DOE/EA-1866

Environmental Assessment for Argonne National Laboratory Modernization Planning

U.S. DEPARTMENT OF ENERGY

U.S. Department of Energy
Office of Science – Argonne Site Office
Argonne, Illinois

November 2011

DOE/EA-1866

ENVIRONMENTAL ASSESSMENT FOR ARGONNE NATIONAL LABORATORY MODERNIZATION PLANNING

U.S. Department of Energy
Office of Science – Argonne Site Office

November 2011

This page intentionally left blank.

CONTENTS

CONTENTS (Cont.)

FIGURES

TABLES

This page intentionally left blank.

NOTATION

The following is a list of acronyms and abbreviations, chemical names, and units of measure used in this document. Some acronyms used only in tables may be defined only in those tables.

GENERAL ACRONYMS AND ABBREVIATIONS

ACHP	Advisory Council on Historic Preservation
ACM	asbestos-containing material
APS	Advanced Photon Source
AQCR	air quality control region
Argonne	Argonne National Laboratory
ASO	Argonne Site Office
ATLAS	Argonne Tandem Linear Accelerator System
CFR	*Code of Federal Regulations*
CHP	central heating plant
CO	carbon monoxide
CO_2	carbon dioxide
COE	Corps of Engineers
ComEd	Commonwealth Edison Company
CRMP	Cultural Resources Management Plan
D&D	Decontamination and Demolition
DOC	U.S. Department of Commerce
DOE	U.S. Department of Energy
EA	environmental assessment
EIS	environmental impact statement
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
ESPC	Energy Savings Performance Contract
FEMA	Federal Emergency Management Agency
FONSI	Finding of No Significant Impact
FR	*Federal Register*
GHG	greenhouse gas
HAP	hazardous air pollutant
HEMSF	High Energy Mission-Specific Facility

I-55	Interstate 55
IAC	*Illinois Administrative Code*
IEPA	Illinois Environmental Protection Agency
IGPP	Institutional General Plant Project
LEED	Leadership in Energy and Environmental Design
LMS	Laboratory Management System
LUCMoA	Land Use Control Memorandum of Agreement
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act of 1969
NESHAPs	National Emission Standards for Hazardous Air Pollutants
NHPA	National Historic Preservation Act
NO_x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NRHP	*National Register of Historic Places*
O_3	ozone
OSHA	Occupational Safety and Health Administration
Pb	lead
$PM_{2.5}$	particulate matter with an aerodynamic diameter of 2.5 µm or less
PM_{10}	particulate matter with an aerodynamic diameter of 10 µm or less
R&D	research and development
RCRA	Resource Conservation and Recovery Act
ROI	region of influence
SC	DOE Office of Science
SHPO	State Historic Preservation Office(r)
SLI	Strategic Laboratory Infrastructure
SO_2	sulfur dioxide
SPCC	Spill Prevention Control and Countermeasures
SWPPP	Stormwater Pollution Prevention Plan
USC	*United States Code*
UST	underground storage tank

UNITS OF MEASURE

dB(A)	A-weighted decibel(s)
ft	foot (feet)
ft^3	cubic foot (feet)

gal	gallon(s)
ha	hectare(s)
kg	kilogram(s)
km	kilometer(s)
L	liter(s)
lb	pound(s)
m	meter(s)
m^3	cubic meter(s)
mi	mile(s)
mrem	millirem
MWh	megawatt-hour(s)
µm	micrometer(s)
µSv	microsievert(s)
yr	year(s)

COMMON METRIC/BRITISH EQUIVALENTS

Area

1 acre = 43,560 square feet = 0.4047 hectare

1 hectare = 2,4710 acres

Length

1 foot = 0.3048 meters

1 kilometer = 0.6214 mile

1 meter = 3.28 feet

1 mile = 1.6093 kilometers

Volume

1 cubic foot = 0.02832 cubic meter

1 cubic meter = 35.31 cubic feet

1 gallon = 3.78 liters

1 liter = 0.26 gallon

Weight

1 kilogram = 2.205 pounds

1 pound = 0.4536 kilogram

1 metric ton = 1.1023 tons

1 ton = 0.9072 metric ton

EXECUTIVE SUMMARY

This environmental assessment (EA) has been prepared for the U.S. Department of Energy (DOE) in compliance with the National Environmental Policy Act of 1969 (NEPA) to evaluate the potential environmental impacts from proposed modernization planning at Argonne National Laboratory (Argonne) in DuPage County, Illinois.

The proposed action evaluated in this EA is to conduct modernization planning at Argonne according to a consolidated campus approach, while ensuring that Argonne's ability to contribute to DOE's science mission is maintained. Planning would govern the construction of new facilities; the rehabilitation of or additions to existing facilities; the decontamination and/or demolition of existing facilities; and also the construction, maintenance, and operation of associated infrastructure such as roads and utilities. Enhancements to the current condition would be planned through the use of a set of guiding principles, to both help in identifying general design features and in locating future science facilities and associated infrastructure. Guiding principles include:

- **Development Program:** Modernize Argonne to revitalize and reshape existing and new facilities and infrastructure to meet the current and emerging needs for Argonne's scientific missions.

- **Development Pattern:** Seek a balance between increased building heights, closer building proximity, simplified but sufficient circulation networks, and open-space preservation to reinforce a range of pedestrian-oriented settings.

- **Visual Character:** Create well-designed Laboratory facilities that visually reflect leading-edge science, while leveraging the abundance of Argonne's natural environment by incorporating the infusion of natural and indigenous elements into designs.

- **Circulation, Parking, and Accessibility:** Improve the movement of people, emergency vehicles, services, and goods.

- **Environment and Sustainability:** Implement proactive policies and procedures to achieve energy-efficient and environmentally responsible development and ensure compliance with the requirements of Executive Order 13514 (Federal Leadership in Environmental, Energy, and Economic Performance, October 5, 2009) (74 FR 52117).

- **Safety and Security:** Protect employees and users, other site personnel, visitors, the public, and the environment from hazards and risks.

- **Infrastructure and Utility Systems:** Continue modernizing Argonne infrastructure and utility systems that directly support Argonne's current and future core capabilities and scientific missions.

Since planning is not the kind of action that could result in a direct impact on human health or the environment, the EA largely explores cumulative impacts. Cumulative impacts are those impacts that may result from the incremental impacts of an action considered additively with the impacts of other past, present, and reasonably foreseeable future actions. Cumulative impacts are considered regardless of the agency or person undertaking the other actions (Title 40, Part 1508.7, of the *Code of Federal Regulations* [40 CFR 1508.7]) and can result from the combined or synergistic effects of individually minor actions over a period of time. Since there are no direct impacts, cumulative impacts are composed entirely of other past, present, and reasonably foreseeable future actions. The facilities and associated infrastructure that are the subject of planning are considered to be reasonably foreseeable future actions under NEPA.

Those projects in the planning process were both individually and collectively evaluated in each resource area against the guiding principles identified above. The common conclusion was that because modernization planning comprehensively addresses the development of the entire Argonne site, coordination may result in efficiencies when projects are implemented. The proposed action also enables the consolidation of facilities, which has the additional benefit of increasing options for later expansion, while also allowing for the preservation of or even expansion of natural areas. Thus, in general, although modernization planning would not result in impacts, cumulative impacts would be reduced in most resource areas when projects are implemented. Specifically, modernization planning when applied to development projects would result in advantages for land use, geologic and soil resources, water resources, air resources, biological resources, infrastructure and utilities, waste management, transportation, and health and safety. Modernization planning would aid in ensuring compliance with the National Historic Preservation Act (NHPA). Modernization planning would not be expected to result in socioeconomic or environmental justice concerns. Since considerable uncertainty about the authorization and implementation of projects exists, only a few general conclusions about impacts can be made. Prior to undertaking any projects, independent NEPA reviews will be completed, which may result in the preparation of an environmental impact statement or EA, or in a Categorical Exclusion determination being made.

ENVIRONMENTAL ASSESSMENT FOR ARGONNE NATIONAL LABORATORY MODERNIZATION PLANNING

1 INTRODUCTION

This environmental assessment (EA) has been prepared for the U.S. Department of Energy (DOE) in compliance with the National Environmental Policy Act of 1969 (NEPA; *United States Code*, Title 42, Section 4321 et seq. [42 USC 4321 et seq.]) to evaluate the potential environmental impacts associated with proposed modernization planning at Argonne National Laboratory (Argonne) in DuPage County, Illinois (Figure 1-1). Argonne is overseen and primarily funded by the DOE Office of Science (SC). It is operated and managed by UChicago Argonne, LLC. The proposed modernization planning is intended to help assure the availability of facilities needed to accomplish the research missions of Argonne.

1.1 PURPOSE AND NEED FOR ACTION

The purpose of modernization planning is to develop a sitewide framework necessary for Argonne to accomplish its role in meeting DOE's science mission. Planning would govern the construction of new facilities; the rehabilitation of or additions to existing facilities; the decontamination and/or demolition of existing facilities that have reached the end of their functional life; and also the building, maintenance, and operation of associated infrastructure such as roads and utilities. The benefits of planning when projects are implemented include the ability to proactively pursue opportunities for (1) revitalization of existing and new facilities and infrastructure, (2) co-location, (3) improved visual character of facilities, (4) improved transportation throughout the Argonne property, (5) development of new facilities to be energy efficient and environmentally responsible, (6) improvement of the safety and security of the Argonne site and employees, and (7) incorporation of the upgrading and maintenance of utilities in every project. The proposed action allows for a broader scope of planning and addresses the entire Argonne site, long-term considerations, and multiple activities.

1.2 BACKGROUND

Argonne is a federal research and development (R&D) facility managed and operated by UChicago Argonne, LLC, for DOE. The Argonne site occupies about 1,500 acres (607 ha) in DuPage County, Illinois, 25 mi (40 km) southwest of Chicago (Figure 1-1). Approximately 57% of the Argonne site is dedicated to scientific R&D programs. The remainder consists of woodlands, fields, and wetlands. The Waterfall Glen Forest Preserve, which surrounds the Argonne site, and the area to the south between the Forest Preserve and the Des Plaines River are largely undeveloped. Beyond the Waterfall Glen Forest Preserve, the residential population density increases rapidly, especially to the northeast. The 2,040-acre (826-ha) Waterfall Glen Forest Preserve surrounding the Argonne site is mostly former Argonne property that was

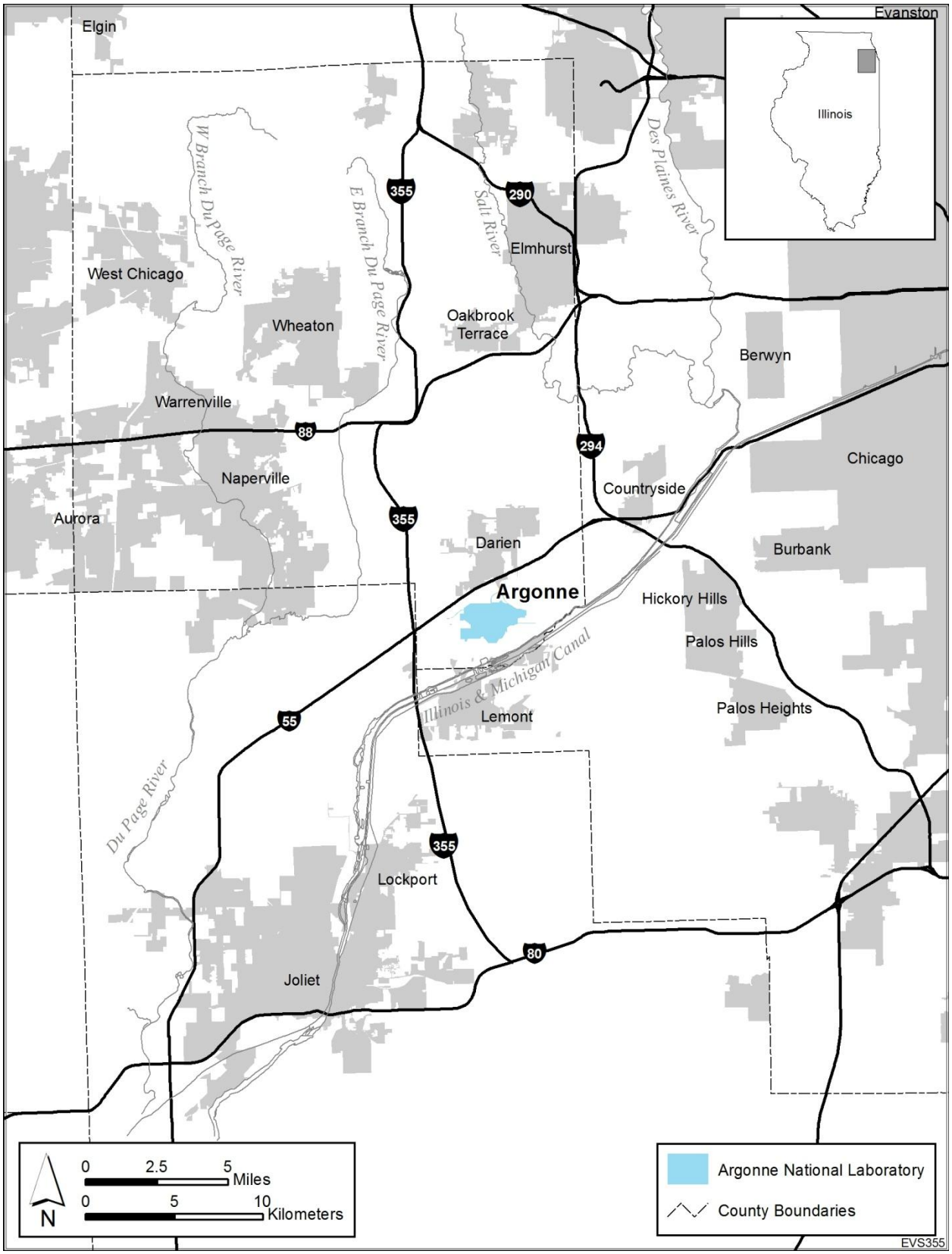


FIGURE 1-1 Location of Argonne National Laboratory

deeded to the DuPage County Forest Preserve District in 1973 for use as a public recreational area and nature preserve. The Des Plaines River, the Chicago Sanitary and Ship Canal, and the Illinois and Michigan Canal are located 1 mi (1.6 km) south of the Argonne site.

Argonne was established in 1946 as the Reactor Center for the Atomic Energy Commission. Argonne's mission was to develop nuclear reactors for both civilian and military applications. In support of its mission, Argonne engaged in material and chemistry studies, fuel design studies, fuel cycle studies, and research into the biological effects of radiation. Argonne maintained a sister facility from 1951 to 2005 in Idaho (Argonne-West), where full-scale reactor experiments occurred. Argonne research was instrumental in the development of the nuclear power industry in the United States through engineering and training. Beginning with the establishment of DOE in 1977, Argonne began transitioning into a multiprogram laboratory. Under DOE, Argonne completed the transition to a multiprogram facility, and, currently, particle accelerator and theory and computational science contribute to its research mission.

Operation of Argonne is accomplished through a series of policies and procedures to manage Laboratory activities. Management objectives are achieved through application of a Laboratory Management System (LMS). The LMS encompasses a number of core processes, including Executive Orders, DOE Orders, DOE policies, and Environment, Safety, and Health (ESH) regulations, which apply to all work performed at Argonne. The LMS defines operating policies and procedures for core operating processes, including strategic planning, asset management, and environmental management.

1.3 SCOPE OF THIS ENVIRONMENTAL ASSESSMENT

This EA addresses Argonne modernization planning. Planning would govern the construction of new facilities; the rehabilitation of or additions to existing facilities; the decontamination and/or demolition of existing facilities; and also the construction, maintenance, and operation of associated infrastructure such as roads and utilities. The potential activities being planned for are dynamic and fluid in that they may change on the basis of federal budget priorities, new regulatory requirements, and changes in Argonne's science mission.

The proposed action does not fall within any of the classes of actions that are described in the DOE NEPA regulations (Title 10, Part 1021, of the *Code of Federal Regulations* [10 CFR Part 1021]). DOE NEPA regulations advise the preparation of an EA to assist agency planning and decision making and specifically to provide sufficient evidence to enable DOE to decide whether to prepare an environmental impact statement (EIS) or issue a "Finding of No Significant Impact" (FONSI). Therefore, this EA has been prepared for DOE to evaluate the potential impacts from the proposed action.

DOE informed the Argonne Community Leaders Roundtable, U.S. Fish and Wildlife Service (USFWS), Illinois Department of Natural Resources (IDNR), Illinois Environmental Protection Agency (IEPA), Illinois State Historic Preservation Office (Illinois SHPO), and the Advisory Council on Historic Preservation (ACHP) of the intent to conduct this EA for the proposed action.

In this EA, the analysis of the proposed action is based on several assumptions. Firstly, modernization planning itself does not authorize any projects. Secondly, if a project was previously authorized, a NEPA review already exists. Thirdly, as other projects are approved, DOE would undertake project-specific NEPA reviews. Finally, given the uncertainty associated with long-term/broad-scale planning, detailed resolution of impacts in this EA is not practical.

DOE Order 436.1 (Departmental Sustainability) implements Executive Order 13514 (Federal Leadership in Environmental, Energy, and Economic Performance, October 5, 2009) (74 FR 52117), which requires the use of Leadership in Energy and Environmental Design (LEED) standards for new construction and other sustainability guidelines, such as reductions in greenhouse gas (GHG) production, water consumption, electrical use, and solid waste generation. These two orders are a major component of the modernization planning process. The Argonne Site Sustainability Plan (Argonne 2010a) details Argonne's sustainability program organization, resources, and actions designed to achieve the goals for transportation, energy and water conservation, renewable and clean energy, pollution prevention, and employee involvement. Sustainability-related impacts by resource area are included in Section 3.2.

2 PROPOSED ACTION AND ALTERNATIVES

2.1 PROPOSED ACTION

The proposed action evaluated by this EA is to conduct modernization planning at Argonne, according to a consolidated campus approach. Modernization planning envisions a number of potential activity types:

- Construction of new buildings to provide collaborative state-of-the-art scientific space;
- Rehabilitation of existing space to adapt to current needs;
- Removal of inefficient, obsolete excess space that is a drain on energy and economic resources;
- Optimization and consolidation of existing space to improve efficiency; and
- Upgrade or expansion of utility and other infrastructure to meet future demands.

The proposed modernization projects listed in Table 2-1 have been identified through a number of processes, including the DOE Strategic Laboratory Infrastructure (SLI), DOE Environmental Management Decontamination and Demolition (D&D), and Institutional General Plant Project (IGPP) programs, as well as State of Illinois-funded projects and third-party financing opportunities, including energy savings performance contracts (ESPCs). Projects are funding- and mission-dependent; however, funding and mission are subject to change over time.

Modernization planning considers the following guiding principles:

- **Development Program:** Modernize Argonne to revitalize and reshape existing and new facilities and infrastructure to meet the current and emerging needs for Argonne's scientific missions.
- **Development Pattern:** Seek a balance between increased building heights, closer building proximity, simplified but sufficient circulation networks, and open-space preservation to reinforce a range of pedestrian-oriented settings.
- **Visual Character:** Create well-designed Laboratory facilities that visually reflect leading-edge science, while leveraging the abundance of Argonne's natural environment by incorporating the infusion of natural and indigenous elements into designs.

TABLE 2-1 Proposed Modernization Projects

		2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
1	SLI-1: Energy Sciences Building (ESB)														
2	Advanced Protein Crystallization Facility (APCF)														
3	Combined Heat & Power Plant (CHP)														
4	APS Beamline Upgrades														
5	Bldg. 200 MA/MB Wings Demolition														
6	IPNS 361, 391, 375 Demolition														
7	SLI-2: Materials Design Laboratory (MDL)														
8	Bldg. 331 Demolition														
9	SLI-3: Bioenvironmental Sciences Building (BESB)														
10	Bldg. 212 Demolition														
11	SLI-4: Multiprogram Laboratory-Office Building														
12	Bldg. 202 Demolition														
13	Bldg. 306 Demolition														
14	SLI-5: Bldg. 362 Renovation														

Construction Demolition Renovation

APS: Advanced Photon Source

IPNS: Intense Pulsed Neutron Source

SLI: Strategic Laboratory Infrastructure

- **Circulation, Parking, and Accessibility:** Improve the movement of people, emergency vehicles, services, and goods.

- **Environment and Sustainability:** Implement proactive policies and procedures to achieve energy-efficient and environmentally responsible development and ensure compliance with the requirements of Executive Order 13514 (Federal Leadership in Environmental, Energy, and Economic Performance, October 5, 2009) (74 FR 52117) and DOE Order 436.1, Departmental Sustainability.

- **Safety and Security:** Protect employees and users, other site personnel, visitors, the public, and the environment from hazards and risks.

