US Army Corps of Engineers

Little Rock District

Appendix D

Environmental Condition of Property Reports

Phase One Acquisition Properties

for

Beaver Lake
Proposed Land Acquisition Study

February 2022

Final

U.S. Army Environmental Condition of Property Report
Priority Area 1

Beaver Lake
Beaver Lake, Arkansas

August 30, 2021

Prepared For:
Beaver Lake Land Acquisition

Prepared By:
U.S. Army Corps of Engineers
Regional Planning and Environmental Center
Fort Worth District
Fort Worth, Texas

[This page is intentionally left blank.]

Table of Contents

List of Appendices:

Appendix A: Visual Site Inspection Photographs, 13 July 2021.

Appendix B: Historical Aerial Photography.

Appendix C: Historical Topographic Maps.

List of Acronyms

ACM	Asbestos-containing material
AR	Army Regulation
AST	Aboveground storage tank
ASTM	American Society for Testing and Materials
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CFR	Code of Federal Regulations
DoD	Department of Defense
ECP	Environmental Condition of Property
EDR	Environmental Data Resources
EPA	Environmental Protection Agency
ERNS	Emergency Response Notification System
HTRW	Hazardous, Toxic and Radioactive Waste
IRP	Installation Restoration Program
LBP	Lead-based Paint
LUST	Leaking underground storage tank
MEC	Munitions and Explosives of Concern
NEPA	National Environmental Policy Act
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NRC	Nuclear Regulatory Commission
ODEQ	Oklahoma Department of Environmental Quality
OWS	Oil-water separator
PCB	Polychlorinated Biphenyl
POL	Petroleum, Oils, and Lubricants
RCRA	Resource Conservation and Recovery Act
SEMS	Superfund Enterprise Management System
SF	Square feet
SHWS	State Hazardous Waste Sites
SWPPP	Stormwater Pollution Prevention Plan
TSD	Transport, Storage, Disposal
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
UST	Underground storage tank
UXO	Unexploded Ordnance
VCP	Voluntary Cleanup Program
VSI	Visual site inspection

1.0 Executive Summary

This environmental condition of property (ECP) report has been prepared to document the environmental conditions and provide information for the acquisition of land that would be necessary for the operation, maintenance, and control of the Beaver Lake reservoir in Arkansas. This fee acquisition pertains to the frequently inundated land immediately surrounding the lake, below an elevation of 1128 ft above mean sea level (msl). The Army prepares an ECP in order to provide the public with information relative to the environmental condition of the property, assist Federal agencies during the property screening process, provide information about completed remedial and corrective actions at the property, and to assist in determining appropriate responsibilities, asset valuation, and liabilities with other parties to a transaction.

Beaver Lake currently occupies more than 38,000 acres of Federal public lands and waters. The Lake is located in northwestern Arkansas, in Benton, Washington, Madison and Carroll Counties and it is approximately 6 miles west of Eureka Springs, Arkansas. This ECP report covers 1.22 acres in two segments of land located off a southeastern branch of Beaver Lake, called Big Clifty Creek, on mostly western and northern shore. The subject property is two coves at the end of a lower order branch of the creek and currently owned by private landowner(s). The subject property, also known as Priority Area 1, is in Carroll County at the eastern end of Penitentiary Hollow, downstream from the Big Clifty recreation area and boat ramp.

This ECP report presents a summary of readily available information on the environmental conditions of, and concerns relative to, the land, facilities, and real property assets of Beaver Lake. The findings included in the report are based on a record search of historical environmental investigation reports and site historical documents, a review of aerial photography, stakeholder interviews, and a site inspection conducted 12 – 13 July 2021.

Based on the environmental conditions found and the ECP analysis, the property can be categorized as an ECP Category 1, indicating a site where no release, or disposal of hazardous substances or petroleum products or their derivatives has occurred (including no migration of these substances from adjacent properties).

2.0 Purpose

2.1 General

This environmental condition of property (ECP) report has been prepared to document the environmental conditions and provide information for the acquisition of land surrounding Beaver Lake in Benton, Washington, Madison and Carrol Counties, Arkansas. This report meets the requirements of Title 40, Code of Federal Regulations (CFR), Part 373, and United States Army Regulation (AR) 200-1 (2007), *Environmental Quality, Environmental Protection and Enhancement*. The ECP report also follows the American Society for Testing and Materials (ASTM) E1527-13 *Standard Practice for Environmental Site Assessments: Phase 1 Environmental Site Assessment Process*. The subject property in this report is subsequently categorized according to ASTM D5746 (2016) *Standard Classification of Environmental Condition of Property Area Types for Defense Base Closure and Realignment Facilities*.

The Army prepares an ECP for the following purposes:

- Provide the public with information relative to the environmental condition of the property.
- Assist Federal agencies during the property screening process.
- Provide information to prospective buyers.
- Provide information about completed remedial and corrective actions at the property.
- Assist in determining appropriate responsibilities, asset valuation, and liabilities with other parties to a transaction.

The ECP contains the information required to comply with the provisions of 40 CFR, Part 373 that require a notice to accompany contracts for the sale of, and deeds entered into the transfer of, federal property on which hazardous substances may have been stored, released or disposed. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) §120(h) stipulates that a notice is required if certain quantities of designated hazardous substances have been stored on the property.

The ECP Report is not prepared to satisfy a real property purchaser's duty to conduct an "all-appropriate inquiry" to establish an "innocent purchaser defense" to CERCLA 107 liability. Any such use of the ECP Report by any party is outside the control of the Army and beyond the scope of the ECP Report. The Army, its officers, employees, or contractors makes no warranties or representations that any ECP Report satisfies any such requirements for any party.

2.2 Scope

This ECP report covers Priority Area 1, which occupies 1.22 acres of land located at the end of Penitentiary Hollow, off Big Clifty Creek in south eastern Beaver Lake. Priority Area 1 is comprised of two adjacent coves, with mostly vertical shorelines or bluffs separated by about 220 yards. There is access via watercraft and although it wasn't explored terrestrial access via private property from County Road 1488. Areas within the lake that are not within the Priority Area will be considered adjacent property. A general site location map is provided in Figure 1, and map showing the subject property are shown in Figure 2.

Beaver Lake currently occupies more than 38,000 acres of Federal public lands and waters. The Lake is located in northwestern Arkansas, in Benton, Washington, Madison and Carroll Counties and it is approximately 6 miles west of Eureka Springs, Arkansas. This ECP report covers two parcels that are adjacent forks at the end of a southeastern branch of the lake and is approximately 1.22 acres of land located South and East of the center of Beaver Lake on primarily western and northern shore. The subject property is on the edge of the lake and currently owned by private landowner(s). The subject property, also known as Priority Area 1, is downstream from the Big Clifty Recreation area.

2.3 Limitations

This ECP report presents a summary of readily available information on the environmental conditions of, and concerns relative to, the land, facilities, and real property assets of the subject property. The findings included in the report are based on a record search of available historical environmental investigation reports and site historical documents, a review of aerial photography, stakeholder interviews, and a site reconnaissance conducted 12 – 13 July 2021. Historical environmental investigation reports and site historical documents were reviewed in support of this ECP, and the information obtained from other studies is reflected within this report by reference. The ECP process recognizes that the condition of property and classification can change as historical contamination is cleaned up (if required) or if a new source of contamination is identified. Records reviewed during the assessment were accepted as accurate and a reasonable effort was made to resolve discrepancies identified during the document review.

During the ECP assessment, all available sources of information concerning both past and present environmentally significant uses of the property were reviewed. This included readily available data associated with adjacent property records; 1985, 1994, 2001, 2004, 2006, 2009, 2010, 2012, 2014, 2016, 2017, 2018, and 2020 aerial photography; personnel interviews; current and historic investigations; and topographical maps. In addition, record sources were reviewed to determine if there have been spills, leaks, discharges, leaching, underground injection, dumping, abandonment, or storage of hazardous substances or petroleum products at the subject property. The site reconnaissance and interview process included inquiries and requests into the existence and availability of records that support the environmental condition of the property. The site reconnaissance included a Visual Site Inspection (VSI) of the subject property. No sampling or analysis was conducted during this survey.

2.4 Report Organization

The remainder of this ECP report is organized as follows:

Section 3 – Property Description: This section provides location and description of the subject property; an overview of historical and current land uses; and a description of the environmental setting of the lake area, including climate, topography, geology, and demography.

Section 4 – Survey Methodology: This section describes the methods used to obtain the information for this ECP Report such as the development of study sections, the VSI, aerial photography analysis, records review, interviews, and data management.

Section 5 – Environmental Conditions: This section provides the existing environmental information. The findings are organized by relevant environmental "issues," including permits and licenses, cleanup activities, hazardous substances, petroleum and related products, asbestos, lead-based paint (LBP), radioactive materials, landfills, explosive contaminated structures, radon, pesticides, and polychlorinated biphenyls (PCBs). This section also includes adjacent property descriptions.

Section 6 – Evaluation and Conclusions: This section provides a summary of the subject property and evaluates the property for categorization as per ASTM D5746 (2016).

Section 7 – Certification: This section documents the approval of the ECP report.

Section 8 – References: This section provides an inventory of the reference material used in the preparation of this ECP Report.

Appendices: A list of appendices is provided in the Table of Contents.

3.0 Property Description

3.1 Parcel Locations and Description

Beaver Lake is located in the scenic Ozark Mountain region of northwestern Arkansas in Benton, Washington, Carroll and Madison counties. The total area currently contained in the Beaver project, including both land and water surface, consists of 38,138 acres owned in fee. Of this total, 1,432 acres are in flowage easement. The proposed Land Acquisition would include adding any land below the 1128 msl water level. The White River drainage area above Beaver Lake is approximately 1,186 square miles. When the lake is at the top of the conservation pool (elevation 1120.43 feet above mean sea level), the water area is 28,299 surface acres with 490 miles of shoreline within the lands owned in fee. The shoreline is irregular with topography primarily consisting of steep bluffs and gentle slopes.

Priority Area 1 consists of two parcels that are adjacent forks at the end of a southeastern branch of the lake and is approximately 1.22 acres of land located South and East of the center of Beaver Lake on primarily western and northern shore. The subject property is on the edge of the lake and currently owned by private landowner(s). The subject property, also known as Priority Area 1, is downstream from the Big Clifty Recreation area. There are two separate sections in this Priority Area, 1.1 and 1.2 but both sections are coves with overhanging bluffs.

3.2 Historic Land Use

Beaver Lake is a multiple purpose water resource development project initially authorized for flood control, hydropower generation and other beneficial uses by the Flood Control Act dated 3 September 1954. The inclusion of storage in the lake for municipal and industrial water supply was authorized by the Water Supply Act of 1958. Beaver Lake is a major component of a comprehensive plan for water resource development in the White River Basin of Arkansas and Missouri. Construction of Beaver Dam was initiated in March 1960. The dam was completed in June 1966, and the powerhouse and switchyard were completed in 1965. Beaver Lake was declared operational for public use in 1965.

For Priority Area 1, the historical aerial photographs show that this area has been used for private residences as far back as 1985.

3.3 Current Land Use

Beaver Lake is located in the Ozark Highlands of Carroll, Washington, Benton, and Madison Counties. Having 490 miles of shoreline (at conservation pool) and over 28,000 water surface acres, Beaver Lake is the largest reservoir in northwest Arkansas and the first federal impoundment on the White River.

There are 12 public use areas around Beaver Lake. There are 11 parks on the lake presently operated by the Corps of Engineers. The State of Arkansas owns and operates Hobbs State Park Conservation Area, which covers 12,056 acres, and Devil's Eyebrow Natural Area, which covers 2,503 acres. Both properties are adjacent to U.S. Army Corps of Engineers (USACE) lands. There are two parks, Ventris, and Blue Springs that have been reduced to lake access only. One Park (Big Clifty) is operated by Carroll County, Arkansas.

Despite being located adjacent to the fast-growing communities of Fayetteville, Springdale, Bentonville, and Rogers, Arkansas and a regional population of over 500,000, the lake provides open spaces and a quality outdoor recreation opportunity. Many arms and coves of the lake offer secluded areas for traditional activities such as fishing, skiing, sailing and scuba diving, but also allow for passive recreation opportunities like photography and nature observation.

Priority Area 1 is currently used for residential and recreational use. Section 1.1 is a well-known cliff diving area while section 1.2 houses a private residence.

3.4 Utilities

Priority Area 1 has no known utilities.

3.5 Environmental Setting

3.5.1 Climate

The climate in the Beaver Lake area is classified as humid subtropical according to the Köppen climate model. A humid subtropical climate is characterized by hot, usually humid summers and mild to cool winters. The Köppen definition of this climate is for the coldest month's mean temperature to be between 26.6 °F (−3 °C) and 64.4 °F (18 °C), and the warmest month to be above 71.6 °F (22 °C). Some climatologists prefer to use 32 °F (0 °C) as the lower bound for the coldest month's mean temperature. Under the modern Trewartha climate classification, climates are termed Humid Subtropical when they have mean temperatures of 50 °F (10 °C) for eight or more months a year. In most locations classed within this system, the mean temperature of the coldest month is between 35 °F (3 °C) and 65 °F (18 °C). Some climatologists consider the Trewartha grouping of subtropical climates to be more real-world and fitting on a global scale.

While technically classified as humid subtropical, the climate in the Beaver Lake area is considered moderate. The area experiences all four seasons and does receive cold air masses from the north; however, some of the Arctic masses are blocked by the higher elevations of the Ozarks.

Average temperatures range from a high of 88 °F (31.1 °C) and low of 27 °F (-2.7 °C) in nearby Rogers, Arkansas. Extreme temperatures rarely exceed 96 °F (35.6 °C) and 13°F (-10.6 °C). Late summer is the time of maximum heat and least rainfall. During the winter months, midday temperatures in the basin are relatively warm, around 55 to 60 °F. Some short periods of cold weather occur with temperature ranging from 0 o to 10 o F. On winter nights, temperatures from 37 o F to below freezing are common. Highest recorded temperature in Rogers, Arkansas was 114 °F (45.6 °C) (recorded in July 1954). The lowest temperature recorded was −16 °F (−26.7 °C), in February 1996.

The relative humidity typically ranges from 41% (comfortable) to 91% (very humid) over the course of the year, rarely dropping below 24% (dry) and reaching as high as 100% (very humid). The air is driest around April 9, at which time the relative humidity drops below 49% (comfortable) three days out of four; it is most humid around June 3, exceeding 87% (very humid) three days out of four.

Dew point is often a better measure of how comfortable a person will find the weather than relative humidity because it more directly relates to whether perspiration will evaporate from the skin, thereby cooling the body. Lower dew points feel drier and higher dew points feel more humid. Over the course of a year, the dew point typically varies from 19°F (dry) to 71°F (muggy) and is rarely below 4°F (dry) or above 74°F (very muggy). There are two periods in the year that are most comfortable: The first is between April 18 and June 6 and the second is between September 3 and October 23. The air feels neither too dry nor too muggy during these periods (https://weatherspark.com/averages/31495/Rogers-Arkansas-United-States).

Average annual rainfall for the Beaver Lake area is 45 inches per year. Precipitation is weakly seasonal, with a bimodal pattern: wet seasons in the spring and fall, and relatively drier summers and winters, but some rain in all months. The spring wet season is more pronounced than fall, with the highest rainfall typically occurring in May. The average annual snowfall for the Beaver area is about 12 inches. Snowpacks are usually short lived and are not commonly a concern for flooding.

Climate change is an area of concern due to the potential for effects on many aspects of the environment, especially those related to water resources. The U.S. Global Change Research Program (USGCRP) summarized information regarding climate change and its potential effects in regional assessments (http://www.globalchange.gov/publications/reports/scientific-assessments/us-impacts). In the Midwest,

which extends from Minnesota to Missouri, extreme events such as heat waves, droughts and heavy rainfall events are projected to occur more frequently. Should these events become significant enough to impact the operation of Beaver Lake, the Master Plan and associated documents (i.e., Operations Management Plan and Shoreline Management Plan) would be reviewed and revised, if necessary.

3.5.2 Topography, Geology, and Soils

The depositional environment of the rocks found in the Arkansas Ozarks is one of a relatively shallow continental shelf, sloping toward deeper water generally toward the south. This shelf emerged many times during the Paleozoic resulting in numerous unconformities throughout the sequence. The Ozark Plateaus region of Arkansas is made up of generally flat-lying Paleozoic age strata divided into three plateau surfaces. The lowest and northern-most plateau is the Salem Plateau. The Springfield Plateau stands above the Salem a few hundred feet and is generally capped by lower Mississippian age limestones and cherts. The southernmost and highest plateau of the Ozarks is the Boston Mountains. All of these plateaus are deeply dissected by numerous streams throughout the area. The faulting in the Ozarks is generally normal; most faults displaying a displacement down on the southern side. However, some observations reveal that a few strike-slip faults may be present. Gentle folds are noted but are generally of very low amplitude. The depositional environment of the rocks found in the Arkansas Ozarks is one of a relatively shallow continental shelf, sloping toward deeper water generally toward the south.

Beaver Lake is part of the Springfield Plateau that occupies primarily the western and southwestern flanks of the Ozark Plateau province. The Springfield Plateau in this region rises to an elevation of approximately 1400 feet and in many areas, forms extensive plains. Hilly areas occur where rivers and their tributaries cut into the plateau surface, most notably in the vicinity of the White River and Beaver Lake. As streams like the Buffalo National River cut through the plateau down to the level of the White River, they sometimes carve spectacular bluffs.

Lower Ordovician, Middle to Upper Devonian and Lower and Upper Mississippian age strata are present around Beaver Lake. Upper Ordovician and Devonian strata crop out around Beaver Lake and its tributaries. The Lower Mississippian Boone Formation comprises the surface rock over the majority of the area and forms the surface of the heavily dissected Springfield Plateau. In addition to the Boone Formation, Cotter and Jefferson City formations (Jefferson City formation has not been successfully differentiated from the Cotter Formation in Arkansas), and the Powel formation, all of Ordovician age are present in the area. Formations in the Devonian strata include the Chattanooga, Clifty and Penters.

The Boone Formation consists of gray, fine- to coarse-grained fossiliferous limestone interbedded with chert. This formation caps the higher hills in the area. Since limestone is easily dissolved by water, cave and solution (karst) features are prominent. The Boone Formation is well known for dissolutional features, such as sinkholes, caves, and enlarged fissures. Surface water may drain directly into channels in limestone, where it can move rapidly and without filtration to the surface as a spring, at a location that is unpredictable without extensive testing. Therefore, water pollution problems are of particular concern in this region. The thickness of the Boone Formation is 300 to 350 feet in most of northern Arkansas, but as much as 390 feet has been reported.

The Cotter Dolomite is composed of dolostone of predominantly two types: a fine-grained, argillaceous, earthy textured, relatively soft, white to buff or gray dolostone called "cotton rock", and a more massive, medium-grained, gray dolostone that weathers to a somewhat hackly surface texture and becomes dark on exposure. The formation contains chert, some minor beds of greenish shale, and occasional thin interbedded sandstone. The thickness is about 340 feet in the vicinity of Cotter, but the interval may range up to 500 feet thick in places.

The Powell Dolomite is generally a fine-grained, light-gray to greenish-gray, limy, argillaceous dolostone with thin beds of shale, sandstone, sandy dolostone, and occasionally chert. The formation’s thickness may be as much as 215 feet but is often much thinner.

The Chattanooga Shale Formation is typically black, fissile clay shale that weathers into thin flakes. The beds are usually cut by prominent joints creating polygonal blocks upon weathering. The upper part of the formation may be slightly sandy and usually contains abundant pyrite. Thickness ranges from 0 to about 85 feet; normally averaging about 30 feet (AGS).

The strata throughout the region are nearly horizontal. One predominant geological feature of the lake area is a low, persistent, limestone bluff, which occurs just above the Ordovician- Mississippian contact.

The faulting in the Ozarks is generally normal; most faults displaying a displacement down on the southern side. Lineaments and faults characteristic of northwest Arkansas are present around Beaver Lake. The Fayetteville Fault lies beneath Beaver Lake. This fault is the west side of a graben that has down-dropped the Boone Formation to lake level. The Starkey Fault bounds the east side of the graben. Both faults trend approximately N 450E. One section of the Starkey fault trends N 60-700E. The Clantonville Lineament – Monocline is a northeast to southwest trending structural feature that extends from north of Clantonville to Ventris Hollow. The location of this feature was determined from the 1:24,000 three dimensional quadrangle and from structural disparities in the Lower Mississippian rock units. This structural feature could be responsible for the presence of lead-zinc mineralization in an old prospect near Clantonville (north of Beaver Lake). The trend of this lineament to monocline is N 30-400E. Paleokarst features within the top of the Powell Dolomite are present around Beaver Lake and coincident with a lineament in Limekiln Hollow near Garfield, northwest of Beaver Lake.

In general, the soils of the Ozark Plateaus are residual and are formed on a broad, domed, upwarp consisting mostly of limestone and dolomite. The main difference in the soils is due to different rocks from which the soils were formed. The main geologic materials are cherty limestone; cherty, very siliceous dolomite; cherty, siliceous dolomite; and alluvium, which are weathered and water transported products of the first three materials. Glade-rock soil occurs where the cherty, very siliceous dolomite is exposed to the soil formation. Dolomite is more resistant to weathering than limestone and siliceous dolomite is even more resistant, so very shallow soil results. In areas where the dolomite is less siliceous, more weathering has taken place; however, the soils produced are not as deep as soils formed by limestone.

The following eight soils associations are found in and around the Beaver project area: Captina-Nixa, Captina-Nixa-Pickwick, Clarksville-Nixa-Baxter, Corydon-Sogn, Enders-Allegheny-Mountainburg, Razort-Captina-Etowah, Linker-Apison-Hector, and Captina-Pembroke.

3.5.3 Hydrology and Groundwater

In the Interior Highlands of western and northern Arkansas ground-water supplies are more limited than in the Coastal Plain. Much of the Ozark Plateaus region is underlain by carbonate rocks, which are quite soluble in the presence of water. Solution by ground water has caused many large openings through which water passes so quickly that contaminants from the surface cannot be filtered out. Signs of these openings are caves, sink holes, springs and lost stream segments. As a consequence, the water in shallow wells may not be suitable for human consumption without treatment.

Three aquifers, which are part of the Ozark Plateaus Aquifer System, are located within northern Arkansas. The Springfield Plateau aquifer is generally under unconfined conditions, with groundwater movement occurring through fractures and solution cavities formed by dissolution of carbonate rock. Local discharge is through springs and streams. The Ozark aquifer is generally under confined conditions, especially where overlain by the units of the Ozark Confining Unit (Chattanooga Shale). Most wells in the Springfield Plateau and upper units in the Ozark aquifer yield 5-10 gpm on the average, with yields greater than 25 gpm in rare cases.

The third aquifer, the Roubidoux Formation and the Gunter Sandstone Member of the Gasconade Formation in northern Arkansas occur at greater depth and constitute the only significant aquifer system in the Ozarks. Both are permeable sandstone and carbonate units of Ordovician age. These aquifers serve as the principal source of high-quality water for many communities in northern Arkansas where surface water sources are unavailable. Together these units may yield up to 500 gpm to wells. These formations do not outcrop anywhere in Arkansas but instead outcrop in southern Missouri.

3.5.4 Water Quality

The waters of the Arkansas portion of the White River watershed have all been designated by the Arkansas Department of Environmental Quality (ADEQ) for fisheries, primary and secondary contact recreation, and domestic, agricultural, and industrial water supplies (ADEQ, 2012). Beaver Lake is classified by ADEQ as a Type A water body, which includes most larger lakes of several thousand acres in size, in upland forest dominated watersheds, having an average depth of 30 to 60 feet, and having low primary production (i.e., having a low trophic status if in natural [unpolluted] condition). Beaver Lake, like all other lakes of its size in the Ozark region, stratifies chemically and thermally in the late spring with stratification extending into late fall and early winter. During the warmer months, lake waters of the upper layer (the epilimnion) are warmer and contain more dissolved oxygen, while the denser, lower layer waters (the hypolimnion) are colder and contain very little or no dissolved oxygen, thus undesirable for fish habitat.

This undesirable water, when discharged downstream from hydropower generation, may cause some problems in the tailwaters. To combat this problem, the dissolved oxygen content is monitored, and various management measures are implemented to improve the dissolved oxygen concentration in the hydropower releases. A highly productive trout fishery has been established in the Beaver tailwaters by the Arkansas Game and Fish Commission because of the available discharge of cold water from the dam, which is reaerated by turbulence as it flows downstream.

