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Notice of Availability of Environmental Assessment

The U.S. Army Corps of Engineers, Louisville District (District) announces the availability of the Draft Environmental Assessment for the Monroe Lake Master Plan, Salt Creek, Indiana

Master Plans are the basic document guiding the fulfillment of U.S. Army Corps of Engineers' (USACE) responsibilities pursuant to federal laws at USACE projects; these responsibilities include preserving, conserving, restoring, maintaining, managing, and developing the lands, waters, and associated resources for the citizens of the United States. It is USACE policy that each master plan be reviewed on a periodic basis and be revised as required. The existing Monroe Lake Project Master Plan was completed in 1967, but has not been comprehensively revised since then.

The District is proposing to update the existing Monroe Lake Master Plan. The update would provide a comprehensive description of the project, a discussion of factors influencing resource management and development, an identification and discussion of special problems, a synopsis of public involvement and input to the planning process, and descriptions of past, present, and proposed development. The purpose of this Environmental Assessment is to consolidate and update information on Master Plan implementation and provide an opportunity for public involvement in the decisionmaking process.

For further project information, to request a copy of the Environmental Assessment, or to submit comments, contact:

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Comments regarding the EA received by August 28th, 2017 will assist in the agency's evaluation of the project changes and will be reflected in the project record



US Army Corps of Engineers Louisville District

Environmental Assessment Monroe Lake Master Plan Salt Creek, Indiana



June 2017

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Executive Summary

The U.S. Army Corps of Engineers' (USACE) Monroe Lake Project (Project) is located on Salt Creek in Monroe County, Indiana, approximately 11 miles south of Bloomington, Indiana and 26 river miles upstream from the confluence of Salt Creek and East Fork White River near Bedford, Indiana.

The USACE retains title to all lands and facilities specifically acquired for project purposes or constructed with government assistance for recreation and wildlife enhancement, and retains total operational jurisdiction over approximately 171.71 acres of land and water at the dam site which are essential for the operation and maintenance of Monroe Lake as a flood control project.

Master plans are required for civil works projects (such as the Monroe Lake Project) for which the USACE has administrative responsibility for management of natural and manmade resources. Master Plans provide guidelines and direction for future project development and provide a District-level policy consistent with national objectives and other state and regional goals and programs. The existing Monroe Lake Master Plan was completed in 1967, and there has been no comprehensive revision to the Master Plan since that time. As such, the current Master Plan provides an inadequate basis on which to evaluate contemporary proposals.

Neither the USACE nor the Indiana Department of Natural Resources (IDNR) currently have plans for development of new major recreational amenities. However, maintaining existing facilities, improving some existing facilities, and protecting the project's natural areas and natural resources have a number of small-scale actions that would be the proposed future development under the updated Master Plan. This Environmental Assessment describes the existing environmental conditions at the Project (affected environment) providing a baseline for measuring expected changes that could result from small-scale actions implemented under the proposed revised Master Plan. This page intentionally left blank

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1 INTRODUCTION

Master Plans are the basic document guiding the fulfillment of U.S. Army Corps of Engineers' (USACE) responsibilities pursuant to federal laws at USACE projects; these responsibilities include preserving, conserving, restoring, maintaining, managing, and developing the lands, waters, and associated resources for the citizens of the United States. The existing Monroe Lake Master Plan (Design Memorandum No. 4B) was completed in 1967.

The purpose of this Environmental Assessment (EA) is to consolidate and update information on Master Plan implementation. The EA will also provide an enhanced opportunity for public involvement in the decision-making process. It has also has allowed the USACE to address compliance with other environmental laws as part of a single review process rather than through separate reviews, thereby reducing paperwork and ensuring comprehensive compliance.

1.1 Project Location

The Monroe Lake dam is located on Salt Creek in Monroe County, Indiana, approximately 11 miles south of Bloomington, Indiana and 26 river miles upstream from the confluence of Salt Creek and East Fork White River near Bedford, Indiana. It is 166 river miles from the confluence of the White River and the Wabash River near Mt. Carmel, Indiana. Figures 1-1 and 1-2 show the location and vicinity of the lake.

State Route (SR) 37 is the nearest major highway (approximately 1.5 miles west of the dam), providing access north to Bloomington and south to Bedford. SR 37 continues north 42 miles from Bloomington to Indianapolis. An



Figure 1. Project vicinity map

extension of I-69 at Bloomington, finished in December 2015, allows interstate access 97 miles southwest to Evansville, Indiana.

The dam is accessed by vehicle from numerous points. The dam area is accessed from SR 37 by traveling Monroe Dam Road east to East Monroe Dam Road. The south part of the lake is accessed by multiple dead end roads intersecting with Valley Mission Road, Hardin Ridge Road, and South Chapel Hill Road. The lake is roughly bisected by SR 446 crossing the lake over a bridge and causeway. SR 446 provides lake access from Bloomington (to the north) and US 50 (to the south near Bedford). The north part of the lake (west of SR 446) is accessed by East Pointe Road, South Fairfax Road, East Ramp Creek Road, South Shields Ridge Road, East Stipp Road and Swartz Ridge Road. Lake areas east of SR 446 are not as easily accessible by car with the main connecting roads being TC Steele Road and Crooked Creek Road.

1.2 Project Overview

The Monroe Lake Dam is comprised of an impervious core with a rock shell and mowed turf downstream face, and riprap upstream face, ground stabilization. Table 1-1 describes the project's structure data. The maximum height of the dam is 93 feet and crest length is 1,350 feet. The top elevation of the dam is 574 feet above msl. The Monroe Lake Dam structures include a conduit-type outlet works and a spillway (with a dry tower), a public use road across the top of the dam, and an operations building with a parking area and a gauging station.

The outlet works consist of a dry type tower and a 12-foot diameter, elliptical, concrete conduit. Flow is controlled by three service gates—each with 3.75 feet horizontal by 12-foot vertical dimensions. The conduit inlet invert elevation is 497.00 feet above msl. The dam also has two bypass gates—each 30-inches in diameter.

The spillway is through an open cut of the left abutment around a natural hillside peninsula known as the Salt Creek lake access. The crest elevation is 556 feet above msl. The width of the cut is 600 feet and the length of the cut is 750 feet. The spillway is designed to accommodate a maximum discharge of 73,760 cubic feet per second of flow.

The lake has a recreational pool elevation of 538 .00 above msl. At recreational pool elevation, the lake is designed for 182,000 acre feet of storage with 190 miles of shoreline. The lake is designed to provide flood storage from elevation 538.00 msl to 556.00 msl with a 258,000 acre feet capacity. A spillway crest elevation of 556.00 msl, the lake extends 38 miles upstream.

1.3 Authorization and Project Description

The Monroe Reservoir project was selected for construction under the general authorization for flood control in an Act of Congress approved 3 July 1958, Public Law No. 85-500, 85th Congress. The estimated land acquisition cost was \$9,347,374 and the total asset acquisition cost was \$4,832,165. Construction started in November 1960 and the project was dedicated in October 1964.

The Monroe Lake dam provides flood control for Salt Creek, the East Fork of the White River and the lower portion of the Wabash River, and augments low-flow periods for Salt Creek.

1.4 National Environmental Policy Act Overview

This Environmental Assessment has been prepared in accordance with the National Environmental Policy Act of 1969 (NEPA) and the Council on Environmental Quality's (CEQ) Regulations (40 CFR §1500-1508), as reflected in the USACE Engineering Regulation, ER 200-2-2. The USACE ER 200-2-2 supplements, and is used in conjunction with, the CEQ regulations.

Within the regulations, a process is set forth where the USACE must assess the environmental effects of proposed federal actions and consider reasonable alternatives to their proposed actions. In general, NEPA requires federal agencies to make a series of evaluations and decisions that anticipate adverse effects on environmental resources. For those actions with the greatest potential to create significant environmental effects, the consideration of the proposed action and alternatives is presented in an Environmental Impact Statement (EIS). Where the potential effects of the proposed action are believed to not be significant, the agencies prepare an EA; the

revision to the Monroe Lake Project Master Plan is accompanied by an EA to support the decision making.