- **Infrastructure and Utility Systems:** Continue modernizing Argonne infrastructure and utility systems that directly support Argonne's current and future core capabilities and scientific missions.

Key plans and programs related to modernization include DOE's Argonne National Laboratory 2010–2015 Strategic Plan (Strategic Plan) (Argonne 2010b), the Department of Energy Laboratory Plan for the Office of Science's Argonne National Laboratory (Annual Laboratory Plan) (DOE 2010), the Argonne Site Sustainability Plan (Argonne 2010a), the Argonne Site Modernization Plan (Argonne 2011a), and the Department of Energy Office of Science Mission Readiness Program (DOE 2008).

The Strategic Plan (Argonne 2010b) focuses on ways to advance the national agenda for a secure economy on the basis of renewable energy free of foreign oil dependence with a low carbon footprint. The specific research areas to help meet these goals are energy storage, alternative energy and efficiency, nuclear energy, biological and environmental systems, and national security. Three types of scientific tools are critical to these initiatives—hard X-ray sciences, leadership computing, and materials and molecular design and discovery.

The Annual Laboratory Plan (DOE 2010) is revised each year so that it accurately describes current core research capabilities and the science strategy for future potential major initiatives, along with the facilities and infrastructure needed to support current and proposed future Argonne research missions. The Site Sustainability Plan (Argonne 2010a) provides an aggressive strategy to reduce GHG emissions, reduce water usage, increase the use of alternative fuels, and reduce the use of petroleum products.

The Argonne Site Sustainability Plan (Argonne 2010a) details Argonne's sustainability program organization, resources, and actions designed to achieve the goals of DOE Order 436.1. Two major initiatives of Argonne's Sustainability Plan implementation are the reduction of GHG (e.g., carbon dioxide [CO_2]) emissions and significantly improved energy efficiency at existing High Energy Mission-Specific Facilities (HEMSFs), such as the Advanced Photon Source (APS) and the Argonne Tandem Linear Accelerator System (ATLAS). Challenges to achieving the sustainability goals are the addition of HEMSFs beyond the planning horizon, such as the next generation supercomputing initiative, which could more than double current energy consumption

at Argonne. The Sustainability Plan, when integrated with the modernization planning process, would identify necessary actions to manage this important challenge.

The 2011 Site Modernization Plan (Argonne 2011a) articulates the long-range vision for Argonne's physical development. The plan provides a framework for modernizing existing facilities and for future development in support of Argonne's mission readiness. This plan takes the mission needs into consideration and overlays them with the physical site conditions to define strategies that provide a productive, safe, secure, and environmentally sound workplace. The plan incorporates known and proposed near-term, mid-range, and long-term projects to ensure that the site remains fully mission ready (see Table 2-1).

DOE's SC requires mission readiness of all national laboratories, which is defined as the ability of existing facilities and infrastructure to enable delivery of the science mission. A process has been developed by SC to uniformly assess each SC laboratory for mission readiness and thus allow SC to make well-founded decisions regarding infrastructure and facility investments (DOE 2008). The projects listed in Table 2.1 are major facility elements necessary to assure Argonne's mission readiness, and the assessment process helps identify adequate funding sources.

2.2 NO-ACTION ALTERNATIVE

Under the No-Action alternative, DOE would not develop and implement a comprehensive modernization planning program for the Argonne site. Development of the site would continue to occur under the existing planning processes, which focus on a building-by-building process included in the Argonne project management planning process, without the benefit of comprehensive modernization planning and its guiding principles.

3 AFFECTED ENVIRONMENT AND POTENTIAL ENVIRONMENTAL IMPACTS

3.1 INTRODUCTION AND BACKGROUND

The proposed action is sitewide modernization planning, which includes the consideration of multiple projects over a 20-year time horizon. The goals of the planning include (1) revitalization of existing and new facilities and infrastructure, (2) co-location of facilities, (3) improved visual character of facilities, (4) improved transportation throughout the Argonne property, (5) development of new facilities to be energy efficient and environmentally sustainable, (6) improvement of the safety and security of the Argonne site and employees, and (7) incorporation of the upgrading and maintenance of utilities in every project. The proposed action allows for a broader scope of planning and addresses the entire Argonne site, long-term considerations, and multiple activities.

Two kinds of impacts are considered—direct and cumulative. Direct impacts are those that occur at the same time and place as, and as a direct result of the proposed action. They include the impacts from connected actions, which (1) automatically trigger other actions that may require EISs, (2) cannot or will not proceed unless other actions are taken previously or simultaneously, and (3) are interdependent parts of a larger action and depend on the larger action for their justification (40 CFR 1508.25 (a)(1)(i-iii)). Since planning is not the kind of action that could result in a direct impact on human health or the environment, this EA largely explores cumulative impacts. Cumulative impacts under NEPA are those that may result from the incremental impacts of an action considered additively with the impacts of other past, present, and reasonably foreseeable future actions. Cumulative impacts are considered regardless of the agency or person undertaking the other actions (40 CFR 1508.7) and can result from the combined or synergistic effects of individually minor actions over a period of time. Since there are no direct impacts, cumulative impacts are composed entirely of other past, present, and reasonably foreseeable (albeit not necessarily authorized) future actions. The facilities and associated infrastructure that are the subject of Argonne modernization planning fall into this category. Some are actions for which a NEPA review has already been completed. Others are reasonably foreseeable future actions. Since considerable uncertainty about their authorization and implementation exists, the following impact analysis is general in nature. Cumulative impacts are identified by resource area in the subsequent sections.

The No-Action alternative involves planning for individual projects, absent the benefits of comprehensive planning. Like with the proposed action, impacts are identified in Section 3.2, Environmental Resource Areas. Similar to the proposed action, no direct impacts are expected from the No-Action alternative. No-action cumulative impacts may or may not be similar to proposed action cumulative impacts.

3.2 ENVIRONMENTAL RESOURCE AREAS

3.2.1 Land Use

3.2.1.1 Affected Environment

Argonne maintains a campus-like setting, where buildings and facilities are interspersed with woodlands, grassland, wetlands, and streams. Argonne is surrounded by the Waterfall Glen Forest Preserve of the DuPage County Forest Preserve District. Figure 3-1 shows land use of the Argonne site. Information regarding land use of Argonne is found in the Strategic Plan (Argonne 2010b).

The Argonne site occupies about 1,500 acres (607 ha) in DuPage County, Illinois, 25 mi (40 km) southwest of Chicago. The site was initially larger than the current campus. In 1974, the U.S. government transferred approximately 1,992 acres (806 ha) of land surrounding Argonne to the DuPage County Forest Preserve District. Under the transfer, the government retains limited access to the land to support Argonne functions.

Land use is considered through Laboratory processes such as ARGPOL-4.2 (Siting of Facilities) and LMS-PROC-32 (Real Property Asset Planning), which would be followed for both the proposed action and the No-Action alternative.

3.2.1.2 Environmental Impacts

The proposed action is a planning process. Given the nature of planning, there would be no irreversible or irretrievable commitments of resources associated or connected with it, and there would be no direct impacts on land use. Consequently, cumulative impacts would be composed entirely of other past, present, and reasonably foreseeable future actions.

The projects identified in Table 2-1 were both individually and collectively evaluated against the guiding principles identified in Section 2.1. The footprints of new facilities and associated infrastructure would trigger the “Development Pattern” guiding principle considerations. Because modernization planning addresses the development of the entire Argonne site, issues related to land use would be coordinated much more comprehensively. Modernization planning at the sitewide scale enables the co-location of scientific facilities and consolidation of land use. It has the duel benefit of increasing options for later expansion while also allowing for the preservation of or even expansion of natural areas. Thus, in general, modernization planning when applied to development projects would result in advantages for land use.

FIGURE 3-1 Land Use of the Argonne Site

Under the No-Action alternative, management of land use would continue to be addressed as project-specific needs are developed, with limited opportunities for more effective sitewide management alternatives. Current land management policies would continue to be followed; however, because of the less comprehensive vision, the opportunities to co-locate or expand programmatic activities would be reduced.

3.2.2 Geology and Soils

3.2.2.1 Affected Environment

The geology of the Argonne area consists of about 30 m (100 ft) of glacial drift on top of nearly horizontal bedrock consisting of Niagaran and Alexandrian dolomite underlain by shale and older dolomites and sandstones of Ordovician and Cambrian age. No tectonic features within 62 mi (135 km) are known to be seismically active. The dolomite limestone underlying the Argonne site includes the groundwater supply for protected habitats south of the site.

The soils at Argonne were derived from glacial drift over the past 12,000 years and are primarily of the Morley series, with a slope ranging from 2 to 20%. Morley soils have a relatively low organic content in the surface layer, moderately slow subsoil permeability, and a large water capacity. Additional information regarding geology and soils of the Argonne site is available in Golchert et al. (2011), which is incorporated by reference.

3.2.2.2 Environmental Impacts

The proposed action is a planning process. Given the nature of planning, there would be no irreversible or irretrievable commitments of resources associated or connected with it, and there would be no direct impacts on geology and soils. Consequently, cumulative impacts would be composed entirely of other past, present, and reasonably foreseeable future actions.

The projects identified in Table 2-1 were both individually and collectively evaluated against the guiding principles identified in Section 2.1. The footprints of new facilities and associated infrastructure would trigger the “Development Pattern” guiding principle considerations. Because modernization planning addresses the development of the entire Argonne site, issues related to geological resources would be coordinated much more comprehensively. Modernization planning at the sitewide scale enables the co-location of scientific facilities and the sitewide consideration of soil erosion and soil reuse. Thus, in general, modernization planning when applied to development projects would result in advantages for geologic and soil resources.

Management of soil erosion across the Argonne site would be incorporated into project planning for all new construction and demolition projects. All erosion management projects would be designed to avoid or minimize impacts on downstream resources. Given the increase in impervious surfaces, Argonne would incorporate erosion control measures into its projects to

maintain or improve the current erosion and sedimentation characteristics. The implementation of these features, such as rain gardens and dry wells, would also improve groundwater recharge compared to standard stormwater discharge to surface water. Retention would increase the groundwater recharge rate and improve groundwater quality.

Most considerations for soils involve restricting erosion and controlling the amount of soil reaching waterways. Generally, management of this resource only occurs during excavations or the alteration of waterways. During project implementation, development would be more concentrated in some areas of the Argonne site, potentially resulting in increased erosion in those areas. A benefit of having a modernization planning framework during project implementation would be the comprehensive manner in which erosion would be addressed. Locations of increased erosion would be identified during the planning stage and controlled more effectively under the proposed action.

Under the No-Action alternative, management of geological and soil resources would continue to be addressed as project-specific needs are developed, with limited opportunities for more effective sitewide management alternatives. The only instance where this could result in greater impacts would be when multiple projects occur simultaneously without coordination of environmental considerations among projects. Current policies regarding geology and soils would continue to be followed; however, because of the less comprehensive vision, the opportunities for sitewide consideration of soil erosion and soil reuse would be reduced.

3.2.3 Water Resources

3.2.3.1 Affected Environment

3.2.3.1.1 Groundwater. Two principal aquifers are used as water supplies in the vicinity of Argonne and are located at depths of approximately 200 ft (60 m) and 500 to 1,500 ft (150 to 450 m) below the surface. In northeastern Illinois, the shallow groundwater is within glacial drift units of varying character and extent, and also within the underlying Niagaran and Alexandrian dolomite (Hughes et al. 1966).

After 1997, Argonne began to receive Lake Michigan water originating from the City of Chicago municipal water system. Argonne now receives all its water from this source, as purchased through the DuPage County Water Commission. Surrounding communities obtain drinking water from the Lake Michigan supply and private wells. A few neighboring homeowners still rely on groundwater wells. Additional information regarding groundwater is found in Golchert et al. (2011).

3.2.3.1.2 Surface Water. Surface water features of the Argonne site are shown in Figure 3-2. The greater portion of the Argonne site is drained by Freund Brook, which discharges into Sawmill Creek.

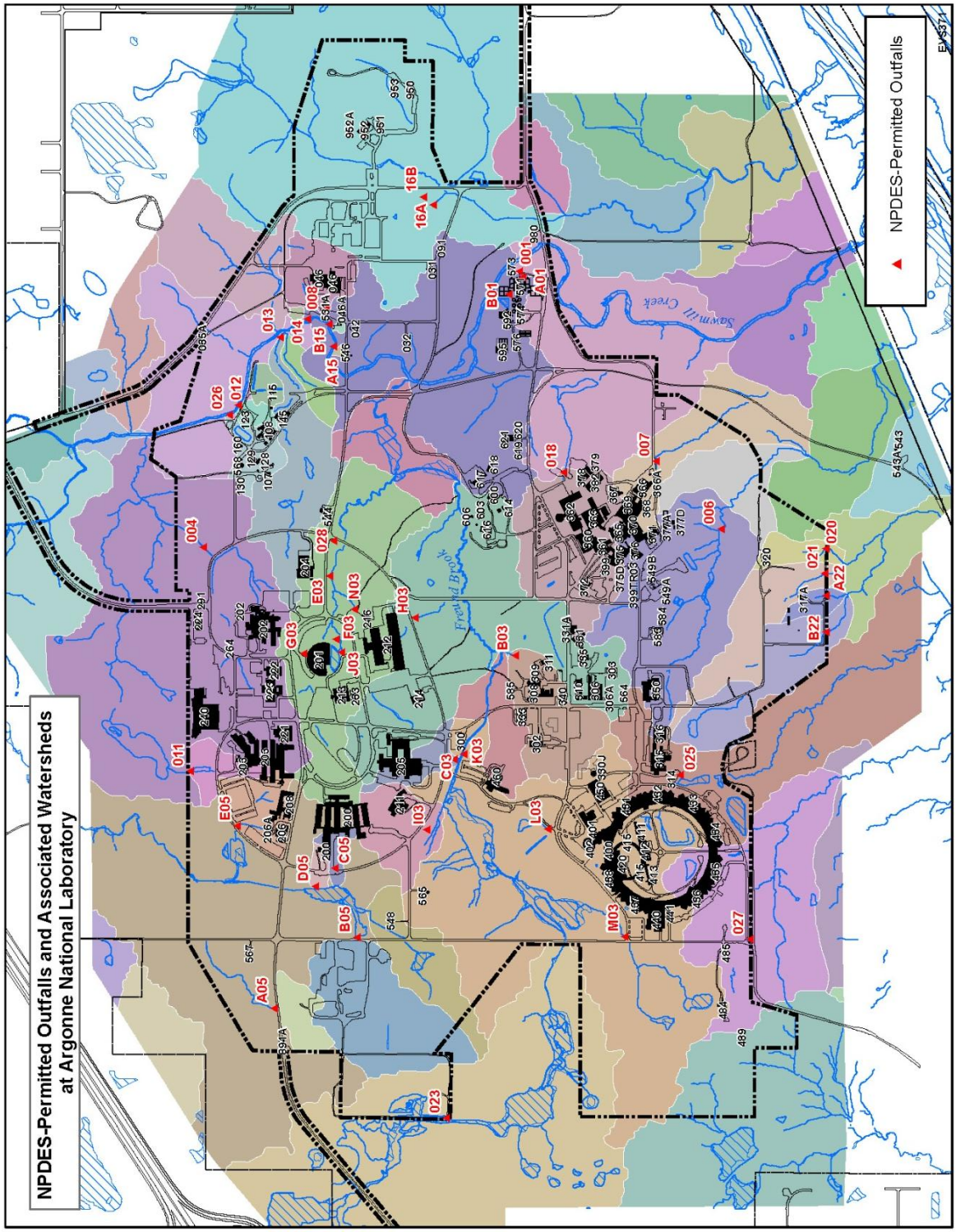


FIGURE 3-2 Surface Water Features, NPDES Outfalls, and Watersheds at Argonne National Laboratory

Sawmill Creek flows through the eastern portion of the site. This stream originates north of the site, flows through the property in a southerly direction, and discharges into the Des Plaines River. Along the southern margin of the property, the terrain slopes abruptly downward to form forested bluffs. These bluffs are dissected by ravines containing intermittent streams that discharge some site drainage into the Des Plaines River.

Residential and commercial development in the area have resulted in the collection and channeling of runoff water into Sawmill Creek. Treated sanitary and laboratory wastewater from Argonne are combined and discharged into Sawmill Creek. The combined Argonne effluent currently consists of 64% laboratory wastewater and 36% sanitary wastewater.

The National Pollutant Discharge Elimination System (NPDES) is the regulatory mechanism designed to achieve the goal of restoration and maintenance of water quality.

Before wastewater can be discharged into any receiving stream, each wastewater discharge point (outfall) must be characterized and described in a permit application. Wastewater discharge at Argonne is permitted by NPDES Permit No. IL 0034592. NPDES Outfalls of the Argonne site are shown in Figure 3-2.

Wastewater at Argonne is generated by a number of activities and consists of sanitary wastewater (from restrooms, cafeteria sinks, and sinks in certain buildings and laboratories), laboratory wastewater (from laboratory sinks and other industrial wastewater sewers), and stormwater. Water softener regenerant from boiler house activities can be discharged into the DuPage County sewer system or the Argonne laboratory sewer system. Cooling water and cooling tower blowdown are generally sent to the laboratory wastewater sewer, although a small volume is still discharged into stormwater ditches that are monitored as part of the NPDES permit. The permit authorizes the release of wastewater from 43 separate outfalls, most of which discharge directly or indirectly into Sawmill Creek.

An extensive stormwater characterization and permitting program was initiated in 1991 and continues as required by the present NPDES permit. Argonne's NPDES permit includes both industrial and stormwater discharges to surface water.

Argonne's Stormwater Pollution Prevention Plan (SWPPP) (Argonne 2011b) ensures compliance with all provisions of the regulations regarding stormwater. Argonne inspects and reports annually on the effectiveness of the sitewide SWPPP. Argonne's annual SWPPP assessment consists of physical walkthroughs of each building on-site to identify any potential pollutant sources and/or conditions that may lead to industrial discharges into Argonne's outfalls. Outfall watersheds are also inspected to verify that no changes have occurred that may affect the permitted discharges at the outfalls. Finally, SWPPP "best management practices" are evaluated to ensure that potential surface water pollution sources remain under good institutional control.

Argonne maintains a Spill Prevention Control and Countermeasures (SPCC) Plan (Argonne 2010e) as required by the Clean Water Act and U.S. Environmental Protection Agency (EPA) regulations at 40 CFR Part 112. This plan describes the planning, design features, and response measures that are in place to prevent oil or oil products from being released into

navigable waters of the United States. Persons with specific duties and responsibilities in such situations are identified, as are reporting and recordkeeping requirements that are mandated by the regulations. Regular training is conducted about implementation of this plan.

In addition to specific NPDES permit conditions, Argonne's discharges are monitored to determine if they conform to the general effluent limits contained in Title 35, Part 304, of the *Illinois Administrative Code* (35 IAC Part 304). Also, samples are collected to determine if Sawmill Creek meets IEPA General Use Water Quality Standards found in 35 IAC Part 302, Subpart B. Additional information regarding surface water management can be found in Golchert et al. (2011).

3.2.3.2 Environmental Impacts

The proposed action is a planning process. Given the nature of planning, there would be no irreversible or irretrievable commitments of resources associated or connected with it, and there would be no direct impacts on water resources. Consequently, cumulative impacts would be composed entirely of other past, present, and reasonably foreseeable future actions.

The projects identified in Table 2-1 were both individually and collectively evaluated against the guiding principles identified in Section 2.1 The footprints of new facilities and associated infrastructure would trigger the "Development Pattern" and "Environment and Sustainability" guiding principle considerations. Because modernization planning addresses the development of the entire Argonne site, issues related to surface water resources would be coordinated much more comprehensively. Modernization planning at the sitewide scale enables the consideration of areawide water conservation and storm water systems. Thus, in general, modernization planning when applied to development projects would result in advantages for water resources.

The initial development of the Argonne site significantly affected water resources. Management of changes in runoff characteristics of the Argonne site, including volume and velocity, would be incorporated into project planning for all new construction and demolition projects. All stormwater management projects would be designed to avoid or minimize impacts on downstream flow conditions. Given the increase in impervious surfaces, Argonne would incorporate stormwater retention systems into its projects to maintain or improve the current runoff characteristics. The implementation of these features, such as rain gardens and dry wells, would also improve groundwater recharge compared to standard stormwater discharge to surface water. Retention would increase the groundwater recharge rate and improve groundwater quality. The increased density of structures in portions of the Argonne site would limit these stormwater management projects to relatively few watersheds. More importantly, this consolidation would result in a smaller overall increase in impervious surfaces, thus increasing opportunities for the establishment of natural drainage patterns in other watersheds.

