CHARITON VALLEY BIOMASS PROJECT

Final Environmental Assessment
and Finding of No Significant Impact

July 2003

U.S. Department of Energy
Golden Field Office
1617 Cole Blvd.
Golden, CO 80401

DOE/EA-1475

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Golden, Colorado 80401-3393

July 10, 2003

DOE/EA 1475

FINDING OF NO SIGNIFICANT IMPACT

for the

CHARITON VALLEY BIOMASS PROJECT

ENVIRONMENTAL ASSESSMENT

AGENCY: Department of Energy, Golden Field Office

ACTION: Finding of No Significant Impact

SUMMARY: Pursuant to the National Environmental Policy Act (NEPA), the Department of Energy (DOE) has prepared an Environmental Assessment (EA) of a biomass co-fire test project at the Ottumwa Generating Station (OGS) near Chillicothe, Iowa. DOE has conducted the EA to evaluate the potential impacts of construction and co-fire testing that would be funded in part by DOE. DOE has conducted this EA to provide the department and other public agency decision-makers with the environmental documentation required to support informed discretionary action on a Proposed Action that would comprise a part of the ongoing Chariton Valley Biomass Project.

The EA assesses the potential environmental impacts that could result if DOE were to provide partial funding for (1) design and construction of a switchgrass storage, handling, and conveying system into the boiler at the OGS; (2) operational testing of switchgrass as a biomass co-fire feedstock at OGS; and (3) ancillary activities related to growing, harvesting, storing, and transporting switchgrass in areas of the Rathbun Lake watershed. The EA also considers the potential for impacts if the Proposed Action were to lead to full-scale commercial switchgrass operations. Under the Proposed Action, DOE would provide a portion of the necessary project funding to the non-profit Chariton Valley Research Conservation and Development Inc. (CVRCD), which in turn would secure the balance of funding and subsequently coordinate with Alliant Energy (an Iowa Utility) and its subcontractors to implement the proposed action at OGS.

In addition to the Proposed Action, the EA considered the No Action Alternative. Under the No Action Alternative, DOE would not partially fund the co-fire testing facilities and activities described under the Proposed Action Alternative, and the project proponents would need to secure other funds for project implementation.

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All discussions and findings related to the Proposed Action and No Action Alternatives are presented in the attached Final Environmental Assessment and appendices. The Final EA is hereby incorporated by reference.

COPIES OF THE FINAL EA ARE AVAILABLE FROM:

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DOE/GO NEPA Compliance Officer
U.S. Department of Energy
1617 Cole Boulevard
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(303) 275-4723 or (800) 644-6735, extension 4723

FOR FURTHER INFORMATION ON THE DOE NEPA PROCESS CONTACT:

Office of NEPA Policy and Assistance
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1000 Independence Avenue, S.W.
Washington, D.C. 20585
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DETERMINATION:

Based on the information presented in the Final EA (DOE/EA 1475), DOE determines that the proposed action does not constitute a major Federal action significantly affecting the quality of the human environment, within the meaning of the National Environmental Policy Act. Therefore, the preparation of an Environmental Impact Statement is not required, and DOE is issuing this Finding of No Significant Impact.

Issued in Golden, Colorado 11th day of July, 2003.

John H. Kersten, Manager
Golden Field Office

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ACRONYMS AND ABBREVIATIONS

ACE	U.S. Army Corps of Engineers
ASTM	American Society for Testing and Materials
BCCE	Bradford Conrad Crow Engineering
BPRD	Biomass Power for Rural Development
BTU	British thermal unit
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CO_2	carbon dioxide
CRP	Conservation Reserve Program
CVBP	Chariton Valley Biomass Project
Chariton Valley RC&D	Chariton Valley Resource Conservation and Development, Inc.
dBA	decibel, A-weighted
DNR	(Iowa) Department of Natural Resources
DOE	U.S. Department of Energy
DOT	(Iowa) Department of Transportation
EA	environmental assessment
EIS	environmental impact statement
EPA	U.S. Environmental Protection Agency
FSA	Farm Service Agency
FWS	U.S. Fish and Wildlife Service
GIS	Geographic Information System
GtC	gigatonnes of carbon
IUB	Iowa Utilities Board
kV	kilovolt
MW	megawatt
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NPDES	National Pollutant Discharge Elimination System
NREL	National Renewable Energy Laboratory
OGS	Ottumwa Generating Station
OSHA	Occupational Safety and Health Act or Administration
PCPI	per capita personal income
PM_{10}	particulate matter with a diameter of 10 microns or less
PSD	prevention of significant deterioration
SHPO	State Historic Preservation Officer
USDA	U.S. Department of Agriculture
USGS	U.S. Geological Survey
VOC	volatile organic compound

GLOSSARY

100-year floodplain	The flat or nearly flat land along a river or stream or in a tidal area that is covered by water during a flood event of such magnitude that it occurs, on average, every 100 years; the 100-year flood equates to a 1-percent chance of occurrence in a given year
alluvial	Pertaining to or consisting of detrital materials that are eroded, transported, and deposited by running water
attainment	A state of compliance with one or more of the National Ambient Air Quality Standards (NAAQS)
baling twine	Any of a variety of heavy-duty, natural fiber (for example, sisal) cords or synthetic (for example, polypropylene) lines used to bind harvested agricultural products into large square or round bales or sheaves for transportation and storage; it is also used for many other general purposes
biomass energy	Energy resources derived from organic matter, including wood, agricultural waste, and other living-cell material that can be burned to produce heat energy; also, in energy accounting, the potential stored energy content of living organisms (such as forests or fuel crops) present at a specific time in a defined unit (community, ecosystem, crop, etc.) of the Earth's surface
bottom ash	The coarse, solid, noncombustible particulate matter that results from the combustion of ground or powdered coal and falls to the bottom of a boiler
cellulose	The main polysaccharide (carbohydrate) in living plants, forming the skeletal structure of the plant cell wall
co-fire	The burning of two fuels in the same combustion unit
C-Stone®	An artificial aggregate used as a paving and foundation material
debaler	A mechanical device that uses a cutting, slicing, or ripping action to loosen tightly compacted bales of a harvested agricultural crop such as hay, switchgrass, or cotton
decibel	A standard unit of measuring sound-pressure levels based on a reference sound pressure of 0.0002 dyne per square centimeter (the smallest sound a human can hear)
decibel, A-weighted	A measurement of sound approximating the sensitivity of the human ear and used to characterize the intensity or loudness of sound
decommissioning	The removal from active service of a facility
diamicton	A nonlithified, calcareous, terrigenous sedimentary rock that is not sorted or is poorly sorted and contains particles of many sizes
economizer	A heat recovery section of a furnace that is designed to capture and remove heat from the flue gas as it leaves the furnace
economizer ash	The ash that accumulates at the bottom hopper section of an economizer

environmental justice	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
feedstock	The raw material furnished to a machine or process
fly ash	Fine particulate, essentially noncombustible refuse, carried in a gas stream from a furnace
fossil fuel	Any hydrocarbon deposit that may be used for fuel; examples are coal, petroleum, and natural gas
Geographic Information System	A computer system for capturing, storing, checking, integrating, manipulating, analyzing, and displaying data related to positions on the Earth's surface
glacial till	Unsorted and unstratified drift consisting of a heterogeneous mixture of clay, sand, gravel, and boulders that is deposited by and underneath a glacier
greenhouse gas	A gas, such as carbon dioxide or methane, that contributes to potential climate change
groundwater	The supply of fresh water contained in pores and fractures beneath the surface of the Earth that often supplies wells and springs
hammer mill	A grinding machine that pulverizes feed and other products by several rows of thin hammers revolving at high speed; or, a type of impact mill or crusher in which materials are reduced in size by hammers revolving rapidly in a vertical plane within a steel casing
hemicellulose	A type of polysaccharide (carbohydrate) found in plant cell walls in association with cellulose and lignin
lacustrine	Belonging to or produced by lakes
lignin	A substance that together with cellulose forms the woody cell walls of plants and cements them together
loess	An essentially unconsolidated, unstratified, calcareous silt; commonly it is homogeneous, permeable, and buff to gray in color
Mercalli scale	A 12-step scale developed to fit construction conditions in the United States and used to classify the magnitude of an earthquake; its values range from I (not felt except by a very few people) to XII (damage total)
mollisol	An order of soils that have a dark surface horizon, are formed from nutrient-rich parent material, and are commonly found in grasslands
Mound Builders	Name given to those people who built mounds in a large area from the Great Lakes to the Gulf of Mexico and from the Mississippi River to the Appalachian Mountains; the greatest concentrations of mounds are found in the Mississippi and Ohio Valleys
National Ambient Air Quality Standards (NAAQS)	Standards established by the U.S. Environmental Protection Agency (EPA) that apply to outdoor air throughout the country; the regulated pollutants, called criteria pollutants, are sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone, lead, and two size classes of particulate matter

National Environmental Policy Act (NEPA)	The Federal statute that is the national charter for protection of the environment; NEPA is implemented by procedures issued by the Council on Environmental Quality and the U.S. Department of Energy
non-potable	Not suitable for drinking
palustrine	Being, living, or thriving in a marsh
perennial (referring to streams or rivers)	A stream or river that contains water at all times except during extreme drought
perennial (referring to plants)	A plant that lives for an indefinite period, dying back seasonally and then producing new growth
potable	Suitable for drinking
Quaternary	The second period of the Cenozoic geologic era, following the Tertiary, and including the last 2 million to 3 million years
ravine	A small, narrow valley with steeply sloping sides
riparian area	An area located along a riverbank
runoff	The part of precipitation, snowmelt, or irrigation water that runs off the land into streams or other surface-water; runoff can carry pollutants from the air and land into the receiving waters
sequestration	The process by which carbon dioxide is removed from the atmosphere and for some period retained; carbon dioxide is most commonly sequestered by plants
siltation	The accumulation of stream-deposited silt
switchgrass	A native Iowa grass that is attractive as a biomass crop because (1) its cultivation results in less soil, pesticide, and fertilizer runoff than do row crops such as corn or soybeans; (2) it grows well on marginal land; and (3) it sequesters significant amounts of carbon dioxide into the soil
vertic	Pertaining to soil having a field texture of 35 percent or more clay that experiences significant shrinking and swelling resulting from drying and wetting
watershed	The drainage area of a stream or river
wetland	An area that is regularly saturated by surface water or groundwater and subsequently is characterized by a prevalence of vegetation that is adapted for life in saturated soil conditions

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1.0 INTRODUCTION

The U.S. Department of Energy (DOE) is proposing to provide partial funding for (1) the design and construction of a biomass (switchgrass [*Panicum virgatum*]) storage, handling, and conveying system into the boiler at the Ottumwa Generating Station (OGS) near Chillicothe, Iowa; (2) operational testing of switchgrass as a biomass co-fire feedstock at OGS; and (3) ancillary activities related to growing, harvesting, storing, and transporting switchgrass in areas of the Rathbun Lake watershed (Figure 1). Chillicothe is in Wapello County on the south side of the Des Moines River, approximately 16 kilometers (10 miles) northwest of Ottumwa, Iowa, and 130 kilometers (80 miles) southeast of Des Moines.

SWITCHGRASS
Switchgrass is a warm-weather, native Iowa grass that grows well on marginal land. It has been identified and extensively studied for its potential as a biomass energy crop, especially its potential for use as co-fire feedstock in coal-burning plants. In this environmental assessment (EA), the term "co-fire" refers to the burning of switchgrass in the OGS boiler in conjunction with coal, with the goal of reducing the amount of coal used and reducing emissions of some objectionable air pollutants associated with coal combustion.

The OGS is a 725-megawatt (MW) maximum output, low-sulfur, pulverized coal-burning plant jointly owned by several Iowa utilities and operated by Alliant Energy. The plant is located about 1.6 kilometers (1 mile) northwest of Chillicothe, Iowa, on the Des Moines River (Figure 2).

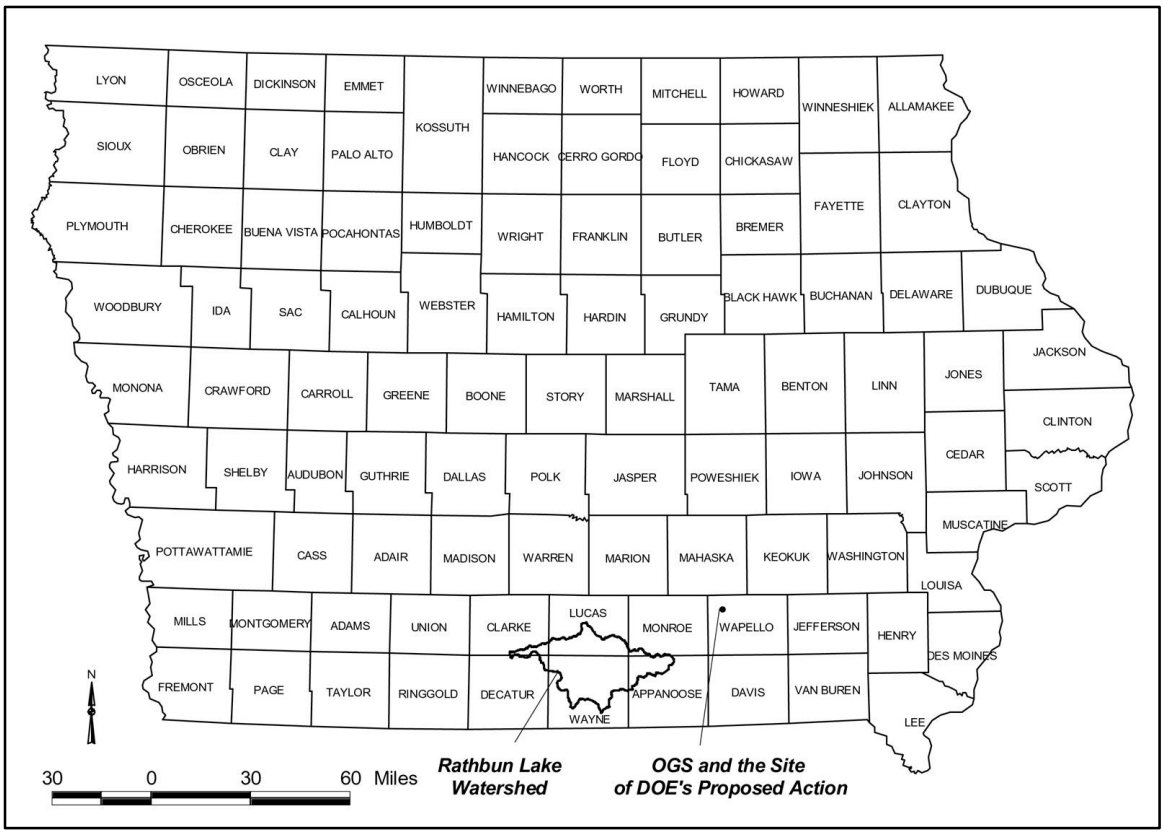


Figure 1. Location of the Rathbun Lake Watershed and the OGS

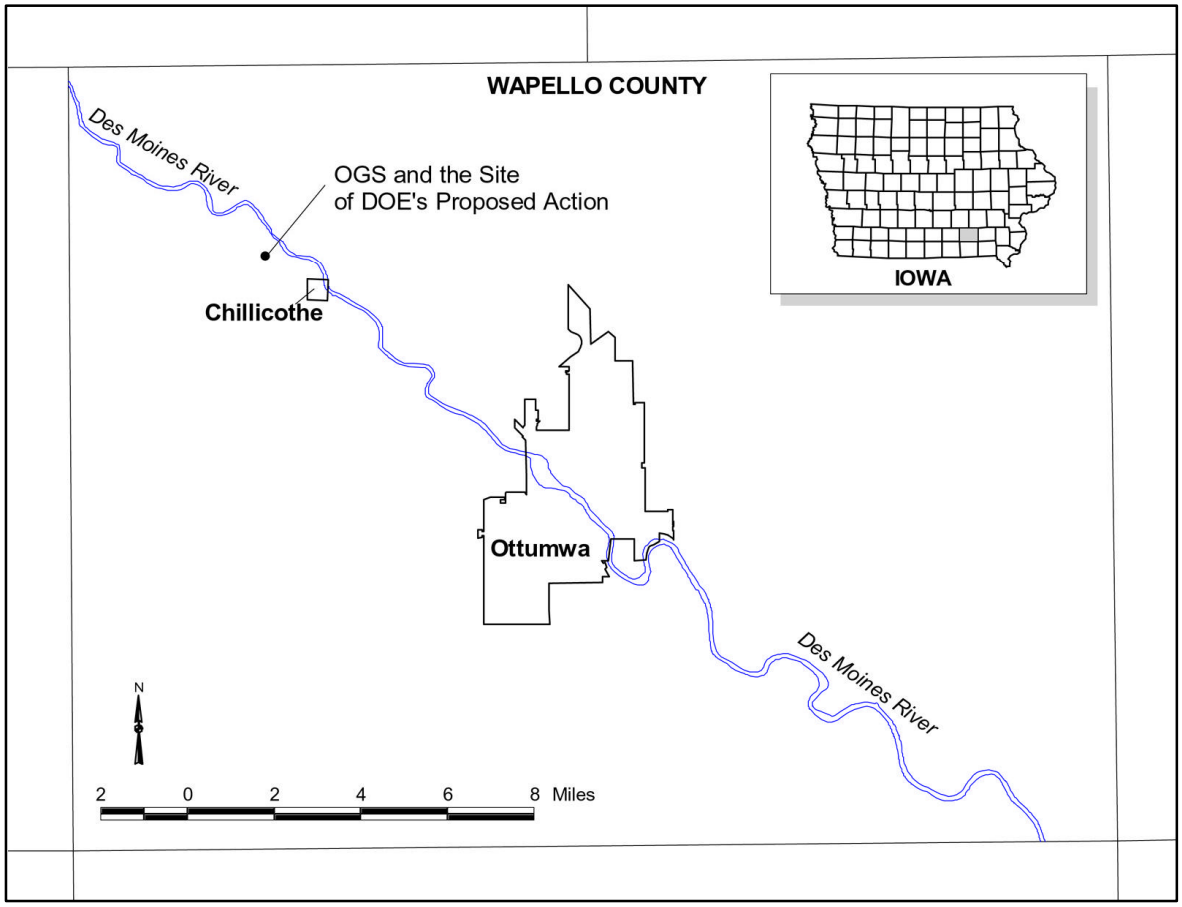


Figure 2. Location of the OGS and the Proposed DOE Action

The following three-phase switchgrass co-fire test campaign has been planned and partially implemented at OGS:

- During Phase 1, which occurred from November 2000 through January 2001, Alliant Energy conducted Co-fire Test 1 at OGS.
- Phase 2 testing, the Proposed Action, would consist of two additional co-fire tests. Co-fire Test 2, which would utilize some residual equipment from Co-fire Test 1 and also test some new equipment, is currently planned for September/October 2003. It would be designed to test and demonstrate the engineering and environmental feasibility of co-firing up to 11.3 tonnes (12.5 tons) of switchgrass per hour and would burn a maximum of 5,440 tonnes (6,000 tons) of switchgrass. Co-fire Test 3, which is tentatively planned for winter 2004/2005, would test the long-term (approximately 2,000 hours) sustainability of processing 11.3 tonnes (12.5 tons) per hour. Co-fire Test 3 would be conducted using a proposed new process building and storage barn that would be constructed at the OGS as part of the Proposed Action.
- Phase 3, commercial operations, may occur if Phase 2 indicated that commercial operations were technically, environmentally, and economically feasible. Continuous, full-scale commercial operations could process up to 23 tonnes (25 tons) of switchgrass per hour, generate 35 MW per year of OGS's annual output, and replace 5 percent of the coal burned at

OGS with switchgrass. Chariton Valley Resource Conservation and Development Inc. (Chariton Valley RC&D), a rural-development-oriented, non-profit corporation (Chariton Valley RC&D 2003a) and Alliant Energy would implement Phase 3 at their discretion after the completion of the Phase 2 co-fire tests.

DOE's Proposed Action would support only Phase 2 testing; that is, Co-fire Tests 2 and 3. DOE has no plans to provide financial support for the commercial operations that would be performed during Phase 3. The new construction that DOE proposes to partially fund would include a new switchgrass processing facility and equipment and a new storage barn that would be used for Co-fire Test 3.

This environmental assessment (EA) evaluates the environmental impacts that could result from the Proposed Action. It also evaluates the impacts that could occur if DOE decided not to partially fund the Proposed Action (the No Action Alternative). No other action alternatives are analyzed because (1) no generating plants other than OGS have the installed infrastructure and operating experience necessary to conduct Phase 2 co-fire testing, and (2) the Rathbun Lake watershed is the only viable source of the supply of switchgrass necessary to conduct the testing at OGS.

This EA has been prepared under DOE's regulations and guidelines for compliance with the National Environmental Policy Act (NEPA) of 1969 (42 U.S.C §§ 4321 *et seq.*). A draft version of this EA was distributed to interested members of the public and to Federal, state, and local agencies for review and comment prior to any final decisions by DOE on the Proposed Action.

1.1 The National Environmental Policy Act (NEPA) and Related Procedures

NEPA, the Council on Environmental Quality (CEQ) regulations for implementing the procedural provisions of NEPA (40 CFR Parts 1500-1508), and DOE's implementing procedures for compliance with NEPA (10 CFR Part 1021) require that DOE, as a Federal agency:

- Assess the environmental impacts of its proposed actions
- Identify any adverse environmental effects that cannot be avoided should a proposed action be implemented
- Evaluate alternatives to the proposed action, including a no action alternative
- Describe the relationship between local short-term uses of the environment and the maintenance and enhancement of long-term productivity
- Characterize any irreversible and irretrievable commitments of resources that would be involved should the proposed action be implemented

These provisions must be addressed before a final decision is made to proceed with any proposed Federal action that could cause significant impacts to human health or the environment. This EA evaluates the potential individual and cumulative effects of the Proposed Action and the No Action Alternative on the physical, human, and natural environment. The EA is intended to (1) meet DOE's regulatory requirements under NEPA, and (2) provide DOE, the U.S. Department of Agriculture (USDA), the State of Iowa, and other agency decision-makers with the information they need to make informed decisions in connection with the proposed project.

1.2 Background

Biomass Energy. In 1992, DOE determined that developing a sustainable biomass energy program in the United States was desirable for a number of reasons. Dedicated energy crops were cited as potential long-

term sources of renewable fuel that could contribute to domestic energy independence, assist in alleviating global climate warming by reducing greenhouse gas emissions, relieve overproduction in certain agricultural sectors, reduce water pollution from agricultural runoff, and increase rural income (DOE 1992). The Midwest, especially Iowa, has a high potential for biomass energy crop production. Switchgrass, a native Iowa grass, is particularly attractive as a biomass crop. Its cultivation results in less soil, pesticide, and fertilizer runoff than row crops such as corn or soybeans; it grows well on marginal land; and it sequesters significant amounts of carbon dioxide, a greenhouse gas, into the soil (Downing et al. 1993).

BIOMASS AND ITS USE IN THE CO-FIRING PROCESS

Plant biomass consists primarily of three materials: cellulose (50 percent), hemicellulose (25 percent), and lignin (25 percent). Geologically, coal is formed from lignin, and typically the lignin component of plant biomass has the same energy content as medium- to high-British thermal unit (BTU)-grade coal. However, when combusted, plant biomass can produce significantly lower concentrations of many of the most objectionable air pollutants associated with coal combustion, notably sulfur and nitrogen oxides. Examples of plant biomass include wood waste, agriculture crop residues, fast-growing grasses and trees, and the paper component of municipal solid waste. Biomass can be directly converted into fuels through processes such as gasification or ethanol production, or it can be used to supplement (co-fire) coal in coal-fired generating plants. The coal industry and many utilities are increasingly interested in using biomass to co-fire existing coal burning plants in order to reduce sulfur and nitrogen oxide air pollutants.

