. API would use a yeast preparation system for system startup. Carbon dioxide (CO_2) would be removed from the fermenters and scrubbed with water. Volatile organic compounds (VOCs) and hazardous air pollutant (HAP) emissions would be controlled by the carbon dioxide scrubber system. The fermentation broth, commonly called *beer*, would be sent to a distillation column.

2.1.3.3 Distillation

The beer from the fermentation process would go to the distillation column to separate the ethanol from the yeast and residual sugars. Ethanol leaving the column would go to a conventional ethanol rectification column where it would be rectified to 95 percent by weight (190 proof). The 190-proof ethanol would go to molecular sieves to raise the concentration to greater than 99 percent by weight (200 proof, or anhydrous ethanol). The bottoms from both the distillation and rectifying columns would go to the onsite wastewater treatment plant, to a local landfill for disposal, or to a nearby cement kiln for use as fuel. The wet carbon dioxide scrubber system would control VOC and HAP emissions from the distillation system.

2.1.3.4 Membrane Separation of Potassium Acetate

The acetic acid-containing condensates from the two VCEs in the Feedstock Pretreatment/Hydrolysis step would be combined and adjusted with potassium hydroxide, which would convert the acetic acid to a potassium acetate salt that would be completely separated from the stream using spiral reverse osmosis membranes. The membranes would concentrate the potassium acetate and generate warm clean water that DPI would reuse. The potassium acetate would go to another VCE and finisher to generate 50-percent-by-weight aqueous potassium acetate for sale as a deicer.

API is evaluating an option to produce aqueous acetic acid for sale rather than potassium acetate based on newly available reverse osmosis membranes capable of economically separating the small acetic acid molecule from water. Acetic acid production would be similar to the potassium acetate process and would include a reverse osmosis membrane with warm clean water generation for reuse at the DPI facility. However, final concentration of acetic acid would occur with distillation rather than evaporation.

2.1.3.5 Material Handling

Ethanol Storage and Loadout. Anhydrous ethanol from the distillation area would go to a day tank for holding until product testing was complete. The ethanol would be denatured with gasoline [maximum Reid vapor pressure (RVP) of 15] and transferred to the product storage tank. The denatured product would be loaded in tank trucks for transportation off site to customers. The following tanks would be in the area:

- Two 1,480-gallon 200-proof ethanol shift tanks
- One 14,830-gallon 190-proof ethanol storage tank
- One 1,040-gallon denaturant (RVP15 gasoline) storage tank

Potassium Acetate Storage and Loadout. Product 50-percent-by-weight aqueous potassium acetate would go to a 15,179-gallon storage tank. The product would be loaded in tank trucks for transportation off site to customers.

Lime Handling. API would transport lime in bulk, store it in a silo with a pollution control device for dust control, and mix it with water to form a calcium hydroxide solution. API would use the solution to neutralize the sugar stream after acid hydrolysis.

Spent Material Handling. The precipitated lignin and gypsum generated during hydrolysis (Section 2.1.3.1) would pass through a filter press. The pressed mass would be land spread on local farm fields as a soil amendment, landfilled, or sold to LaFarge, a nearby cement manufacturer, for use as fuel for cement kilns.

Wastewater Handling. The sugar-rich washwater processed in the biorefinery would contain much of the biochemical oxygen demand (BOD) loading currently going to the DPI wastewater plant. The biorefinery would convert about 80 percent of the BOD to ethanol and acetic acid products; it would generate about 100 gallons per minute of wastewater including spent cooling water, distillate bottoms, and evaporator condensate, which would be pumped to the wastewater treatment plant.

Supporting Infrastructure and Utilities. The APB project would require supporting infrastructure including steam, river water, electricity, natural gas, process wastewater, potable water, and sanitary wastewater systems. API would purchase most of these utilities from DPI, as described below.

- Steam – API would purchase steam for the ethanol production processes from DPI.

- River Water – API would purchase water from DPI, which would supply approximately 300,000 gallons per day (MGD) of river water for the carbon dioxide scrubber and process cooling. DPI currently withdraws approximately 8 MGD of water from the Thunder Bay River under a MDNRE water withdrawal permit for manufacturing processes and electrical power generation. The Thunder Bay River flow is governed by operation of a reservoir and dam upstream of Alpena. The minimum flow measured in the Thunder Bay River at Alpena between 2007 and 2009 was approximately 218 MGD (USGS Water Data Reports, 2007 – 2009).

- Electricity – API would purchase electricity for the biorefinery from DPI, which produces electricity from an onsite turbine and purchases electricity from Alpena Power.

- Natural Gas – The biorefinery would fuel office and building heaters through a connection to the DPI natural gas system or to a new distribution point off the local distribution system main. Michigan Consolidated Gas Company (MichCon), a subsidiary of DTE Energy Corporation, provides natural gas to DPI. The biorefinery would not require natural gas for the ethanol production process.

- Potable Water – API would pipe potable water for the biorefinery from DPI, which is connected to the Alpena municipal water system.

- Domestic Wastewater – Domestic wastewater from the biorefinery would go to the DPI domestic wastewater system, which discharges to the City of Alpena sanitary sewer in the street, or would bypass the DPI system and connect directly to the sanitary sewer. The sanitary sewer discharges to the City of Alpena municipal wastewater treatment plant.

- Process Wastewater – All APB project and DPI process water would discharge to the onsite wastewater treatment plant.

Section 3.6 discusses existing utilities and utility requirements for the proposed APB project.

2.1.3.6 Startup, Shutdown, Maintenance, and Emergency Conditions

API anticipates that the APB demonstration project would last for 8 to 12 months and would normally operate 24 hours per day, 7 days per week, depending on the DPI production schedule. The facility would operate approximately 330 to 350 days per year. After the demonstration period, API expects the facility to continue to operate as a commercial facility for the foreseeable future. API would schedule minor maintenance activities regularly throughout the operating year with an additional plantwide shutdown scheduled each year for major maintenance activities that required the entire plant to be off line. This would limit the number of times the facility went through a complete startup and shutdown cycle.

API would develop Standard Operating Procedures (SOPs) for each operating system and the associated pollution control systems. These would include the following:

- Feedstock pretreatment
- Acid hydrolysis
- Neutralization
- Filtration
- Fermentation and distillation systems
- Separation of potassium acetate
- Ethanol and denaturant loading and storage
- Byproduct (lignin and gypsum) handling
- Sludge handling

The APB project would shut down under emergency conditions such as power or process water loss. The project would use existing emergency services from the City of Alpena in the event of a fire.

The pollution control systems would be interconnected with motor controls on the process equipment. Shutdown of the pollution control device would automatically shut down the associated process.

2.1.4 Construction

2.1.4.1 Construction Schedule

API would obtain the appropriate environmental and building permits. Following issuance of the required permits, construction time for the APB project would be 8 to 12 months. As part of site preparation activities, the erosion control measures specified in the Soil Erosion and Sedimentation Control Plan (SESC) would be completed. The construction of the facility would follow.

2.1.4.2 Construction Staffing

API would have full-time construction management on site throughout the duration of construction activities. API would designate an area on the APB property near the construction site for placement of temporary job trailers and storage areas during construction; it would use subcontracted labor. The biorefinery construction contractor would establish an office on the site where all people and equipment entering the construction work zones would report. Contractor employees would park their vehicles in a designated parking area. Only construction equipment and subcontractor and supervisor vehicles would have access to the construction zones as a safety precaution. API would assign an onsite manager to monitor installation and safety.

At the peak of construction, API would employ approximately 80 construction contractor personnel for 8 to 12 months.

2.1.4.3 Preconstruction, Grading, and Earthworks

API would complete a preconstruction topographical survey of the construction areas before preparation of a grading plan. API does not anticipate the need for access roads or other site disturbances to complete the topographical survey and geotechnical evaluations. A wetland survey is not necessary for the site because it is in an upland area on an existing industrial property.

API would clear approximately 1 acre of treeless, unpaved industrial land for construction of the biorefinery. Clearing would consist of the removal of brush, rubbish, and other material, including foundations, and other existing obstructions to the construction work. Construction would require the removal of approximately 4,500 cubic yards of soil unsuitable for use as backfill. API would import approximately 7,500 cubic yards of fill material from an offsite source for foundation backfill and finish grading.

API would seek approval from a solid waste landfill for disposal of the approximately 4,500 cubic yards of unsuitable material. It would complete all required soil sampling and soil acceptance documentation required by the landfill. Landfills that could accept the material include the Montmorency-Oscoda-Alpena Solid Waste Management Authority (MOASWMA) landfill in Loud Township, Montmorency County, and the Waste Management, Inc. landfill in Waters, Michigan.

API would complete the site grading design to minimize the impact to the surrounding environment. Site development practices would conform to those in the *Michigan Erosion & Sediment Control Handbook (MDOT, 2006)*.

API would apply for a SESC permit from the City of Alpena before starting construction. API would use engineering and construction Best Management Practices (BMPs) to control the amount of sedimentation and erosion created by the construction process. The BMPs would include but not be limited to:

- Minimizing traffic and activity outside the construction area,
- Using silt fencing, hay bales, riprap, and
- Using sedimentation ponds.

API would routinely inspect the BMPs to ensure implementation and to evaluate the need for additional measures to prevent unnecessary impacts.

2.1.4.4 Roads and Facility Access

APB project employees would use the current access to DPI property on Ford Street. Truck traffic to the DPI site is from U.S. Highway 23 to the northwest. From Highway 23, trucks travel east on Hamilton Road (approximately 2.5 miles north of DPI) to Wessel Road. The trucks then travel south on Wessel Road approximately 2 miles to Ford Street, then approximately one-half mile southwest to DPI. Figure 2-3 shows the route to the DPI facility. This route would be in use during construction and operation of the proposed facility. API would construct a 200-foot stretch of asphalt roadway across the DPI property for vehicular access to and from the biorefinery. This would reduce the amount of fugitive dust generated from truck traffic on site; it would also help reduce the potential for sediment entrainment in stormwater.

API would transport all product and raw materials for the APB project by truck. The traffic for shipping ethanol from the facility would average an estimated 118 trucks per year, or approximately 10 trucks per month. An estimated 201 trucks per year (approximately 18 trucks per month) of potassium acetate and 418 trucks per year (approximately 35 trucks per month) of gypsum would leave the biorefinery. The total truck traffic (materials and product) would be approximately 1,145 trucks per year.

2.1.4.5 Major Buildings and Structures

The APB project would include the construction of new buildings and exterior tanks. API would build all storage tanks outside buildings in a concrete containment structure to contain potential spills. The containment structures would hold the contents of the largest tanks plus sufficient additional volume for precipitation (rain or snow), as required by EPA regulations. Table 2-1 outlines the major buildings and equipment that API would add to the site for the APB project.

2.1.5 Operations

2.1.5.1 Operational Workforce

During operations, the APB project would require a permanent workforce of approximately 10 to 20, which the surrounding area's population and skilled personnel could support. API expects to hire the necessary people from existing local and regional resources.

[Figure placeholder]

Table 2-1. Major APB project structures.

Structure	Size
Biorefinery Building containing: Four 65,200-gal fermenters One 74,600-gal beer well One reverse osmosis membrane system One hydrolysis system	Approx. 20,000 ft^2
Low solids feed tank[a]	34-ft diameter by 28 ft tall; 188,800 gal
Potassium acetate (or acetic acid) storage tanks[a]	12.75-ft diameter by 16 ft tall; 15,179 gallons
Two 200-proof ethanol day tanks[a]	5.75-ft diameter by 8 ft tall; 1,480 gal each
Vapor compression evaporator	Approx. 37 ft × 46-foot × 75-ft
One denaturant (gasoline) tank[a]	4.75-ft diameter by 8 ft tall; 1,040 gal
One ethanol product storage tank[a]	12.75-ft diameter by 16 ft tall; 14,830 gal
Two truck loading/unloading areas	2,100 ft^2 each loading area
Distillation and Dehydration System	Approx. 3,200 ft^2 skid

a. Tanks in bermed tank farm.

2.1.5.2 Material Balance and Logistics

Table 2-2 summarizes resources and products the APB project would require for the production of 900,000 gallons of anhydrous ethanol, up to 945,000 gallons of standard denatured ethanol (5 percent denaturant), or up to 1.2 million gallons per year of E-70 and approximately 700,000 gallons per year of an aqueous potassium acetate (50 percent by weight) coproduct. The following paragraphs contain additional details.

Table 2-2. APB Project material balance.