Implementing projects within a modernization planning framework would also conserve water by using LEED principles in modernization projects, such as the reduction of industrial cooling water. Efforts to achieve water conservation goals are outlined in the Argonne

Sustainability Plan (Argonne 2010a), including the goal of reducing potable water use by 26% by 2020. Additional sitewide planning for new water lines or sewer lines would be performed with the goal of reducing water line breaks and leakage and reducing water infiltration into the sewers, which could improve the wastewater treatment process. There would also be a reduction in the number of lines at the site based on this planning.

Under the No-Action alternative, management of runoff would continue to be addressed as project-specific needs are developed, with limited opportunities for more effective sitewide management alternatives. Potential effects would include increases in runoff within some stream channels, with associated increases in channel erosion and sediment loads, as well as reduced infiltration to shallow groundwater. Downstream flows may be subjected to increased fluctuations, with increased volumes and velocities.

3.2.4 Air Quality and Noise

3.2.4.1 Affected Environment

The meteorology of the Argonne site is monitored at the on-site meteorological station, which is located adjacent to the APS site. Meteorological conditions for 2010 are summarized in the Argonne 2010 Site Environmental Report (Golchert et al. 2011).

3.2.4.1.1 Ambient Air Quality and Noise. The Clean Air Act (CAA) is a federal statute that addresses the emission of regulated air pollutants, which include criteria pollutants (carbon monoxide [CO], sulfur dioxide [SO_2], lead [Pb], nitrogen oxides [NO_x], particulate matter with an aerodynamic diameter of 2.5 µm and 10 µm [$PM_{2.5}$ and PM_{10}], and ozone [O_3]), hazardous air pollutants (HAPs), and ozone-depleting substances. The Illinois State Ambient Air Quality Standards for criteria pollutants are identical to the National Ambient Air Quality Standards (NAAQS) set by the EPA.

The Argonne site is located in the Metropolitan Chicago Interstate Air Quality Control Region (AQCR 067), which covers northeastern Illinois and northwestern Indiana. DuPage County is currently an attainment area for all criteria pollutants except O_3 and $PM_{2.5}$ (40 CFR 81.314 and 40 CFR Part 81). DuPage County emissions of criteria pollutants are shown in Table 3-1. An attainment area for a criteria pollutant is an AQCR (or portion thereof) in which the EPA has determined that ambient air concentrations do not exceed the pollutant's respective NAAQS.

Under Title V of the Clean Air Act Amendments of 1990, a finalized Clean Air Act Permit Program (CAAPP) was issued on April 3, 2001, by the IEPA for a sitewide, federally enforceable operating permit to cover emissions of all regulated air pollutants at the facility. Argonne meets the definition of a major source because of potential emissions of NO_x in excess of 90.72 metric tons/yr (100 tons/yr), CO in excess of 90.72 metric tons/yr (100 tons/yr), or SO_2 in excess of 90.72 metric tons/yr (100 tons/yr) at the Building 108 central heating plant (CHP).

Table 3-1 presents a summary of estimated air discharges (estimated based on equipment runtime and other emission factors for each source) of criteria pollutants from the permitted air point-source discharges at Argonne.

The Argonne site contains a large number of air emission point sources. The vast majority are laboratory ventilation systems used for bench-scale research activities. For purposes of the Title V permit, these activities are categorized as insignificant, except in cases involving the emission of radionuclides.

The National Emission Standards for Hazardous Air Pollutants (NESHAPs) constitute a body of federal regulations that set forth emission limits and other requirements, such as monitoring, recordkeeping, and operational and reporting requirements, for activities generating emissions of certain HAPs. The only standards affecting Argonne operations are those for asbestos and radionuclides. Many buildings on the Argonne site contain large amounts of asbestos-containing material (ACM), such as thermal system insulation around pipes and tanks, spray-applied surfacing material for fireproofing, floor tile, and asbestos-cement (Transite) panels. This material is removed as necessary during renovations or maintenance of equipment and facilities. The removal and disposal of this material are governed by the asbestos NESHAP. Argonne maintains an asbestos abatement program designed to ensure compliance with these and other regulatory requirements. All removal work is performed in accordance with both NESHAP and Occupational Safety and Health Administration (OSHA) requirements governing worker safety at ACM removal sites.

TABLE 3-1 Emissions of Criteria Pollutants and Volatile Organic Compounds from DuPage County and Argonne Sources in 2009

Air Pollutant	DuPage County Emissions (tons/yr)[a,b]	Argonne Emissions (tons/yr)[b,c]	Argonne Emissions % of DuPage County
SO_2	228.3	41.72	18.3
NO_x	1057.4	67.78	6.4
CO	931.3	61.95	6.7
VOM	1740.4	3.82	0.2
PM_{10}	328.0	3.98	1.2
$PM_{2.5}$	NA[d]	1.07	NA
Pb	NA	0	NA

[a] Source: IEPA (2010).

[b] To convert to metric tons, multiply by 0.9072.

[c] Source: Golchert et al. (2010).

[d] NA = not available or not applicable.

The NESHAP for radionuclide emissions from DOE facilities (40 CFR Part 61, Subpart H) establishes the emission limits for the release of radionuclides other than radon to the air and the corresponding requirements for monitoring, reporting, and recordkeeping. A number of emission points at Argonne are subject to these requirements and are operated in compliance with them. The amount of radioactive material released to the atmosphere from Argonne emission sources is extremely small, thereby contributing little to the off-site dose.

Argonne has established goals for the management of GHG emissions in the *Argonne National Laboratory Site Sustainability Plan* (Argonne 2010a), which is incorporated by reference. Progress in meeting the goals is tracked and reported annually.

The Argonne site contains a number of sources of conventional air pollutants, including a steam plant, gasoline and ethanol/gasoline blend fuel-dispensing facilities, a dust collection system, an engine test facility, a surface treatment facility for etching research equipment, a number of diesel generators, and a wastewater treatment plant.

Argonne operations and research activities utilize a number of nonradioactive volatile chemicals, fuels, and combustion products that have the potential to adversely affect the environment if released into the air in sufficient quantities. However, most of these materials are used or generated in small enough quantities that the potential for measureable release into the atmosphere is very low (Golchert et al. 2011).

Because of the small scale of the research conducted at Argonne, most chemicals are used in small quantities within laboratories, and the potential for a significant release to the outside air is very small.

The Argonne site is surrounded by forest preserve, and there are residential and commercial developments around the preserve. The major source of noise around the Argonne site is Interstate 55 (I-55), which runs southwest–northeast about 0.9 mi (1.45 km) north of the site.

Currently, no major noise-producing sources exist on-site, except for temporary truck traffic and heavy equipment operations (Hinterman 2004). No off-site sensitive noise receptors (e.g., hospital, schools) are located near the site. The closest sensitive receptor is the Argonne Child Development Center on the Argonne property.

Daytime ambient sound levels around the Argonne site were measured in September 2001 near Argonne's boundary and at the nearest residential area, which are 0.45 mi (0.72 km) and 0.33 mi (0.53 km), respectively (Hinterman 2001). Results showed that noise levels are relatively high due to heavy traffic from I-55, averaging 55 dB(A) near the Argonne boundary and 60 dB(A) at the nearby residential area. The Noise Control Act of 1972, with its subsequent amendments (Quiet Communities Act of 1978 [42 USC 4901−4918]), delegates to the states the authority to regulate environmental noise and directs government agencies to comply with local community noise statues and regulations. The State of Illinois has quantitative noise-limit regulations (*Illinois Noise Regulations,* Title 35).

3.2.4.2 Environmental Impacts

The proposed action is a planning process. Given the nature of planning, there would be no irreversible or irretrievable commitments of resources associated or connected with it, and there would be no direct impacts on air quality and noise. Consequently, cumulative impacts would be composed entirely of other past, present, and reasonably foreseeable future actions.

The projects identified in Table 2-1 were both individually and collectively evaluated against the guiding principles identified in Section 2.1. The construction and operation of new facilities and associated infrastructure would trigger the "Environment and Sustainability" guiding principle considerations. Because modernization planning addresses the development of the entire Argonne site, issues related to air quality and noise management would be coordinated much more comprehensively. Modernization planning at the sitewide scale enables the coordination of areawide air emission controls. Thus, in general, modernization planning when applied to development projects would result in advantages for air resources.

Management of air quality and noise would be incorporated into project planning for all new construction, renovation, and demolition projects. All projects would be designed to avoid or minimize impacts on overall air quality and noise. The management of air emissions across the entire Argonne site would result in increased opportunities to effectively manage air quality. Implementing projects within a modernization planning framework would also protect air quality by using LEED principles in modernization projects such as the reduction of GHGs. While the addition of multiple new facilities would add new sources of criteria pollutants and electricity consumption across the site, with concomitant emissions of GHGs, the incorporation of energy efficiency and environmentally responsible development would help control the increases of overall air emissions. In addition, the focus on removal of inefficient facilities would contribute to effective air quality management.

The increased density of structures in portions of the Argonne site would present challenges in the management of fugitive dust and other criteria pollutants during implementation of modernization project activities. However, because modernization planning focuses on comprehensive planning across the site, during project implementation, management of multiple projects would be coordinated, which would provide opportunities for the effective management of emissions of fugitive dust and other criteria pollutants. By implementing projects within a modernization planning framework, there is an increased likelihood of multiple construction, demolition, or renovation projects occurring simultaneously, due to benefits related to economies of scale and continuity of operations. In the event that multiple construction projects were occurring simultaneously, implementing projects within a modernization planning framework would allow for increased coordination and comprehensive noise management.

A cumulative benefit from implementing projects within a modernization planning framework relates to controlling air emissions. Air emissions from Argonne are limited by an air permit. To maintain permitted levels, Argonne must coordinate its releases in order to stay below permitted levels. Without coordination, there is a potential for exceedances of the permit, which could affect mission goals. Management would provide the direction of the limits and would make the final decision for Argonne. The removal of obsolete radiological facilities would

reduce radiological air emissions, which would be a positive cumulative effect. Reduction in nuclear materials eliminates the safety hazard associated with these facilities. Additional cumulative air sources include prescribed burns that are performed both on and off the site. Prescribed burns are performed by Argonne on-site and by the county off-site. These emissions can occur in the spring and fall and would be small and localized. Therefore, implementing projects within a modernization planning framework would make a small contribution to cumulative impacts on air quality and noise.

Temporary increases in noise could occur due to increased coordination from modernization planning. However, coordination of projects would ensure compliance with regulatory limits. Temporary increases in noise levels from construction, demolition, and renovation projects would minimally affect on-site workers.

Under the No-Action alternative, management of air quality would continue to be addressed as project-specific needs are developed, with limited opportunities for long-term coordination. Lack of coordination may cause emission permit limits to be reached without consideration of potential emissions from future science missions. Because fewer projects are likely to occur simultaneously under the No-Action alternative, noise from construction, demolition, and renovation would likely be lower than if projects were implemented using modernization planning.

3.2.5 Biological Resources

3.2.5.1 Affected Environment

The 1,500-acre (608-ha) Argonne site includes approximately 850 acres (344 ha) of developed areas (including facilities, roadways, parking lots, and lawns) and 650 acres (264 ha) of relatively undisturbed woodlands, prairies, old fields, and wetlands. The site is surrounded by the Waterfall Glen Forest Preserve, which contains habitat types similar to the undeveloped habitats present on Argonne. The 2,240-acre (907-ha) preserve is managed by the Forest Preserve District of DuPage County.

Habitats on the Argonne site include deciduous forest, coniferous forest, woodland, savanna, old field, prairie, wetland (marsh and forested wetland), and open water (Figure 3-3). Large areas of mowed lawn are present in developed areas of the site. Mowed lawn, oak woodland, oak savanna, and old field are the most common habitat types. The woodlands and savannas represent remnant native natural communities.

Old-field habitats are dominated by non-native grasses and forbs, with occasional mixtures of agricultural grasses and native prairie grasses and forbs (Messenger et al. 1969). Areas dominated by native prairie plants occur in the eastern and southwestern portions of Argonne.

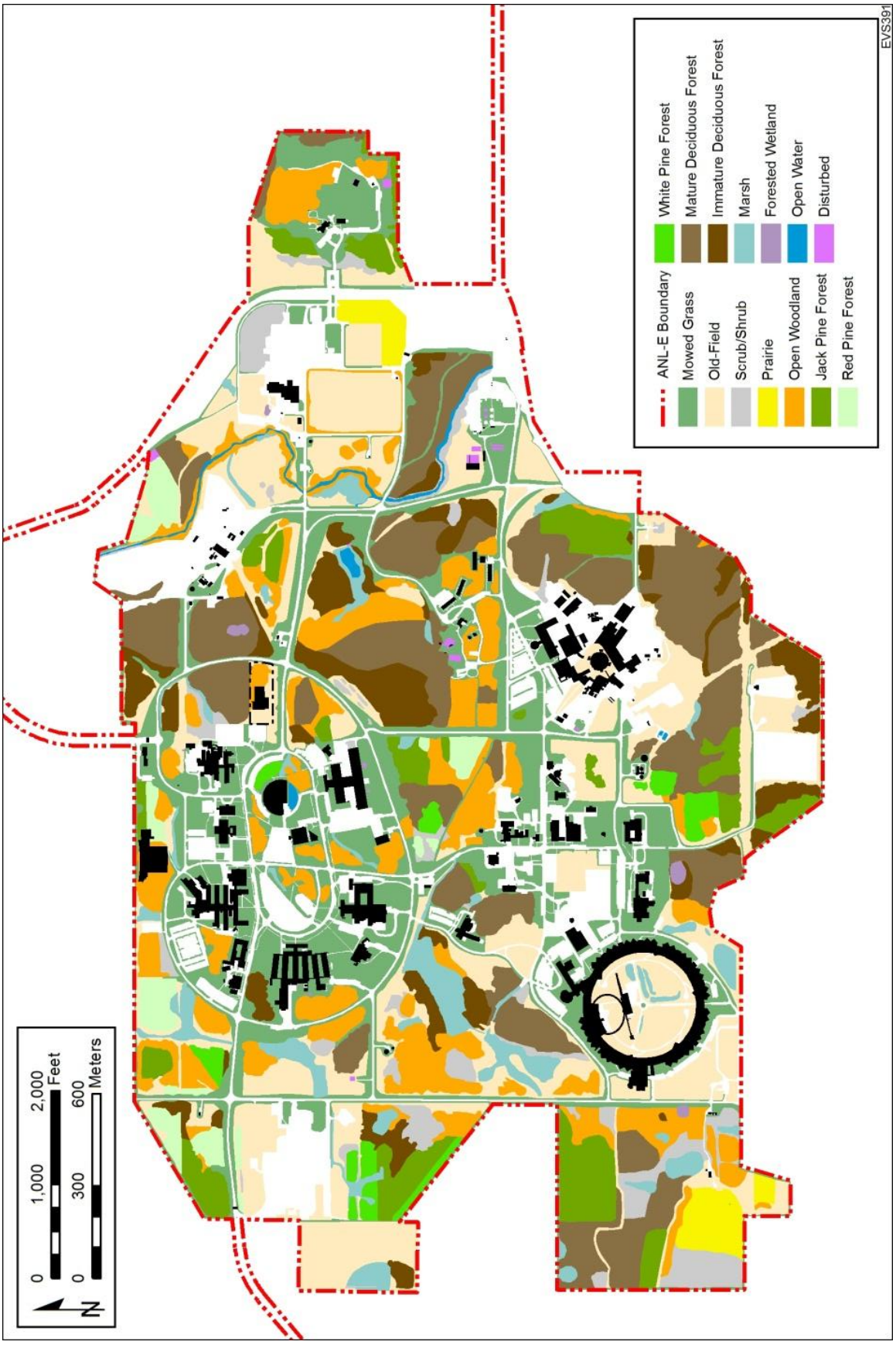


FIGURE 3-3 Habitats of the Argonne Site

A diverse assemblage of wildlife species occurs at Argonne. Messenger and associates (Messenger et al. 1969) listed more than 120 vertebrate species at Argonne, and many others have since been identified.

Wetlands are a common feature of the northern Illinois landscape, although many wetlands have been drained for agricultural purposes or lost due to urban development. Many wetlands of the region, including those on the Argonne site, are the result of glacial activity, such as scouring of depressions, deposition of various glacial materials, and development of drainageways. Numerous shallow depressions and drainages support wetlands at Argonne (Van Lonkhuyzen et al. 1999). Wetlands of Argonne are shown in Figure 3-4. Prior to construction of the APS, the Corps of Engineers (COE) issued a permit allowing the loss of small wetlands that would be affected during APS construction. The permit was issued on the basis that a new wetland (Wetland R) would be established to replace the lost wetlands (DOE 1990). An additional small wetland, Wetland C, was to be protected during construction. When the COE conducted an inspection in 1996, the COE found that the wetlands (C & R) did not meet COE standards after the required 5-year monitoring period. In 2000, Argonne began providing annual funding of efforts to improve the Wetland R status. Nevertheless, the *Environmental Assessment for Enhanced Operations of the Advanced Photon Source at Argonne National Laboratory East, Argonne, Illinois* concluded that Wetland C had been lost (DOE 2003a). However, agreement from the COE to terminate efforts was not obtained at that time. The COE has recently accepted Wetland R as a viable wetland replacement for the small wetlands destroyed during construction and has concluded that Wetland C is isolated and therefore nonjurisdictional; thus mitigation of Wetland C impacts is no longer needed.

Wetland types that occur at Argonne include floodplain or riparian wetlands, forested wetlands, and marshes. Several high-quality, relatively undisturbed wetlands that support unusual plant species or high species diversity occur at Argonne. Aquatic habitats on the Argonne site include streams (Sawmill Creek, Freund Brook, and associated tributary drainages), ditches, beaver ponds, and artificial ponds. Within the Argonne site, 100-year floodplains are located along Sawmill Creek, Freund Brook, Wards Creek, and a small unnamed creek running through Argonne Park and the eastern portion of the Argonne site (Figure 3-4) (FEMA 1982; Argonne 1998).

No federally listed threatened or endangered species are known to occur on the Argonne site, and no critical habitats of federally listed species exist on the site. Informal consultation with the USFWS for Endangered Species Act (ESA) Section 7 compliance confirmed this conclusion. See Section 4 for details of consultations. Because the modernization planning process in itself has no impacts, no official correspondence was required.

Three federally listed endangered species and one federally listed threatened species inhabit the Waterfall Glen Forest Preserve that surrounds the Argonne property (Golchert et al. 2011). The Hine's emerald dragonfly (*Somatochlora hineana*), federally and state listed as endangered, occurs in locations with calcareous seeps and wetlands along the Des Plaines River floodplain. Leafy prairie clover (*Dalea foliosa*), which is federally and state listed as endangered, is associated with dolomite prairie remnants of the Des Plaines River

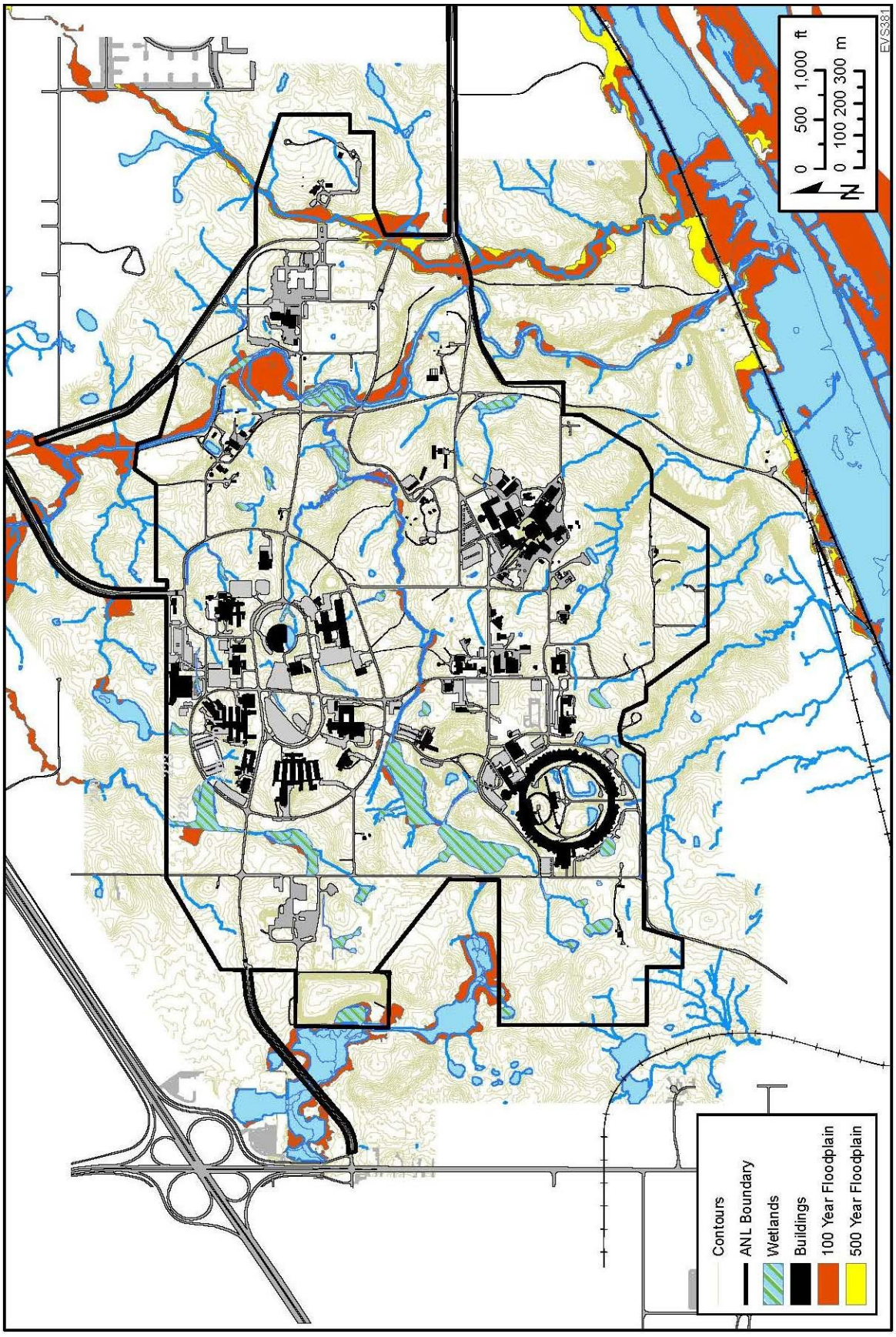


FIGURE 3-4 Wetlands and Floodplains at Argonne National Laboratory

Valley; two planted populations of this species occur in the Waterfall Glen Forest Preserve. An unconfirmed capture in the Waterfall Glen Forest Preserve of an Indiana bat (*Myotis sodalis*), which is federally and state listed as endangered, indicates that this species may occur in the area. The federally listed threatened and state-listed endangered lakeside daisy (*Tetraneuris herbacea*) occurs as a planted population in the Waterfall Glen Forest Preserve.