Chariton Valley Biomass Project. In 1995, formal efforts by DOE and the USDA to encourage the use of biomass as an energy source converged with the Biomass Power for Rural Development (BPRD) initiative. Under this initiative, the two agencies issued requests for proposals which sought to demonstrate and deploy integrated biomass systems that were both economically and environmentally viable and sustainable. This solicitation resulted in the funding of three projects, each of which included a utility partner and a coalition of local agricultural interests. One of these projects, the Chariton Valley Biomass Project (CVBP), emerged as promising in terms of (1) the level of public-private commitment to the effort, (2) the viability of the technical approach, and (3) the overall potential for success. The goal of the CVBP is to eventually use switchgrass as a fuel to replace a portion of the coal burned at OGS.

The CVBP is sponsored by Chariton Valley RC&D. The Chariton Valley RC&D/Alliant Energy partnership is assisted by the Energy Research Corporation; the Iowa Department of Agriculture and Land Stewardship, Division of Soil Conservation; the Iowa Department of Natural Resources (DNR); the Iowa Energy Center; the Iowa Farm Bureau Federation; Iowa State University; the Iowa State University Extension; Appanoose, Lucas, Monroe, and Wayne counties; John Deere Works; the Leopold Center for Sustainable Agriculture; the National Renewable Energy Laboratory (NREL); Prairie Lands Bio-Products Inc.; R.W. Beck; the USDA Farm Service Agency; the USDA Natural Resources Conservation Service; DOE; Oak Ridge National Laboratory; Vermeer Manufacturing Company; and Foster Wheeler, Inc.

Since 1998, the CVBP has made progress on several fronts, including (1) agricultural (identification of and research on acreage in southern Iowa that is best suited for potential conversion to switchgrass production as an energy crop); (2) permitting (identification of permitting and environmental issues that will need to be identified and resolved), and (3) engineering (demonstration that the existing OGS plant design and the modifications required for commercial switchgrass co-fire operations are compatible.)

Ottumwa Generating Station. Construction of the OGS began in 1976, and commercial operations began in 1981. Prior to the current switchgrass co-fire tests, coal was the only fuel burned at OGS. The plant receives all its coal from Wyoming via rail. Of the approximately 3.2 million tonnes (3.5 million tons) of coal that the facility receives annually, approximately 360,000 to 450,000 tonnes (400,000 to

500,000 tons) have been resold to local industry and transported offsite via trucks (approximately 16,000 to 20,000 trucks per year). However, some of this resale activity is currently being changed from truck to rail shipments. Fly ash is the main product left after the coal is burned. It has significant commercial value as a component used in cement manufacturing and as a construction fill material. Fly ash is stored onsite in silos until it is sold, usually during the construction season—March through October. Some fly-ash is also processed onsite into C-Stone®, an artificial aggregate used as a paving and foundation material. Coal, fly ash, and C-Stone®, are all shipped offsite via truck. Currently, outbound coal and fly ash shipments comprise a majority of the truck traffic at OGS.

WHY SWITCHGRASS?
DOE and Oak Ridge National Laboratory's Biofuels Feedstock Development Program have identified switchgrass, a warm-season grass, as a model biomass energy crop. Favorable features of switchgrass include its native origin in North America, genetic diversity, adaptation to a wide range of climates and soil types, effectiveness in carbon sequestration and soil improvement, and value for other uses such as forage for livestock and wildlife habitat. In terms of characteristics related to its quality as a biomass fuel, switchgrass has ash and alkali contents favorable for use in coal-fired combustion boilers, sulfur and nitrogen contents that could result in lower sulfur dioxide and nitrogen oxide emissions than coal, an energy content comparable to that of wood, low moisture content, and the capability of producing high biomass yields with relatively low fertilizer and herbicide inputs.

Phase 1 Co-fire Tests. From November 2000 through January 2001, Alliant Energy conducted Phase 1 of a planned three-phase switchgrass co-fire test campaign at OGS. During Phase 1, Alliant Energy co-fired approximately 1,151 tonnes (1,269 tons) of switchgrass at rates up to 15.2 tonnes (16.8 tons) per hour. The Phase 1 co-fire testing included facility modifications, combustion tests, and post-test analyses. Stack testing for emissions was conducted during co-firing and when burning coal only. Fuel and ash samples, boiler performance information, and emissions data were collected and analyzed. Phase 1 testing was completed without environmental incident, personnel injuries, or loss of power output from OGS. In general, the results of the Phase 1 testing were as expected; however, some of the emission test results were inconclusive. A report on the Phase 1 testing (NREL 2002) provides details on the testing process, equipment performance, and test results.

1.3 Scoping

During February 2003, DOE sent scoping letters to the U.S Fish and Wildlife Service (FWS), the State Historic Preservation Officer (SHPO), and the Iowa DNR describing the Proposed Action and asking for their assistance in identifying potential issues that should be evaluated in this EA. DOE also sent scoping letters to various other potentially interested organizations and agencies and ran a 3-day notice in the *Ottumwa Courier* to inform the public of the Proposed Action and to solicit public comments. Appendix A contains copies of the scoping letters. Appendix B contains the responses DOE received (DOE did not receive any public comments in response to the *Ottumwa Courier* notice). Appendix C contains the full scoping letter distribution list.

1.4 Purpose and Need

By testing various aspects of the technical, environmental, and economic feasibility of intermediate-scale biomass co-fire operations at OGS, the Proposed Action would support a collaborative effort by DOE, Alliant Energy, and Chariton Valley RC&D. Each of these three partners has distinct, although related, needs that would be met by the Proposed Action.

U.S. Department of Energy. It is a mission of DOE to assist in advancing the development and commercialization of energy efficiency and renewable energy technologies such as biomass energy (reference the Energy Policy Act of 1992). Pursuant to this mission, DOE has a need to demonstrate

renewable sources of electricity that would be commercially feasible in the United States and that would reduce fossil fuel dependence and air pollutant emissions. The Proposed Action would address this need by partially funding the construction of an intermediate-scale switchgrass processing and storage facility and related activities to test the viability of a promising biomass energy crop.

Alliant Energy. Before Alliant Energy would proceed with plans and investments for commercial switchgrass operations, it needs to demonstrate that full-scale operations can be achieved, sustained, and verified in a manner that allows it to remain in compliance with all existing permitted emission levels. Alliant Energy further needs to ensure that (1) sustained co-fire operations are technically feasible, (2) such operations would not result in any degradation of the plant's boiler or operating parameters, and (3) OGS fly ash would continue to be marketable. The Proposed Action would also support Alliant Energy's need to confirm whether switchgrass co-fire operations would qualify it for credits under a recently enacted Iowa law (Iowa Code Section 476.41 et seq. (2001) [House File 577]) that requires all electric utilities operating in the state, including those not regulated by the Iowa Utilities Board (IUB), to offer green power options to their customers, beginning January 1, 2004.

Chariton Valley Resource Conservation and Development Inc. The Proposed Action responds to Chariton Valley RC&D's need to further assess the adequacy of the existing regional infrastructure to sustain switchgrass harvesting, transportation, storage, and sales, and to assess further the overall economic and agricultural viability of switchgrass as an energy crop. Information gained through these further assessments would be used as a basis for gauging the technical and environmental feasibility, costs, and benefits of using switchgrass as a fuel to replace a portion of the coal burned at OGS. Upon approval of the Proposed Action, DOE would provide a portion of the necessary funding to the Chariton Valley RC&D, which in turn would secure the balance of the necessary funding and subsequently coordinate with Alliant Energy and engineering firms to implement the Proposed Action.

1.5 Organization of the EA

This EA is structured in accordance with the standards set forth in DOE's NEPA implementing regulations and guidelines. Section 2.0 describes the Proposed Action and the No Action Alternative in sufficient detail to give the reader an understanding of the actions that would take place during construction, operation, and decommissioning of the proposed switchgrass co-fire test facilities, and the ramifications if they did not take place. Section 3.0 characterizes the existing environment at the proposed site and the area where the switchgrass feedstock would be obtained from various environmental perspectives: air quality and meteorology; soils and geology; biological, water, and cultural resources; land use; noise; infrastructure; aesthetics, socioeconomics, and environmental justice. Section 4.0 assesses the impacts that would or could occur if the Proposed Action were implemented. Section 5.0 describes the cumulative impacts that could occur from the Proposed Action when combined with other related activities. Section 6.0 addresses short-term uses of the environment and the effect on long-term productivity, and the irreversible and irretrievable commitment of resources should the Proposed Action be implemented. Section 7.0 lists the documents, websites, and other sources of information cited in this EA. Appendix A contains the text of DOE's scoping letters, Appendix B contains the responses DOE received, and Appendix C contains the scoping letter distribution list. Appendix D contains a summary and a full copy of the one comment letter DOE received regarding the Draft EA and DOE's responses to the items raised in the letter.

2.0 PROPOSED ACTION AND NO ACTION ALTERNATIVE

DOE is considering providing partial funding for (1) the design and construction of a switchgrass storage, handling, and conveying system into the boiler at the OGS, (2) operational testing of switchgrass as a biomass co-fire feedstock at OGS, and (3) ancillary activities related to growing, harvesting, storing, and

transporting switchgrass in areas of the Rathbun Lake watershed. This section describes both general and site-specific activities that would occur if the Proposed Action were authorized. It also characterizes the No Action Alternative, as required under NEPA. No other action alternatives are analyzed because (1) no generating plants other than OGS have the installed infrastructure and operating experience necessary to conduct Phase 2 co-fire testing, and (2) the Rathbun Lake watershed is the only viable source of the supply of switchgrass necessary to conduct the testing.

2.1 Proposed Action

2.1.1 New Facilities

Design Basis. During the last 12 years, the Danish power company Elsam has implemented a comprehensive program to develop clean coal and biomass technologies in order to comply with Danish government-mandated carbon dioxide abatement goals and biomass applications. One option considered and advanced was co-firing straw at existing pulverized coal plants. In order to assess the prospects of this technology, a 150-MW coal-fired plant, the Studstrup Power Station, was converted and retrofitted to co-fire straw. From January 1996 to February 1998, Elsam conducted a 2-year demonstration program. The design and operational experience at Studstrup Power Station provided the engineering design basis for DOE's Proposed Action. A Danish consulting engineering services firm, Tech-Wise A/S, and Bradford Conrad Crow Engineering (BCCE) of Tigard, Oregon, have designed a switchgrass storage and processing system based on Tech-Wise's experience with the Studstrup plant. Construction and operation of this system at OGS is part of the Proposed Action assessed in this EA. Alliant Energy, BCCE, Tech-Wise A/S, and others have prepared and submitted to DOE a detailed design package for the proposed new facilities, which is incorporated into this EA by reference (Alliant Energy et al. 2002).

Location. The proposed new facilities would be built on OGS plant property. Figure 3 illustrates the OGS and the proposed location for the new facilities directly west of the plant. Originally, the proposed new facilities were to be located directly east of the OGS plant. This location was the site of the switchgrass handling operations during Phase 1. However, Alliant Energy has determined that in order to maintain future options to expand the OGS plant, it would need to retain the area east of the main plant. Consequently, the proposed site for the new switchgrass facilities has been moved to a location approximately 335 meters (1,100 feet) west of the OGS main plant. Figure 4, an aerial photograph of the OGS taken in 2001, illustrates the location of the proposed new facilities and other OGS site features. Most of the area that the proposed switchgrass operation would occupy is an old parking lot currently used to store power line poles and other equipment. Pole storage would be relocated to another onsite location or to leased offsite land. In this area, only very limited demolition would be required to remove an old pole-mounted transformer. A small office building is located on the proposed site; this building would remain. The existing Phase 1 storage barn and process building shown in Figure 4 would also be used for storage and processing during the Proposed Action.

Footprints. The new storage barn and process building that would be built for the Proposed Action would have footprints of approximately 2,512 square meters (27,035 square feet) and 637 square meters (6,862 square feet), respectively. The two buildings would be connected by a transfer gallery of approximately 189 square meters (2,035 square feet), elevated approximately 7 meters (23 feet) above the ground. Thus, the total footprint of the new construction for the Proposed Action would be approximately 3,338 square meters (35,932 square feet) (Table 1). Full-scale commercial operations (Phase 3) are not part of DOE's Proposed Action. However, if Phase 2 were successful and led to Phase 3, the size of the new storage barn and process building would both be expanded (approximately doubled) to accommodate the increased volume of switchgrass necessary for Phase 3 (Table 1).

Figure 3. OGS Plant Looking Northeast from the Site of the Proposed New Facilities

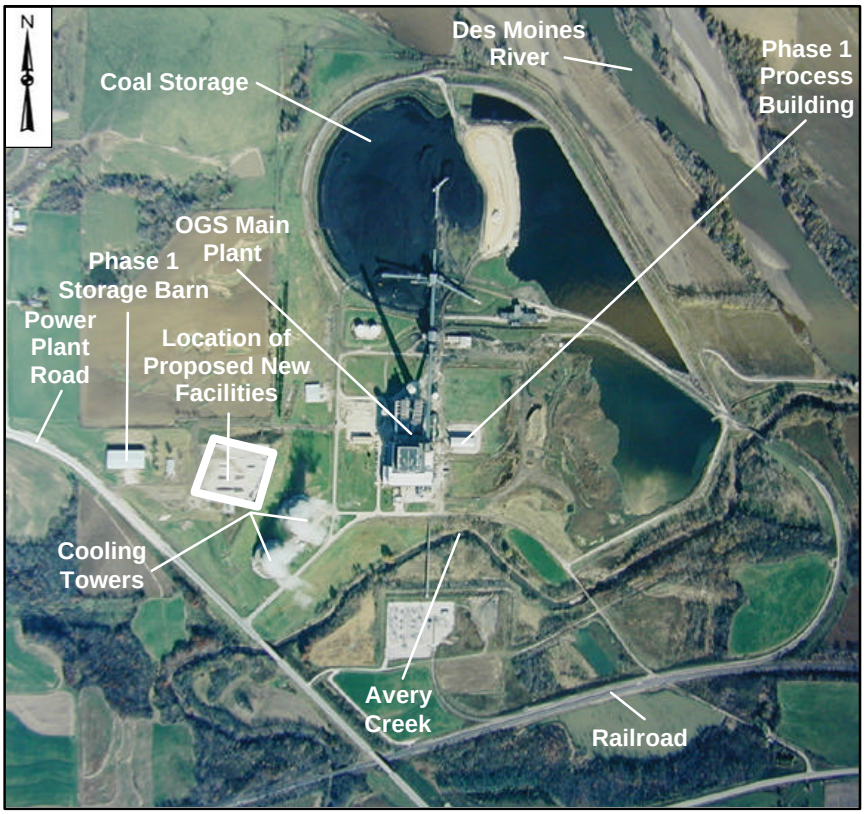


Figure 4. Aerial View of the OGS

Table 1. New Facility Footprints[a]

Facility	Footprint (Square Feet)[b]		
	Phase 2 (Proposed Action)	Phase 3	Total
Storage Barn	27,035	23,950	50,985
Gallery	2,035	0	2,035
Process Building	6,862	6,862	13,724
Total	**35,932**	**30,812**	**66,744**

a. Source: BCCE 2003a.
b. To convert square feet to square meters, multiply by 0.093.

Figure 5 illustrates the approximate configuration and alignment of the new facilities (for Phases 2 and 3) in relation to the OGS main plant site. Figure 6 illustrates the profiles of the new facilities (for Phases 2 and 3) as they would be seen from the ground. Figure 7 illustrates the footprints of the new facilities for the Proposed Action (Phase 2) and for a potential future expansion (Phase 3). Ground elevation differences in the area of the footprints would require up to 1.5 meters (5 feet) of cut and/or fill grade-work.

Utilities. Two transformers would be installed and located to take advantage of an existing buried line and to deliver the required electrical services for the proposed facilities. Existing sanitary and non-potable (non-drinking) water lines would be extended to the proposed process building and would be used for a single toilet, a sink, and eyewash stations. A bottled-water dispenser would be used to supply potable (drinking) water. Four new fire hydrants would be installed outside of the buildings, with two fire department hose connections.

Truck Parking. As illustrated in Figure 5, a new delivery truck parking and staging area would be built. This area would accommodate two groups of switchgrass delivery truck drivers. One group would be those drivers who would not exchange their incoming, full trailer for an outgoing, empty trailer; these drivers would likely be farmers who owned their own trailers and preferred to make deliveries themselves. The second group of drivers would exchange their full trailer for an empty trailer to avoid potential waiting delays at the storage barn; these drivers would likely be contract drivers who would handle deliveries for farmers not wishing to deliver the switchgrass themselves.

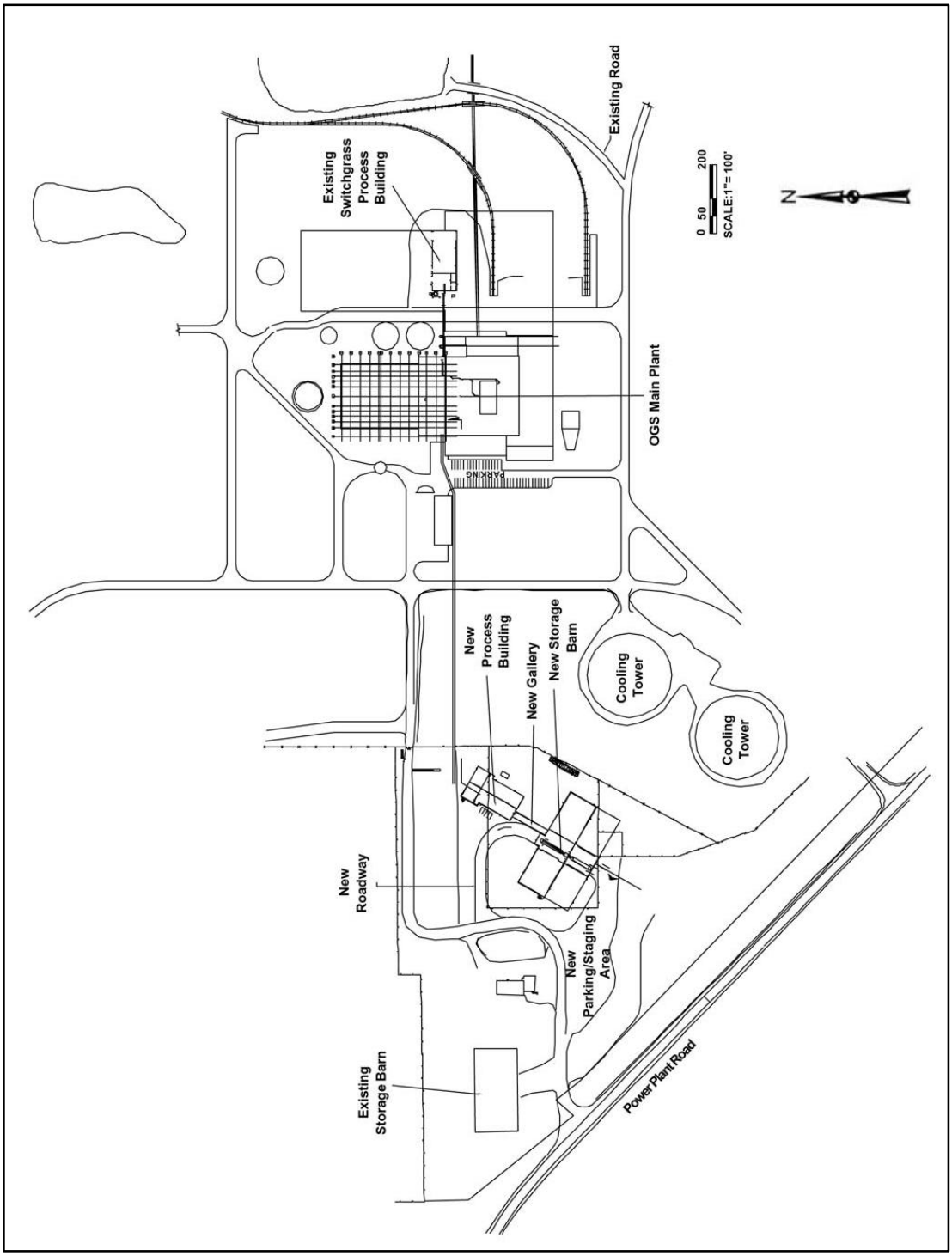
Approximately 1,100 square meters (12,000 square feet) of parking would be developed just west of the proposed storage barn and process building. This area would prevent potential traffic backups at the unloading facility. There would be approximately 150 meters (500 feet) (six-truck capacity) of available space for trucks to queue in front of the storage barn. This area would be used by both groups of drivers. The normal unloading time per truck, including cleanup, would be about 20 minutes. There would be two receiving/unloading bays in the storage barn. Therefore, if there were a line of six trucks at the facility, the last driver in line would have to wait at least 60 minutes.

2.1.2 Operations

This section describes the processes and equipment that would comprise the Proposed Action and potentially a subsequent commercial scenario.

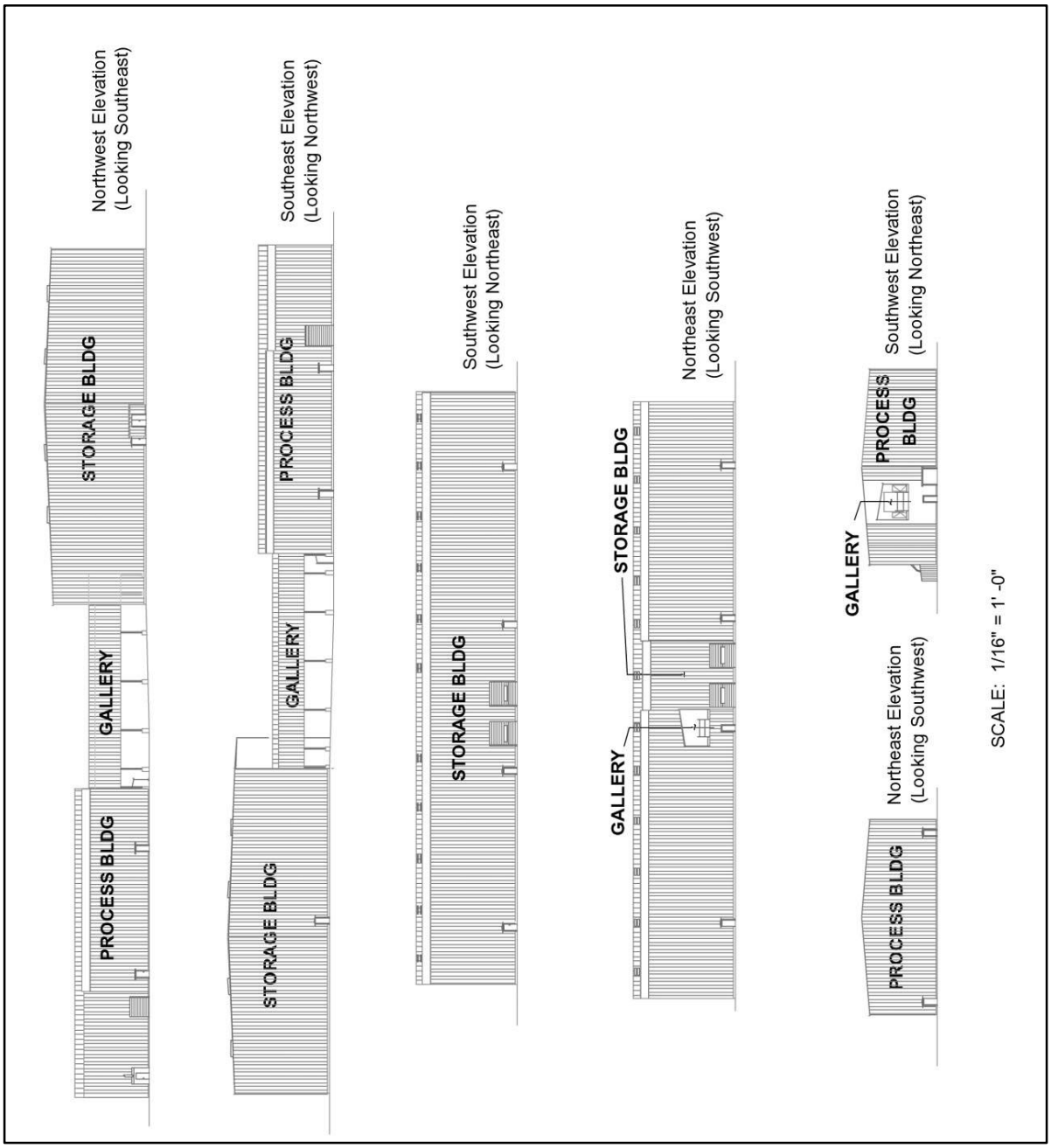
2.1.2.1 Switchgrass Harvest and Storage

When ready, switchgrass would be harvested and baled into large bales approximately 0.9 × 1.2 × 2.4 meters (3 × 4 × 8 feet) and weighing approximately 450 kilograms (0.5 ton, or 1,000 pounds) each. The bales would be loaded onto 16-meter (53-foot) extended flatbed trucks.