Material description	Rate
Biorefinery inputs	
Wastewater from DPI (feedstock)	Approx.450 gpm
Sulfuric acid	Approx. 700 lb/hr dry
Lime	Approx. 500 lb/hr dry
Potassium hydroxide	Approx. 300 lb/hr dry
Yeast & nutrients	Approx. 25 lb/hr dry
Biorefinery products	
Ethanol	Approx. 675 lb/hr dry
Potassium acetate	Approx.450 lb/hr dry
Biorefinery by-products and waste	
Gypsum	Approx. 1,000 lb/hr dry
Lignin, unfermentable sugars, and spent yeast	Approx. 1,000 lb/hr dry
Water formed in reactions	Approx. 200 lb/hr dry
CO_2	Approx. 675 lb/hr dry
Hazardous waste	Less than 220 lb/month
Nonhazardous solid waste	Less than 1 ton/week
Biorefinery process steam (provided by DPI)	
Steam for hydrolysis	Approx. 1,000 lb/hr
Steam for distillation column	Approx. 3,000 lb/hr
Steam to mole sieves	Approx. 425 lb/hr
Miscellaneous steam	Approx. 500 lb/hr

DPI would provide the APB process steam. The biorefinery would use approximately 4,900 pounds per hour of steam for process operations. Reduced wastewater load, reduced use of the steam-heated sludge dryer, and improved water utilization would result in reduced steam production at DPI by about 2,500 pounds per hour in the summer and 13,500 pounds per hour in the winter. The wastewater treatment plant currently generates approximately 17.7 bone dry tons per day of total sludge, approximately 12.9 bone dry tons per day of which DPI burns in a boiler; it uses the rest as landspread or landfill. During biorefinery operation, the wastewater treatment plant would generate approximately 4.1 bone dry tons per day of sludge, which DPI would handle in a similar manner.

2.1.5.3 Feedstock Availability

Section 2.1.3.1 discusses feedstock availability. The biorefinery would not increase chip demand or require any new equipment at DPI. DPI would provide feedstock at no cost.

2.1.5.4 Permits, Approvals, and Applicant-Committed Measures

The APB project would require a number of environmental permits, approvals, and plans for construction and operation, as summarized in Table 2-3.

Table 2 3. APB Project potentially applicable permits, approvals and API-committed measures.

Activity	Permit, Plan or Approval	Parties Involved	Completed by	Comments
Federal				
Use of yeast for production of ethanol	Toxic Substances Control Act Microbial Commercial Activity Notice (MCAN)	U.S. EPA	Operation	As required by the USEPA, API will submit the exemption at least 10 days prior to facility start-up. Applicant does not need to wait for EPA response before starting up. API would collect the information, maintain records and submit reports as required by the MCAN regulations.
Production and sale of fuel ethanol	Alcohol Fuel Producer Permit	U.S. Dept of Treasury/Alcohol and Tobacco Tax and Trade Bureau	Operations	Submit TTB FORM 5110.74 to the Department of Treasury. API would collect the information, maintain records and submit reports as required by the permit and associated regulations.
Transport and handle ethanol and/or other hazardous materials	Transportation and Handling of Hazardous Materials Certificate of Registration	U.S. DOT	Operation	API would register online prior to operation. API would collect the information, maintain records and submit reports as required by the USDOT regulations.

Activity	Permit, Plan or Approval	Parties Involved	Completed by	Comments
Plan of actions to be taken to prevent or respond to spills and releases of oil or petroleum products.	Spill Prevention Control and Countermeasure (SPCC) Plan	USEPA	Operations	SPCC requirements will be included in an Integrated Contingency Plan (ICP) for the proposed APB project API would prepare the SPCC plan prior to starting operations. API would complete the inspections, training, collect the information, and maintain records as required by the SPCC regulations.
Plan of actions to be taken to prevent or respond to spills and releases of chemicals in the laboratory	Laboratory Chemical Hygiene Plan	OSHA	Operations	To be completed before start of operations. No submittal required. API would operate the laboratory in accordance with the plan.
	State			
Construction sources of air emissions	Permit to Install	Michigan DNRE	Construction	Permit Application has been submitted to the MDNRE. The draft permit was placed on public notice on July 30, 2010. API would collect the information, maintain records and submit reports as required by the permit and associated regulations.
Operate sources of air emissions	Renewable Operating Permit	Michigan DNRE	Operation	API would submit an application for significant modification to DPI permit number MI-ROP-B1476-2009. API would collect the information, maintain records and submit reports as required by the permit and associated regulations.
Transfer of existing DPI water discharge permit to API	Authorization to Discharge under the NPDES	Michigan DNRE	Operation	API would submit an application for amendment to DPI permit number MI0002500. API would prepare an ICP to address storm water discharges. API would collect the information, maintain records and submit reports as required by the permit and associated regulations.

Activity	Permit, Plan or Approval	Parties Involved	Completed by	Comments
Plan of actions to be taken to prevent contamination of storm water.	Storm Water Pollution Prevention Plan (SWPPP)	Michigan DNRE	Operations	SWPPP requirements would be included in an Integrated Contingency Plan for the proposed APB project. API would complete the inspections, training, collect the information, and maintain records as required by the storm water regulations
Permit for discharge of hydrostatic test water	Hydrostatic Pressure Test Water Discharge General Permit	Michigan DNRE	Operations	API would submit application for Certificate of Coverage from the Water Bureau. API would complete the inspections, training, collect the information, and maintain records as required SPCC regulations
Not required since storm water discharged to DPI WWTP.	Discharge of storm water from construction activity	Not Applicable (NA)	NA	NA
Not required because storm water will be routed through NPDES permitted outfalls	Discharge of storm water associated with industrial activity	NA	NA	NA
Notification that the facility may generate hazardous waste	Notification of Hazardous Waste or Liquid Industrial Waste activity	Michigan DNRE USEPA	Operations	API would submit site identification form EQP5150 to the MDNRE and USEPA. API would complete the inspections, training, collect the information, and maintain records as required by the hazardous waste regulations.
Notification of design and installation of storage tanks	Aboveground storage tank plan review	Michigan DNRE	Must be submitted not less than 30 days before installation of the tanks	API would submit the application for plan review. API would complete the inspections, collect the information, and maintain records as required by the storage tank regulations.
Amend existing DPI permit to include APBs water consumption.	Process Water Supply	Michigan DNRE	Operation	APB would submit an application to amend the DPI permit. API would collect the information and maintain records as required by the permit and associated regulations.

Activity	Permit, Plan or Approval	Parties Involved	Completed by	Comments
Amend existing DPI permit to reflect APB as permittee. Amend to include pressed lignin and gypsum.	Land Application of WWTP Sludge	Michigan DNRE	Operation	APB would submit an application to amend the DPI permit. API would collect the information and maintain records as required by the permit and associated regulations.
Program to detect leaks in piping, components, and valves and repair them.	Leak Detection and Repair (LDAR) Program	Michigan DNRE	Must be established within 180 days after startup of facility	API would develop an LDAR program for all applicable systems that contain ethanol or denaturant. API would complete the inspections, collect the information and maintain records as required by the LDAR regulations (New Source Performance Standard Subpart VVa).
Revise the existing DPI Malfunction Abatement Plan	Malfunction Abatement Plan for all equipment with a control device.	Michigan DNRE	Operations	API would prepare and implement a revised MAP. API would complete the inspections, collect the information and maintain records as required by the MAP.
Revise the existing DPI Odor Management Plan	Odor Management Plan for facility	Michigan DNRE	Operations	API would prepare and implement a revised OMP. API would complete the inspections, collect the information and maintain records as required by the OMP
Plan for actions to be taken to prevent or respond to spills and releases of hazardous materials such as sulfuric acid or potassium acetate	Pollution Incident Prevention Plan (PIPP)	Michigan DNRE	Operations	API would include the PIPP requirements the ICP. API would complete the inspections, training, collect the information, and maintain records as described in the ICP and PIPP regulations.
	Local			
Submit letter describing project and site plan to Commission prior to hearing	Special Land Use Permit	City Planning Commission	.	Approval anticipated at required public hearing held by the Alpena City Planning Commission.
Acquire a building permit allowing construction of the proposed facility	Building Permit	City of Alpena Building Department	Construction	API would prepare and submit stamped drawings and specifications. API would arrange and facilitate the required inspections by the City of Alpena.

Activity	Permit, Plan or Approval	Parties Involved	Completed by	Comments
Plan describing the actions that will be taken to minimize soil erosion due to construction	Soil Erosion/Grading Permit including Soil Erosion and Sedimentation Control Plan (SESC)	City of Alpena Building Department	Construction	API would prepare and submit the SESC with the building permit application. API would implement or require their contractors to implement the provisions of the SESC. API would complete the inspections, training, collect the information, and maintain records as described in the SESC and building permit.
Acquire a permit to install electrical equipment.	Electrical Permit	Michigan Department of Consumer and Industry Services, Bureau of Construction Codes	Construction	API would submit stamped drawings and specifications with the permit application. API would arrange and facilitate the required inspections
Acquire a permit to install plumbing and fixtures.	Plumbing Permit	Michigan Department of Consumer and Industry Services, Bureau of Construction Codes	Construction	API would submit stamped drawings and specifications with the permit application. API would arrange and facilitate the required inspections
Acquire a permit to install mechanical systems and equipment	Mechanical Permit	Michigan Department of Consumer and Industry Services, Bureau of Construction Codes	Construction	API would submit stamped drawings and specifications with the permit application. API would arrange and facilitate the required inspections
Acquire permit to allow large loads to use the roads to the plant site.	Overload Limit Permits - Construction deliveries	County and MDOT as applicable.	As needed	Equipment suppliers are responsible for obtaining these permits prior to shipping. API would include permit requirements in contracts with suppliers.
Provide information on hazardous materials to the Alpena Fire Department, Local Emergency planning Commission, the MDNRE, and USEPA.	Hazardous Material Inventory and Emergency Response Plan (ERP)	Alpena County Emergency Planning Commission; Alpena Deputy Fire Chief; Alpena EMC/911	Operations	API would prepare and submit the ERP to the required agencies.

2.1.5.5 Project Design Features To Minimize Threat from Intentional Destructive Activities

The APB project design would include measures to minimize potential threats or damages from intentional destructive acts (that is, acts of sabotage or terrorism). The facility design would include additional security lighting and communication procedures with the local 911 emergency response system. In addition, API would staff the facility 24 hours per day.

2.2 No-Action Alternative

Under the No-Action Alternative, DOE would not authorize API to expend Recovery Act funding for the proposed project. As a result, API would delay the project as it looked for other funding sources to meet its need, or would abandon it if it could not obtain funding. Further, DOE's ability to achieve its objectives to deploy sustainable energy infrastructure projects and energy-efficient industrial technologies could be impaired.

Although this and other selected projects could proceed if DOE decided not to provide financial assistance, the Department has assumed for this EA that the project would not proceed without its assistance. If the project proceeded without DOE assistance, the potential impacts would be essentially identical to those under the DOE Proposed Action (that is, providing assistance that enables the project to proceed). To enable a comparison between the potential impacts of a project as implemented and the impacts of not proceeding with a project, DOE has assumed that if it decided to withhold assistance, this project would not proceed.

3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES OF THE ALTERNATIVES

In this chapter, DOE assesses the following resource areas: land use; water resources; air quality; safety and occupational health; waste management and hazardous materials handling; utilities; traffic; and socioeconomics and environmental justice. Each of the following sections first describes the "environmental baseline" for a resource area, then assesses potential impacts of the proposed project and the No-Action Alternative. Section 1.5 discusses environmental resource areas that DOE did not consider in this EA.

3.1 Land Use

3.1.1 Affected Environment

This section describes existing land use conditions on and surrounding the site of the proposed project. The APB facility would be constructed on 1 acre on the existing DPI industrial property at 412 Ford Avenue, City of Alpena, Alpena County, Michigan. The remaining 27 acres of the project consist of the existing wastewater treatment plant and lagoons. Alpena is the northeastern region of the Lower Peninsula of Michigan. It is near the western shore of Lake Huron, on Thunder Bay.

The site is in the southwest quarter of Section 23, Township 31 North, Range 8 East, Alpena County, Michigan, at the mouth of the Thunder Bay River along Thunder Bay of Lake Huron (see Figure 2-1). The property is zoned for general industry. DPI currently uses the property, about 91 acres, as a hardwood manufacturing plant that contains two wastewater treatment plant lagoons and an aeration pond that collectively cover about 27 acres. DPI has been operating at this location for 6 years. Hardboard has been manufactured at the site for more than 50 years.

The adjacent areas north and northwest of the DPI property are zoned as residential. The area to the northeast is zoned for general industry. The LaFarge quarry and cement production facility is in this area, approximately 0.75 mile northeast from the proposed APB project. The City of Alpena wastewater treatment plant is on the opposite bank at the mouth of the Thunder Bay River and is in an area zoned for general industry. Downtown Alpena is on the opposite bank of the Thunder Bay River, to the west of the APB project, in an area zoned for central business.

The immediate area includes the WWTP Environmental Building, a garage, a fuel storage tank, sample building, the wastewater treatment plant lagoons and aeration pond, and sludge drying pans and storage areas

3.1.2 Environmental Consequences of Proposed Action

The proposed APB project would be on an active industrial site, which is adjacent to industrial, commercial, and residential properties. Under the Proposed Action, construction and paving would develop approximately 1 acre of land adjacent to a wastewater treatment plant into a building, structures, storage tanks, and other impervious surfaces such as roads and parking areas. Figure 2-2 shows the proposed layout of the project. The nearest residence, which is in a residential area, would be the nearest sensitive area; it is approximately 800 feet northwest of the site of the proposed biorefinery and adjacent to the northwestern property boundary.