Although state-listed species that occur in the area are not covered by the ESA, the following additional state-listed species can be found on the Argonne site or within the vicinity of Argonne:

- Endangered
  - Blanding's turtle (*Emydoidea blandingii*)
  - Eastern massasauga (*Sistrurus catenatus catenatus*) (candidate for federal listing)
  - Tennessee milkvetch (*Astragalus tennesseensis*)
  - Tuckerman's sedge (*Carex tuckermanii*)
  - Yellow-crowned night heron (*Nyctanassa violacea*)
- Threatened
  - Buffalo clover (*Trifolium reflexum*)
  - Kirtland's snake (*Clonophis kirtlandi*)
  - Marsh speedwell (*Veronica scutellata*)
  - Shadbush (*Amelanchier interior*)

Of these, the Kirtland's snake has been observed on Argonne property. DOE conducted informal consultation with the IDNR regarding state-listed species.

3.2.5.2 Environmental Impacts

The proposed action is a planning process. Given the nature of planning, there would be no irreversible or irretrievable commitments of resources associated or connected with it, and there would be no direct impacts on biological resources. Consequently, cumulative impacts would be composed entirely of other past, present, and reasonably foreseeable future actions.

The projects identified in Table 2-1 were both individually and collectively evaluated against the guiding principles identified in Section 2.1. The footprints of new facilities and associated infrastructure would trigger the "Development Pattern" and "Environment and Sustainability" guiding principle considerations. Because modernization planning addresses the development of the entire Argonne site, issues related to biological resources would be coordinated much more comprehensively. Modernization planning at the sitewide scale enables the co-location of scientific facilities and consolidation of land use, which allows for the preservation of or even expansion of natural areas. Thus, in general, modernization planning when applied to development projects would result in advantages for biological resources.

Management of changes in characteristics of surface or groundwater flows into wetlands on the Argonne site, related to changes in impervious surfaces, would be incorporated into project planning for all new construction and demolition projects. By implementing projects within a modernization planning framework, the resulting sitewide consideration of surface water and groundwater (see Section 3.2.3) would increase the effectiveness of wetlands management across the site. Indirect effects related to hydrologic and water quality changes, such as water level fluctuations and sediment inputs, in wetlands within watersheds of new facilities would be minimized. Restored natural drainage patterns in other areas would be conducive to improvement of wetland quality in affected watersheds.

The increased density of structures in portions of the Argonne site would limit habitat losses to relatively few areas. In addition, implementing projects using comprehensive sitewide project planning would provide greater opportunities to (1) avoid negative impacts on high-quality habitats, (2) assess habitat losses across the site, and (3) address those losses by the creation of new habitats as old facilities are removed. As a result of implementing projects within a modernization planning framework, management of biological resources of the Argonne site would be improved, with expected benefits, including reductions in hydrologic changes to wetlands and overall increases in native habitats. No direct impacts on wetlands or federally or state-listed threatened or endangered species would occur as a result of the proposed action. Cumulative impacts on wetlands and threatened or endangered species from project implementation would be evaluated in project-specific NEPA analyses.

The initial development of the Argonne site significantly affected biological resources. However, biological resource management, occurring as a result of activities identified in the Land Management and Habitat Restoration Plan (Argonne 2008) and other land management initiatives, could potentially beneficially affect biological resources. Additional management activities could occur in the Waterfall Glen Forest Preserve, which could beneficially affect species or communities.

Under the No-Action alternative, management of biological resources would continue to be addressed as project-specific needs are developed, with limited opportunities for effective management alternatives. Potential effects would include increases in indirect impacts on wetlands and other habitats from changes in surface water flows as well as reduced infiltration to shallow groundwater. Wetlands may be subjected to greater hydrologic changes, such as increased fluctuations, along with increased sediment inputs. With the absence of comprehensive sitewide planning during project implementation, greater losses of native habitat may occur across the Argonne site, with limited opportunities for creating new habitat.

3.2.6 Cultural Resources

3.2.6.1 Affected Environment

Cultural resources include both archaeological sites (e.g., prehistoric campsites, former historic farmsteads) and historic structures and features (e.g., historic buildings, irrigation

ditches). Phase I archaeological surveys have been completed for 465 acres (188 ha) of the Argonne facility, and 46 archaeological sites have been recorded. Of these, 25 sites have been evaluated for inclusion in the *National Register of Historic Places* (NRHP); 3 sites are eligible, 22 are not. The remaining 21 recorded sites have not been formally evaluated to determine if they are eligible for inclusion on the NRHP (Argonne 2010d). The locations of the 46 sites have been plotted on a site map, which is used for identification purposes by individuals responsible for regulatory compliance review.

In addition to archaeological resources, two historic districts, seven individual structures (including two that are also part of a district), eight specialized facilities, and one historically significant building complex have been determined eligible for listing in the NRHP at Argonne. The sitewide historic property inventory of all buildings constructed at Argonne prior to 1989 identified the two historic districts (one district predates the Laboratory), four individual buildings, and three specialized facilities. Prior to the inventory, five nuclear reactors, an individual building, and a building complex were determined eligible following project-specific evaluations (Figure 3-5). Two of the reactors and the individual building have been documented according to Illinois Historic American Building Survey/Historic American Engineering Record (IL HABS/HAER) standards, and subsequently demolished.

3.2.6.2 Environmental Impacts

The proposed action is a planning process. Given the nature of planning, there would be no irreversible or irretrievable commitments of resources associated or connected with it, and DOE determined there would be no direct impacts on cultural resources. Pursuant to Section 106 of the National Historic Preservation Act (NHPA), DOE consulted with the Illinois SHPO and the ACHP concerning the proposed action. Ultimately, a finding of no adverse effect was reached for the proposed action. The corroborating correspondence is found in Appendix A. Consequently, cumulative impacts would be composed entirely of other past, present, and reasonably foreseeable future actions.

The projects identified in Table 2-1 were both individually and collectively evaluated against the guiding principles identified in Section 2.1 The footprints of new facilities and associated infrastructure would trigger the “Development Pattern” and “Environment and Sustainability” guiding principle considerations. Modernization planning at the sitewide scale enables the co-location of scientific facilities, which could limit effects on significant cultural resources. Because modernization planning addresses the development of the entire Argonne site, issues related to cultural resources would be coordinated much more comprehensively. Thus, in general, modernization planning would aid in ensuring compliance with the NHPA.

When individual projects are proposed, DOE will conduct a Section 106 review in consultation with the Illinois SHPO for the project. The appropriate surveys and evaluations would be undertaken for the projects. If adverse effects are identified, mitigation actions would be developed and implemented early in the process to avoid project delays. Cultural resource management activities, such as site monitoring or stabilization of cultural resources identified

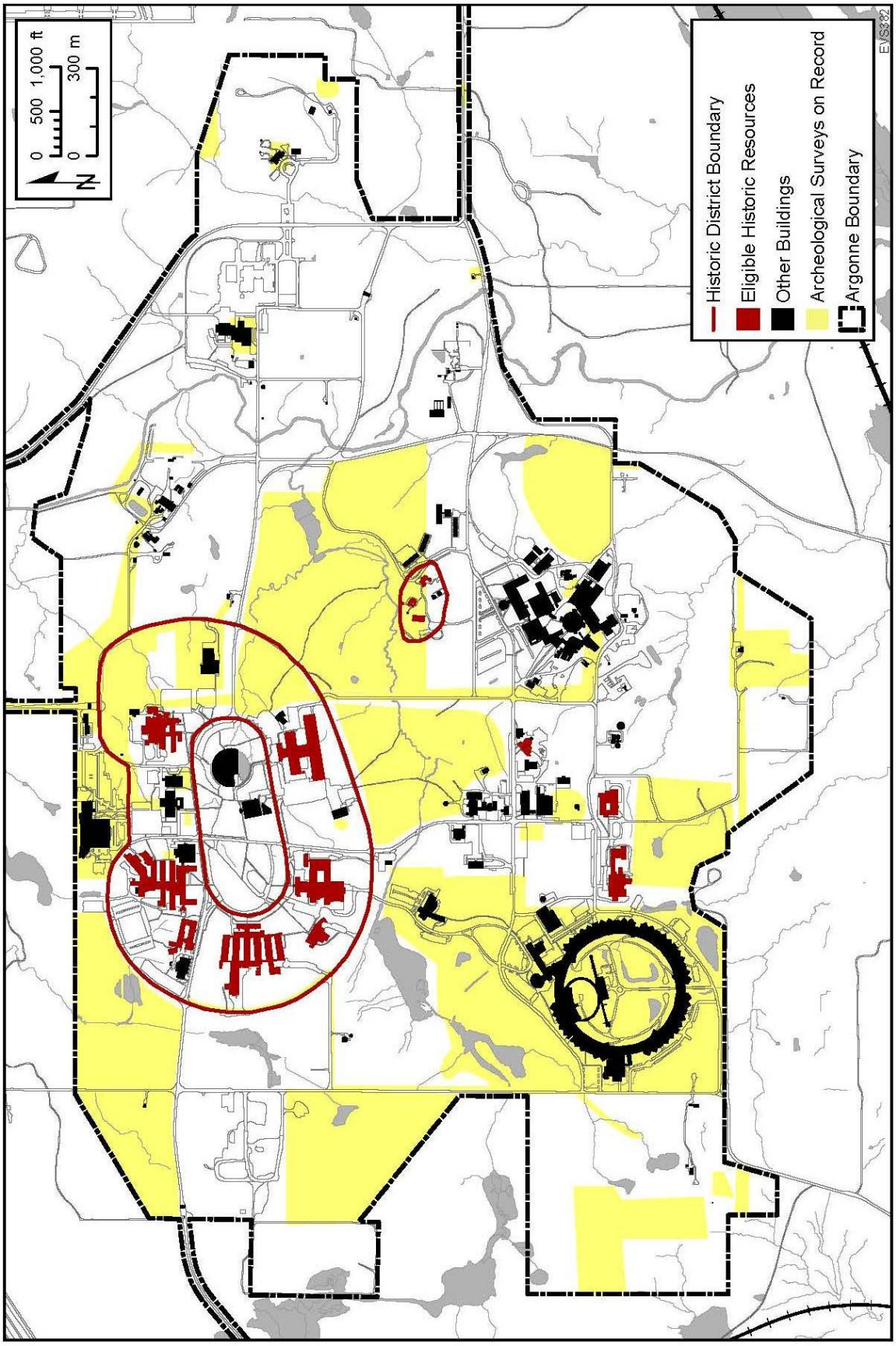


FIGURE 3-5 Historic Districts and Archeological Surveys at Argonne National Laboratory

through the Argonne Cultural Resources Management Plan (CRMP) (Argonne 2010d), are considered outside the scope of the planning for modernization.

Cultural resources are managed through the processes identified in the Argonne CRMP. The CRMP incorporates a Programmatic Agreement (DOE 2002) between the Illinois State Historic Preservation Agency (IHPA) and the DOE, signed in 1999, that helps guide the management of cultural resources at Argonne. Implementing projects within a modernization planning framework can identify issues that would alter historic properties at Argonne and aid in developing appropriate mitigation for larger-scale development.

Under the No-Action alternative, management of cultural resources would continue to be addressed as project-specific needs are developed, with limited opportunities for more effective sitewide management initiatives. It is not expected that advanced planning for surveys or mitigation would be implemented under the No-Action alternative.

3.2.7 Socioeconomics

3.2.7.1 Affected Environment

The Argonne site is located in southern DuPage County in the greater Chicago metropolitan region in an area of suburban development and county parks. The site is surrounded by a number of suburban communities. The area also contains manufacturing centers, utilities, transportation, warehousing, and commercial development. The Waterfall Glen Forest Preserve of the Forest Preserve District of DuPage County surrounds the Argonne site.

Socioeconomic data for Argonne are presented for a region of influence (ROI) encompassing three counties—Cook, DuPage, and Will. The ROI is based on the residential locations of Argonne full-time employees and captures the area in which Argonne workers are expected to spend their wages and salaries, and where a substantial portion of construction and operation procurement is expected to occur. Currently, approximately 85% of Argonne workers live in the three-county ROI (Stepuszek 2005).

In the following sections, two key measures of economic development for the ROI are described—employment and personal income. Additionally, the proximity of minority and low-income populations to Argonne is described in an environmental justice section.

3.2.7.1.1 Employment. In 2008, total employment in the ROI stood at 3.2 million (Table 3-2). ROI employment grew at an annual average rate of 0.1% over the period 1998 to 2008. The economy of the ROI is dominated by service industries, with employment in these activities currently contributing more than 50% of all employment in the ROI. The wholesale and retail trade sectors (16.7%) and manufacturing sector (9.5%) are also significant employers in the ROI. Employment at Argonne is approximately 3,200 employees.

TABLE 3-2 ROI Employment by Industry, 2008

Sector	Number of Employees	% of ROI Total
Forestry, fishing, hunting, and agriculture support	163	0.005
Mining, quarrying, and oil and gas extraction[a]	1,185	0.04
Utilities	10,972	0.3
Construction	139,728	4.4
Manufacturing	305,195	9.5
Wholesale trade	193,375	6.0
Retail trade	341,398	10.7
Transportation and warehousing	151,690	4.7
Information	94,281	2.9
Finance and insurance	228,107	7.1
Real estate and rental and leasing	61,038	1.9
Professional, scientific, and technical services	270,114	8.4
Management of companies and enterprises	120,560	3.8
Administrative and support and waste management and remediation services	294,668	9.2
Educational services	106,238	3.3
Health care and social assistance	413,072	12.9
Arts, entertainment, and recreation	44,429	1.4
Accommodation and food services	273,972	8.6
Other services (except public administration)	151,583	4.7
Industries not classified[a]	197	0.006
Total	3,201,965	

[a] Estimated.

Source: U.S. Census Bureau (2008).

3.2.7.1.2 Income. According to the U.S. Department of Commerce (DOC), personal income in the ROI was $319 billion in 2009. Personal income grew at an annual average rate of growth of 3.5% over the 2000 to 2009 period (Table 3-3). ROI personal income per capita also rose over that period. It was $45,689 in 2009, compared with $37,342 in 2000.

3.2.7.1.3 Environmental Justice. Executive Order 12898 (Federal Actions to Address Environmental Justice in Minority and Low-Income Populations, February 11, 1994) (59 FR 7629) mandates that federal agencies incorporate environmental justice considerations as part of their missions.

On the basis of the 2010 Census, approximately 9.4 million people live within census tracts located within a 50-mi (80-km) radius of Argonne, and approximately 230,000 people live within census tracts located within a 5-mi (8-km) radius of Argonne (Table 3-4). A 50-mi (80-km) radius area would include the potential extent of all possible adverse health and environmental effects of Argonne operations. Approximately 34.9% of the 50-mi (80-km) population and 22.7% of the 5-mi (8-km) population are composed of minorities, as compared

TABLE 3-3 ROI Personal Income (2009 dollars)

Income	2000	2009	Average Annual Growth Rate (%), 2000–2009
Total personal income (billions of $)	243	319	3.5
Personal income per capita ($)	37,342	45,689	2.5

Source: DOC (2011).

TABLE 3-4 Summary of the Distribution of Minority and Low-Income Populations Surrounding Argonne

	Radial Distance around Argonne	
	50 mi	5 mi
Population and Minority Population Statistics (2010)[a]		
Population	9,357,894	229,776
Minority population	3,262,568	52,056
Native Americans or Alaska Natives	35,866	454
African Americans	1,646,473	17,460
Asians	530,286	20,024
Native Hawaiians and other Pacific Islanders and other race categories	1,049,943	14,118
Percentage of minority populations	34.9%	22.7%
Population and Low-Income Population Statistics (2000)[a]		
Population	8,705,854	183,870
Population below poverty line	929,011	6,460
Percentage of low-income populations	10.7%	3.5%

[a] Based on information available for whole census tracts that fall within a 50-mi (80-km) and a 5-mi (8-km) radius of the center of the Argonne site. Income data are not yet available for the 2010 Census.

with the averages of 28.5% for Illinois, 16.0% for Indiana, and 25.4% for the nation. Figure 3-6 illustrates census tracts higher and lower than the Illinois state average. One the basis of the 2000 census data (2010 data are not yet available), 10.7% of the 50-mi (80-km) population and 3.5% of the 5-mi (8-km) population are low-income, as compared with the Illinois average of 10.7%, Indiana average of 9.5%, and national average of 12.4%. Figure 3-7 illustrates census tracts higher and lower than the Illinois state average. The population located within a 5-mi (8-km) radius of the proposed facility would not, therefore, be predominantly minority or low-income. Table 3-4 summarizes the distribution of minority and low-income populations for the area surrounding Argonne.

3.2.7.2 Environmental Impacts

The proposed action is a planning process. Given the nature of planning, there would be no irreversible or irretrievable commitments of resources associated or connected with it, and there would be no direct impacts on socioeconomics. Consequently, cumulative impacts would be composed entirely of other past, present, and reasonably foreseeable future actions.

Socioeconomic issues relating to the Argonne site are addressed by the Argonne and DOE senior management teams. When projects are implemented, the resulting construction, renovation, and demolition activities would increase employment in the ROI (Cook, DuPage, and Will Counties). By implementing projects within a modernization planning framework, there is an increased likelihood of multiple construction, demolition, or renovation projects occurring simultaneously, due to benefits related to economies of scale and continuity of operations. Simultaneous scheduling of modernization projects could lead to sharper increases and decreases in construction-related employment. However, no in-migrant labor force is expected for either the construction phase or the operations phase of potential projects. Construction and demolition projects occurring outside of Argonne could affect the availability of labor. The cumulative effect of these activities could be a larger than typical demand for construction personnel, but given the potential labor force in the three-county ROI, these effects on the overall workforce would be minimal.

Executive Order 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, February 11, 1994) (59 FR 7629) requires federal agencies to analyze disproportionally high and adverse environmental effects of proposed actions on minority and low-income populations. Off-site impacts of project implementation would be minimal. Since the "adverse" criterion is not met, the "disproportionately high" criterion need not be considered. Thus, in general, there would be no environmental justice concerns associated with modernization planning.

Under the No-Action alternative, socioeconomics would continue to be addressed on a sitewide basis. Employment within the ROI would increase incrementally with individual projects.