As the stratified epilimnion cools in the late fall and winter, the layers begin to mix (de-stratify) and dissolved oxygen (DO) is more evenly distributed. This condition is more favorable to the fishery of the lake and overall water quality.

The upper 1500 acres of Beaver Lake has been listed by the Arkansas Department of Environmental Quality (ADEQ) on Arkansas' 303(d) list of impaired waters, approved by the Environmental Protection Agency (EPA), due to turbidity (ADEQ, 2008). According to the Arkansas 303(d) list, these excessive levels impact the local fisheries as well as primary contact, both designated uses of Beaver Lake. The elevated turbidity levels are due to excessive silt from surface erosion from agriculture activities, unpaved road surfaces, in-stream erosion – mainly from unstable stream banks, and any other land surface disturbing activity. The Draft 2010 Integrated Water Quality and Monitoring Report (ADEQ, 2010) added pathogen indicator bacteria as a contaminant for the same area of Beaver Lake. Surface erosion activities are listed as the probable source for this contaminant as well.

Clean Water Act requires states to list waters that do not meet Federal water quality standards or have a significant potential not to meet standards as a result of point source dischargers or non- point source run-off. Subsequent to listing on the 303(d) list, the statute requires that the states develop and set the Total Maximum Daily Load (TMDL) for water bodies on the list within 13 years. A TMDL establishes the maximum amount of a pollutant that can enter a specific water body without violating the water quality standards. Values are normally calculated amounts based on dilution and the assimilative capacity of the water body. TMDLs have not been established by ADEQ for the upper Beaver Lake area.

3.6 Biological and Cultural Resources

3.6.1 Terrestrial Ecosystems

The area surrounding Beaver Lake is mostly forested. Trees and shrubs around the lakeshore include upland oak and hickory species, persimmon, honey locust, hawthorn, dogwood, redbud, coralberry, smooth and winged sumac, and buttonbush. Frequent periods of inundation keep a thin strip of government owned lands around the lake in early stages of succession. Red cedar and short-leafed pine, the principal evergreens, are dispersed throughout the region and are found in many large, scattered groups. Ground covers consist of greenbrier, sedges, and native grasses. White-tailed deer and eastern wild turkey are common game animals found and hunted in the Beaver Lake area. Black bears have also become common in the area and are hunted on the lands around the lake. The principal small game species found in the open upland areas include bobwhite quail, cottontail rabbit, and mourning dove. Gray and fox squirrels are common in upland wooded areas. Furbearing animals found in the Beaver Lake area include coyote, red fox, gray fox, otter, mink, muskrat, beaver, bobcat, and raccoon. Habitat management that includes wildlife food plot plantings, mowing, soil disturbance, removal of exotic species and application of prescribed fire provide benefit to these populations.

The common goldeneye, hooded merganser, bufflehead, and ring-necked duck are the predominant migratory waterfowl species visiting Beaver Lake. Mallards, gadwall, and other duck species are also present; however, they are only transient visitors as their characteristic feeding habits of obtaining food from shallow waters is limited. Resident Canada geese are so numerous in many coves and recreation areas that their presence has become a nuisance.

Ring-billed gulls are seen frequently around the Beaver Lake area. Greater and lesser yellow legs, pelicans, and large flocks of horned grebes are also seen during their peak migration in the spring and fall. Beaver Lake is also one of the few places where visitors can see both the turkey vulture and the black vulture at the same time in the winter. Beaver Lake has also become a popular place that visitors come to observe bald eagles, commonly wintering 150 or more birds and hosting 5-6 breeding pairs during the nesting period of March to June. The surrounding woodlands and grasslands serve as prime nesting areas for resident and neotropical migratory songbirds.

3.6.2 Aquatic Ecosystems and Wetlands

Walleye, smallmouth bass, striped bass, hybrid white-striped bass, and paddlefish have been introduced into Beaver Lake to add diversity to the fishery. Natural reproduction of striped bass and hybrid white-striped bass does not occur in Beaver Lake. Since 2004, AGFC stocks approximately 100,000 walleye, 30,000 channel catfish, 30,000 blue catfish, and 200,000 striped bass each year. While natural reproduction occurs in white crappie, black crappie, largemouth bass, and smallmouth bass, AGFC supplements this reproduction by occasional stockings of these species. Historically, there have also been introductions of northern pike, blue catfish, lake trout, and threadfin shad.

Located within the Springfield Plateau of the Ozark Mountains region of northern Arkansas, the area surrounding Beaver Lake is characterized by limestone, dolomite, or chert geology. The many rivers and streams flowing through the region have created a landscape of level highlands dissected by rugged valleys rich in karst features such as caves and sinkholes. Associated with these streams and landscape features are a variety of wetland habitats representative of the five wetland classes occurring within the region. These wetland classes include depressions, flats, fringe, riverine, and slope. It is possible, and perhaps even likely, that all of these classes of wetlands occur in the general area of Beaver Lake. However, those most likely to occur in the area immediately surrounding the lake are fringe (most likely reservoir), riverine (most likely spring runs) and slope wetlands (most likely calcareous slope).

3.6.3 Threatened and Endangered Species

The following species listed in Table 1 are from the U.S. Fish and Wildlife Service's federally classified status list of species and the Arkansas Natural Heritage data sets which have been reported and identified on project lands. Although the bald eagle was delisted by USFWS in 2007 due to recovery of the species, both the bald and golden eagles are still protected in accordance with the Bald and Golden Eagle Protection Act. The federal Migratory Bird Treaty Act of 1918 also provides protection to certain species of migratory birds. A total of 31 bird species are currently protected under this federal statute.

Table 1: Threatened and Endangered Species

	Federal Status	**State Status/Global Rank**
Gray Bat	LE	SE / S2S3/G4
Indiana Bat	LE	SE / /S1/G2
Northern long-eared Bat	LT	SE / S1S2/ G1G2
Ozark Big-eared Bat	LT	Not listed
Little Brown Bat	-	SE / S1
Bald Eagle	*Protected under Bald and Golden Eagle Protection Act	S3B,S4N/G5
Eastern Black Rail	LT	Not listed
Piping Plover	LT	Not listed
Rufa Red Knot	LT	Not listed
Whooping Crane	Experimental Population, Non-Essential	Not listed
Ozark Cavefish	LT	SE / S1/G3
Neosho Mucket	LE	Not Listed
Rabbitsfoot mussel	LT	SE/S3/G3G4
Snuffbox Mussel	LE	Not listed
Monarch Butterfly	C	Not listed
Missouri Bladderpod	LT	S2/G3

Opaque Prairie Sedge	-	SE / S2S3G4
Yellow Coneflower	-	ST / S2G3T3
Ovate-leaf Catchfly	-	ST / S2G3
Royal Catchfly	-	ST / S2G3

FEDERAL STATUS CODES

LE = Listed Endangered; the U.S. Fish and Wildlife Service has listed this species as endangered under the Endangered Species Act.
LT = Listed Threatened; the U.S. Fish and Wildlife Service has listed this species as threatened under the Endangered Species Act.
C = Candidate Species;

STATE STATUS CODES

INV = Inventory Element; The Arkansas Natural Heritage Commission is currently conducting active inventory work on these elements. Available data suggests these elements are of conservation concern. These elements may include outstanding examples of Natural Communities, colonial bird nesting sites, outstanding scenic and geologic features as well as plants and animals, which, according to current information, may be rare, peripheral, or of an undetermined status in the state. The ANHC is gathering detailed location information on these elements.

GLOBAL RANKS

G3 = Vulnerable globally. At moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors.
G4 = Apparently secure globally. Uncommon but not rare; some cause for long-term concern due to declines or other factors.
G5 = Secure globally. Common, widespread and abundant.
T-RANKS= T subranks are given to global ranks when a subspecies, variety, or race is considered at the state level. The subrank is made up of a "T" plus a number or letter (1, 2, 3, 4, 5, H, U, X) with the same ranking rules as a full species.

STATE RANKS

S1 = Critically imperiled in the state due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors making it vulnerable to extirpation.
S2 = Imperiled in the state due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it vulnerable to extirpation.
S3 = Vulnerable in the state due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.

GENERAL RANKING NOTES

Q = A "Q" in the global rank indicates the element's taxonomic classification as a species is a matter of conjecture among scientists.

Source: Arkansas Natural Heritage Commission

3.6.4 Cultural Resources

The records search, interviews, and site inspection identified no cultural resource assessments or findings for the subject property.

During the past seventy years scientific investigation of archaeological sites in the Beaver Lake area has been carried out in several phases. In 1922 and 1923, Mark R. Harrington of Phillip Academy was the first archeologist to excavate sites on the area that is now Beaver Lake. He excavated 13 bluff shelters. Between 1928 and 1935, the work of Harrington was continued by S.C. Dellinger of the University of Arkansas Museum. Dellinger supervised the excavation of 21 rock shelters. In the early 1960's, a series of surveys were conducted by several archeologists from the University of Arkansas Museum. Today, there are 280 known archeological sites along or immediately adjacent to Beaver Lake. Of these, 271 are identified as prehistoric, seven are historic and two sites have no known cultural affiliation.

Table 2: Historical and Cultural Resources at Beaver Lake

Type of Site	Number of sites
Historic	7
Prehistoric	271
No known cultural affiliation	2
Total	280
National Register Eligibility Status	
Not Evaluated	132
Not Eligible	5
Eligible	1

4.0 Survey Methodology

4.1 Development of Study Sections

The information gathered during the development of the ECP was used to group the subject property into standardized categories using Department of Defense (DoD) guidance, and in accordance with ASTM D5746 (2016). The ECP category definitions are summarized below in Table 3.

Table 3: Definitions of ECP Categories

ECP Category	Definition
1	An area or parcel of real property where no release, or disposal of hazardous substances or petroleum products or their derivatives has occurred (including no migration of these substances from adjacent properties).
2	An area or parcel of real property where only the release or disposal of petroleum products or their derivatives has occurred.
3	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but at concentrations that do not require a removal or remedial action.
4	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, and all remedial actions necessary to protect human health and the environment have been taken.
5	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred and removal or remedial actions, or both, are under way, but all required actions have not yet been taken.
6	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but required response actions have not yet been initiated.
7	An area or parcel of real property that is unevaluated or requires additional evaluation.

The final ECP category designations for the subject property are shown in Section 6.2, Table 5.

4.2 Visual Site Inspection

A VSI was conducted on 13 July 2021 at the subject property to check for recognized environmental conditions. The VSI was conducted by Mrs. Eugenia Barnes and Mr. Robert Singleton from the U.S. Army Corps of Engineers (USACE). USACE representatives were accompanied by Mr. Michael Hurley of the USACE Beaver Lake office.

The VSI was performed from a USACE Beaver Lake Office watercraft near the bank of the subject property as a Right of Entry (ROE) was not available at the time of the inspection. On the day of the VSI,

the lake water level was 1127 feet above sea level, conservation pool lake level is at 1121 feet above sea level. At the time of inspection, Priority Area 1.1, which is a known cliff diving spot, was occupied by a single watercraft. A small waterfall was noted with mineral stains on the bluff edges. Vegetation growth was healthy under the overhanging bluff. Parts of the bank were rocky with fallen trees, while others were sheer rock. No debris could be seen from the boat and no apparent signs of Hazardous, Toxic and Radioactive Waste (HTRW) were visible during the VSI.

For Priority Area 1.2, the narrow sliver of bank leading to the cove had healthy vegetation with some woody debris. A private residence could be seen with a wooden chair on point overlooking the water. The cove was comprised of an overhanging ledge with a large boulder below, where woody debris has also deposited. No debris could be seen from the boat and no apparent signs of HTRW were visible during the VSI.

Photos from the VSI can be found in Appendix A.

4.3 Aerial Photography Analysis

Aerial photographs were available from Google Earth maps for 1985, 1994, 2001, 2004, 2006, 2009, 2010, 2012, 2014, 2016, 2017, 2018, and 2020.

The initial aerial photograph from 1985 is of poor quality and the area isn't discernable. The next photo from 1994 is also of poor quality but a residence can be seen at adjacent part of the southern portion of the Site 1 parcel. There is no change until the 2009 photo where the residence has been demolished and only the foundation remains. From 2009 until the most recent photo in 2020 the foundation of the house remains.

All aerial photographs are included in Appendix B.

4.4 Sanborn Map Review

Sanborn maps were not available for the subject property, or for the adjacent areas.

4.5 Topographic Map Review

Historical topographic maps were available from the US Geological Survey Website for the Beaver Lake area for 1900, 1901, 1945, 1949, 1954, 1957, 1958, 1964, 1985, 2011, 2014, 2017, and 2020. Several observations can be gleaned from these maps. First, the area before the lake was formed consisted of valleys with steep bluffs and hill sides around the White River and its tributaries. The historical maps show this valley and river basin from the 1900 to 1964 topographic maps. In 1985 the river and Beaver Dam at the northern end of the lake can been seen in the valley of the historical White River.

All topographic maps are included in Appendix C.

4.6 Records Review

4.6.1 Standard Environmental Record Sources

In this evaluation records, maps and other documents that provide environmental information about the project area are obtained and reviewed. A desktop records review was conducted using various sources to determine the presence of HTRW sites on or near the subject property. This search was focused on active cleanup sites and sites with a reasonable risk of HTRW release. Several databases were searched manually to narrow down the search area. These databases included the Environmental Protection Agency (EPA) Cleanups in my Community database, the EPA Envirofacts databases, the Arkansas Department of Environmental Quality's (ADEQ) web search tool of Underground Storage Tanks (UST) and Above Ground Storage Tanks (AST), and the Arkansas Department of Energy and Environment Oil and Gas Commission oil and gas well maps. The information collected from this desktop records review was

analyzed for recognized environmental conditions (RECs) that would affect the proposed project or need further investigation, given the proposed project measures. The following resources were searched.

Federal National Priorities List (NPL) – The records search did not reveal any NPL sites in the project footprint or adjacent areas. There are nine NPL sites in the state of Arkansas, none of which are located near Beaver Lake or the priority areas. This is based on a search of the EPA Superfund: National Priorities List (NPL) list.

Federal Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) List – The CERCLIS, now called the Superfund Enterprise Management System (SEMS) database, tracks hazardous waste sites where remedial action has occurred under EPA's CERCLA program. This list also includes sites that are in the screening and assessment phase for possible inclusion on the NPL. The records search of EPA's listed SEMS sites did not reveal any sites in the project footprints or adjacent areas. This is based on a search of the EPA SEMS database.

Federal No Further Remedial Action Planned (NFRAP) – The Federal NFRAP list (now known as the SEMS archive list) tracks sites where no further remedial action is planned, based on available assessments and information. The list also represents sites that were not chosen for the NPL. Further EPA assessment could possibly be ongoing, and hazardous environmental conditions may still exist; however, in the absence of remedial action and assessment data, no determination about environmental hazards can be made. The records search did not reveal any NFRAP sites in the project footprint or adjacent areas. This is based on a search of the EPA SEMS database.

Federal Resource Conservation and Recovery Act (RCRA) Corrective Action List – The records search of EPAs Cleanups in My Community showed two RCRA Corrective Actions within one mile of the project search area. No RCRA corrective actions were found to be located within one mile of the project footprint. This is based on a search of the EPA Cleanups in My Community.

State Superfund Sites - This search is to check for any state CERCLA sites in the project vicinity. The records search of state CERCLA cleanup sites did not show any sites of concern in the project or adjacent areas. This search is based on a search of the Arkansas Department of Energy and Environment data base.

State and Tribal Solid Waste Facilities/Landfill Sites – This search is designed to check any state or tribal databases for solid waste handling facilities or landfills in the project vicinity. The records search did not find any solid waste facilities or landfill sites in area of this project or adjacent areas. This is based on a search of the EPA Landfill Methane Outreach Program (LMOP) and ADEQ Permitted Solid Waste Disposal database.

State and Tribal Registered Storage Tanks – This list is a combination of the State of Arkansas registered UST and AST databases, representing sites with storage tanks registered with the State of Arkansas. The search revealed one AST within one mile of the work area or adjacent areas. This AST is not expected to impact the project due to its distance from the proposed project. These results are based on a search of the Arkansas Department of Energy and Environment Oil and Gas Commission website.

State and Tribal Voluntary Cleanup Sites – The ADEQ Elective Site Cleanup Agreement (ESCA) database identifies sites where the responsible party chooses to clean up the site themselves with ADEQ oversight. Five sites were identified from this database. None of the sites are within one mile of the work area and are therefore not expected to impact the proposed project. These results are based on a search of the ADEQ ESCA Database.

Brownfields List – A brownfield is a property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. There are no brownfield sites within one mile of the work area or adjacent areas. These results are based on a search for Brownfields sites using the EPA Envirofacts search engine.

Oil and Gas Wells – A search of the oil and gas wells in the area using the Arkansas Department of Energy and Environment Oil and Gas Commission website identifies multiple sites including oil wells, plugged oil wells, injection/disposal sites within the surrounding area. Although not classified as HTRW under USACE regulations, pipelines and oil wells play an important role in the HTRW existing conditions near the potential project area. This is because the well and/or pipeline contents could potentially leak or spill into the surrounding environment or affect the proposed project features. As a result of these findings, a thorough pipeline/well search should be initiated during design to ensure no interaction with the existing oil and gas infrastructure occurs. The Oil and Gas Commission website was used to map these findings. No oil wells or pipelines were found near the priority areas.

4.7 Interviews

Two interviews were conducted on 12 and 13 July 2021 in conjunction with the site inspection, and the following stakeholders were interviewed:

- Mr. Matthew Franklin; Natural Resource Specialist, Beaver Lake Office; Matthew.G.Franklin@usace.army.mil
- Mr. Matthew Voskamp; Natural Resource Specialist, Beaver Lake Office; Matthew.Voskamp@usace.army.mil

Information gleaned from the interviews is incorporated by way of reference throughout the report. The interview questions can be found in Figure 3.

5.0 Environmental Conditions

5.1 Environmental Permits and Licenses

5.1.1 RCRA Status

The subject property is not covered under a Resource Conservation and Recovery Act (RCRA) permit, and no hazardous waste is generated or stored on the property.

5.1.2 Solid Waste

The subject property has no active, inactive, or expired permits or licenses for solid waste disposal. No landfills exist on the property.

5.1.3 USTs/ASTs

No USTs or ASTs were found during the records search, site inspection and interviews indicated no UST/AST have been known to be located at the subject property.

5.1.4 National Pollutant Discharge Elimination System (NPDES)

Section 402 of the Clean Water Act (33 U.S.C. 1251 et. seq.) requires all facilities that discharge stormwater to acquire an NPDES that defines contaminant limits in effluent to be discharged. As per the Beaver Lake Shoreline Management Plan no discharge of any type of effluent is prohibited in the waters of Little Rock District Lakes including Beaver Lake and its tributaries.

5.1.5 Drinking Water Permits

No drinking water permits are in place at the subject property.

5.1.6 Air Permits

No air emission or air quality permits are in place at the subject property.

5.1.7 Nuclear Regulatory Commission (NRC)

The NRC is tasked with permitting the use and handling of radioactive materials and reactors. No NRC licenses are in place at the subject property.

5.1.8 Other Permits/ Licenses

The property has an erosion control permit issued by the USACE Beaver Lake office for the retaining wall.

5.2 Environmental Cleanup and Remediation

5.2.1 Installation Restoration Program

Beaver Lake is not an active military facility, and therefore would not be eligible for cleanup under the Installation Restoration Program.

5.2.2 Military Munitions Response Program

Beaver Lake is not an active military facility, and therefore would not be eligible for cleanup under the Military Munitions Restoration Program.

5.2.3 Other Environmental Investigations and Cleanups

No known environmental investigations or cleanups were found during the records search, site inspection and interviews indicated that no known investigations or cleanups are ongoing at Beaver Lake.

5.2.4 Storage, Release, and Disposal of Hazardous Substances

No releases to the environment or improper disposal of these substances were found during the records search, site inspection and interviews indicated no known improper disposal at the priority area.

5.3 Petroleum and Petroleum Products

No releases to the environment or improper disposal of petroleum products were found during the records search, site inspection and interviews indicated no known improper disposal at the priority area.

5.4 Polychlorinated Biphenyls (PCBs)

No evidence exists of the presence of PCBs on the subject property. No PCB-containing oils were found during the records search, site inspection and interviews indicated no known PCB-containing oils have been used or stored at the priority area.

5.5 Asbestos

No asbestos assessments were found during the ECP process, none were found during the records search, site inspection and interviews indicated no known asbestos containing material has been used or stored at the priority area.

5.6 Lead and Lead-Based Paint (LBP)

No lead-based paint (LBP) assessments were found during the ECP process. No LBP was found during the records search, site inspection and interviews indicated no known improper disposal at the priority area.

5.7 Radioactive Material

No radioactive material assessments were found during the ECP process. No potentially radioactive materials were identified during the VSI, and the presence of radioactive materials on the subject property is extremely unlikely.

5.8 Landfills/Dumps

No landfills or dumps were found during the records search, site inspection or interview investigation.

5.9 Munitions and Explosives of Concern (MEC) and/or Unexploded Ordnance (UXO)

No munitions, explosives, or unexploded ordinance (UXO) were found during the records search, site inspection or interview investigation.

5.10 Radon

Beaver Lake spans across Benton, Washington and Carroll Counties. Washington County is in the Environmental Protection Agency (EPA) Radon Zone 3. Counties in Radon Zone 3 are counties with predicted average indoor radon screening levels of less than 2 pCi/L (EPA, 2018). Benton and Carroll Counties are in the EPA Radon Zone 2 with a predicted average indoor radon level between 2 and 4 pCi/L (EPA, 2018). No radon assessments were found during the records search (EPA, 2019).

5.11 Pesticides

No records were found to indicate the storage, improper use, or disposal of pesticides on the subject property.

5.12 Other Identified Concerns

No significant other concerns were found during the records search, site inspection or interviews.

5.13 National Environmental Policy Act (NEPA)

As the federal agency in charge of this project USACE is in charge of coordinating National Environmental Policy Act (NEPA) compliance of 1969 (Public Law 91-190), the Council on Environmental Quality (CEQ) regulations (40 CFR 1500–1508), and the USACE implementing regulations, Policy and Procedures for Implementing NEPA, ER 200-2-2. As part of the records search and interview process recent NEPA documents were reviewed including the 2018 Draft Environmental Assessment for the Beaver Lake Master Plan Revision.

5.14 Adjacent Properties

As part of the ECP process, adjacent properties are assessed for environmental conditions, and those discovered conditions are evaluated based on the potential to affect the subject property. The nearest structure to the priority area is a residence approximately 0.15 miles from Priority Area 1.1. The residence sits above the small cove in Priority Area 1.2. This residence is first seen in the 1994 historical aerial photographs. There are additional residences in neighboring plots of land directly adjacent to Priority Area 1. The adjacent properties are unlikely to pose any HTRW concerns to the priority area.

6.0 Evaluation and Conclusions

6.1 Summary of ECP

Beaver Lake currently occupies more than 38,000 acres of Federal public lands and waters. The Lake is located in northwestern Arkansas, in Benton, Washington, Madison and Carroll Counties and it is approximately 6 miles west of Eureka Springs, Arkansas. This ECP report covers 1.22 acres in two segments of land located off a southeastern branch of Beaver Lake, called Big Clifty Creek, on mostly western and northern shore. The subject property is two coves at the end of a lower order branch of the creek and currently owned by private landowner(s). The subject property, also known as Priority Area 1, is in Carroll County at the eastern end of Penitentiary Hollow, downstream from the Big Clifty recreation area and boat ramp.

This ECP report was prepared to characterize the existing environmental conditions at the subject property and is intended to be an aid in the leasing of real property. The ECP findings are based on the available sources of information concerning both past and present uses of the subject property. Information included readily available data associated with adjacent property records, aerial photography, personnel interviews, environmental programs and associated documentation, and current and historic investigations. In addition, record sources were reviewed to determine if there have been spills, leaks, discharges, leaching, underground injections, dumping, abandonments, or storage of hazardous substances or petroleum products at the installation. The VSI and interview process included inquiries and requests into the existence and availability of records that support the environmental condition of the property.

6.2 Conclusions

The subject property was classified into one of seven standard ECP area types (categories) as defined by ASTM D5746-98(2016) *Standard Classification of Environmental Condition of Property Area Types for Defense Base Closure and Realignment Facilities*. Below are the seven categories for reference.