The Alpena Planning Commission approved a Special Land Use permit in May 2010 for the proposed project. The permit was necessary because the zoning ordinance does not list a biorefinery as a land use.

The permit was also necessary because the facility would exceed 10,000 square feet and because the project would require environmental permits.

While the project would alter 1 acre of land cover, there would be a negligible impact on land use because the intended industrial use of the property would not change. Construction and operation of the biorefinery would not change or affect current adjacent land uses.

3.1.3 Environmental Consequences of the No-Action Alternative

Under the No-Action Alternative, DOE would not provide funding to API, which would not build the biorefinery. No changes to land use would occur.

3.2 Water Resources

3.2.1 Affected Environment

This section describes water resources, including groundwater, surface water and flood plains, on and surrounding the site of the proposed project. It also describes process wastewater and stormwater because they directly affect Lake Huron. Section 3.6 discusses municipal water and wastewater systems.

3.2.1.1 Groundwater

According to the February 2005 MDNRE Wellogic database, approximately 39 percent of wells in Alpena County are in glacial deposits, and 41 percent are in bedrock units. There is insufficient information to make this distinction for 20 percent of the wells in the county. Glacial wells are more abundant in the southern portion of the county, while bedrock wells dominate in the northern portion (USGS 2007).

The water table elevation in the project area is approximately 580 feet above sea level. Soil borings at the project site by Wilcox (2009) encountered groundwater at elevations ranging from 578.8 to 580.0 feet. The surface-water elevation of Lake Huron is 577 feet.

Development of groundwater within 1 mile of the project site is limited to a few residential wells. The nearest domestic well is approximately 1 mile southwest of the project site; the well is 33 feet deep and set in limestone. Two other wells approximately 1 mile northwest of the project site are 35 feet deep and are set in sand and gravel. DOE obtained additional groundwater aquifer information from the MDNRE "Interactive Groundwater Map Viewer." According to MDNRE, the glacial aquifer yield at the project site ranges from 200 to 500 gallons per minute. Glacial transmissivity can range from 2,000 to 3,000 square feet per day. The indicated yield and transmissivity of the local bedrock aquifer are 10 to 500 gallons per minute and 501 to 5,000 square feet per day, respectively (MDNRE 2009a).

3.2.1.2 Surface Water

As shown on Figure 2-1, the APB project site would be along the mouth of the Thunder Bay River and Thunder Bay of Lake Huron. The Thunder Bay River Watershed covers parts of Alpena, Alcona, Montmorency, Oscoda, and Presque Isle Counties. The entire Thunder Bay watershed consists primarily of coarse-textured glacial till (50 percent); glacial outwash sand, gravel, and postglacial alluvium (17 percent); and ice-contact outwash sand and gravel (10 percent) (MDNRE 2006).

3.2.1.3 Floodplains

The southern boundary of the DPI site along the Thunder River and the eastern end of the property along Thunder Bay are in Zone A, the 100-year floodplain (Federal Emergency Management Agency Flood Insurance Rate Map 1992). The wastewater treatment plant lagoons are in the floodplain. In the event of a 100 year flood, the untreated or partially treated wastewater from the lagoons may be discharged directly to the Thunder Bay.

3.2.1.4 Wastewater

DPI operates an onsite wastewater treatment plant under NDPES Permit No. MI0002500. The permit will expire on October 1, 2011.

The wastewater treatment plant consists of a primary clarifier, an oil/water separator, a hydra sieve to remove fiber sludge, an aerated lagoon with nutrient addition for secondary treatment, and two dissolved air flotation units for separation of secondary sludge. DPI adds polymer to the sludge and then dewaters the sludge in belt presses, dries it in a steam dryer, and burns it in the power plant or uses it as landfill. The secondary treatment system effluent is discharged through Outfall 001 to Thunder Bay in Lake Huron through a diffuser pipe. The diffuser portion is the final 700 feet of the 1,240-foot pipe. Noncontact cooling water is discharged without treatment from Outfall 002 to Thunder Bay River.

According to its 2007 Wastewater Report submitted to the MDNRE on July 29, 2008, DPI discharged approximately 1,204 million gallons of wastewater, stormwater, and noncontact cooling water in 2007. Of this total, it discharged approximately 538 million gallons to Thunder Bay and approximately 666 million gallons to the Thunder Bay River.

The permit authorizes DPI to discharge a maximum of 3.4 million gallons per day (1,241 million gallons per year) of process wastewater and stormwater from Monitoring Point 001A through Outfall 001 to Thunder Bay. Process wastewater discharge to this outfall is limited to 1.5 million gallons per day. DPI is also authorized to discharge a maximum of 6.2 million gallons per day (2,263 million gallons per year) of noncontact cooling water from Monitoring Point 002A through Outfall 002 to the Thunder Bay River.

DPI domestic wastewater is connected to the City of Alpena sanitary sewer system, which discharges to the City's wastewater treatment plant. Section 3.6.1 discusses the municipal wastewater treatment plant.

3.2.1.5 Stormwater

Approximately 15 to 20 percent of the surface-water runoff from the DPI property drains directly to the Thunder Bay River. The balance drains to the DPI wastewater treatment plant, where it is treated and discharged in accordance with the DPI National Pollutant Discharge Elimination System (NPDES) permit.

3.2.2 Environmental Consequences of the Proposed Action

This section describes the environmental consequences of the proposed biorefinery on water resources, including groundwater and surface water. It also describes impacts from process wastewater and stormwater because they directly affect Lake Huron. Section 3.6 discusses impacts to the municipal water and wastewater systems.

3.2.2.1 Groundwater

The APB project would not use groundwater resources as a source of potable or process water. Therefore, impacts to groundwater quantity would be unlikely.

Potential impacts to the surficial aquifer could result from releases of hazardous materials from facility operations. The APB project would use facility designs that include secondary containment and have operational policies and procedures to manage and store such materials, so releases should not occur. If an accidental release occurred, the facility would have a Spill Prevention, Control and Countermeasure (SPCC) Plan to contain, manage, and clean up the release. These procedures would minimize, to the extent possible, potential impacts to the surficial aquifer.

Additional measures for preventing soil and groundwater contamination include the development of both a construction and an operational Storm Water Pollution Prevention Plan (SWPPP), as required by the NPDES permit.

3.2.2.2 Surface Water

DPI would supply approximately 300,000 gallons per day of water from the Thunder Bay River to the APB biorefinery for use in the air emission scrubber and for process cooling. The minimum flow measured in the Thunder Bay River at Alpena between 2007 and 2009 was approximately 218,000,000 gallons per day (USGS Water Data Reports, 2007 – 2009). The MDNRE Water Withdrawal Permit would be amended to include the water for the biorefinery. API would purchase potable water from DPI for domestic use, as discussed in Section 3.6.2.

The APB project would develop approximately 1 acre of treeless, primarily unpaved land in an active industrial facility into structures and paved surfaces. Soil disturbance during construction activities could result in modified surface-water runoff patterns from the site. Impacts on hydrology could result from land clearing, loss of vegetation, and associated accelerated runoff from impervious surfaces following precipitation events. Although erosion could affect water quality, the use of construction and post construction BMPs, as described in Section 3.2.2.4, would prevent a significant increase in runoff following construction and operation of the APB project.

Impacts to surface-water quality could occur from accidental releases of hazardous materials from facility operations. The APB project would use facility designs that included secondary containment and had operational policies and procedures to manage and store such materials, so releases should not occur. If an accidental release occurred, the facility would have an SPCC Plan to contain, manage, and clean up the release. These procedures should minimize, to the extent possible, potential impacts to surface-water quality.

3.2.2.3 Floodplains

The new APB is outside the boundary of the 100-year floodplain. No change would occur to the wastewater treatment lagoons.

3.2.2.4 Wastewater

The DPI wastewater treatment plant currently processes approximately 800 gallons per minute of effluent from the mill with a total BOD loading of 31.2 tons per day (TPD). DPI returns approximately the same amount of clean effluent to Lake Huron with a BOD loading of 1 TPD.

During biorefinery operation, the wastewater treatment plant would continue to receive the DPI wastewater streams minus the sugar-rich washwater stream, but would receive three new effluent streams (spent cooling water, distillate bottoms, and evaporator condensate) from the APB project. Before their discharge to the wastewater treatment plant, API would filter the solids in the distillate bottoms (gypsum, lignin, unfermentable sugars, and spent yeast). During operation of the APB project, the wastewater treatment plant would process approximately 550 gallons per minute of effluent with an approximate BOD loading of 5.2 TPD and discharge the same amount of clean effluent to Lake Huron.

The existing DPI NPDES permit would be divided such that Outfall 001 would be assigned to the APB project. During biorefinery operation, this outfall would discharge the treated DPI and APB process wastewater mentioned above and treated stormwater from DPI and APB. Outfall 002 , the permitted outfall for DPI noncontact cooling water from the hardboard manufacturing process, would remain with DPI and continue to discharge this cooling water.

APB domestic wastewater would either connect to the DPI domestic wastewater system, which connects to the City of Alpena sanitary sewer in the street, or would bypass the DPI system and connect directly to the city sewer, which discharges to the city's municipal wastewater treatment plant. Section 3.6.2 discusses impacts to the Alpena wastewater treatment plant from construction and operation of the facility.

3.2.2.5 Stormwater

API would clear approximately 1 acre of treeless, primarily unpaved land for construction of the biorefinery. The Michigan Natural Resources and Environmental Protection Act (1994 PA 451, Part 91 Soil Erosion and Sedimentation Control) requires a permit application (including an SESC Plan) for all earth change activities that disturb 1 or more acres of land, or if the earth change is within 500 feet of a lake or stream. The City of Alpena is the permitting authority for the MDNRE under Part 91.

API would have to complete the permit application and SESC Plan as required by Part 91 for submission to the City of Alpena Building Official. The site grading design would minimize the impact to the surrounding environment by reducing the potential for erosion. Clearing would consist of the removal of brush, rubbish, and other material, including structures, foundations, and other existing obstructions to construction. Construction would require the excavation and removal of approximately 4,500 cubic yards of material unsuitable for use as backfill. API would dispose of this material at a licensed landfill, and would import up to 7,500 cubic yards of fill material from an offsite source for foundation backfill and finish grading.

The SESC Plan would incorporate BMPs to prevent sedimentation impacts. These BMPs could include:

- Installation of silt fencing
- Installation of hay bales for sediment control
- Construction of temporary stormwater retention ponds
- Retention of vegetative cover where practical.

As stated above, API and DPI would divide the DPI NPDES permit. The revised permit would assign API Outfall 001 for discharge of API and DPI stormwater and process water from DPI and the APB site. During operation of the APB project, the existing permit would cover discharge of stormwater.

As part of the permit, API would develop a SWPPP, which would have three major components:

1. Identification of significant materials that existed at the permitted site and could contaminate stormwater.

2. Measures to prevent stormwater at the site from becoming contaminated with oil, debris, or other waste materials, and

3. Control of stormwater that could have become contaminated through contact with significant materials at the site.

As required by the permit, API would have an MDNRE-certified stormwater operator implement the SWPPP and ensure the stormwater control measures were effective.

3.2.3 Environmental Consequences of the No-Action Alternative

Under the No-Action Alternative, DOE would not provide funding to API, which would not build the biorefinery. No changes to water resources would occur. The beneficial impact of reusing DPI wastewater streams and reducing the treated discharge to Lake Huron would not occur.

3.3 Air Quality

3.3.1 Affected Environment

This section describes air quality in terms of ambient air quality, odor, and greenhouse gases.

3.3.1.1 Ambient Air Quality

The Clean Air Act (CAA) required the U.S. Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. The NAAQS include two types of air quality standards: Primary standards protect public health including sensitive populations such as asthmatics, children, and the elderly; secondary standards protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings (EPA 2009a). The EPA has established and Michigan has adopted NAAQS for seven principal pollutants, which are called *criteria pollutants,* as listed in Table 3-1.

Areas that meet the air quality standards for the criteria pollutants are designated as being *in attainment*. Areas that do not meet the air quality standard for one or more of the criteria pollutants could be subject to the formal rule-making process and designated as being *in nonattainment* for that standard. Alpena County is in attainment for all criteria air pollutants (EPA 2009b).

The EPA maintains a database of selected ambient air quality data. Table 3-2 summarizes criteria air pollutant emissions by category for Alpena County for 2002, the most recent date available from the database.

Table 3-3 lists the sources identified in the EPA Envirofacts database for air releases within 15 miles of the proposed facility (EPA 2009d).

Table 3-1. National Ambient Air Quality Standards.