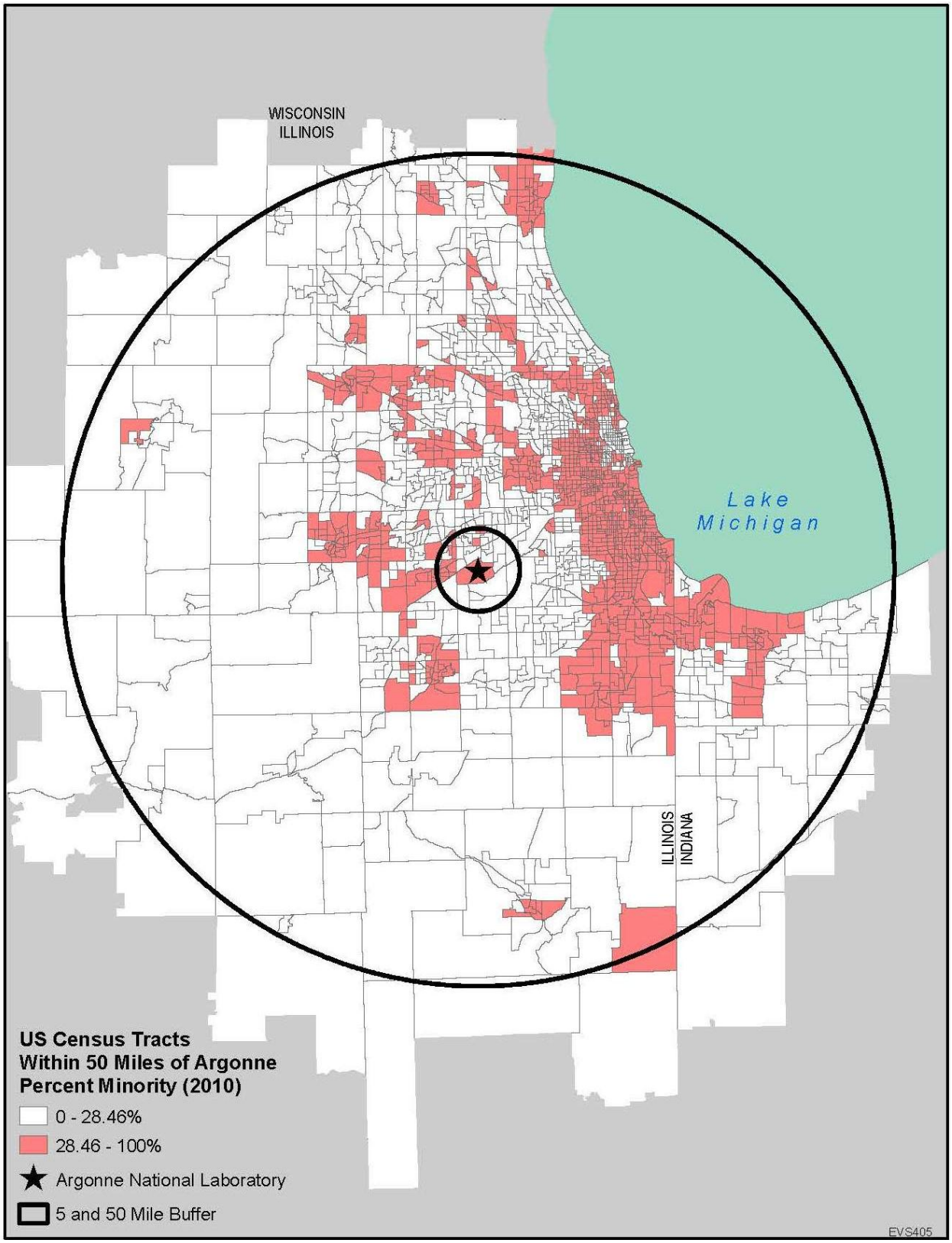


FIGURE 3-6 Minority Composition of Populations within 5 and 50 mi (8 and 80 km) of Argonne, Compared to the Illinois State Average (U.S. Census Bureau 2011)

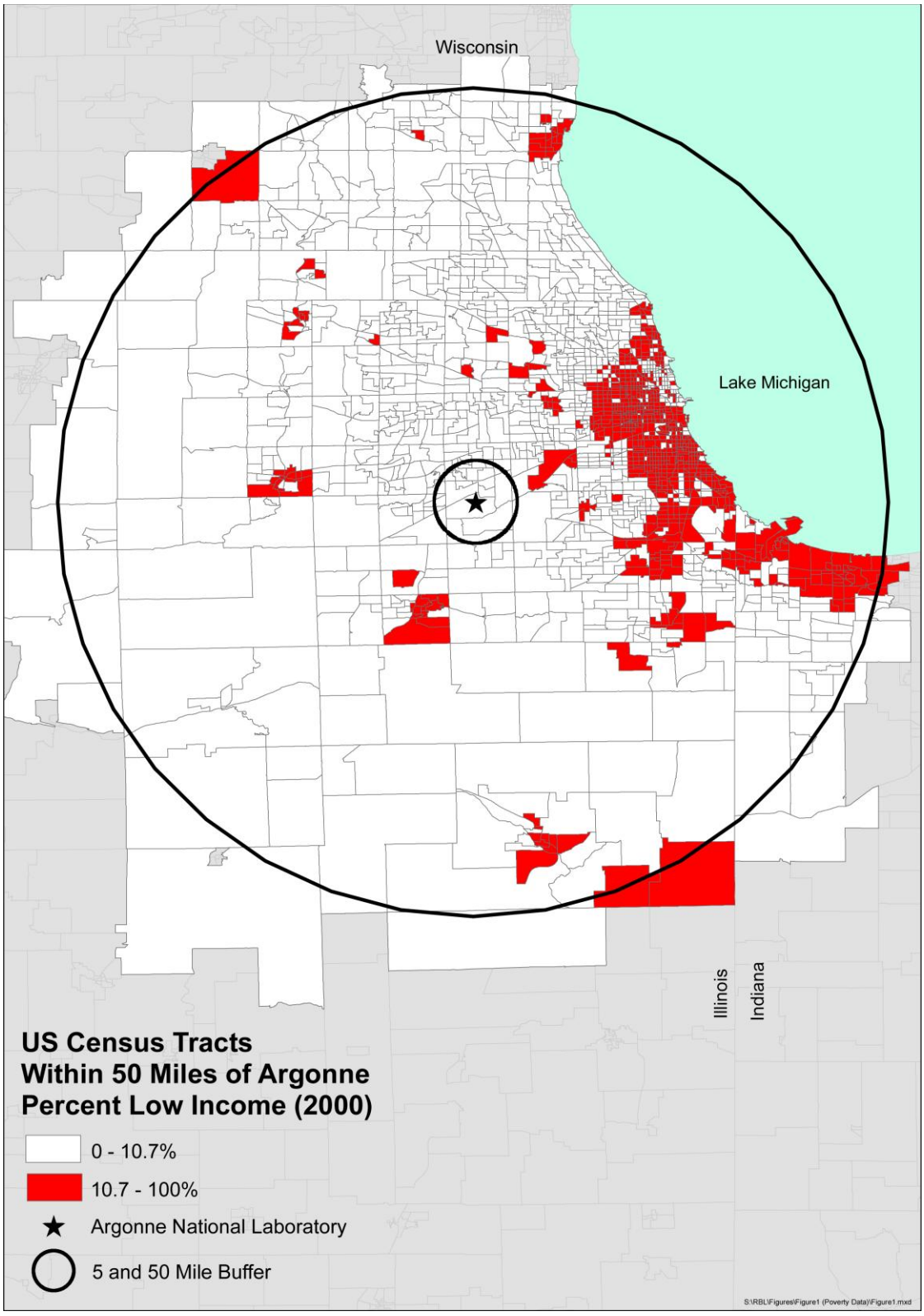


FIGURE 3-7 Low-Income Composition of Populations within 5 and 50 mi (8 and 80 km) of Argonne, Compared to the Illinois State Average (Based on 2000 Data, U.S. Census Bureau 2010)

3.2.8 Transportation

3.2.8.1 Affected Environment

The site's roadways connect all of the site's developed areas. The site contains approximately 28 mi (45 km) of roadways, bridges, parking and vehicle loading areas, and pedestrian circulation, including sidewalks and trails.

Access to the site is primarily through West Gate (connecting to Lemont Road) and North Gate (connecting to Cass Avenue), with access also available through East Gate (to Cass Avenue). Outer Circle Drive is the major transportation loop in the northern part of the Argonne site. Both Westgate and Northgate Roads connect with Outer Circle Drive. Deliveries to Argonne enter the site by a delivery gate from Cass Avenue. In addition, bulk materials are shipped near the Argonne site along the Ship and Sanitary Canal between the Illinois River and Lake Michigan. Accidents associated with truck traffic related to waste shipments from Argonne were evaluated by DOE (DOE 1997). The Illinois annual average truck accident rate on interstate highways for 1994 to 1996 was 2.22×10^{-8} per km (3.57×10^{-8} per mi); however, the overall rate is dependent on the destination of shipments (Saricks and Tompkins 1999). This corresponds to one accident per 45 million km (28 million mi).

Within each area on the site, employees generally walk between buildings. A few individuals bicycle to work, and bicycles are often used between buildings, due primarily to Argonne's bike-share program, which provides bicycles for employees' use on-site. Little work-related pedestrian travel occurs between areas, because walking time is excessive. Employees routinely use private cars for work-related trips between areas.

According to Illinois Department of Transportation standards, vehicle accumulation at intersections and gates is minor, even during rush hours. Argonne maintains a traffic control light outside the West Gate (at Lemont Road). Development along the frontage road south of I-55 has increased the use of Westgate Road at Lemont Road. Increasing employee residence in the expanding suburbs to the west has significantly increased the traffic load at the West Gate during normal rush hours.

Parking lots exist reasonably near virtually all facilities. The layout and design of parking lots vary greatly, but capacity generally slightly exceeds present needs, and the use of existing parking is generally unassigned. Sitewide parking capacity is adequate at existing levels of program activity. Two areas of exception to this general condition are in the eastern part of the 200 Area, near Building 201, as well as in the vicinity of Building 401, Building 402, and some of the laboratory modules at the APS.

Some 7,700 linear ft (2,347 m) of sidewalk on-site connects parking areas with buildings, and, in the 200 Area, provides a connection between the buildings fronting on the Inner Circle Drive.

3.2.8.2 Environmental Impacts

The proposed action is a planning process. Given the nature of planning, there would be no irreversible or irretrievable commitments of resources associated with it, and there would be no direct impacts on transportation. Consequently, cumulative impacts would be composed entirely of other past, present, and reasonably foreseeable future actions.

The projects identified in Table 2-1 were both individually and collectively evaluated against the guiding principles identified in Section 2.1. The footprints of new facilities and associated infrastructure would trigger considerations related to the "Circulation, Parking, and Accessibility" modernization planning guiding principle. Because modernization planning addresses the development of the entire Argonne site, issues related to transportation would be coordinated much more comprehensively. Modernization planning at the sitewide scale enables the co-location of scientific facilities and consolidation of land use, and consequently makes transportation quicker and more efficient. Thus, in general, modernization planning when applied to development projects would result in advantages for transportation.

Long-term management of transportation at the Argonne site would be incorporated into project planning for all new construction and demolition projects. Guiding principles for modernization planning include consideration of circulation, parking, and accessibility to improve current traffic patterns. This would include incorporating areas of concentrated development with its associated parking and egress needs. Transportation needs are currently addressed in the Argonne Land Use Plan (Argonne 2010c).

Implementation of projects would result in increased truck traffic on and off the site related to delivery of construction materials or removal of demolition debris. Increased truck traffic would result in potential increases in truck accidents. Impacts on transportation would also derive from modification of the existing Laboratory transportation patterns. The current Argonne transportation network remains substantially as it was originally planned more than 60 years ago. Traffic patterns and early facility locations were based on several concepts, such as sitewide commuter buses, which were never fully implemented. Modernizing the transportation network will require reconfiguration of parking and travel patterns that would disrupt the current traffic flow. The expectation is that implementing projects within a modernization planning framework will result in improvements in key locations, with other portions of the Argonne site remaining largely unchanged. Other factors that may also contribute to reducing impacts include coordination of parking, footpaths, and bike paths. Thus, in general, modernization planning when applied to development projects would result in advantages for transportation.

Under the No-Action alternative, management of transportation would continue to be addressed as project-specific needs are developed and with limited opportunities for more effective sitewide management alternatives. Transportation needs would be based on individual project requirements without full consideration of sitewide modernization activities. Under this alternative, there would likely be minor improvements to the transportation network associated with individual modernization projects, but no comprehensive transportation improvement plan. Argonne's transportation network would likely remain largely as it currently exists well into the future.

3.2.9 Infrastructure and Utilities

3.2.9.1 Affected Environment

Infrastructure and utility systems include ground transportation, security and safety, steam generation and distribution, natural gas distribution, domestic and canal water treatment and distribution, laboratory water distribution, sanitary and laboratory wastewater collection and treatment, storm sewer, chilled water generation and distribution, electric power distribution, and telecommunications. Details of these systems are provided in the Argonne Site Modernization Plan (Argonne 2011a).

The sitewide physical security infrastructure consists of three guard posts to admit vehicles and approximately 38,500 ft (11,735 m) of perimeter fencing.

The central heating plant (CHP) generates all of the steam required by the Laboratory. An extensive piping network distributes the steam to most buildings. Steam is used primarily for central heating. Originally, all five boilers burned coal; however, in 1973, the plant was converted from coal to gas/oil to meet environmental requirements. In 1981, the large boiler was reconverted to coal only to reduce fuel costs. A flue gas dry desulfurization scrubber was installed at the same time so that high-sulfur coal could be used. In 1997, the large boiler was modified again; natural gas burners were installed to enable the use of two types of fuel. The principal fuels used for generating steam at the CHP are natural gas and low-sulfur coal. Retrofitting of portions of the existing CHP to allow burning of pelletized biofuels (agricultural and/or wood-based) was completed in fiscal year 2010.

Since 1996, water for Argonne has been supplied by the DuPage County Water Commission from Lake Michigan. Water is pumped into the general distribution system, which provides for domestic and laboratory process use and for fire protection. Argonne's annual potable water use is approximately 150 million gal/yr (567 million L/yr) (Argonne 2010a).

A separate supply system (not directly connected to the main on-site water supply system) is used for laboratory purposes. The canal water system consists of a water treatment facility, storage tanks, and a distribution system. Nonpotable canal water is used on-site, primarily in cooling towers, and, to a lesser degree, for a variety of other cooling needs, such as building air compressors. Argonne uses approximately 0.45 million gal/day (1.7 million L/day) of canal water (Golchert et al 2011).

Sanitary sewage from various buildings is conveyed through an underground sewer system to the sanitary wastewater treatment plant. The system is for domestic waste; drains subject to radioactivity or chemical contamination are not connected to this system.

A separate laboratory sewer system serves all areas of the Argonne site, except the East Area and the 800 Area. A laboratory waste treatment facility is designed to provide treatment capability for heavy metals, suspended solids, volatile organic compounds, and semivolatile organic compounds.

All known radioactive liquid wastes are placed into special containers that are collected regularly and sent to a separate processing building for treatment to reduce waste volume. Residual wastes are prepared for further handling and disposal. To prevent inadvertent emptying of radioactive waste or other toxic substances into laboratory sinks or drains, a separate drain system is installed in all radiochemical laboratories. All such laboratory sewers are connected to the laboratory wastewater treatment plant.

Roof drains, downspouts, and certain noncontact cooling water discharges are connected to storm sewers at most permanent buildings. Storm sewers discharge into the nearest suitable outfall point, usually a creek or a well-drained low area. Existing storm sewer discharges do not contain provisions for detention or retention of stormwater, other than natural capacities inherent in the surface drainage system. At present, the storm sewer system collects water from floor drains in several buildings and blowdown wastewater from cooling towers. All sources of stormwater are directed toward collection systems that lead to the outfalls covered under the NPDES permits. Though the water is untreated, the discharges are permitted and are monitored as required by the NPDES permit; the results of the monitoring are transmitted to the State of Illinois.

Chilled water for process and comfort cooling is provided by three separate chilled water systems that serve many of the major buildings on-site. These systems serve the 360 Area, the APS, and the 200 Area.

Electric power for the Argonne site is purchased from the Commonwealth Edison Company (ComEd). The ComEd transmission system consists of two lines fed by the Joliet and McCook generating stations and routed along the Atchison, Topeka, and Santa Fe Railroad in the Des Plaines River valley south of the site. Annual electricity usage at Argonne is approximately 280,000 MWh (Argonne 2010a).

The Laboratory operates a PBX (private branch exchange) communications system of Internet protocol (IP) networked control servers on a dedicated local area network.

Efforts to achieve energy conservation goals are outlined in the Argonne Sustainability Plan (Argonne 2010a), including the goal of reducing electricity use from nonrenewable sources. The Argonne Site Sustainability Plan details Argonne's sustainability program organization, resources, and actions designed to achieve the energy goals. For example, Argonne has already met the DOE goal for 7.5% of the site's annual electrical consumption through renewable sources. It is committed to reducing its overall energy intensity by 30% by the end of September 2015.

3.2.9.2 Environmental Impacts

The proposed action is a planning process. Given the nature of planning, there would be no irreversible or irretrievable commitments of resources associated or connected with it, and there would be no direct impacts on infrastructure and utilities. Consequently, cumulative impacts would be composed entirely of other past, present, and reasonably foreseeable future actions.

The projects identified in Table 2-1 were both individually and collectively evaluated against the guiding principles identified in Section 2.1. The footprints of new facilities and associated infrastructure would trigger considerations related primarily to the "Environment and Sustainability" and "Infrastructure and Utility Systems" modernization planning guiding principles. Because modernization planning addresses the development of the entire Argonne site, issues related to infrastructure and utilities would be coordinated much more comprehensively. Modernization planning at the sitewide scale enables the co-location of scientific facilities and consolidation of land use, and consequently utilities and infrastructure. Thus, in general, modernization planning when applied to development projects would result in advantages for infrastructure and utilities.

Infrastructure and utilities are specifically included within the modernization planning guiding principles. By implementing projects within a modernization planning framework, upgrades and maintenance of infrastructure and utilities would be included in all future development efforts. This approach ensures that Argonne's infrastructure would be continuously improving so that it can support Laboratory mission needs. Project implementation within a modernization planning framework would also take long-term development into consideration. Advanced planning for infrastructure and utilities would be required to adequately support a more concentrated development pattern. The co-location of facilities would minimize road and sewer improvements and make the delivery of electricity and cooling more efficient.

Management and maintenance of Argonne's infrastructure and utilities would improve by implementing projects within a modernization planning framework. Current development in infrastructure and utilities is designed to meet the needs of individual projects. Often infrastructure and utility upgrades are addressed in individual projects without full consideration of other modernization activities. By implementing projects using modernization planning, all known and proposed projects would be considered together. The expected result is more timely infrastructure and facility upgrades and maintenance allowing for improvements that are less resource intense and more cost-effective. This would also help ensure that mission readiness needs are properly addressed. As mentioned, by implementing projects within a modernization planning framework, development would be concentrated to increase the efficiency of building supply delivery needs and to improve pedestrian movement between areas. Thus, in general, modernization planning when applied to development projects would result in advantages for infrastructure and utilities.

Under the No-Action alternative, development and maintenance of infrastructure and utilities would continue to be addressed on a project-specific basis as needs are developed, with limited long-term considerations and also limited opportunities for more effective sitewide

management alternatives. This would result in extended project schedules and higher cost upgrades with possible negative effects on mission readiness.

3.2.10 Waste Management

3.2.10.1 Affected Environment

The Argonne waste management program was designed to achieve compliance with all applicable environmental requirements related to treatment, storage, and disposal of hazardous materials.

3.2.10.1.1 Hazardous Waste Generation, Storage, Treatment, and Disposal. The nature of the research activities conducted at Argonne results in the generation of small quantities of a large number of waste chemicals. Many of these materials are classified as hazardous waste under the Resource, Conservation, and Recovery Act (RCRA). Argonne has 15 hazardous waste management units: 9 container storage units, 1 tank storage unit, 3 miscellaneous treatment units, and 2 tank chemical treatment units (Argonne 1995).

Argonne prepares an annual Hazardous Waste Report (IEPA 2011). The report is submitted to the IEPA by March 1 of each year and describes the activities of the previous year. It is a summation of all RCRA waste activities, including storage, treatment, and disposal. The RCRA-permitted storage facilities, designed and operated in compliance with RCRA requirements, allow for the accumulation and storage of waste, pending off-site disposal. Argonne's on-site permitted treatment facilities address a small number of hazardous wastes generated by Argonne operations. Off-site treatment and disposal take place at approved hazardous waste treatment and disposal facilities.

Argonne generates several types of mixed waste, including acids, solvents, and debris contaminated with radionuclides. The total amount of nonradiological waste materials generated at Argonne in 2010 was 488,181 lb (221,435.2 kg) (Golchert et al. 2011). The RCRA Part B permit provides for on-site treatment in five mixed waste treatment systems. Seven sites with residual soil and groundwater contamination require long-term monitoring and surveillance under the Land Use Control Memorandum of Agreement (LUCMoA) (DOE 2003b). The LUCMoA is a two-part agreement between DOE and the State of Illinois to ensure access control of these seven sites.