Table 4: Definitions of ECP Categories

ECP Category	Definition
1	An area or parcel of real property where no release, or disposal of hazardous substances or petroleum products or their derivatives has occurred (including no migration of these substances from adjacent properties).
2	An area or parcel of real property where only the release or disposal of petroleum products or their derivatives has occurred.
3	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but at concentrations that do not require a removal or remedial action.
4	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, and all remedial actions necessary to protect human health and the environment have been taken.
5	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred and removal or remedial actions, or both, are under way, but all required actions have not yet been taken.
6	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but required response actions have not yet been initiated.
7	An area or parcel of real property that is unevaluated or requires additional evaluation.

Given these seven categories, the subject property is categorized below, along with the reasoning for each classification.

Table 5: Properties and ECP Categories

Acreage	ECP Category	Reasoning
1.22 ac.	1	No release or disposal of hazardous substances or petroleum products or their derivatives has occurred beyond de minimus amounts, including no migration of these substances from adjacent properties.

No release or disposal of hazardous substances or petroleum products or their derivatives has occurred beyond de minimus amounts on the subject property and no releases to the environment were observed or reported.

Asbestos assessments were not available for the subject property. It is unlikely that Asbestos Containing Material (ACM) is present but, in the future, if a building or structure will be disturbed, a licensed asbestos inspector is needed to confirm whether ACM is present or not.

7.0 Certification

I declare that, to the best of our professional knowledge and belief, we meet the definition of *Environmental professional* as defined in Part 312.10 of 40 CFR 312. We have the specific qualifications based on education, training, and experience to assess a property of the nature, history and setting of the subject property. We have developed and performed the appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312. All information/documentation provided accurately reflects the condition of the property. This report meets the DoD requirements for completion of an ECP Report.

_____ _____

Eugenia Barnes
Environmental Protection Specialist
U.S. Army Corps of Engineers
Fort Worth District

Date

_____ _____

Jennifer Jefcoat
Chemist
U.S. Army Corps of Engineers
Fort Worth District

Date

_____ _____

Hollie Eljizi
Environmental Engineer
U.S. Army Corps of Engineers
Fort Worth District

Date

8.0 References

American Society for Testing and Materials (ASTM), 2013. E1527-13, *Standard Practice for Environmental Site Assessments: Phase 1 Environmental Site Assessment Process*.

ASTM, 2016. D5746, *Standard Classification of Environmental Condition of Property Area Types for Defense Base Closure and Realignment Facilities*.

Department of the Army, 13 December 2007. Army Regulation 200-1. *Environmental Quality: Environmental Protection and Enhancement.*

Environmental Protection Agency (EPA), February 2019. *EPA Map of Radon Zones including State Radon Information and Contacts*. https://www.epa.gov/radon/find-information-about-local-radon-zones-and-state-contact-information#radonmap

Federal Emergency Management Agency (FEMA), 2019. FEMA Flood Map Service Center. https://msc.fema.gov/portal

USACE. 1993. White River Basin, Arkansas and Missouri, *Water Control Master Manual.*

USACE. 2013. Little Rock District Water Management website. Accessed at: www.swl-wc.usace.army.mil

United States Census Bureau. 2013. Easy Facts Website. Accessed at: http://www.census.gov/easystats/

USACE. 2018. Beaver Lake White River and Tributaries, *Arkansas Shoreline Management Plan.*

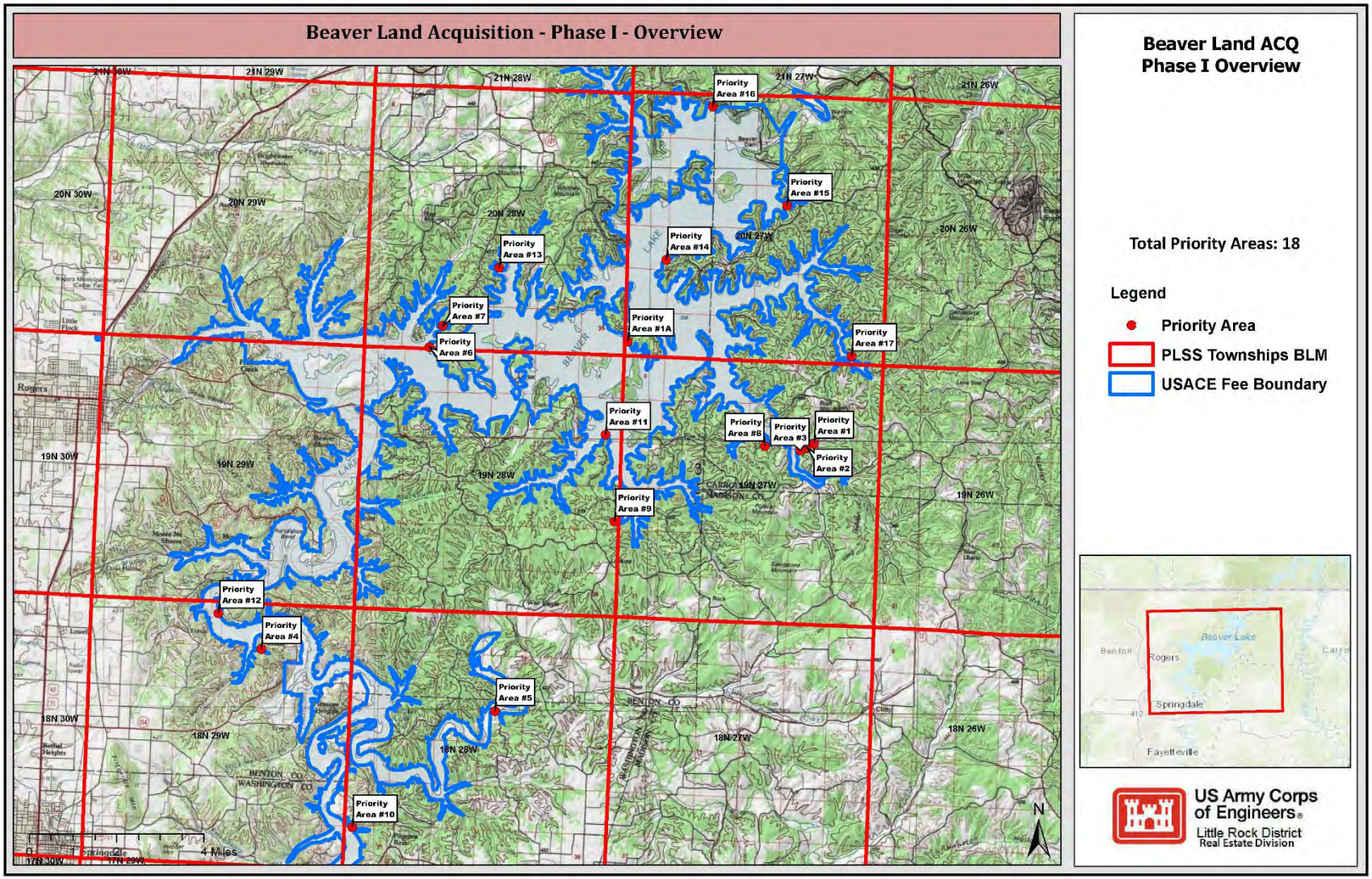
Arkansas Department of Energy and Environment Oil and Gas Commission website Accessed August 2021 at: Commission, http://www.aogc.state.ar.us/maps/googleEarth.aspx

Beaver Watershed Alliance (BWA), 2012. *Beaver Lake Watershed Protection Strategy.*

Arkansas Department of Energy and Environment for Environmental Quality website. Accessed August 2021 at: https://www.adeq.state.ar.us/rst/programs/fees/facility_data.aspx

Figures

Figure 1: Beaver Lake Priority Areas



ACQ = Acquisition; PLSS = Public Land Survey System; BLM = Bureau of Land Management

Figure 2: Subject Property Detail

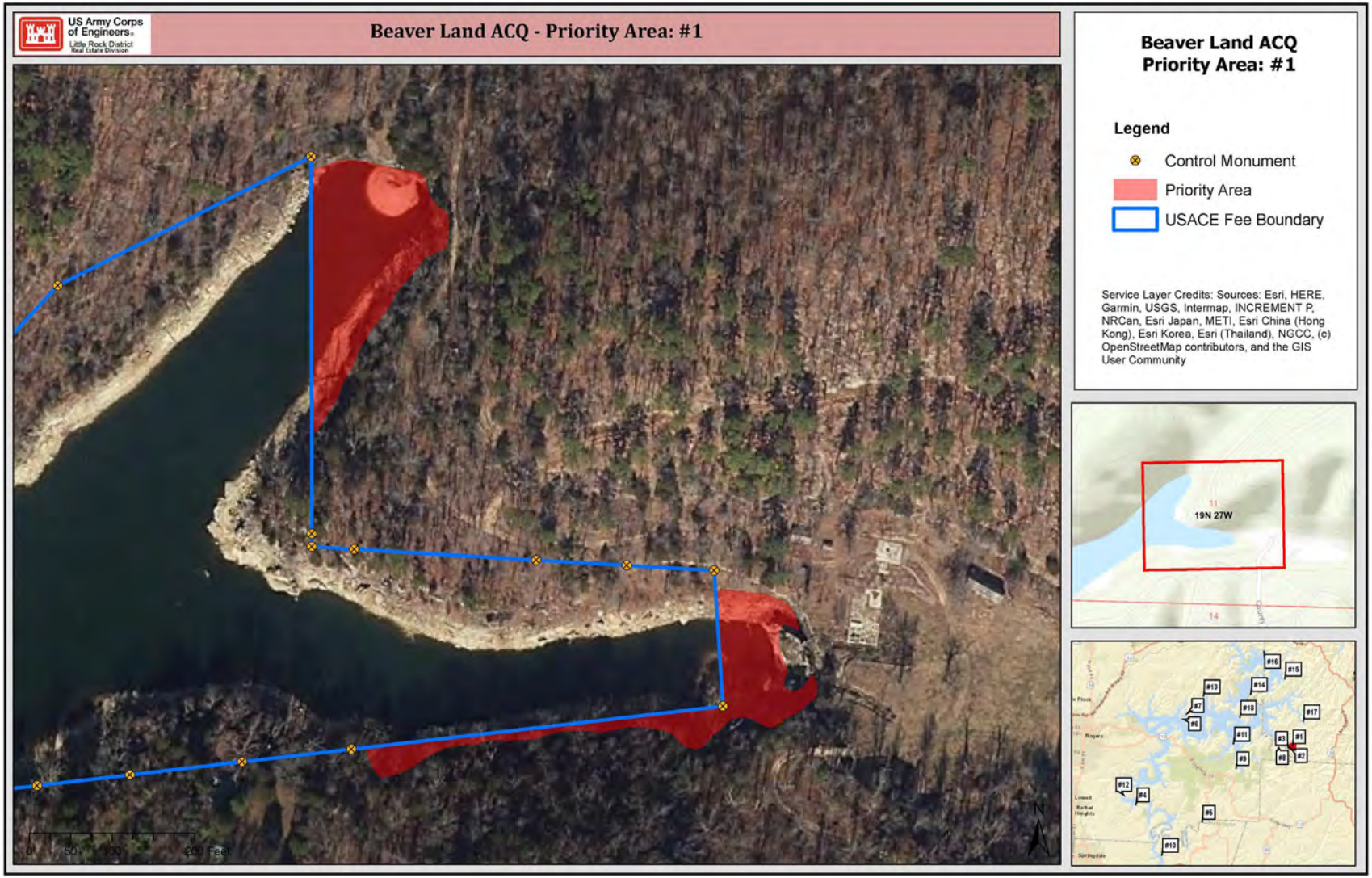


Figure 3: Interview Questions

Beaver Lake ECP
Interview Questions

1. Do you know of any environmental issues with this property?
2. Do you know of, or have access to, any reports concerning the environmental condition of this property? (i.e. site assessments, permits, storage tank registrations, safety plans, etc.) If so, would you be able to provide them? SWPPPs, SPCCs, air permits?
3. Do you know how this property has been historically used?
4. What is the property currently used for?
5. When were the site buildings constructed?
6. Are hazardous materials or petroleum products stored or used on this site? If so, what is the RCRA EPA ID? Does fueling occur on this property?
7. Do you know of any asbestos or LBP on the property or its buildings? Do you know the age of the buildings?
8. Has the site layout been manipulated in your recollection? (i.e. grading, excavation, etc.)?
9. Are there or have there been any cultural/historic items or buildings found on the property?
10. Is there anything else environmentally relevant that we should know?

Final

U.S. Army Environmental Condition of Property Report
Priority Area 1A

Beaver Lake
Beaver Lake, Arkansas

August 30, 2021

Prepared For:
Beaver Lake Land Acquisition

Prepared By:
U.S. Army Corps of Engineers
Regional Planning and Environmental Center
Fort Worth District
Fort Worth, Texas

[This page is intentionally left blank.]

Table of Contents

List of Appendices:
Appendix A: Visual Site Inspection Photographs, 12 July 2021.
Appendix B: Historical Aerial Photography.
Appendix C: Historical Topographic Maps.

List of Acronyms

ACM	Asbestos-containing material
AR	Army Regulation
AST	Aboveground storage tank
ASTM	American Society for Testing and Materials
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CFR	Code of Federal Regulations
DoD	Department of Defense
ECP	Environmental Condition of Property
EDR	Environmental Data Resources
EPA	Environmental Protection Agency
ERNS	Emergency Response Notification System
FAA	Federal Aviation Administration
HTRW	Hazardous, Toxic and Radioactive Waste
IRP	Installation Restoration Program
LBP	Lead-based Paint
LUST	Leaking underground storage tank
MEC	Munitions and Explosives of Concern
NEPA	National Environmental Policy Act
NFRAP	No Further Remedial Action Planned
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NRC	Nuclear Regulatory Commission
ODEQ	Oklahoma Department of Environmental Quality
OWS	Oil-water separator
PCB	Polychlorinated Biphenyl
POL	Petroleum, Oils, and Lubricants
RCRA	Resource Conservation and Recovery Act
SEMS	Superfund Enterprise Management System
SF	Square feet
SHWS	State Hazardous Waste Sites
SWPPP	Stormwater Pollution Prevention Plan
TSD	Transport, Storage, Disposal
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
UST	Underground storage tank
UXO	Unexploded Ordnance
VCP	Voluntary Cleanup Program
VSI	Visual site inspection

1.0 Executive Summary

This environmental condition of property (ECP) report has been prepared to document the environmental conditions and provide information for the acquisition of land that would be necessary for the operation, maintenance, and control of the Beaver Lake reservoir in Arkansas. This fee acquisition pertains to the frequently inundated land immediately surrounding the lake, below an elevation of 1128 ft above mean sea level (msl). The Army prepares an ECP in order to provide the public with information relative to the environmental condition of the property, assist Federal agencies during the property screening process, provide information about completed remedial and corrective actions at the property, and to assist in determining appropriate responsibilities, asset valuation, and liabilities with other parties to a transaction.

Beaver Lake currently occupies more than 38,000 acres of Federal public lands and waters. This ECP report covers a parcel that consists of two sections that total 3.84 acres of land located near the center on the western side of Beaver Lake. The subject property is on the edge of the lake and currently owned by private landowner(s). The lake is located in northwestern Arkansas, in Benton, Washington, Madison and Carroll Counties and it is approximately 6 miles west of Eureka Springs, Arkansas. The subject property, also known as Priority Area 1A, is immediately adjacent to the Slate Gap Wildlife Management Area.

This ECP report presents a summary of readily available information on the environmental conditions of, and concerns relative to, the land, facilities, and real property assets of Beaver Lake. The findings included in the report are based on a record search of historical environmental investigation reports and site historical documents, a review of aerial photography, stakeholder interviews, and a site inspection conducted 12 – 13 July 2021.

Based on the environmental conditions found and the ECP analysis, the property can be categorized as an ECP Category 1, indicating a site where no release, or disposal of hazardous substances or petroleum products or their derivatives has occurred (including no migration of these substances from adjacent properties).

2.0 Purpose

2.1 General

This environmental condition of property (ECP) report has been prepared to document the environmental conditions and provide information for the acquisition of land surrounding Beaver Lake in Benton, Washington, Madison and Carrol Counties, Arkansas. This report meets the requirements of Title 40, Code of Federal Regulations (CFR), Part 373, and United States Army Regulation (AR) 200-1 (2007), *Environmental Quality, Environmental Protection and Enhancement*. The ECP report also follows the American Society for Testing and Materials (ASTM) E1527-13 *Standard Practice for Environmental Site Assessments: Phase 1 Environmental Site Assessment Process*. The subject property in this report is subsequently categorized according to ASTM D5746 (2016) *Standard Classification of Environmental Condition of Property Area Types for Defense Base Closure and Realignment Facilities*.

The Army prepares an ECP for the following purposes:

- Provide the public with information relative to the environmental condition of the property.
- Assist Federal agencies during the property screening process.
- Provide information to prospective buyers.
- Provide information about completed remedial and corrective actions at the property.
- Assist in determining appropriate responsibilities, asset valuation, and liabilities with other parties to a transaction.

The ECP contains the information required to comply with the provisions of 40 CFR, Part 373 that require a notice to accompany contracts for the sale of, and deeds entered into for the transfer of, federal property on which hazardous substances may have been stored, released or disposed. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) §120(h) stipulates that a notice is required if certain quantities of designated hazardous substances have been stored on the property.

The ECP Report is not prepared to satisfy a real property purchaser's duty to conduct an "all-appropriate inquiry" to establish an "innocent purchaser defense" to CERCLA 107 liability. Any such use of the ECP Report by any party is outside the control of the Army and beyond the scope of the ECP Report. The Army, its officers, employees, or contractors makes no warranties or representations that any ECP Report satisfies any such requirements for any party.

2.2 Scope

Priority Area 1A occupies a total of 3.84 acres of land. This ECP report covers 3.84 acres of land located adjacent to the Slate Gap Wildlife Management Area on Beaver Lake. Priority Area 1A is comprised of two wooded shoreline narrow strips of land separated by about 120 yards. There is access via watercraft and although it wasn't explored terrestrial access via private property from Hinchingbrooke Ln. Areas within the lake that are not within the Priority Area will be considered adjacent property. A general site location map is provided in Figure 1, and a map showing the subject property is shown in Figure 2.

2.3 Limitations

This ECP report presents a summary of readily available information on the environmental conditions of, and concerns relative to, the land, facilities, and real property assets of the subject property. The findings included in the report are based on a record search of available historical environmental investigation reports and site historical documents, a review of aerial photography, stakeholder interviews, and a site reconnaissance conducted 12 – 13 July 2021. Historical environmental investigation reports and site historical documents were reviewed in support of this ECP, and the information obtained from other studies is reflected within this report by reference. The ECP process recognizes that the condition of property and classification can change as historical contamination is cleaned up (if required) or if a new

source of contamination is identified. Records reviewed during the assessment were accepted as accurate and a reasonable effort was made to resolve discrepancies identified during the document review.

During the ECP assessment, all available sources of information concerning both past and present environmentally significant uses of the property were reviewed. This included readily available data associated with adjacent property records; 1985, 1994, 2001, 2004, 2006, 2009, 2010, 2012, 2014, 2016, 2017, 2018, and 2020 aerial photography; personnel interviews; current and historic investigations; and topographical maps. In addition, record sources were reviewed to determine if there have been spills, leaks, discharges, leaching, underground injection, dumping, abandonment, or storage of hazardous substances or petroleum products at the subject property. The site reconnaissance and interview process included inquiries and requests into the existence and availability of records that support the environmental condition of the property. The site reconnaissance included a Visual Site Inspection (VSI) of the subject property. No sampling or analysis was conducted during this survey.

2.4 Report Organization

The remainder of this ECP report is organized as follows:

Section 3 – Property Description: This section provides location and description of the subject property; an overview of historical and current land uses; and a description of the environmental setting of the lake area, including climate, topography, geology, and demography.

Section 4 – Survey Methodology: This section describes the methods used to obtain the information for this ECP Report such as the development of study sections, the VSI, aerial photography analysis, records review, interviews, and data management.

Section 5 – Environmental Conditions: This section provides the existing environmental information. The findings are organized by relevant environmental "issues," including permits and licenses, cleanup activities, hazardous substances, petroleum and related products, asbestos, lead-based paint (LBP), radioactive materials, landfills, explosive contaminated structures, radon, pesticides, and polychlorinated biphenyls (PCBs). This section also includes adjacent property descriptions.

Section 6 – Evaluation and Conclusions: This section provides a summary of the subject property and evaluates the property for categorization as per ASTM D5746 (2016).

Section 7 – Certification: This section documents the approval of the ECP report.

Section 8 – References: This section provides an inventory of the reference material used in the preparation of this ECP Report.

Appendices: A list of appendices is provided in the Table of Contents.

3.0 Property Description

3.1 Parcel Locations and Description

Beaver Lake is located in the scenic Ozark Mountain region of northwestern Arkansas in Benton, Washington, Carroll and Madison counties. The total area currently contained in the Beaver project, including both land and water surface, consists of 38,138 acres owned in fee. Of this total, 1,432 acres are in flowage easement. The proposed Land Acquisition would include adding any land below the 1128 msl water level. The White River drainage area above Beaver Lake is approximately 1,186 square miles. When the lake is at the top of the conservation pool (elevation 1120.43 ft msl) the water area is 28,299 surface acres with 490 miles of shoreline within the lands owned in fee. The shoreline is irregular with topography primarily consisting of steep bluffs and gentle slopes.

Priority Area 1A is a narrow strip of land separated into two parcels totaling 3.84 acres along the lake shoreline near the narrowest part of the Slate Gap Wildlife Management Area. The area is undisturbed forest with no structures or visible vehicle or pedestrian pathways. The subject property is on the edge of the lake and currently owned by private landowner(s).

3.2 Historic Land Use

Beaver Lake is a multiple purpose water resource development project initially authorized for flood control, hydropower generation and other beneficial uses by the Flood Control Act dated 3 September 1954. The inclusion of storage in the lake for municipal and industrial water supply was authorized by the Water Supply Act of 1958. Beaver Lake is a major component of a comprehensive plan for water resource development in the White River Basin of Arkansas and Missouri. Construction of Beaver Dam was initiated in March 1960. The dam was completed in June 1966, and the powerhouse and switchyard were completed in 1965. Beaver Lake was declared operational for public use in 1965.

The historical aerial photography shows that Priority Area 1A has been used for private residences as far back as 1985 although no residence structures are present on or immediately adjacent to the priority area.

3.3 Current Land Use

Beaver Lake is located in the Ozark Highlands of Carroll, Washington, Benton, and Madison Counties. Having 490 miles of shoreline (at conservation pool) and over 28,000 water surface acres, Beaver Lake is the largest reservoir in northwest Arkansas and the first federal impoundment on the White River.

There are 12 public use areas around Beaver Lake. There are 11 parks on the lake presently operated by the Corps of Engineers. The State of Arkansas owns and operates Hobbs State Park Conservation Area, which covers 12,056 acres, and Devil's Eyebrow Natural Area, which covers 2,503 acres. Both properties are adjacent to United States Corps of Engineers (USACE) lands. There are two parks, Ventris, and Blue Springs that have been reduced to lake access only. One Park (Big Clifty) is operated by Carroll County, Arkansas.

Despite being located adjacent to the fast-growing communities of Fayetteville, Springdale, Bentonville, and Rogers, Arkansas and a regional population of over 500,000, the lake provides open spaces and a quality outdoor recreation opportunity. Many arms and coves of the lake offer secluded areas for traditional activities such as fishing, skiing, sailing and scuba diving, but also allow for passive recreation opportunities like photography and nature observation.

Priority Area 1A remains an undeveloped forested area currently owned by a private landowner.

3.4 Utilities

Priority Area 1A has no known utilities.

3.5 Environmental Setting

3.5.1 Climate

The climate in the Beaver Lake area is classified as humid subtropical according to the Köppen climate model. A humid subtropical climate is characterized by hot, usually humid summers and mild to cool winters. The Köppen definition of this climate is for the coldest month's mean temperature to be between 26.6 °F (−3 °C) and 64.4 °F (18 °C), and the warmest month to be above 71.6 °F (22 °C). Some climatologists prefer to use 32 °F (0 °C) as the lower bound for the coldest month's mean temperature. Under the modern Trewartha climate classification, climates are termed Humid Subtropical when they have mean temperatures of 50 °F (10 °C) for eight or more months a year. In most locations classed within this system, the mean temperature of the coldest month is between 35 °F (3 °C) and 65 °F (18 °C). Some climatologists consider the Trewartha grouping of subtropical climates to be more real-world and fitting on a global scale.

While technically classified as humid subtropical, the climate in the Beaver Lake area is considered moderate. The area experiences all four seasons and does receive cold air masses from the north; however, some of the Arctic masses are blocked by the higher elevations of the Ozarks.