The CEQ's NEPA Regulations do not contain a detailed discussion regarding the format and content of an EA, but an EA must briefly discuss the:

- Need for the proposed action;
- Proposed action and alternatives;
- Probable environmental effects of the proposed action and alternatives; and
- Agencies and persons consulted in the preparation of the EA.

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2 PURPOSE AND NEED FOR CORPS OF ENGINEERS ACTION

2.1 Master Plan Overview

A master plan was approved for the Monroe Lake Project in 1967. It is USACE policy that each master plan shall be reviewed on a periodic basis and be revised as required. Engineer Regulation (ER) 1130-2-550 establishes the policy for the management of recreation programs and activities, and for the operation and maintenance of USACE recreation facilities and related structures, at civil works water resource projects.

The master plan is the basic document guiding USACE responsibilities pursuant to federal laws to preserve, conserve, restore, maintain, manage, and develop the project lands, waters, and associated resources. The master plan is a dynamic planning document that deals in concepts, not in details of design or administration.

Master plans are required for civil works projects and other fee-owned lands for which the USACE has administrative responsibility for management of natural and manmade resources. Engineer Pamphlet (EP) 1130-2-550 establishes guidance for the preparation of master plans. As stated therein, the primary goals of the master plans are to prescribe an overall land and water management plan, resource objectives, and associated design and management concepts, which:

1) Provide the best possible combination of responses to regional needs, resource capabilities and suitabilities, and expressed public interests and desires consistent with authorized project purposes;

2) Contribute towards providing a high degree of recreation diversity within the region;

3) Emphasize the particular qualities, characteristics, and potentials of the project; and

4) Exhibit consistency and compatibility with national objectives and other state and regional goals and programs.

2.2 Purpose and Need for the Updated Master Plan

The existing Monroe Lake Master Plan was approved in 1967, and there has been no revision to the plan since that time. As such, the current master plan provides an inadequate basis with which to evaluate contemporary proposals. There have been changes in demand for recreation, adjacent population growth, and the construction of adjacent recreational amenities not on USACE property, which dictate the need to update the Master Plan for the Monroe Lake Project.

The purpose of the Master Plan update would provide a comprehensive description of the project, a discussion of factors influencing resource management and development, an identification and discussion of special problems, a synopsis of public involvement and input to the planning process, and descriptions of past, present, and proposed development.

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3 ALTERNATIVES

When preparing an EA, the USACE should develop a range of alternatives that could reasonably achieve the need that the proposed action is intended to address. The alternatives to be considered in this EA are a no action alternative of continuing to operate the Project under the 1967 Master Plan, and the proposed action of operating the Project consistent with a new master plan. The preparation of an environmental assessment, with only two alternatives (continuing to operate the Project without a new master plan and operating the Project with a new master plan) is appropriate because there are no other reasonable alternatives to consider for evaluation; there has been no comprehensive revision to the master plan in nearly 50 years. The CEQ regulations provide that "agencies may prepare an environmental assessment on any action at any time in order to assist agency planning and decision making" (40 CFR 1501.3(b)).

3.1 No Action

The no action alternative being evaluated should be viewed as "no change" from current management direction or level of management intensity. Therefore, the "no action" alternative may be thought of in terms of continuing with the present course of action (under the existing Master Plan) until that action is changed (under a revised Master Plan). Because master plans provide the basis for evaluating contemporary proposals, the 1967 document does not account for the many substantial changes that have occurred since then. The existing master plan is capable of providing only minimal support to development and management of the project. Future development decisions would therefore be assessed on an *ad hoc* basis without the benefit of a comprehensive assessment of recreation and natural resource conditions and opportunities at the project.

Under the no action alternative, development and management of the project area would likely take the same general direction outlined in the proposed updated master plan and therefore, would generally share the same environmental consequences. However, future developments or resource management policies would require approval on a case-by-case basis without the benefit of evaluation in the context of a revised overall plan or analysis in an Environmental Assessment.

3.2 Proposed Action – Approval and Use of the Updated Master Plan

Under this alternative, an updated master plan would be approved for the Project to provide management guidance and would replace the 1967 document. The revised master plan addresses important updates due to the considerable changes in the demographics, recreation demand, amenities within the project, amenities on adjacent properties, current environmental conditions, and pertinent laws and policies. The scope of the revised master plan and environmental assessment are limited to actions on the USACE property. The only exception being the consideration of potential cumulative effects associated with actions off of USACE property.

3.2.1 Scope and Objectives of the Updated Master Plan

The master plan provides guidelines and direction for future project development and use and is based on authorized project purposes, USACE policies and regulations on the operation of USACE projects (USACE, 1996; USACE, 1996a; USACE, 1999), responses to regional and local needs, resource capabilities and suitable uses, and expressed public interests consistent with authorized

project purposes and pertinent legislation. The master plan provides a District-level policy consistent with national objectives and other state and regional goals and programs.

3.2.2 Land Allocation, Land Classifications, and Resource Objectives

Land allocation is defined as the congressionally authorized purpose for which the lands were acquired (EP 1130-2-550). There are four land allocation categories applicable to USACE projects:

- 1. Operations
- 2. Recreation
- 3. Fish and wildlife
- 4. Mitigation

Monroe Lake lands are currently allocated for operations, recreation, and fish and wildlife purposes (Figure 2). The current location of recreation and wildlife management lands throughout the project were deemed compatible with the project purposes, and recreation and wildlife management uses do not interfere with project operations.

The land is further categorized into classifications to identify use and management of all project lands (Figure 3). Land classification categories as defined by EP 1130-2-550 are as follows:

- 1. Project operations
- 2. High density recreation
- 3. Multiple resource management
 - a. Recreation–low-density
 - b. Wildlife management
 - c. Vegetative management
 - d. Future high density recreation areas
 - e. Future low density recreation areas
- 4. Environmental sensitive areas



Figure 2. Land Allocation at Monroe Lake



4 AFFECTED ENVIRONMENT/ENVIRONMENTAL CONSEQUENCES

The National Environmental Policy Act and the Council on Environmental Quality's NEPA Implementing Regulations require that an Environmental Assessment identify the likely environmental effects of a proposed project and that the agency determine whether those impacts may be significant. The determination of whether an impact significantly affects the quality of the human environment must consider the context of an action and the intensity of the impacts (40 CFR 1508.27).

The term context refers to the affected environment in which the proposed action would take place and is based on the specific location of the proposed action, taking into account the entire affected region, the affected interests, and the locality. The term intensity refers to the magnitude of change that would result if the proposed action were implemented.

Determining whether an effect significantly affects the quality of the human environment also requires an examination of the relationship between context and intensity. In general, the more sensitive the context (i.e., the specific resource in the proposed action's affected area), the less intense an impact needs to be in order for the action to be considered significant. Conversely, the less intense of an impact, the less scrutiny even sensitive resources need because of the overt inability of an action to effect change to the physical environment. The consideration of context and intensity also must account for the indirect and cumulative effects from a proposed action. This section describes the existing environmental conditions in the project area (affected environment) providing a baseline for measuring expected changes that would result from implementation of the proposed revised Master Plan.

This Section presents the adverse and beneficial environmental effects (direct and indirect) of the proposed action and the No Action alternative. The section is organized by resource topic, with the effects of alternatives discussed under each resource topic. Impacts are quantified whenever possible. Qualitative descriptions of impacts are explained by accompanying text where used.

Qualitative definitions/descriptions of impacts as used in this section of the EA include:

Intensity:

- Minor noticeable impacts to the resource in the project area, but the resource is still mostly functional,
- Moderate the resource is impaired, so that it cannot function normally,
- Major the resource is severely impaired so that it is no longer functional in the project area

Duration:

• Short term – temporary effects caused by the construction and/or implementation of a selected alternative, and

• Long term – caused by an alternative after the action has been completed and/or after and is in full and complete operation is in full and complete operation.

4.1 Reservoir, Pool, and Lake Operation

4.1.1 Existing Condition

The primary purpose of the Monroe Lake project is flood control. The reservoir was designed to store floodwaters and slow the release downstream, reducing flood risk for Salt Creek, the East Fork of the White River, and the lower portion of the Wabash River.