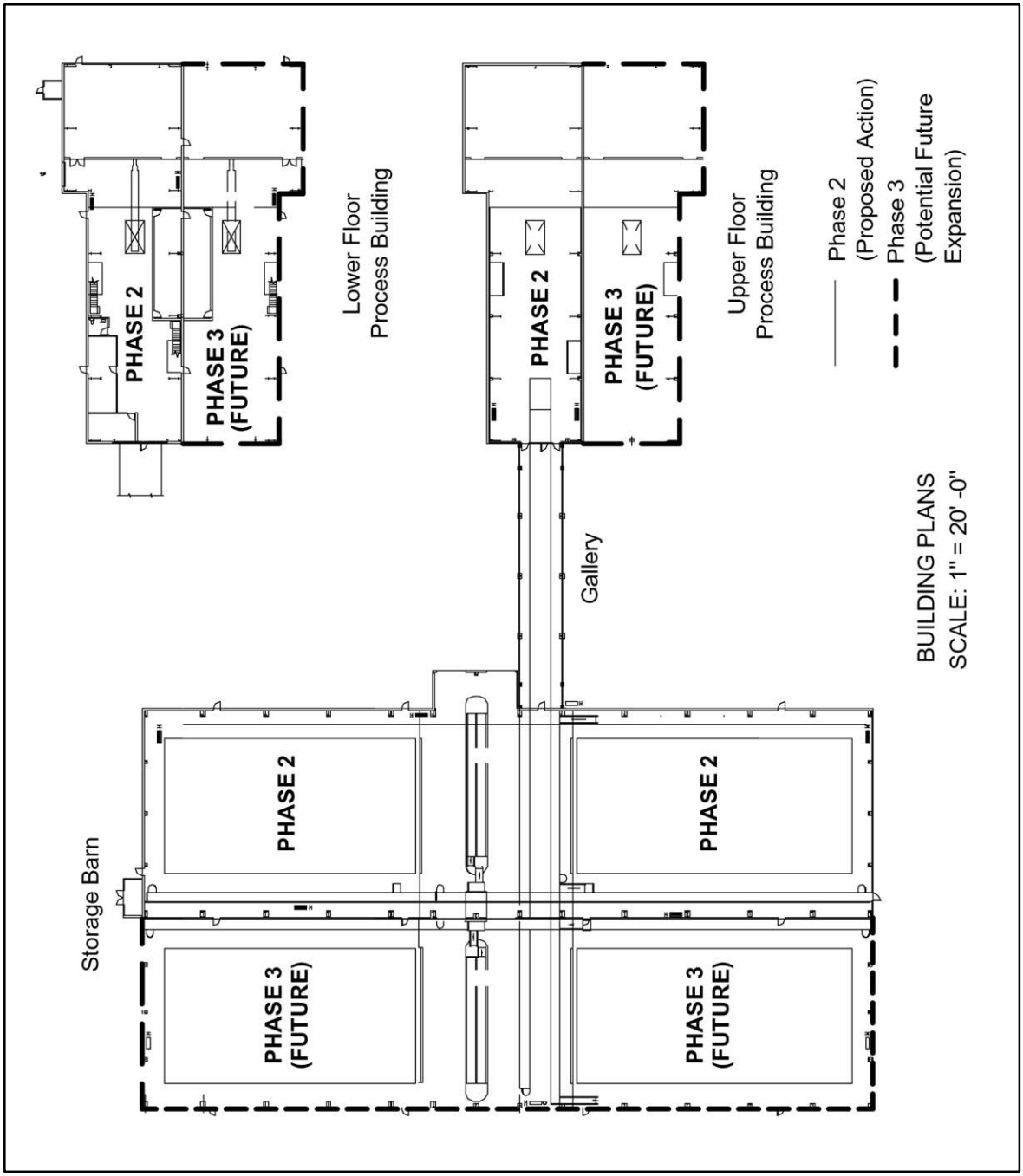
Source: BCCE 2003b.

Figure 5. Site Plan



Source: BCCE 2003c.

Figure 6. Profile of New Facilities (Phases 2 and 3)



Source: BCCE 2003d

Figure 7. Footprints for Proposed Action and Potential Future Expansion

Typically, each fully loaded truck would carry 42 bales and would weigh approximately 19 tonnes (21 tons). Depending on the supply of switchgrass at OGS and the plant's immediate needs, the bales would be either stored in temporary offsite storage facilities, delivered to the proposed new storage barn, or unloaded directly at the proposed new process building. Because the switchgrass harvest season is approximately 3 months long, and because co-firing operations would occur virtually year-round (except for 1 month per year when the plant is shut down for maintenance), it would be necessary to store significant volumes of switchgrass before it is processed and co-fired. A bale-receiving system that uses an overhead crane would serve three purposes. First, the system would unload bales from the delivery trucks. Second, for bales going into storage, the system would stack the bales in the barn. Third, when needed, the system would recover stacked bales and deliver them to the process building via a conveyer system. Stored bales would be recovered using a first-in/first-out inventory control system. Figure 8 illustrates various aspects of switchgrass harvest and storage operations.

Figure 8. Switchgrass Harvest and Storage Operations (clockwise from upper left: typical switchgrass field, harvesting, storage, fully loaded flat-bed delivery truck)

2.1.2.2 Switchgrass Processing and Co-firing

When ready for processing, the bales would be loaded onto a chain conveyor system that would transport them to one of several processing units in the process building. The baling twine holding the bales together would be automatically removed and recovered. The loose bales would then be conveyed to a debaler. After debaling, the loose switchgrass would be leveled on a belt conveyor. An induced draft fan with a bag house would then vacuum the loose switchgrass through a stone trap to remove the heaviest foreign particles; the switchgrass would then be conveyed to a hammer mill unit. In the hammer mill, the switchgrass would be sieved and beaten into fine particles. The particles would be caught in a hopper below the hammer mill. A screw conveyor would convey the particles to a rotary airlock and pneumatic

transport system that would carry the pulverized switchgrass to the OGS burner. At the burner, the pulverized switchgrass would be injected through nozzles into the burner, where it would be co-fired with pulverized coal.

2.1.3 Decommissioning

Decommissioning would entail the dismantling and disposal of the switchgrass storage barn and process building constructed under the Proposed Action. This would be necessary if switchgrass operations were determined to be economically, technically, or environmentally infeasible. Similarly, decommissioning would be required when the OGS reached the end of its life cycle. If, in the short term, it were decided that the project was not feasible, dismantling and removal of the onsite additions would be negotiated among DOE, Alliant Energy, and the Chariton Valley RC&D. Alliant might request restoration of the property to its original condition. The owner of the existing onsite switchgrass storage barns, Prairie Lands Bio Products, Inc., would retain ownership of the barns and would be responsible for their disposition. DOE would have the option of recovering the equipment and buildings it paid for and installed under the Proposed Action. Alternately, DOE could opt to sell them to Alliant Energy, or to another party, or to contract for their removal and disposal. Regardless of which short-term decommissioning option would be selected, it would not require a shutdown or any disruption of OGS's normal operations or pose significant permitting obstacles.

If switchgrass co-fire operations proved to be economically, technically, and environmentally feasible and were fully integrated into OGS's normal operations by Chariton Valley RC&D and Alliant Energy, decommissioning of the onsite switchgrass storage and process buildings constructed under the Proposed Action at the OGS plant would be integrated into the decommissioning and closure plans for the whole OGS plant at the end of its life cycle.

2.2 No Action Alternative

For NEPA compliance purposes and for the purposes of analyzing a meaningful "no action" scenario, DOE has assumed that Chariton Valley RC&D and Alliant Energy would abandon the plans for Phase 2 and Phase 3 co-fire infrastructure construction and ancillary activities if DOE funding were not forthcoming. Under this scenario, DOE assumes that the existing switchgrass storage and processing facilities would be demolished or converted to other uses. However, DOE recognizes that Chariton Valley RC&D and Alliant Energy, at their discretion, could opt to pursue the project independently or to seek alternate sources of funding if DOE decided not to fund the Proposed Action.

3.0 EXISTING ENVIRONMENT

To assess the potential impacts under the Proposed Action, DOE first determines the condition of the environment as it currently exists. This section characterizes the existing environment; Section 4.0 assesses the potential impacts that could occur under the Proposed Action.

3.1 Air Quality and Meteorology

3.1.1 Air Quality

The National Ambient Air Quality Standards (NAAQS) established by the U.S. Environmental Protection Agency (EPA) and subsequently adopted as the Iowa Ambient Air Quality Standards define the allowable concentration of criteria air pollutants that may be reached but not exceeded in a given time period. These standards were established to protect human health (primary standards) and welfare (secondary standards) with a reasonable margin of safety. The criteria pollutant standards establish maximum concentrations for ozone, carbon monoxide, nitrogen oxides, sulfur dioxide, lead, and particulate matter with a diameter of 10 microns or less (PM_{10}). Ozone is formed by the photo-oxidation of reactive

hydrocarbons in the presence of nitrogen oxide. Emissions of volatile organic compounds (VOCs) that participate in atmospheric photochemical reactions also result in ozone formation.

As of May 2003, all 99 counties in Iowa were in attainment status and in compliance with the NAAQS. The OGS is about 56 kilometers (35 miles) north of the Missouri state line. All of the counties in northern Missouri are also in attainment status and in compliance with the NAAQS (EPA 2003). Because the Proposed Action would not be implemented in criteria air pollutant nonattainment or maintainance areas, a Clean Air Act (CAA) conformity determination is not required.

In areas that are in attainment status, the maintenance of air quality is mandated by the Prevention of Significant Deterioration (PSD) provisions of the CAA (PROACT 2000). In general, these provisions include (1) a permit review process applicable to the construction and operation of new and modified stationary sources in attainment areas, (2) a requirement that a new source obtain a preconstruction permit demonstrating that the source will implement the required technologies to control future emissions of pollutants, and (3) a demonstration that the new source will not exceed the PSD increment (that is, the maximum increase in concentration that is allowed to occur above the baseline concentration for a pollutant).

The OGS operates under continuing provisions of Title V Air Quality Operating Permit Number 98-TV-009-M005 issued by the Iowa DNR (DNR 2002a).1 Phase 1 switchgrass co-fire testing (November 2000 through January 2001) was conducted under an air quality operating permit variance issued by the Iowa DNR to allow for initial use and testing of switchgrass as a biomass co-fire feedstock. The Iowa DNR has stated that it fully supports proceeding with the project through Co-fire Test 2, and that after Co-fire Test 2, both the Iowa DNR and the CVBP will be in a better position to identify the appropriate permitting path going forward (DNR 2002b). However, a modification to the operating permit would be required if Phase 3 (full-scale commercial co-fire operations) were authorized and undertaken.

3.1.2 Meteorology

In general, Iowa has a humid continental climate and experiences extremes in both temperature and precipitation, as well as a potential for violent storms such as tornadoes, blizzards, and thunderstorms. From 1971 to 2000, the average annual high and low temperatures at Ottumwa Industrial Airport were 15.7 degrees Celsius (°C) (60.2 degrees Fahrenheit [°F]) and 5.4 °C (41.8 °F), respectively. During the same period, January low temperatures averaged -10.1 °C (13.8 °F) and July highs averaged 30.1 °C (86.2 °F). Summertime high temperature can reach into high 30 °C readings (more than 100 °F), accompanied by high humidity. In some years, periods of extended hot, humid conditions stress both crops and livestock. Extremely cold winter temperatures also occur periodically.

Precipitation, usually occurring when moist air from the Gulf of Mexico meets colder air from the Pacific or Arctic, averaged 91.2 centimeters (35.9 inches) annually at Ottumwa Airport from 1971 to 2000. May, June, and July are the wettest months, each averaging approximately 11.4 centimeters (4.5 inches) of rain as recorded at Ottumwa Airport from 1971 to 2000. However, the precipitation can be highly variable, with large amounts falling at once or with long periods between precipitation events. The region is susceptible to floods, droughts, blizzards, and tornadoes.

[1] This permit expired on December 31, 2002, but continuing plant operations under this permit are authorized under the umbrella of Alliant Energy's application for renewal of the permit, which is currently being reviewed by the Iowa DNR.

Seventeen tornadoes have been reported in Wapello County, Iowa, between 1950 and 1998 (Tornado Project 1999). This statistic indicates there is a low probability that a tornado would occur near the OGS and a very low probability that the plant would be struck by one.

Chariton Valley RC&D has reported the following climate data for the OGS site (Alliant Energy et al. 2002):

- Average wind velocity: 20.5 kilometers per hour (12.7 miles per hour)
- Maximum recorded temperature: 40 °C (104 °F)
- Minimum recorded temperature: -33 °C (-31 °F)
- Highest monthly average: 24.4 °C (75.9 °F)
- Lowest monthly average: -4.9 °C (23.1 °F)

3.2 Soils and Geology

3.2.1 Soils

The Chariton River watershed covers 3,000 square kilometers (1,160 square miles) of the southern Iowa drift plain, a land region that extends across 60,000 square kilometers (23,000 square miles) of southern Iowa as well as northern Missouri and eastern Nebraska and Kansas (Prior 1991). Its landscape is characterized by rolling uplands and occasional broad alluvial plains. The lengthy and complex glacial and climatic history resulted in areas of prairie, forest, and savanna being present at the time of European-style settlement. Common features of the upland soils in the watershed include their being poorly drained and having vertic characteristics (Molstad 2000). Most alluvial soils in the area are mollisols, although they tend to be somewhat coarser textured and better drained than their contiguous upland counterparts.

Diversified farming has been the norm in the Chariton River watershed since around 1860. Common crops during the late 20th century were corn, soybeans, a variety of cool season forages and pasture species, and woodlots. The main limitations to crop production are steep, erosive landscapes; clayey soils that alternate between being too wet and too dry; and acidic subsoils. These limitations resulted in a large proportion (about 12 percent) of the watershed being enrolled in the Conservation Reserve Program (CRP), and many areas being planted to switchgrass during the 1980s and 1990s to improve productivity and conserve soil (Burras and McLaughlin 2002).

CONSERVATION RESERVE PROGRAM
The USDA Farm Service Agency's (FSA's) Conservation Reserve Program (CRP) is a voluntary program available to agricultural producers to help them safeguard environmentally sensitive land. Producers enrolled in the CRP plant long-term, resource-conserving crops or covers to improve the quality of water, control soil erosion, and enhance wildlife habitat. In return, the FSA provides participants with rental payments and cost-share assistance. Contract duration is between 10 and 15 years. The Food Security Act of 1985, as amended, authorized the CRP. The program is governed by USDA regulations published in Title 7 CFR, Part 1410, and is implemented by the FSA on behalf of USDA's Commodity Credit Corporation.

3.2.2 Geology

A new bedrock geologic mapping of south-central Iowa produced with the assistance of the U.S. Geological Survey (USGS) incorporates all available sources of bedrock information for the region (Pope et al. 2002). South-central Iowa is largely covered by a mantle of Quaternary deposits of various thickness, although extensive areas of shallow bedrock and bedrock exposure are also found due primarily to a relatively mature stream and river drainage system which has

exhumed and exposed the underlying bedrock in some places. In the study area, bedrock exposure is generally limited to a few stream or river valleys in each county. Quaternary deposits in south-central Iowa are dominated by glacial till (diamicton) with lesser volumes of loess across the Southern Iowa Drift Plain, the Iowa landform where the study area is located.

USGS information on historic Iowa earthquakes indicates that the area is relatively stable seismically. Only 12 earthquakes with epicenters in Iowa are known to have occurred in historic times. The first known earthquake occurred in 1867 near Sidney in southwest Iowa; the most recent occurred in 1948 near Oxford in the east-central part of the state. The largest known earthquake (Mercalli scale magnitude VI) occurred near Davenport in southeast Iowa in 1934.

Site-Specific Characteristics. Allender Butzke Engineers, Inc. conducted geotechnical explorations on the proposed new construction site for Alliant Energy. Their 2002 report, which is based in part on four soil borings to depths of 8 meters (25 feet), indicates an expectation that stiff to very stiff fill, capable of providing adequate floor slab and foundation support for the proposed lightly loaded structures, was placed and compacted under the proposed new construction site in a controlled manner during original plant construction (Allender Butzke 2002). However, without additional background information or documentation on the fill, uncertainties regarding the support capabilities of the underlying fill would remain unanswered. To address this uncertainty, the report recommends that extensive geotechnical probing, testing, and observations be conducted during site preparation and foundation excavation to further evaluate the suitability of the fill soil and also recommends specific engineering remedies if unsuitable fill conditions are encountered. Three of the four borings did not result in observed groundwater immediately after drilling. One drilling resulted in observed groundwater at 7 meters (23 feet) below grade. However, loess formation coloring suggests past influctions of groundwater to shallower levels. In the past, the depth to groundwater may have been as shallow as 1 meter (3 feet) due to variations in seasonal rainfall, drainage, topography, irrigation, and groundcover.

3.3 Biological Resources

The term “biological resources” refers to the animal and plant species resident to an area and to their supporting habitat. The term generally does not refer to agricultural species. Special concern is afforded to species whose reproductive populations are dwindling and which are in danger of local and possibly global extinction. Federal and state lists of endangered, threatened, and sensitive species are updated regularly for each county of the United States. Should threatened or endangered species be found to be adversely impacted by a proposed action, mitigation measures must be implemented under consultation with the appropriate agencies.

3.3.1 Common Species

Biological resources near the OGS have been disturbed due to plant construction, which started in 1976, and from plant operations, which have been ongoing since 1981. The location where the proposed new facilities would be constructed on the OGS plant is an old parking lot currently used for storage and is essentially devoid of vegetation resources. However, wildlife is present around the plant. Ducks, Canada geese, deer, turtles, seagulls, foxes, and coyotes visit the plant site. The Rathbun Lake watershed affords substantial wildlife and botanical habitat on and in the lake and on the adjacent land, which includes 85 square kilometers (21,000 acres) of public land. The 45-square-kilometer (11,000-acre) Rathbun Lake supports numerous sport fish, including crappie, channel catfish, walleye, and largemouth bass. The Rathbun Fish Hatchery raises channel catfish, walleye, saugeye (a hybrid walleye/sauger cross) and largemouth bass. Fish produced at the Rathbun Hatchery are stocked statewide.

Ongoing field research supported by CVBP partner organizations is characterizing biological resources associated with Chariton Valley switchgrass test plots. The field work has included nest searches,

breeding bird surveys, placement and monitoring of artificial nests, and vegetation measurements in biomass fields. This research is yielding a current inventory of wildlife, especially birds, in the Rathbun Lake watershed. Forty-seven species of breeding birds were observed; the five most common were common yellowthroat, barn swallow, grasshopper swallow, red-ringed blackbird, and song swallow. Other observed species included ring-necked pheasants, horned lark, sedge wren, vesper sparrow, brown-headed cow-bird, killdeer, dickcissel, meadowlarks, and field sparrows.

3.3.2 Listed Species

The FWS lists five endangered or threatened species (one bird species, three plant species, and one bat species) that have been collected in Wapello County and six nearby counties, portions of which make up the Rathbun Lake watershed (Table 2).

Table 2. Federally Listed Species in Wapello County and Six Iowa Counties Potentially Impacted by the Proposed Action[a]

County	Common Name	Scientific Name	Status[b]
Appanoose	Bald eagle	*Haliaeetus leucocephalus*	T
	Indiana bat	*Myotis sodalis*	E
Clarke	Indiana bat	*Myotis sodalis*	E
	Prairie bush clover	*Lespedeza leptostachya*	T
	Mead's milkweed	*Asclepias meadii*	T
Decatur	Indiana bat	*Myotis sodalis*	E
	Mead's milkweed	*Asclepias meadii*	T
	Eastern prairie fringed orchid	*Platantheia leucophaea*	T
	Bald eagle	*Haliaeetus leucocephalus*	T
Lucas	Indiana bat	*Myotis sodalis*	E
	Bald eagle	*Haliaeetus leucocephalus*	T
	Prairie bush clover	*Lespedeza leptostachya*	T
Monroe	Indiana bat	*Myotis sodalis*	E
Wapello (OGS site)	Indiana bat	*Myotis sodalis*	E
	Bald eagle	*Haliaeetus leucocephalus*	T
Wayne	Indiana bat	*Myotis sodalis*	E

a. Source: FWS 2001.
b. T = threatened, E = endangered

In response to DOE's request for an opinion regarding the presence of critical habitat, the FWS confirmed that the federally threatened bald eagle (*Haliaeetus leucocephalus*) and endangered Indiana bat (*Myotis sodalis*) are known to occur in Wapello County, Iowa, but that habitat for the bald eagle and the Indiana bat does not appear to occur on the project site (FWS 2003). Also, the Iowa DNR searched records of the project area and found no site-specific records of rare species or significant natural communities (DNR 2003).

3.4 Water Resources

The major water aquatic resources potentially impacted by the Proposed Action are the lower Des Moines River, riparian and wetland areas in the Rathbun Lake watershed, and Rathbun Lake.

Lower Des Moines River. The OGS main plant building is approximately 1 kilometer (0.6 mile) from the Des Moines River, the largest river in interior Iowa, and is approximately 16 kilometers (10 miles)

upstream from Ottumwa, the largest population center on the lower Des Moines River and the only population center that uses it as a primary source of drinking water. The river begins to flow (ice-out) in early to mid-April but is nearly dry by late September. From Chillicothe to its confluence with the Mississippi River at Keokuk, the river meanders lazily for about 160 kilometers (100 miles) through land that varies from flat agricultural bottomland to high bluff sandstone outcroppings. The river has few rapids, none of which are more difficult than Class I. It is valued as a recreational resource.

The Des Moines River floods every spring. Figure 9 shows the location of the OGS in relation to the 100-year floodplain of the Des Moines River and Avery Creek (HUD 1977).