Average temperatures range from a high of 88 °F (31.1 °C) and low of 27 °F (-2.7 °C) in nearby Rogers, Arkansas. Extreme temperatures rarely exceed 96 °F (35.6 °C) and 13°F (-10.6 °C). Late summer is the time of maximum heat and least rainfall. During the winter months, midday temperatures in the basin are relatively warm, around 55 o to 60 o F. Some short periods of cold weather occur with temperature ranging from 0 o to 10 o F. On winter nights, temperatures from 37 o F to below freezing are common. Highest recorded temperature in Rogers, Arkansas was 114 °F (45.6 °C) (recorded in July 1954). The lowest temperature recorded was −16 °F (−26.7 °C), in February 1996.

The relative humidity typically ranges from 41% (comfortable) to 91% (very humid) over the course of the year, rarely dropping below 24% (dry) and reaching as high as 100% (very humid). The air is driest around April 9, at which time the relative humidity drops below 49% (comfortable) three days out of four; it is most humid around June 3, exceeding 87% (very humid) three days out of four.

Dew point is often a better measure of how comfortable a person will find the weather than relative humidity because it more directly relates to whether perspiration will evaporate from the skin, thereby cooling the body. Lower dew points feel drier and higher dew points feel more humid. Over the course of a year, the dew point typically varies from 19°F (dry) to 71°F (muggy) and is rarely below 4°F (dry) or above 74°F (very muggy). There are two periods in the year that are most comfortable: The first is between April 18 and June 6 and the second is between September 3 and October 23. The air feels neither too dry nor too muggy during these periods (https://weatherspark.com/averages/31495/Rogers-Arkansas-United-States).

Average annual rainfall for the Beaver Lake area is 45 inches per year. Precipitation is weakly seasonal, with a bimodal pattern: wet seasons in the spring and fall, and relatively drier summers and winters, but some rain in all months. The spring wet season is more pronounced than fall, with the highest rainfall typically occurring in May. The average annual snowfall for the Beaver area is about 12 inches. Snowpacks are usually short lived and are not commonly a concern for flooding.

Climate change is an area of concern due to the potential for effects on many aspects of the environment, especially those related to water resources. The U.S. Global Change Research Program (USGCRP) summarized information regarding climate change and its potential effects in regional assessments (http://www.globalchange.gov/publications/reports/scientific-assessments/us-impacts). In the Midwest, which extends from Minnesota to Missouri, extreme events such as heat waves, droughts and heavy rainfall events are projected to occur more frequently. Should these events become significant enough to

impact the operation of Beaver Lake, the Master Plan and associated documents (i.e. Operations Management Plan and Shoreline Management Plan) would be reviewed and revised, if necessary.

3.5.2 Topography, Geology, and Soils

The depositional environment of the rocks found in the Arkansas Ozarks is one of a relatively shallow continental shelf, sloping toward deeper water generally toward the south. This shelf emerged many times during the Paleozoic resulting in numerous unconformities throughout the sequence. The Ozark Plateaus region of Arkansas is made up of generally flat-lying Paleozoic age strata divided into three plateau surfaces. The lowest and northern-most plateau is the Salem Plateau. The Springfield Plateau stands above the Salem a few hundred feet and is generally capped by lower Mississippian age limestones and cherts. The southernmost and highest plateau of the Ozarks is the Boston Mountains. All of these plateaus are deeply dissected by numerous streams throughout the area. The faulting in the Ozarks is generally normal; most faults displaying a displacement down on the southern side. However, some observations reveal that a few strike-slip faults may be present. Gentle folds are noted but are generally of very low amplitude. The depositional environment of the rocks found in the Arkansas Ozarks is one of a relatively shallow continental shelf, sloping toward deeper water generally toward the south.

Beaver Lake is part of the Springfield Plateau that occupies primarily the western and southwestern flanks of the Ozark Plateau province. The Springfield Plateau in this region rises to an elevation of approximately 1400 feet and in many areas, forms extensive plains. Hilly areas occur where rivers and their tributaries cut into the plateau surface, most notably in the vicinity of the White River and Beaver Lake. As streams like the Buffalo National River cut through the plateau down to the level of the White River, they sometimes carve spectacular bluffs.

Lower Ordovician, Middle to Upper Devonian and Lower and Upper Mississippian age strata are present around Beaver Lake. Upper Ordovician and Devonian strata crop out around Beaver Lake and its tributaries. The Lower Mississippian Boone Formation comprises the surface rock over the majority of the area and forms the surface of the heavily dissected Springfield Plateau. In addition to the Boone Formation, Cotter and Jefferson City formations (Jefferson City formation has not been successfully differentiated from the Cotter Formation in Arkansas), and the Powel formation, all of Ordovician age are present in the area. Formations in the Devonian strata include the Chattanooga, Clifty and Penters.

The Boone Formation consists of gray, fine- to coarse-grained fossiliferous limestone interbedded with chert. This formation caps the higher hills in the area. Since limestone is easily dissolved by water, cave and solution (karst) features are prominent. The Boone Formation is well known for dissolutional features, such as sinkholes, caves, and enlarged fissures. Surface water may drain directly into channels in limestone, where it can move rapidly and without filtration to the surface as a spring, at a location that is unpredictable without extensive testing. Therefore, water pollution problems are of particular concern in this region. The thickness of the Boone Formation is 300 to 350 feet in most of northern Arkansas, but as much as 390 feet has been reported.

The Cotter Dolomite is composed of dolostone of predominantly two types: a fine-grained, argillaceous, earthy textured, relatively soft, white to buff or gray dolostone called "cotton rock", and a more massive, medium-grained, gray dolostone that weathers to a somewhat hackly surface texture and becomes dark on exposure. The formation contains chert, some minor beds of greenish shale, and occasional thin interbedded sandstone. The thickness is about 340 feet in the vicinity of Cotter, but the interval may range up to 500 feet thick in places.

The Powell Dolomite is generally a fine-grained, light-gray to greenish-gray, limy, argillaceous dolostone with thin beds of shale, sandstone, sandy dolostone, and occasionally chert. The formation's thickness may be as much as 215 feet but is often much thinner.

The Chattanooga Shale Formation is typically black, fissile clay shale that weathers into thin flakes. The beds are usually cut by prominent joints creating polygonal blocks upon weathering. The upper part of the formation may be slightly sandy and usually contains abundant pyrite. Thickness ranges from 0 to about 85 feet; normally averaging about 30 feet (AGS).

The strata throughout the region are nearly horizontal. One predominant geological feature of the lake area is a low, persistent, limestone bluff, which occurs just above the Ordovician- Mississippian contact.

The faulting in the Ozarks is generally normal; most faults displaying a displacement down on the southern side. Lineaments and faults characteristic of northwest Arkansas are present around Beaver Lake. The Fayetteville Fault lies beneath Beaver Lake. This fault is the west side of a graben that has down-dropped the Boone Formation to lake level. The Starkey Fault bounds the east side of the graben. Both faults trend approximately N 450E. One section of the Starkey fault trends N 60-700E. The Clantonville Lineament – Monocline is a northeast to southwest trending structural feature that extends from north of Clantonville to Ventris Hollow. The location of this feature was determined from the 1:24,000 three dimensional quadrangle and from structural disparities in the Lower Mississippian rock units. This structural feature could be responsible for the presence of lead-zinc mineralization in an old prospect near Clantonville (north of Beaver Lake). The trend of this lineament to monocline is N 30-400E. Paleokarst features within the top of the Powell Dolomite are present around Beaver Lake and coincident with a lineament in Limekiln Hollow near Garfield, northwest of Beaver Lake.

In general, the soils of the Ozark Plateaus are residual and are formed on a broad, domed, upwarp consisting mostly of limestone and dolomite. The main difference in the soils is due to different rocks from which the soils were formed. The main geologic materials are cherty limestone; cherty, very siliceous dolomite; cherty, siliceous dolomite; and alluvium, which are weathered and water transported products of the first three materials. Glade-rock soil occurs where the cherty, very siliceous dolomite is exposed to the soil formation. Dolomite is more resistant to weathering than limestone and siliceous dolomite is even more resistant, so very shallow soil results. In areas where the dolomite is less siliceous, more weathering has taken place; however, the soils produced are not as deep as soils formed by limestone.

The following eight soils associations are found in and around the Beaver project area: Captina-Nixa, Captina-Nixa-Pickwick, Clarksville-Nixa-Baxter, Corydon-Sogn, Enders-Allegheny-Mountainburg, Razort-Captina-Etowah, Linker-Apison-Hector, and Captina-Pembroke.

3.5.3 Hydrology and Groundwater

In the Interior Highlands of western and northern Arkansas ground-water supplies are more limited than in the Coastal Plain. Much of the Ozark Plateaus region is underlain by carbonate rocks, which are quite soluble in the presence of water. Solution by ground water has caused many large openings through which water passes so quickly that contaminants from the surface cannot be filtered out. Signs of these openings are caves, sink holes, springs and lost stream segments. As a consequence, the water in shallow wells may not be suitable for human consumption without treatment.

Three aquifers, which are part of the Ozark Plateaus Aquifer System, are located within northern Arkansas. The Springfield Plateau aquifer is generally under unconfined conditions, with groundwater movement occurring through fractures and solution cavities formed by dissolution of carbonate rock. Local discharge is through springs and streams. The Ozark aquifer is generally under confined conditions, especially where overlain by the units of the Ozark Confining Unit (Chattanooga Shale). Most wells in the Springfield Plateau and upper units in the Ozark aquifer yield 5-10 gpm on the average, with yields greater than 25 gpm in rare cases.

The third aquifer, the Roubidoux Formation and the Gunter Sandstone Member of the Gasconade Formation in northern Arkansas occur at greater depth and constitute the only significant aquifer system in the Ozarks. Both are permeable sandstone and carbonate units of Ordovician age. These aquifers serve as the principal source of high-quality water for many communities in northern Arkansas where surface water sources are unavailable. Together these units may yield up to 500 gpm to wells. These formations do not outcrop anywhere in Arkansas but instead outcrop in southern Missouri.

3.5.4 Water Quality

The waters of the Arkansas portion of the White River watershed have all been designated by the Arkansas Department of Environmental Quality (ADEQ) for fisheries, primary and secondary contact recreation, and domestic, agricultural, and industrial water supplies (ADEQ, 2012). Beaver Lake is classified by ADEQ as a Type A water body, which includes most larger lakes of several thousand acres in size, in upland forest dominated watersheds, having an average depth of 30 to 60 feet, and having low primary production (i.e., having a low trophic status if in natural [unpolluted] condition). Beaver Lake, like all other lakes of its size in the Ozark region, stratifies chemically and thermally in the late spring with stratification extending into late fall and early winter. During the warmer months, lake waters of the upper layer (the epilimnion) are warmer and contain more dissolved oxygen, while the denser, lower layer waters (the hypolimnion) are colder and contain very little or no dissolved oxygen, thus undesirable for fish habitat.

This undesirable water, when discharged downstream from hydropower generation, may cause some problems in the tailwaters. To combat this problem, the dissolved oxygen content is monitored, and various management measures are implemented to improve the dissolved oxygen concentration in the hydropower releases. A highly productive trout fishery has been established in the Beaver tailwaters by the Arkansas Game and Fish Commission because of the available discharge of cold water from the dam, which is reaerated by turbulence as it flows downstream.

As the stratified epilimnion cools in the late fall and winter, the layers begin to mix (de-stratify) and dissolved oxygen (DO) is more evenly distributed. This condition is more favorable to the fishery of the lake and overall water quality.

The upper 1500 acres of Beaver Lake has been listed by the Arkansas Department of Environmental Quality (ADEQ) on Arkansas' 303(d) list of impaired waters, approved by the Environmental Protection Agency (EPA), due to turbidity (ADEQ, 2008). According to the Arkansas 303(d) list, these excessive levels impact the local fisheries as well as primary contact, both designated uses of Beaver Lake. The elevated turbidity levels are due to excessive silt from surface erosion from agriculture activities, unpaved road surfaces, in-stream erosion – mainly from unstable stream banks, and any other land surface disturbing activity. The Draft 2010 Integrated Water Quality and Monitoring Report (ADEQ, 2010) added pathogen indicator bacteria as a contaminant for the same area of Beaver Lake. Surface erosion activities are listed as the probable source for this contaminant as well.

Clean Water Act requires states to list waters that do not meet Federal water quality standards or have a significant potential not to meet standards as a result of point source dischargers or non-point source run-off. Subsequent to listing on the 303(d) list, the statute requires that the states develop and set the Total Maximum Daily Load (TMDL) for water bodies on the list within 13 years. A TMDL establishes the maximum amount of a pollutant that can enter a specific water body without violating the water quality standards. Values are normally calculated amounts based on dilution and the assimilative capacity of the water body. TMDLs have not been established by ADEQ for the upper Beaver Lake area.

3.6 Biological and Cultural Resources

3.6.1 Terrestrial Ecosystems

The area surrounding Beaver Lake is mostly forested. Trees and shrubs around the lakeshore include upland oak and hickory species, persimmon, honey locust, hawthorn, dogwood, redbud, coralberry, smooth and winged sumac, and buttonbush. Frequent periods of inundation keep a thin strip of government owned lands around the lake in early stages of succession. Red cedar and short-leafed pine, the principal evergreens, are dispersed throughout the region and are found in many large, scattered groups. Ground covers consist of greenbrier, sedges, and native grasses. White-tailed deer and eastern wild turkey are common game animals found and hunted in the Beaver Lake area. Black bears have also become common in the area and are hunted on the lands around the lake. The principal small game species found in the open upland areas include bobwhite quail, cottontail rabbit, and mourning dove. Gray and fox squirrels are common in upland wooded areas. Furbearing animals found in the Beaver Lake area include coyote, red fox, gray fox, otter, mink, muskrat, beaver, bobcat, and raccoon. Habitat management that includes wildlife food plot plantings, mowing, soil disturbance, removal of exotic species and application of prescribed fire provide benefit to these populations.

The common goldeneye, hooded merganser, bufflehead, and ring-necked duck are the predominant migratory waterfowl species visiting Beaver Lake. Mallards, gadwall, and other duck species are also present; however, they are only transient visitors as their characteristic feeding habits of obtaining food from shallow waters is limited. Resident Canada geese are so numerous in many coves and recreation areas that their presence has become a nuisance.

Ring-billed gulls are seen frequently around the Beaver Lake area. Greater and lesser yellow legs, pelicans, and large flocks of horned grebes are also seen during their peak migration in the spring and fall. Beaver Lake is also one of the few places where visitors can see both the turkey vulture and the black vulture at the same time in the winter. Beaver Lake has also become a popular place that visitors come to observe bald eagles, commonly wintering 150 or more birds and hosting 5-6 breeding pairs during the nesting period of March to June. The surrounding woodlands and grasslands serve as prime nesting areas for resident and neotropical migratory songbirds.

3.6.2 Aquatic Ecosystems and Wetlands

Walleye, smallmouth bass, striped bass, hybrid white-striped bass, walleye, and paddlefish have been introduced into Beaver Lake to add diversity to the fishery. Natural reproduction of striped bass and hybrid white-striped bass does not occur in Beaver Lake. Since 2004, AGFC stocks approximately 100,000 walleye, 30,000 channel catfish, 30,000 blue catfish, and 200,000 striped bass each year. While natural reproduction occurs in white crappie, black crappie, largemouth bass, and smallmouth bass, AGFC supplements this reproduction by occasional stockings of these species. Historically, there have also been introductions of northern pike, blue catfish, lake trout, and threadfin shad.

Located within the Springfield Plateau of the Ozark Mountains region of northern Arkansas, the area surrounding Beaver Lake is characterized by limestone, dolomite, or chert geology. The many rivers and streams flowing through the region have created a landscape of level highlands dissected by rugged valleys rich in karst features such as caves and sinkholes. Associated with these streams and landscape features are a variety of wetland habitats representative of the five wetland classes occurring within the region. These wetland classes include depressions, flats, fringe, riverine, and slope. It is possible, and perhaps even likely, that all of these classes of wetlands occur in the general area of Beaver Lake. However, those most likely to occur in the area immediately surrounding the lake are fringe (most likely reservoir), riverine (most likely spring runs) and slope wetlands (most likely calcareous slope).

3.6.3 Threatened and Endangered Species

The following species listed in Table 1 are from the U.S. Fish and Wildlife Service's federally classified status list of species and the Arkansas Natural Heritage data sets which have been reported and identified on project lands. Although the bald eagle was delisted by USFWS in 2007 due to recovery of the species, both the bald and golden eagles are still protected in accordance with the Bald and Golden Eagle Protection Act. The federal Migratory Bird Treaty Act of 1918 also provides protection to certain species of migratory birds. A total of 31 bird species are currently protected under this federal statute.

Table 1: Threatened and Endangered Species

Common Name	Federal Status	State Status/Global Rank
Gray Bat	LE	SE / S2S3/G4
Indiana Bat	LE	SE / /S1/G2
Northern long-eared Bat	LT	SE / S1S2/ G1G2
Ozark Big-eared Bat	LT	Not listed
Little Brown Bat	-	SE / S1
Bald Eagle	*Protected under Bald and Golden Eagle Protection Act	S3B,S4N/G5
Eastern Black Rail	LT	Not listed
Piping Plover	LT	Not listed
Rufa Red Knot	LT	Not listed
Whooping Crane	Experimental Population, Non-Essential	Not listed
Ozark Cavefish	LT	SE / S1/G3
Neosho Mucket	LE	Not Listed
Rabbitsfoot mussel	LT	SE/S3/G3G4
Snuffbox Mussel	LE	Not listed
Monarch Butterfly	C	Not listed
Missouri Bladderpod	LT	S2/G3
Opaque Prairie Sedge	-	SE / S2S3G4
Yellow Coneflower	-	ST / S2G3T3
Ovate-leaf Catchfly	-	ST / S2G3
Royal Catchfly	-	ST / S2G3

FEDERAL STATUS CODES

LE = Listed Endangered; the U.S. Fish and Wildlife Service has listed this species as endangered under the Endangered Species Act.

LT = Listed Threatened; the U.S. Fish and Wildlife Service has listed this species as threatened under the Endangered Species Act.

C = Candidate Species;

STATE STATUS CODES

INV = Inventory Element; The Arkansas Natural Heritage Commission is currently conducting active inventory work on these elements. Available data suggests these elements are of conservation concern. These elements may include outstanding examples of Natural Communities, colonial bird nesting sites, outstanding scenic and geologic features as well as plants and animals, which, according to current information, may be rare, peripheral, or of an undetermined status in the state. The ANHC is gathering detailed location information on these elements.

GLOBAL RANKS

G3 = Vulnerable globally. At moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors.

G4 = Apparently secure globally. Uncommon but not rare; some cause for long-term concern due to declines or other factors.

G5 = Secure globally. Common, widespread and abundant.

T-RANKS= T subranks are given to global ranks when a subspecies, variety, or race is considered at the state level. The subrank is made up of a "T" plus a number or letter (1, 2, 3, 4, 5, H, U, X) with the same ranking rules as a full species.

STATE RANKS

S1 = Critically imperiled in the state due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors making it vulnerable to extirpation.

S2 = Imperiled in the state due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it vulnerable to extirpation.

S3 = Vulnerable in the state due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.

GENERAL RANKING NOTES

Q = A "Q" in the global rank indicates the element's taxonomic classification as a species is a matter of conjecture among scientists.

Source: Arkansas Natural Heritage Commission

3.6.4 Cultural Resources

The records search, interviews, and site inspection identified no cultural resource assessments or findings for the subject property.

During the past seventy years scientific investigation of archaeological sites in the Beaver Lake area has been carried out in several phases. In 1922 and 1923, Mark R. Harrington of Phillip Academy was the first archeologist to excavate sites on the area that is now Beaver Lake. He excavated 13 bluff shelters. Between 1928 and 1935, the work of Harrington was continued by S.C. Dellinger of the University of Arkansas Museum. Dellinger supervised the excavation of 21 rock shelters. In the early 1960's, a series of surveys were conducted by several archeologists from the University of Arkansas Museum. Today, there are 280 known archeological sites along or immediately adjacent to Beaver Lake. Of these, 271 are identified as prehistoric, seven are historic and two sites have no known cultural affiliation.

Table 2: Historical and Cultural Resources at Beaver Lake

Type of Site	Number of sites
Historic	7
Prehistoric	271
No known cultural affiliation	2
Total	280
National Register Eligibility Status	
Not Evaluated	132
Not Eligible	5
Eligible	1

4.0 Survey Methodology

4.1 Development of Study Sections

The information gathered during the development of the ECP was used to group the subject property into standardized categories using Department of Defense (DoD) guidance, and in accordance with ASTM D5746 (2016). The ECP category definitions are summarized below in Table 3.

Table 3: Definitions of ECP Categories

ECP Category	Definition
1	An area or parcel of real property where no release, or disposal of hazardous substances or petroleum products or their derivatives has occurred (including no migration of these substances from adjacent properties).
2	An area or parcel of real property where only the release or disposal of petroleum products or their derivatives has occurred.
3	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but at concentrations that do not require a removal or remedial action.
4	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, and all remedial actions necessary to protect human health and the environment have been taken.
5	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred and removal or remedial actions, or both, are under way, but all required actions have not yet been taken.

6	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but required response actions have not yet been initiated.
7	An area or parcel of real property that is unevaluated or requires additional evaluation.

The final ECP category designations for the subject property are shown in Section 6.2, Table 5.

4.2 Visual Site Inspection

A VSI was conducted on 12 July 2021 at the subject property to check for recognized environmental conditions. The VSI was conducted by Mrs. Hollie Eljizi, Ms. Jennifer Jeffcoat and Mr. Robert Singleton from USACE. The USACE representatives were accompanied by Mr. Mathew Voskamp of the USACE Beaver Lake office.

The VSI was performed from a USACE Beaver Lake Office watercraft near the bank of the subject property as a Right of Entry (ROE) was not available at the time of the inspection. At the time of inspection, the lake water level was 1127 feet above sea level, conservation pool is 1121 feet above sea level. Some parts of the had a significant bank soil erosion and other parts were rocky with fallen tree woody debris. At the time of inspection, minor debris could be seen from the boat including a piece of encapsulated foam and a beach ball. No apparent signs of Hazardous, Toxic and Radioactive Waste (HTRW) were visible during the VSI.

Photos from the VSI can be found in Appendix A.

4.3 Aerial Photography Analysis

Aerial photographs were available from Google Earth maps for 1985, 1994, 2001, 2004, 2006, 2009, 2010, 2012, 2014, 2016, 2017, 2018, and 2020.

The initial aerial photograph from 1985 is of poor quality and the area isn't discernable. The next photo from 1994 shows a treed and undisturbed area with a dirt road that leads down to the southern portion of the priority area. There is no change in the next photos from 2001 to 2020. The dirt road can still be seen and there are no structures on or adjacent to the priority area. The dirt road pathway was created sometime prior to 1994 as access to a planned recreational park that has never been developed in the Slate Gap Wildlife Management Area.

All aerial photographs are included in Appendix B.

4.4 Sanborn Map Review

Sanborn maps were not available for the subject property, or for the adjacent areas.

4.5 Topographic Map Review

Historical topographic maps were available from the US Geological Survey Website for the Beaver Lake area for 1900, 1901, 1945, 1949, 1954, 1957, 1958, 1964, 1985, 2011, 2014, 2017, and 2020. Several observations can be gleaned from these maps. First, the area before the lake was formed consisted of valleys with steep bluffs and hill sides around the White River and its tributaries. The historical maps show this valley and river basin from the 1900 to 1964 topographic maps. In 1985 the river and Beaver Dam at the northern end of the lake can been seen in the valley of the historical White River.

All topographic maps are included in Appendix C.

4.6 Records Review

4.6.1 Standard Environmental Record Sources

In this evaluation records, maps and other documents that provide environmental information about the project area are obtained and reviewed. A desktop records review was conducted using various sources to determine the presence of HTRW sites on or near the subject property. This search was focused on active cleanup sites and sites with a reasonable risk of HTRW release. Several databases were searched manually to narrow down the search area. These databases included the Environmental Protection Agency (EPA) Cleanups in my Community database, the EPA Envirofacts databases, the Arkansas Department of Environmental Quality's (ADEQ) web search tool of Underground Storage Tanks (UST) and Above Ground Storage Tanks (AST), and the Arkansas Department of Energy and Environment Oil and Gas Commission oil and gas well maps. The information collected from this desktop records review was analyzed for recognized environmental conditions (RECs) that would affect the proposed project or need further investigation, given the proposed project measures. The following resources were searched.