Figure 4 shows inundation areas between the permanent, or winter, pool level of 538 msl and the maximum flood control elevation of 556 msl. The top of the dam is at 574 msl. Based on the inundation areas displayed in Figure 4, the north and south forks will experience the most significant flooding.



4.1.2 Environmental Consequences

4.1.2.1 No Action

Under the no action alternative, an updated master plan would not be approved for the Monroe Lake Project in the foreseeable future and there would be no comprehensive planning for the project. However, future development would likely still occur, but without the benefit of a comprehensive planning document. As such, the construction-related effects to reservoir, pool, and lake operation occur under no action as they would under the proposed action.

4.1.2.2 Proposed Action

Implementation of the ongoing project management under the revised master plan would result in no changes to the Monroe Lake operations. Operations are controlled by the project's Operational Management Plan; the revised master plan does not change lake operations.

4.2 Climate

4.2.1 Existing Condition

Central Indiana's climate exhibits strongly marked seasons. Winters are often cold, and summers are often hot. The transition from cold to hot weather can produce an active spring with thunderstorms and tornadoes. Oppressive humidity and high temperatures arrive in summer. Autumn is generally marked by lower humidity and mostly sunny skies.

Indiana's location within the continent highly determines this cycle of climate. The Gulf of Mexico is a major player in Indiana's climate. Southerly winds from the Gulf region readily transport warm, moisture laden air into the state. The warm moist air collides with continental polar air brought southward by the jet stream from central and western Canada. A third air mass source found in Indiana originates from the Pacific Ocean. Due to the obstructions posed by the Rocky Mountains, however, this third source arrives less frequently in the state.

A winter may be unusually cold or a summer cool if the influence of polar air is persistent. Similarly, a summer may be unusually warm or a winter mild if air of tropical origin predominates. The interaction between these two air masses of contrasting temperature, humidity, and density favors the development of low pressure centers that move generally eastward and frequently pass over or close to the state, resulting in abundant rainfall. These systems are least active in midsummer and during this season frequently pass north of Indiana (National Oceanic and Atmospheric Administration, 2017).

4.2.2 Environmental Consequences

4.2.2.1 No Action

Under the no action alternative, an updated master plan would not be approved for the Monroe Lake Project in the foreseeable future and there would be no comprehensive planning for the project. However, future development would likely still occur, but without the benefit of a comprehensive planning document. As such, the construction-related effects to climate would occur under no action as they would under the proposed action.

4.2.2.2 Proposed Action

There would be no environmental consequences of implementing the new master plan or future actions within the new master plan on the climate in the project vicinity.

4.3 Air Quality

4.3.1 Existing Condition

The U.S. Environmental Protection Agency (USEPA) Office of Air Quality Planning and Standards has set National Ambient Air Quality Standards (NAAQS) for six principal pollutants, called "criteria" pollutants. They are carbon monoxide, nitrogen dioxide, ozone, lead, particulates of 10 microns or less in size (PM-10 and PM-2.5), and sulfur dioxide. Ozone is the only parameter not directly emitted into the air but forms in the atmosphere when three atoms of oxygen (O₃) are combined by a chemical reaction between oxides of nitrogen (NO_x) and volatile organic compounds (VOC) in the presence of sunlight. Motor vehicle exhaust and industrial emissions, gasoline vapors, and chemical solvents are some of the major sources of NO_x and VOC, also known as ozone precursors. Strong sunlight and hot weather can cause ground-level ozone to form in harmful concentrations in the air.

Monroe County is in attainment for all criteria pollutants (U.S. Environmental Protection Agency, 2015).

4.3.2 Environmental Consequences

4.3.2.1 No Action

Under the no action alternative, an updated master plan would not be approved for the Monroe Lake Project in the foreseeable future and there would be no comprehensive planning for the project. However, future development would likely still occur, but without the benefit of a comprehensive planning document. As such, the construction-related effects to air quality would occur under no action as they would under the proposed action.

4.3.2.2 Proposed Action

Air quality would not be predicted to change from existing conditions as the effects of implementing the updated master plan and any of the future development actions on air quality would be minimal. There would be some localized and temporary emissions associated with construction of new or improved amenities (e.g., utility trenching, road paving, supplying asphalt/concrete, excavation). Emissions from construction actions would typically include byproducts of diesel and gasoline combustion, fugitive dust, and vapors from asphalt paving. The emissions associated with equipment operation and construction would be localized, of relatively short duration, and would occur when constructing any new or improved future development features.

4.4 Topography, Geology, and Soils

4.4.1 Existing Condition

Monroe Lake Reservoir is underlain with limestone, siltstone and shale (Jones, 1997) dating to the Mississippian age, about 330 million years ago (Hill, 2015). The Mississippian rock around the lake is split into two regions: the Norman Upland to the east and Mitchell Karst Plain to the west. The Norman Upland contains the majority of the project as well as the watersheds, which drain into the lake. The rocks surrounding the project site create steep hills and valleys around eastern edges of the lake. On the western side, the Mississippian rock under the broad rolling hills has undergone acid dissolution, creating karst features.

The Mitchell Karst Plain on the western lake edges is characterized by karst features. Karst is a terrain type with a distinctive landform and hydrology system. Acid dissolution of limestone and dolomite creates a network of interconnected fissures, fractures and conduits allowing groundwater flow and storage. Visible surface features of karst terrains include caves, vanishing streams, sinkholes and springs. Often karst features can be used as a water source; however, the features surrounding Monroe Lake are not viable water sources.

According to the United States Department of Agriculture (USDA) Natural Resources Conservation Service (USDA NCRS), four soil associations occur at the project site. These soil associations are listed in Table 3-5. Figure 3-6 divides the soils identified in Table 1 into three development suitability categories:

- 1. Most suitable for development
- 2. Limited development
- 3. Least suitable for development

Table 1. Soil Associations in Order of Predominance					
Soil Association	Typical Slope	Suitability Based on Slope and Soil Type			
Wellston-Weikert- Gilpin-Berks	Moderately— Very Steep	<i>Limited Suitability.</i> Well-drained soil found on gentle to steep slopes			
Stendal-Bonnie	Flat	<i>Least Suitable</i> . Somewhat poorly drained, often characterized by floodplains or wetlands, may flood frequently			
Wakeland- Haymond	Flat	<i>Least Suitable.</i> Somewhat poorly drained, often characterized by floodplains or wetlands, may flood frequently			
Crider-Bedford- Baxter	Flat— Moderately Steep	<i>Most Suitable.</i> Moderately to well-drained soil found on gentle to steep slopes			

Source: USDA NRCS, Digital General Soil Map of U.S. 2006

Based on information presented in Table 1, the Wellston-Weikert-Gilpin-Berks and Crider-Bedford-Baxter provide the best development opportunities because they are classified as having "limited" and "most" suitability. These soils are found on rolling hills, ridge tops and other steep slopes. NCRS classifies Stendal-Bonnie and Wakeland-Haymond as hydric soils; therefore, they are least suitable for development.

4.4.2 Environmental Consequences

4.4.2.1 No Action

Under the no action alternative, an updated master plan would not be approved for the Monroe Lake Project in the foreseeable future and there would be no comprehensive planning for the project. However, future development would likely still occur, but without the benefit of a comprehensive planning document. As such, the construction-related effects to topography, geology, and soils would occur under no action as they would under the proposed action.

4.4.2.2 Proposed Action

Prior to construction of any of the new or improved future development features, best management practices would be deployed (e.g., use of silt fences) to minimize erosion and soil loss, when appropriate. As a result of the reasonable use of best management practices, minimal effects would be predicted to topography, geology, and soils from implementing the new master plan or future actions within the new master plan.

4.5 Surface Water Hydrology and Groundwater

4.5.1 Existing Condition

Monroe Lake Reservoir is a 24,630.03-acre project fed by the North, Middle and South Forks of Salt Creek. The tailwater from Monroe Lake drains into Salt Creek, a tributary of the East Fork of the White River. Salt Creek flows south from the tailwater for 26 miles to merge with the East Fork of the White River downstream of Bedford in Lawrence County, Indiana (USACE, 1998). The White River flows into Wabash River which eventually empties into the Ohio River.