The OGS operates under the water discharge pollutant concentration provisions of Iowa National Pollutant Discharge Elimination System (NPDES) permit # 900101 (EPA Number IA0060909), which was issued and is monitored by the Iowa DNR. River water intake limits are established by the provisions of Iowa DNR permit number 4851-R2, which authorizes OGS to withdraw river water in the

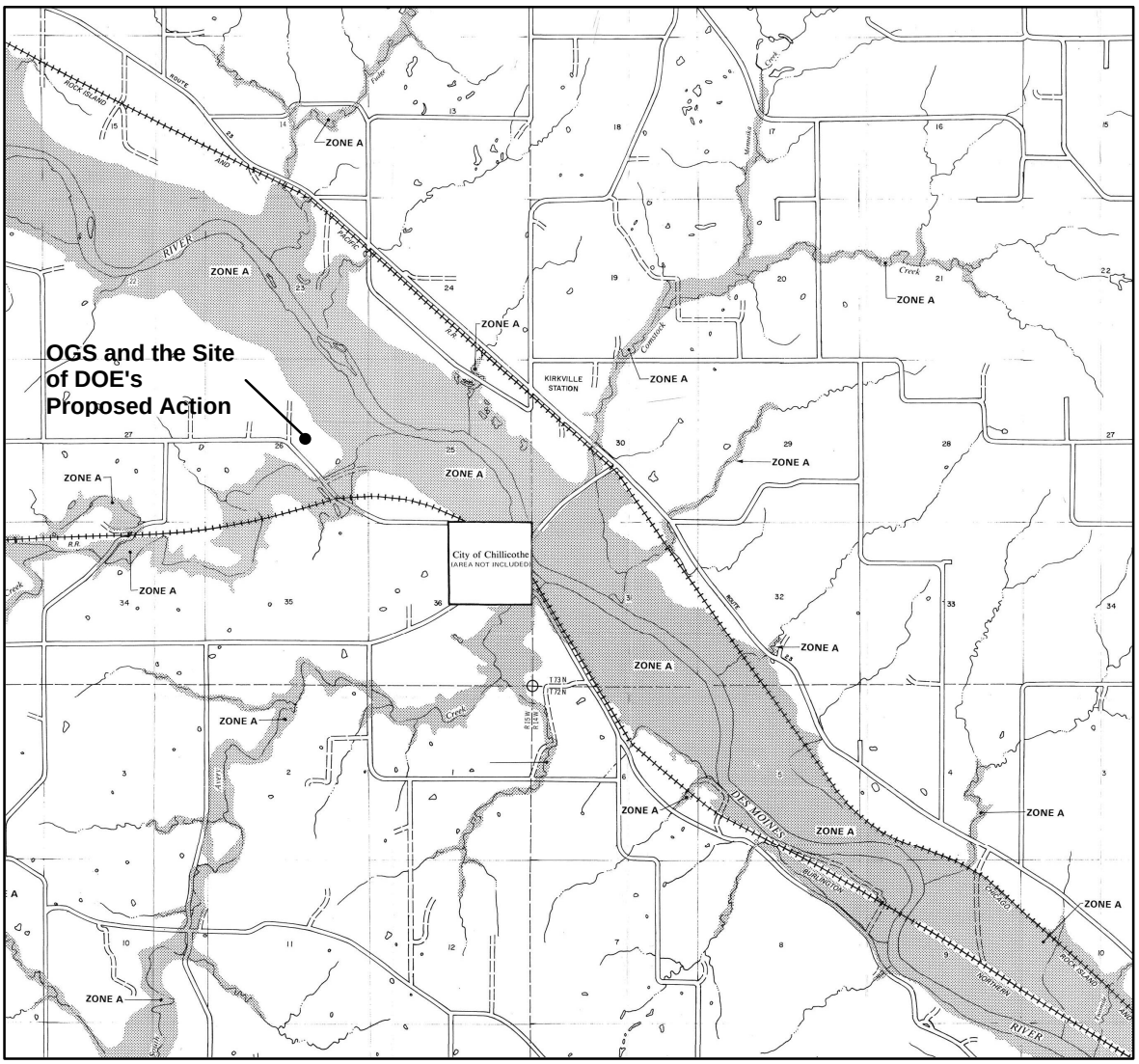


Figure 9. Proposed Location of New Facilities in Relation to 100-Year Floodplain

"maximum quantity of 12,464 acre-feet per year (4 billion gallons/year) at a maximum rate of 20 cubic feet per second." Current usage is approximately 2 billion gallons per year. The plant's two cooling towers and closed-cycle system design result in only a very small volume of water being returned to the river, none of which is heated.

Riparian and Wetland Areas. The Chariton and Des Moines Rivers are among the major streams and watersheds in the Southern Drift Plain landform region. Streams have had time to establish well-connected drainage systems that cut deeply into the land surface. Many finely etched rills give way to ravines, then to creeks that flow part of the year, and eventually to perennial streams and rivers in major valleys, including the Chariton. Glacial deposits in this region typically have a high clay content, which aids in building farm ponds and artificial lakes. Common wetland and riparian communities in the region include wooded ravines, floodplain and stream-side woodlands, and artificial lakes and ponds. National Wetlands Inventory data show that the predominant wetlands and riparian areas in the Southern Iowa Drift Plain region are palustrine forested (39 percent), palustrine emergent (18 percent), lacustrine unconsolidated bottom (15 percent), and palustrine unconsolidated bottom (15 percent). The proposed new facilities would not be constructed on or near wetlands.

Rathbun Lake. Rathbun Lake is a 45-square-kilometer (11,000-acre) reservoir located on the Chariton River within Wayne County in southeast Iowa. It was constructed in the 1970s by the U.S. Army Corps of Engineers (ACE) to provide flood protection. The lake has become a valuable recreation resource and boon to the economy of southeast Iowa. It also provides a reliable source of drinking water to more than 60,000 residents in Iowa and Missouri. Due to its location inside a watershed that largely supports row crop agriculture, the water quality of the lake is threatened by agricultural runoff, and its use as a flood impoundment is hindered by siltation rates that are now three times higher than the ACE originally predicted would occur.

3.5 Solid Waste

Fly ash, bottom ash, and economizer ash are the major solid wastes that result from OGS plant operations. The plant generates approximately 20 tonnes (23 tons) per hour of fly ash, 4.5 tonnes (5 tons) per hour of bottom ash, and lesser amounts of economizer ash. Fly ash is a light-weight, airborne ash that is produced when coal or other combustion feedstocks are burned in the plant boiler. It is actually more of a commodity than a waste and is essential to the economic viability of the plant. An electrostatic precipitator removes more than 99 percent of the fly ash from the flue gas stream. Most of the recovered fly ash is sold as an additive that enhances the plasticity and strength of concrete. The American Society of Testing and Materials (ASTM) has established a standard (ASTM C618-01) that specifies the physical and chemical properties of fly ash for use as a cement additive (ASTM 2001).

Fly ash that is not sold as a concrete additive is processed onsite into C-Stone®, a proprietary material used as construction fill or paving material. Recovered fly ash is stored onsite in silos until it is sold and shipped offsite, or until it is processed into C-Stone®, sold, and shipped offsite.

3.6 Infrastructure

Site Utilities. Power for the proposed new facilities would come from the main 13.8-kilovolt (kV) switch box service located at the southeast side of the main plant. A buried power line currently runs to an abandoned substation and would be reused for the new facility if possible. Another power line connection is available near the southeast side of the existing storage barn.

A possible connection to an existing 10-centimeter (4-inch) sanitary sewer line and a 5-centimeter (2-inch) non-potable water line is available near an abandoned guard house about 120 meters (400 feet) northeast of the proposed process building. No potable (drinking) water is available near the proposed

new facilities. The closest fire hydrant is located about 120 meters (400 feet) from the southeast corner of the proposed storage barn.

No natural gas service is available. Steam heat is available from the existing boiler; the closest connection point is about 210 meters (700 feet) from the proposed process building.

Transportation. The OGS site and the agricultural lands surrounding Rathbun Lake have a well-developed transportation infrastructure. The Burlington and Northern Railroad supplies coal directly to the plant. Ottumwa Municipal Airport is about 16 kilometers (10 miles) from the plant. State and county roads currently support offsite transportation of fly-ash, C-Stone®, and resold coal. A county road, Power Plant Road, passes within a few hundred yards of the site of the proposed new facilities. A 1998 study by the Iowa Department of Transportation (DOT) indicated peak traffic volume along Power Plant Road of 700 vehicles per day (DOT 1998).

Fire Protection. In addition to OGS's internal fire safety systems and programs, firefighting protection at the plant is provided by the full-time, 24-hour Ottumwa Fire Department and the volunteer Wapello County Fire Department. Both of these fire departments are located in Ottumwa about 13 kilometers (8 miles) from the OGS, and both would respond to a fire emergency at the OGS.

3.7 Cultural Resources

Detailed information regarding the history and prehistory of the State of Iowa and Iowa counties is available from several on-line and library sources. The homepage of the Office of the State Archaeologist (http://www.uiowa.edu/~osa/archaeologyle.htm) includes links that describe salient features of the region's history and prehistory (OSA 2002). Specific information about Wapello County is available from the University of Iowa/Wapello County extension services (http://www.extension.iastate.edu/wapello/) (University of Iowa 2003). The most detailed site-specific information regarding cultural resources in the immediate vicinity of the Proposed Action is found in the 1977 Draft Environmental Impact Statement (EIS) for construction of the OGS, Appendix A, Archeological Investigations in the Proposed Area of the Ottumwa Generating Station Chillicothe, Iowa (EPA 1977), which is incorporated into this EA by reference.

In response to DOE's request for an opinion regarding the presence of cultural or historic resources at the site of the Proposed Action, the SHPO advised DOE that a Phase 1 archaeological survey previously conducted on the entire OGS property identified 15 archaeological sites (Appendix B). Of these 15 sites, 10 were not considered eligible for listing on the National Register of Historic Places, four were mitigated at the time of OGS plant construction and are no longer considered eligible for listing, and one was considered still eligible for listing. As recommended by the SHPO, DOE contacted the Office of the State Archaeologist regarding the site that was still eligible for listing. The Office of the State Archaeologist conducted an Iowa site file search (Appendix B), which indicated that the one site still considered eligible by the SHPO for listing was not within or near the location of DOE's Proposed Action.

However, the report from the Office of the State Archaeologist identified two other sites within or near the Proposed Action location that were not cited in SHPO's response to DOE. One of these two sites no longer exists. It was excavated and removed prior to OGS plant construction and is described in the original OGS EIS (EPA 1977). The second site was discovered during a Phase 1 cultural resource investigation for construction of Power Plant Road in 1996. The SHPO does not consider this site as eligible for listing on the National Register of Historic Places (Jones 2003).

3.8 Land Use

Land use in Wapello County, the site of the proposed new facilities, and in the counties surrounding Rathbun Lake is predominantly agricultural. During the 5-year period from 1997 to 2001, the percent of the land in farmland use for the seven counties in the region was as follows: Wapello County, 87 percent; Clarke County, 94 percent; Lucas County, 90 percent; Monroe County, 93 percent; Decatur County, 94 percent; Wayne County, 93 percent; and Appanoose County, 84 percent (Iowa Agricultural Statistics 2002). Land in the area immediately surrounding the OGS site is currently used for agriculture or for plant support activities. The closest resident occupies a farmhouse about 0.4 kilometer (0.25 mile) from the plant gate. The Wapello County Conservation Board's approximately 57,000-square-meter (14-acre) McNeese Wildlife Area, which supports upland hunting, is located less than a mile southwest of the OGS.

3.9 Noise

Noise can be defined as any sound that is undesirable because it interferes with speech, communication, or hearing; is intense enough to damage hearing; or is otherwise loud, discordant, or disagreeable to some receptors. Depending upon the loudness and the duration of a noise, its effects can range from temporary annoyance to permanent hearing impairment or loss. Ambient noise is the collective sound resulting from the omnipresent background noise associated with a given environment. It is usually a composite of many sounds from many sources. An environment's ambient noise serves as a point of departure and comparison for analyzing the impact of a new or additional noise on a sensitive environment.

Noise is generally considered to be low when its ambient levels are below 45 A-weighted decibels (dBA), moderate in the 45- to 60-dBA range, and high above 60 dBA. Typical wilderness area ambient sound is about 35 dBA, typical rural residential levels are about 40 dBA, and typical urban residential sound levels on a busy street are about 68 dBA (outdoor day-night average sound levels) (Suter 1991). Noise levels above 45 dBA at night can result in the onset of sleep interference; above 70 dBA, sleep interference effects become considerable.

Different environments can be characterized by noise levels that are generally considered acceptable or unacceptable. Lower levels are expected in rural or suburban areas than would be expected for commercial, industrial, or construction zones. Many Federal agencies use average day-night sound levels as guidelines for land-use compatibility and to assess the impacts of noise on people. For example, the EPA uses an average day-night sound level of 55 dBA as an outdoor goal for protecting public health and welfare in residential areas (EPA 1974, 1978). Some Iowa counties are considering noise ordinances modeled from Missouri county ordinances. These ordinances would limit noise to a certain decibel level and to a certain time frame. This type of ordinance has the potential to affect farm practices during planting and harvest, at times when farmers are working late into the night. Potential sources of noise include grain dryers, tractors, combines, and other farm implements and structures.

The Proposed Action would occur in two areas with different ambient noise environments. At the OGS plant, the ambient noise environment is dominated by operational noise from OGS plant operations. In agricultural areas of the Rathbun Lake watershed, ambient noise levels are dominated by seasonally variable noises associated with agricultural activities: planting, cultivation, pesticide and fertilizer application, and harvesting. Where and when agricultural operations are not in progress, ambient noise levels would be typical of average outdoor noise levels in rural areas. Background sounds are produced

mostly by natural phenomena (wind, rain, and wildlife) and by light to moderate road traffic. DOE estimates that ambient noise levels associated with these sources in the agricultural areas of the Rathbun Lake watershed would range from 38 to 55 dBA. The ambient noise associated with intermittent traffic can be highly variable in that it is significantly influenced by vehicle and engine type, number of tires, road-surface conditions, and the condition of exhaust systems. Background noise levels associated with these sources would range from 60 to 80 dBA. DOE estimates that in the study area, there are no sustained outdoor ambient noise levels above 85 dBA, the level considered harmful by the U.S. Department of Health and Human Services, National Institute of Occupational Safety and Health.

3.10 Aesthetics

Figure 3 illustrates the OGS main plant from the west as seen from the location of the proposed new facilities. Figure 10 shows the OGS substation, which is immediately south of and adjacent to the OGS main plant, and illustrates the typical surrounding landscape. The landscape surrounding the plant is generally flat and featureless except for trees that have been maintained near the periphery of the plant property or that grow along the Des Moines River or Avery Creek embankments. Except for tree lines and occasional low hills, there is a generally unobstructed view of flat to gently rolling agricultural land from the edge of the plant property to the horizon. From beyond the boundary of the plant property, trees generally serve to screen the OGS plant from ground-level view. As shown in Figure 11, the dominant aspects of the plant that are visible at ground level from beyond the tree lines are the 180-meter (600-foot) high stack, the top of the OGS main plant, which is about 80 meters (250 feet) high, and the steam plume from the cooling towers.

3.11 Socioeconomics

Wapello County, the site of the new construction under the Proposed Action, and the counties where switchgrass would be harvested under the Proposed Action are all non-metropolitan rural counties.

Wapello County comprises seven incorporated communities, including Chillicothe, the smallest, and Ottumwa, the largest, and their surrounding rural areas. From 1990 to 2000, the county's population increased only 1.0 percent compared to a statewide increase of 5.4 percent over the same period. Compared to the state, Wapello County has a lower percentage of young people (19 or younger) and a higher percentage of older people (65+ years). The 2000 census reported that the county had a higher unemployment rate (4.1 percent) than the statewide rate of 2.1 percent. Of the 16,493 persons reporting themselves as employed in Wapello County in 2000, the largest percentage (24.7 percent) said they were employed in production, transportation, and material moving occupations.

3.12 Environmental Justice

Environmental justice is 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 of people, including a racial, ethnic, or socioeconomic group, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of Federal, state, local, and tribal programs and policies.

Figure 10. OGS Substation and Typical Surrounding Landscape

Figure 11. OGS Plant from the East

In February 1994, President Clinton issued Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (59 Fed. Reg. 7629 (1994)). This Order directs Federal agencies to incorporate environmental justice as part of their missions. As such, Federal agencies are specifically directed to identify and address as appropriate disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations.

The CEQ has issued guidance to Federal agencies to assist them with their NEPA procedures so that environmental justice concerns are effectively identified and addressed (CEQ 1997). In this guidance, the Council encouraged Federal agencies to supplement the guidance with their own specific procedures tailored to particular programs or activities of an agency. 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). DOE's draft guidance is based on Executive Order 12898 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 population.

Table 3 illustrates the high degree of racial homogeneity in Iowa and in the counties where the Proposed Action would occur. White residents account for 96.3 to 98.8 percent of the population in seven counties in this area, compared to 93.9 percent statewide, and 75.1 percent nationally. Hispanic/Latino and African-American/Black are the two largest minority groups, but neither of these two groups account for more than 4 percent of the population, and in most Iowa census areas they represent less than 2 percent of the population. Nationally, the Hispanic/Latino and African-American/Black populations represent 12.5 percent and 12.3 percent of the population, respectively. Native Americans represent 0.3 percent of the population in Wapello County and statewide.

Economically, Wapello County and the counties surrounding Rathbun Lake are among the poorest in Iowa. All seven counties have median household incomes below the state average, and all but one have a higher percent of families below the poverty level than does the state overall (Table 3). The Bureau of Economic Analysis reports that in 2000, Wapello County, the site of the proposed new construction, had a per capita personal income (PCPI) of $22,110. This PCPI ranked 80th among the state's 99 counties and was 84 percent of the state average and 75 percent of the national average. In 1990, Wapello County's PCPI ranked 62nd in the state, indicating a significantly declining trend in the county's comparative PCPI. This unfavorable trend is further seen in the county's 3.6 percent average annual growth rate of PCPI over the past 10 years, compared to 4.3 percent statewide and 4.2 percent nationwide.

4.0 ENVIRONMENTAL IMPACTS

Impacts from the Proposed Action are described in Section 4.1; impacts under the No Action Alternative are described in Section 4.2.

The Proposed Action would result in impacts from construction of switchgrass feedstock storage, handling, and conveying systems and from switchgrass co-fire tests that would be conducted at the OGS. The Proposed Action would also result in impacts from agricultural activities in the 16 to 28 square kilometers (4,000 to 7,000 acres) needed to supply switchgrass for Phase 2 testing. These activities

Table 3. General Socioeconomic Profile Data for Iowa Counties and Cities Near the Proposed Action[a]

Jurisdiction	Population	Percent White	Percent Hispanic	Percent African-American	Percent Unemployed	Median Household Income ($)	Percent Families Below Poverty Level
Iowa	2,926,324	93.9	2.8	2.1	2.8	39,469	6.0
Counties in the Potentially Affected Area							
Appanoose	13,721	98.2	1.0	0.4	3.4	28,612	10.1
Clarke	9,133	96.6	4.0	0.1	4.0	34,474	6.2
Decatur	8,689	96.5	1.7	1.0	4.8	27,343	10.9
Lucas	9,422	98.4	0.9	0.1	3.1	30,876	8.4
Monroe	8,016	98.4	0.5	0.2	2.2	34,877	5.6
Wapello	36,051	96.3	2.2	0.9	4.1	32,188	9.4
Wayne	6,730	98.8	0.7	0.1	2.4	29,380	10.8
Cities in the Potentially Affected Area							
Albia	3,706	97.9	0.8	0.3	2.9	31,728	4.3
Chillicothe	90	97.8	0	0	0	30,781	12.0
Centerville	5,924	97.3	1.5	0.8	4.8	25,498	11.3
Moravia	713	99.0	0.1	0	1.0	26,042	7.6
Ottumwa	24,998	95.3	2.8	1.3	4.8	30,174	10.9

a. Source: U.S. Census Bureau, Census 2000.

would be switchgrass growing, harvesting, storage, transporting, and related research that would occur in the Rathbun Lake watershed area. Potential indirect impacts could result over the 200 square kilometers (50,000 acres) needed for switchgrass production if the Proposed Action led ultimately to commercialization of switchgrass as a biomass energy crop. Under a commercialization scenario, switchgrass would be obtained from farms within a 110-kilometer (70-mile) radius of the OGS. This area would include the 30 counties of southeast Iowa and portions of northeast Missouri.

4.1 Impacts from the Proposed Action

4.1.1 Air Quality and Meteorology

Stack Emissions. The results of Phase 1 testing at OGS (as well as results of similar co-fire tests in Denmark and Alabama), and the known chemical composition differences between coal and switchgrass suggest that the Proposed Action would not result in emissions that exceed those currently permitted at OGS. During Phase 1 testing, a problem unrelated to the switchgrass testing caused high carbon monoxide levels in flue gas, but further flue gas sampling showed that carbon monoxide emissions were not significantly affected. Sulfur emissions decreased during Phase 1 testing due to the lower sulfur content of the switchgrass. Nitrogen oxide levels were somewhat higher during Phase 1 testing, but problems in the feed-handling system and boiler load conditions may have contributed to higher nitrogen oxide emissions (NREL 2002). Modifications to the feed-handling system and boiler load that would be implemented for Phase 2 testing would be expected to reduce nitrogen oxide emissions.

Alliant Energy's *Environmental Permitting Plan for the Chariton Valley Biomass Project* (Alliant Energy 2002) acknowledges that the ability of the project to proceed under an Iowa DNR variance depends critically on whether Co-fire Test 2 can be conducted without creating emission increases in excess of the PSD limits. The appendix to the permitting plan includes calculations that suggest that

Co-fire Test 2 could be conducted without exceeding PSD limits. Specifically, the appendix draws the following conclusions regarding expected Co-fire Test 2 emissions compared with current coal-only emissions:

- Lead emission increases would not exceed the PSD threshold, even under commercial operations.
- Carbon monoxide emissions would likely not exceed the PSD threshold.
- It does not appear that nitrogen oxide emissions would exceed the PSD threshold. However, given the limitations of Co-fire Test 1, this cannot be said with 100 percent certainty. A running total of nitrogen oxide emissions should be maintained, and there should be agreement that the Iowa DNR may terminate the test prematurely if the nitrogen oxide PSD threshold is in danger of being exceeded.
- Sulfur oxide emissions would be expected to decrease.
- Even though Co-fire Test 1 showed PM/PM_{10} emission decreases of about 50 percent, this large reduction was unexpected and calls the validity of these data into doubt. Co-fire Test 2 should proceed with caution in regard to PM/PM_{10} emissions.

Dust. During the Proposed Action, switchgrass processing equipment would be located in an enclosed building, as it was during Phase 1 testing. Fugitive dust emissions from milling operations would occur but would be minimized by enclosing the processing equipment in a slight negative pressure envelope downstream from the milling equipment and by using a baghouse system for dust collection and filtering. Collected dust would be sent to the boiler in the same pneumatic lines that would deliver the processed switchgrass to the boiler.

Construction. Potential construction-related air quality impacts associated with the Proposed Action would be consistent with the provisions of Iowa DNR air quality construction permits or variances to existing construction permits. The Iowa DNR would review the construction permit applications for Phase 2 equipment. Some fugitive dust from construction-related activities would occur. Reasonable precautions to prevent fugitive dust from becoming airborne in quantities sufficient to become a nuisance, as defined in Iowa Code Section 657.1, would be implemented.

The need for open burning is not anticipated, but if some limited open burning were found to be unavoidable, it would be conducted in compliance with Iowa Administrative Code rule 23.2[567]. Demolition of existing facilities is not part of the Proposed Action; the only deconstruction would be removal of an existing pole-mounted transformer.

Traffic. The Proposed Action would result in increased truck traffic along county roads leading to OGS, which would result in a comparable increases in vehicle-related dust and exhaust emissions. The increase is expected to be about 6 percent, reflecting a projected 6 percent increase in truck traffic.

Carbon Sequestration. Carbon dioxide, the principal greenhouse gas emitted by fossil fuel combustion and deforestation, is adding about 3.5 billions metric tonnes (gigatonnes) of carbon (GtC) to the atmosphere annually. Scientists of the Intergovernmental Panel on Climate Change have calculated that over the course of the next 50 to 100 years, between 40 and 80 GtC might be absorbed in agricultural soils by applying well-established land management practices. For example, when crop lands are planted to perennial grasses under the CRP or formerly cultivated land is planted to switchgrass, a biomass crop, between 0.5 and 1.5 tonnes per hectare (1 hectare = 2.47 acres) of carbon are added to the soil annually (CAST 1998).

Because the CRP land that would provide the switchgrass feedstock for the Proposed Action is currently already planted in switchgrass, the Proposed Action would not have a significant impact on greenhouse gas due to changes in carbon sequestration rates in soil. However, under a full commercialization scenario where large areas of pasture, marginal, or poorer row crop acreage would be converted to commercial switchgrass, such a potential exists.