Federal National Priorities List (NPL) – The records search did not reveal any NPL sites in the project footprint or adjacent areas. There are nine NPL sites in the state of Arkansas, none of which are located near Beaver Lake or the priority areas. This is based on a search of the EPA Superfund: National Priorities List (NPL) list.

Federal Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) List – The CERCLIS, now called the Superfund Enterprise Management System (SEMS) database, tracks hazardous waste sites where remedial action has occurred under EPA's CERCLA program. This list also includes sites that are in the screening and assessment phase for possible inclusion on the NPL. The records search of EPA's listed SEMS sites did not reveal any sites in the project footprints or adjacent areas. This is based on a search of the EPA SEMS database.

Federal No Further Remedial Action Planned (NFRAP) – The Federal NFRAP list (now known as the SEMS archive list) tracks sites where no further remedial action is planned, based on available assessments and information. The list also represents sites that were not chosen for the NPL. Further EPA assessment could possibly be ongoing, and hazardous environmental conditions may still exist; however, in the absence of remedial action and assessment data, no determination about environmental hazards can be made. The records search did not reveal any NFRAP sites in the project footprint or adjacent areas. This is based on a search of the EPA SEMS database.

Federal Resource Conservation and Recovery Act (RCRA) Corrective Action List – The records search of EPAs Cleanups in My Community showed two RCRA Corrective Actions within one mile of the project search area. No RCRA corrective actions were found to be located within one mile of the project footprint. This is based on a search of the EPA Cleanups in My Community.

State Superfund Sites - This search is to check for any state CERCLA sites in the project vicinity. The records search of state CERCLA cleanup sites did not show any sites of concern in the project or adjacent areas. This search is based on a search of the Arkansas Department of Energy and Environment data base.

State and Tribal Solid Waste Facilities/Landfill Sites – This search is designed to check any state or tribal databases for solid waste handling facilities or landfills in the project vicinity. The records search did not find any solid waste facilities or landfill sites in area of this project or adjacent areas. This is based on a

search of the EPA Landfill Methane Outreach Program (LMOP) and ADEQ Permitted Solid Waste Disposal database.

State and Tribal Registered Storage Tanks – This list is a combination of the State of Arkansas registered UST and AST databases, representing sites with storage tanks registered with the State of Arkansas. The search revealed one AST within one mile of the work area or adjacent areas. This AST is not expected to impact the project due to its distance from the proposed project. These results are based on a search of the Arkansas Department of Energy and Environment Oil and Gas Commission website.

State and Tribal Voluntary Cleanup Sites – The ADEQ Elective Site Cleanup Agreement (ESCA) database identifies sites where the responsible party chooses to clean up the site themselves with ADEQ oversight. Five sites were identified from this database. None of the sites are within one mile of the work area and are therefore not expected to impact the proposed project. These results are based on a search of the ADEQ ESCA Database.

Brownfields List – A brownfield is a property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. There are no brownfield sites within one mile of the work area or adjacent areas. These results are based on a search for Brownfields sites using the EPA Envirofacts search engine.

Oil and Gas Wells – A search of the oil and gas wells in the area using the Arkansas Department of Energy and Environment Oil and Gas Commission website identifies multiple sites including oil wells, plugged oil wells, injection/disposal sites within the surrounding area. Although not classified as HTRW under USACE regulations, pipelines and oil wells play an important role in the HTRW existing conditions near the potential project area. This is because the well and/or pipeline contents could potentially leak or spill into the surrounding environment or affect the proposed project features. As a result of these findings, a thorough pipeline/well search should be initiated during design to ensure no interaction with the existing oil and gas infrastructure occurs. The Oil and Gas Commission website was used to map these findings. No oil wells or pipelines were found near the priority areas.

4.7 Interviews

Two interviews were conducted on 12 and 13 July 2021 in conjunction with the site inspection, and the following stakeholders were interviewed:

- Mr. Matthew Franklin; Natural Resource Specialist, Beaver Lake Office; Matthew.G.Franklin@usace.army.mil
- Mr. Matthew Voskamp; Natural Resource Specialist, Beaver Lake Office; Matthew.Voskamp@usace.army.mil

Information gleaned from the interviews is incorporated by way of reference throughout the report. The interview questions can be found in Figure 3.

5.0 Environmental Conditions

5.1 Environmental Permits and Licenses

5.1.1 RCRA Status

The subject property is not covered under a Resource Conservation and Recovery Act (RCRA) permit, and no hazardous waste is generated or stored on the property.

5.1.2 Solid Waste

The subject property has no active, inactive, or expired permits or licenses for solid waste disposal. No landfills exist on the property.

5.1.3 USTs/ASTs

No USTs or ASTs were found during the records search, site inspection and interviews indicated no UST/AST have been known to be located at the subject property.

5.1.4 National Pollutant Discharge Elimination System (NPDES)

Section 402 of the Clean Water Act (33 U.S.C. 1251 et. seq.) requires all facilities that discharge stormwater to acquire an NPDES that defines contaminant limits in effluent to be discharged. No permits were found using the EPA's Envirofacts database on or adjacent to the priority area.

5.1.5 Drinking Water Permits

No drinking water permits are in place at the subject property.

5.1.6 Air Permits

No air emission or air quality permits are in place at the subject property.

5.1.7 Nuclear Regulatory Commission (NRC)

The NRC is tasked with permitting the use and handling of radioactive materials and reactors. No NRC licenses are in place at the subject property.

5.1.8 Other Permits/ Licenses

No additional environmental permits or licenses were identified during records research, interviews, or the VSI.

5.2 Environmental Cleanup and Remediation

5.2.1 Installation Restoration Program

Beaver Lake is not an active military facility, and therefore would not be eligible for cleanup under the Installation Restoration Program.

5.2.2 Military Munitions Response Program

Beaver Lake is not an active military facility, and therefore would not be eligible for cleanup under the Military Munitions Restoration Program.

5.2.3 Other Environmental Investigations and Cleanups

No known environmental investigations or cleanups were found during the records search, site inspection and interviews indicated that no known investigations or cleanups are ongoing at Beaver Lake.

5.2.4 Storage, Release, and Disposal of Hazardous Substances

No releases to the environment or improper disposal of these substances were found during the records search, site inspection and interviews indicated no known improper disposal at the priority area.

5.3 Petroleum and Petroleum Products

No releases to the environment or improper disposal of petroleum products were found during the records search, site inspection and interviews indicated no known improper disposal at the priority area.

5.4 Polychlorinated Biphenyls (PCBs)

No evidence exists of the presence of PCBs on the subject property. No PCB-containing oils were found during the records search, site inspection and interviews indicated no known PCB-containing oils have been used or stored at the priority area.

5.5 Asbestos

No asbestos assessments were found during the ECP process, none were found during the records search, site inspection and interviews indicated no known asbestos containing material has been used or stored at the priority area.

5.6 Lead and Lead-Based Paint (LBP)

No lead-based paint (LBP) assessments were found during the ECP process. No LBP was found during the records search, site inspection and interviews indicated no known improper disposal at the priority area.

5.7 Radioactive Material

No radioactive material assessments were found during the ECP process. No potentially radioactive materials were identified during the VSI, and the presence of radioactive materials on the subject property is extremely unlikely.

5.8 Landfills/Dumps

No landfills or dumps were found during the records search, site inspection or interview investigation.

5.9 Munitions and Explosives of Concern (MEC) and/or Unexploded Ordnance (UXO)

No munitions, explosives, or unexploded ordinance (UXO) were found during the records search, site inspection or interview investigation.

5.10 Radon

Beaver Lake spans across Benton, Washington and Carroll Counties. Washington County is in the Environmental Protection Agency (EPA) Radon Zone 3. Counties in Radon Zone 3 are counties with predicted average indoor radon screening levels of less than 2 pCi/L (EPA, 2018). Benton and Carroll Counties are in the EPA Radon Zone 2 with a predicted average indoor radon level between 2 and 4 pCi/L (EPA, 2018). No radon assessments were found during the records search (EPA, 2019).

5.11 Pesticides

No records were found to indicate the storage, improper use, or disposal of pesticides on the subject property.

5.12 Other Identified Concerns

No significant other concerns were found during the records search, site inspection or interviews.

5.13 National Environmental Policy Act (NEPA)

As the federal agency in charge of this project, USACE is in charge of coordinating National Environmental Policy Act (NEPA) compliance of 1969 (Public Law 91-190), the Council on Environmental Quality (CEQ) regulations (40 CFR 1500–1508), and the USACE implementing regulations, Policy and Procedures for Implementing NEPA, ER 200-2-2. As part of the records search and interview process recent NEPA documents were reviewed including the 2018 Draft Environmental Assessment for the Beaver Lake Master Plan Revision.

5.14 Adjacent Properties

As part of the ECP process, adjacent properties are assessed for environmental conditions, and those discovered conditions are evaluated based on the potential to affect the subject property. The nearest structure to the priority area is a residence approximately 0.2 miles east. The residence sits on a small peninsula with a small cove separating it from the subject property peninsula. The residence is first seen in the 2012 historical aerial photographs. The adjacent properties are unlikely to pose any HTRW concerns to the priority area.

6.0 Evaluation and Conclusions

6.1 Summary of ECP

Beaver Lake currently occupies more than 38,000 acres of Federal public lands and waters. This ECP report covers a parcel that consists of two sections that total 3.84 acres of land located near the center on the western side of Beaver Lake. The subject property is on the edge of the lake and currently owned by private landowner(s). The lake is located in northwestern Arkansas, in Benton, Washington, Madison and Carroll Counties, and it is approximately 6 miles west of Eureka Springs, Arkansas. The subject property, also known as Priority Area 1A, is immediately adjacent to the Slate Gap Wildlife Management Area.

This ECP report was prepared to characterize the existing environmental conditions at the subject property and is intended to be an aid in the leasing of real property. The ECP findings are based on the available sources of information concerning both past and present uses of the subject property. Information included readily available data associated with adjacent property records, aerial photography, personnel interviews, environmental programs and associated documentation, and current and historic investigations. In addition, record sources were reviewed to determine if there have been spills, leaks, discharges, leaching, underground injections, dumping, abandonments, or storage of hazardous substances or petroleum products at the installation. The VSI and interview process included inquiries and requests into the existence and availability of records that support the environmental condition of the property.

6.2 Conclusions

The subject property was classified into one of seven standard ECP area types (categories) as defined by ASTM D5746-98(2016) *Standard Classification of Environmental Condition of Property Area Types for Defense Base Closure and Realignment Facilities*. Below are the seven categories for reference.

Table 4: Definitions of ECP Categories

ECP Category	Definition
1	An area or parcel of real property where no release, or disposal of hazardous substances or petroleum products or their derivatives has occurred (including no migration of these substances from adjacent properties).

2	An area or parcel of real property where only the release or disposal of petroleum products or their derivatives has occurred.
3	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but at concentrations that do not require a removal or remedial action.
4	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, and all remedial actions necessary to protect human health and the environment have been taken.
5	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred and removal or remedial actions, or both, are under way, but all required actions have not yet been taken.
6	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but required response actions have not yet been initiated.
7	An area or parcel of real property that is unevaluated or requires additional evaluation.

Given these seven categories, the subject property is categorized below, along with the reasoning for each classification.

Table 5: Properties and ECP Categories

Acreage	ECP Category	Reasoning
1.22 ac.	1	No release or disposal of hazardous substances or petroleum products or their derivatives has occurred beyond de minimus amounts, including no migration of these substances from adjacent properties.

No release or disposal of hazardous substances or petroleum products or their derivatives has occurred beyond de minimus amounts on the subject property and no releases to the environment were observed or reported.

Asbestos assessments were not available for the subject property. It is unlikely that Asbestos Containing Material (ACM) is present but, in the future, if a building or structure will be disturbed, a licensed asbestos inspector is needed to confirm whether ACM is present or not.

7.0 Certification

I declare that, to the best of our professional knowledge and belief, we meet the definition of *Environmental professional* as defined in Part 312.10 of 40 CFR 312. We have the specific qualifications based on education, training, and experience to assess a property of the nature, history and setting of the subject property. We have developed and performed the appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312. All information/documentation provided accurately reflects the condition of the property. This report meets the DoD requirements for completion of an ECP Report.

_____ _____

Eugenia Barnes — Date
Environmental Protection Specialist
U.S. Army Corps of Engineers
Fort Worth District

_____ _____

Hollie Eljizi — Date
Environmental Engineer
U.S. Army Corps of Engineers
Fort Worth District

_____ _____

Jennifer Jefcoat — Date
Chemist
U.S. Army Corps of Engineers
Fort Worth District

8.0 References

American Society for Testing and Materials (ASTM), 2013. E1527-13, *Standard Practice for Environmental Site Assessments: Phase 1 Environmental Site Assessment Process*.

ASTM, 2016. D5746, *Standard Classification of Environmental Condition of Property Area Types for Defense Base Closure and Realignment Facilities*.

Department of the Army, 13 December 2007. Army Regulation 200-1. *Environmental Quality: Environmental Protection and Enhancement.*

Environmental Protection Agency (EPA), February 2019. *EPA Map of Radon Zones including State Radon Information and Contacts*. https://www.epa.gov/radon/find-information-about-local-radon-zones-and-state-contact-information#radonmap

Federal Emergency Management Agency (FEMA), 2019. FEMA Flood Map Service Center. https://msc.fema.gov/portal

USACE. 1993. White River Basin, Arkansas and Missouri, *Water Control Master Manual.*

USACE. 2013. Little Rock District Water Management website. Accessed at: www.swl-wc.usace.army.mil

United States Census Bureau. 2013. Easy Facts Website. Accessed at: http://www.census.gov/easystats/

USACE. 2018. Beaver Lake White River and Tributaries, *Arkansas Shoreline Management Plan*.

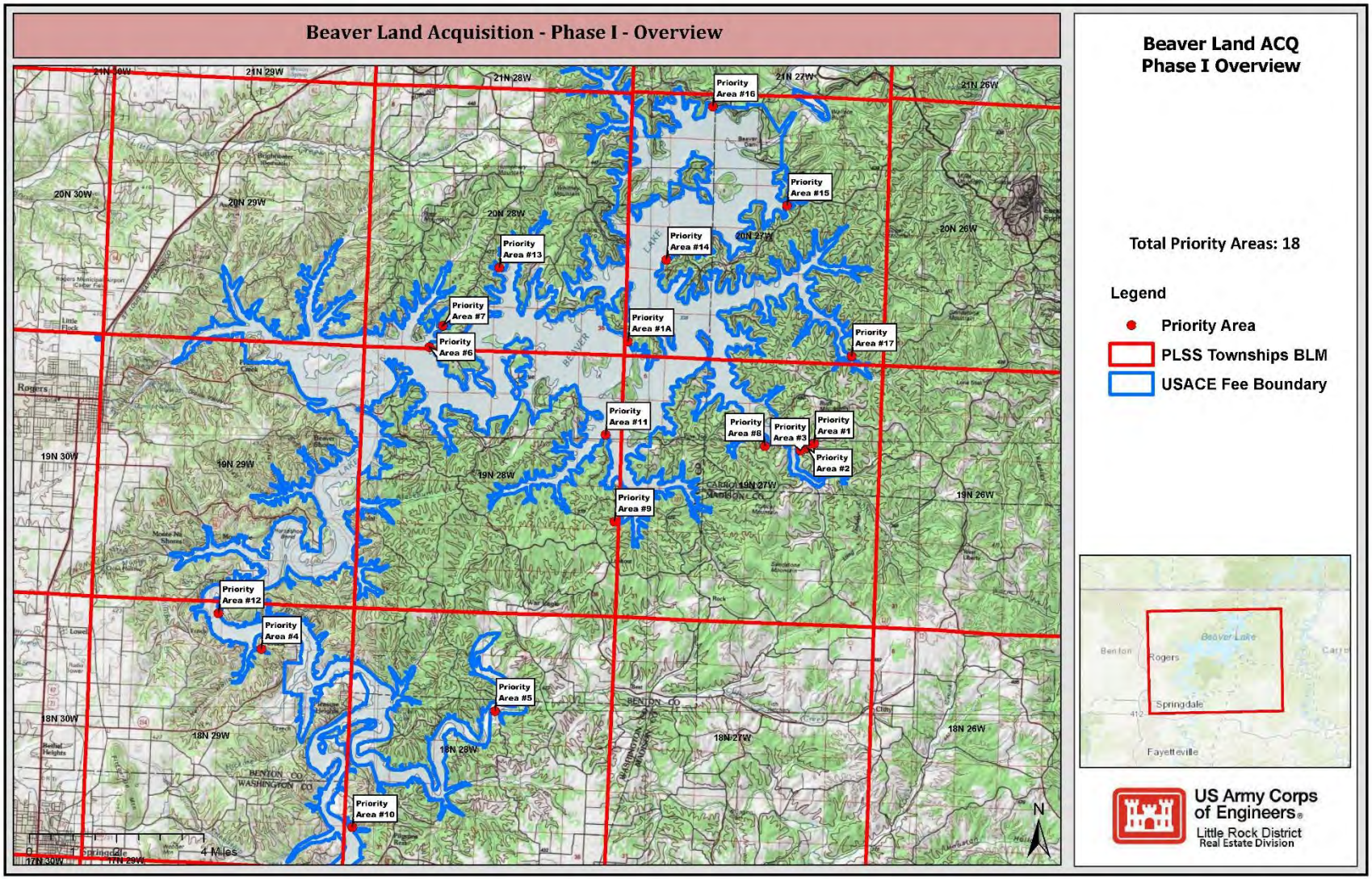
Arkansas Department of Energy and Environment Oil and Gas Commission website accessed August 2021 at: Commission, http://www.aogc.state.ar.us/maps/googleEarth.aspx

Beaver Watershed Alliance (BWA), 2012. *Beaver Lake Watershed Protection Strategy.*

Arkansas Department of Energy and Environment, Division of Environmental Quality website accessed August 2021 at: https://www.adeq.state.ar.us/rst/programs/fees/facility_data.aspx

Figures

Figure 1: Beaver Lake Priority Areas



ACQ = Acquisition; PLSS = Public Land Survey System; BLM = Bureau of Land Management

Figure 2: Subject Property Detail

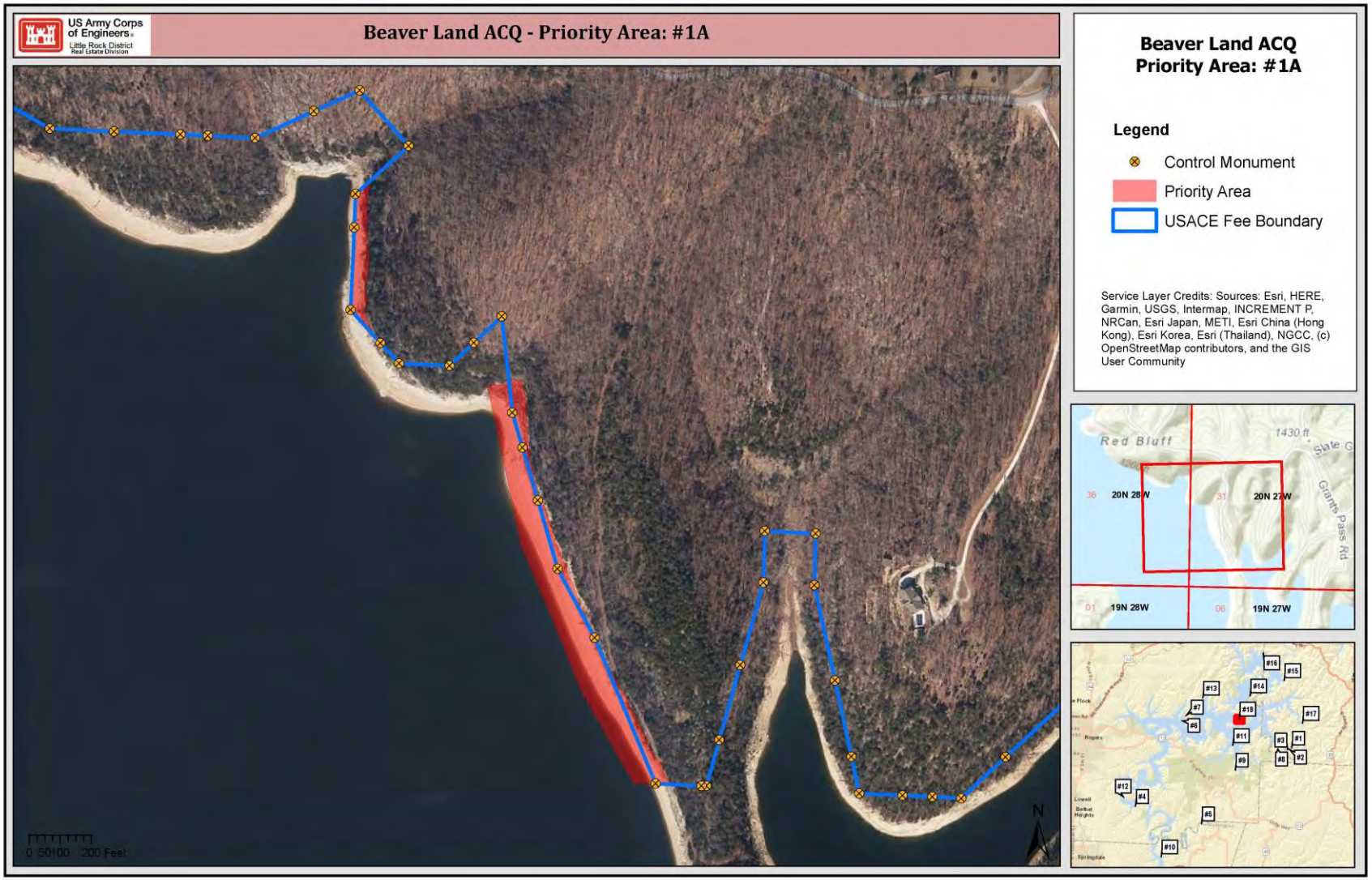


Figure 3: Interview Questions

Beaver Lake ECP
Interview Questions

1. Do you know of any environmental issues with this property?
2. Do you know of, or have access to, any reports concerning the environmental condition of this property? (i.e. site assessments, permits, storage tank registrations, safety plans, etc.) If so, would you be able to provide them? SWPPPs, SPCCs, air permits?
3. Do you know how this property has been historically used?
4. What is the property currently used for?
5. When were the site buildings constructed?
6. Are hazardous materials or petroleum products stored or used on this site? If so, what is the RCRA EPA ID? Does fueling occur on this property?
7. Do you know of any asbestos or LBP on the property or its buildings? Do you know the age of the buildings?
8. Has the site layout been manipulated in your recollection? (i.e. grading, excavation, etc.)?
9. Are there or have there been any cultural/historic items or buildings found on the property?
10. Is there anything else environmentally relevant that we should know?

Appendix A Visual Site Inspection Photographs

12 July 2021

Priority Area 1A.1 – Minor debris visible

Priority Area 1A.1 – Shoreline view

Priority Area 1A.1 – Shoreline view

Priority Area 1A.1 – Shoreline view

Site 1A.1 – Shoreline view erosion visible

Priority Area 1A.1 – Shoreline view erosion visible

Priority Area 1A.1 – Shoreline view erosion visible

Priority Area 1A.1 – Shoreline view enclosed foam

Priority Area 1A.1 – Shoreline view

Priority Area 1A.1 – Shoreline view

Priority Area 1A.2 – Shoreline view

Priority Area 1A.2 – Shoreline view

Priority Area 1A.2 – Shoreline view

Priority Area 1A.2 – Shoreline view

Priority Area 1A.2 – Shoreline view some erosion visible

Priority Area 1A.2 – Bobcat seen from watercraft near priority area

Priority Area 1A.2 – Shoreline view some erosion visible

Final

U.S. Army Environmental Condition of Property Report
Priority Area 2

Beaver Lake
Beaver Lake, Arkansas

August 30, 2021

Prepared For:
Beaver Lake Land Acquisition

Prepared By:
U.S. Army Corps of Engineers
Regional Planning and Environmental Center
Fort Worth District
Fort Worth, Texas

[This page is intentionally left blank.]

Table of Contents

List of Appendices:
Appendix A: Visual Site Inspection Photographs, 13 July 2021.
Appendix B: Historical Aerial Photography.
Appendix C: Historical Topographic Maps.