The Monroe Lake dam provides flood control for Salt Creek, the East Fork of the White River and the lower portion of the Wabash River, and augments low-flow periods for Salt Creek (USACE, 1998).

Monroe Lake gathers storm water runoff from 432 square miles, covering parts of Monroe, Brown, Jackson, Bartholomew and Lawrence Counties. The sub-basin for the lake, called Lower East Fork White, drains 2,029 square miles (see Figure 5).



Monroe Lake was formed on Salt Creek by the building of the dam in 1965, making it the State of Indiana's largest inland man-made water body. The dam is located on Salt Creek, 25.9 miles upstream from its confluence with the White River (USACE, 1998). At the permanent pool level (538 msl), the lake has 103 miles of shoreline and 10,750 acres of water (USACE, 1967). The lake is split into three basins—upper, middle and lower—and has an average depth of 17.3 feet, with a maximum depth of 55 feet at 538 msl (Jones, 1997).

Two zones control boat speed on Monroe Lake. Zone 1 limits any area 200 feet or less away from the shoreline or docks (USACE, 2004) as well as all embayments which are less than 1,500 feet wide at the mouth to idling speeds with no wake. Areas of the lake east of SR 446 are also categorized under Zone 1. Zone 2 limits two areas to idling speeds with no wake, which from October 1 to April 15, are closed to watercraft to protect waterfowl habitat (USACE, 1967). The main body of the lake is unrestricted.

The City of Bloomington withdraws an average of 15 million gallons per day through the Monroe Water Treatment Plant from Monroe Lake. This withdrawal can increase to as much as 24 million gallons per day during warmer months. By contract, the maximum daily withdrawal available to Bloomington is 24 million gallons (Jones, 1997). In addition to Bloomington, three other organizations (Eagle Pointe Golf Resort, Indianapolis Power and Light, and Salt Creek Services) account for additional water draws from the reservoir (see section 5.2 for more details). The State of Indiana reserves the right to withdraw more water in the future. See Section 1.4.2 for governing Indiana Codes. Any requests for future additional water withdrawals require entering into an agreement with the State of Indiana.

The tailwater area is located downstream of the dam. Water released from the dam is drawn from various depths, allowing for a range of choices to control water temperature. For example, the dam mixes water from various strata to maintain a tailwater temperature within 5 degrees centigrade of the downstream seasonal water temperature to maintain natural stream conditions. Additionally, water release is controlled to maintain a minimum 20 cubic feet per second of flow downstream (USACE, 1998).

Groundwater

Monroe Lake lies within the Mississippian Borden Group Aquifer System, which outcrops over most of the eastern half of Monroe County. This bedrock aquifer system is composed primarily of siltstone and shale, but fine-grained sandstones are common. Carbonates are rare, but do occur as discontinuous interbedded limestone lenses, mostly in the upper portion of the group.

Thickness of the Borden Group in Monroe County is up to 660 feet and in general thins as it dips to the southwest beneath younger rock formations. Well depths in the Borden Group Aquifer System may exceed 400 feet. However, most wells are completed at depths of 90 to 200 feet. Static water levels in the wells completed in the Borden aquifer range from 0 to 200 feet below land surface, but are commonly between 5 and 60 feet.

Because the Borden Group is generally not very productive, it is typically used only where overlying glacial drift or outwash deposits (if present) do not contain aquifer deposits. The Borden Group is often described as an aquitard and yields of wells completed in it are typically quite limited. Many wells, however, are able to produce sufficient water for domestic purposes by

relying on extra well-bore storage created by drilling relatively large diameter and relatively deep wells. Most domestic wells completed in the group have reported testing rates from 1 to 7 gpm. A limited number of wells have been tested at greater capacities but it is doubtful that many could sustain such a rate for very long. Overall, there is little chance for development of high-capacity wells in the Borden Group Aquifer System (Maier 2003a).

Monroe Lake is also contained within an unconsolidated aquifer system known as the Dissected Till and Residum/Unglaciated Southern Hills and Lowlands Aquifer System, which covers most of Monroe County. Total thickness of unconsolidated deposits overlying bedrock is commonly 6-25 feet. Clay material dominates this unconsolidated aquifer system, however, discontinuous sand or gravel deposits are reported. These deposits are commonly 1-3 feet think There is no record of drilled wells actually producing from this system (Maier 2003b).

4.5.2 Environmental Consequences

4.5.2.1 No Action

Under the no action alternative, an updated master plan would not be approved for the Monroe Lake Project in the foreseeable future and there would be no comprehensive planning for the project. However, future development would likely still occur, but without the benefit of a comprehensive planning document. As such, the construction-related effects to surface water hydrology or groundwater would occur under no action as they would under the proposed action.

4.5.2.2 Proposed Action

There would be no environmental consequences of implementing the new master plan or potential future actions within the new master plan expected on the surface water hydrology or groundwater of the Project.

4.6 Water Quality

4.6.1 Existing Condition

The Indiana Department of Environmental Management (IDEM) determines water quality criteria based on the designated use of the water body. Monroe Lake Reservoir is designated for recreation, fishing, drinking and aquatic life. A 2008 assessment of water quality indicators for the reservoir identified impairments from mercury, algal growth, and taste and odor (Bloomington, Water Quality). The sources of mercury contamination may be atmospheric in nature, as mercury emissions from industrial processes and coal fired power stations can travel thousands of miles in the atmosphere before it is eventually deposited back to the earth in rainfall or in dry gaseous form (Environmental Protection Agency, 2017). Ongoing challenges identified in the 1997 diagnostic report include sedimentation, erosion and impacts from heavy recreational use (Jones, 1997). The water quality report for Monroe Lake is currently being updated.

Water quality monitoring is performed by the USACE in coordination with the State of Indiana. Lake project personnel take daily measurements from spring to fall during lake stratification, monitoring the temperature and dissolved oxygen levels at the dam site. Benthic macroinvertebrates and phytoplankton are used as water guality indicators to assess short- and long-term trends. Among the list of water quality concerns are representation of natural conditions and habitat in the tailwater, eutrophication—especially those resulting in harmful algal blooms (HAB)-and biomagnification due to bioaccumulation. Fish contaminated by lake pollutants are caught by anglers at the lake. USACE is aware of this issue and has recommended to IDNR that IDNR monitor catches and provide information to anglers on the potential contaminated catches.

USACE began monitoring Monroe Lake for HABs in fiscal year 2012. Since this time, the Corps' Louisville District (LRL) Water Quality Program has coordinated with Indiana state agencies to develop a HAB Response Sampling Plan that protects the public while recognizing the state agencies as the water quality authority per the authority designated to them by the United States Environmental Protection Agency (USEPA), via the Clean Water Act. USACE's primary function in the Indiana HAB Response Plan is to provide support for Indiana state agencies through data collection at the lakes managed by USACE.

The current coordination with Indiana state agencies states that USACE will await the results of the IDEM HAB sampling efforts to determine which LRL reservoirs in Indiana will be sampled prior to Memorial Day weekend. Beyond Memorial Day, Indiana reservoirs will be sampled in response to a reported incident or observation and HAB response sampling will occur monthly when cyanobacteria cell counts remain higher than 20,000 cells/mL. Sampling will be suspended when results are below 20,000 cells/mL for two consecutive sampling events. HAB response sampling is limited to the May to September recreational season. Table 2 summarizes Indiana advisory and caution levels for cyanobacteria.

Table 2. Indiana Cyanobacteria Caution and Advisory Levels						
Alert Cell						
Level	Count/msl	Toxin Level	Color	Precautions		
Low Risk	< 100,000	< 6 ppb	Blue	Don't drink the water. Shower after you swim.		
Advisory	> 100,000	< 6 ppb	Yellow	Swimming and boating permitted. Avoid contact with algae. Don't drink the water. Shower after you swim. Keep pets out of the water or, at minimum, bathe them after swimming and prevent them from licking algae/water from fur.		
Caution	> 100,000	> 6 ppb but < 20 ppb	Orange	All ADVISORY precautions plus children and immune-compromised individuals should avoid the water.		
Closed > 100,000 > 20 ppb Red Unsafe to swim for hum				Unsafe to swim for humans or pets.		
Source: USACE Monroe Lake HAB Results 2012-2015						

There are 10 established HAB sampling sites at Monroe Lake. Samples at each site are collected by the lake staff and shipped overnight to an analytical laboratory that has been secured by the LRL Water Quality Program. Based on the sampling results, IDEM issues cautions or advisories. HAB advisories have been issued every year since sampling began in 2011, generally throughout August. Although sampling has occurred in various years as late as December, August is usually the last month sampling, and therefore the last month for the state to issue recreational advisories. IDNR and USFS personnel are responsible for ensuring that signs are installed at Monroe Lake recreational areas.