The Argonne site currently contains 12 underground storage tanks (USTs). Six of the existing tanks are being used to store fuel oil for emergency generators. The on-site maintenance facility (Building 46) uses underground tanks to store diesel, gasoline, used oil, antifreeze, and an ethanol/gasoline blend. The Illinois State Fire Marshal regulates the UST program at Argonne.

3.2.10.1.2 Solid Waste Disposal. In 1992, Argonne ceased operation of its 800 Area Landfill, which had begun operating in 1966. In 2003, the IEPA determined that the postclosure care of the 800 Area Landfill, which includes groundwater monitoring, would be required.

Groundwater quality standards of some routine indicator parameters have been consistently exceeded, such as total dissolved solids, iron, chloride, sulfate, manganese, and tritium. Exceedances occur primarily in shallow, perched pockets of groundwater in the glacial drift that are not in direct communication with the deeper dolomite bedrock aquifer.

3.2.10.1.3 Radioactive Waste Generation, Storage, Treatment, and Disposal. DOE Order 435.1 (Radioactive Waste Management) requires that an environmental monitoring and surveillance program be conducted to determine any releases or migration from low-level radioactive waste treatment, storage, or disposal sites. Transuranic waste is generated from Argonne operations. It is stored, characterized, packaged, and shipped for off-site disposal at the Waste Isolation Pilot Plant facility in New Mexico. The total amount of radioactive mixed waste generated in 2010 was 35,029 ft^3 (992 m^3) (Golchert et al. 2011). Compliance with the requirements of DOE Order 435.1 is an integral part of the Argonne sitewide monitoring and surveillance program. Waste management operations are covered by relying on the perimeter air monitoring network and monitoring of the liquid effluent streams and Sawmill Creek.

Of particular interest is monitoring of the waste management activities conducted in the 317 Area. These include air particulate monitoring for total alpha, total beta, and gamma-ray emitters; direct radiation measurements with thermoluminescent dosimeters; surface water discharges for hydrogen-3 and gamma-ray emitters; and subsurface water samples at all monitoring wells with analyses for hydrogen-3, strontium-90, and gamma-ray emitters, plus selected monitoring for volatile organic compounds. Direct radiation measurements are also conducted at other waste management areas—Building 306, Building 331, and the 398A Area.

3.2.10.2 Environmental Impacts

The proposed action is a planning process. Given the nature of planning, there would be no irreversible or irretrievable commitments of resources associated or connected with it, and there would be no direct impacts on waste management. Consequently, cumulative impacts would be composed entirely of other past, present, and reasonably foreseeable future actions.

The projects identified in Table 2-1 were both individually and collectively evaluated against the guiding principles identified in Section 2.1 The footprint of new facilities and associated infrastructure would trigger the “Environment and Sustainability” and “Safety and Security” guiding principle considerations. Because modernization planning addresses the development of the entire Argonne site, issues related to waste management would be coordinated much more comprehensively. Modernization planning at the sitewide scale enables the limiting of waste shipments from the site. Thus, in general, modernization planning when applied to development projects would result in advantages for waste management.

Management of waste at the Argonne site would be incorporated into project planning for all new construction and demolition projects. By implementing projects within a modernization planning framework, there is an increased likelihood of multiple construction, demolition, or renovation projects occurring simultaneously, due to benefits related to economies of scale and continuity of operations. Although such occurrences could potentially increase the generation of waste within the Argonne site during some periods, the broader scope of consideration within a modernization planning framework for project implementation, focusing on comprehensive planning across the Laboratory, and coordinated management of multiple projects, would result in opportunities for more effective waste management, thereby limiting waste shipments from the site. In the long-term, reduction of waste could allow the removal of selected waste management facilities. Even if new waste-producing facilities were developed as the result of modernization, the long-term goals are for less storage and more efficient disposal of waste material.

The incorporation of efficient and environmentally responsible development, along with the removal of inefficient facilities, would result in smaller increases in the overall generation of waste at the Argonne site. Minimization of waste would result in reductions in annual shipments of waste from the site. Thus, in general, modernization planning when applied to development projects would result in advantages for waste management.

Under the No-Action alternative, waste management would continue to be addressed as project-specific needs are developed, with fewer opportunities for effective management alternatives. Potential negative effects include increased shipments of waste from the Argonne site over the long term, compared to implementing projects within a modernization planning framework; however, lower waste volumes may be shipped per year.

3.2.11 Human Health and Safety

3.2.11.1 Affected Environment

Argonne is a multipurpose laboratory, which has a history of radiological research, and as a result, has extensive tracking and monitoring programs for both chemical and radiological materials. The tracking and monitoring programs are integrated into Argonne's management systems to ensure the health and safety of the Laboratory's employees. The tracking and monitoring systems focus on individual workers, airborne pathways, and waterborne pathways. The highest dose rate at the site boundary is 0.024 mrem/yr (0.24 µSv) (Golchert et al. 2011). The full-time resident who receives the highest dose will receive 0.007 mrem/yr (0.07 µSv) using conservative values (Golchert et al. 2011). Argonne maintains an on-site medical center that provides employee health monitoring as well as emergency care. In addition, the Argonne Fire Department maintains emergency medical technician (EMT) capabilities. Personal injury rates at Argonne are maintained at low levels by programs such as Integrated Safety Management and Work Planning and Control. OSHA recordable accidents at Argonne over the 5-year period 2006 to 2010 averaged 27.2 per year. Several major health centers are within a 10-mi (16-km) radius of Argonne.

3.2.11.2 Environmental Impacts

The proposed action is a planning process. Given the nature of planning, there would be no irreversible or irretrievable commitments of resources associated or connected with it, and there would be no direct impacts on human health and safety. Consequently, cumulative impacts would be composed entirely of other past, present, and reasonably foreseeable future actions.

The projects identified in Table 2-1 were both individually and collectively evaluated against the guiding principles identified in Section 2.1. The footprints of new facilities and associated infrastructure would trigger considerations related to the "Safety and Security" modernization planning guiding principle. Because modernization planning addresses the development of the entire Argonne site, issues related to human health and safety would be coordinated much more comprehensively. Implementation of new construction, renovation, and demolition projects would replace outmoded facilities with modern, more inherently safe facilities. Thus, in general, modernization planning when applied to development projects would result in advantages for human health and safety.

Implementing modernization planning would increase the likelihood that simultaneous development projects would occur. This would result in an increase in the potential for work-related accidents; however, health and safety considerations would be more fully integrated.

Under the No-Action alternative, the occurrence of work-related accidents would likely increase because of construction, renovation, and demolition activities. However, the likelihood of multiple projects occurring simultaneously would be lower; thus annual occurrences may be lower compared to implementing projects within a modernization planning framework. Because projects would be implemented using current procedures, the health and safety of scientific and support staff at Argonne would not likely change from current conditions.

3.3 INTENTIONAL DESTRUCTIVE ACTS

The consideration of intentional destructive acts, such as sabotage and terrorism, is required by DOE in the preparation of EAs or EISs. Argonne modernization planning is not expected to change the potential for intentional destructive acts at Argonne. The protection of employees, visitors, and the public is incorporated into the Safety and Security guiding principles that would be implemented under the proposed action. Argonne maintains measures to control Laboratory and facility access and provide the necessary levels of security (e.g., identification badges, alarms, card readers, and security patrols). The risk of intentional destructive acts is further minimized because public access to Argonne is controlled by security forces and antiterrorism measures such as security fences and security checkpoints at the entry gates. Modernization planning would not alter the existing security features currently employed at Argonne.

This page intentionally left blank.

4 LIST OF AGENCIES AND PERSONS CONTACTED

Advisory Council on Historic Preservation, Office of Federal Agency Programs, Federal Property Management Section
- Tom McCulloch, Program Analyst
- Letter dated May 19, 2011

Argonne Community Leaders Roundtable
- Meetings on March 23, 2011, and September 28, 2011

Illinois Department of Natural Resources, Division of Ecosystems and Environment, Impact Assessment Section
- Karen Miller, Director
- Phone call on February 25, 2011

Illinois Environmental Protection Agency
- DiAnne Schuerman, Deputy Director
- Letter dated February 16, 2011
- E-mail dated August 18, 2011

Illinois Historic Preservation Agency
- Anne E. Haaker, Deputy State Historic Preservation Officer
- Meeting on March 2, 2011
- Letters dated February 25, 2011; March 25, 2011; and May 19, 2011

U.S. Army Corps of Engineers, Chicago District
- Keith Wozniak, Chief, West Section Regulatory Branch
- Ron Abrant, Senior Project Manager, Regulatory Branch
- Letter dated June, 25, 2008
- E-mail dated April 11, 2011
- Phone call on April 20, 2011

U.S. Department of the Interior, Fish and Wildlife Service, Chicago Ecological Services Field Office
- Cathy Pollack, Director
- Phone call on February 17, 2011

This page intentionally left blank.

5 REFERENCES

Argonne (Argonne National Laboratory), 1995, *Environmental Assessment, Proposed Upgrade of Waste Storage Facilities at Argonne National Laboratory-East, Argonne, Illinois*, DOE/EA-1073.

Argonne, 1998, *Site Development Plan*, JOSTD-106-G-T007, Argonne, Ill.

Argonne, 2008, *Argonne National Laboratory Land Management and Habitat Restoration Plan*, Argonne, Ill.

Argonne, 2010a, *Argonne National Laboratory Site Sustainability Plan*, prepared for U.S. Department of Energy, Argonne, Ill., Dec.

Argonne, 2010b, *Argonne National Laboratory 2010–2015 Strategic Plan*, Argonne, Ill.

Argonne, 2010c, *Argonne National Laboratory Land Use Plan*, prepared by Facilities Management and Services, Argonne, Ill.

Argonne, 2010d, *Cultural Resource Management Plan for Argonne National Laboratory*, Environmental Science Division, Argonne, Ill., July.

Argonne, 2010e, *Argonne National Laboratory—Spill Prevention, Control, and Countermeasures Plan*, Argonne, Ill., Nov. 10.

Argonne, 2011a, *Argonne Site Modernization Plan*, Facilities Management and Services, Argonne, Ill. (in progress).

Argonne, 2011b, *Argonne National Laboratory Storm Water Pollution Prevention Plan*, Argonne, Ill., Jan. 7.

DOC (U.S. Department of Commerce), 2011, *Regional Accounts Data—Local Area Personal Income*, Bureau of Economic Analysis, Washington, D.C. Available at http://www.bea.gov/regional/reis/default.cfm?selTable=CA1-3&section=2. Accessed May 14, 2011.

DOE (U.S. Department of Energy), 1990, *Environmental Assessment, Proposed 7-GeV Advanced Photon Source*, DOE/EA-0389, Washington, D.C., Feb.

DOE, 1997, *Final Waste Management Programmatic Environmental Impact Statement for Managing Treatment, Storage, and Disposal of Radioactive and Hazardous Waste*, DOE/EIS-0200-F, Office of Environmental Management, Washington, D.C.

DOE, 2002, *Programmatic Agreement among the Department of Energy Argonne Area Office, the Illinois State Historic Preservation Officer, and the Advisory Council on Historic Preservation, Concerning Management of Historical and Cultural Properties at Argonne National Laboratory-East*, Jan. 17.

DOE, 2003a, *Environmental Assessment for Enhanced Operations of the Advanced Photon Source at Argonne National Laboratory-East, Argonne, Illinois*, DOE/EA-1455, Washington, D.C., June.

DOE, 2003b, *Land Use Control Memorandum of Agreement (LUCMoA)*, Memorandum of Agreement between U.S. Department of Energy and Illinois Environmental Protection Agency, Aug.

DOE, 2008, *Mission Readiness Peer Review Guide*, Office of Science, Washington, D.C., Sept. 17.

DOE, 2010, *Department of Energy Laboratory Plan for the Office of Science's Argonne National Laboratory*, Washington, D.C., May.

FEMA (Federal Emergency Management Agency), 1982, *Flood Insurance Rate Map*, Community Panel No. 170197 0065 B, DuPage County, Ill.

Golchert, N.W., et al., 2010, *Argonne National Laboratory Site Environmental Report for Calendar Year 2009*, ANL-10/02, Argonne National Laboratory, Argonne, Ill., Sept. Available at http://www.anl.gov/Community_and_Environment/Environmental_Reports/ser2009.pdf.

Golchert, N.W., et al., 2011, *Argonne National Laboratory Site Environmental Report for Calendar Year 2010*, ANL-11/02, Argonne National Laboratory, Argonne, Ill., Sept. Available at http://www.anl.gov/Community_and_Environment/Environmental_Reports/ser2010.pdf.

Hinterman, R., 2001, personal communication from Hinterman to Y.-S. Chang (Argonne National Laboratory, Argonne, Ill.), Sept. 21.

Hinterman, R., 2004, personal communication from Hinterman (Argonne National Laboratory, Argonne, Ill.) to Y.-S. Chang (Argonne National Laboratory, Argonne, Ill.), May 19.

Hughes, G.M., et al., 1966, *Bedrock Aquifers of Northeastern Illinois*, Circular 406, Illinois State Geological Survey.

IEPA (Illinois Environmental Protection Agency), 2010, *Illinois 2009 Annual Air Quality Report*. Nov. Available at http://www.epa.state.il.us/air/air-quality-report/2009/air-quality-report-2009.pdf. Accessed May 14, 2011.

IEPA, 2011, *Illinois Environmental Protection Agency 2010 Hazardous Waste Report*, March.

Messenger, A.S., et al., 1969, *Ecological Survey of Argonne National Laboratory*, ANL-7559, prepared by Office of College and University Cooperation for Argonne National Laboratory, Argonne, Ill.

Saricks, C.L., and M.M. Tompkins, 1999, *State-Level Accident Rates of Surface Freight Transportation: A Reexamination*, ANL/ESD/TM-150, prepared by Argonne National Laboratory, Argonne, Ill., for the DOE Office of Energy Efficiency and Renewable Energy, Washington, D.C., April.

Stepuszek, P.A., 2005, "County Report," personal communication from Stepuszek (Manager, HR Records and Information Center, Argonne National Laboratory, Argonne, Ill.) to N. Akiyoshi (Argonne National Laboratory, Argonne, Ill.), April 28.

U.S. Census Bureau, 2008, *County Business Patterns, 2008,* Washington, D.C. Available at http://www.census.gov/econ/cbp/.

U.S. Census Bureau, 2010, *United States Census 2000*, Washington, D.C. Available at http://www.census.gov/main/www/cen2000.html.

U.S. Census Bureau, 2011, *2010 Census Data*, Washington, D.C. Available at http://2010.census.gov/2010census/data.

Van Lonkhuyzen, R.A., et al., 1999, *Options for Mitigation of Potential Wetland Impacts in the Vicinity of the Advanced Photon Source, Argonne National Laboratory-East*, Environmental Assessment Division, Argonne National Laboratory, Argonne, Ill.

This page intentionally left blank.

APPENDIX A:

CORRESPONDENCE

This page intentionally left blank.

APPENDIX A:

CORRESPONDENCE

25 JUN 2008

Mr. Keith Wozniak
Chief, West Section Regulatory Branch
U.S. Army Corps of Engineers
111 North Canal Street
Chicago, Illinois 60606-7206

Dear Mr. Wozniak:

The U.S. Department of Energy is requesting U.S. Army Corps of Engineers (USACE) approval of Wetland R as mitigation for wetlands that were filled during the construction of the Advanced Photon Source (APS). This mitigation wetland (Wetland R) is covered under permit number 001708901 issued in February 1989.

Data collected and compiled for this area was provided to Ron Abrant on September 20, 2007. That data, along with more recent data, is enclosed. We believe the data document that this wetland meets the USACE mitigation criteria standards.

As suggested by Mr. Abrant, we are also requesting a Jurisdictional Determination for another wetland near the APS, Wetland C, and have attached a jurisdictional determination form. Based on recent court decisions, Wetland C may no longer be a jurisdictional wetland.

We appreciate all the support your staff has provided over the past several years to help us manage the wetlands on the Argonne site. If you have any questions, please call Donna Green of my staff at (630) 252-2264.

Sincerely,

signed by

Ronald J. Lutha
Site Manager

Enclosures:
As Stated

bc: M. Kamiya, ANL/EQO, 201, w/o encls.
C. Sullivan, ANL/FMS, 46, w/o encls.
K. Chiu, ASO, w/o encls.

File: 5400.2 (2.9)

S:\ASO\Secretaries' Documents\Terry\MSOFFICE\WINWORD\ES&H Divisions\Donna\Wetland R approval request.doc

CONCUR
ASO/dt
Green DG
6/25/08
ASO
Zook CZ
6/25/08
ASO
Lutha RJL
6/25/08

DEPARTMENT OF THE ARMY
CHICAGO DISTRICT, CORPS OF ENGINEERS
111 NORTH CANAL STREET
CHICAGO, ILLINOIS 60606-7206

REPLY TO
ATTENTION OF:

February 1, 2011

Technical Services Division
Regulatory Branch
LRC-2006-14025 (RAMS 200600241 and Original 001708901)

SUBJECT: Final Compliance Sign-Off for Compensatory Mitigation Plan for Wetland R at Argonne National Laboratory in Argonne, Illinois (LAT/LON 41.70115/-87.98627)

Department of Energy
Argonne Site Office
Dr. Joanna M. Livengood
9800 South Cass Avenue
Argonne, Illinois 60439

Dear Dr. Livengood:

This is in reference to your request for Final Compliance Signoff for the wetland mitigation project as required by Department of the Army (DA) Nationwide Permit authorization 001708901 granted on February 2, 1989. Wetland R has been successfully completed, and the terms and conditions of your permit have been fulfilled. It is our understanding that the Department of Energy will continue its ownership of this wetland area, and we encourage them to continue with management activities such as prescribed burning and selective application of herbicide in order to maintain a healthy wetland system.

Thank you for your efforts in making this wetland mitigation area a valuable resource for both the environment and the community. If you have any questions, please contact Mr. Ron Abrant of my staff by telephone at 312-846-5536, or email at Ron.J.Abrant@usace.army.mil. You can also visit our website at www.lrc.usace.army.mil/co-r/index.htm for additional information on our program.

Sincerely,

Keith L. Wozniak
Chief, West Section
Regulatory Branch

Department of Energy
Argonne Site Office
9800 South Cass Avenue
Argonne, Illinois 60439

FEB 16 2011

Illinois Environmental Protection Agency
Deputy Director's Office/MC#1
ATTN: DiAnne Schuerman
P.O. Box 19276
Springfield, IL 62794-9276

Dear Ms. Schuerman:

SUBJECT: NOTIFICATION TO PREPARE AN ENVIRONMENTAL ASSESSMENT (EA) FOR ARGONNE NATIONAL LABORATORY (ARGONNE) MODERNIZATION PLANNING, ARGONNE, ILLINOIS

Pursuant to Title 10 of the Code of Federal Regulations, Section 1021.301(c), this letter notifies IEPA that the Department of Energy (DOE) is preparing an EA under the National Environmental Policy Act (NEPA) to assess Argonne's Modernization Planning initiative. DOE and Council on Environmental Quality NEPA regulations advise the preparation of an EA "to assist agency planning and decision-making" and to determine whether to prepare an Environmental Impact Statement or issue a Finding of No Significant Impact (10 CFR § 1021.321 and 40 CFR § 1508.9(a), respectively; see also 10 CFR § 1021.300(b)).

The proposed modernization action is to conduct site infrastructure (e.g., roads, utilities) and natural resources-related planning for the construction of new, upgrade of existing, and demolition of obsolete facilities at Argonne including, but not limited to, offices, laboratories, and research user facilities. The planning will address projects which would be funded by DOE, State of Illinois, and potentially by other sources.

Upon completion of a draft EA, we intend to forward a copy for your comment. We anticipate that this will occur in the late summer of 2011.

Should you have any questions about the NEPA process, please contact Mr. Peter Siebach at 630-252-2007 or via e-mail at peter.siebach@ch.doe.gov. If you have questions about Argonne Modernization Planning itself, please contact Ms. Angela Harvey at 630-252-2696 or via e-mail at angela.harvey@ch.doe.gov.