List of Acronyms

ACM	Asbestos-containing material
AR	Army Regulation
AST	Aboveground storage tank
ASTM	American Society for Testing and Materials
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CFR	Code of Federal Regulations
DoD	Department of Defense
ECP	Environmental Condition of Property
EDR	Environmental Data Resources
EPA	Environmental Protection Agency
ERNS	Emergency Response Notification System
HTRW	Hazardous, Toxic and Radioactive Waste
IRP	Installation Restoration Program
LBP	Lead-based Paint
LUST	Leaking underground storage tank
MEC	Munitions and Explosives of Concern
NEPA	National Environmental Policy Act
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NRC	Nuclear Regulatory Commission
ODEQ	Oklahoma Department of Environmental Quality
OWS	Oil-water separator
PCB	Polychlorinated Biphenyl
POL	Petroleum, Oils, and Lubricants
RCRA	Resource Conservation and Recovery Act
SEMS	Superfund Enterprise Management System
SF	Square feet
SHWS	State Hazardous Waste Sites
SWPPP	Stormwater Pollution Prevention Plan
TSD	Transport, Storage, Disposal
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
UST	Underground storage tank
UXO	Unexploded Ordnance
VCP	Voluntary Cleanup Program
VSI	Visual site inspection

1.0 Executive Summary

This environmental condition of property (ECP) report has been prepared to document the environmental conditions and provide information for the acquisition of land that would be necessary for the operation, maintenance, and control of the Beaver Lake reservoir in Arkansas. This fee acquisition pertains to the frequently inundated land immediately surrounding the lake, below an elevation of 1128 ft above mean sea level (msl). The Army prepares an ECP in order to provide the public with information relative to the environmental condition of the property, assist Federal agencies during the property screening process, provide information about completed remedial and corrective actions at the property, and to assist in determining appropriate responsibilities, asset valuation, and liabilities with other parties to a transaction.

Beaver Lake currently occupies more than 38,000 acres of Federal public lands and waters. The Lake is located in northwestern Arkansas, in Benton, Washington, Madison and Carroll Counties and it is approximately 6 miles west of Eureka Springs, Arkansas. This ECP report covers 0.41 acres of land located off a southeastern branch of Beaver Lake, called Big Clifty Creek, on northern shore. The subject property is a narrow strip of land that leads to the end of a lower order branch of the creek. It is currently owned by private landowner(s). The subject property, also known as Priority Area 2, is in Carroll County near the eastern end of Penitentiary Hollow, downstream from the Big Clifty recreation area and boat ramp.

This ECP report presents a summary of readily available information on the environmental conditions of, and concerns relative to, the land, facilities, and real property assets of Beaver Lake. The findings included in the report are based on a record search of historical environmental investigation reports and site historical documents, a review of aerial photography, stakeholder interviews, and a site inspection conducted 12 – 13 July 2021.

Based on the environmental conditions found and the ECP analysis, the property can be categorized as an ECP Category 1, indicating a site where no release, or disposal of hazardous substances or petroleum products or their derivatives has occurred (including no migration of these substances from adjacent properties).

2.0 Purpose

2.1 General

This environmental condition of property (ECP) report has been prepared to document the environmental conditions and provide information for the acquisition of land surrounding Beaver Lake in Benton, Washington, Madison and Carrol Counties, Arkansas. This report meets the requirements of Title 40, Code of Federal Regulations (CFR), Part 373, and United States Army Regulation (AR) 200-1 (2007), *Environmental Quality, Environmental Protection and Enhancement*. The ECP report also follows the American Society for Testing and Materials (ASTM) E1527-13 *Standard Practice for Environmental Site Assessments: Phase 1 Environmental Site Assessment Process*. The subject property in this report is subsequently categorized according to ASTM D5746 (2016) *Standard Classification of Environmental Condition of Property Area Types for Defense Base Closure and Realignment Facilities*.

The Army prepares an ECP for the following purposes:

- Provide the public with information relative to the environmental condition of the property.
- Assist Federal agencies during the property screening process.
- Provide information to prospective buyers.
- Provide information about completed remedial and corrective actions at the property.
- Assist in determining appropriate responsibilities, asset valuation, and liabilities with other parties to a transaction.

The ECP contains the information required to comply with the provisions of 40 CFR, Part 373 that require a notice to accompany contracts for the sale of, and deeds entered into the transfer of, federal property on which hazardous substances may have been stored, released, or disposed. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) §120(h) stipulates that a notice is required if certain quantities of designated hazardous substances have been stored on the property.

The ECP Report is not prepared to satisfy a real property purchaser's duty to conduct an "all-appropriate inquiry" to establish an "innocent purchaser defense" to CERCLA 107 liability. Any such use of the ECP Report by any party is outside the control of the Army and beyond the scope of the ECP Report. The Army, its officers, employees, or contractors makes no warranties or representations that any ECP Report satisfies any such requirements for any party.

2.2 Scope

This ECP report covers Priority Area 2, which occupies 0.41 acres of land located near the end of Penitentiary Hollow, off Big Clifty Creek in south eastern Beaver Lake. Priority Area 2 is comprised of a narrow strip of land, with steep, rocky shoreline or bluff and an overhanging ledge. There is access to the waterfront via a private wooden staircase. Although it wasn't explored, terrestrial access is assumed via private property from County Road 1488. Areas within the lake that are not within the Priority Area will be considered adjacent property. A general site location map is provided in Figure 1, and map showing the subject property is shown in Figure 2.

Beaver Lake currently occupies more than 38,000 acres of Federal public lands and waters. The Lake is located in northwestern Arkansas, in Benton, Washington, Madison and Carroll Counties and it is approximately 6 miles west of Eureka Springs, Arkansas. This ECP report covers 0.41 acres of land located off a southeastern branch of Beaver Lake, called Big Clifty Creek, on northern shore. The subject property is a narrow strip of land that leads to the end of a lower order branch of the creek. It is currently owned by private landowner(s). The subject property, also known as Priority Area 2, is in Carroll County near the eastern end of Penitentiary Hollow, downstream from the Big Clifty recreation area and boat ramp.

2.3 Limitations

This ECP report presents a summary of readily available information on the environmental conditions of, and concerns relative to, the land, facilities, and real property assets of the subject property. The findings included in the report are based on a record search of available historical environmental investigation reports and site historical documents, a review of aerial photography, stakeholder interviews, and a site reconnaissance conducted 12 – 13 July 2021. Historical environmental investigation reports and site historical documents were reviewed in support of this ECP, and the information obtained from other studies is reflected within this report by reference. The ECP process recognizes that the condition of property and classification can change as historical contamination is cleaned up (if required) or if a new source of contamination is identified. Records reviewed during the assessment were accepted as accurate and a reasonable effort was made to resolve discrepancies identified during the document review.

During the ECP assessment, all available sources of information concerning both past and present environmentally significant uses of the property were reviewed. This included readily available data associated with adjacent property records; 1985, 1994, 2001, 2004, 2006, 2009, 2010, 2012, 2014, 2016, 2017, 2018, and 2020 aerial photography; personnel interviews; current and historic investigations; and topographical maps. In addition, record sources were reviewed to determine if there have been spills, leaks, discharges, leaching, underground injection, dumping, abandonment, or storage of hazardous substances or petroleum products at the subject property. The site reconnaissance and interview process included inquiries and requests into the existence and availability of records that support the environmental condition of the property. The site reconnaissance included a Visual Site Inspection (VSI) of the subject property. No sampling or analysis was conducted during this survey.

2.4 Report Organization

The remainder of this ECP report is organized as follows:

Section 3 – Property Description: This section provides location and description of the subject property; an overview of historical and current land uses; and a description of the environmental setting of the lake area, including climate, topography, geology, and demography.

Section 4 – Survey Methodology: This section describes the methods used to obtain the information for this ECP Report such as the development of study sections, the VSI, aerial photography analysis, records review, interviews, and data management.

Section 5 – Environmental Conditions: This section provides the existing environmental information. The findings are organized by relevant environmental "issues," including permits and licenses, cleanup activities, hazardous substances, petroleum and related products, asbestos, lead-based paint (LBP), radioactive materials, landfills, explosive contaminated structures, radon, pesticides, and polychlorinated biphenyls (PCBs). This section also includes adjacent property descriptions.

Section 6 – Evaluation and Conclusions: This section provides a summary of the subject property and evaluates the property for categorization as per ASTM D5746 (2016).

Section 7 – Certification: This section documents the approval of the ECP report.

Section 8 – References: This section provides an inventory of the reference material used in the preparation of this ECP Report.

Appendices: A list of appendices is provided in the Table of Contents.

3.0 Property Description

3.1 Parcel Locations and Description

Beaver Lake is located in the scenic Ozark Mountain region of northwestern Arkansas in Benton, Washington, Carroll, and Madison counties. The total area currently contained in the Beaver project, including both land and water surface, consists of 38,138 acres owned in fee. Of this total, 1,432 acres are in flowage easement. The proposed Land Acquisition would include adding any land below the 1128 msl water level. The White River drainage area above Beaver Lake is approximately 1,186 square miles. When the lake is at the top of the conservation pool (elevation 1120.43 ft msl), the water area is 28,299 surface acres with 490 miles of shoreline within the lands owned in fee. The shoreline is irregular with topography primarily consisting of steep bluffs and gentle slopes.

Priority Area 2 consists of a narrow strip of land near the end of a southeastern branch of the lake and is approximately 0.41 acres of land located South and East of the center of Beaver Lake on northern shore. The subject property is on the edge of the lake and currently owned by private landowner(s). The subject property, also known as Priority Area 2, is downstream from the Big Clifty Recreation area.

3.2 Historic Land Use

Beaver Lake is a multiple purpose water resource development project initially authorized for flood control, hydropower generation and other beneficial uses by the Flood Control Act dated 3 September 1954. The inclusion of storage in the lake for municipal and industrial water supply was authorized by the Water Supply Act of 1958. Beaver Lake is a major component of a comprehensive plan for water resource development in the White River Basin of Arkansas and Missouri. Construction of Beaver Dam was initiated in March 1960. The dam was completed in June 1966, and the powerhouse and switchyard were completed in 1965. Beaver Lake was declared operational for public use in 1965.

For Priority Area 2, the historical aerial photographs show that this area has been used for private residences as far back as 1985.

3.3 Current Land Use

Beaver Lake is located in the Ozark Highlands of Carroll, Washington, Benton, and Madison Counties. Having 490 miles of shoreline (at conservation pool) and over 28,000 water surface acres, Beaver Lake is the largest reservoir in northwest Arkansas and the first federal impoundment on the White River.

There are 12 public use areas around Beaver Lake. There are 11 parks on the lake presently operated by the Corps of Engineers. The State of Arkansas owns and operates Hobbs State Park Conservation Area, which covers 12,056 acres, and Devil's Eyebrow Natural Area, which covers 2,503 acres. Both properties are adjacent to U.S. Army Corps of Engineers (USACE) lands. There are two parks, Ventris, and Blue Springs that have been reduced to lake access only. One Park (Big Clifty) is operated by Carroll County, Arkansas.

Despite being located adjacent to the fast-growing communities of Fayetteville, Springdale, Bentonville, and Rogers, Arkansas, and a regional population of over 500,000, the lake provides open spaces and a quality outdoor recreation opportunity. Many arms and coves of the lake offer secluded areas for traditional activities such as fishing, skiing, sailing and scuba diving, but also allow for passive recreation opportunities like photography and nature observation.

Priority Area 2 is currently used for residential and recreational use. There is a private wooden staircase leading to the water and a wooden chair on the overlooking point, indicating recreational use.

3.4 Utilities

Priority area 2 has no known utilities.

3.5 Environmental Setting

3.5.1 Climate

The climate in the Beaver Lake area is classified as humid subtropical according to the Köppen climate model. A humid subtropical climate is characterized by hot, usually humid summers and mild to cool winters. The Köppen definition of this climate is for the coldest month's mean temperature to be between 26.6 °F (−3 °C) and 64.4 °F (18 °C), and the warmest month to be above 71.6 °F (22 °C). Some climatologists prefer to use 32 °F (0 °C) as the lower bound for the coldest month's mean temperature. Under the modern Trewartha climate classification, climates are termed Humid Subtropical when they have mean temperatures of 50 °F (10 °C) for eight or more months a year. In most locations classed within this system, the mean temperature of the coldest month is between 35 °F (3 °C) and 65 °F (18 °C). Some climatologists consider the Trewartha grouping of subtropical climates to be more real-world and fitting on a global scale.

While technically classified as humid subtropical, the climate in the Beaver Lake area is considered moderate. The area experiences all four seasons and does receive cold air masses from the north; however, some of the Arctic masses are blocked by the higher elevations of the Ozarks.

Average temperatures range from a high of 88 °F (31.1 °C) and low of 27 °F (-2.7 °C) in nearby Rogers, Arkansas. Extreme temperatures rarely exceed 96 °F (35.6 °C) and 13°F (-10.6 °C). Late summer is the time of maximum heat and least rainfall. During the winter months, midday temperatures in the basin are relatively warm, around 55 o to 60 o F. Some short periods of cold weather occur with temperature ranging from 0 o to 10 o F. On winter nights, temperatures from 37 o F to below freezing are common. Highest recorded temperature in Rogers, Arkansas was 114 °F (45.6 °C) (recorded in July 1954). The lowest temperature recorded was −16 °F (−26.7 °C), in February 1996.

The relative humidity typically ranges from 41% (comfortable) to 91% (very humid) over the course of the year, rarely dropping below 24% (dry) and reaching as high as 100% (very humid). The air is driest around April 9, at which time the relative humidity drops below 49% (comfortable) three days out of four; it is most humid around June 3, exceeding 87% (very humid) three days out of four.

Dew point is often a better measure of how comfortable a person will find the weather than relative humidity because it more directly relates to whether perspiration will evaporate from the skin, thereby cooling the body. Lower dew points feel drier and higher dew points feel more humid. Over the course of a year, the dew point typically varies from 19°F (dry) to 71°F (muggy) and is rarely below 4°F (dry) or above 74°F (very muggy). There are two periods in the year that are most comfortable: The first is between April 18 and June 6 and the second is between September 3 and October 23. The air feels neither too dry nor too muggy during these periods (https://weatherspark.com/averages/31495/Rogers-Arkansas-United-States).

Average annual rainfall for the Beaver Lake area is 45 inches per year. Precipitation is weakly seasonal, with a bimodal pattern: wet seasons in the spring and fall, and relatively drier summers and winters, but some rain in all months. The spring wet season is more pronounced than fall, with the highest rainfall typically occurring in May. The average annual snowfall for the Beaver area is about 12 inches. Snowpack's are usually short lived and are not commonly a concern for flooding.

Climate change is an area of concern due to the potential for effects on many aspects of the environment, especially those related to water resources. The U.S. Global Change Research Program (USGCRP) summarized information regarding climate change and its potential effects in regional assessments (http://www.globalchange.gov/publications/reports/scientific-assessments/us-impacts). In the Midwest,

which extends from Minnesota to Missouri, extreme events such as heat waves, droughts and heavy rainfall events are projected to occur more frequently. Should these events become significant enough to impact the operation of Beaver Lake, the Master Plan, and associated documents (i.e., Operations Management Plan and Shoreline Management Plan) would be reviewed and revised, if necessary.

3.5.2 Topography, Geology, and Soils

The depositional environment of the rocks found in the Arkansas Ozarks is one of a relatively shallow continental shelf, sloping toward deeper water generally toward the south. This shelf emerged many times during the Paleozoic resulting in numerous unconformities throughout the sequence. The Ozark Plateaus region of Arkansas is made up of generally flat-lying Paleozoic age strata divided into three plateau surfaces. The lowest and northern-most plateau is the Salem Plateau. The Springfield Plateau stands above the Salem a few hundred feet and is generally capped by lower Mississippian age limestones and cherts. The southernmost and highest plateau of the Ozarks is the Boston Mountains. All of these plateaus are deeply dissected by numerous streams throughout the area. The faulting in the Ozarks is generally normal; most faults displaying a displacement down on the southern side. However, some observations reveal that a few strike-slip faults may be present. Gentle folds are noted but are generally of very low amplitude. The depositional environment of the rocks found in the Arkansas Ozarks is one of a relatively shallow continental shelf, sloping toward deeper water generally toward the south.

Beaver Lake is part of the Springfield Plateau that occupies primarily the western and southwestern flanks of the Ozark Plateau province. The Springfield Plateau in this region rises to an elevation of approximately 1400 feet and in many areas, forms extensive plains. Hilly areas occur where rivers and their tributaries cut into the plateau surface, most notably in the vicinity of the White River and Beaver Lake. As streams like the Buffalo National River cut through the plateau down to the level of the White River, they sometimes carve spectacular bluffs.

Lower Ordovician, Middle to Upper Devonian and Lower and Upper Mississippian age strata are present around Beaver Lake. Upper Ordovician and Devonian strata crop out around Beaver Lake and its tributaries. The Lower Mississippian Boone Formation comprises the surface rock over the majority of the area and forms the surface of the heavily dissected Springfield Plateau. In addition to the Boone Formation, Cotter and Jefferson City formations (Jefferson City formation has not been successfully differentiated from the Cotter Formation in Arkansas), and the Powel formation, all of Ordovician age are present in the area. Formations in the Devonian strata include the Chattanooga, Clifty and Penters.

The Boone Formation consists of gray, fine- to coarse-grained fossiliferous limestone interbedded with chert. This formation caps the higher hills in the area. Since limestone is easily dissolved by water, cave, and solution (karst) features are prominent. The Boone Formation is well known for dissolutional features, such as sinkholes, caves, and enlarged fissures. Surface water may drain directly into channels in limestone, where it can move rapidly and without filtration to the surface as a spring, at a location that is unpredictable without extensive testing. Therefore, water pollution problems are of particular concern in this region. The thickness of the Boone Formation is 300 to 350 feet in most of northern Arkansas, but as much as 390 feet has been reported.

The Cotter Dolomite is composed of dolostone of predominantly two types: a fine-grained, argillaceous, earthy textured, relatively soft, white to buff or gray dolostone called "cotton rock", and a more massive, medium-grained, gray dolostone that weathers to a somewhat hackly surface texture and becomes dark on exposure. The formation contains chert, some minor beds of greenish shale, and occasional thin interbedded sandstone. The thickness is about 340 feet in the vicinity of Cotter, but the interval may range up to 500 feet thick in places.

The Powell Dolomite is generally a fine-grained, light gray to greenish-gray, limy, argillaceous dolostone with thin beds of shale, sandstone, sandy dolostone, and occasionally chert. The formation’s thickness may be as much as 215 feet but is often much thinner.

The Chattanooga Shale Formation is typically black, fissile clay shale that weathers into thin flakes. The beds are usually cut by prominent joints creating polygonal blocks upon weathering. The upper part of the formation may be slightly sandy and usually contains abundant pyrite. Thickness ranges from 0 to about 85 feet; normally averaging about 30 feet (AGS).

The strata throughout the region are nearly horizontal. One predominant geological feature of the lake area is a low, persistent, limestone bluff, which occurs just above the Ordovician-Mississippian contact.

The faulting in the Ozarks is generally normal; most faults displaying a displacement down on the southern side. Lineaments and faults characteristic of northwest Arkansas are present around Beaver Lake. The Fayetteville Fault lies beneath Beaver Lake. This fault is the west side of a graben that has down dropped the Boone Formation to lake level. The Starkey Fault bounds the east side of the graben. Both faults trend approximately N 450E. One section of the Starkey fault trends N 60-700E. The Clantonville Lineament – Monocline is a northeast to southwest trending structural feature that extends from north of Clantonville to Ventris Hollow. The location of this feature was determined from the 1:24,000 three-dimensional quadrangle and from structural disparities in the Lower Mississippian rock units. This structural feature could be responsible for the presence of lead-zinc mineralization in an old prospect near Clantonville (north of Beaver Lake). The trend of this lineament to monocline is N 30-400E. Paleokarst features within the top of the Powell Dolomite are present around Beaver Lake and coincident with a lineament in Limekiln Hollow near Garfield, northwest of Beaver Lake.

In general, the soils of the Ozark Plateaus are residual and are formed on a broad, domed, upwarp consisting mostly of limestone and dolomite. The main difference in the soils is due to different rocks from which the soils were formed. The main geologic materials are cherty limestone; cherty, very siliceous dolomite; cherty, siliceous dolomite; and alluvium, which are weathered, and water transported products of the first three materials. Glade-rock soil occurs where the cherty, very siliceous dolomite is exposed to the soil formation. Dolomite is more resistant to weathering than limestone and siliceous dolomite is even more resistant, so very shallow soil results. In areas where the dolomite is less siliceous, more weathering has taken place; however, the soils produced are not as deep as soils formed by limestone.

The following eight soils associations are found in and around the Beaver project area: Captina-Nixa, Captina-Nixa-Pickwick, Clarksville-Nixa-Baxter, Corydon-Sogn, Enders-Allegheny-Mountainburg, Razort-Captina-Etowah, Linker-Apison-Hector, and Captina-Pembroke.

3.5.3 Hydrology and Groundwater

In the Interior Highlands of western and northern Arkansas ground-water supplies are more limited than in the Coastal Plain. Much of the Ozark Plateaus region is underlain by carbonate rocks, which are quite soluble in the presence of water. Solution by ground water has caused many large openings through which water passes so quickly that contaminants from the surface cannot be filtered out. Signs of these openings are caves, sink holes, springs and lost stream segments. As a consequence, the water in shallow wells may not be suitable for human consumption without treatment.

Three aquifers, which are part of the Ozark Plateaus Aquifer System, are located within northern Arkansas. The Springfield Plateau aquifer is generally under unconfined conditions, with groundwater movement occurring through fractures and solution cavities formed by dissolution of carbonate rock. Local discharge is through springs and streams. The Ozark aquifer is generally under confined conditions, especially where overlain by the units of the Ozark Confining Unit (Chattanooga Shale). Most wells in the Springfield Plateau and upper units in the Ozark aquifer yield 5-10 gpm on the average, with yields greater than 25 gpm in rare cases.

The third aquifer, the Roubidoux Formation and the Gunter Sandstone Member of the Gasconade Formation in northern Arkansas occur at greater depth and constitute the only significant aquifer system in the Ozarks. Both are permeable sandstone and carbonate units of Ordovician age. These aquifers serve as the principal source of high-quality water for many communities in northern Arkansas where surface water sources are unavailable. Together these units may yield up to 500 gpm to wells. These formations do not outcrop anywhere in Arkansas but instead outcrop in southern Missouri.

3.5.4 Water Quality

The waters of the Arkansas portion of the White River watershed have all been designated by the Arkansas Department of Environmental Quality (ADEQ) for fisheries, primary and secondary contact recreation, and domestic, agricultural, and industrial water supplies (ADEQ, 2012). Beaver Lake is classified by ADEQ as a Type A water body, which includes most larger lakes of several thousand acres in size, in upland forest dominated watersheds, having an average depth of 30 to 60 feet, and having low primary production (i.e., having a low trophic status if in natural [unpolluted] condition). Beaver Lake, like all other lakes of its size in the Ozark region, stratifies chemically and thermally in the late spring with stratification extending into late fall and early winter. During the warmer months, lake waters of the upper layer (the epilimnion) are warmer and contain more dissolved oxygen, while the denser, lower layer waters (the hypolimnion) are colder and contain very little or no dissolved oxygen, thus undesirable for fish habitat.

This undesirable water, when discharged downstream from hydropower generation, may cause some problems in the tailwaters. To combat this problem, the dissolved oxygen content is monitored, and various management measures are implemented to improve the dissolved oxygen concentration in the hydropower releases. A highly productive trout fishery has been established in the Beaver tailwaters by the Arkansas Game and Fish Commission because of the available discharge of cold water from the dam, which is reaerated by turbulence as it flows downstream.

As the stratified epilimnion cools in the late fall and winter, the layers begin to mix (de-stratify) and dissolved oxygen (DO) is more evenly distributed. This condition is more favorable to the fishery of the lake and overall water quality.

The upper 1500 acres of Beaver Lake has been listed by the Arkansas Department of Environmental Quality (ADEQ) on Arkansas' 303(d) list of impaired waters, approved by the Environmental Protection Agency (EPA), due to turbidity (ADEQ, 2008). According to the Arkansas 303(d) list, these excessive levels impact the local fisheries as well as primary contact, both designated uses of Beaver Lake. The elevated turbidity levels are due to excessive silt from surface erosion from agriculture activities, unpaved road surfaces, in-stream erosion – mainly from unstable stream banks, and any other land surface disturbing activity. The Draft 2010 Integrated Water Quality and Monitoring Report (ADEQ, 2010) added pathogen indicator bacteria as a contaminant for the same area of Beaver Lake. Surface erosion activities are listed as the probable source for this contaminant as well.