Pollutant	Primary standards	Averaging times	Secondary standards
Carbon monoxide	9 ppm ($10\ mg/m^3$)	8-hour[a]	None
	35 ppm ($40\ mg/m^3$)	1-hour[a]	None
Lead	$1.5\ \mu g/m^3$[(b)]	Quarterly average	Same as primary
Nitrogen dioxide	0.053 ppm ($100\ \mu g/m^3$)	Annual arithmetic mean	Same as primary
Nitrogen dioxide[i]	100 ppb ($188\ \mu g/m^3$)	1-hour	None
PM_{10}	$150\ \mu g/m^3$	24-hour[c]	Same as primary
$PM_{2.5}$	$15.0\ \mu g/m^3$	Annual[d] arithmetic mean	Same as primary
	$35\ \mu g/m^3$	24-hour[e]	Same as primary
Ozone	0.075 ppm (2008 std)	8-hour[f]	Same as primary
	0.08 ppm (1997 std)	8-hour[g]	Same as primary
	0.12 ppm	1-hour[h] Applies only in limited areas	Same as primary
Sulfur oxides	0.03 ppm	Annual arithmetic mean	-------
	0.14 ppm	24-hour[a]	-------
	-------	3-hour[a]	0.5 ppm ($1{,}300\ \mu g/m^3$)

Table from EPA (2009a).

a. Not to be exceeded more than once per year.
b. Final rule signed October 15, 2008.
c. Not to be exceeded more than once per year on average over 3 years.
d. To attain this standard, the 3-year average of the weighted annual mean $PM_{2.5}$ concentrations from single or multiple community-oriented monitors must not exceed 15.0 micrograms per cubic meter.
e. To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor in an area must not exceed 35 micrograms per cubic meter (effective December 17, 2006).
f. To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor in an area over each year must not exceed 0.075 parts per million (effective May 27, 2008).
g. 1. To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor in an area over each year must not exceed 0.08 parts per million.
   2. The 1997 standard – and the implementation rules for that standard – will remain in place for implementation purposes as EPA undertakes rulemaking to address the transition from the 1997 ozone standard to the 2008 ozone standard.
h. 1. The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 parts per million is less than 1.
   2. As of June 15, 2005, EPA revoked the 1-hour ozone standard in all areas except the 8-hour ozone nonattainment Early Action Compact Areas.
i. The 1-hour NO_2 standard is based on the 3-year average of the 98th percentile of the annual distribution of the daily hourly maximum 1-hour concentrations.

Table 3-2. 2002 Alpena County emissions by category – criteria air pollutants (tons per year).

Pollutant	Point source emissions	Nonpoint + mobile source emissions
PM_{10}	1,069	2,628
$PM_{2.5}$	538	639
Nitrogen oxides	10,029	2,081
Carbon monoxide	945	16,240
Volatile organic compounds	349	4,513
Sulfur dioxide	17,214	475
Ammonia	2.34	248

Table from EPA (2009c).

Table 3-3. Air emission sources within 15 miles of the proposed facility.

Source	Relative location to proposed facility	Description
Alpena Power Company	0.5 mile northwest	Major source (inactive). Crude petroleum and natural gas.
	1 mile northeast	Minor source, potential emissions less than 100 tons per year (inactive).
	2 miles north	Minor source, potential emissions less than 100 tons per year (inactive).
	8 miles northeast	Minor source, potential emissions less than 100 tons per year (inactive).
Alpena Power Generation LLC	2.5 miles northwest	Major source. Fossil fuel electric power generation.
Alpena Power Generation	--	Major source.
BBI Enterprises, Inc.	1 mile north-northwest	Minor source, potential emissions less than 100 tons per year.
Breitburn Operating LP-Minke Coat	--	Minor source, potential emissions less than 100 tons per year.
Casting Service	1 mile west-northwest	Minor source, potential emissions less than 100 tons per year.
Conveyor Systems, Inc.	2.5 miles northwest	Minor source, potential emissions less than 100 tons per year.
Everett Goodrich Trucking, Inc.	4 miles north-northeast	Minor source, potential emissions less than 100 tons per year.
HRF Exploration & Production-Walking B	--	Minor source, potential emissions less than 100 tons per year.
Jordan Development Company, LLC	--	Minor source, potential emissions less than 100 tons per year.
LaFarge Midwest, LLC	0.75 mile northeast.	Major source, potential emission greater than 100 tons per year. Cement, hydraulic.
Louisiana-Pacific Canada, LTD (Decorative Panels International)[a]	0 miles	Major source, potential emission greater than 100 tons per year. Reconstituted wood products.
Panel Processing Incorporated	3 miles north-northwest	Minor source, potential emissions less than 100 tons per year.
Specification Stone	2 miles northwest	Minor source, potential emissions less than 100 tons per year.
U.S. Air Force Michigan National Guard Combat Readiness Training Center Alpena Range	2 miles southwest	Minor source, potential emissions less than 100 tons per year.
Savoy-Beck 1-7A (Alcona County)	± 15 miles south	Minor source, potential emissions less than 100 tons per year.
Breitburn Operating LP – New Caledonia (Alcona County)	± 15 miles south	Minor source, potential emissions less than 100 tons per year.
Petroleum Development Corporation (Alcona County)	± 15 miles south	Minor source, potential emissions less than 100 tons per year.

-- Location information not in database.

a. DPI is an existing major source for criteria pollutants under the Prevention of Significant Deterioration regulations. DPI is also an existing major source of HAPs. The MDNRE Air Quality Division issued Renewable Operating Permit MI-ROP-B1476-2009 to DPI on December 17, 2009, with an expiration of December 17, 2014.

3.3.1.2 Conformity

Section 176(c) of the CAA [42 U.S.C. 7506(c)] requires any agency of the federal government that engages in, supports, or in any way provides financial support for, licenses or permits, or approves any activity to demonstrate that the action conforms to the applicable State Implementation Plan (SIP)

required under Section 110(a) of the CAA [42 U.S.C. 7410(a)] before the action is otherwise approved. In this context, conformity means that such federal actions must be consistent with a SIP's purpose of eliminating or reducing the severity and number of violations of the NAAQS and achieving expeditious attainment of those standards. Each federal agency must determine that any action it proposes and that is subject to the regulations implementing the conformity requirements will, in fact, conform to the applicable SIP before the action is taken. DOE is sponsoring and supports the proposed project and must, therefore, review it for general conformity.

3.3.1.3 Odor

Operation of the DPI wastewater treatment plant sludge dryer has historically been a source of odor in Alpena, which has led to the issuance of Consent Order 34-2004 between the Michigan Department of Environmental Quality Air Quality Division and DPI. The Renewable Operating Permit for DPI includes the terms of the Consent Order, which require DPI operate a venturi scrubber and condenser and to route the exhaust from the sludge dryer through Boiler 1 or Boiler 2 to control odors.

DPI has prepared a Preventive Maintenance and Malfunction Abatement Plan that specifies the operating conditions for the venturi scrubber and the condenser and the actions DPI will take in the event of an equipment breakdown that causes objectionable odors.

The City of Alpena wastewater treatment plant has also been a source of odors in Alpena. At the City plant, the offensive odors are typically caused by the bacterial decomposition of organic compounds. The classic "rotten egg" sewer gas odor is one byproduct of this process. Because of the plant proximity to the boat harbor area, the Alpena Municipal Council voted to add 1.5 million dollars worth of odor control equipment to the facility. All treatment vessels have been covered to contain inherent odors. The foul air is moved by a series of fans, blowers, and ductwork to two odor scrubbers. These scrubbers use bleach and caustic soda to remove the odor-causing agents in the collected air.

3.3.1.4 Greenhouse Gases

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 its Fourth Assessment Report issued in 2007, 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 manmade emissions would add to cumulative regional carbon dioxide emissions and to global concentrations of carbon dioxide. The effects from any individual source of greenhouse gases, therefore, cannot be determined. Existing businesses and residences use fossil fuels, primarily natural gas, for process operations and space heat. A greenhouse gas inventory has not been developed for the City of Alpena or Alpena County.

3.3.2 Environmental Consequences of the Proposed Action

The construction and operation of the APB project would result in an increase in the amount of air pollutants emitted.

Emissions during construction would consist primarily of fugitive dust generated by site grading and vehicles moving on the site and exhaust emissions from construction equipment and trucks. The primary risks from blowing dust particles relate to human health and nuisance values. Fugitive dust can contribute to respiratory health problems and create an inhospitable working environment. Deposition on surfaces

can be a nuisance to those living or working downwind. API would minimize fugitive dust emissions by using appropriate control measures, such as road watering, temporary vegetative cover, or dust suppressants, as needed. Therefore, impacts to air quality during the construction phase of the APB project would be minor and temporary.

Potential emissions during operations would come from several sources. Vehicle traffic hauling raw materials and finished products to and from the site would generate fugitive dust. The existing DPI asphalt plant road has a 10 mile per hour (mph) speed limit. API would extend the existing road with a new paved section to the proposed APB facility. The 10 mph speed limit would be applicable to the new road section. The fugitive dust would be minimized by the speed limit and maintaining the roads as needed. The fermentation and ethanol distillation systems would generate emissions of VOCs and HAPs, including acetaldehyde, formaldehyde, and methanol. API would control these pollutants by venting the exhaust gases from these processes through a wet scrubber that would remove approximately 98 percent of the VOCs and 50 percent of the HAPs. Ethanol storage and loadout operations would also generate emissions of VOCs and HAPs. API would store the ethanol in fixed-roof tanks. Table 3-4 compares the maximum potential to emit from the APB project with actual emissions in Alpena County in 2002.

Table 3-4. Comparison of the APB project potential to emit and Alpena County emissions (tons per year).

Air contaminant	**Alpena County 2002 point source emissions** **Tons per year**	**APB project potential to emit** **Tons per year**
PM	Not reported	0.33
PM_{10}	1,069	0.22
$PM_{2.5}$	538	0.20
NO_x	10,029	0.00
CO	945	0.00
VOCs	349	7.72
SO_2	17,214	0.00
Acetaldehyde	Not reported	0.04
Aggregate HAP	Not reported	0.25

As noted in Section 3.3.1.1, the EPA has established and the MDNRE has adopted the NAAQS for criteria air pollutants. The NAAQS include two types of air quality standards: Primary standards protect the public, including the health of sensitive populations such as asthmatics, children, and the elderly; secondary standards protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings (EPA 2009a). The MDNRE requires new facilities that would have significant air emissions to acquire an air permit to construct before beginning construction.

API has submitted a Draft Permit to Install application for the proposed APB project to the MDNRE. The permit application is for a minor source because the controlled potential to emit criteria pollutants for the APB would be below major source thresholds. In addition, the APB would be a minor source of HAPs, because individual and aggregate HAP potential emissions should be below their major thresholds of 10 and 25 tons per year, respectively.

The MDNRE requires that all facilities that emit Toxic Air Contaminants (TACs) complete an analysis to demonstrate compliance with MDNRE Air Pollution Control Rule R 336.1225 (Rule 225). The rule prohibits the emission of any TAC in excess of a rate that results in a maximum ambient impact that is more than a health-based screening level. Based on the Allowable Emission Rate Methodology specified in R 336.1227, the APB would demonstrate compliance with the TAC requirements, as listed in Table 3-5.

Table 3-5. Comparison of the APB project toxic air pollutants maximum potential emission rate and Michigan's allowable emission rate (pounds per hour).

Chemical compound	Allowable emission rate under Michigan TAC regulations	APB maximum potential emission rate
Ethanol	380	18.7
Acetaldehyde	0.27	0.01
Formaldehyde	0.0432	0.00
Methanol	3.25	0.00
Benzene	3.6	0.01
Carbon disulfide	84	0.00
Cumene	48	0.00
Ethylbenzene	120	0.00
Hexane	84	0.01
Toluene	600	0.01
Xylenes	12	0.03
Gasoline	10.8	3.37
Acetic acid	5	0.1

3.3.2.1 Conformity

Because the proposed project would be in Alpena, Michigan, an area that has been designated as in attainment for all criteria pollutants, it would meet the conformity requirements of the Clean Air Act.

3.3.2.2 Odor

The APB project would have potential odor sources from the fermentation system, the pressed lignin and gypsum, and the wastewater treatment plant. Potential odors from the fermentation system would be VOCs. API would use a wet scrubber to reduce the VOC emissions from the process by at least 97 percent. The lignin would be either landspread as a soil amendment or sold as kiln fuel to a local cement manufacturer. Routine transport of the lignin would reduce the potential for odors to develop.

API would address odor from the wastewater treatment plant in accordance with the Odor Management Plan in the WWTP Operation and Maintenance Manual. Operation of the biorefinery would be likely to reduce the amount of biosolids generated by the wastewater treatment plant by approximately 70%. Less biosolids would reduce the use of the sludge dryers and the associated odors. However, API would still route the exhaust from the sludge dryers through the scrubber, condenser, and boilers in accordance with the Renewable Operating Permit.

3.3.2.3 Greenhouse Gases

The APB project would generate greenhouse gases primarily from the fermentation process. Fermentation is a biogenic source of carbon dioxide emissions. Biogenic sources are natural sources of carbon dioxide in which living organisms or biological processes produce emissions; they are typically part of the natural carbon cycle and, therefore, not an increase in global greenhouse gas emissions.