Sincerely,

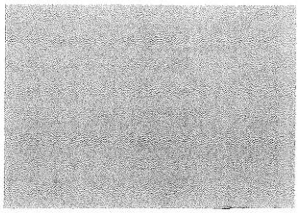
Dr. Joanna M. Livengood
Manager

cc: M. Kamiya, ANL/ESQ, 201
T. Sydelko, ANL/FMS, 214

A component of the Office of Science

DEPARTMENT OF THE ARMY
CHICAGO DISTRICT, CORPS OF ENGINEERS
111 NORTH CANAL STREET
CHICAGO, ILLINOIS 60606-7206

REPLY TO
ATTENTION OF:



February 21, 2011

Technical Services Division
Regulatory Branch
LRC-2008-00337

SUBJECT: Jurisdictional Determination for Wetland C (406) for Future Development of Advanced Photon Source (APS) at Argonne National Labs in Argonne, DuPage County, Illinois

Department of Energy
Argonne Site Office
Dr. Joanna M. Livengood
9800 South Cass Avenue
Argonne, Illinois 60439

Dear Dr. Livengood:

This is in response to your request for a jurisdictional determination for the above-referenced project. This office has determined that there are no waterways, wetlands or other areas considered "waters of the United States" under Corps of Engineers jurisdiction at the subject site. Therefore, a Department of the Army permit under Section 404 of the Clean Water Act is not required. **Wetland C (406) is isolated and therefore non-jurisdictional.** Please note that this office does not concur with the boundaries of waters not under federal jurisdiction. It is your responsibility however to obtain any required state or local approvals for this project.

This determination covers only your project as described above and as shown in the plans submitted with your request. We do not concur with the boundaries of waters not under federal jurisdiction. Enclosed, please find a copy of the decision document for our determination. Caution should be taken so that construction materials and/or activities do not enter any waterway or wetlands beyond the scope of this determination. If the design, location or purpose of the project is changed, you should contact this office to determine the need for other authorization.

This determination has been conducted to identify the limits of the Corps Clean Water Act jurisdiction for the particular site identified in this request. This determination may not be valid for the wetland conservation provisions of the Food Security Act of 1985, as amended. If you or your tenant are USDA program participants, or anticipate participation in USDA programs, you should request a certified wetland determination from the local office of the Natural Resources Conservation Service prior to starting work.

It is your responsibility to obtain any required state, county, or local approvals for impacts to wetland areas not under the Department of the Army jurisdiction. For projects located in DuPage County, please contact the DuPage County Department of Environmental Concerns at (630) 682-6724.

This letter is considered an approved jurisdictional determination for your subject site. If you wish to appeal this decision or if you have any questions please contact Mr. Ron Abrant of my staff by telephone at 312-846-5536 or email at Ron.J.Abrant@usace.army.mil. You may also visit our website at www.lrc.usace.army.mil/co-r for information on our program.

Sincerely,

Kathleen G. Chernich
Chief, East Section
Regulatory Branch

Enclosures

Copy Furnished w/out Enclosures:

DuPage County DEC (Karen Laskowski)

Department of Energy
Argonne Site Office
9800 South Cass Avenue
Argonne, Illinois 60439

FEB 25 2011

Ms. Anne E. Haaker
Deputy State Historic Preservation Officer
Illinois Historic Preservation Agency
1 Old State Capitol
Springfield, Illinois 62701

Dear Ms. Haaker:

SUBJECT: NATIONAL HISTORIC PRESERVATION ACT DETERMINATION – ARGONNE NATIONAL LABORATORY (ARGONNE) MODERNIZATION PLANNING, ARGONNE, ILLINOIS

The purpose of this letter is to initiate consultation with your office regarding Argonne Modernization Planning, in order to satisfy Section 106 of the National Historic Preservation Act (NHPA – Public Law 102-575).

The scope Argonne's undertaking is to conduct site infrastructure (e.g., roads, utilities) and natural resources-related planning for the construction of new, upgrade of existing, and demolition of obsolete facilities at Argonne including, but not limited to, offices, laboratories, and research user facilities. The undertaking will address future projects from multiple sources including the Department of Energy (DOE) Offices of Science and Environmental Management, Argonne Institutional General Plant Project programs, as well as State of Illinois funded projects and third party financing opportunities.

We believe it would be beneficial to use this planning period as an opportunity to discuss options with you for satisfying our section 106 responsibilities. I understand that our respective staffs have already had some preliminary discussions. I propose that this be the subject of a meeting for which my staff would plan to travel to your offices in Springfield on March 2, 2011.

If you have questions, or to schedule the meeting, please feel free to contact me via telephone at (630) 252-2366 or by e-mail at joanna.livengood@ch.doe.gov. Alternatively, you or a member of your staff can contact Kate Panek, our Historic Resources Manager, at (630) 252-2736 or by email at katrina.panek@ch.doe.gov.

Sincerely,

Joanna M. Livengood

Dr. Joanna M. Livengood
Manager

A component of the Office of Science

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 North Grand Avenue East, P.O. Box 19276, Springfield, Illinois 62794-9276 • (217) 782-2829
James R. Thompson Center, 100 West Randolph, Suite 11-300, Chicago, IL 60601 • (312) 814-6026

PAT QUINN, GOVERNOR DOUGLAS P. SCOTT, DIRECTOR

DL2010364

ARGONNE SITE OFFICE
MAR 07 2011
RECEIVED

217-782-0547

February 24, 2011

Dr. Joanna M. Livengood
Manager
Department of Energy
Argonne Site Office
9800 South Cass Avenue
Argonne, Illinois 60439

Dear Dr. Livengood:

Thank you for the opportunity to review the environmental assessment for the proposed modernization project for Argonne National Laboratory.

The Agency has no objections to the projects; however, asbestos notification will be required to the Bureau of Air, Division of Air Pollution Control at least ten (10) working days prior to each demolition project initiation. Please contact Alan Grimmett, 217-782-2113, if you have questions concerning notification requirements.

A permit construction site activity stormwater NPDES permit will be required from the Division of Water Pollution Control for the modernization project for the construction and demolition activities of this project. You may contact Al Keller, 217-782-0610, with questions.

Solid and hazardous waste must be properly disposed of or recycled.

Sincerely,

Lisa Bonnett
Acting Deputy Director

Rockford • 4302 N. Main St., Rockford, IL 61103 • (815) 987-7760
Elgin • 595 S. State, Elgin, IL 60123 • (847) 608-3131
Bureau of Land – Peoria • 7620 N. University St., Peoria, IL 61614 • (309) 693-5462
Collinsville • 2009 Mall Street, Collinsville, IL 62234 • (618) 346-5120
Des Plaines • 9511 W. Harrison St., Des Plaines, IL 60016 • (847) 294-4000
Peoria • 5415 N. University St., Peoria, IL 61614 • (309) 693-5463
Champaign • 2125 S. First St., Champaign, IL 61820 • (217) 278-5800
Marion • 2309 W. Main St., Suite 116, Marion, IL 62959 • (618) 993-7200

Department of Energy
Argonne Site Office
9800 South Cass Avenue
Argonne, Illinois 60439

MAR 2 5 2011

Ms. Anne E. Haaker
Deputy State Historic Preservation Officer
Illinois Historic Preservation Agency
1 Old State Capitol
Springfield, Illinois 62701

Dear Ms. Haaker:

SUBJECT: ARGONNE NATIONAL LABORATORY'S (ARGONNE'S) MODERNIZATION PLANNING ENVIRONMENTAL ASSESSMENT

The purpose of this letter is to continue consultation with your office regarding Argonne National Laboratory's (Argonne's) Modernization Planning as required by Section 106 of the National Historic Preservation Act (NHPA – Public Law 102-575). As we discussed at our March 2, 2011 meeting, Argonne will prepare an Environmental Assessment as required by the National Environmental Policy Act (NEPA) on this planning activity. The projects and programs that are addressed in the Modernization Plan would each receive individual 106 reviews as they occur. The reviews will follow the process identified in the Argonne Cultural Resource Management Plan (CRMP).

The Department of Energy-Argonne Site Office has determined that *planning* does not have the potential to directly impact historical resources. Therefore, pursuant to 36 Code of Federal Regulations Section 800.4(d)(1), we believe that "no historic properties [will be] affected" by this activity.

We request your concurrence on our determination that the Modernization Planning will not have an adverse affect as defined by the NHPA.

If you have any questions, please contact Kate Panek of my staff at (630) 252-2736 to discuss the proposed project.

Sincerely,

Joanna M. Livengood

Dr. Joanna M. Livengood
Manager

cc: D. O'Rourke, ANL/EVS
M. Kamiya, ANL/ESQ
J. Stauber, ANL/FMS

A component of the Office of Science

Illinois Historic
Preservation Agency

FAX (217) 782-8161

1 Old State Capitol Plaza • Springfield, Illinois 62701-1512 • www.illinois-history.gov

DuPage County
Argonne National Laboratory's Modernization Planning
Facility Wide

DOE
IHPA Log #002033011

April 4, 2011

Dr. Joanna M. Livengood
Department of Energy
Argonne Site Office
9800 S. Cass Ave.
Argonne, IL 60439

Dear Dr. Livengood:

We are in receipt of your opinion that planning activity associated with the Argonne National Laboratory's Modernization Planning Environmental Assessment does not constitute an adverse effect as pursuant to 36 CFR 800. The proposed planning document addresses proposed changes to the Main Campus District that was previously determined eligible for listing on the National Register of Historic Places.

The Modernization Plan constitutes an adverse effect on the district as defined in 36 CFR 800 as it will diminish the district through demolition and the introduction of new construction. This action does not meet the Secretary of the Interior's "Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings."

At this time, you should begin consultation with this office to seek ways to avoid or minimize this adverse effect. You should also notify the Advisory Council on Historic Preservation of this finding to determine if they wish to join the consultation process.

If you have any questions, please contact me at 217-785-5027.

Sincerely,

Anne E. Haaker

Anne E. Haaker
Deputy State Historic
Preservation Officer
AEH

A teletypewriter for the speech/hearing impaired is available at 217-524-7128. It is not a voice or fax line.

Department of Energy
Argonne Site Office
9800 South Cass Avenue
Argonne, Illinois 60439

MAY 1 9 2011

Ms. Anne E. Haaker
Deputy State Historic Preservation Officer
Illinois Historic Preservation Agency
1 Old State Capitol
Springfield, Illinois 62701

Dear Ms. Haaker:

SUBJECT: ARGONNE NATIONAL LABORATORY'S (ARGONNE'S) MODERNIZATION PLANNING ENVIRONMENTAL ASSESSMENT, ARGONNE, ILLINOIS (IHPA LOG #002033011)

We received your letter of April 4, 2011, responding to our letter of March 25, 2011, where the Department of Energy Argonne Site Office (DOE ASO) made its determination of No Adverse Effect from planning for the modernization of Argonne. We have reviewed our position and the guidelines you referenced in your letter. Upon further review, we reach the same conclusion that planning with no expenditures does not have an adverse effect.

We are seeking the opinion of the Advisory Council on Historic Preservation to determine if planning constitutes the type of activity that could cause adverse effects to historic properties. We will provide a copy of the letter and its attachments so you remain fully informed on the consultation for the project.

In the interim, we will continue to follow the approved Cultural Resources Management Plan which includes the Section 106 review of projects that are funded – such as the Energy Sciences Building.

Should you have any questions, please contact me or Kate Panek of my staff at (630) 252-2736.

Sincerely,

Joanna M. Livengood

Dr. Joanna M. Livengood
Manager

cc: D. Halpin, SHPO
D. O'Rourke, ANL/EVS
M. Kamiya, ANL/ESQ
J. Stauber, ANL/FMS
M. McKown, SC-CH
P. Siebach, SC-CH

A component of the Office of Science

Department of Energy
Argonne Site Office
9800 South Cass Avenue
Argonne, Illinois 60439

MAY 19 2011

Mr. Tom McCulloch, Program Analyst
Advisory Council on Historic Preservation
Old Post Office Building
1100 Pennsylvania Avenue, NW, Suite 803
Washington, D.C. 20004

Dear Mr. McCulloch:

SUBJECT: ARGONNE NATIONAL LABORATORY'S (ARGONNE'S) MODERNIZATION PLANNING ENVIRONMENTAL ASSESSMENT, ARGONNE, ILLINOIS (IHPA LOG #002033011)

Pursuant to 36 CFR § 800.5(c)(2)(i), the United States Department of Energy (DOE) requests the Advisory Council on Historic Preservation's review of a finding made by the Illinois Historic Preservation Agency (IHPA) regarding an undertaking as defined in 36 CFR § 800.16(y) at Argonne National Laboratory (Argonne). Argonne is a federally funded research and development facility owned by DOE and located in DuPage County, Illinois. Argonne is managed and operated by a contractor, UChicago Argonne, LLC. DOE's Argonne Site Office (DOE-ASO) regulates and oversees the contractor assuring compliance with all applicable federal, state, and local laws. Recently, DOE-ASO has determined that an environmental assessment is appropriate to evaluate the potential environmental impacts from modernization planning at the site. Planning addresses three types of projects: new construction, rehabilitation of existing structures, and demolition of existing structures. Associated infrastructure improvements are also being considered. Concurrent with preparation of the EA, DOE-ASO initiated consultation pursuant to Section 106 of the National Historic Preservation Act (NHPA) with the IHPA. At issue for the consultation was whether an undertaking consisting of planning, which does not authorize or fund any activities, is the type of activity which has the potential to adversely affect historic properties at Argonne. DOE-ASO has determined that planning does not have the potential to adversely affect historic properties. The IHPA disagrees with this determination. DOE-ASO, therefore, requests your agency's review of the determination. Following is a description of the undertaking and the consultation process that has occurred to date. Enclosed for your review are all previous correspondences between the DOE-ASO and the IHPA on this matter (Enclosures 1, 2 and 3).

On February 25, 2011, DOE-ASO initiated consultation with the IHPA regarding planning for the modernization of Argonne (Enclosure 1). The planning being proposed applies several guiding principles concerning sustainability and environmental responsibility to the modernizing of the Argonne site over the next decade. Enclosure 4 describes the goals for modernizing Argonne. As noted above, the assessment of the new approach to planning was determined by DOE-ASO to be an undertaking as defined in 36 CFR § 800.16(y). The DOE-ASO followed up its February 25, 2011 letter with a visit to the IHPA office on March 2, 2011, where personnel discussed the scope of modernization planning to staff at the IHPA. DOE-ASO's approach addresses modernization planning in a holistic manner to identify and minimize cumulative effects.

A component of the Office of Science

Mr. Tom McCulloch -2- **MAY 19 2011**

Argonne contains numerous historic properties including two historic districts and several buildings and facilities that have been determined to be significant at the national level for their association with development of the nuclear power industry, the Cold War, and for their advanced engineering. The IHPA agreed with this determination in January 2002. Additionally, there are three archaeological sites that have been determined to be eligible for listing on the National Register of Historic Places and 20 archaeological sites that have not been evaluated for listing.

In the letter of February 25, 2011, and during the meeting of March 2, 2011, DOE-ASO acknowledged that while planning does not have the potential to adversely affect historic properties, when and if any of these types of projects are enacted, there would be the potential for adverse effects to historic properties. DOE-ASO stated that it intends to fulfill any and all responsibilities under the NHPA as projects are authorized and/or funded. On March 25, 2011, DOE-ASO sent another letter to the IHPA formally making our determination that modernization planning does not have the potential to adversely affect historic properties since it does not authorize any activities, but is merely planning (Enclosure 2). In that letter, DOE-ASO reiterated its commitment to conduct the Section 106 consultation process review for specific new construction, rehabilitation, and demolition projects as they are authorized and funded. On April 4, 2011, the IHPA responded that it disagrees with DOE-ASO's determination of no historic properties affected from modernization planning (Enclosure 3). The IHPA stated that modernization planning "constitutes an adverse effect on the district."

DOE-ASO requests your review of our determination that planning for modernization does not have the potential to adversely affect historic properties at Argonne. If you have any questions, please contact Kate Panek of my staff at (630) 252-2736 or by e-mail at katrina.panek@ch.doe.gov.

Sincerely,

Joanna M. Livengood

Dr Joanna M. Livengood
Manager

Enclosures:
As Stated

cc: A. Haaker, SHPO, w/encls.
D. Halpin, SHPO, w/encls.
D. O'Rourke, ANL/EVS, w/encls.
M. Kamiya, ANL/ESQ, w/encls.
J. Stauber, ANL/FMS, w/encls.
M. McKown, SC-CH, w/encls.
P. Siebach, SC-CH, w/encls.

Enclosure 1

Department of Energy
Argonne Site Office
9800 South Cass Avenue
Argonne, Illinois 60439

FEB 25 2011

Ms. Anne E. Haaker
Deputy State Historic Preservation Officer
Illinois Historic Preservation Agency
1 Old State Capitol
Springfield, Illinois 62701

Dear Ms. Haaker:

SUBJECT: NATIONAL HISTORIC PRESERVATION ACT DETERMINATION – ARGONNE NATIONAL LABORATORY (ARGONNE) MODERNIZATION PLANNING, ARGONNE, ILLINOIS

The purpose of this letter is to initiate consultation with your office regarding Argonne Modernization Planning, in order to satisfy Section 106 of the National Historic Preservation Act (NHPA – Public Law 102-575).

The scope Argonne's undertaking is to conduct site infrastructure (e.g., roads, utilities) and natural resources-related planning for the construction of new, upgrade of existing, and demolition of obsolete facilities at Argonne including, but not limited to, offices, laboratories, and research user facilities. The undertaking will address future projects from multiple sources including the Department of Energy (DOE) Offices of Science and Environmental Management, Argonne Institutional General Plant Project programs, as well as State of Illinois funded projects and third party financing opportunities.

We believe it would be beneficial to use this planning period as an opportunity to discuss options with you for satisfying our section 106 responsibilities. I understand that our respective staffs have already had some preliminary discussions. I propose that this be the subject of a meeting for which my staff would plan to travel to your offices in Springfield on March 2, 2011.

If you have questions, or to schedule the meeting, please feel free to contact me via telephone at (630) 252-2366 or by e-mail at joanna.livengood@ch.doe.gov. Alternatively, you or a member of your staff can contact Kate Panek, our Historic Resources Manager, at (630) 252-2736 or by email at katrina.panek@ch.doe.gov.

Sincerely,

Joanna M. Livengood

Dr. Joanna M. Livengood
Manager

A component of the Office of Science

Enclosure 2

Department of Energy
Argonne Site Office
9800 South Cass Avenue
Argonne, Illinois 60439

MAR 2 5 2011

Ms. Anne E. Haaker
Deputy State Historic Preservation Officer
Illinois Historic Preservation Agency
1 Old State Capitol
Springfield, Illinois 62701

Dear Ms. Haaker:

SUBJECT: ARGONNE NATIONAL LABORATORY'S (ARGONNE'S) MODERNIZATION PLANNING ENVIRONMENTAL ASSESSMENT

The purpose of this letter is to continue consultation with your office regarding Argonne National Laboratory's (Argonne's) Modernization Planning as required by Section 106 of the National Historic Preservation Act (NHPA – Public Law 102-575). As we discussed at our March 2, 2011 meeting, Argonne will prepare an Environmental Assessment as required by the National Environmental Policy Act (NEPA) on this planning activity. The projects and programs that are addressed in the Modernization Plan would each receive individual 106 reviews as they occur. The reviews will follow the process identified in the Argonne Cultural Resource Management Plan (CRMP).

The Department of Energy-Argonne Site Office has determined that *planning* does not have the potential to directly impact historical resources. Therefore, pursuant to 36 Code of Federal Regulations Section 800.4(d)(1), we believe that "no historic properties [will be] affected" by this activity.

We request your concurrence on our determination that the Modernization Planning will not have an adverse affect as defined by the NHPA.

If you have any questions, please contact Kate Panek of my staff at (630) 252-2736 to discuss the proposed project.

Sincerely,

Joanna M. Livengood

Dr. Joanna M. Livengood
Manager

cc: D. O'Rourke, ANL/EVS
M. Kamiya, ANL/ESQ
J. Stauber, ANL/FMS

A component of the Office of Science

Enclosure 3

Illinois Historic Preservation Agency

FAX (217) 782-8161

1 Old State Capitol Plaza • Springfield, Illinois 62701-1512 • www.illinois-history.gov

DuPage County
Argonne National Laboratory's Modernization Planning
Facility Wide

DOE
IHPA Log #002033011

April 4, 2011

Dr. Joanna M. Livengood
Department of Energy
Argonne Site Office
9800 S. Cass Ave.
Argonne, IL 60439

Dear Dr. Livengood:

We are in receipt of your opinion that planning activity associated with the Argonne National Laboratory's Modernization Planning Environmental Assessment does not constitute an adverse effect as pursuant to 36 CFR 800. The proposed planning document addresses proposed changes to the Main Campus District that was previously determined eligible for listing on the National Register of Historic Places.

The Modernization Plan constitutes an adverse effect on the district as defined in 36 CFR 800 as it will diminish the district through demolition and the introduction of new construction. This action does not meet the Secretary of the Interior's "Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings."

At this time, you should begin consultation with this office to seek ways to avoid or minimize this adverse effect. You should also notify the Advisory Council on Historic Preservation of this finding to determine if they wish to join the consultation process.

If you have any questions, please contact me at 217-785-5027.