Clean Water Act requires states to list waters that do not meet Federal water quality standards or have a significant potential not to meet standards as a result of point source dischargers or non- point source run-off. Subsequent to listing on the 303(d) list, the statute requires that the states develop and set the Total Maximum Daily Load (TMDL) for water bodies on the list within 13 years. A TMDL establishes the maximum amount of a pollutant that can enter a specific water body without violating the water quality standards. Values are normally calculated amounts based 39 on dilution and the assimilative capacity of the water body. TMDLs have not been established by ADEQ for the upper Beaver Lake area.

3.6 Biological and Cultural Resources

3.6.1 Terrestrial Ecosystems

The area surrounding Beaver Lake is mostly forested. Trees and shrubs around the lakeshore include upland oak and hickory species, persimmon, honey locust, hawthorn, dogwood, redbud, coralberry, smooth and winged sumac, and buttonbush. Frequent periods of inundation keep a thin strip of government owned lands around the lake in early stages of succession. Red cedar and short-leafed pine, the principal evergreens, are dispersed throughout the region and are found in many large, scattered groups. Ground covers consist of greenbrier, sedges, and native grasses. White-tailed deer and eastern wild turkey are common game animals found and hunted in the Beaver Lake area. Black bears have also become common in the area and are hunted on the lands around the lake. The principal small game species found in the open upland areas include bobwhite quail, cottontail rabbit, and mourning dove. Gray and fox squirrels are common in upland wooded areas. Furbearing animals found in the Beaver Lake area include coyote, red fox, gray fox, otter, mink, muskrat, beaver, bobcat, and raccoon. Habitat management that includes wildlife food plot plantings, mowing, soil disturbance, removal of exotic species and application of prescribed fire provide benefit to these populations.

The common goldeneye, hooded merganser, bufflehead, and ring-necked duck are the predominant migratory waterfowl species visiting Beaver Lake. Mallards, gadwall, and other duck species are also present; however, they are only transient visitors as their characteristic feeding habits of obtaining food from shallow waters is limited. Resident Canada geese are so numerous in many coves and recreation areas that their presence has become a nuisance.

Ring-billed gulls are seen frequently around the Beaver Lake area. Greater and lesser yellow legs, pelicans, and large flocks of horned grebes are also seen during their peak migration in the spring and fall. Beaver Lake is also one of the few places where visitors can see both the turkey vulture and the black vulture at the same time in the winter. Beaver Lake has also become a popular place that visitors come to observe bald eagles, commonly wintering 150 or more birds and hosting 5-6 breeding pairs during the nesting period of March to June. The surrounding woodlands and grasslands serve as prime nesting areas for resident and neotropical migratory songbirds.

3.6.2 Aquatic Ecosystems and Wetlands

Walleye, smallmouth bass, striped bass, hybrid white-striped bass, and paddlefish have been introduced into Beaver Lake to add diversity to the fishery. Natural reproduction of striped bass and hybrid white-striped bass does not occur in Beaver Lake. Since 2004, AGFC stocks approximately 100,000 walleye, 30,000 channel catfish, 30,000 blue catfish, and 200,000 striped bass each year. While natural reproduction occurs in white crappie, black crappie, largemouth bass, and smallmouth bass, AGFC supplements this reproduction by occasional stockings of these species. Historically, there have also been introductions of northern pike, blue catfish, lake trout, and threadfin shad.

Located within the Springfield Plateau of the Ozark Mountains region of northern Arkansas, the area surrounding Beaver Lake is characterized by limestone, dolomite, or chert geology. The many rivers and streams flowing through the region have created a landscape of level highlands dissected by rugged valleys rich in karst features such as caves and sinkholes. Associated with these streams and landscape features are a variety of wetland habitats representative of the five wetland classes occurring within the region. These wetland classes include depressions, flats, fringe, riverine, and slope. It is possible, and perhaps even likely, that all of these classes of wetlands occur in the general area of Beaver Lake. However, those most likely to occur in the area immediately surrounding the lake are fringe (most likely reservoir), riverine (most likely spring runs) and slope wetlands (most likely calcareous slope).

3.6.3 Threatened and Endangered Species

The following species listed in Table 1 are from the U.S. Fish and Wildlife Service's federally classified status list of species and the Arkansas Natural Heritage data sets which have been reported and identified on project lands. Although the bald eagle was delisted by USFWS in 2007 due to recovery of the species, both the bald and golden eagles are still protected in accordance with the Bald and Golden Eagle Protection Act. The federal Migratory Bird Treaty Act of 1918 also provides protection to certain species of migratory birds. A total of 31 bird species are currently protected under this federal statute.

Table 1: Threatened and Endangered Species

	Federal Status	**State Status/Global Rank**
Gray Bat	LE	SE / S2S3/G4
Indiana Bat	LE	SE / /S1/G2
Northern long-eared Bat	LT	SE / S1S2/ G1G2
Ozark Big-eared Bat	LT	Not listed
Little Brown Bat	-	SE / S1
Bald Eagle	*Protected under Bald and Golden Eagle Protection Act	S3B,S4N/G5
Eastern Black Rail	LT	Not listed
Piping Plover	LT	Not listed
Rufa Red Knot	LT	Not listed
Whooping Crane	Experimental Population, Non-Essential	Not listed
Ozark Cavefish	LT	SE / S1/G3
Neosho Mucket	LE	Not Listed
Rabbitsfoot mussel	LT	SE/S3/G3G4
Snuffbox Mussel	LE	Not listed
Monarch Butterfly	C	Not listed
Missouri Bladderpod	LT	S2/G3

Opaque Prairie Sedge	-	SE / S2S3G4
Yellow Coneflower	-	ST / S2G3T3
Ovate-leaf Catchfly	-	ST / S2G3
Royal Catchfly	-	ST / S2G3

FEDERAL STATUS CODES

LE = Listed Endangered; the U.S. Fish and Wildlife Service has listed this species as endangered under the Endangered Species Act.
LT = Listed Threatened; the U.S. Fish and Wildlife Service has listed this species as threatened under the Endangered Species Act.
C = Candidate Species;

STATE STATUS CODES

INV = Inventory Element; The Arkansas Natural Heritage Commission is currently conducting active inventory work on these elements. Available data suggests these elements are of conservation concern. These elements may include outstanding examples of Natural Communities, colonial bird nesting sites, outstanding scenic and geologic features as well as plants and animals, which, according to current information, may be rare, peripheral, or of an undetermined status in the state. The ANHC is gathering detailed location information on these elements.

GLOBAL RANKS

G3 = Vulnerable globally. At moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors.
G4 = Apparently secure globally. Uncommon but not rare; some cause for long-term concern due to declines or other factors.
G5 = Secure globally. Common, widespread and abundant.
T-RANKS= T subranks are given to global ranks when a subspecies, variety, or race is considered at the state level. The subrank is made up of a "T" plus a number or letter (1, 2, 3, 4, 5, H, U, X) with the same ranking rules as a full species.

STATE RANKS

S1 = Critically imperiled in the state due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors making it vulnerable to extirpation.
S2 = Imperiled in the state due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it vulnerable to extirpation.
S3 = Vulnerable in the state due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.

GENERAL RANKING NOTES

Q = A "Q" in the global rank indicates the element's taxonomic classification as a species is a matter of conjecture among scientists.

Source: Arkansas Natural Heritage Commission

3.6.4 Cultural Resources

The records search, interviews, and site inspection identified no cultural resource assessments or findings for the subject property.

During the past seventy years scientific investigation of archaeological sites in the Beaver Lake area has been carried out in several phases. In 1922 and 1923, Mark R. Harrington of Phillip Academy was the first archeologist to excavate sites on the area that is now Beaver Lake. He excavated 13 bluff shelters. Between 1928 and 1935, the work of Harrington was continued by S.C. Dellinger of the University of Arkansas Museum. Dellinger supervised the excavation of 21 rock shelters. In the early 1960's, a series of surveys were conducted by several archeologists from the University of Arkansas Museum. Today, there are 280 known archeological sites along or immediately adjacent to Beaver Lake. Of these, 271 are identified as prehistoric, seven are historic and two sites have no known cultural affiliation.

Table 2: Historical and Cultural Resources at Beaver Lake

Type of Site	Number of sites
Historic	7
Prehistoric	271
No known cultural affiliation	2
Total	280
National Register Eligibility Status	
Not Evaluated	132
Not Eligible	5
Eligible	1

4.0 Survey Methodology

4.1 Development of Study Sections

The information gathered during the development of the ECP was used to group the subject property into standardized categories using Department of Defense (DoD) guidance, and in accordance with ASTM D5746 (2016). The ECP category definitions are summarized below in Table 3.

Table 3: Definitions of ECP Categories

ECP Category	Definition
1	An area or parcel of real property where no release, or disposal of hazardous substances or petroleum products or their derivatives has occurred (including no migration of these substances from adjacent properties).
2	An area or parcel of real property where only the release or disposal of petroleum products or their derivatives has occurred.
3	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but at concentrations that do not require a removal or remedial action.
4	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, and all remedial actions necessary to protect human health and the environment have been taken.
5	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred and removal or remedial actions, or both, are under way, but all required actions have not yet been taken.
6	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but required response actions have not yet been initiated.
7	An area or parcel of real property that is unevaluated or requires additional evaluation.

The final ECP category designations for the subject property are shown in Section 6.2, Table 6.

4.2 Visual Site Inspection

A VSI was conducted on 13 July 2021 at the subject property to check for recognized environmental conditions. The VSI was conducted by Mrs. Eugenia Barnes and Mr. Robert Singleton from the U.S. Army Corps of Engineers (USACE). USACE representatives were accompanied by Mr. Michael Hurley of the USACE Beaver Lake office.

The VSI was performed from a USACE Beaver Lake Office watercraft near the bank of the subject property as a Right of Entry (ROE) was not available at the time of the inspection. At the time of

inspection, the lake water level was 1127 feet above sea level, conservation pool is 1121 feet above sea level. While in Priority Area 2, which is a narrow strip of land with private residences surrounding it, there was no activity to note. A small inlet with some woody debris was seen, under an overhanging ledge. The steep banks are highly vegetated with some erosion of the shoreline and mineral stains visible on the bluff edges. A wooden staircase is set into the nearly vertical shoreline, providing access to the private residence(s) above. There is a point near the end of the Priority Area with a chair visible, overlooking the water. No debris could be seen from the boat and no apparent signs of Hazardous, Toxic and Radioactive Wastes (HTRW) were visible during the VSI.

Photos from the VSI can be found in Appendix A.

4.3 Aerial Photography Analysis

Aerial photographs were available from Google Earth maps for 1985, 1994, 2001, 2004, 2006, 2009, 2010, 2012, 2014, 2016, 2017, 2018, and 2020.

The initial aerial photograph from 1985 is of poor quality and the area isn't discernable. The next photo from 1994 is also of poor quality but a residence can be seen above the subject property and also on an adjacent part of the western portion of the Site 2 parcel. There is no change in later aerials except for the addition of another residential structure on an eastern property.

All aerial photographs are included in Appendix B.

4.4 Sanborn Map Review

Sanborn maps were not available for the subject property, or for the adjacent areas.

4.5 Topographic Map Review

Historical topographic maps were available from the US Geological Survey Website for the Beaver Lake area for 1900, 1901, 1945, 1949, 1954, 1957, 1958, 1964, 1985, 2011, 2014, 2017, and 2020. Several observations can be gleaned from these maps. First, the area before the lake was formed consisted of valleys with steep bluffs and hill sides around the White River and its tributaries. The historical maps show this valley and river basin from the 1900 to 1964 topographic maps. In 1985 the river and Beaver Dam at the northern end of the lake can been seen in the valley of the historical White River.

All topographic maps are included in Appendix C.

4.6 Records Review

4.6.1 Standard Environmental Record Sources

In this evaluation records, maps and other documents that provide environmental information about the project area are obtained and reviewed. A desktop records review was conducted using various sources to determine the presence of HTRW sites on or near the subject property. This search was focused on active cleanup sites and sites with a reasonable risk of HTRW release. Several databases were searched manually to narrow down the search area. These databases included the Environmental Protection Agency (EPA) Cleanups in my Community database, the EPA Envirofacts databases, the Arkansas Department of Environmental Quality's (ADEQ) web search tool of Underground Storage Tanks (UST) and Above Ground Storage Tanks (AST), and the Arkansas Department of Energy and Environment Oil and Gas Commission oil and gas well maps. The information collected from this desktop records review was analyzed for recognized environmental conditions (RECs) that would affect the proposed project or need further investigation, given the proposed project measures. The following resources were searched.

Federal National Priorities List (NPL) – The records search did not reveal any NPL sites in the project footprint or adjacent areas. There are nine NPL sites in the state of Arkansas, none of which are located

near Beaver Lake or the priority areas. This is based on a search of the EPA Superfund: National Priorities List (NPL) list.

Federal Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) List – The CERCLIS, now called the Superfund Enterprise Management System (SEMS) database, tracks hazardous waste sites where remedial action has occurred under EPA's CERCLA program. This list also includes sites that are in the screening and assessment phase for possible inclusion on the NPL. The records search of EPA's listed SEMS sites did not reveal any sites in the project footprints or adjacent areas. This is based on a search of the EPA SEMS database.

Federal No Further Remedial Action Planned (NFRAP) – The Federal NFRAP list (now known as the SEMS archive list) tracks sites where no further remedial action is planned, based on available assessments and information. The list also represents sites that were not chosen for the NPL. Further EPA assessment could possibly be ongoing, and hazardous environmental conditions may still exist; however, in the absence of remedial action and assessment data, no determination about environmental hazards can be made. The records search did not reveal any NFRAP sites in the project footprint or adjacent areas. This is based on a search of the EPA SEMS database.

Federal Resource Conservation and Recovery Act (RCRA) Corrective Action List – The records search of EPAs Cleanups in My Community showed two RCRA Corrective Actions within one mile of the project search area. No RCRA corrective actions were found to be located within one mile of the project footprint. This is based on a search of the EPA Cleanups in My Community.

State Superfund Sites - This search is to check for any state CERCLA sites in the project vicinity. The records search of state CERCLA cleanup sites did not show any sites of concern in the project or adjacent areas. This search is based on a search of the Arkansas Department of Energy and Environment data base.

State and Tribal Solid Waste Facilities/Landfill Sites – This search is designed to check any state or tribal databases for solid waste handling facilities or landfills in the project vicinity. The records search did not find any solid waste facilities or landfill sites in area of this project or adjacent areas. This is based on a search of the EPA Landfill Methane Outreach Program (LMOP) and ADEQ Permitted Solid Waste Disposal database.

State and Tribal Registered Storage Tanks – This list is a combination of the State of Arkansas registered UST and AST databases, representing sites with storage tanks registered with the State of Arkansas. The search revealed one AST within one mile of the work area or adjacent areas. This AST is not expected to impact the project due to its distance from the proposed project. These results are based on a search of the Arkansas Department of Energy and Environment Oil and Gas Commission website.

State and Tribal Voluntary Cleanup Sites – The ADEQ Elective Site Cleanup Agreement (ESCA) database identifies sites where the responsible party chooses to clean up the site themselves with ADEQ oversight. Five sites were identified from this database. None of the sites are within one mile of the work area and are therefore not expected to impact the proposed project. These results are based on a search of the ADEQ ESCA Database.

Brownfields List – A brownfield is a property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. There are no brownfield sites within one mile of the work area or adjacent areas. These results are based on a search for Brownfields sites using the EPA Envirofacts search engine.

Oil and Gas Wells – A search of the oil and gas wells in the area using the Arkansas Department of Energy and Environment Oil and Gas Commission website identifies multiple sites including oil wells, plugged oil wells, injection/disposal sites within the surrounding area. Although not classified as HTRW under USACE regulations, pipelines and oil wells play an important role in the HTRW existing conditions near the potential project area. This is because the well and/or pipeline contents could potentially leak or spill into the surrounding environment or affect the proposed project features. As a result of these findings, a thorough pipeline/well search should be initiated during design to ensure no interaction with the existing oil and gas infrastructure occurs. The Oil and Gas Commission website was used to map these findings. No oil wells or pipelines were found near the priority areas.

4.7 Interviews

Two interviews were conducted on 12 and 13 July 2021 in conjunction with the site inspection, and the following stakeholders were interviewed:

- Mr. Matthew Franklin; Natural Resource Specialist, Beaver Lake Office; Matthew.G.Franklin@usace.army.mil
- Mr. Matthew Voskamp; Natural Resource Specialist, Beaver Lake Office; Matthew.Voskamp@usace.army.mil

Information gleaned from the interviews is incorporated by way of reference throughout the report. The interview questions can be found in Figure 3.

5.0 Environmental Conditions

5.1 Environmental Permits and Licenses

5.1.1 RCRA Status

The subject property is not covered under a Resource Conservation and Recovery Act (RCRA) permit, and no hazardous waste is generated or stored on the property.

5.1.2 Solid Waste

The subject property has no active, inactive, or expired permits or licenses for solid waste disposal. No landfills exist on the property.

5.1.3 USTs/ASTs

No USTs or ASTs were found during the records search, site inspection and interviews indicated no UST/AST have been known to be located at the subject property.

5.1.4 National Pollutant Discharge Elimination System (NPDES)

Section 402 of the Clean Water Act (33 U.S.C. 1251 et. seq.) requires all facilities that discharge stormwater to acquire an NPDES that defines contaminant limits in effluent to be discharged. As per the Beaver Lake Shoreline Management Plan no discharge of any type of effluent is prohibited in the waters of Little Rock District Lakes including Beaver Lake and its tributaries.

5.1.5 Drinking Water Permits

No drinking water permits are in place at the subject property.

5.1.6 Air Permits

No air emission or air quality permits are in place at the subject property.

5.1.7 Nuclear Regulatory Commission (NRC)

The NRC is tasked with permitting the use and handling of radioactive materials and reactors. No NRC licenses are in place at the subject property.

5.1.8 Other Permits/ Licenses

The property has an erosion control permit issued by the USACE Beaver Lake office for the retaining wall.

5.2 Environmental Cleanup and Remediation

5.2.1 Installation Restoration Program

Beaver Lake is not an active military facility, and therefore would not be eligible for cleanup under the Installation Restoration Program.

5.2.2 Military Munitions Response Program

Beaver Lake is not an active military facility, and therefore would not be eligible for cleanup under the Military Munitions Restoration Program.

5.2.3 Other Environmental Investigations and Cleanups

No known environmental investigations or cleanups were found during the records search, site inspection and interviews indicated that no known investigations or cleanups are ongoing at Beaver Lake.

5.2.4 Storage, Release, and Disposal of Hazardous Substances

No releases to the environment or improper disposal of these substances were found during the records search, site inspection and interviews indicated no known improper disposal at the priority area.

5.3 Petroleum and Petroleum Products

No releases to the environment or improper disposal of petroleum products were found during the records search, site inspection and interviews indicated no known improper disposal at the priority area.

5.4 Polychlorinated Biphenyls (PCBs)

No evidence exists of the presence of PCBs on the subject property. No PCB-containing oils were found during the records search, site inspection and interviews indicated no known PCB-containing oils have been used or stored at the priority area.

5.5 Asbestos

No asbestos assessments were found during the ECP process, none were found during the records search, site inspection and interviews indicated no known asbestos containing material has been used or stored at the priority area.

5.6 Lead and Lead-Based Paint (LBP)

No lead-based paint (LBP) assessments were found during the ECP process. No LBP was found during the records search, site inspection and interviews indicated no known improper disposal at the priority area.

5.7 Radioactive Material

No radioactive material assessments were found during the ECP process. No potentially radioactive materials were identified during the VSI, and the presence of radioactive materials on the subject property is extremely unlikely.

5.8 Landfills/Dumps

No landfills or dumps were found during the records search, site inspection or interview investigation.

5.9 Munitions and Explosives of Concern (MEC) and/or Unexploded Ordnance (UXO)

No munitions, explosives, or unexploded ordinance (UXO) were found during the records search, site inspection or interview investigation.

5.10 Radon

Beaver Lake spans across Benton, Washington and Carroll Counties. Washington County is in the Environmental Protection Agency (EPA) Radon Zone 3. Counties in Radon Zone 3 are counties with predicted average indoor radon screening levels of less than 2 pCi/L (EPA, 2018). Benton and Carroll Counties are in the EPA Radon Zone 2 with a predicted average indoor radon level between 2 and 4 pCi/L (EPA, 2018). No radon assessments were found during the records search (EPA, 2019).

5.11 Pesticides

No records were found to indicate the storage, improper use, or disposal of pesticides on the subject property.

5.12 Other Identified Concerns

No significant other concerns were found during the records search, site inspection or interviews.

5.13 National Environmental Policy Act (NEPA)

As the federal agency in charge of this project USACE is in charge of coordinating National Environmental Policy Act (NEPA) compliance of 1969 (Public Law 91-190), the Council on Environmental Quality (CEQ) regulations (40 CFR 1500–1508), and the USACE implementing regulations, Policy and Procedures for Implementing NEPA, ER 200-2-2. As part of the records search and interview process recent NEPA documents were reviewed including the 2018 Draft Environmental Assessment for the Beaver Lake Master Plan Revision.

5.14 Adjacent Properties

As part of the ECP process, adjacent properties are assessed for environmental conditions, and those discovered conditions are evaluated based on the potential to affect the subject property. The nearest structure to the priority area is a residence approximately 0.03 miles from Priority Area 2. The residence sits above the steep shoreline and bluff. This residence is first seen in the 1994 historical aerial photographs. There are additional residences in neighboring plots of land directly adjacent to Priority Area 2. The adjacent properties are unlikely to pose any HTRW concerns to the priority area.

6.0 Evaluation and Conclusions

6.1 Summary of ECP

Beaver Lake currently occupies more than 38,000 acres of Federal public lands and waters. The Lake is located in northwestern Arkansas, in Benton, Washington, Madison and Carroll Counties and it is approximately 6 miles west of Eureka Springs, Arkansas. This ECP report covers 0.41 acres of land located off a southeastern branch of Beaver Lake, called Big Clifty Creek, on northern shore. The subject property is a narrow strip of land near the end of a lower order branch of the creek and currently owned by private landowner(s). The subject property, also known as Priority Area 2, is in Carroll County at the eastern end of Penitentiary Hollow, downstream from the Big Clifty recreation area and boat ramp.

This ECP report was prepared to characterize the existing environmental conditions at the subject property and is intended to be an aid in the leasing of real property. The ECP findings are based on the available sources of information concerning both past and present uses of the subject property. Information included readily available data associated with adjacent property records, aerial photography, personnel interviews, environmental programs and associated documentation, and current and historic investigations. In addition, record sources were reviewed to determine if there have been spills, leaks, discharges, leaching, underground injections, dumping, abandonments, or storage of hazardous substances or petroleum products at the installation. The VSI and interview process included inquiries and requests into the existence and availability of records that support the environmental condition of the property.

6.2 Conclusions

The subject property was classified into one of seven standard ECP area types (categories) as defined by ASTM D5746-98(2016) *Standard Classification of Environmental Condition of Property Area Types for Defense Base Closure and Realignment Facilities*. Below are the seven categories for reference.

Table 4: Definitions of ECP Categories

ECP Category	Definition
1	An area or parcel of real property where no release, or disposal of hazardous substances or petroleum products or their derivatives has occurred (including no migration of these substances from adjacent properties).
2	An area or parcel of real property where only the release or disposal of petroleum products or their derivatives has occurred.
3	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but at concentrations that do not require a removal or remedial action.
4	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, and all remedial actions necessary to protect human health and the environment have been taken.
5	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred and removal or remedial actions, or both, are under way, but all required actions have not yet been taken.
6	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but required response actions have not yet been initiated.
7	An area or parcel of real property that is unevaluated or requires additional evaluation.

Given these seven categories, the subject property is categorized below, along with the reasoning for each classification.

Table 5: Properties and ECP Categories

Acreage	ECP Category	Reasoning
0.41 ac.	1	No release or disposal of hazardous substances or petroleum products or their derivatives has occurred beyond de minimus amounts, including no migration of these substances from adjacent properties.

No release or disposal of hazardous substances or petroleum products or their derivatives has occurred beyond de minimus amounts on the subject property and no releases to the environment were observed or reported.

Asbestos assessments were not available for the subject property. It is unlikely that Asbestos Containing Material (ACM) is present but, in the future, if a building or structure will be disturbed, a licensed asbestos inspector is needed to confirm whether ACM is present or not.

7.0 Certification

I declare that, to the best of our professional knowledge and belief, we meet the definition of *Environmental professional* as defined in Part 312.10 of 40 CFR 312. We have the specific qualifications based on education, training, and experience to assess a property of the nature, history and setting of the subject property. We have developed and performed the appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312. All information/documentation provided accurately reflects the condition of the property. This report meets the DoD requirements for completion of an ECP Report.