The Center for Global and Regional Environmental Research conducted a study of the greenhouse gas emission impacts of switchgrass production and combustion as a substitute for coal. The proposed displacement of up to 5 percent of the coal-fired generation at the OGS appears to provide a positive impact on greenhouse gas emissions. The analysis indicated that co-firing 5 percent switchgrass with coal may reduce emissions of greenhouse gases (carbon dioxide equivalent emissions [CO_2-eq]) by as much as 462,000 tonnes (509,000 tons) per year (Ney and Schnoor 2002). However, while recognizing the potential for increased carbon sequestration, other investigators are reluctant to make quantitative estimates due to variations in current soil carbon levels in the Chariton Valley and uncertainties regarding the status and total acreage of land that would be converted to switchgrass (CAST 1998).

4.1.2 Soils and Geology

OGS Site. The Proposed Action would result in new construction on approximately 3,340 square meters (36,000 square feet) of previously disturbed land on the OGS plant property. The proposed construction site is currently used primarily for storage and parking and is underlain by fill emplaced during construction of the OGS. The Proposed Action would not disturb any previously undisturbed soils or geological resources. Required construction cut depths would not intrude on groundwater levels observed during recent soil borings.

Rathbun Lake Watershed. The switchgrass needed for the Proposed Action would be drawn from existing stored supplies or would be harvested from the existing 16 square kilometers (4,000 acres) of CRP reserve lands that the USDA has previously authorized for the project and planted in switchgrass. If necessary, an additional 12 square kilometers (3,000 acres) of switchgrass could be harvested. No soils currently in production for other crops would be converted to switchgrass production for the Proposed Action. Because the Proposed Action would not require cropland conversion, it would not impact current soil quality.

Under a commercialization scenario (Phase 3), up to 200 square kilometers (50,000 acres) of cropland could be dedicated to switchgrass production, much of which would be converted from CRP lands that are typically marginal lands and may currently support native switchgrass pasture or row crops. Conversion of pasture to switchgrass production would increase soil erosion and could require additional soil conservation measures on highly erosive soils. In contrast, conversion of row crop land to switchgrass production would reduce soil erosion.

4.1.3 Biological Resources

4.1.3.1 OGS Site

At the OGS plant site, the Proposed Action would result in short-term construction-related disturbances to the wildlife that visits the plant site. These disturbances would include increased noise, outdoor human presence, and vehicles. The new facilities would occupy land currently used largely for pole and equipment storage, land that is not an attractive source of wildlife food or habitat. During and immediately after construction, the new facilities and the increased level of human activity would discourage wildlife from occupying the site area immediately west of the main plant. Because the wildlife that visits the site is attracted to it and is acclimated to plant operations and noises, it would probably initially move to land further removed from the new facilities until it became acclimated, and then return.

4.1.3.2 Rathbun Lake Watershed

Research to characterize the potential impact of switchgrass as a biomass energy crop on biological resources in the Chariton Valley has only recently been systematically undertaken and is still ongoing. Results published to date suggest that harvesting standing switchgrass acreage for the Proposed Action would change the habitat structure and wildlife recruitment and retention potential of the harvested acres and that under a commercialization scenario, conversion of pasture or row crop acreage to commercial switchgrass production would change the habitat structure and wildlife recruitment and retention potential of the converted acres. The research, most of which addresses avian resources, allows for a qualitative assessment of probable impacts. A recent Iowa State University thesis addresses three critical aspects of avian impacts: (1) bird abundance and nesting success in CRP fields harvested for biomass in southern Iowa, (2) potential effects of converting marginal cropland to switchgrass production, and (3) winter bird use of CRP fields harvested for biomass (Murray 2002). The following discussion summarizes the reported results relative to the Proposed Action and a full commercialization scenario.

Harvesting Switchgrass Under the Proposed Action. Switchgrass fields probably support stable populations of grassland birds, and the harvest of switchgrass, which typically occurs in the fall and winter, would not have direct effects on the reproductive success of grassland birds. Other grasslands (e.g., hayfields) in the region are often disturbed during the breeding season and thus experience low nest success in these habitats. However, the switchgrass harvest would alter vegetation structure in the fields and thus would affect relative bird abundances. Strip-harvest fields would provide habitat for more species of concern than would total-harvest fields, but grasshopper sparrows are more abundant in the latter. In the winter, sparrow species would be more abundant in strip-harvest fields than total-harvest fields, and pheasants would use the uncut strips of strip-harvest fields for protective cover.

Conversion of Other Acreage to Switchgrass Production Under a Commercialization Scenario. Replacing row crop fields with switchgrass fields would benefit some bird species of management concern in the region. Converting row crop fields to switchgrass fields would create more habitat for grassland birds in the region. A Geographic Information System (GIS) model showed that species that are management priorities would increase if row crop fields in areas of marginal soil were replaced by biomass fields in the Rathbun Lake watershed. However, the abundances of species that are common in row crop fields (e.g., horned lark, killdeer) could decrease by more than 25 percent in the watershed.

4.1.4 Water Resources

OGS Site. Switchgrass operations would not require any modifications to OGS's extracted cooling water or discharge water because both are independent of the fuel source combusted in the boiler. Intake and discharge water needs depend only on steam flow rates and boiler operating properties, neither of which is expected to change due to switchgrass co-firing either during the Proposed Action or during possible future Phase 3 operations. Effective March 10, 2003, any construction activity in Iowa that bares the soil of an area equal to or greater than 4,047 square meters (1 acre), including clearing, grading, or excavation, may require a stormwater discharge permit from the Iowa DNR. The projected combined footprints of the proposed new facilities and parking area exceed 4,047 square meters (1 acre); consequently, a new or revised stormwater discharge permit may be required.

Agricultural Runoff. Because the CRP land that would provide the switchgrass for the Proposed Action is currently already planted in switchgrass, the Proposed Action would not require changes to current fertilizer or pesticide application rates and would therefore not have significant impacts on water quality due to changes in runoff. However, under a full commercialization scenario where a significant number of acres could be converted to commercial switchgrass production, a potential for beneficial changes in water quality exists. Switchgrass requires lesser amounts of applied fertilizer and pesticides than do row crops such as corn or soybeans. Ongoing research indicates that conversion of row crop acreage to

switchgrass would reduce the levels of fertilizer, pesticide, and sediment that reach Rathbun Lake and surrounding wetlands due to runoff (Kost et al. 2002).

Floodplains and Wetlands. Under the Proposed Action, new facilities would be built at the OGS site on a low hill that is approximately 370 meters (1,200 feet) from Avery Creek and 1 kilometer (0.6 mile) from the Des Moines River. This proposed location is close to, but outside of, the 100-year floodplain (see Figure 9). The hill is above the OGS main plant and the coal storage yard, neither of which have been threatened by floodwaters since operations began, including the Great Flood of 1993 (a record flood for the Des Moines River). Even if flooding were to occur at the proposed new facilities, DOE does not believe that this would pose an unacceptable risk. The proposed new facilities would house little or no highly toxic, volatile, or water-reactive materials. Finally, if major flooding were to occur, the main OGS plant, being on lower ground, would be flooded before the proposed new facilities, and any incremental disruptions due to flooding of the new facilities would be minor in comparison. There are no wetlands at the site of the proposed new facilities.

4.1.5 Solid Waste

The Proposed Action would result in a very small increase in the total amount of ash generated at OGS. Co-firing the maximum amount of switchgrass per year under commercial operations (approximately 180,000 tonnes [200,000 tons]) would result in an increased annual ash generation of about 154 tonnes (170 tons), an increase of about 0.1 percent relative to the current (coal-only) annual ash generation. Because the chemical composition of coal differs from that of switchgrass, there would also be differences, albeit minor ones, in the chemical composition of the generated ash. These minor chemical differences would not pose any human or environmental safety or health concerns. They may, however, impact whether co-fire fly ash can meet ASTM C618-01 (ASTM 2001) and be certified for use as a cement additive. Approximately 90 percent of the OGS fly ash finds its way to the Iowa DOT market for use in cement mixtures used for roads. Fly ash that does not meet ASTM standards cannot be used as a cement additive unless and until the Iowa DOT certifies its suitability or until the standard is revised. Although this is not an environmental assessment issue, per se, it is significant to the economic viability of the use of switchgrass as a biomass crop. Alliant Energy is working closely with the Iowa DOT to resolve specific concerns related to the use of co-fire fly ash and is currently confident that the marketability of its fly ash would not be compromised by adding switchgrass to the combustion process.

Baling twine is the only new solid waste that would be generated at the OGS due to the Proposed Action. After its removal, the twine would be collected and either recycled or disposed of as municipal waste.

4.1.6 Infrastructure

4.1.6.1 OGS Site

With the exception of fire safety systems, the Proposed Action would not require major upgrades to the utility infrastructure currently in place at OGS. Relatively short extensions of existing water, sewer, electric, and steam lines would support the utility service needs of the proposed new facilities.

The Proposed Action would pose a new and increased fire hazard at the plant due to increased truck traffic; increased storage of large amounts switchgrass, which is combustible; increased generation of potentially flammable dust; and the mechanical operations that would be involved in unloading, storing, processing, and co-firing the switchgrass. The increased fire hazard impact would be mitigated by mandatory fire safety design features that would be coordinated with and approved by the fire marshal. These features would include sprinkler systems in the proposed new buildings, dry valve systems, six hose reels and standpipes in the new storage barn, a deluge system in the new process building, spark detection and mist generators in the dust collection systems, and new outside fire hydrants.

With regard to traffic on the plant property under full-scale operations, a recent study concluded that (1) the historic traffic peak at OGS in late summer 1999 is higher than would be expected if switchgrass were supplied to OGS at a rate of 180,000 tonnes (200,000 tons) per year, and (2) traffic expected for the switchgrass project, even at the maximum supply volume, "should be manageable without disrupting other traffic at OGS under most circumstances" (Antares Group 2002a). However, the projected increase of approximately 40 vehicles per day would represent an increase of approximately 50 percent over the historic daily average (approximately 80 vehicles per day) from offsite shipments of C-Stone®, coal, and ash. Moreover, short-term traffic volumes at OGS could exceed the 1999 historic peak if the plant were to experience another transient spike in demand for fly ash or C-Stone®. A changeover from truck to rail for some coal resale shipments could offset the increase in local truck traffic should commercialization be realized.

4.1.6.2 State and County Roads

The Proposed Action would result in increased truck traffic on state and county roads, especially on Power Plant Road, the Wapello County road leading directly to OGS. The Antares Group study estimates that delivery of switchgrass in amounts necessary to support full-scale operations (180,000 tonnes [200,000 tons] per year) would require approximately 40 fully loaded flatbed trucks a day for a 5-day-a-week schedule (Antares Group 2002a). This would represent an increase of approximately 6 percent over the 700 vehicles per day that used Power Plant Road during the Iowa DOT's 1998 survey (DOT 1998).

Switchgrass transported for the Proposed Action would come to OGS primarily from the west from sources near Rathbun Lake, especially from Monroe, Wapello, Lucas, and Wayne counties. Trucks would use the primary route shown in Figure 12. For full commercial operations, the switchgrass would potentially come from locations within a 110-kilometer (70-mile) or less radius around OGS, and could also use the secondary route approaching OGS from the east.

Traffic starting from the Rathbun Lake vicinity would feed into U.S. Highway 34 and follow it east across Monroe County to the Wapello County line, where the traffic would proceed on Wapello Road northbound (County Road T59/T61) to Power Plant Road east and follow Power Plant Road to the OGS. Under a commercial scenario, switchgrass could also be delivered to OGS from counties located wholly or partially east of the Des Moines River, including Wapello, Mahaska, Keokuk, Jefferson, and Van Buren counties. Traffic coming from these counties would likely approach Chillicothe on State Highway 23, cross the Des Moines River on the single bridge serving Chillicothe, and proceed to the OGS via Power Plant Road.

The exact amount of traffic coming from either direction is uncertain; however, a total of 40 flatbed trucks would deliver switchgrass to OGS daily (Monday through Friday) under the maximum planned volume for commercial operations (180,000 tonnes [200,000 tons] per year). Switchgrass delivery trucks, which would carry a slightly lighter load than the coal trucks that take coal from OGS (19 tonnes [21 tons] versus 20 tonnes [22 tons]), would take similar or identical routes to OGS as do the approximately 60 coal trucks that currently come to the plant each day. This additional switchgrass traffic volume would not present problems or require upgrades to county or state roads (Chariton Valley RC&D 2003b; Redeker 2003).

Because state and county officials do not anticipate any problems on the roads that would experience the greatest traffic volume increases (the roads nearest to OGS), increased traffic volume issues would be even less significant at locations remote from OGS (for example, traffic to and from temporary switchgrass storage barns that would be widely distributed throughout the supply region).

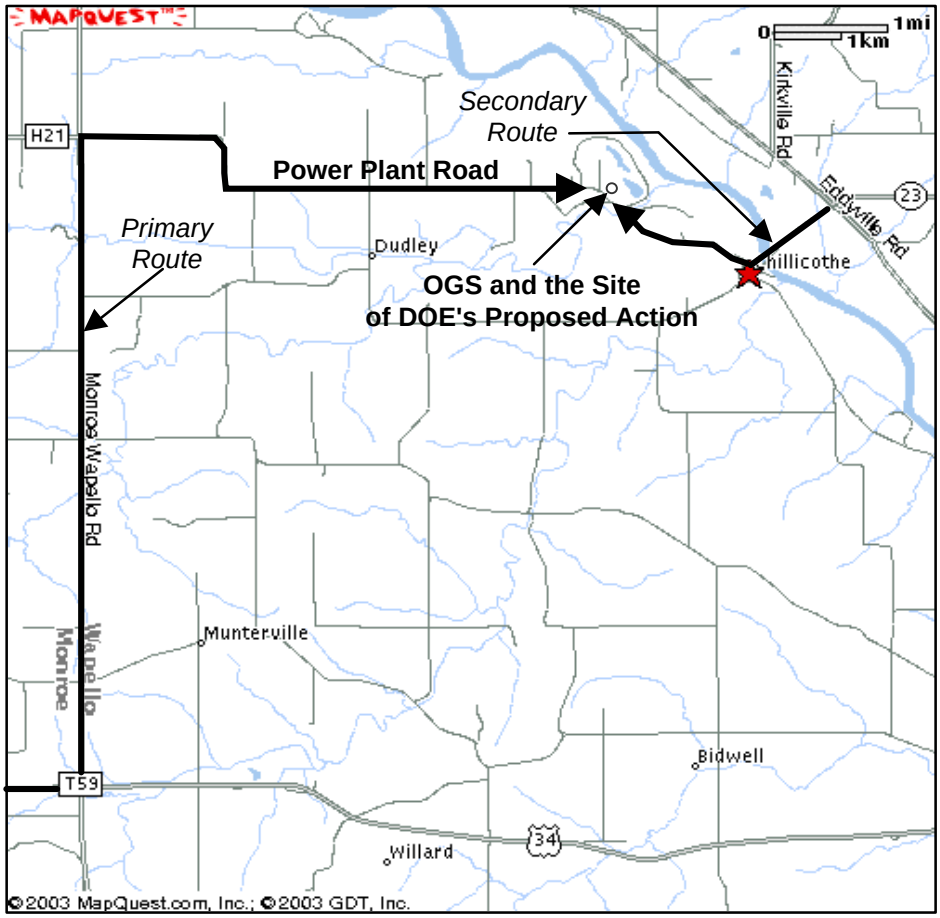


Figure 12. Major Truck Routes

4.1.7 Cultural Resources

4.1.7.1 OGS Site

The proposed new construction at the OGS site would not impact any cultural or historic resources. The proposed new facilities would be constructed entirely on previously disturbed OGS land. The SHPO has indicated that an eligible archeological site, 13WP28, still remains on the facility property. However, this site was avoided by the construction of the original facility and the SHPO agreed with the proposed construction activities at that time (EPA 1977). Site 13WP28 is not located within the area of potential effects for the Proposed Action. No sites on or near the location of the Proposed Action, including the one site that was discovered after the SHPO cleared the site for construction, are considered by the SHPO as eligible for listing in the National Register of Historic Places.

4.1.7.2 Rathbun Lake Watershed

The SHPO has stated that at this time, it would be difficult to assess whether the proposed activities associated with growing and harvesting switchgrass in the Rathbun Lake watershed would affect any significant historical properties. However, the SHPO's opinion also indicated that, based on the personal experience of the cognizant archaeologist, establishing switchgrass tracts actually helps stabilize and preserve archaeological sites and that switchgrass can be harvested under conditions that either would not affect or would not adversely affect significant archaeological sites at all (see Appendix B, SHPO letter dated March 25, 2003).

4.1.8 Land Use

4.1.8.1 OGS Site

Under the Proposed Action, onsite land that is currently used primarily for storage would be used for new facility construction. DOE does not consider this change to represent a significant impact on land use or land use planning. The proposed new construction would occur on the OGS plant site, where the land is already dedicated to plant operations.

4.1.8.2 Rathbun Lake Watershed

Cropland that would generate the switchgrass feedstock for the Proposed Action is currently planted in switchgrass. The Proposed Action would not result in any changes to current land use in the Rathbun Lake watershed.

Under a commercialization scenario (Phase 3), switchgrass would be obtained from farms located within a 110-kilometer (70-mile) radius from OGS, a expanse of land that contains potential switchgrass-producing areas totaling about 1,700 square kilometers (420,000 acres). To meet and sustain the maximum co-firing rate, at least 12 percent of the potentially available land, or about 200 square kilometers (50,000 acres), would have to produce 3.6 tonnes (4 tons) of switchgrass per acre. Some of the required 50,000 acres would be converted from CRP lands, which are typically marginal lands and may currently support native switchgrass, pasture, or row crops. Although the designation of the land as CRP land could change, this change would not impact the basic agricultural use of the land.

4.1.9 Noise

4.1.9.1 OGS Site

The Proposed Action would result in a new source of occupational noise above the Occupational Safety and Health Administration's (OSHA's) 8-hour noise threshold limit in the milling rooms of the proposed new process building. Personnel entering the milling rooms would be required to wear hearing protection, similar to Alliant's policy requiring the use of hearing protection when entering the main boiler buildings. Current design plans include noise insulation on all milling room walls and ceilings. The intention is to reduce noise levels outside the milling rooms to levels that would not require hearing protection. Operational noise levels would be tested after installation to determine the need for future modifications or for expanded requirements for mandatory use of hearing protection in the process building. The sound levels from the process building would be minor to workers in adjacent buildings and indistinguishable from current ambient plant noise at the OGS plant site boundaries.

A June 2002 report (Antares Group 2002b) indicates that noise levels in the storage barn from switchgrass deliveries and from bale transfer operations would be well below the OSHA 8-hour threshold level and that hearing protection would not be required.

4.1.9.2 Rathbun Lake Watershed

Agricultural operational noise from the Proposed Action would be similar to or indistinguishable from current ambient noise from agricultural activity in this region.

4.1.10 Aesthetics

4.1.10.1 OGS Site

The Proposed Action would not significantly impact the current aesthetics or viewscapes at or near the OGS plant. Although the proposed new buildings would be built on slightly higher ground than the OGS plant, they would be small and low (approximately 11 meters [36 feet] maximum height) compared to the

80-meter (250-foot) high OGS main plant building. The proposed new structures would not be visible from the Des Moines River, because the view would be screened by trees and by the relative position of the OGS main plant. The elevated gallery connecting the two proposed buildings would mitigate the collective visual impact of the new construction. The new buildings would be visible from a short stretch (approximately 400 meters [a quarter of a mile]) of Power Plant Road. Except for this stretch, the two cooling towers, the existing storage barn, and the proposed northeast–southwest longitudinal axis of the proposed new building would largely screen or minimize the view of the proposed buildings from Power Plant Road.

4.1.10.2 Rathbun Lake Watershed

The Proposed Action would not significantly impact the current aesthetics or viewscapes on the agricultural land that would produce switchgrass for co-fire testing, because new construction would not be required. Under a possible future commercialization scenario, the visual impacts would be limited to construction of offsite storage barns that would be used to store switchgrass prior to shipment to the OGS if onsite storage were temporarily unavailable.

4.1.11 Socioeconomics

4.1.11.1 OGS Site

Because switchgrass co-fire operations would be largely automated, fewer than eight additional workers would be required at the OGS for the Proposed Action or for full commercial operations. Full construction of the proposed new facilities—including site preparation, building construction, and equipment installation—would begin about October 2003 and take about 13 months. The size of the construction workforce that would commute to the site would vary with the stage of construction. Estimates of the construction workforce size are not available, but based on experience with the construction of the Phase 1 buildings, the workforce would probably not exceed 20 workers.

4.1.11.2 Rathbun Lake Watershed

Under the Proposed Action, and in particular under a full-scale commercial scenario, there would be both seasonal and year-round labor requirements to produce and deliver 180,000 tonnes (200,000 tons) of switchgrass to the OGS. Antares Group Inc. analyzed the labor requirements for full-scale operations and estimated that approximately 500 to 640 workers would be needed, depending on the degree to which farmers contracted out their work (Antares Group 2002a). Most of this projected demand would be for production activities; less than 15 percent would be for post-harvest transportation activities.

4.1.12 Environmental Justice

DOE applied the environmental justice guidance described in Section 3.12 to determine whether implementing the Proposed Action could result in disproportionately high and adverse human health or environmental impacts on minority or low-income populations. For purposes of assessing environmental justice impacts, “minority population” is defined as a demographic composition of the populace where either the minority population of the affected area exceeds 50 percent or the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population. As shown in Table 3, minority populations do not exceed 50 percent of the population in any county or city in the vicinity of the Proposed Action, nor is the minority population meaningfully greater in the vicinity of the Proposed Action than in the general population. Any adverse health or environmental impacts associated with the Proposed Action would not have a disproportionably high impact on a minority population.

The Proposed Action would occur just outside Chillicothe which, based on census 2000 data, had a meaningfully higher percent of families below the poverty level (12 percent) than the statewide average

(6 percent) and the national average (9.2 percent). However, the total population of Chillicothe is very small, only 90. The percent of families below the poverty level in Chillicothe is comparable to that in several neighboring cities, including Ottumwa (10.9 percent) and Centerville (11.3 percent). The percent of families below the poverty level in Chillicothe is also quite comparable to that in Wapello County as a whole (9.4 percent).

Although the Proposed Action would occur in one of Iowa's poorer economic regions, nothing about the Proposed Action nor any demographic clusters would cause low-income residents to suffer impacts to a greater extent than would other residents. DOE believes that any impacts potentially resulting from the Proposed Action would not disproportionately impact minority or low-income populations. In any case, the analyses in Sections 4.1.1 through 4.1.10 conclude that the Proposed Action would not result in adverse human health or environmental impacts.

4.2 Impacts from the No Action Alternative

Under the No Action Alternative, DOE would not partially fund the Phase 2 testing facilities and activities described under the Proposed Action. Alternate funding sources for these activities would, in all likelihood, not be immediately available, and Phase 2 and Phase 3 testing of switchgrass as a biomass energy source at OGS would either be terminated or postponed indefinitely. The existing switchgrass processing and storage facilities would either be decommissioned and disassembled or converted to other uses. The potential long-term environmental benefits from the Proposed Action (less agricultural runoff, increased carbon dioxide sequestration, reduced sulfur oxide emissions) would not be realized. The goal of the CVBP to eventually use switchgrass as a fuel to replace a portion of the coal burned at OGS would be delayed or derailed.

5.0 CUMULATIVE IMPACTS

CEQ regulations implementing the procedural provisions of NEPA require Federal agencies to consider the cumulative impacts of a proposal (40 CFR 1508.25(c)). A cumulative impact on the environment is the impact that results from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (Federal or non-Federal) or person undertakes such other actions (40 CFR 1508.7). This type of assessment is important because significant cumulative impacts can result from several smaller actions that by themselves do not have significant impacts.