4.6.2 Environmental Consequences

4.6.2.1 No Action

Under the no action alternative, an updated master plan would not be approved for the Monroe Lake Project in the foreseeable future and there would be no comprehensive planning for the project. However, future development would likely still occur, but without the benefit of a comprehensive planning document. As such, the construction-related effects to water quality would occur under no action as they would under the proposed action.

4.6.2.2 Proposed Action

Under the proposed action, future development under the proposed master plan would occur without discernible effects to the water quality of Monroe Lake or its tributaries. Although construction activities would result in ground-surface disturbances that could increase runoff and diminish water quality, best management practices during construction would be expected to minimize the potential for deleterious effects. After construction was completed, re-seeding and re-vegetation would be performed to minimize erosion losses and protect surface soils. The existing water quality in Monroe Lake is a result of factors substantially unrelated to the management actions on Project lands and results from land use and discharges to the watershed upstream from the Project.

4.7 Habitats

4.7.1 Existing Condition

Of the eight habitats contained at Monroe Lake, four consist of regularly disturbed areas including agricultural fields, developed lands, clear-cut and successional woods, and managed tree areas. These regularly disturbed areas are home to edge and urban adaptive species. Typical animal species found in these habitats may include songbirds, coyotes, foxes, deer, raptors, mice, squirrels, raccoons, etc.

Open Water

The majority of the project consists of open water. Fish living in the open water environment include sunfish, catfish, northern pike, walleye, bass and crappie. A 2015 survey by the IDNR Division of Fish and Wildlife found 29 species of fish and two hybrid species at the lake. The primary game species found were largemouth bass, white and black crappie, channel catfish, and

bluegill. The most abundant species found was gizzard shad. IDNR annually stocks the lake with hybrid striped bass and walleye (Kittaka, 2016).

Wetlands

Monroe Lake wetlands are located in floodplains surrounding the lake and the headwater streams. Typical wetland flora include cattail, spikerush, smartweed, knotweed, arrowhead, pickerelweed, pondweed, naid, watermilfoil, bladderwort, duckweed and waterlily. Trees also may be found in Monroe Lake wetlands including willow, sycamore, maple, river birch, oak and elm. Wetlands provide habitat for many animals including red-winged blackbird, muskrats, mink, beaver, reptiles and amphibians, and a wide range of waterfowl.

South-Central Interior Mesophytic Forest

A mixed-mesophytic community found south of the glacial boundary, the South-Central Interior Mesophytic Forest, is typically found on lower slopes, in coves and in other protected landscape areas. Small streams often bisect this community. This habitat contains a rich herb layer often comprised of abundant spring ephemerals such as spring beauty and Dutchman's breeches. Other herbs include white trillium, black baneberry and great Indian plantain. Dominant canopy species are sugar maple and American beech with maples, black walnut and sassafras among others as subdominants (NatureServe, 2007).

Southern Interior Low Plateau Dry-Mesic Oak Forest

Typically found on mid-slopes to broad ridges, the Southern Interior Low Plateau Dry-Mesic Oak Forest is an upland hardwood-dominated forest. Dominant species vary greatly depending on soil moisture and slope aspect. In general, oaks and hickories comprise the canopy while flowering dogwood dominates the sub-canopy (NatureServe, 2008).

Common animals to both forest habitats include white-tailed deer, gray squirrels, fox squirrels, raccoons, songbirds, woodpeckers, owls and foxes.

4.7.2 Environmental Consequences

4.7.2.1 No Action

Under the no action alternative, an updated master plan would not be approved for the Monroe Lake Project in the foreseeable future and there would be no comprehensive planning for the project. However, future development would likely still occur, but without the benefit of a comprehensive planning document. As such, the construction-related effects to the habitats would occur under no action as they would under the proposed action.

4.7.2.2 Proposed Action

Proposed development actions on the Project are required to comply with the NEPA and many other laws pertaining to the conservation of natural and cultural resources. Prior to implementation of any development activity that could adversely impact terrestrial or aquatic habitats, field surveys and all appropriate coordination with state and/or federal agencies will be conducted by the USACE. As such, future development would occur with minimal effects to the habitats of Monroe Lake Project.

In addition, under the proposed action, the IDNR would continue to work to improve the fishery at the Project by stocking fish and maintaining and creating fish habitat in accordance to the IDNR fisheries program. Likewise, forest management would still be accomplished through agreements with the USACE and INDR.

4.8 Listed Species

Lists of threatened, endangered and species of special concern are maintained by the USFWS and the State of Indiana. Under the Endangered Species Act (ESA) of 1973 (16 U.S.C. §§ 1531-1544), endangered species are defined as any species in danger of extinction throughout all or portions of its range. A threatened species is any species likely to become endangered in the foreseeable future. The ESA defines critical habitat of the above species as a geographic area that contains the physical or biological features that are essential to the conservation of a particular species and that may need special management or protection. This section also covers birds listed under the Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S.C §§ 703-712) as birds of conservation concern.

4.8.1 Existing Condition

The USFWS maintains lists of rare plants and wildlife that occur in each county of the United States. The State of Indiana maintains a separate inventory of state-ranked endangered and threatened species and species of special concern. This list can be obtained from the Indiana Natural Heritage Data Center by county or by vicinity to the project site. Threatened and endangered species at both the federal and state level are listed in the Environmental Assessment in Appendix D.

In 1985, efforts to reintroduce bald eagles began at Monroe Lake. The first successful eagle nests occurred in 1991 and since then bald eagles have been sighted on several occasions within the project area. There are currently 15 active bald eagle nests at Monroe Lake. Although no longer federally-listed under ESA, they are protected by the Golden and Bald Eagle Protection Act of 1940 (16 U.S.C. §§ 668-668d) and the Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S.C. §§ 703-712). These laws prohibit harming the eagles, their nests and the eggs. Bald eagles prefer bodies of open water with nearby large trees, making Monroe Lake excellent eagle habitat.

Ruffed grouse is considered a high priority for management at Monroe Lake by IDNR. Successional areas created by natural disturbance found in large continuous forests and transitional zones between grasslands and forests provide ruffed grouse habitat. If artificial methods were to be used to create these habitats, they would be addressed in the OMP. In 1983, ruffed grouse distribution in south-central Indiana reached a high of 41 counties after having experienced decline for several decades. Today, its distribution has likely been reduced to between 16 and 26 counties (IDNR, Ruffed Grouse, 2015*). Ruffed grouse are protected under the MBTA. Additional MBTA birds include the cerulean warbler, Canada goose, Red-tailed hawk, great blue heron, and Henslow's sparrow. The MBTA provides a framework for regulating the hunting of protected game species, such as the grouse and Canada goose, through varying opening and closing season dates, season length, daily bag and possession limits, and shooting hours. Each year, the USFWS works with the states from the four Flyway Councils to establish

regulatory frameworks for hunting based on the abundance of birds, number of hunters, and other factors.

An official species list from the USFWS, dated April 19th, 2017, for the Monroe Lak Lake Project included two species: the endangered Indiana bat (*Myotis sodalis*) and the threatened northern long-eared bat (*Myotis septentrionalis*).

Indiana bat (*Myotis sodalis*) has been found in the vicinity of the project. In the spring, bats emerge from hibernation and migrate to summer roost sites. During the summer months, female Indiana bats establish maternity colonies of up to 100 bats under the loose bark of trees and in tree cavities. Loss and fragmentation of forest habitat are among the major threats to Indiana bat populations. Other threats include white-nose syndrome, winter disturbance, and environmental contaminants (USFWS, 2007).