API completed a Life Cycle Assessment (LCA) to determine the potential decrease in climate change emissions from vehicles powered by alternative biofuels. API followed the methods of the International Organization for Standardization (ISO 2006) for the LCA, and adopted a complete life-cycle approach from "cradle to grave" for all material and energy inputs.

DOE used steam and energy demands plus chemical inputs for the wastewater treatment plant, DPI, and the proposed APB project to determine total greenhouse gas emissions. As recommended by ISO LCA guidelines (ISO 2006), API would receive a greenhouse gas credit for the ethanol the project would produce due to the coproduction of potassium acetate, which would displace fossil-derived potassium acetate. Coproduct electricity and steam recovered from the project and used to reduce steam utilization at DPI is also allocated to APB ethanol production. The total reduction in greenhouse gas emissions over the ethanol product life cycle of the project would be equivalent to 25,530 tons of carbon dioxide per year.

The emissions of process-related greenhouse gases would be a function of the amount of ethanol produced. Therefore, emissions of greenhouse gases would be unlikely to be higher during startup or shutdown conditions than during normal operations.

3.3.3 Environmental Consequences of the No-Action Alternative

Under the No-Action Alternative, DOE would not provide funding to API, which would not build the biorefinery. Emissions from the biorefinery would not occur. The beneficial production of cellulosic ethanol would not occur. Operation of the DPI sludge dryer would continue under the terms of the existing Renewable Operating Permit. The potential for a reduction in odors would not occur because there would be no reduction in sludge dryer operation. The expected reduction of life-cycle carbon dioxide emissions from the APB project would not occur. In addition, the potential beneficial impact of long-term reduction of carbon dioxide gases nationwide would not occur.

3.4 Safety and Occupational Health

This section describes safety and occupational health at the DPI facility and available emergency and medical services.

3.4.1 Affected Environment

Potential hazards present on the DPI property are those common to industrial activities, including trip and fall hazards, hazardous material spills, worker exposure to hazardous materials, fire, industrial and vehicle accidents, drowning, and confined spaces.

The DPI WWTP Operation and Maintenance Manual contains a section on safety considerations, which outlines potential safety hazards that could be present and precautions to ensure worker safety. Some of the hazards include personal injury, electrical, mechanical, chemical handling, drowning, and confined spaces.

The City of Alpena Police Department and Fire Department provide emergency services. The Fire and Police Departments are at the City Public Safety Facility at 501 West Chisholm Street, approximately one-half mile northwest of the site of the proposed project. Fire Department services include confined space rescue and hazardous materials mitigation response.

The Alpena Regional Medical Center in the City of Alpena provides medical services. The medical center has a 24-hour-a-day emergency department with ambulance and air transportation available. The center also has rehabilitation services that provide occupational and physical therapy.

3.4.2 Environmental Consequences of the Proposed Action Alternative

The chemicals and chemical processes used to produce ethanol create a potential for health and safety hazards. Section 3.5 discusses the hazards related to hazardous material storage and handling. In

summary, hazardous materials generally fall into two categories, flammable or reactive. Ethanol and denaturant (gasoline) are flammable. Many of the process chemicals are reactive (that is, acids or bases).

Storage and handling of hazardous materials have the potential to release to the environment. A catastrophic release of hazardous materials could affect the public. A spill of ethanol could catch fire. A spill of acid or caustic could present a hazard if a member of the public came into contact with the liquid. The most likely hazardous material release at the proposed APB project would be an accidental release at a bulk storage (tank) location.

To prevent a catastrophic accident from affecting the public, API would design and construct storage tanks outside a building with secondary containment structures large enough to hold the contents of the largest tank plus sufficient additional volume for precipitation (rain or snow). Tanks inside the buildings could also be in secondary containment if necessary for employee safety or protection of the environment. The secondary containment would limit the movement of a spilled liquid.

API would develop appropriate spill response, pollution prevention, and emergency response plans (ERPs) to address the medical and environmental hazards that could affect the public, employees, and the environment. The plans would include, at a minimum, an SPCC Plan, a SWPPP, and an ERP. API would complete the plans in accordance with federal and Michigan Occupational Safety and Health Administration (MIOSHA), EPA, and MDNRE regulations and guidance. These plans would:

- Analyze the potential for spills or releases of ethanol, petroleum products, and other hazardous materials. This analysis would include spills or releases from equipment failures, human error, natural disasters, and intentional destructive acts;
- Outline steps to prevent releases or spills from occurring;
- Evaluate the potential impacts of releases should they occur;
- Describe response actions API would take in the event of a release; and
- Describe procedures to follow in the event of fires or explosions, tornados, severe weather, medical emergencies, or bomb threats.

API would adopt the DPI WWTP Operation and Maintenance Manual and adhere to the hazard mitigation protocol in the manual. API would amend the manual as appropriate to include new procedures or potential hazards that would be unique to APB operation of the wastewater treatment plant.

API would meet with local fire and emergency response providers to discuss potential emergencies, determine capabilities, and establish communication protocols and responsibilities.

In addition, API would establish safety and emergency response procedures for construction activities, excavation and trenching, electrical, hazardous chemicals, hot work permits, fall prevention, proper equipment usage, confined space entry, fire protection and prevention, and hearing and respiratory protection for employees, contractors, and visitors.

API would design the fire protection systems for the APB project to protect the public, limit personal injury to employees, and limit property loss and plant downtime from a fire or explosion. The project would have the following fire protection systems:

- Fire Hydrant/Hose Stations – The facility would have adequate numbers of fire hydrants and hose stations to ensure sufficient coverage of the process areas as designated National Fire Protection Association standards and City of Alpena building codes.

- Design and construction of storage tanks that would contain flammable materials in accordance with the National Fire Protection Association standards.

- Local Fire Protection Service – The APB project would rely on the local fire department or emergency response teams in the event of a serious fire. These authorities would be familiar with the layout of the ethanol facilities, the hazards of materials handled on the premises, places where personnel would normally work, and possible evacuation routes. API would create a Fire Protection Plan for the plant and update it to detail APB project information necessary to ensure the use of safe and effective firefighting measures at the plant.

In addition to fire hydrants and foam systems, the plant have with handheld fire extinguishers, temperature detectors, smoke detectors, and other fire detection devices required by local fire codes or the Office of the State Fire Marshal.

DOE expects the existing emergency response capabilities of the City of Alpena and Alpena County to remain in place and available to the ABP project, if needed.

3.4.3 Environmental Consequences of the No-Action Alternative

Under the No-Action Alternative, DOE would not provide funding and API would not build the biorefinery. The potential hazards related to the industrial activity on DPI property would not change. The No-Action Alternative would have no effect on existing emergency response capabilities of the City of Alpena or Alpena County.

3.5 Waste Management and Hazardous Materials Handling

3.5.1 Affected Environment

This section describes current DPI practices for solid and hazardous waste management and hazardous materials handling.

3.5.1.1 Solid and Hazardous Waste Management

The City of Alpena is in the Montmorency-Oscoda-Alpena Solid Waste Management Authority, which owns and operates an 89.14-acre municipal solid waste landfill in Loud Township, Montmorency County, Michigan. The landfill's license expires on February 12, 2015. A flow control ordinance requires disposal of all residential and commercial solid waste generated in Alpena County in the landfill. The following portions of the landfill are licensed to accept solid waste: Cell 6 (5.09 acres); Cell A, Phase I (4.87 acres); Cell A, Phase II (4.08 acres); Cell A, Phase III (4.06 acres); and Cell B, Phase I (3.15 acres) (MDNRE 2010).

Alpena County industrial solid waste is disposed of at Waste Management Inc.'s landfill in Waters, Michigan; this is where DPI disposes of its compacted domestic waste.

DPI disposes of limited amounts of wastewater treatment sludge and boiler fly ash in the MOASWMA municipal landfill. In addition, DPI has an Agricultural Use Permit from the MDNRE authorizing land spreading of the sludge. The sludge is used as a soil amendment to improve soil condition.

DPI is a Conditionally Exempt Small Quantity Generator of hazardous waste (State of Michigan Identification Number MID005338157). DPI does not generate hazardous waste on a regular basis and has not disposed of any hazardous waste for more than 5 years. Environmental Recycling, a commercial entity, removes mercury-containing switches, fluorescent bulbs, computers, etc. from the DPI site (DPI 2010).

3.5.1.2 Hazardous Materials Handling

Table 3-6 list hazardous materials that DPI currently uses on the site.

Table 3-6. Hazardous materials currently used on site by DPI.[a]

Material	Maximum quantity on site	Primary storage/use location
Aluminum sulfate	50,000 lb	E-Laboratory
Bioxide calcium sulfate	121,000 lb	Adjacent to WWTP lagoons
Bituminous coal	20,000 tons	Adjacent to powerhouse
Cationic polyacrylamide	87,500 lb	E-Laboratory
Diesel fuel	26,000 lb	Woodyard, pumphouse, warehouse
Ferric sulfate	165,000 lb	Main Building
Fibertite prepress sealer	110,000 lb	Main Building
Hydraulic oil	213,000 lb	Main Building, maintenance, powerhouse
Integral oil	327,000 lb	Main Building
Lime	48,000 lb	Inside powerhouse
Liquid fertilizer	170,000 lb	Warehouse
Sodium hydroxide	140,000 lb	Main Building
Sodium hypochlorite	13,000 lb	Inside powerhouse
Tempering oil	255000 lb	Main Building

a. Source: Decorative Panels, Inc. 2009 Tier II Report.

3.5.2 Environmental Consequences of Proposed Action

This section describes the impact of the proposed biorefinery from solid and hazardous waste generation, hazardous materials handling, and the use of genetically modified organisms.

3.5.2.1 Solid and Hazardous Waste Management

The APB project would generate approximately 8,700 tons per year of distillate bottoms consisting of gypsum, lignin, unfermentable sugars, and spent yeast. API would filter-press these solids and send them to a landfill, landspread them, or sell them to a local cement manufacturer for use as fuel for the kilns. Landfill material would be disposed of at either the Waste Management, Inc. landfill in Waters, Michigan, or the MOASWMA municipal landfill. Land spreading would be contingent on API receiving an Agricultural Use Permit from the MDNRE.

During biorefinery operation, the wastewater treatment plant would generate approximately 4.1 bone dry tons per day of sludge, approximately 80 percent less sludge than the DPI site currently generates. API would ship the sludge for combustion in the existing boilers, landspread it, or dispose of it at the MOASWMA municipal landfill, as DPI does currently.

The APB project would generate less than 1 ton per week of paper waste from office operations and nonhazardous solid wastes including scrap metal, wood, plastic products, paper from plant operations, and empty containers (that is, drums, totes, and boxes). API would recycle its nonhazardous waste

products to the extent practical, and would dispose of nonhazardous solid waste in the Waste Management, Inc. landfill in Waters, Michigan.

The APB project would be a small-quantity generator of hazardous waste, which would consist primarily of flammable liquids and laboratory chemicals. A small quantity generator produces less than 2,200 lbs of hazardous waste per month. The hazardous waste would consist primarily of spent laboratory chemicals. A licensed hazardous waste transportation company would transport hazardous wastes to a licensed hazardous waste treatment, storage, and disposal facility. API would neutralize spent acids and acidic waste it could not reuse on site. API would dispose of neutralized solid waste off site with other nonhazardous waste.

The APB facility would generate universal wastes including used oil, fluorescent and high-intensity-discharge light bulbs, and batteries. A licensed universal waste transportation company would transport such materials to a licensed disposal facility.

3.5.2.2 Hazardous Materials Handling

The APB project would store and use various hazardous materials. Table 2-1 summarizes the bulk quantities of such materials. API would use materials compatible with the chemical being stored to build each storage tank. As stated above, outdoor storage tanks would have secondary containment structures capable of holding the largest tank volume plus additional volume for rainfall. Indoor tanks could be in secondary containment if necessary for employee or environmental protection.

API would use and store the following chemicals, additives, and nutrients at the APB project:

- Two ethanol shift tanks (1,480 gallons each)
- One denaturant (gasoline) tank (1,040 gallons)
- One product storage tank (14,830 gallons)
- One potassium acetate storage tank (15,179 gallons)
- One 98-percent sulfuric acid solution tank (9,800 gallons)
- One 50-percent potassium hydroxide solution tank (9,800 gallons)
- Lime (calcium oxide) in dry form in a 6,400-gallon aboveground storage tank and made down to 15 percent by weight solution with mill water

Section 3.4.2 discusses the plans API would develop to address environmental hazards associated with the APB project. API would provide spill response training to employees working with hazardous materials. These measures would reduce the likelihood of spills of such materials. Therefore, DOE anticipates the measures would minimize the potential impacts as a result of the proposed project.

3.5.2.3 Genetically Modified Organism Handling

APB would use the genetically engineered Ho-Purdue yeast for fermentation. The Ho-Purdue yeast is a recombinant *Saccharomyces cerevisae* yeast, containing two genes from the *Pichia stipitis* yeast. The introduced genes are stably integrated in the Ho-Purdue yeast.