5.1 OGS Plant

The OGS is located in an agricultural area with no major existing or reasonably foreseeable industrial or commercial centers near it. Alliant Energy currently has no plans for expanding the plant or for other reasonably foreseeable future actions at the plant other than the possible future expansion of the co-fire testing infrastructure that would be installed under the Proposed Action (schematically illustrated in Figure 7). DOE considers the future expansion illustrated in Figure 7 to be a reasonably foreseeable future action that could result from the Proposed Action, although DOE has no plans to support a possible future expansion. DOE believes that the impacts at the OGS from a possible future expansion to commercial-scale operations would not result in significant cumulative environmental impacts at the OGS. Any cumulative impacts at or near the OGS due to a possible future expansion would be qualitatively identical and quantitatively similar to those described for the Proposed Action in Section 4.0. From an energy security perspective, decreased use of finite coal resources at OGS and potentially at other plants would represent a cumulative impact associated with a future commercial scenario.

5.2 Rathbun Lake Watershed

If Phase 2 were to be successful, it could lead to commercial switchgrass operations, which could require the dedication of up to 200 square kilometers (50,000 acres) of CRP acreage to switchgrass production. DOE considers this to be a reasonably foreseeable potential future action that could result from the Proposed Action, although DOE has no plans to support possible future commercial agricultural operations. In contrast to the cumulative impacts at the OGS plant, DOE believes that the cumulative impacts that could occur in the Rathbun Lake Watershed area under a commercial scenario would be both quantitatively and qualitatively different from those associated with the agricultural activities under the Proposed Action. On the basis of the impacts described in Section 4.0, most if not all of the cumulative impacts that would result in the Rathbun Lake Watershed under a commercial scenario would be beneficial. It is not possible to quantify the cumulative impacts at this time, but qualitatively they would include, but would not necessarily be limited to, (1) decreased chemical runoff and soil erosion into Rathbun Lake, with a concomitant improvement in regional water quality, (2) enhanced habitat for bird species of management concern, (3) an economic and employment stimulus for the region, (4) increased soil sequestration of harmful greenhouse gases, and (5) possibly the stabilization and preservation of archaeological and historic sites.

The SHPO's comments and recommendations (see Appendix B) implicitly recognize the potential for cumulative impacts from commercial switchgrass agricultural operations when the Office recommends a programmatic agreement between SHPO and other agencies that would be involved with future switchgrass undertakings. DOE concurs in principle with the potential value of such an agreement but feels that it would be most appropriate for USDA and SHPO to be the signatories, because DOE has no plans to be involved in future commercial agricultural operations, whereas the CRP would be involved with such operations.

6.0 SHORT-TERM USES AND COMMITMENT OF RESOURCES

As identified in Section 1.1, NEPA requires Federal agencies to (1) describe the relationship between local short-term uses of the environment and the maintenance and enhancement of long-term productivity, and (2) characterize any irreversible and irretrievable commitments of resources that would be involved should a proposed action be implemented.

The Proposed Action that is the subject of this EA would commit less than 6,200 square meters (1.5 acres) of previously disturbed OGS site property to the potential annual production of 35 MW of electrical energy while concurrently replacing 5 percent of the coal burned at OGS with switchgrass, a renewable bioenergy crop. This commitment could serve to demonstrate the economic viability and pollution reduction benefits of the use of a biomass feedstock to co-fire coal-burning plants. Quantitatively, these benefits would not be significant on a national or global scale, but, if found to be viable and sustainable, they could encourage more widespread use of biomass energy crops.

The Proposed Action would result in the commitment of approximately 180,000 tonnes (200,000 tons) of switchgrass and small quantities of steel, lumber, concrete, and other construction materials and machines. Use of the switchgrass is a commitment of resources in that the crop, or a stored supply, would be harvested and burned. However, in contrast to coal, the switchgrass is a renewable resource. Therefore, the commitment of this resource is not irreversible.

Upon decommissioning of the proposed new facilities, it would be possible to recycle or reuse some of the committed construction materials. Any remaining materials that could not be recycled or reused would be disposed of in a landfill, making their use an irreversible commitment. The fuel, oil, and maintenance costs committed to growing, harvesting, storing, transporting, processing, and co-firing the

switchgrass would be irreversibly committed. The conversion of some land from row crops or pasture to switchgrass production under a commercial scenario would be a reversible commitment of these resources.

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APPENDIX A

SCOPING LETTERS

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February 14, 2003

Mr. Richard C. Nelson
U.S. Fish and Wildlife Service
Rock Island Field Office
4469 48th Avenue Court
Rock Island, IL 61201

SUBJECT: NOTICE OF SCOPING – SWITCHGRASS CO-FIRE TESTING AT OTTUMWA GENERATING STATION, CHILLICOTHE, IOWA

Dear Mr. Nelson:

The U. S. Department of Energy (DOE) is proposing to provide partial funding to Chariton Valley Resource Conservation and Development, Inc. (CVRCD), a non-profit organization sponsored by the U. S. Department of Agriculture (USDA), for (1) the construction of a biomass (switchgrass) storage, handling, and conveying system into the boiler at the Ottumwa Generating Station (OGS) at Chillicothe, Iowa, (2) operational testing of switchgrass as a biomass co-fire feedstock at OGS, and (3) corollary activities related to growing, harvesting, and transporting switchgrass grown in Chariton River Valley counties in southern Iowa to the OGS. One of DOE's missions is to advance the development and commercialization of renewable energy technologies such as biomass energy. The proposed action is intended to help demonstrate a renewable source of electricity that is commercially feasible in the United States, that reduces fossil fuel (coal) dependence, and that could potentially reduce emissions of criteria air pollutants, in particular sulfur and nitrogen oxides, and which could reduce greenhouse gases. Previous tests and initial demonstrations at OGS and elsewhere have shown switchgrass to be promising as a co-firing feedstock in coal-burning plants, such as OGS.

The OGS is a 725-megawatt (MW) maximum output, low-sulfur pulverized coal-burning plant owned jointly by several Iowa utilities and operated by Alliant Energy. The plant is located about a mile (1.6 kilometers) northwest of the City of Chillicothe on the Des Moines River, approximately ten miles (16 kilometers) northwest of Ottumwa, Iowa and 80 (129 kilometers) miles southeast of Des Moines, Iowa (map enclosed). A three-phase switchgrass co-fire test campaign has been planned and implemented at OGS. From November 2000 through January 2001, Alliant Energy conducted Phase 1 (Co-fire Test 1) at OGS. Phase 2 testing would comprise two additional co-fire tests.

Co-fire Test 2, which would use some residual equipment and test some new equipment, is currently planned for September/October 2003. It would test and demonstrate the

engineering and environmental feasibility of co-firing up to 12.5 tons of switchgrass per hour and would burn a maximum of 6,000 tons of switchgrass. Co-fire Test 3, which is tentatively scheduled for winter 2004/2005, would test the long-term (approximately 2000 hours) sustainability of processing 12.5 tons/hour. Co-fire Test 3 would be conducted using a proposed new process and new storage building constructed onsite at the current pole storage yard. Phase 3 (commercial operation testing) may be pursued if the results of the next two tests continue to point to technical and environmental feasibility. Continuous, full-scale commercial operations could process up to 25 tons of switchgrass per hour, generate 35 MW per year of OGS's annual output, and replace 5 percent of the coal used at OGS in one year.

DOE's Proposed Action would only support the second and third co-fire tests. DOE has no current plans to provide financial support for commercial operations. The new construction that DOE proposes to fund would include a new switchgrass processing facility and a new switchgrass storage barn that would be used for Phase 2 testing.

DOE has determined that this Proposed Action requires an Environmental Assessment (EA) under the provisions of the National Environmental Policy Act (NEPA) and we have tasked our contractor, Battelle Memorial Institute, with preparing it. Formal scoping meetings on this Proposed Action are not planned. However, we believe it is appropriate to have informal consultations with potentially interested agencies and organizations to afford them an opportunity to comment on our Proposed Action and to identify specific issues or concerns that they believe we should address in the EA.

The proposed new facilities would be built on OGS plant property approximately 1,100 feet (335 meters) west of the main plant. Only very limited demolition would be required to remove an old pole-mounted transformer. The proposed new construction area would occupy an old parking lot currently used for storing power line poles. A small office building located on the proposed site would remain. The new facilities would be separated from OGS's coal-firing operations, and Alliant Energy has indicated that the Proposed Action would not interfere with OGS plant operations or with vehicle traffic at the plant. The proposed new storage barn and process building would have footprints of approximately 27,035 square feet (2,511 square meters) and 6,862 square feet (638 square meters), respectively. The two buildings would be connected by an approximately 2,035 square foot (198 square meter) elevated transfer gallery. Thus, the total footprint of the new construction would be approximately 35,932 square feet (3,338 square meters). The ground elevation differences would require up to five feet (1.5 meters) of cut and/or fill grade-work. If necessary for dust control, new on-site concrete roads leading into the new facilities will be evaluated. New delivery truck parking areas would be built of compacted C-stone®, a proprietary material produced on-site as a byproduct of the fly ash that remains after coal is burned. Full-scale commercial testing (Phase 3) of switchgrass co-fire operations is not part of DOE's Proposed Action. However, if Phase 2 were to be successful and lead to Phase 3, the size of the new storage and processes buildings would be approximately doubled to accommodate the increased volume of switchgrass necessary for Phase 3.

The Proposed Action's corollary activities related to growing and harvesting switchgrass in the Rathbun Lake watershed would support continued production of switchgrass on

approximately 4,000 acres of existing Conservation Reserve Program (CRP) lands approved for the Chariton Valley Biomass Project in 1995 by the USDA, and harvesting, transporting, and storing the switchgrass using existing truck routes. Although it is anticipated that full-scale commercial operations could require up to 50,000 acres to produce the necessary 200,000 tons/year of switchgrass, DOE does not anticipate that it would have any involvement in the decision to operate at commercial levels nor to convert additional CRP lands to switchgrass production. However, DOE is working with USDA to identify USDA's NEPA compliance strategy should CVRCD and Alliant Power determine that commercial scale operations are viable and that the additional acreage for switchgrass production would be needed.

Because the location of the new construction associated with our Proposed Action is on the previously disturbed OGS site, we do not believe there would be any critical habitat in the area. Because the activities associated with our Proposed Action in Chariton Valley are limited to harvesting on approximately 4000 acres currently producing switchgrass, we do not believe our Proposed Action would adversely impact listed species or critical habitat, if there is any critical habitat in the vicinity of the Proposed Action. However, we wish to confirm these opinions with FWS and provide you with an opportunity to comment on our Proposed Action.

More detailed information regarding the Chariton Valley Biomass Project and our Proposed Action is available on line at http://www.cvrcd.org/deliverables.htm. This link includes links to three documents, the Chariton Valley Biomass Project's Engineering Design Package, Environmental Permits Report, and Environmental Strategies Plan. Collectively, they provide comprehensive background and planning information regarding the engineering and environmental issues associated with the overall Chariton Valley Biomass Project and our Proposed Action. (Note: Although these documents provide relevant background regarding the Chariton Valley Biomass Project's history and the results of the already completed co-fire tests, the Proposed Action for which we are preparing the EA is limited to the new construction and operations described above.)

Finally, the following table shows our current understanding of the federally listed species in the project area by county. We would welcome your review to ensure the table is current and accurate.

Federally listed species in Six Iowa Counties Potentially Impacted by the Proposed Action. Threatened (T), Endangered (E)

County	Common Name	Scientific Name	Status	Habitat
Appanoose	Bald eagle	*Haliaeetus leucocephalus*	T	Breeding/wintering
	Indiana bat	*Myotis sodalis*	E	
Clarke	Indiana bat	*Myotis sodalis*	E	
	Prairie bush clover	*Lespedeza leptostachya*	T	Dry-mesic prairies
	Mead's milkweed	*Asclepias medii*	T	Dry-mesic prairies
Decatur	Indiana bat	*Myotis sodalis*	E	
	Mead's milkweed	*Asclepias medii*	T	Dry-mesic prairies
	Eastern prairie fringed orchard	*Platantheria leucophaea*	T	
	Bald eagle	*Haliaeetus leucocephalus*	T	Breeding
Lucas	Indiana bat	*Myotis sodalis*	E	
	Bald eagle	*Haliaeetus leucocephalus*	T	Breeding
	Prairie bush clover	*Lespedeza leptostachya*	T	Dry-mesic prairies
Monroe	Indiana bat	*Myotis sodalis*	E	
Wapello	Indiana bat	*Myotis sodalis*	E	
(OGS site)	Bald eagle	*Haliaeetus leucocephalus*	T	Breeding/wintering
Wayne	Indiana bat	*Myotis sodalis*	E	

Please provide us with a FWS opinion regarding the presence or absence of critical habitat on the OGS plant site or advise us of any additional information your office would need in order to provide an opinion.

Please direct any comments or questions you may have to:

Joyce Beck, NEPA Documents Manager
U.S. Department of Energy
Golden Field Office
1617 Cole Blvd.
Golden CO 80401
1-800-644-6735 x 4774

joyce_beck@nrel.gov

DOE plans to distribute the Draft EA for public review and comment by April 2003. Doe will post the draft EA on the Golden Field Office electronic reading room at http://ww.golden.doe.gov. **Please provide your input by March 19, 2003.** Thank you for your interest and participation in our process.

Sincerely,

John H. Kersten
Manager

Enclosure

cc:
S. Blazek
D. Pasarrelli
T. Anderson, Battelle Memorial Institute

Concur _____SPB _____DGP _____CAP

Response Date:

File #

M/NEPA/Chariton Valley/FWS Letter-Rev

February 14, 2003

Mr. Jeffrey Vonk, Director
Iowa Department of Natural Resource
Wallace State Office Building
502 East 9th Street
Des Moines, IA 50319

SUBJECT: NOTICE OF SCOPING – SWITCHGRASS CO-FIRE TESTING AT OTTUMWA GENERATING STATION, CHILLICOTHE, IOWA

Dear Mr. Vonk:

The U. S. Department of Energy (DOE) is proposing to provide partial funding to Chariton Valley Resource Conservation and Development, Inc. (CVRCD), a non-profit organization sponsored by the U. S. Department of Agriculture (USDA), for (1) the construction of a biomass (switchgrass) storage, handling, and conveying system into the boiler at the Ottumwa Generating Station (OGS) at Chillicothe, Iowa, (2) operational testing of switchgrass as a biomass co-fire feedstock at OGS, and (3) corollary activities related to growing, harvesting, and transporting switchgrass grown in Chariton River Valley counties in southern Iowa to the OGS. One of DOE's missions is to advance the development and commercialization of renewable energy technologies such as biomass energy. The proposed action is intended to help demonstrate a renewable source of electricity that is commercially feasible in the United States, that reduces fossil fuel (coal) dependence, and that could potentially reduce emissions of criteria air pollutants, in particular sulfur and nitrogen oxides, and which could reduce greenhouse gases. Previous tests and initial demonstrations at OGS and elsewhere have shown switchgrass to be promising as a co-firing feedstock in coal-burning plants, such as OGS.

The OGS is a 725-megawatt (MW) maximum output, low-sulfur pulverized coal-burning plant owned jointly by several Iowa utilities and operated by Alliant Energy. The plant is located about a mile (1.6 kilometers) northwest of the City of Chillicothe on the Des Moines River, approximately ten miles (16 kilometers) northwest of Ottumwa, Iowa and 80 (129 kilometers) miles southeast of Des Moines, Iowa (map enclosed). A three-phase switchgrass co-fire test campaign has been planned and implemented at OGS. From November 2000 through January 2001, Alliant Energy conducted Phase 1 (Co-fire Test 1) at OGS. Phase 2 testing would comprise two additional co-fire tests.

Co-fire Test 2, which would use some residual equipment and test some new equipment, is currently planned for September/October 2003. It would test and demonstrate the engineering and environmental feasibility of co-firing up to 12.5 tons of switchgrass per hour

and would burn a maximum of 6,000 tons of switchgrass. Co-fire Test 3, which is tentatively scheduled for winter 2004/2005, would test the long-term (approximately 2000 hours) sustainability of processing 12.5 tons/hour. Co-fire Test 3 would be conducted using a proposed new process and new storage building constructed onsite at the current pole storage yard. Phase 3 (commercial operation testing) may be pursued if the results of the next two tests continue to point to technical and environmental feasibility. Continuous, full-scale commercial operations could process up to 25 tons of switchgrass per hour, generate 35 MW per year of OGS's annual output, and replace 5 percent of the coal used at OGS in one year.

DOE's Proposed Action would only support the second and third co-fire tests. DOE has no current plans to provide financial support for commercial operations. The new construction that DOE proposes to fund would include a new switchgrass processing facility and a new switchgrass storage barn that would be used for Phase 2 testing.

DOE has determined that this Proposed Action requires an Environmental Assessment (EA) under the provisions of the National Environmental Policy Act (NEPA) and we have tasked our contractor, Battelle Memorial Institute, with preparing it. Formal scoping meetings on this Proposed Action are not planned. However, we understand that you serve as the Iowa point-of-contact for NEPA matters and we would like to advise you of this Proposed Action and EA and also to request that you forward this information to the appropriate Iowa state agencies. Under separate cover, we have already advised and requested comment from Ms. Anita Walker, the Acting Iowa State Historic Preservation Officer regarding cultural or historic resources and from the U. S. Fish and Wildlife Service regarding listed species and critical habitat. We will also be advising other potentially interested Federal agencies. We would welcome your assistance in advising other appropriate Iowa State agencies.

The proposed new facilities would be built on OGS plant property approximately 1,100 feet (335 meters) west of the main plant. Only very limited demolition would be required to remove an old pole-mounted transformer. The proposed new construction area would occupy an old parking lot currently used for storing power line poles. A small office building located on the proposed site would remain. The new facilities would be separated from OGS's coal-firing operations, and Alliant Energy has indicated that the Proposed Action would not interfere with OGS plant operations or with vehicle traffic at the plant. The proposed new storage barn and process building would have footprints of approximately 27,035 square feet (2,511 square meters) and 6,862 square feet (638 square meters), respectively. The two buildings would be connected by an approximately 2,035 square foot (198 square meter) elevated transfer gallery. Thus, the total footprint of the new construction would be approximately 35,932 square feet (3,338 square meters). The ground elevation differences would require up to five feet (1.5 meters) of cut and/or fill grade-work. If necessary for dust control, new on-site concrete roads leading into the new facilities will be

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The Proposed Action's corollary activities related to growing and harvesting switchgrass in the Rathbun Lake watershed would support continued production of switchgrass on approximately 4,000 acres of existing Conservation Reserve Program (CRP) lands approved for the Chariton Valley Biomass Project in 1995 by the USDA, and harvesting, transporting, and storing the switchgrass using existing truck routes. Although it is anticipated that full-scale commercial operations could require up to 50,000 acres to produce the necessary 200,000 tons/year of switchgrass, DOE does not anticipate that it would have any involvement in the decision to operate at commercial levels nor to convert additional CRP lands to switchgrass production. However, DOE is working with USDA to identify USDA's NEPA compliance strategy should CVRCD and Alliant Energy determine that commercial scale operations are viable and that the additional acreage for switchgrass production would be needed.

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Please direct any comments or questions you may have to:

Joyce Beck, NEPA Documents Manager
U.S. Department of Energy
Golden Field Office
1617 Cole Blvd.
Golden CO 80401
1-800-644-6735 x 4774
joyce_beck@nrel.gov

DOE plans to distribute the Draft EA for public review and comment by April 2003. DOE will post the draft EA on the Golden Field Office electronic reading room at http://www.golden.doe.gov. **Please provide your input by March 19, 2003.** Thank you for

your interest and participation in our process. Thank you for your interest and participation in our process.

Sincerely,

John H. Kersten
Manager

Enclosure

cc:
S. Blazek
D. Pasarrelli
T. Anderson, Battelle Memorial Institute

Concur _____SPB _____DGP _____CAP

Response Date:

File #

M/NEPA/Chariton Valley/Iowa NEPA POC letter-Rev

February 14, 2003

Ms. Anita Walker
Acting State Historic Preservation Officer
Iowa Department of Cultural Affairs
State of Iowa Historical Building
600 East Locust
Des Moines, IA 50319-0290

SUBJECT: NOTICE OF SCOPING – SWITCHGRASS CO-FIRE TESTING AT OTTUMWA GENERATING STATION, CHILLICOTHE, IOWA

Dear Ms. Walker:

The U. S. Department of Energy (DOE) is proposing to provide partial funding to Chariton Valley Resource Conservation and Development, Inc. (CVRCD), a non-profit organization sponsored by the U. S. Department of Agriculture (USDA), for (1) the construction of a biomass (switchgrass) storage, handling, and conveying system into the boiler at the Ottumwa Generating Station (OGS) at Chillicothe, Iowa, (2) operational testing of switchgrass as a biomass co-fire feedstock at OGS, and (3) corollary activities related to growing, harvesting, and transporting switchgrass grown in Chariton River Valley counties in southern Iowa to the OGS. One of DOE's missions is to advance the development and commercialization of renewable energy technologies such as biomass energy. The proposed action is intended to help demonstrate a renewable source of electricity that is commercially feasible in the United States, that reduces fossil fuel (coal) dependence, and that could potentially reduce emissions of criteria air pollutants, in particular sulfur and nitrogen oxides, and which could reduce greenhouse gases. Previous tests and initial demonstrations at OGS and elsewhere have shown switchgrass to be promising as a co-firing feedstock in coal-burning plants, such as OGS.

The OGS is a 725-megawatt (MW) maximum output, low-sulfur pulverized coal-burning plant owned jointly by several Iowa utilities and operated by Alliant Energy. The plant is located about a mile (1.6 km) northwest of the City of Chillicothe on the Des Moines River, approximately ten miles (10 km) northwest of Ottumwa, Iowa and 80 miles (129 km) southeast of Des Moines, Iowa (map enclosed). A three-phase switchgrass co-fire test campaign has been planned and implemented at OGS. From November 2000 through January 2001, Alliant Energy conducted Phase 1 (Co-fire Test 1) at OGS. Phase 2 testing would comprise two additional co-fire tests.

Co-fire Test 2, which would use some residual equipment and test some new equipment, is currently planned for September/October 2003. It would test and demonstrate the

engineering and environmental feasibility of co-firing up to 12.5 tons of switchgrass per hour and would burn a maximum of 6,000 tons of switchgrass. Co-fire Test 3, which is tentatively scheduled for winter 2004/2005, would test the long-term (approximately 2000 hours) sustainability of processing 12.5 tons/hour. Co-fire Test 3 would be conducted using a proposed new process and new storage building constructed onsite at the current pole storage yard. Phase 3 (commercial operation testing) may be pursued if the results of the next two tests continue to point to technical and environmental feasibility. Continuous, full-scale commercial operations could process up to 25 tons of switchgrass per hour, generate 35 MW per year of OGS's annual output, and replace 5 percent of the coal used at OGS in one year.

DOE's Proposed Action would only support the second and third co-fire tests. DOE has no current plans to provide financial support for commercial operations. The new construction that DOE proposes to fund would include a new switchgrass processing facility and a new switchgrass storage barn that would be used for Phase 2 testing.

DOE has determined that this Proposed Action requires an Environmental Assessment (EA) under the provisions of the National Environmental Policy Act (NEPA) and we have tasked our contractor, Battelle Memorial Institute, with preparing it. Formal scoping meetings on this Proposed Action are not planned. However, we believe it is appropriate to have informal consultations with potentially interested agencies and organizations to afford them an opportunity to comment on our Proposed Action and to identify specific issues or concerns that they believe we should address in the EA.