The northern long-eared bat was listed as a threatened species in 2015 due to declines mostly associated with white-nose syndrome. The bats spend winter hibernating in caves and mines. During the summer, the bats roost singly or in colonies underneath bark, in cavities or in crevices of both live trees and snags. Males and non-reproductive females may also roost in cooler places, like caves and mines (USFWS, 2016).

Bald eagles are known to nest within the project and are regularly sighted in the vicinity of the lake. These birds are protected under the MBTA and the Bald and Golden Eagle Protection Act.

4.8.2 Environmental Consequences

4.8.2.1 No Action

No changes to the listed species resources of the Project would be predicted as a result of implementing the no action alternative.

4.8.2.2 Proposed Action

Listed Species Effects Determination

There are no changes to the operations of the Monroe Lake Project as part of the proposed master plan and future development actions. As such, there would be no effects to the Indiana bat (*Myotis sodalis*) or northern long-eared bat (*Myotis septentrionalis*) and no consultation with the USFWS would be required regarding the target species.

Under the proposed action, future development action will still be subject to the required seasonal restrictions on timber clearing to protect roosting bats. Tree harvests over three inches in diameter at breast height are restricted within five miles of known Indiana bat locations from April 1 through September 30. Around known hibernacula, restrictions may be more extensive. Future developmental actions on the Monroe Lake Project will be also be assessed to determine potential impacts to the northern long-eared bat, in compliance with the ESA.

4.9 Demographics and Environmental Justice

4.9.1 Existing Condition

The proposed Master Plan identified the area of influence of Monroe Lake. The simple definition of the area of influence is the area in which the majority of project visitors live. Due to Monroe

Lake's size, scope, and its lodging and camping capacity, it is possible that many of the lake's users travel more than one hour to enjoy the recreational activities of Monroe Lake. The lake is, however, in close proximity to the metropolitan area of Bloomington, which indicates that there is also a high volume of local visitors. For these two reasons, we have identified two sub-areas of influence based on drive time—the population within one hour's drive, referred to as the primary area of influence, and the population between one hour's drive and a 90-minute drive, referred to as the secondary area of influence. Figure 6 on the following page shows the Monroe Lake area of influence.

The Monroe Lake area of influence is comprised of 22 counties in southern and central Indiana, eight of which are in the primary area of influence. Fourteen of the counties are in the secondary area of influence. Table 3 shows historic populations and future population projections for each area of influence as well as the projected growth rate for each study area from 2010 to 2030.

Table 3. Population in Area of Influence						
Area of	2000	2010	2020	2030	Projected Growth.	
Influence	Population	Population	Population	Population	2010-2030	
Primary	497,896	548,643	590,511	623,796	13.7%	
Secondary	1,371,359	1,467,673	1,563,618	1,643,575	12.0%	
Total	1,869,255	2,016,316	2,154,129	2,267,371	12.5%	

Source: US Census Bureau, STATS Indiana



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Table 4 shows the age distribution of each area of influence in 2010 as well as the projected change in age distribution between 2010 and 2030.

Table 4. Age Distribution, 2010-2030							
	Primary Area of Influence			Secondary Area of Influence			
			Change			Change	
Age Group	2010	2030	2010-2030	2010	2030	2010-2030	
Less than 5	6.1%	5.8%	-0.3%	7.1%	6.9%	-0.2%	
5 to 19	21.1%	19.1%	-2.0%	20.9%	20.2%	-0.7%	
20 to 24	9.1%	8.6%	-0.5%	7.1%	6.5%	-0.6%	
25 to 44	25.9%	24.4%	-1.5%	28.4%	26.9%	-1.5%	
45 to 64	25.3%	22.1%	-3.2%	25.0%	21.9%	-3.1%	
65 and up	12.5%	20.0%	7.5%	11.5%	17.6%	6.1%	

Source: US Census Bureau, STATS Indiana

4.9.2 Environmental Justice

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Population and Low-Income Populations (Executive Order, 1994), directs federal agencies to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority population and low-income populations. When conducting NEPA evaluations, the USACE incorporates Environmental Justice (EJ) considerations into both the technical analyses and the public involvement in accordance with the USEPA and the Council on Environmental Quality guidance (CEQ, 1997).

The CEQ guidance defines "minority" as individual(s) who are members of the following population groups: American Indian or Alaskan native, Asian or Pacific Islander, Black, not of Hispanic origin, and Hispanic. The Council defines these groups as minority populations when either the minority population of the affected area exceeds 50-percent of the total population, or the percentage of minority population in the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographical analysis.

Low-income populations are identified using statistical poverty thresholds from the Bureau of the Census Current Population Reports, Series P-60 on Income and Poverty (USCB, 2010). In identifying low-income populations, a community may be considered either as a group of individuals living in geographic proximity to one another, or a set of individuals (such as migrant workers or Native Americans), where either type of group experiences common conditions of environmental exposure or effect. The threshold for the 2010 census was an income of \$10,956 for an individual and \$21,954 for a family of four (USCB, 2010). This threshold is a weighted average based on family size and ages of the family members.

Table 5 shows the median household incomes in each area of influence, the State of Indiana, and the United States.

Both areas of influence as well as the State of Indiana have lower median household incomes than the national estimate in 2013. The primary area of influence has a significantly higher median household income than the secondary area of influence.

Table 5. Median Household Income				
Area of				
Influence	2013 Income			
Primary	\$50,004			
Secondary	\$45,309			
State of Indiana	\$48,248			
United States \$53,046				
e 116.0 B				

Source: US Census Bureau

Three of the four counties surrounding Monroe Lake – Brown, Jackson, and Lawrence have race minority populations of 1.3% or less of the total population according to 2010 U.S. Census data. Monroe County's minority population makes up 12.2% of the county's population, while race minorities make up 37.3% of the total population in Marion County- the most populated county within the area of influence.

4.9.2.1 No Action

Under the no action alternative, an updated master plan would not be approved for the Monroe Lake Project in the foreseeable future and there would be no comprehensive planning for the project. However, future development would likely still occur, but without the benefit of a comprehensive planning document. Under the no action alternative, the trends of growth of population observed in the recent years surrounding the Project would be expected to continue. There would also be no disproportionate adverse effects to minority or low-income communities as a result of implementing the no action alternative.

4.9.2.2 Proposed Action

The changes in population and associated stresses on the municipal resources and services over the past 50 years have occurred while the USACE have managed the Project at Monroe Lake. Implementing the revised master plan would be expected to have no effect on the demographic trends of the surrounding communities.

4.10 Recreation and Visitation

4.10.1 Existing Condition

Public recreation lands at Monroe Lake are operated and managed by three different entities. Operational responsibilities for the designated recreation areas are divided among the USACE, United Stated Forest Service (USFS) and IDNR. Eight of the recreation areas are managed by IDNR through a lease granted by USACE. Hardin Ridge Recreation Area (identified below) is owned and operated by the USFS through a MOU with USACE, as stated in the Monroe Reservoir Master Plan of 1967.

Monroe Lake encompasses several recreation areas that are managed by public and private entities. These areas are scattered along the perimeter of the lake and are diverse in uses provided. This section describes the overall purpose, layout and administrative structure of each recreation area. The areas described are listed in Table 6 along with their managing entity.

Table 6. Recreational Areas of Monroe Lake					
Approximate					
Recreation Area	Size	Managing Entity			
Allen's Creek SRA	380 acres	IDNR			
Crooked Creek Ramp	70 acres	IDNR			
		IDNR			
Cutright SRA	126 acres	(marina and concessions managed by			
		private entity)			
Dam Site and Operations Area	171.71 acres	USACE			
Enirfay SPA	700 acres	IDNR (resort and marina managed by			
	700 acres	Fourwinds)			
Hardin Ridge	1,200 acres	USFS			
Moore's Creek SRA	140 acres	IDNR			
Paynetown SRA	280 acres	IDNR			
Pinegrove	40 acres	IDNR			
Salt Creek SRA	90 acres	IDNR			

There are national and regional variables that affect the way people spend their leisure time. From year to year the overall number of visitors to Monroe Lake can change due to these variables. Table 7 presents the number of visitors that have visited any or multiple of Monroe Lake's eight SRAs since 2007.