Sincerely,

Anne E. Haaker

Anne E. Haaker
Deputy State Historic
Preservation Officer
AEH

A teletypewriter for the speech/hearing impaired is available at 217-524-7128. It is not a voice or fax line.

Argonne NATIONAL LABORATORY | Facilities Management & Services

Enclosure 4

Argonne Modernization Program

The Argonne modernization program is a long range facility revitalization plan designed to ensure that the Laboratory is fully Mission Ready to perform cutting edge 21st century science in support of the goals and missions of the Department of Energy.

Revitalization Needs

The Laboratory has developed a 20 year modernization plan to ensure that the Argonne site and facilities, which were built to support mid-20th century science, are fully mission ready and capable of supporting cutting edge science for the 21st century. This modernization program, which is already underway, encompasses a number of initiatives:

- construction of new buildings to provide collaborative state of the art scientific space
- rehabilitation of existing space to adapt to current needs
- removal of inefficient, obsolete excess space that is a drain on energy and economic resources
- optimization and consolidation of existing space to improve efficiency
- upgrade or expansion of utility infrastructure to meet new demands

The long range modernization plan incorporates these initiatives and identifies implementing strategies. The plan incorporates near term, mid range and long term projects to ensure that the site remains fully mission ready.

Over the course of the 20 year program roughly $1.28 billion will be devoted to revitalization and modernization of the site facilities and infrastructure.

Guiding Principles

In focusing the modernization strategy, the Laboratory developed a number of guiding principles for achieving modernization:

- **Development Program:** Modernize Argonne to revitalize and reshape existing and new facilities and infrastructure to meet the current and emerging needs for Argonne's scientific missions.
- **Development Pattern**: Seek a balance between increased building heights, closer building proximity, simplified but sufficient circulation networks, and open-space preservation to reinforce a range of pedestrian-oriented settings.
- **Visual Character**: Create well-designed Laboratory facilities that visually reflect leading-edge science while leveraging the abundance of Argonne's natural environment by incorporating the infusion of natural and indigenous elements into designs
- **Circulation, Parking, and Accessibility**: Improve the movement of people, emergency vehicles, services, and goods.
- **Environment and Sustainability**: Implement proactive policies and procedures to achieve energy-efficient and environmentally responsible development and ensure compliance with the requirements of Executive Order 13514: Federal Leadership in Environmental, Energy and Economic Performance.
- **Safety and Security**: Protect employees and users, other site personnel, visitors, the public, and the environment from hazards and risks.
- **Infrastructure and Utility Systems**: Continue modernizing Argonne infrastructure that directly supports Argonne's core capabilities, is critical to its missions, and will enable reducing deferred maintenance while providing a good return on investment.

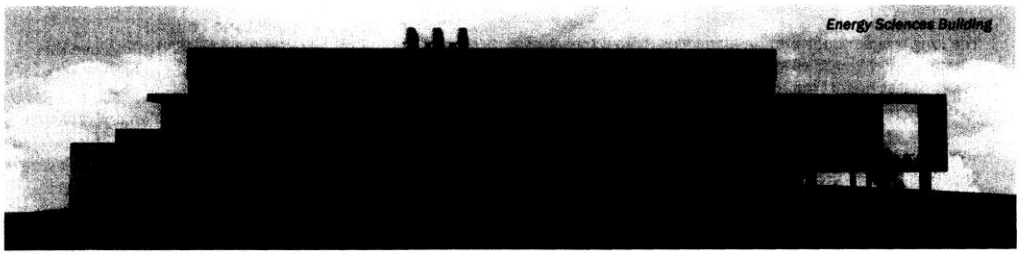
Argonne National Laboratory

Known and Expected Modernization Projects FY 2011 – FY 2025

		Construction	Renovation	Demolition	IGPP
			10 Years		
			2016 2017 2018 2019 2020		
9	IPNS 361, 391, 375 Demolition				
10	SLI-2: Materials Design Laboratory (MDL)				
11	Bldg. 212 Demolition				
12	SLI-3: Multiprogram Laboratory-Office Building				
13	Bldg. 331 Demolition				
	Funding Total	$680	$300		$300
		2011 - 2015	2016-2020		2021-2025
	Time bars indicate approximate years of construction or demolition				
	SLI 1 - 5: Strategic Laboratory Infrastructure Program Projects				

Challenges

The Laboratory faces significant challenges in implementation of the modernization plan. These include aging, inflexible and obsolete facilities and infrastructure which jeopardizes mission readiness. These needs are coupled with sustainability imperatives to meet DOE requirements. Declining funding streams for facilities and infrastructure exacerbate the problem. Forecasted funding demands outweigh projected funding availability. Therefore, the Laboratory is exploring all available avenues to ensure support of the scientific missions.



Modernization Solutions

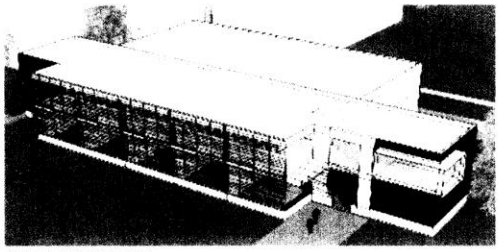
The most significant source of modernization funding is the DOE Strategic Laboratory Infrastructure (SLI) line item program funded through the Office of Science. Initial funding has been received for the new Energy Sciences Building and the critical decision process is underway for a second new building, the Materials Design Laboratory that is slated for initial funding in FY 2013. Two additional replacement buildings and a project to modernize Building 362 round out the SLI modernization plans. Infrastructure upgrades to support the new facilities will be included within the scope of the projects. Continued funding of the SLI program to completion is critical to continued Mission Readiness at Argonne.

Along with construction and rehabilitation of the facilities and infrastructure through the SLI program, the Laboratory plans to decommission, decontaminate (D&D) and demolish a number of obsolete legacy facilities. The majority of this work is requested through the DOE Environmental Management (EM) program. DOE-EM recently funded the removal of two of the oldest facilities on the site, Building 301 and the CP-5 Reactor, Bldg. 330. Funding has been received and D&D and demolition work is underway for Building 310, a legacy facility from the some of the earliest nuclear engineering programs in the early 1950's. Future demolition plans include removal of Buildings 212, 331, 200, 306 and a number of 360 Area facilities that previously housed the Intense Pulsed Neutron Source program. Funding for these efforts is also crucial to the realization of the modernized laboratory campus.

Coupled with pursuit of the various funding sources, the Laboratory is vigorously undertaking productivity and space utilization improvements to free site resources for reuse or reinvestment. These include efforts to reclaim inefficiently utilized laboratory and high bay space, establishment of a modular storage facility, and, where appropriate, mothballing or shutdown of unneeded spaces to reduce maintenance and operation costs. The space consolidation efforts are expected to result in a significant improvement in overall space optimization. Continuous productivity improvement efforts, along with with improved energy efficiency and optimized space utilization will allow the Laboratory to focus more resources on upgrades to existing facilities and infrastructure systems.

Direct Program Funded Projects

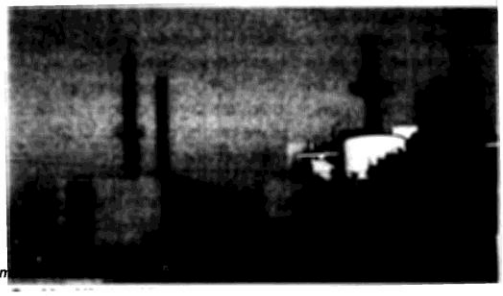
Other key elements of the modernization planning include a number of direct scientific program funded projects including the major upgrade of the Advance Photon Source (APS), the exascale Computing Facility and the upgrade to the Argonne Tandem Linac Accelerator (ATLAS). The APS upgrade and the ATLAS project are in the initial project stages now and the cost estimates for the support infrastructure required for the exascale project have been developed. Completion of these major projects will have a dramatic impact on the ability of the Laboratory to produce cutting edge science.



Agile Facility Concept

Internally Funded Efforts

Internally, the laboratory generates several sources of facility related funds through the Institutional General Plant Projects (IGPP) program and the Major Repair program. These funds are allocated to specific facility related projects based on a systematic Environment, Safety, Health and Infrastructure prioritization process. These projects address smaller capital needs or maintenance and repair needs such as roof replacement, utility support projects such as the new 200 Area central chilled water plant or site paving repairs. The Laboratory is currently investigating the potential for construction of smaller "agile" research facilities (ARF) (<$10M) utilizing IGPP funds. These facilities would provide roughly 18,000 square feet of combination high bay and research space in a flexible configuration.



Alternate Funding Sources

Where conventional funding sources fall short of meeting the facilities and infrastructure needs, the laboratory is pursuing alternative funding sources including third-party financing and support from the State of Illinois. The most recent State of Illinois project is the funding for the Advanced Protein Crystallization Facility to be constructed adjacent to APS. Third party financing will be utilized to fund a new Combined Heat and Power plant which will include a 5MW Cogeneration facility through an Energy Savings Performance Contract (ESPC) to begin in FY 2011.

The efforts described here; SLI line item funding, EM funded D & D and demolition, Internally generated IGPP and Major Repair funds, and 3rd Party and State of Illinois financing or funding comprise a strategic portfolio of funding options that will be pursued to ensure that Laboratory remains mission ready to perform cutting edge 21st century science in support of the goals and missions of the Department of Energy.

Sustainability

Argonne has designed an aggressive strategy to meet all goals from Executive Order 13514: Federal Leadership in Environmental, Energy, and Economic Performance. In the areas of petroleum use, alternative fuels, and water reductions, the Laboratory has already exceeded the goals. Almost 95 percent of Argonne's baseline Greenhouse Gas (GHG) emissions comes from three sources: purchased electricity, on-site steam production, and sulfur hexafluoride use (SF6). Key Site Sustainability Planning strategies include a new Combined Heat and Power Plant, an intranet-based Energy Information System, SF6 leak detection and recovery systems, and construction of new, energy-efficient buildings.

The main challenge is managing sustainability goals during a period in which the Laboratory is undergoing significant growth. Since the 2008 GHG baseline was established, four major facilities—the Theory and Computing Science (TCS) Building, the Ricketts Laboratory, the Advanced Leadership Computing Facility (ALCF), and the Sub-Angstrom Microscopy and Microanalysis (SAMM) Facility—have come on line.

Argonne National Laboratory, 9700 South Cass Avenue, Lemont, IL 60439

Despite investment in numerous energy efficiency projects in the last two years, GHG emissions from electricity have actually increased due to the high power demand of these new facilities. Adding to this growth will be near-term startups of the new Central Chilled Water Plant, Energy Sciences Building, Advanced Protein Crystallization Facility, and Materials Design Lab, as well as the expansion of the Argonne Leadership Computing Facility.

To balance this growth, Argonne is both retrofitting existing facilities and demolishing unnecessary legacy facilities that, although unoccupied, still require heat and power for safety and security reasons. Buildings 301 and 330 were recently demolished and Building 310 will be demolished this fiscal year. Several nuclear facilities are presently being de-inventoried in preparation for deactivation and demolition. Critical to the success of Argonne's sustainability plan, is the Laboratory's ability to obtain continued support from the Department of Energy's Office of Environmental Management (EM) for decontamination and decommissioning (D&D) of legacy facilities. In the interim, Argonne is evaluating the effective consolidation of operations so that entire buildings and/or wings can be placed in a cold-shutdown status.

Building Argonne's Future

"The mission readiness implementation at ANL seems to be part of a perfect storm of leadership, vision, and achievement oriented staff that has eroded past barriers between research and facility organizations."

Quote from Mission Readiness review report, November 2009

CONTACT >>> **Gail Stine** 630.252.8930 | gstine@anl.gov
Facilities Management and Services Division | www.anl.gov

Enclosure 5

2010-2015

STRATEGIC PLAN

THE U.S. DEPARTMENT OF ENERGY'S

ARGONNE NATIONAL LABORATORY

Argonne NATIONAL LABORATORY

Preserving America's Heritage

July 6, 2011

Dr. Joanna M. Livengood
Manager
Argonne Site Office
9800 South Cass Avenue
Argonne, IL 60439

REF: Argonne's Modernization Planning Environmental Assessment

Dear Dr. Livengood:

Argonne National Laboratory has asked the Advisory Council on Historic Preservation (ACHP) for its advisory opinion on the question of whether development of a master plan, in this case the referenced document, constitutes an adverse effect to historic properties under the regulations implementing Section 106 of the National Historic Preservation Act at 36 CFR part 800 (2004).

Under the Section 106 regulations an adverse effect occurs when an undertaking "may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion to the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association." 36 CFR § 800.5(a)(1).

To provide our opinion on this matter we have reviewed Argonne's 2010-2015 Strategic Plan, its 2010 Cultural Resource Management Plan, and correspondence between Argonne and the Illinois State Historic Preservation Officer (SHPO). It is the SHPO's position that Argonne's planning activities are an adverse effect because the plans do not meet the Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings.

It is the ACHP's advisory opinion that Argonne's modernization plan, by itself, does not constitute an adverse effect to historic properties. While parts of the plan do call for removal of several historic properties, the plan is just that—a plan, and not a fully funded and approved directive moving forward on a specific timetable. According to Argonne, it does not currently have funding to implement the plan in its entirety, and components are subject to change and revision according to future operational and budgetary priorities. Further, Argonne will not proceed with a component of the plan that could potentially affect historic properties, or that could restrict the subsequent consideration of alternatives to avoid, minimize or mitigate adverse effects on historic properties, without first initiating and concluding the Section 106 process prior

ADVISORY COUNCIL ON HISTORIC PRESERVATION
1100 Pennsylvania Avenue NW, Suite 803 • Washington, DC 20004
Phone: 202-606-8503 • Fax: 202-606-8647 • achp@achp.gov • www.achp.gov

to making a final decision on the component. See 36 CFR § 800.1(c). Since approval of this kind of a plan does not represent a final agency decision on an undertaking or restrict future alternatives, its approval does not need to be preceded by conclusion of a Section 106 review.

If a federal agency proposed a modernization or master plan that would be implemented on a specific timetable and components of it that could affect historic properties were certain to be implemented, so that approval of such a plan would represent a final agency decision to proceed with the plan, we would agree that the agency should initiate the Section 106 process with the SHPO before such a plan approval. However, in this specific case, we believe the agency approval of the kind of plan at issue here is just a planning exercise that does not irrevocably commit the agency to proceed with particular actions that could affect historic properties.

If you have any questions, or would like to discuss this matter further, please call Dr. Tom McCulloch at 202-606-8554 or via email to tmcculloch@achp.gov.

Sincerely,

Caroline D. Hall
Assistant Director
Federal Property Management Section
Office of Federal Agency Programs

U.S. Department of Energy
Finding of No Significant Impact
Environmental Assessment for Argonne National Laboratory
Modernization Planning (DOE/EA-1866)
Argonne, Illinois

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

ACTION: Finding of No Significant Impact (FONSI)

SUMMARY: DOE has prepared an Environmental Assessment (EA), to evaluate impacts from modernization planning at Argonne National Laboratory (Argonne) in Argonne, Illinois. Under this proposed action, DOE would conduct planning to govern the development of Argonne.

Based on the analysis in the EA, DOE has determined that the proposed action would not significantly affect the quality of the human environment within the meaning of the National Environmental Policy Act of 1969 (NEPA). Therefore, the preparation of an Environmental Impact Statement (EIS) is not required.

DESCRIPTION OF THE PROPOSED ACTION: The proposed action evaluated in this EA is to conduct modernization planning at Argonne according to a consolidated campus approach, while ensuring that Argonne's ability to contribute to DOE's science mission is maintained. Planning would govern the construction of new facilities; the rehabilitation of or additions to existing facilities; the decontamination and/or demolition of existing facilities; and also the building, maintenance, and operation of associated infrastructure such as roads and utilities. Enhancements to the current condition would be planned through the use of a set of guiding principles, to both help in identifying general design features and in locating future science facilities and associated infrastructure. Guiding principles include:

- **Development Program:** Modernize Argonne to revitalize and reshape existing and new facilities and infrastructure to meet the current and emerging needs for Argonne's scientific missions.

- **Development Pattern:** Seek a balance between increased building heights, closer building proximity, simplified but sufficient circulation networks, and open-space preservation to reinforce a range of pedestrian-oriented settings.

- **Visual Character:** Create well-designed Laboratory facilities that visually reflect leading-edge science, while leveraging the abundance of Argonne's natural environment by incorporating the infusion of natural and indigenous elements into designs.

Argonne National Laboratory Modernization Planning

- **Circulation, Parking, and Accessibility:** Improve the movement of people, emergency vehicles, services, and goods.

- **Environment and Sustainability:** Implement proactive policies and procedures to achieve energy-efficient and environmentally responsible development and ensure compliance with the requirements of Executive Order 13514 (Federal Leadership in Environmental, Energy, and Economic Performance, October 5, 2009) (74 FR 52117).

- **Safety and Security:** Protect employees and users, other site personnel, visitors, the public, and the environment from hazards and risks.

- **Infrastructure and Utility Systems:** Continue modernizing Argonne infrastructure and utility systems that directly support Argonne's current and future core capabilities and scientific missions.

ALTERNATIVES: Under the No-Action alternative, DOE would not develop and implement a comprehensive modernization planning program for the Argonne site. Development of the site would continue to occur under the existing planning processes, which focus on a building-by-building process included in the Argonne project management planning process, without the benefit of comprehensive modernization planning and its guiding principles.

ENVIRONMENTAL IMPACTS: Impacts associated with the Proposed Action were analyzed in the EA. Since planning is not the kind of action that could result in a direct impact on human health or the environment, the EA largely explores cumulative impacts. Cumulative impacts are those impacts that may result from the incremental impacts of an action considered additively with the impacts of other past, present, and reasonably foreseeable future actions. Cumulative impacts are considered regardless of the agency or person undertaking the other actions (Title 40, Part 1508.7, of the *Code of Federal Regulations* [40 CFR 1508.7]; CEQ 1997) and can result from the combined or synergistic effects of individually minor actions over a period of time. Since there are no direct impacts, cumulative impacts are composed entirely of other past, present, and reasonably foreseeable future actions. The facilities and associated infrastructure that are the subject of planning are reasonably foreseeable future actions.

Those projects in the planning process were both individually and collectively evaluated in each resource area against the guiding principles identified above. The common conclusion was that because modernization planning comprehensively addresses the development of the entire Argonne site, coordination may result in efficiencies when projects are implemented. The proposed action also enables the consolidation of facilities, which has the additional benefit of increasing options for later expansion, while also allowing for the preservation of or even expansion of natural areas. Thus, in general, although modernization planning would not result in impacts, cumulative impacts would be reduced in most resource areas when projects are implemented. Specifically,

Argonne National Laboratory Modernization Planning

modernization planning when applied to development projects would result in advantages for land use, geologic and soil resources, water resources, air resources, biological resources, infrastructure and utilities, waste management, transportation, and health and safety. Modernization planning would aid in ensuring compliance with the National Historic Preservation Act (NHPA). Modernization planning would not be expected to result in socioeconomic or environmental justice concerns. Since considerable uncertainty about the authorization and implementation of projects exists, only a few general conclusions about impacts can be made. Prior to undertaking any projects, independent NEPA reviews will be completed, which may result in the preparation of an EIS or EA, or in a Categorical Exclusion determination being made.

DETERMINATION: Based on the analysis in the EA, DOE has determined that the proposed modernization planning at Argonne does not constitute a major federal action that would significantly affect the quality of the human environment within the meaning of NEPA, and DOE will not prepare an EIS. The proposed action alternative would result in only minor environmental, health, and safety impacts and is the most efficient and cost-effective alternative.

PUBLIC AVAILABILITY: Copies of the EA, including documentation incorporated by reference, are available for viewing at the following locations:

Lemont Public Library
50 East Wend Street
Lemont, IL 60439

Indian Prairie Public Library
Reference Section
401 Plainfield Road
Darien, IL 60561

Chicago Office, Public Reading Room
University of Illinois at Chicago
University Library, Document Department
801 South Morgan Street, 3rd Floor Center
Chicago, IL 60607

The EA may also be viewed on-line at:
http://www.ch.doe.gov/html/site_info/Environmental_Assessments.htm

Copies of the EA are available from:

Kaushik N. Joshi
NEPA Document Manager
9800 South Cass Avenue
Argonne, Illinois 60439
(630) 252-4226

Argonne National Laboratory Modernization Planning

FOR FURTHER INFORMATION REGARDING THE DOE NEPA PROCESS, CONTACT:

Peter R. Siebach
Acting NEPA Compliance Officer
Argonne Site Office
9800 South Cass Avenue
Argonne, Illinois, 60439
(630) 252-2007

Issued in Argonne, Illinois, this 1st day of November, 2011.

Joanna M. Livengood, Manager
Argonne Site Office