The proposed new facilities would be built on OGS plant property approximately 1,100 feet (335 meters) west of the main plant. Only very limited demolition would be required to remove an old pole-mounted transformer. The proposed new construction area would occupy an old parking lot currently used for storing power line poles. A small office building located on the proposed site would remain. The new facilities would be separated from OGS's coal-firing operations, and Alliant Energy has indicated that the Proposed Action would not interfere with OGS plant operations or with vehicle traffic at the plant. The proposed new storage barn and process building would have footprints of approximately 27,035 square feet (2,511 square meters) and 6,862 square feet (638 square meters), respectively. The two buildings would be connected by an approximately 2,035 square foot (198 square meter) elevated transfer gallery. Thus, the total footprint of the new construction would be approximately 35,932 square feet (3,338 square meters). The ground elevation differences would require up to five feet (1.5 meters) of cut and/or fill grade-work. If necessary for dust control, new on-site concrete roads leading into the new facilities will be evaluated. New delivery truck parking areas would be built of compacted C-stone®, a proprietary material produced on-site as a byproduct of the fly ash that remains after coal is burned. Full-scale commercial testing (Phase 3) of switchgrass co-fire operations is not part of DOE's Proposed Action. However, if Phase 2 were to be successful and lead to Phase 3, the size of the new storage and processes buildings would be approximately doubled to accommodate the increased volume of switchgrass necessary for Phase 3.

The Proposed Action's corollary activities related to growing and harvesting switchgrass in the Rathbun Lake watershed would support continued production of switchgrass on

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Because the location of the proposed new construction is on the previously disturbed OGS site, we do not believe our Proposed Action would disturb or discover any cultural or historical resources. However, we wish to confirm this with your office and provide you with an opportunity to comment on our Proposed Action. Would you please provide us with a SHPO opinion regarding the presence or absence of cultural or historic sites that could be impacted by our Proposed Action, or advise us of any additional information your office would need in order to provide an opinion.

Please direct any comments or questions you may have to:

Joyce Beck, NEPA Documents Manager
U.S. Department of Energy
Golden Field Office
1617 Cole Blvd.
Golden CO 80401
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DOE plans to distribute the Draft EA for public review and comment by April 2003. DOE will post the draft EA on the Golden Field Office electronic reading room at http://www.golden.doe.gov. **Please provide your input by March 19, 2003.** Thank you for your interest and participation in our process.

Thank you for your interest and participation in our process.

Sincerely,

John H. Kersten
Manager

Enclosure

cc:
S. Blazek
D. Pasarrelli
T. Anderson, Battelle Memorial Institute
D. Jones, Archeologist

Concur _____SPB _____DGP _____CAP

Response Date:

File #

M/NEPA/Chariton Valley/SHPO Letter-Rev

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

February 14, 2003

TO: Distribution List

SUBJECT: NOTICE OF SCOPING – SWITCHGRASS CO-FIRE TESTING AT OTTUMWA GENERATING STATION, CHILLICOTHE, IOWA

The U. S. Department of Energy (DOE) is proposing to provide partial funding to Chariton Valley Resource Conservation and Development, Inc. (CVRCD), a non-profit organization sponsored by the U. S. Department of Agriculture (USDA), for (1) the construction of a biomass (switchgrass) storage, handling, and conveying system into the boiler at the Ottumwa Generating Station (OGS) at Chillicothe, Iowa, (2) operational testing of switchgrass as a biomass co-fire feedstock at OGS, and (3) corollary activities related to growing, harvesting, and transporting switchgrass grown in Chariton River Valley counties in southern Iowa to the OGS. One of DOE's missions is to advance the development and commercialization of renewable energy technologies such as biomass energy. The proposed action is intended to help demonstrate a renewable source of electricity that is commercially feasible in the United States, that reduces fossil fuel (coal) dependence, and that could potentially reduce emissions of criteria air pollutants, in particular sulfur and nitrogen oxides, and which could reduce greenhouse gases. Previous tests and initial demonstrations at OGS and elsewhere have shown switchgrass to be promising as a co-firing feedstock in coal-burning plants, such as OGS.

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DOE is requesting public input on the NEPA process, proposed action and alternatives, and the environmental issues to be addressed in the EA. Please direct any comments or questions you may have to:

Joyce Beck, NEPA Documents Manager
U.S. Department of Energy
Golden Field Office
1617 Cole Blvd.
Golden CO 80401
1-800-644-6735 x 4774
joyce_beck@nrel.gov

3

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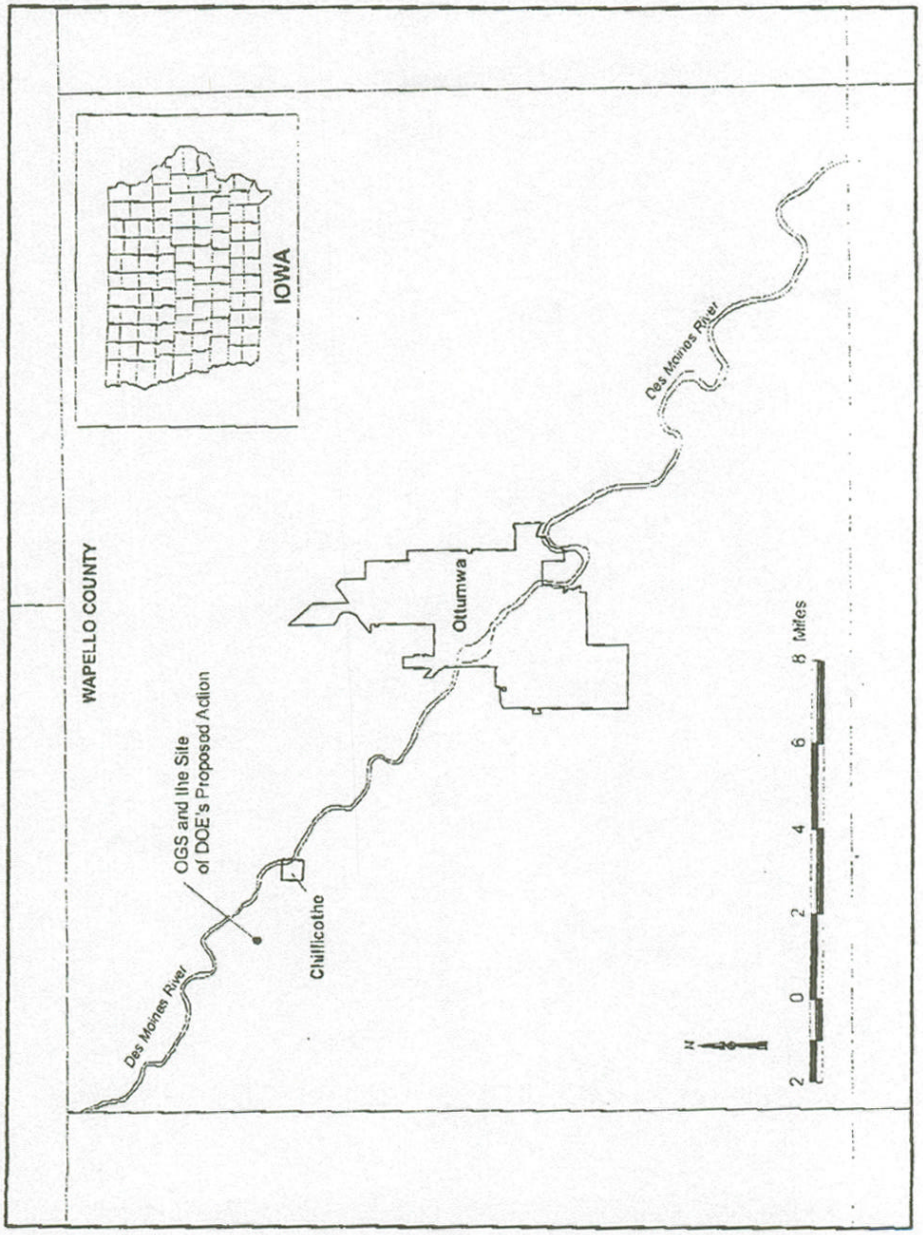
Sincerely,

John H. Kersten
Manager

Enclosure

cc/w address list
S. Blazek
D. Pasarrelli
T. Anderson, Battelle Memorial Institute

4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APPENDIX B

RESPONSES TO SCOPING LETTERS

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FWS/RIFO

March 5, 2003

John H. Kersten
Department of Energy
Golden Field Office
1617 Cole Boulevard
Golden, Colorado 80401-3393

Dear Mr. Kersten:

This is in response to your letter of February 14, 2003, requesting our input regarding federally threatened and endangered species for the proposed action of building new facilities on previously disturbed Ottumwa Generating Station plant property.

The federally threatened bald eagle (*Haliaeetus leucocephalus*) and endangered Indiana bat (*Myotis sodalis*) are known to occur in Wapello County, Iowa.

The threatened bald eagle is listed as breeding in the following counties in Iowa: Allamakee, Black Hawk, Clayton, Dubuque, Fremont, Iowa, Jackson, Jefferson, Howard, Linn, Lucas, Washington and Winneshiek. Potentially, it may also be found to breed in Benton, Delaware, Jones, Mahaska, Marion, Sac and Webster counties.

It is also listed as wintering along large rivers, lakes, and reservoirs in the following Iowa counties: Allamakee, Appanoose, Clayton, Clinton, Des Moines, Dubuque, Fremont, Hardin, Harrison, Johnson, Lee, Linn, Louisa, Mahaska, Marion, Monona, Muscatine, Polk, Pottawattamie, Scott, Van Buren, Wapello, and Woodbury.

During the winter, this species feeds on fish in the open water areas created by dam tailwaters, the warm water effluents of power plants and municipal and industrial discharges, or in power plant cooling ponds. The more severe the winter, the greater the ice coverage and the more concentrated the eagles become. They roost at night in groups in large trees adjacent to the river in areas that are protected from the harsh winter elements. They perch in large shoreline trees to rest or feed on fish. There is no critical habitat designated for this species. The eagle may not be harassed, harmed, or disturbed when present nor may nest trees be cleared.

In Iowa, the Indiana bat is known to occur in Appanoose, Clarke, Davis, Decatur, Des Moines, Henry, Jasper, Jefferson, Keokuk, Lee, Louisa, Lucas, Madison, Mahaska, Marion, Monroe, Muscatine, Ringgold, Union, Van Buren, Wapello, Warren, Washington, and Wayne or portions of these counties south of Interstate 80. It could potentially occur in counties of Adair, Adams, Audubon, Cass, Cedar, Dallas, Fremont, Guthrie, Harrison, Iowa, Johnson, Mills, Montgomery, Page, Polk, Pottawattamie, Poweshiek, Scott, and Taylor.

During the summer, the Indiana bat frequents the corridors of small streams with well-developed riparian woods as well as mature upland forests. It forages for insects along the stream corridor, within the canopy of floodplain and upland forests, over clearings with early successional vegetation (old fields), along the borders of croplands, along wooded fencerows, and over farm ponds and in pastures. It has been shown that the foraging range for the bats varies by season, age, and sex and ranges up to 81 acres (33ha). It roosts and rears its young in cavities and beneath the loose bark of some live species of trees and those of large dead or dying trees. It winters in caves and abandoned mines.

An Indiana bat maternity colony typically consists of a primary roost tree and several alternate roost trees. The use of a particular tree appears to be influenced by weather conditions (temperature and precipitation). For example, dead trees found in more open situations were used more often during cooler or drier days while interior live and dead trees were selected during periods of high temperature and/or precipitation. It has been shown that pregnant and neonatal bats do not thermoregulate well and the selection of the roost tree with the appropriate microclimate may be a matter of their survival. The primary roost tree, however, appears to be used on all days and during all weather conditions by at least some bats. Indiana bats tend to be philopatric, i.e. they return to the same roosting area year after year.

Suitable summer habitat in Iowa is considered to have the following characteristics within a ½ mile radius of the project site:

1) forest cover of 15% or greater;
2) permanent water;
3) one or more of the following tree species 9 inches diameter at breast height (dbh) or greater: shagbark and shellbark hickory that may be dead or alive, and dead bitternut hickory, American elm, slippery elm, eastern cottonwood, silver maple, white oak, red oak, post oak, and shingle oak with slabs or plates of loose bark.
4) at least 1 potential roost tree per 2.5 acres;
5) potential roost trees must have greater than 10% coverage of loose bark (by visual estimation of peeling bark on trunks and main limbs) or cavities.

Habitat for the bald eagle and the Indiana bat does not appear to occur in the project site.

I have sent a corrected copy of the table that you included for review. Please see attached copy.

These comments provide technical assistance only and do not constitute a report of the Secretary of the Interior on a project within the meaning of Section 2(b) of the Fish and Wildlife

Coordination Act, do not fulfill the requirements under Section 7 of the Endangered Species Act, nor do they represent the review comments of the U.S. Department of the Interior on any forthcoming environmental statement.

If you have any questions regarding our comments, please contact Ginger Molitor of my staff at (309) 793-5800 ext. 513.

Sincerely,

Richard C. Nelson
Supervisor

Enclosure

STATE HISTORICAL SOCIETY of IOWA

A Division of the Iowa Department of Cultural Affairs

March 25, 2003

In reply refer to:
R&C#: 030290082

Joyce Beck, NEPA Documents Manager
U.S. Department of Energy
Golden Field Office
1617 Cole Blvd.
Golden, Colorado 80401

RE: DOE – WAPELLO COUNTY – NOTICE OF SCOPING– SWITCHGRASS CO-FIRE TESTING AT OTTUMWA GENERATING STATION, CHILLICOTHE, IA – SECS. 25, 26, 27, 35, & 36, T73N-R15W

Dear Ms. Beck,

We have received information regarding the above-referenced project for our consideration. Thank you for providing the Iowa State Historic Preservation Office (SHPO) with the opportunity to review this undertaking. We make the following **comments** and **recommendations** based on our examination of this material and in accordance with Section 106 of the National Historic Preservation Act of 1966 and its implementing regulations 36 CFR part 800 (revised, effective January 11, 2001).

Proposed New Facilities at the Ottumwa Generating Station

According to our records, a Phase I archaeological survey (R&C#:750090000) was conducted on the entire property of the Ottumwa Generating Station at Chillicothe, Iowa. A total of 15 archaeological sites were identified as part of the Phase I archaeological surveys. Ten of these sites (13WP15, 13WP16, 13WP17, 13WP18, 13WP19, 13WP21, 13WP23, 13WP25 prehistoric component, 13WP26, and 13WP27) were recommended as not eligible for listing on the National Register of Historic Places and no further work was recommended for these sites. Additional investigations in the form of archaeological excavations were recommended for four sites: 13WP13, 13WP14, 13WP22, and 13WP25 historic component. Site 13WP28 was considered to be eligible for listing on the National Register of Historic Places and significant enough to warrant preservation. No further work was recommended for this site as it was not going to be affected by the proposed construction activities at that time. Site 13WP28 is still considered by our office to be eligible for listing on the National Register of Historic Places. As far as our office is aware, this site has been preserved. Sites 13WP13, 13WP14, 13WP22, and 13WP25 were mitigated as part of the original project and are no longer considered eligible for listing on the National Register.

Based on your proposed project information, it is difficult to assess whether the proposed construction activities will affect site 13WP28, the only remaining site on the property that is considered eligible for listing on the National Register. We encourage you to consult with the Office of the State Archaeologist (Colleen Eck, Site Records Manager at the UI-OSA (319) 384-0735)) to conduct a site background check to determine whether site 13WP28 will be affected by the proposed project. If site 13WP28 will be located within the Area of Potential Effect for the undertaking, we look forward to further consulting

600 EAST LOCUST STREET, DES MOINES, IA 50319-0290 P: (515) 281-5111

with your agency on whether the site will be affected by the proposed undertaking in accordance with 36 CFR 800.5. If this site will be adversely affected by the proposed project, your agency will need to consider alternatives for resolving any adverse effects at the site in accordance with 36 CFR 800.6, including possibilities such as redesigning the project to avoid the site or developing a data recovery plan for mitigating the adverse effects at the site.

Proposed Action's Corollary Activities

At this time, it is difficult to assess whether any of the proposed corollary activities associated with the action such as growing and harvesting switchgrass in the Rathbun Lake watershed will affect any significant historic properties. My personal experience with growing switchgrass has indicated that establishing switchgrass tracts actually helps stabilize and preserve archaeological sites. Harvesting switchgrass can be done under certain conditions that would either not affect or not adversely effect significant archaeological sites at all. We recommend that your agency should consider developing a Programmatic Agreement with our agency to further explore these issues and to help streamline the future Section 106 consultation process for these future corollary activities. Also, if other federal agencies will be involved with these future undertakings, such as growing switchgrass on U.S. Army Corps of Engineer's property or easement ground, we would encourage the other federal agencies to participate in the development and implementation of a Programmatic Agreement.

Please reference the Review and Compliance Number provided above in all future submitted correspondence to our office for this project. We look forward to further consulting with you as part of the Section 106 consultation process for this project. Should you have any questions please contact me at the number below.

Sincerely,

Douglas W. Jones, Archaeologist
Community Programs Bureau
(515) 281-4358

THE UNIVERSITY OF IOWA

OFFICE OF THE STATE ARCHAEOLOGIST
700 Clinton Street Building
Iowa City, Iowa 52242
319-384-0732 Fax 319-384-0768
osa@uiowa.edu
www.uiowa.edu/~osa

Tuesday, April 01, 2003

William Fallon
Battelle Memorial Institute
822 Jonker Ct.
Gaithersburg MD 20878-

Ref: WP Wapello **Iowa Site File Search No.** 2003120

Dear William:

I have conducted a search of the Iowa Site File for archaeological sites recorded within a one-mile radius of the project area described in your request for search on 4/1/2003 . This area is within 73N-15W Section 26 . Our records indicate that five archaeological sites have been reported to the OSA within or near the project location. Twenty sites were recorded within one mile of that location at the time of the site records search. Other archaeological sites may be present at or near the project location but have not been discovered or reported to the OSA. A summary of site information is included with this letter along with a map of site locations and previously surveyed areas.

If you have not already done so, you may wish to consult with the State Historic Preservation Office (SHPO) to determine whether an archaeological survey may be needed. In the event that previously unidentified archaeological resources are discovered during ground disturbing activities on projects complying with Section 106 of the National Historic Preservation Act or other applicable federal and state laws, construction work should cease in the area of the resource and in the surrounding area where further subsurface remains can reasonably be expected to occur. The responsible federal or state agency and State Historic Preservation Office should be immediately notified and consulted about the discovery.

If during the course of construction or earthmoving signs of a human burial are encountered, those activities should be stopped at once and the Office of the State Archaeologist should be contacted immediately. Human burials may potentially include bone, ashes, or subterranean structures with or without overlying mound structures. All human burials in the state of Iowa are legally protected under Chapters 263B, 566, and 716 of the Iowa Code.

Should you need more information about a particular site, you may write to me including the appropriate site number in your request. Since every county has a different series of site numbers, be sure to include the full trinomial site designation in your request. This designation takes the form of 13XY### where XY is the county abbreviation and ### is the order in which site reports are received for a given county.

The information in this letter is intended to assist you in fulfilling any local, state, or federal laws and regulations related to archaeological sites concerning historic preservation such as Section 106 of the National Historic Preservation Act and to assist avoidance of any burial sites potentially located within the subject area. Prior to any federal undertaking, all archaeological sites should be evaluated for their National Register eligibility. Federal undertakings include but are not limited to projects receiving any federal financial support, technical assistance, licenses, or permits received by private landowners or permits received by private landowners or federal, state, or local governments. The State Historical Preservation Officer (SHPO) would need to be contacted for details about the final determination of significance for any site to be affected by a federal undertaking. This letter is not meant to confirm or deny that any applicable requirements have been met.

Sincerely,

Colleen Eck

Colleen Eck
Site Records Manager
enclosure

Sites within or near Project location

SITE	CulturalAffiliation	Site Type	UTM_X	UTM_Y	DTYPE
13WP18	Prehistoric	Open habitation	537402.2088	4549258.386	circle
13WP19	Prehistoric	Open habitation	536902.374	4549234.545	inverted triangle
13WP25	Historic Euro-American	Historic farm/residence	537124.2941	4549196.886	circle
13WP85	Late Archaic	Open habitation	537055.7213	4549100.121	circle
13WP341	Historic Euro-American	Historic scatter	537364.6723	4549360.228	polygon

Sites within 1 mile of Project location

SITE	CulturalAffiliation	Site Type	SITEAREA	DTYPE
13WP13	Late Woodland	Prehistoric scatter	8170.868	circle
13WP14	Middle Woodland	Prehistoric scatter	389.711	inverted triangle
13WP15	Prehistoric	Open habitation	4071.297	circle
13WP16	Prehistoric	Open habitation	8379.622	polygon
13WP21	Prehistoric	Open habitation	4071.297	circle
13WP22	Historic	Historic scatter	4071.297	circle
13WP22	Prehistoric	Prehistoric scatter	4071.297	circle
13WP23	Prehistoric	Open habitation	4071.297	circle
13WP24	Woodland	Mounds: conical	4071.297	circle
13WP26	Archaic	Prehistoric scatter	2941.512	circle
13WP27	Archaic	Prehistoric scatter	1661.818	circle
13WP28	Historic Euro-American	Historic farm/residence	1030.263	polygon
13WP44	Woodland	Prehistoric scatter	32715.526	polygon
13WP46	Prehistoric	Prehistoric scatter	2909.885	polygon
13WP69	Prehistoric	Mounds: conical	314.143	dot
13WP70	Prehistoric	Prehistoric scatter	1468.631	polygon
13WP71	Prehistoric	Prehistoric scatter	314.143	dot
13WP72	Prehistoric	Prehistoric scatter	314.143	dot
13WP73	Historic Euro-American	Historic scatter	314.143	dot
13WP73	Historic Euro-American	Structure/building remains	314.143	dot
13WP74	Prehistoric	Prehistoric scatter	389.711	inverted triangle
13WP114	Early Archaic	Prehistoric scatter	1800.027	polygon
13WP114	Early Woodland	Prehistoric scatter	1800.027	polygon

Dtype definitions

Polygon:	Boundaries and location known
Triangle:	Location not certain
Inverted Triangle:	Location known, boundaries unknown
Dot: (10 m radius)	Location known, area < 20 m in any direction
Circle:	Location and site area known, exact boundaries not known

Joyce Beck, NEPA Documents Manager
U.S. Department of Energy
Golden Field Office
1617 Cole Blvd.
Golden, CO 80401

Ms. Beck -

This e-mail represents the Iowa Department of Natural Resources' comments on the above referenced document. I apologize the lateness of our comments.

Protected Species, Rare Natural Communities, State Lands and Waters

The McNeese Wildlife Area (Wapello CCB property) is located approximately 3,500 feet SW of the project area.

We have search our records of the project area and found no site-specific records of rare species or significant natural communities. However, our data are not the result of through field surveys. If listed species or rare communities are found during the planning or construction phases, additional studies and/or mitigation may be required.

Any questions regarding these comments should be directed to Keith Dohrmann at 515/281-8967 or keith.dohrmann@dnr.state.ia.us.

Storm Water

Effective March 10, 2003, any construction activity that bares the soil of an area greater than or equal to one acre; including clearing, grading or excavation; may require a storm water discharge permit from the Department. For more information regarding this matter, please contact Ruth Rosdail at 515/281-6782 or ruth.rosdail@dnr.state.ia.us.

Air Quality

Please refer to the attached document, which address air construction permit, transition to phase 3, asbestos, open burning and fugitive dust. Questions or comments regarding this document should be submitted to Monica Wnuk at 515/281-7212 or monica.wnuk@dnr.state.ia.us.

Energy

Question - What is happening to the old switchgrass barn? Is it too small? Response to this question may be directed to Angela Chen at 515/281-4736 or angela.chen@dnr.state.ia.us.

This e-mail represents a record of review of your project and project area by personnel representing the Environmental Services Division and Conservation and Recreation Division of the Department. This review does not constitute a permit you may need to obtain from the Department or other state and federal agencies, nor does this substitute any applicable permit requirements . Thank you for the opportunity to comment on this project. If you need any additional information, please don't hesitate to contact me.