Most of the yeast would be recycled during fermentation, with only a small purge stream ending in the beer distillation column bottoms. The beer column would operate at a temperature high enough to kill the yeast. The spent yeast would be sent to wastewater treatment or filter-pressed with the gypsum, lignin, and unfermentable sugars and landfilled, landspread, or used as raw material filler for a local cement manufacturer's kiln.

Under the Toxic Substances Control Act (TSCA), the EPA Biotechnology Program regulates commercially used microorganisms. EPA has established two exemptions for new microorganisms, after the research and development stage, which are being manufactured for introduction into commerce. In the Tier I exemption, if three criteria are met, manufacturers are only required to notify EPA that they are manufacturing a new microorganism that qualifies for this exemption 10 days before commencing manufacture, and to keep certain records. A manufacturer is not required to wait for EPA approval before commencing manufacture. To qualify for the Tier I exemption, a manufacturer must use one of the listed recipient organisms and must implement specific physical containment and control technologies. In addition, the DNA introduced into the recipient microorganism must be well characterized, limited in size, unable to mobilize easily, and free of certain sequences.

A manufacturer who otherwise meets the conditions of the Tier I exemption may modify the specified containment restrictions, but must submit a Tier II exemption notice. The Tier II exemption requires the manufacturers to submit an abbreviated notice describing the modified containment, and provides for a 45-day period during which EPA would review the proposed containment. The manufacturer may not proceed under this exemption until EPA approves the exemption.

API would seek an exemption from the EPA for the Ho-Purdue yeast. The biorefinery design would include specific physical containment and control technologies to ensure containment and killing of the live yeast in the biorefinery before disposal. Process controls would include sterilizing liquid or gaseous (exhaust gas or aerosol) emissions to control release of the recombinant yeast strain. Gases emitted during fermentation would vent first to the beerwell to collect any condensate and to reduce the load on the scrubber. From there, the gases would be sent to the fermentation scrubber. Blow down from the scrubber would be sent back to the beerwell. The fermentation area sump would capture all spills and wash-downs within the fermentation area. The sump discharges to the beerwell. All fermenters discharge liquid waste to the beerwell.

The contents of the beerwell would be heated in the beer preheater to expose the yeast cells to a temperature of 220°F. The pipe from the beer preheater to the beer column is designed to maintain this temperature in the beer for a period of no less than 1 minute before entering the beer column. An inactivation assessment of the *S. cerevisiae* strain LNH-ST strain conducted by API confirmed that the yeast is 100% inactivated under these conditions. Samples of the beer column bottoms would be taken daily to confirm the inactivation of the yeast after distillation. The distillation bottoms would then be sent directly to the waste water treatment plant.

3.5.3 Environmental Consequences of No-Action Alternative

Under the No-Action Alternative, DOE would not provide funding and API would not build the biorefinery. There would be no generation of new waste and no onsite use of new hazardous materials or genetically altered organisms. DPI would continue to generate solid and hazardous waste in the same quantities it does now. The beneficial reduction of wastewater treatment plant sludge would not occur.

3.6 Utilities

This section describes the utilities in place and municipal systems used, including electricity, natural gas, potable water, and domestic wastewater, for the current DPI facility. Section 3.2 discusses process water, process wastewater, and stormwater because they directly affect Lake Huron and are not part of a municipal system.

3.6.1 Affected Environment

DPI uses approximately 10.5 megawatts of electricity; it purchases approximately 50 percent from Alpena Power Company, a privately owned electric utility, and generates 50 percent with its onsite steam turbine.

MichCon provides natural gas for the City of Alpena and DPI. DPI uses approximately 1 million cubic feet per day of natural gas for dryers and heaters for the manufacturing process and office and building heaters.

The City of Alpena Municipal Water system provides DPI potable water from Lake Huron through a 40-inch-diameter pipe with intakes at 1,000 and 2,000 feet. The rated capacity of the intake pipe is 8 million gallons per day at 2.52 feet per second. Four low-service pumps deliver lake water from a shore well structure to the treatment plant, which is a conventional surface-water plant, using coagulation, flocculation, and filtration to clean the water. The present plant capacity is 6 million gallons per day. The average daily production is 2.3 million gallons per day. On a hot, dry summer day, the plant produces 5 million gallons per day to meet city and township water needs. The lowest production usually occurs on Christmas Day, approximately 1.8 million gallons per day. The water is stored in four elevated towers: 750,000 gallons at Ninth Avenue, 750,000 gallons at North Industrial, 500,000 gallons at Alpena Township M-32, and 500,000 gallons at Alpena Township Piper Road (City of Alpena 2009).

DPI domestic wastewater discharges to the City of Alpena municipal wastewater treatment plant, which consists of preliminary treatment to remove screenings and grit from raw wastewater. This is followed by four 100,000-gallon primary clarifiers to settle solids, two 600,000-gallon aeration reactors that mix the primary effluent with activated sludge bacteria, and two 500,000-gallon final clarifiers where the bacteria settle to the bottom. The purified water moves outside the tanks and flows over the discharge weirs. The plant discharges treated wastewater to the Thunder Bay River under NPDES Permit No. MI0022195, which expires October 1, 2011. The NDPES permit limitations were determined using a design flow of 5.5 million gallons per day.

3.6.2 Environmental Consequences of Proposed Action

This section describes the impact the proposed biorefinery would have on site utilities and municipal systems. Section 3.2 discusses process water, process wastewater, and stormwater because they directly affect Lake Huron and are not part of a municipal system.

API would purchase electricity for the biorefinery from DPI or directly from Alpena Power Company. The biorefinery would use a maximum of 3.2 megawatts of electricity. A transformer on the project site would receive the electricity from DPI or the Alpena Power Company, step it down to a usable level, and distribute it through the biorefinery. New supply lines from Alpena Power Company would be unnecessary Therefore, there would be no new environmental impacts associated with electricity usage.

A connection to the DPI natural gas system or to a new distribution point off the local distribution system main would provide natural gas, which the biorefinery would use to fuel office and building heaters. The biorefinery would not require natural gas for the ethanol production process.

DPI would provide steam for the biorefinery production processes. The biorefinery would use approximately 4,900 pounds per hour of steam for process operations. Reduced wastewater load, reduced use of the steam-heated sludge dryer, and improved water utilization would result in a reduced steam production at DPI by about 2,500 pounds per hour in the summer and 13,500 pounds per hour in the winter.

A connection to DPI, which is connected to the Alpena municipal water system, would provide potable water for the biorefinery. The APB project would use approximately 900 gallons per day of domestic water, based on 20 full-time employees and the average daily indoor per capita water consumption for toilets, faucets, and showers (AWWA Research Foundation 1999). APB domestic water consumption of approximately 900 gallons per day would not affect the City of Alpena's potable water withdrawal from Lake Huron.

Domestic wastewater from the biorefinery would go to the DPI domestic wastewater system, which discharges to the City of Alpena sanitary sewer in the street, or would bypass the DPI system and connect directly to the sanitary sewer. The sanitary sewer discharges to the municipal wastewater treatment plant on the opposite bank of the Thunder Bay River from the DPI wastewater treatment plant. Impacts to the municipal plant from construction and operation of the proposed facility would be minor, because the domestic wastewater generated by the APB project and up to 20 full-time employees would be small in comparison with the capacity of the municipal plant.

Impacts to site or local (city/county) utilities from the proposed project would be unlikely.

3.6.3 Environmental Consequences of the No-Action Alternative

Under the No-Action Alternative, DOE would not provide funding to API, which would not build the biorefinery. The No-Action Alternative would have no effect on the utilities or infrastructure of the City of Alpena or Alpena County.

3.7 Traffic

3.7.1 Affected Environment

DPI is bounded by Ford Street to the northwest. The City of Alpena has designated Ford Street as a "major street." U.S. Highway 23 (northwest-to-southeast direction) and State Highway M-32 (east-west) converge in downtown Alpena, approximately one-half mile west of the project site. U.S. Highway 23 from the southwest of Alpena to downtown Alpena is also called State Avenue. Where State Avenue turns to the northwest in downtown Alpena, it is called Chisholm Street. Highway M-32 is also known as Washington Avenue in the City of Alpena.

Truck traffic to DPI flows from U.S. Highway 23 to the northwest. From Highway 23, trucks travel east on Hamilton Road (approximately 2.5 miles north of DPI) to Wessel Road. The trucks then travel south on Wessel Road approximately 2 miles to Ford Street, then approximately 0.5 mile southwest to DPI. Figure 4 in Appendix A shows the truck route.

Truck traffic from the west of Alpena enters on State Highway M-32, then north on Bagley Street approximately 1 mile, then east on Johnson Street approximately 1 mile to U.S. Highway 23. The trucks continue north on Highway 23 approximately 2 miles to Hamilton Road and then to DPI as described above. Truck traffic from the south of Alpena travels north on Highway 23 through downtown Alpena to Hamilton Road, then to DPI as above.

Tables 3-7, 3-8, and 3-9 summarize vehicle traffic in the Alpena area.

3.7.2 Environmental Consequences of the Proposed Action

Construction of the APB project would temporarily increase the amount of auto and truck traffic due to construction staff and deliveries to the facility. Up to 80 contractor vehicles and 10 delivery trucks would come to the site each day for between 8 and 12 months. This would represent less than a 10 percent increase in daily traffic on local roads and less than 0.1 percent on U.S. 23.

Traffic would use the truck access route and entrance to DPI property on Ford Street during construction and operation of the proposed facility. API would construct a 200-foot stretch of asphalt roadway on the DPI site for vehicular access to and from the biorefinery; this would reduce the amount of fugitive dust generated from onsite truck traffic. It would also help reduce the potential for sediment entrainment in stormwater. DOE anticipates that the facility would be able to work with contractors to control the routes and timing of delivery of materials to the facility to mitigate traffic concerns if they arose.

Table 3-7. Average daily traffic, project site area.

Year	Route	Daily count (vehicles per day)
2001	Miller Street – 2nd Avenue to Ford Street	916
2008	2nd Avenue – Miller Street to Lake Street	1,256
2008	Miller Street – 2nd Avenue to Merchant Street	2,606
2008	Oldfield Street – Pine Street to Commercial Street	1,256

Source: City of Alpena 2009.

Table 3-8. Alpena area average daily traffic, 2008.

Highway	Location	Vehicle count
U.S. 23 (State Avenue)	Joseph Road to Werth Road	10,100
U.S. 23 (State Avenue)	Werth Road to Ripley Blvd.	14,800
U.S. 23 (State Avenue)	Ripley Blvd. to Chisholm St.	8,800
U.S. 23 (Chisholm St.)	3rd Ave. to 11th Ave.	8,400
U.S. 23 (Chisholm St.)	11th Ave. to Johnson St.	15,100
U.S. 23 (Chisholm St.)	Webster St. to Hamilton St.	8,100
M-32 (Washington Ave.)	Deer Valley Rd. to Elizabeth Rd.	5,200
M-32 (Washington Ave.)	Elizabeth Rd. to Bagley St.	19,500
M-32 (Washington Ave.)	Bagley St. to Ripley St.	7,200
M-32 (Washington Ave.)	Ripley St. to Chisholm St. (U.S. 23)	2,900

Source: MDOT 2009.
U.S. Highway 23 is called State Avenue from the southwest of Alpena to downtown.
U.S. Highway 23 is called Chisholm Street from downtown (State Avenue) to the northwest.

Table 3-9. Alpena area commercial average daily traffic, 2008.

Street	Vehicle count
State Avenue (U.S. 23)	160
Chisholm St. (U.S. 23)	190
Washington Ave. (M-32)	440

Source: MDOT 2009.

Operation of the APB project would result in an increase in truck traffic (raw material and product) to the site of approximately 1,145 trucks per year, or approximately 22 per week. The number of trucks that would travel to the project site would be an addition of less than 0.05 percent to the current total on U.S.

Highway 23 between Webster and Hamilton Streets, part of the designated truck route to the site. The raw material and product deliveries on Hamilton Road and Wessel Road, which the LaFarge cement plant also uses as truck access routes, would increase the traffic on those roads.

Truck traffic on Ford Avenue, which DPI uses as a truck route, would increase during operation of the APB project by an average of approximately 22 trucks per week. Ford Avenue is in areas zoned as general industry and residential. DPI borders private residences along its northwestern property boundary. The increased Ford Avenue truck traffic from the APB project would increase the potential for accidents involving commercial vehicles and private vehicles. In addition, APB project traffic would contribute to the deterioration of the roads and highways.

The existing truck route is capable of handling the increased traffic load with minimal impacts on traffic congestion or road condition.

3.7.3 Environmental Consequences of the No-Action Alternative

Under the No-Action Alternative, DOE would not provide funding to API, which would not build the biorefinery. No increase in traffic would occur.

3.8 Socioeconomics and Environmental Justice

3.8.1 Affected Environment

DPI purchased the hardboard manufacturing facility in 2004. Hardboard has been manufactured at this location since 1957. While there was a slight downturn for the facility during the past 2 years, production levels in 2010 have returned to historic levels.