Table 7. Visitation Data 2007-2015						
	USACE Project Visitation					
IDNR Fiscal Year	(IDNR Sites Only)	USACE Fiscal Year	(Reservoir-Wide)			
FY 2007-2008	949,066	FY 2007	1,022,210			
FY 2008-2009	927,745	FY 2008	882,125			
FY 2009-2010	946,793	FY 2009	1,060,215			
FY 2010-2011	860,039	FY 2010	900,237			
FY 2011-2012	1,053,041	FY 2011	972,091			
FY 2012-2013	900,168	FY 2012	967,716			
FY 2013-2014	950,029	FY 2013	Not available			

Sources: <u>http://www.in.gov/dnr/parklake/2441.htm</u> and <u>USACE data from The Operations</u> and <u>Maintenance Business Information Link, 2016</u>

4.10.2 Environmental Consequences

4.10.2.1 No Action

Under the no action alternative, an updated master plan would not be approved for the Monroe Lake Project in the foreseeable future and there would be no comprehensive planning for the Project. However, future development would likely still occur without the benefit of a comprehensive planning document. As such, the construction-related disruptions to recreation

as well as the beneficial effects of improved facilities would occur under no action as they would under the proposed action.

4.10.2.2 Proposed Action

Recreational use of the Monroe Lake Project would not be predicted to change appreciably from existing use patterns as a result of implementing the proposed action. Because there are no major new recreational amenities currently planned in the future, and most of the development at the Project involves minor improvements, replacements-in-kind, and facility improvements; none of these would be expected to substantially increase visitation. However, several potential recreational activities and opportunities have been identified in the updated Master Plan for the Project, and may be considered for implementation in the future. There would be some localized and temporary annoyance to recreational users (e.g., noise, fugitive dust, trails closed) during construction of new or improved amenities, but these would be relatively short-term.

4.11 Cultural Resources

4.11.1 Existing Condition

In 1976, the USACE Louisville District contracted Glenn A. Black Laboratory of Archaeology to assess the impacts on prehistoric cultural resources after the impoundment of Monroe Reservoir. The archaeological assessment was conducted along the summer pool levels (538 feet above sea level). The assessment revealed a total of 118 sites, including 97 previously unrecorded sites and 21 previously recorded sites. The majority of the prehistoric sites date to the Middle-Late Archaic period (6000-1500 B.C) and the Middle Woodland to Mississippian Period (Munson 1977). In 1986, Indiana University-Bloomington completed a shoreline survey to document any archaeological sites that could have been exposed by water erosion. The report documented ten sites and suggested that five of those should be further tested to determine eligibly for the listing of the National Register of Historic Places (NRHP).

The Indiana State Historic Architectural and Archaeological Research Database (SHAARD) shows numerous cemeteries located within Monroe Lake Reservoir, however no sites are currently listed on the NRHP. There are two known historic bridges located within the reservoir in Brown County. The bridges, Brown County Bridge # 40 and Brown County Bridge # 45, were both demolished in 1986.

4.11.2 Environmental Consequences

4.11.2.1 No Action

Under the no action alternative, an updated master plan would not be approved for the Monroe Lake Project in the foreseeable future and there would be no comprehensive planning for the Project. However, future development would likely still occur without the benefit of a comprehensive planning document. As such, the construction-related effects to known or unknown cultural resources would occur under no action as they would under the proposed action.

4.11.2.2 Proposed Action

Implementing the revised master plan would be expected to have no effect on the cultural resources of the Project as all proposed development actions would still be required to comply with the NHPA, as they are currently. Prior to implementation of any ground disturbing activity, field surveys and Section 106 NHPA coordination with the Indiana State Historic Preservation Office (SHPO) will be conducted by the USACE. Federal and state laws require federal agencies to minimize or mitigate adverse impacts to historic properties (36 CFR Part 800.13). Should unanticipated historic or prehistoric resources be discovered during ground disturbing activities, work must cease immediately and the USACE will contact the Indiana SHPO.

4.12 Hazardous, Toxic, and Radioactive Waste Materials (HTRW)

4.12.1 Existing Condition

There are no permitted hazardous waste disposal facilities in proximity to the Monroe Lake Project and there are no known sites of hazardous, toxic, or radioactive materials on Project lands.

4.12.2 Environmental Consequences

4.12.2.1 No Action

Under the no action alternative, an updated master plan would not be approved for the Monroe Lake Project in the foreseeable future and there would be no comprehensive planning for the Project. However, future development would likely still occur without the benefit of a comprehensive planning document. Regardless, there would be no environmental consequences related to HTRW, because these substances are not found on Project lands.

4.12.2.2 Proposed Action

Implementing the revised master plan would be expected to have no effect on HTRW materials as there are no known pre-existing sources at the Project. While the potential to create HTRW materials as a result of equipment malfunction or failure during the construction process exists (e.g., fluid leaks from heavy equipment), best management practices and regular equipment maintenance reduce these risks. Storage, fueling, and lubrication of equipment and motor vehicles associated with the construction process (e.g., pavers, trenchers, cement trucks) would be conducted in a manner that affords the maximum protection against accidents and spills.

4.13 Aesthetics/Visual Qualities

4.13.1 Existing Condition

Views of Monroe Lake are available at all recreation areas throughout the project. Hardin Ridge, located in the Hoosier National Forest, is the most popular sightseeing destination around Monroe Lake, but with the hilly topography of southern Indiana, there's no shortage of aesthetic views.

4.13.2 Environmental Consequences

4.13.2.1 No Action

Under the no action alternative, an updated master plan would not be approved for the Monroe Lake Project in the foreseeable future and there would be no comprehensive planning for the Project. However, future development would likely still occur without the benefit of a comprehensive planning document. As such, the construction-related effects to the aesthetic character and visual quality of the Project would occur under no action as they would under the proposed action.

4.13.2.2 Proposed Action

Implementing the revised master plan would be expected to have no long-term effect on the aesthetic character of the Project. Comprehensive planning under the new master plan could potentially facilitate improved construction planning minimizing the temporary aesthetic effects during construction.

4.17 Noise

4.17.1 Existing Condition

Changes in noise are typically measured and reported in units of dBA, a weighted measure of sound level. The primary sources of noise within the Project area would include everyday vehicular traffic along the adjacent highways (typically between 50 and 60 dBA at 100 feet) and human-generated recreational activities at the Project. Noise ranging from about 10 dBA for the rustling of leaves to as much as 115 dBA (the upper limit for unprotected hearing exposure established by the Occupational Safety and Health Administration) is common in areas where there are sources of recreational activities, construction activities, and vehicular traffic.

4.17.2 Environmental Consequences

4.17.2.1 No Action

Under the no action alternative, an updated master plan would not be approved for the Monroe Lake Project in the foreseeable future and there would be no comprehensive planning for the Project. However, future development would likely still occur without the benefit of a comprehensive planning document. Noise related to the construction of would still occur, but would be temporary and short-term.

4.17.2.2 Proposed Action

Implementing the revised master plan would be expected to have no long-term effect on the level of background or ambient noise character of the Project. Temporary increases in noise would be expected during future construction, but comprehensive planning under the new master plan could potentially facilitate implementing best management practices to minimize the temporary noise effects during construction.

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5 CUMULATIVE EFFECTS

NEPA requires a Federal agency to consider not only the direct and indirect impacts of a proposed action, but also the cumulative impact of the action. A cumulative impact is defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions (40 CFR§1508.7)." Cumulative impacts can result from individually minor, but collectively significant actions taking place over a period of time. These actions include on- or off-site projects conducted by government agencies, businesses, or individuals that are within the spatial and temporal boundaries of the actions considered.