Sincerely,

Scott J. Vander Hart, Executive Officer
Environmental Services Division
Iowa Department of Natural Resources
Phone: 515.281.5325; Fax: 515.281.6794
www.iowadnr.com

Potential Air Quality related Issues - Phase 2 and Phase 3 Trial Burns involving coal –switchgrass blend at the Ottumwa Generating Station

- **Existing Construction Permit Issues**
  As the existing boiler is covered by a PSD permit issued by the US EPA, the DNR has contacted the Kansas City office of the upcoming environmental assessment. The Region VII US EPA office's primary objectives are as follows:

  > "As we've expressed to the company in past messages and letters, two primary objectives to us are (1) protection of the national ambient air quality standards [NAAQSs] and (2) the development, as quickly as possible, of emission rates for purposes of setting emission limits and for purposes of determining if the alternative fuel use will trigger PSD applicability."

Regarding the emission rates, the test report for the initial trial burn indicates an increase of carbon monoxide (CO) emissions which exceed the PSD regulation's significant increase amount of 100 tpy for CO. However, the initial burn may have been suspect from an operational standpoint and, as a result, the resulting measured emissions may not be representative of the true operating scenario with the switchgrass blend.

The EPA would be agreeable to additional trial burns if it is demonstrated, using appropriate dispersion modeling studies, that the 1-hour and 8-hour CO NAAQSs were not exceeded during the initial burn period. Conservative modeling performed by the department using the latest version of the EPA's SCREEN3 model indicates that the predicted 1-hr and 8-hr impacts at the maximum CO emission rate noted in the trail burn summary report (64.2 lb/hr) are much less than the 1-hr and 8-hr CO PSD significant impact levels of 2,000 ug/m^3 and 500 ug/m^3, respectively. Therefore, CO impacts from the combustion of the switchgrass blend in the boiler are not a concern at this time.

The EPA will also consider rationale from the department and/or the source as to why lesser emissions of CO will probably be generated during trial burns to follow. Without such rationale, the EPA will take the position that blended fuel use will routinely generate CO emissions similar to those measured during the initial burn and that the blended fuel in question (i.e., coal and switch grass blends) triggers the need for a PSD permit.

If the PSD regulation applies to the blended fuel proposal, the company should not be allowed to begin construction of activities which are prohibited by the PSD regulation prior to obtaining a PSD permit.

In summary, the initial trial burn, while possibly not representative, showed a significant CO emission increase. A demonstration should be made that further burns are likely to show lower CO emission levels.

- **New Construction Permitting Requirements**
  Sources of air emissions are required to be covered by an air quality construction permit. The regulations that cover the permitting requirements are found in Chapter 22 [IAC 567]. If the project includes any new emission units, they may be subject to these construction-permitting requirements.

  As some of the emissions from the trial burn activities may generally require construction permits, we recognize that these emission units may be of a temporary nature. You are encouraged to apply for a waiver from the construction permitting requirements if any of those emission units exist. In particular, it is unclear if the baghouse emissions from the switchgrass handling operations are covered by an existing construction permit.

- **Transition to Phase 3**
  The department requests that additional details be provided on what assessment will be made of the Phase 1 and Phase 2 results to determine if the Phase 3 will be pursued.

- **Asbestos**
  Demolition of any buildings will trigger the National Emission Standards for Hazardous Air Pollutants (NESHAPS) for asbestos. Regulations apply before renovation and demolition projects begin. Before renovation or demolition, a thorough asbestos inspection is required. Thorough inspection means all suspect asbestos containing materials require sampling and laboratory analysis or are assumed to contain asbestos and handled in accordance with the regulation. All facility demolitions require submission of a two-page demolition notification form to the Department of Natural Resources (DNR), even if no asbestos is found. Upon postdate of submitted forms, ten working days must pass before any disturbance of asbestos containing material takes place. Before demolition or renovation occurs, asbestos-containing materials must be removed. If the asbestos requirements listed above will apply to this project and you need more information, the Department's Asbestos Program Coordinator is Marion Burnside, (515) 281-8443.

- **Open Burning**
  The department regulates open burning. "Open burning" is the burning of combustible materials where the products of combustion are emitted into the open air without passing through a chimney or stack. The regulations are contained in 567 Iowa Administrative Code rule 23.2 [567] and are provided below in case they are applicable to this project.

  567—23.2(455B) Open burning.

  23.2(1) *Prohibition.* No person shall allow, cause or permit open burning of combustible materials, except as provided in 23.2(2) and 23.2(3).

  23.2(2) *Variances from rules.* Any person wishing to conduct open burning of materials not exempted in 23.2(3) may make application for a variance as specified in 567—subrule 21.2(1).

  23.2(3) *Exemptions.* The following shall be permitted unless prohibited by local ordinances or regulations.

a. Disaster rubbish. The open burning of rubbish, including landscape waste, for the duration of the community disaster period in cases where an officially declared emergency condition exists.

b. Trees and tree trimmings. The open burning of trees and tree trimmings not originated on the premises provided that the burning site is operated by a local governmental entity, the burning site is fenced and access is controlled, burning is conducted on a regularly scheduled basis and is supervised at all times, burning is conducted only when weather conditions are favorable with respect to surrounding property, and the burning site is limited to areas at least one-quarter mile from any inhabited building unless a written waiver in the form of an affidavit is submitted by the owner of the building to the department and to the local governmental entity prior to the first instance of open burning at the site which occurs after November 13, 1996. The written waiver shall become effective only upon recording in the office of the recorder of deeds of the county in which the inhabited building is located. How ever, when the open burning of trees and tree trimmings causes air pollution as defined in Iowa Code section 455B.131(3), the department may take appropriate action to secure relocation of the burning operation. Rubber tires shall not be used to ignite trees and tree trimmings.

This exemption shall not apply within the area classified as the PM10 (inhalable) particulate Group II area of Mason City. This Group II area is described as follows: the area in Cerro Gordo County, Iowa, in Lincoln Township including Sections 13, 24 and 25; in Lime Creek Township including Sections 18, 19, 20, 21, 27, 28, 29, 30, 31, 32, 33, 34 and 35; in Mason Township the W ½ of Section 1, Sections 2, 3, 4, 5, 8, 9, the N ½ of Section 11, the NW ¼ of Section 12, the N ½ of Section 16, the N ½ of Section 17 and the portions of Sections 10 and 15 north and west of the line from U.S. Highway 18 south on Kentucky Avenue to 9th Street SE; thence west on 9th Street SE to the Minneapolis and St. Louis railroad tracks; thence south on Minneapolis and St. Louis railroad tracks to 19th Street SE; thence west on 19th Street SE to the section line between Sections 15 and 16.

c. Flare stacks. The open burning or flaring of waste gases, providing such open burning or flaring is conducted in compliance with 23.3(2*)"d"* and 23.3(3*)"e."*

d. Landscape waste. The disposal by open burning of landscape waste originating on the premises. However, the burning of landscape waste produced in clearing, grubbing and construction operations shall be limited to areas located at least one-fourth mile from any building inhabited by other than the landowner or tenant conducting the open burning. Rubber tires shall not be used to ignite landscape waste.

e. Recreational fires. Open fires for cooking, heating, recreation and ceremonies, provided they comply with 23.3(2*)"d."* Burning rubber tires is prohibited from this activity.

f. Residential waste. Backyard burning of residential waste at dwellings of four-family units or less. The adoption of more restrictive ordinances or regulations of a governing body of the political subdivision, relating to control of backyard burning, shall not be precluded by these rules.

g. Training fires. Fires set for the purpose of bona fide training of public or industrial employees in firefighting methods, provided that written notification is postmarked or delivered to the director at least ten working days before such action commences. Notification shall be made in accordance with 40 CFR Section 61.145, "Standard for demolition and renovation," of the asbestos National Emission Standards for Hazardous Air Pollutants, as amended through January 16, 1991. All asbestos-containing materials shall be removed prior to the training fire. Asphalt shingles may be burned in a training fire only if the notification to the director contains testing results indicating that none of the layers of the asphalt shingles contain asbestos. Each fire department may conduct no more than two training fires per calendar year where asphalt roofing has not been removed, provided that for

each of those training fires the asphalt roofing material present has been tested to ensure that it does not contain asbestos. Rubber tires may not be burned during a training fire.

h. Paper or plastic pesticide containers and seed corn bags. The disposal by open burning of paper or plastic pesticide containers (except those formerly containing organic forms of beryllium, selenium, mercury, lead, cadmium or arsenic) and seed corn bags resulting from farming activities occurring on the premises. Such open burning shall be limited to areas located at least one-fourth mile from any building inhabited by other than the landowner or tenant conducting the open burning, livestock area, wildlife area, or water source. The amount of paper or plastic pesticide containers and seed corn bags that can be disposed of by open burning shall not exceed one day's accumulation or 50 pounds, whichever is less. However, when the burning of paper or plastic pesticide containers or seed corn bags causes a nuisance, the director may take action to secure relocation of the burning operation. Since the concentration levels of pesticide combustion products near the fire may be hazardous, the person conducting the open burning should take precautions to avoid inhalation of the pesticide combustion products.

i. Agricultural structures. The open burning of agricultural structures, provided that the open burning occurs on the premises and, for agricultural structures located within a city or town, at least one-fourth mile from any building inhabited by a person other than the landowner, a tenant, or an employee of the landowner or tenant conducting the open burning unless a written waiver in the form of an affidavit is submitted by the owner of the building to the department prior to the open burning; all chemicals and asphalt shingles are removed; burning is conducted only when weather conditions are favorable with respect to surrounding property; and permission from the local fire chief is secured in advance of the burning. Rubber tires shall not be used to ignite agricultural structures.

For the purposes of this subrule, "agricultural structures" means barns, machine sheds, storage cribs, animal confinement buildings, and homes located on the premises and used in conjunction with crop production, livestock or poultry raising and feeding operations.

23.2(4) *Unavailability of exemptions in certain areas.* Notwithstanding 23.2(2) and 23.2(3)*"b," "d," "f,"* and *"i,"* no person shall allow, cause or permit the open burning of trees or tree trimmings, residential or landscape waste or agricultural structures in the cities of: Cedar Rapids, Marion, Hiawatha, Council Bluffs, Carter Lake, Des Moines, West Des Moines, Clive, Windsor Heights, Urbandale, and Pleasant Hill.

This rule is intended to implement Iowa Code section 455B.133.

- Fugitive Dust

  The department administers regulations that pertain to fugitive dust. These regulations, which may be applicable to this project, are contained in 567 Iowa Administrative Code[567] paragraph 23.3(2)"c" as follows:

c. Fugitive dust.

(1) Attainment and unclassified areas. No person shall allow, cause or permit any materials to be handled, transported or stored; or a building, its appurtenances or a construction haul road to be used, constructed, altered, repaired or demolished, with the exception of farming operations or dust generated by ordinary travel on unpaved public roads, without taking reasonable precautions to prevent particulate matter in quantities sufficient to create a nuisance, as defined in Iowa Code section 657.1, from becoming airborne. All persons, with the above exceptions, shall take reasonable precautions to prevent the discharge of visible emissions of fugitive dusts beyond the lot line of the property on which the emissions originate. The public highway authority shall be responsible for taking

corrective action in those cases where said authority has received complaints of or has actual knowledge of dust conditions which require abatement pursuant to this subrule. Reasonable precautions may include, but not be limited to, the following procedures.

1. Use, where practical, of water or chemicals for control of dusts in the demolition of existing buildings or structures, construction operations, the grading of roads or the clearing of land.

2. Application of suitable materials, such as but not limited to asphalt, oil, water or chemicals on unpaved roads, material stockpiles, race tracks and other surfaces which can give rise to airborne dusts.

3. Installation and use of containment or control equipment, to enclose or otherwise limit the emissions resulting from the handling and transfer of dusty materials, such as but not limited to grain, fertilizer or limestone.

4. Covering, at all times when in motion, open-bodied vehicles transporting materials likely to give rise to airborne dusts.

5. Prompt removal of earth or other material from paved streets or to which earth or other material has been transported by trucking or earth-moving equipment, erosion by water or other means.

If you have any questions please feel free to contact me at (515) 281-7212 or via e-mail at monica.wnuk@dnr.state.ia.us.

IOWA DEPARTMENT OF AGRICULTURE AND LAND STEWARDSHIP

PATTY JUDGE
SECRETARY OF AGRICULTURE

March 17, 2003

Joyce Beck, NEPA Documents Manager
U.S. Deparment of Energy
Golden Field Office
1617 Cole Blvd.
Golden, CO 80401

Dear Ms. Beck:

This is in response to a letter sent to William Ehm, Iowa Division of Soil Conservation concerning a Notice of Scoping – Switchgrass CO – Fire testing at Ottumwa Generating Station, Chillicothe, Iowa.

The Division of Soil Conservation supports the testing and construction of a new storage building and supports the Chariton Valley Biomass Project. The Production of fuel from biomass reduces the dependency of getting fuel from other countries and also has the potential to help farmers and meet conservation and envronmental goals.

Sincerely,

William B. Mc Gill, de

William B. McGill, Financial Incentives Bureau Chief
IDALS – Division of Soil Conservation

WBM:dc

Henry A. Wallace Building • Des Moines, Iowa 50319 • 515-281-5321

APPENDIX C

SCOPING LETTER DISTRIBUTION LIST

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Richard C. Nelson
U.S. Fish and Wildlife Service
Rock Island Field Office
4469 48th Avenue Court
Rock Island, IL 61201

Jeffrey Vonk, Director
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Wallace State Office Building
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Des Moines, IA 50319

Anita Walker
Acting State Historic Preservation Officer
Iowa Department of Cultural Affairs
State of Iowa Historical Building
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Leroy Brown, State Conservationist
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210 Walnut Street
693 Federal Building
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William Ehm, Director
IDALS/DSC
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John Glenn, Executive Director
Rathbun Regional Water Assn.
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Gerald Miller
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APPENDIX D

COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT AND DOE RESPONSES

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On May 14, 2003, DOE distributed the Draft EA to the distribution list shown in Appendix C for a 30-day comment period. During the comment period, the Draft EA and a request for comments were also posted on the Golden Field Office electronic reading room at http://www.golden.doe.gov. DOE received one comment: a letter dated June 19, 2003, from Mr. Doug Jones, Archeologist, Community Programs Bureau, State Historical Society of Iowa, which is a Division of the Iowa Department of Cultural Affairs. The following table summarizes the three items raised in Mr. Jones' letter and DOE's responses to them. A full copy of the letter follows the table.

Comment Summary	DOE Response
#1. Section 3.7 (Cultural Resources) Using information found in *A Brief History of Wapello County, Iowa (Quinn 2001)* http://www.extension.iastate.edu/wapello/county/history.html resulted in some inaccurate statements which could be interpreted as controversial and insensitive regarding American Indians in Wapello County. The information in that source does not accurately portray the current state of knowledge of either the prehistory or history of Wapello County. Better sources of both archeological and historical information in Wapello County are available, for example, information from the archeological investigations conducted for the initial construction of the OGS. Instead of just footnoting that more information on Iowa's cultural resources are available on-line at the office of the State Archeologist's website, DOE should incorporate that information into the EA.	The challenged article (1) was written by the Past President of the Wapello County Historical Society; (2) was posted on the Wapello County/Iowa State University Extension Homepage; and (3) appeared to offer an historical synopsis that was appropriate for an EA. Both the author and the sponsor of the webpage appeared to be reliable sources. DOE included the discussion of Native American history in Wapello County specifically to include Native American cultural resource concerns. DOE recognizes that detailed archeological investigations of Iowa's history and pre-history, including the information presented in Appendix A of the 1977 Draft EIS for construction of the OGS, would provide additional depth, detail, and rigor. However, the level of detail that is requisite for a pre-construction EIS would be inappropriately excessive for a post-construction EA at the same site. DOE did review the homepage of the State Archaeologist's office http://www.uiowa.edu/~osa/archaeology.htm and agrees that it offers a wealth of detailed information on Iowa's cultural resources. This website is now specifically cited in the text of the EA rather than just being footnoted. To address the commenter's concerns regarding historic and prehistoric accuracy, especially in regard to Native American history, the last two paragraphs of 3.7 were deleted and the following language added as the lead to Section 3.7.

	"Detailed information regarding the history and prehistory of the State of Iowa and Iowa counties is available from several on-line and library sources. The homepage of the Office of the State Archeologist (http://www.uiowa.edu/~osa/archaeologyle.htm) includes links that describe salient features of the region's history and prehistory (OSA 2002). Specific information about Wapello County is available from the University of Iowa/Wapello County extension services (http://www.extension.iastate.edu/wapello/) (University of Iowa 2003). The most detailed site-specific information regarding cultural resources in the immediate vicinity of the Proposed Action is found in the 1977 Draft EIS for construction of the OGS, Appendix A, Archeological Investigations in the Proposed Area of the Ottumwa Generating Station Chillicothe, Iowa (EPA 1977), which is incorporated into this EA by reference."
#2. Section 4.1.7.1 Cultural Resources -OGS Site The comment requests a point of clarification regarding archeological site 13WP28.	Section 4.1.7.1. was revised as follows to include the requested clarification regarding 13WP28. "The proposed new construction at the OGS site would not impact any cultural or historic resources. The proposed new facilities would be constructed entirely on previously disturbed OGS land. The SHPO has indicated that an eligible archeological site, 13WP28, still remains on the facility property. However, this site was avoided by the construction of the original facility and the SHPO agreed with the proposed construction activities at that time (EPA 1977). Site 13WP28 is not located within the area of potential effects for the Proposed Action. No sites on or near the location of the Proposed Action, including the one site that was discovered after the SHPO cleared the site for construction, are considered by the SHPO as eligible for listing in the National Register of Historic Places."

#3. Section 4.1.7.1 (sic) Cultural Resources - Rathbun Lake Watershed. (Refer to section 4.1.7.2) The comment requests that the following point of clarification be added : "The SHPO requests that federal agencies responsible for these future corollary activities should consider developing a Programmatic Agreement in consultation with the SHPO and other potential consulting parties to further explore these issues and help to streamline the future Section 106 process consultation on these projects.	The commenter previously raised this issue in his response to DOE's scoping letter (reference Appendix B). DOE considers this issue to be within the domain of cumulative impacts and considers the issue of Programmatic Agreements regarding commercial, full-scale switchgrass operations to be within the purview of the Department of Agriculture. Consequently, in response to the scoping letter comment, DOE included the following language in Section 5.2 (Cumulative Effects – Rathbun Lake Watershed) of the Draft EA: "The SHPO's comments and recommendations (see Appendix B) implicitly recognize the potential for cumulative impacts from commercial switchgrass agricultural operations when the Office recommends a programmatic agreement between SHPO and other agencies that would be involved with future switchgrass undertakings. DOE concurs in principle with the potential value of such an agreement but feels that it would be most appropriate for USDA and SHPO to be the signatories, because DOE has no plans to be involved in future commercial agricultural operations, whereas the CRP would be involved with such operations." DOE believes that the above language in Section 5.2 addresses this comment.

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STATE HISTORICAL SOCIETY of IOWA

A Division of the Iowa Department of Cultural Affairs

June 19, 2003

In reply refer to:
R&C#: 030290082

Joyce Beck, NEPA Documents Manager
U.S. Department of Energy
Golden Field Office
1617 Cole Blvd.
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RE: DOE – WAPELLO COUNTY – NOTICE OF SCOPING– SWITCHGRASS CO-FIRE TESTING AT OTTUMWA GENERATING STATION, CHILLICOTHE, IA – SECS. 25, 26, 27, 35, & 36, T73N-R15W – DRAFT ENVIRONMENTAL ASSESSMENT FOR COMMENT

Dear Ms. Beck,

We have received the Draft Enviornmental Assessment for the above-referenced project. Thank you for providing the Iowa State Historic Preservation Office (SHPO) with the opportunity to review this undertaking and document. We make the following **comments** and **recommendations** based on our examination of this material and in accordance with Section 106 of the National Historic Preservation Act of 1966 and its implementing regulations 36 CFR part 800 (revised, effective January 11, 2001).

We would like to comment on a number of items within this document that we believe should be further clarified or reconsidered.

3.7 Cultural Resources

We would like to express our sincere concerns about the utilization of information from *A Brief History of Wapello County, Iowa* (Quinn 2001) found at the following website: http://www.extension.iastate.edu/wapello/county/history.html>. The information on this website does not accurately portray the current state of knowledge of either the prehistory or history of Wapello County. It does discuss some factual information. However, it also includes inaccurate statements, which can be interpreted as controversial and insensitive regarding American Indians in Wapello County, both prehistorically and historically. An example of this is "The Fox and Sac tribes, which were originally from the Great Lakes region, have given Wapello County most of its Native American heritage." (p.22) The Sac (Sauk) and Fox (Meskwaki) tribes lived in Wapello County during the late 1700s and early 1800s. These tribes did live in the Great Lakes Region prior to living in Wapello County; however, both of these tribes were originally from the Eastern Seaboard. How can two tribes which were historic immigrants to this area be credited as responsible for most of the Native American Heritage in this county when archaeological investigations have demonstrated that American Indian occupation of this area goes back 12,000 years before present and involves many different tribal groups? Moreover, the archaeological investigations conducted for the intial construction of this facility demonstrates that Native American Mound Builders were not the first inhabitants of Wapello County.

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Another example of the inaccuracy of this information can be found in the statement "Iowa was never a permanent home to any Native Americans after the Mound Builders, but the state's plentiful game attracted migrating hunting parties." (p.21) Permanence of a home or occupation is a relative matter. It can be defined based on a number of criteria including size of a settlement and length of duration of occupation to mention a few. Many tribes would take serious issue with this statement as the archaeological evidence and their own oral history and traditions suggests that occupations of the area were just as permanent as our current occupation of the area.

This information seems to be based on information contained in county histories published in the late 1800s or early 1900s. Within this context, this information would make sense. However, much better sources for both archaeological and historical information from Wapello County are available and current. We strongly encourage your agency to reconsider its utilization of this dated information. We strongly encourage your agency to utilize archaeological and historical sources which are more current and accurate regarding the American Indian occupation of Wapello County. For example, you could reference information from the past archaeological investigations conducted for the initial construction of the facility. Instead of just footnoting that more information on Iowa's cultural resources is available on-line at the Office of the State Archaeologist's website, we encourage you to incorporate information from the website into your discussion.

4.1.7.1 Cultural Resources-OGS Site

We have a point of clarification in addition to the information your presented in this section. According to our records, there is an eligible archaeological site still remaining on the facility property, 13WP28. However, this site was avoided by the construction of the original facility and we agreed with the proposed construction activities at that time. We understand that site 13WP28 is not located within the Area of Potential Effect for the currently proposed undertaking at the existing facility. Therefore, we would concur that site 13WP28 will not be affected by the proposed undertaking at the existing facility. We would be able to concur with a finding of **No Historic Properties Affected** for the proposed undertaking activities at the current facility.

4.1.7.1 Cultural Resources-Rathbun Lake Watershed

We have a point of clarification to add to this section. We would like you to incorporate the following sentence to the end of this paragraph:

The SHPO recommends that federal agencies responsible for these future corollary activities should consider developing a Programmatic Agreement in consultation with the SHPO and other potential consulting parties to further explore these issues and to help streamline the future Section 106 process consultation on these projects.

As stated above, our office would be able to concur with a finding of **No Historic Properties Affected** for the proposed undertaking activities at the current facility once that determination has been provided

to our office. We will look forward to consulting with the various agencies that may be involved in the proposed future corollary activities.

Please reference the Review and Compliance Number provided above in all future submitted correspondence to our office for this project. We look forward to further consulting with you as part of the Section 106 consultation process for this project. Should you have any questions please contact me at the number below.

Sincerely,

Douglas W. Jones

Douglas W. Jones, Archaeologist
Community Programs Bureau
(515) 281-4358

cc: Lowell Soike, Iowa Deputy State Historic Preservation Officer
Beth Pauls, Iowa State Archaeologist, Office of the State Archaeologist