Alpena County has seen a general population increase (9.7 percent) over the past four decades. However, the City of Alpena has not experienced this growth. The city recorded a steady decline in population from 14,682 to an estimated 10,792 in the years between 1960 and 2005 (City of Alpena 2007).

In 1960, the population of Alpena County was 28,556 and more than half of those persons resided in the City of Alpena. The county's continued growth combined with the city's drop in population for the same period resulted in a decrease in the percentage of persons living in the city from 51 percent to 36 percent, about one-third of the county population. There are indications that this downward trend is slowing. The City of Alpena saw its largest decrease in population (11.5 percent) in the 1970s, with the rate of decline slowing to 7 percent in the 1980s. In the decade between 1990 and 2000, the city experienced a 0.44-percent decline. Projected populations for the state and county predict small but steady increases over the next 20 years (City of Alpena 2007).

Table 3-10 summarizes population changes based on U.S. Census data.

Table 3-10. Population changes for Alpena County, City of Alpena, Michigan, and the United States 1990–2008.

Political unit	1990 population	2000 population	1990–2000 % change	2008 population	2000–2008 % change	1990–2008 % change
Alpena County	30,605	31,314	2.3	29,520	-5.7	-3.5
City of Alpena	11,354	11,304	-0.04	10,490	-7.2	-7.6
Michigan	9,295,297	9,938,444	6.9	10,003,422	0.7	7.6
United States	248,709,873	281,421,906	13.2	304,374,846	8.2	22.4

Source: Bureau of the Census 2009.

The home ownership rate in Alpena County in 2000 was 79.1 percent, in comparison with a Michigan rate of 73.8 percent. In 2000, the median value of owner-occupied homes in Alpena County was $78,100 in comparison with a state average of $115,600 (Bureau of the Census 2009).

3.8.1.1 Environmental Justice

Environmental justice refers to the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. *Fair treatment* means that no group, including racial, ethnic, or socioeconomic, should bear a disproportionate share of adverse environmental consequences resulting from industrial, municipal, or commercial operations or the execution of federal, state, local, and tribal programs and policies.

The CEQ has issued guidance to federal agencies to assist them with their NEPA procedures so they identify and address environmental justice concerns effectively (CEQ 1997). In this guidance, the Council encouraged federal agencies to supplement the guidance with their own specific procedures tailored to particular programs or activities. DOE has prepared a document titled *Draft Guidance on Incorporating Environmental Justice Considerations into the Department of Energy's National Environmental Policy Act Process* (DOE 2000). The guidance is based on Executive Order 12898, "Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations," and the CEQ environmental justice guidance. Among other things, the DOE draft guidance states that even for actions that are at the low end of the sliding scale with respect to the significance of environmental impacts, some consideration (which could be qualitative) is needed to show that DOE considered environmental justice concerns. DOE needs to demonstrate that it considered apparent pathways or uses of resources that are unique to a minority or low-income community before determining that, even in light of these special pathways or practices, there are no disproportionately high and adverse impacts on the minority or low-income populations.

The racial make-up of Alpena County is 97.5 percent white, 0.6 percent black, 0.5 percent American Indian and Alaska Native, 0.5 percent Asian, 0.8 percent two or more races, and 0.8 percent Hispanic or Latino (Bureau of the Census 2009).

The DPI property and proposed APB project site and all the residences along Ford Avenue that border the DPI northwestern property boundary are in the 2000 Census Block Group 4, Census Tract 4. According to 2000 U.S. Census data, the total population of this tract was 692, of whom 686 were listed white and 6 were listed as American Indian and Alaska Native (Bureau of the Census 2010).

The adjacent block group is Block Group 3, Census Tract 4, which begins on 2nd Avenue, the next street over (to the northwest) from Ford Avenue. According to 2000 Census data, the population of this tract was 1,025, all of whom are listed as white (Bureau of the Census 2010).

3.8.1.2 Socioeconomics

The median household income for Alpena County is $36,105 in comparison with a statewide median household income of $49,694 (2008 inflation-adjusted dollars). The poverty rate for individuals in Alpena County is 16.4 percent, in comparison with a statewide poverty rate of 14.0 percent (Bureau of the Census 2009), as summarized in Table 3-11.

Alpena County's 2000 labor force numbered approximately 14,973 (14,862 civilian and 111 armed forces). The unemployment rate increased from 5.5 percent in 2000 to 9.3 percent in 2008. The median

household income increased from $34,177 in 1999 to $36,105 in 2008. The medium household income in Michigan increased from $44,667 in 1999 to $49,694 in 2008 (Bureau of the Census 2009).

Table 3-11. Individual poverty status, labor force, and unemployment for Alpena County, Michigan, and the United States (percent).

Geographic area	Individual poverty status[a]	Labor[a]	2000 unemployment[b]
Alpena County	16.4	58.3	7.3
Michigan	14.0	63.7	5.8
United States	13.2	65.2	5.8

a. Source: 2006-2008 American Community Survey 3-Year Estimates, Bureau of the Census (2009)
b. Source: Civilian labor force unemployment, 2000 U.S. Census

According to 2000 Census data for Block 4, Census Tract 4 (which includes the Ford Avenue residences adjacent to the DPI property boundary), the median household income in 1999 was $23,667 in comparison with $34,177 for Alpena County (Bureau of the Census 2010). Table 3-12 summarizes the income information for the area around the DPI facility, the City of Alpena, and Alpena County.

Table 3-12. Summary of Income for Alpena County and Block 4, Census Tract 4 (percent).

	Block 4, Census Tract 4		City of Alpena		Alpena County	
Income Level per year	**Total Households**		**Total Households**		**Total Households**	
Less than $10,000	54	17.8%	676	13.8%	1,326	10.3%
$10,000 to $19,999	70	23.0%	964	19.6%	2,221	17.2%
$20,000 to $34,999	94	30.9%	1169	23.8%	3,032	23.5%
$35,000 to $49,999	44	14.5%	797	16.2%	2,364	18.4%
$50,000 to $99,999	42	13.8%	1,171	23.8%	3,404	26.4%
Greater than $100,000	0	0.0%	138	2.8%	530	4.1%
Total	**304**	**100.0%**	**4,915**	**100.0%**	**12,877**	**100.0%**

(Bureau of the Census 2010)

3.8.2 Environmental Consequences of the Proposed Action

Based on 2000 Census block data, the proposed APB project would be in an area with a total population of 692, 6 of whom are Native American. Combined with the adjacent 2000 Census block, which starts at the next street (2nd Avenue) over from Ford Avenue, the population is 1,717. The total minority population for these combined blocks is six Native Americans. Therefore, the proposed project would not affect a disproportionately high percentage of minority residents.

The City of Alpena and Alpena County have a meaningfully higher percentage of individuals below the poverty level than the general population of Michigan. The immediate area around the DPI site has a higher incidence of households with an income of less than $20,000 per year than the City of Alpena but also has higher incidence of households with an income of between $20,000 to $34,999.

The site of the proposed APB project is on property zoned for general industry. The DPI facility has been at this location since 1957. Prior to development of the DPI facility, the location was used as a lumber mill. The APB facility will be built to the east of DPI and will not be visible from the residential neighborhood along Ford Avenue. Truck traffic and air emissions related APB during its operation are a small fraction of the current DPI traffic and emission levels.

Although the APB project would be near residences, due to its location and small size, its construction and operation would not adversely affect any economic subgroup.

The construction personnel and permanent employees for the APB project would come from skilled workers in the region. Construction of the biorefinery would employ approximately 80 full-time contractor personnel for 8 to 12 months. The biorefinery would result in approximately 10 to 20 new full-time positions when in full operation. This workforce would come from existing local and regional resources.

As discussed above, there would be only minor adverse environmental impacts associated with the proposed project, and none of these impacts would disproportionately affect minority or low-income populations. DOE did not identify any unique pathways for minority or low-income populations. The economic benefits of the facility to the county, which are discussed above, would be likely to benefit those currently living below the poverty level to some degree, either directly by offering new jobs or indirectly through secondary job creation and increased services from the increased tax revenue.

Because the APB project would be on industrial property and away from any areas where children would congregate, its construction and operation would not pose direct environmental health and safety risks to children in the City of Alpena or Alpena County. There would be only minor adverse environmental impacts associated with the project and none of these would create environmental health and safety risks to children.

Minority or low-income groups would not bear adverse human health and environmental consequences from the proposed project disproportionately. There would be no increased environmental health and safety risks for children.

3.8.3 Environmental Consequences of the No-Action Alternative

Under the No-Action Alternative, DOE would not provide funding to API, which would not build the biorefinery. The No-Action Alternative would have no impact on socioeconomics or environmental justice.

3.9 The Relationship Between Local Short-Term Uses of the Environment and the Maintenance and Enhancement of Long-Term Productivity

CEQ regulations require consideration of "the relationship between short-term uses of man's environment and the maintenance and enhancement of long-term productivity" (40 CFR 1502.16). Construction and operation of the APB project would require short-term uses of land and other resources. *Short-term use of the environment*, as used here, is use that occurs during the life of the project, whereas *long-term productivity* refers to the period after project decommissioning, equipment removal, and land reclamation and stabilization. The short-term use of the project site for the proposed facility would not affect the long-term productivity of the area. If API decided that the project had reached its useful life, it could decommission and remove the facility and foundations and reclaim and revegetate the site to resemble conditions similar to the predisturbance conditions.

3.10 Irreversible and Irretrievable Commitments of Resources

The proposed project would not cause an additional irretrievable commitment of land for construction and operation of the new facility because it would be within the operating boundary of an existing industrial

facility. There would be an irreversible commitment of energy and construction materials to build the facility. Water resources used by APB would be returned to the environment by water treatment facilities.

The implementation of the Proposed Action would require the commitment of financial resources by API, its investors and lenders, and DOE for the construction and operation of APB. However, these commitments are consistent with the purpose of and need for the Proposed Action as described in Chapter 1.

3.11 Unavoidable Adverse Impacts

Construction and operation of the proposed facility would cause unavoidable emissions of some criteria air pollutants, use of electric power and natural gas. However, air pollutant concentrations would not exceed significance thresholds established by EPA and MDNRE and no new facilities would be required to supply power or natural gas. Water used from cooling will be discharged back into the Thunder Bay River under an existing NPDES permit with little evaporative loss.

Short-term adverse impacts from noise generated during the construction would occur; however, activities would comply with all local noise ordinances. The need for construction materials such as steel and concrete would be unavoidable, but would represent a small fraction of available materials.

4. CUMULATIVE IMPACTS

CEQ regulations stipulate that the cumulative effects analysis in an EA consider potential environmental impacts resulting from the "incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such actions" (40 CFR 1508.7). Past and present actions that have been accounted for in the affected environment are not considered separately in this section because the combined effects are already addressed in Section 3 of this EA.

API would build APB on land currently used by DPI as a hardwood manufacturing plant that contains two wastewater treatment plant lagoons and an aeration pond that collectively cover about 27 acres. DPI has been operating at this location for 6 years. Hardboard has been manufactured at the site for more than 50 years. The environmental impacts as a result of construction and operation of the proposed project, would be additive with those of DPI's current and future operations, as described in Section 3.

According to Mr. Greg Sundin, City of Alpena Director of Planning and Development, no plans for other industrial projects have been publicly announced nor has the City Planning Department been notified of plans for other industrial projects in the City of Alpena. The City of Alpena has not identified a need for infrastructure improvements related to or caused by the proposed project. (Telephone call with Greg Sundin, September 17, 2010).

5. REFERENCES

AWWA (American Water Works Association) Research Foundation, 1999, *Residential End Uses of Water*.

Bureau of the Census, 2009, *State and County Quick Facts*, U.S. Department of Commerce, accessed December, http://www.census.gov/.

Bureau of the Census, *American Fact Finder*, U.S. Department of Commerce, accessed December 2009 and July 2010, http://www.census.gov/.

Bureau of the Census, *2006-2008 American Community Survey 3-Year Estimates*, U.S. Department of Commerce, accessed December 2009, http://www.census.gov/

CEQ (Council on Environmental Quality), 1997, *Environmental Justice Guidance Under the National Environmental Policy Act*, Washington, D. C., December 10.

City of Alpena, 2007, *Comprehensive Plan*, Alpena, Michigan, September 4.

City of Alpena, 2010, "Traffic Data for City of Alpena," E-mail correspondence, Assistant City Engineer, December.

DOE (U.S. Department of Energy), 2000, *Draft Guidance on Incorporating Environmental Justice Considerations into the Department of Energy's National Environmental Policy Act Process*, Office of NEPA Policy and Assistance, Washington, D.C., April.

DPI (Decorative Panels Incorporated), 2010, e-mail correspondence, January.

Decorative Panels, Inc. 2009 Tier II Report.

EPA (U.S. Environmental Protection Agency), 2009a, *National Ambient Air Quality Standards*, accessed January 5,2010, http://www.epa.gov/air/criteria.html.