The master plan is intended to guide the USACE toward achieving its goal of managing, conserving and enhancing natural resources, while providing quality opportunities for outdoor recreation to the public. The plan is consistent with authorized project purposes and relevant legislation and regulations, and was developed in response to regional and local needs, resource capabilities and suitability, and expressed public interests. Any future development by the USACE or the Indiana DNR on the Project lands could produce some temporary and minor construction-related effects (e.g., noise, fugitive dust, etc.). However, there would also be cumulative beneficial effects from implementing actions that align with the resource objectives identified in the updated master plan. This page intentionally left blank

6 SUMMARY OF ENVIRONMENTAL EFFECTS

The revised master plan provides guidelines and direction for future Project development and use and is based on authorized Project purposes, USACE policies and regulations on the operation of USACE projects, responses to regional and local needs, resource capabilities and suitable uses, and expressed public interests consistent with authorized Project purposes and pertinent legislation.

Careful planning, sound engineering, appropriate coordination with resource agencies and effective execution have developed the recreational resources at the Project while protecting and enhancing the important environmental resources; these practices would be expected to continue.

If and when future development projects were implemented, localized and temporary construction-related effects (e.g., diesel/gasoline engine emissions, noise, fugitive dust, minor earth-moving) would be the extent of the environmental consequences.

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7 COMPLIANCE WITH ENVIRONMENTAL LAWS

Revision of the Monroe Lake Master Plan and the subsequent construction of the potential future modifications to existing infrastructure as well as new features would not commence until the proposed actions achieve environmental compliance with the applicable laws and regulations, as described below. Environmental compliance for any proposed actions would be achieved upon coordination of this Environmental Assessment with appropriate agencies, organizations, and individuals for their review and comments.

Bald Eagle Protection Act, 16 U.S.C. Sec. 668, 668 note, 668a-668d.

In compliance.

The Bald Eagle Protection Act contains requirements on USACE projects concerning bald eagles. Approval and implementation of the revised master plan would not adversely affect bald eagles or their habitat.

Clean Air Act, as amended, 42 U.S.C. 1857h-7, et seq.

In compliance.

The purpose of this Act is to protect public health and welfare by the control of air pollution at its source, and to set forth primary and secondary National Ambient Air Quality Standards to establish criteria for States to attain, or maintain. Minor and temporary releases would occur during construction activities for actions to maintain or improve facilities at the Monroe Lake Project (e.g., fugitive dust, internal combustion engine emissions); however, these emissions would be short term, small-scale, and air quality would not be affected to any measurable degree.

Clean Water Act, as amended, (Federal Water Pollution Control Act) 33 U.S.C. 1251, et seq.

In compliance.

The objective of this Act is to restore and maintain the chemical, physical and biological integrity of the Nation's waters (33 U.S.C. 1251). The USACE regulates discharges of dredge or fill material into waters of the United States pursuant to Section 404 of the Clean Water Act. This permitting authority applies to all waters of the United States including navigable waters and wetlands. The Section 404 requires authorization to place dredged or fill material into water bodies or wetlands. If a Section 404 authorization is required, a Section 401- water quality certification from the state in which the discharge originates is also needed. The proposed projects considered in the master plan would not result in the placement of dredged or fill material into water bodies or wetlands.

Comprehensive Environmental Response, Compensation, and Liability Act of 1980.

Not applicable.

Typically CERCLA is triggered by (1) the release or substantial threat of a release of a hazardous substance into the environment; or (2) the release or substantial threat of a release of any pollutant or contaminant into the environment that presents an imminent threat to the public health and welfare. To the extent such knowledge is available, 40 CFR Part 373 requires notification of CERCLA hazardous substances in a land transfer. The implementation of the revised master plan would not involve real estate transactions.

Endangered Species Act, as amended. 16 U.S.C. 1531, et seq.

In compliance.

Section 7 (16 U.S.C. 1536) states that all Federal departments and agencies shall, in consultation with and with the assistance of the Secretary of the Interior (Secretary), insure that any actions authorized, funded, or carried out by them do not jeopardize the continued existence of any threatened or endangered (T&E) species, or result in the destruction or adverse modification of habitat of such species which is determined by the Secretary to be critical.

This Environmental Assessment represents the assessment and findings regarding the proposed revised master plan and serves as the Biological Assessment with a determination of no effect to the Indiana bat (*Myotis sodalis*) and northern long-eared bat (*Myotis septentrionalis*).

Environmental Justice (E.O. 12898).

In compliance.

Federal agencies shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low- income populations in the United States. The Project does not disproportionately affect minority or low-income populations.

Fish and Wildlife Coordination Act, as amended, 16 U.S.C. 661, et seq.

In compliance.

The FWCA requires governmental agencies, including the USACE, to coordinate activities so that adverse effects on fish and wildlife would be minimized when water bodies are proposed for modification. No modifications are proposed in association with the proposed update to the Master Plan.

Migratory Bird Treaty Act

In compliance.

The Migratory Bird Treaty Act of 1918 (MBTA) is the domestic law that affirms, or implements, the United States' commitment to four international conventions with Canada, Japan, Mexico, and Russia for the protection of shared migratory bird resources. The MBTA governs the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts and nests. The take of all migratory birds is governed by the MBTA's regulation of taking migratory birds for educational, scientific, and recreational purposes and requiring harvest to be limited to levels that prevent over utilization. Executive Order 13186 (2001) directs agencies to take certain actions to implement the act. The USACE will consult with the USFWS (through their review of the draft EA) with regard to their consideration of the effects of the actions identified in the master plan revision for potential effects on migratory birds. No effects are anticipated.

National Historic Preservation Act, as amended, 16 U.S.C. 470a, et seq.

In compliance.

Federal agencies having direct or indirect jurisdiction over a proposed federal or federally assisted undertaking would take into account the effect of the undertaking on any district, site, building, structure, or object that is included in, or eligible for inclusion in, the National Register of Historic Places. The Louisville District has made the determination that the actions identified in the proposed master plan revision and update do not have the potential to adversely impact cultural resources.

National Environmental Policy Act (NEPA), as amended, 42 U.S.C. 4321, et seq.

In compliance.

This Environmental Assessment and Finding of No Significant Impact (FONSI) has been prepared in accordance with the Council on Environmental Quality's NEPA Implementing Regulations (40 CFR 1500-1508). An Environmental Impact Statement (EIS) is not required.

Noise Control Act of 1972, 42 U.S.C. Sec. 4901 to 4918.

In compliance.

This Act establishes a national policy to promote an environment for all Americans free from noise that jeopardizes their health and welfare. Federal agencies are required to limit noise emissions to within compliance levels. Noise emission levels at the Project site would increase above current levels temporarily due to construction of improvements or features identified in the proposed master plan revision. Appropriate measures would be taken to keep the noise level within the compliance levels.

Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403)

In compliance.

This law prohibits the unauthorized obstruction or alteration of any navigable water of the United States. This section provides that the construction of any structure in or over any navigable water of the United States, or the accomplishment of any other work affecting the course, location, condition, or physical capacity of such waters is unlawful unless the work has been recommended by the Chief of Engineers and authorized by the Secretary of the Army. The actions identified in the proposed master plan revision would not involve the construction of structures within Monroe Lake.

Floodplain Management (E.O. 11988).

In compliance.

Section 1 requires each agency to provide leadership and take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by flood plains in carrying out its responsibilities for (1) acquiring, managing, and disposing of Federal lands and facilities; (2) providing Federally undertaken, financed, or assisted construction and improvements; and (3) conducting Federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulating, and licensing activities. The actions identified in the proposed master plan revision would not affect the flood holding capacity or flood surface profiles of Monroe Lake.

Protection of Wetlands (E.O. 11990).

In compliance.

Federal agencies shall take action to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands in carrying out the agencies responsibilities. Each agency, to the extent permitted by law, shall avoid undertaking or providing assistance for new construction located in wetlands unless the head of the agency finds (1) that there is no practicable alternative to such construction, and (2) that the proposed action includes all practicable measures to minimize harm to wetlands, which may result from such use. The actions identified in the proposed master plan revision would not involve construction in, or affects to, wetlands.

8 Public Involvement

In compliance with 40 CFR 1501.4(e)(2), this EA is being circulated for a 30-day review to concerned agencies, organizations, and the interested public. All comments received during this review period will be evaluated and appropriate changes to the EA will be implemented and addressed in the Finding of no Significant Impact (FONSI). The EA and FONSI will be retained in the Louisville District's administrative files for future reference and as a record of NEPA compliance.

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