EPA (U.S. Environmental Protection Agency), 2009b, *Green Book Non-Attainment Areas*, last modified January 6, 2010, accessed January 6, 2010, http://www.epa.gov/oar/oaqps/greenbk/ancl.html#MICHIGAN.

EPA (U.S. Environmental Protection Agency), *Air Data*, 2009c, last modified January 10, 2009, accessed January 6, 2010, http://www.epa.gov/air/data/index.html.

Federal Emergency Management Agency Flood Insurance Rate Map for the City of Alpena, Alpena County, Michigan Community Panel Number 260010 0005 B Revised November 4, 1992

IPCC (Intergovernmental Panel on Climate Change), 2007,

ISO (International Standards Organization) 2006,

MDNRE (Michigan Department of Natural Resources and Environment), 2006, *Thunder Bay River Assessment*, February.

MDNRE (Michigan Department of Natural Resources and Environment), 2009a, *Water Use Reporting Form for Decorative Panels, Inc.*, March 27.

MDNRE (Michigan Department of Natural Resources and Environment), 2010, *Montmorency-Oscoda-Alpena Landfill, Solid Waste Operating License*, accessed May 21, 2010 http://www.deq.state.mi.us/WDSPI/SWOpLic.

Michigan Department of Transportation, Construction and Technology Support Area, Soil Erosion and Sedimentation Control Manual, April 2006

United States Geological Survey Water Data Report, 04135020 Thunder Bay River at Alpena Michigan, 2007 – 2009, http://wdr.water.usgs.gov/.

United States Fish and Wildlife Service, 2010, National Wetlands Inventory MAPPER Database, www.fws.gov.wetlands/Data/Mapper.html.

Wilcox (Wilcox Professional Services, LLC), 2009, *Final Geotechnical Report, Proposed Alpena Prototype Biorefinery*, April 8.

Appendix A
Public Involvement Correspondence

Scoping Letter Distribution List

Tribal Contacts

Sault Ste. Marie Tribe of Chippewa Indians
Attn: Tribal Chairman
523 Ashmun Street
Sault Ste. Marie, MI 49783

Little Traverse Bay Bands of Odawa Indians
Attn: Tribal Chairman
7500 Odawa Circle
Harbor Springs, MI 49740

Inter-Tribal Council of Michigan, Inc.
Attn: Dwight Sargent
2956 Ashmun Street
Sault Ste. Marie, MI 49783

State of Michigan

Michigan Department of Natural Resources and Environment
Attn: Lori Sargent
Endangered Species Specialist
Wildlife Division
PO Box 30180
Lansing, MI 48909

Michigan Department of Natural Resources and Environment
Gaylord Field Office, Water Bureau
Attn: Ryan Blazic
2100 West M-32
Gaylord, MI 49735-9282

Michigan Department of Transportation
Attn: Scott Thayer
Alpena Transportation Service Center
1540 Airport Road
Alpena, MI 49707
State Historic Preservation Office
Attn: Environmental Review Coordinator
Michigan Historical Center
P.O. Box 30740
702 W. Kalamazoo St.
Lansing, MI 48909-8240

Local Government

City of Alpena
Attn: Thad Taylor, City Manager
208 N. First Avenue

Alpena, MI 49707

Northeast Michigan Council of Governments
Attn: Diane Rekowski, Executive Director
121 E. Mitchell Street
P.O. Box 457
Gaylord, MI 49734

Federal Agencies

Huron-Manistee National Forest
Attn: Barry Paulson, Supervisor
1755 S. Mitchell Street
Cadillac, MI

U.S. Fish & Wildlife Service
Attn: Craig Czarnecki, Field Supervisor
East Lansing Field Office
2651 Coolidge Rd., Suite 101
East Lansing, MI 48823

Thunder Bay National Marine Sanctuary
Attn: Jeff Gray, Manager
500 W. Fletcher Street
Alpena, MI 49707
US Environmental Protection Agency Region 5
Attn: Ken Westlake, Chief
NEPA Implementation Section (Mail Code E-19J)
77 W. Jackson Blvd.
Chicago, IL 60604

Note: EPA Region 5 covers the Midwest, including Michigan.

Local Library

Alpena County George N. Fletcher Public Library
211 N. 1st Street
Alpena, MI 49707

Appendix B
Consultation Correspondence

[Text placeholder]

Department of Energy
Golden Field Office
1617 Cole Boulevard
Golden, Colorado 80401-3393

DOE/EA 1789

FINDING OF NO SIGNIFICANT IMPACT

CONSTRUCTION AND OPERATION OF A PROPOSED CELLULOSIC BIOREFINERY ALPENA PROTOTYPE BIOREFINERY ALPENA, MICHIGAN

AGENCY: U.S. Department of Energy, Golden Field Office

ACTION: Finding of No Significant Impact

SUMMARY: The U.S. Department of Energy (DOE) is proposing to authorize expenditure of American Recovery and Reinvestment Act of 2009 funding to American Process, Inc. (API) to complete final design, construction and initial operation of the Alpena Prototype Biorefinery (APB) in Alpena, Michigan. The biorefinery, which would be constructed in an existing industrial facility, would convert wood sugars from the adjacent Decorative Panels International (DPI) hardwood manufacturing plant's wastewater into ethanol. The maximum production of the facility would be 900,000 gallons per year of anhydrous (200-proof) ethanol or up to 1.2 million gallons per year of 70-percent ethanol (E-70), an automotive fuel. API would purchase a total of 28 acres of the existing industrial facility from DPI; one acre for construction of the biorefinery and the existing 27 acre wastewater treatment facility.

All discussion, analysis and findings related to the potential impacts of constructing and operating the proposed biorefinery, including the API-committed environmental protection measures, are documented in the Final EA. The Final EA is hereby incorporated by reference.

This FONSI was prepared in accordance with the *National Environmental Policy Act of 1969* (NEPA), the Council on Environmental Quality regulations for implementing NEPA, as amended, 40 CFR 1500 to 1508, and DOE NEPA regulations 10 CFR 1021.322.

ENVIRONMENTAL IMPACTS: In compliance with NEPA and the DOE NEPA implementing regulations, the EA examined the potential impacts of DOE's decision to authorize API to expend Recovery Act funds for the proposed project and also examined a No-Action alternative. Under the No-Action alternative, DOE would not authorize expenditure of Recovery Act funds by API and API would not design, construct or operate the proposed biorefinery.

The EA describes and analyzes potential impacts on the environment that could result from construction and operation of the proposed biorefinery. However, not all resource areas were evaluated at the same level of detail. For the following resource areas--noise, visual and aesthetic resources, geology and soils, biological resources (including wetlands), and cultural resources--DOE determined early in the analysis there would be no impacts or that the potential impacts would be negligible, temporary, or both, and therefore did not carry these areas forward for further analysis in the EA.

DOE analyzed in more detail land use, air quality; utilities and energy, water resources, socioeconomics, environmental justice, public and occupational safety and health, waste management and hazardous materials, and transportation, as well as cumulative impacts of the proposed project. Based on the more detailed analysis of these resources areas, DOE has determined as well that there would be no impacts or that the potential impacts would be negligible, temporary, or both. As described below, the following resource areas would require applicant-committed measures, in compliance with required permits, to ensure environmental impacts would be minimal: air quality; water resources; and waste management and hazardous material handling.

The construction and operation of the proposed APB project would result in an increase in the amount of air pollutants emitted primarily from dust generated by site grading and exhaust emission from construction vehicles. During construction, API would minimize fugitive dust emissions by using appropriate control measures, such as road watering, temporary vegetative cover, or dust suppressants, as needed to ensure that impacts to air quality during the construction phase of the proposed project would be minor and temporary.

Potential emissions during operations would come from several sources including fugitive dust (PM_{10} and $PM_{2.5}$) from new vehicle hauling traffic and lime handling activities. The fugitive dust would be minimized by using a 10 mile per hour speed limit and maintaining the roads as needed. No other criteria air pollutants would be emitted by stationary sources. The fermentation and ethanol distillation systems would generate emissions of volatile organic compounds (VOCs) and hazardous air pollutants (HAPs), including acetaldehyde, formaldehyde, and methanol. API would control these pollutants by venting the exhaust gases from these processes through a wet scrubber that would remove approximately 98 percent of the VOCs and 50 percent of the HAPs. Ethanol storage and loadout operations would also generate emissions of VOCs and HAPs. API would store the ethanol in fixed-roof tanks that would prevent emissions. API has submitted a Draft Permit to Install application for the proposed APB project to the MDNRE. The permit application is for a minor source because the controlled potential to emit PM_{10} and $PM_{2.5}$, VOCs and HAPs for the APB would be below major source thresholds.

The APB project would have potential volatile organic compound (VOC) odors from the fermentation system, the pressed lignin and gypsum, and the wastewater treatment plant. API would use wet scrubbers to reduce the VOC emissions from the process by at least 97 percent, similar to a conventional ethanol facility. The lignin would be landspread as a soil amendment or sold as kiln fuel to a local cement manufacturer. Routine transport of the lignin would reduce the potential for odors to develop.

Potential impacts to the surficial aquifer could result from accidental releases of hazardous materials from facility operations. API would use facility designs that include secondary containment and would have operational policies and procedures to manage and store such materials, so releases should not occur.

Soil disturbance during construction activities could result in modified surface water runoff patterns from the site. Impacts on hydrology could result from land clearing, loss of vegetation,

and associated accelerated runoff from impervious surfaces following precipitation events. Although erosion could affect water quality, the use of construction and post construction Best Management Practices (BMPs) would minimize surface water runoff to neglible levels following construction and operation of the proposed APB.

Impacts to surface-water quality could occur from accidental releases of hazardous materials from facility operations. API would use facility designs that include secondary containment and operational policies and procedures to manage and store such materials, so releases should not occur.

The chemicals and chemical processes used to produce ethanol create a potential for health and safety hazards. To prevent a catastrophic accident from affecting the public, API would design and construct storage tanks outside a building with secondary containment structures large enough to hold the contents of the largest tank plus sufficient additional volume for precipitation (rain or snow). The secondary containment would limit the movement of a spilled liquid.

API would use the genetically engineered Ho-Purdue yeast for fermentation under the *Toxic Substances Control Act* (TSCA); the EPA Biotechnology Program regulates commercially used microorganisms. API would apply for a Tier 1 exemption from the EPA for the Ho-Purdue yeast which would allow API to commence operations. API would implement specific physical containment and control technologies to meet the Tier 1 exception requirements.

The proposed APB project would be a small-quantity generator of hazardous waste, which would consist primarily of flammable liquids and laboratory chemicals. A licensed hazardous waste transportation company would transport hazardous wastes to a licensed hazardous waste treatment, storage, and disposal facility. API would neutralize spent acids and acidic waste it could not reuse on site. It would dispose of neutralized solid waste off site with other nonhazardous waste.

PUBLIC PARTICIPATION IN THE EA PROCESS: In accordance with applicable regulations and policies, DOE sent a scoping notice on June 16, 2010, to federal, state, and local agencies; tribal governments; elected officials; businesses; organizations and special interest groups; and members of the general public providing 30 days to submit comments regarding the EA's scope. DOE published the Scoping Notice online at the DOE Golden Field Office Public Reading Room. No public comments were received on the Scoping Notice.

In addition, DOE initiated consultation with the U.S. Fish and Wildlife Service, the Michigan Department of Natural Resources and Environment, and the Michigan State Historic Preservation Office, the Inter-Tribal Council of Michigan, Inc., and the sovereign nations of the Sault Tribe of Chippewa Indians and the Little Traverse Bay Bands of Odawa Indians. Appendix B of the EA contains copies of the consultation letters and responses.

DOE published the Draft EA online at the DOE Golden Field Office Public Reading Room for a 15-day review period which ended September 13, 2010. A Notice of Availability was mailed to identified stakeholders and published online at the Golden Field Office Public Reading Room. DOE received no comments during the comment period.

DETERMINATION: DOE determines that authorizing the expenditures of Federal funds to American Process, Inc. to facilitate final design, construction, and operation of the proposed Alpena Prototype Biorefinery would not constitute a major federal action significantly affecting the human or natural environment, as defined by NEPA.

API's commitment to obtain and comply with all appropriate federal, state, and local permits required for construction and operation of the biorefinery and to minimize potential impacts through the implementation of best management practices and various applicant-committed measures detailed in the Final EA, shall be incorporated and enforceable through DOE's financial assistance agreement.

Therefore, the preparation of an Environmental Impact Statement is not required, and DOE is issuing this Finding of No Significant Impact (FONSI). Subject to any other conditional provisions, this FONSI informs DOE's decision to authorize release of its cost-shared funding for the design, construction, and operation of the biorefinery in Alpena, Michigan.

Copies of the Final EA are available at the DOE Golden Field Office Public Reading Room website at: http://www.eere.energy.gov/golden/Reading_Room.aspx.

For questions about this FONSI, please contact:

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Issued in Golden, Colorado this 7th day of October, 2010

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