_____ _____

Eugenia Barnes
Environmental Protection Specialist
U.S. Army Corps of Engineers
Fort Worth District

Date

_____ _____

Jennifer Jefcoat
Chemist
U.S. Army Corps of Engineers
Fort Worth District

Date

_____ _____

Hollie Eljizi
Environmental Engineer
U.S. Army Corps of Engineers
Fort Worth District

Date

8.0 References

American Society for Testing and Materials (ASTM), 2013. E1527-13, *Standard Practice for Environmental Site Assessments: Phase 1 Environmental Site Assessment Process*.

ASTM, 2016. D5746, *Standard Classification of Environmental Condition of Property Area Types for Defense Base Closure and Realignment Facilities*.

Department of the Army, 13 December 2007. Army Regulation 200-1. *Environmental Quality: Environmental Protection and Enhancement.*

Environmental Protection Agency (EPA), February 2019. *EPA Map of Radon Zones including State Radon Information and Contacts*. https://www.epa.gov/radon/find-information-about-local-radon-zones-and-state-contact-information#radonmap

Federal Emergency Management Agency (FEMA), 2019. FEMA Flood Map Service Center. https://msc.fema.gov/portal

USACE. 1993. White River Basin, Arkansas and Missouri, *Water Control Master Manual.*

USACE. 2013. Little Rock District Water Management website. Accessed at: www.swl-wc.usace.army.mil

United States Census Bureau. 2013. Easy Facts Website. Accessed at: http://www.census.gov/easystats/

USACE. 2018. Beaver Lake White River and Tributaries, *Arkansas Shoreline Management Plan.*

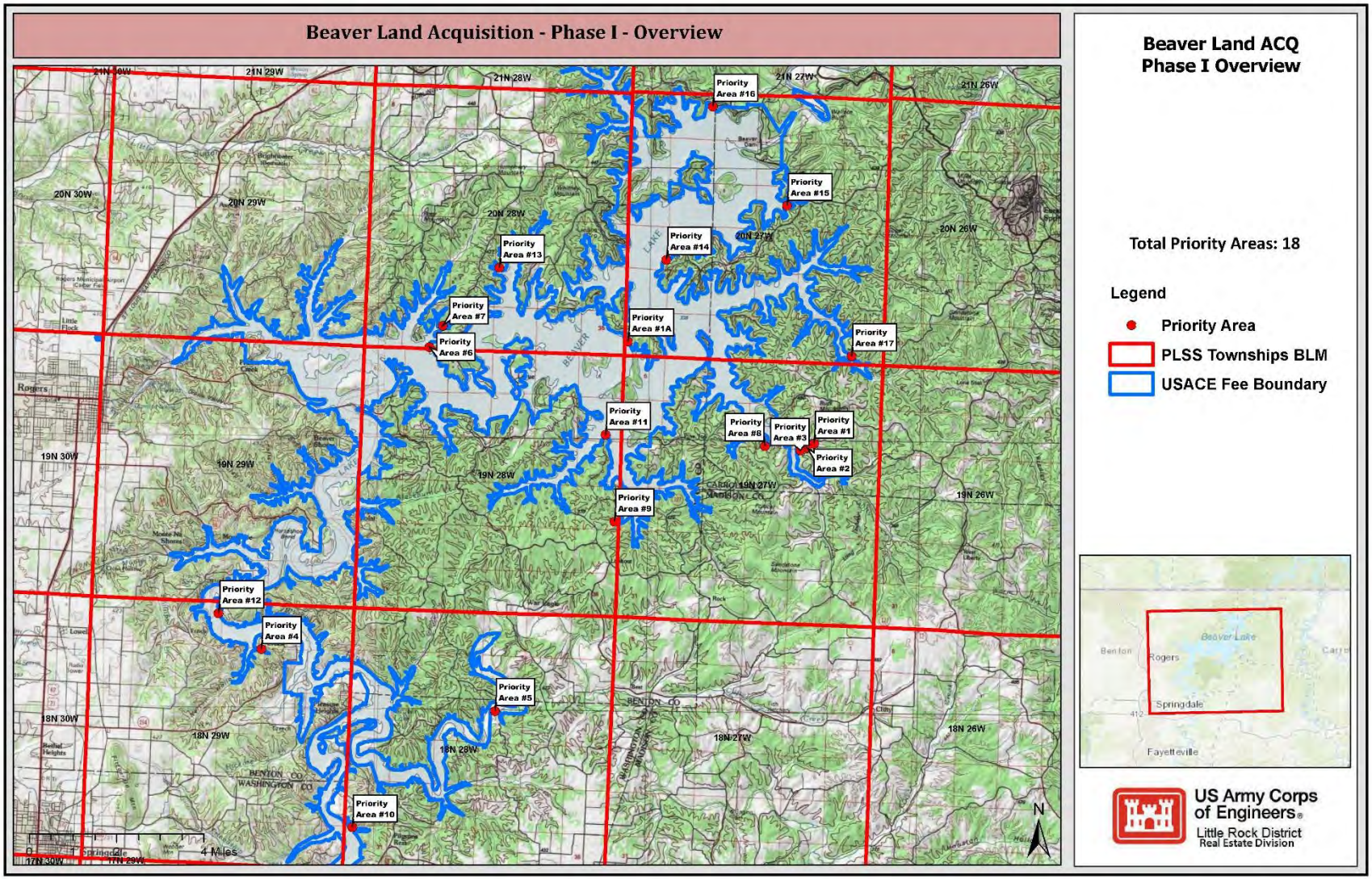
Arkansas Department of Energy and Environment Oil and Gas website Accessed August 2021 at: Commission, http://www.aogc.state.ar.us/maps/googleEarth.aspx

Beaver Watershed Alliance (BWA), 2012. *Beaver Lake Watershed Protection Strategy.*

Arkansas Department of Energy and Environment Environmental Quality Website Accessed August 2021 at: https://www.adeq.state.ar.us/rst/programs/fees/facility_data.aspx

Figures

Figure 1: Beaver Lake Priority Areas



ACQ = Acquisition; PLSS = Public Land Survey System; BLM = Bureau of Land Management

Figure 2: Subject Property Detail

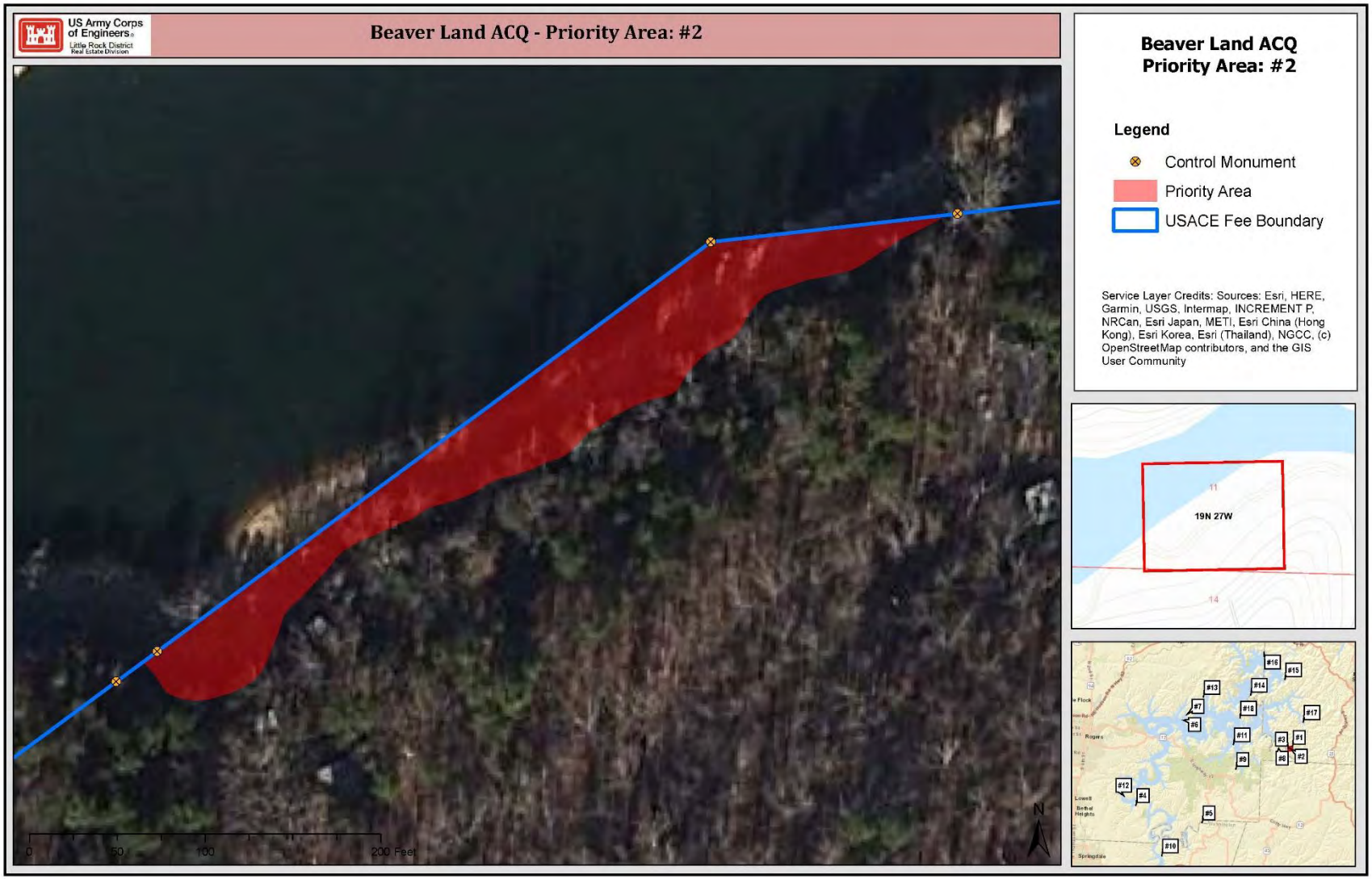


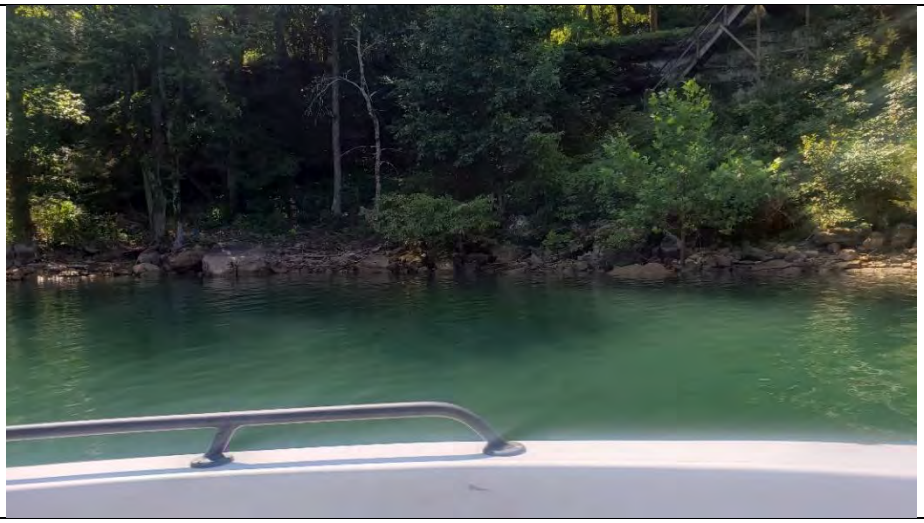
Figure 3: Interview Questions

Beaver Lake ECP
Interview Questions

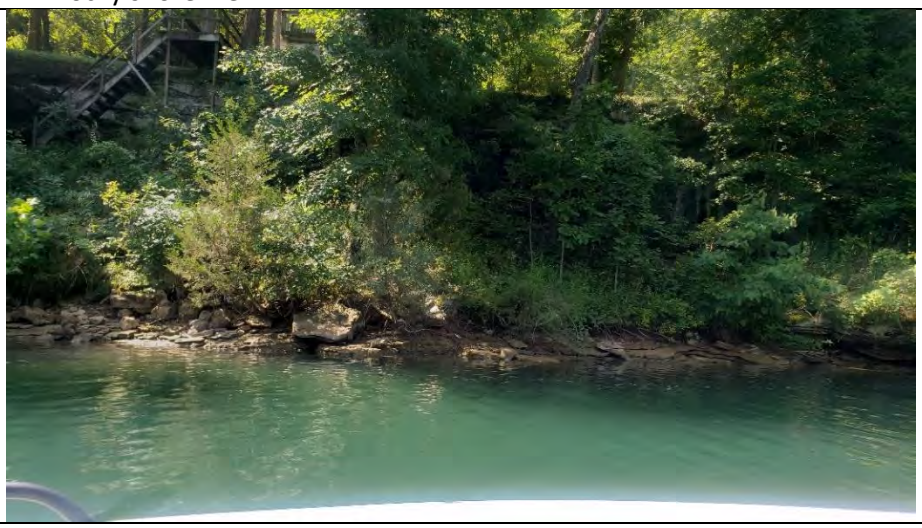
1. Do you know of any environmental issues with this property?
2. Do you know of, or have access to, any reports concerning the environmental condition of this property? (i.e., site assessments, permits, storage tank registrations, safety plans, etc.) If so, would you be able to provide them? SWPPPs, SPCCs, air permits?
3. Do you know how this property has been historically used?
4. What is the property currently used for?
5. When were the site buildings constructed?
6. Are hazardous materials or petroleum products stored or used on this site? If so, what is the RCRA EPA ID? Does fueling occur on this property?
7. Do you know of any asbestos or LBP on the property or its buildings? Do you know the age of the buildings?
8. Has the site layout been manipulated in your recollection? (i.e., grading, excavation, etc.)?
9. Are there or have there been any cultural/historic items or buildings found on the property?
10. Is there anything else environmentally relevant that we should know?

Appendix A: Visual Priority Area Inspection Photographs

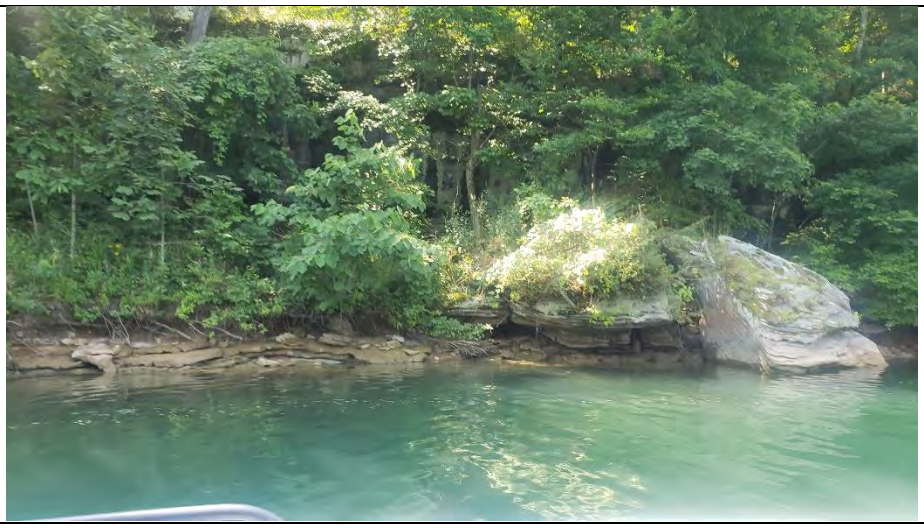
13 July 2021



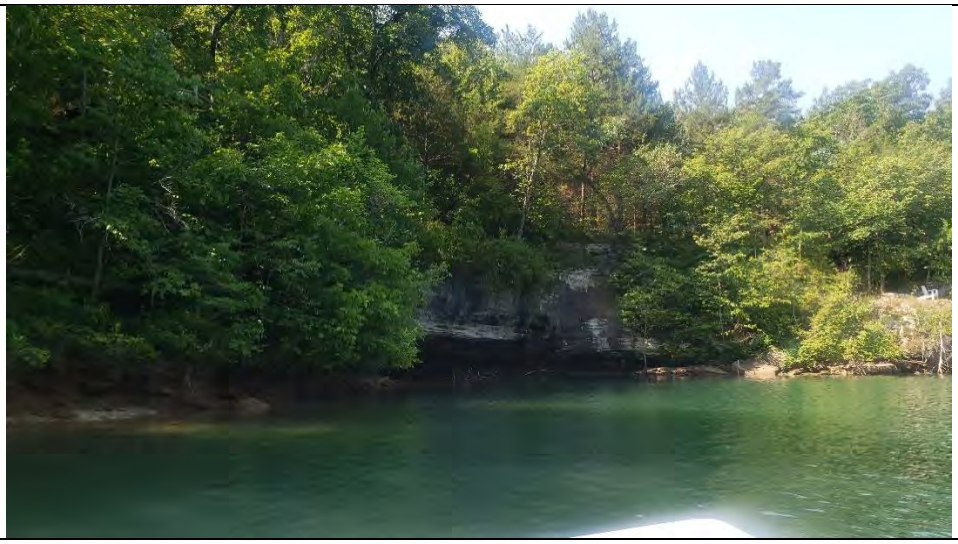
Priority Area 2 – Rocky shoreline



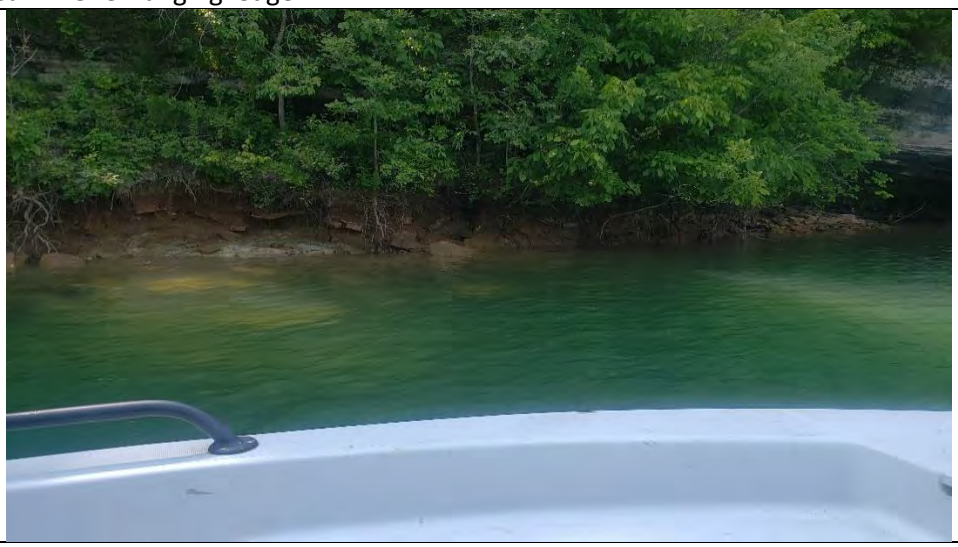
Priority Area 2 – Private residence access



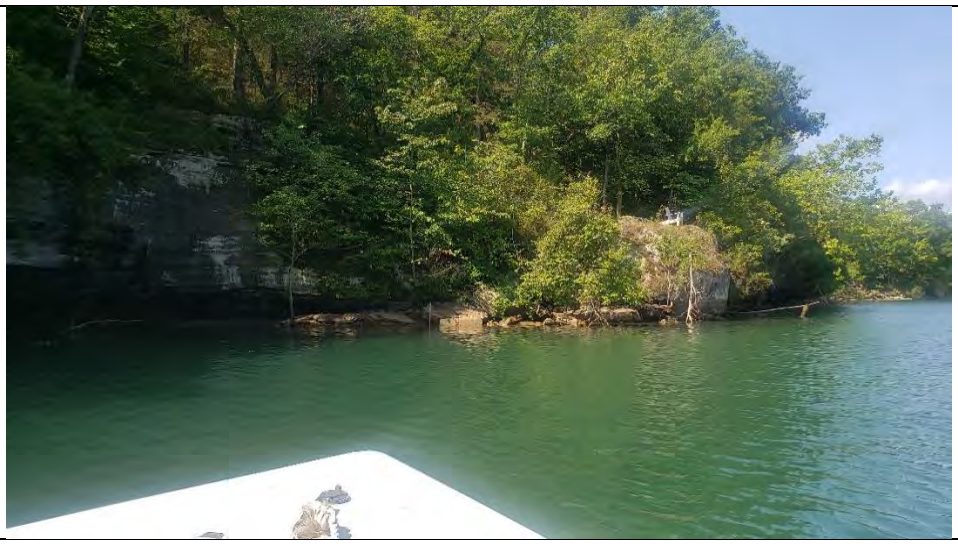
Priority Area 2 – Shoreline view



Priority Area 2 – Overhanging ledge

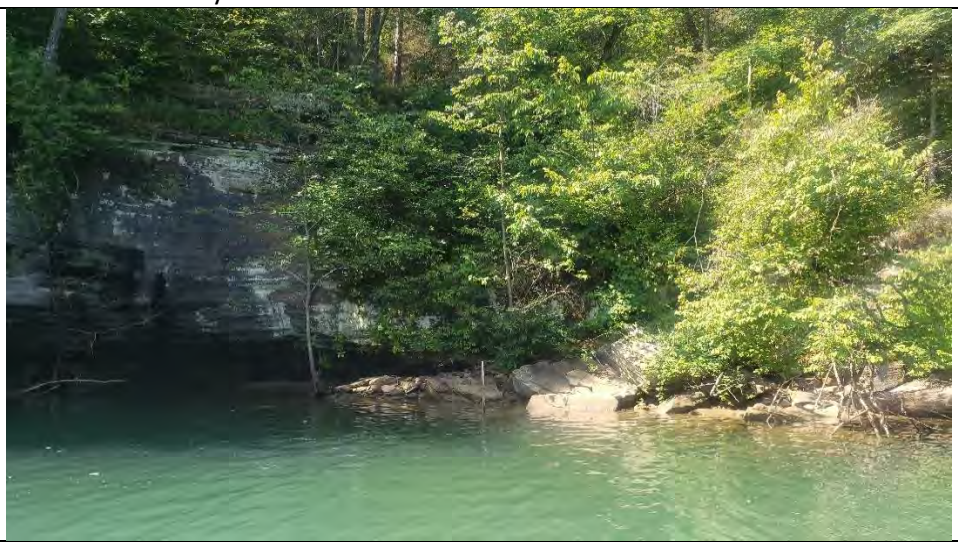


Priority Area 2 – Vegetated shoreline



Priority Area 2 – Chair on overlooking point

Priority Area 2 – Some woody debris



Priority Area 2 – Shoreline view with woody debris

Final

U.S. Army Environmental Condition of Property Report
Priority Area 3

Beaver Lake
Beaver Lake, Arkansas

August 30, 2021

Prepared For:
Beaver Lake Land Acquisition

Prepared By:
U.S. Army Corps of Engineers
Regional Planning and Environmental Center
Fort Worth District
Fort Worth, Texas

[This page is intentionally left blank.]

Table of Contents

List of Appendices:
Appendix A: Visual Site Inspection Photographs, 13 July 2021.
Appendix B: Historical Aerial Photography.
Appendix C: Historical Topographic Maps.

List of Acronyms

ACM	Asbestos-containing material
AR	Army Regulation
AST	Aboveground storage tank
ASTM	American Society for Testing and Materials
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CFR	Code of Federal Regulations
DoD	Department of Defense
ECP	Environmental Condition of Property
EDR	Environmental Data Resources
EPA	Environmental Protection Agency
ERNS	Emergency Response Notification System
HTRW	Hazardous, Toxic and Radioactive Waste
IRP	Installation Restoration Program
LBP	Lead-based Paint
LUST	Leaking underground storage tank
MEC	Munitions and Explosives of Concern
NEPA	National Environmental Policy Act
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NRC	Nuclear Regulatory Commission
ODEQ	Oklahoma Department of Environmental Quality
OWS	Oil-water separator
PCB	Polychlorinated Biphenyl
POL	Petroleum, Oils, and Lubricants
RCRA	Resource Conservation and Recovery Act
SEMS	Superfund Enterprise Management System
SF	Square feet
SHWS	State Hazardous Waste Sites
SWPPP	Stormwater Pollution Prevention Plan
TSD	Transport, Storage, Disposal
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
UST	Underground storage tank
UXO	Unexploded Ordnance
VCP	Voluntary Cleanup Program
VSI	Visual site inspection

1.0 Executive Summary

This environmental condition of property (ECP) report has been prepared to document the environmental conditions and provide information for the acquisition of land that would be necessary for the operation, maintenance, and control of the Beaver Lake reservoir in Arkansas. This fee acquisition pertains to the frequently inundated land immediately surrounding the lake, below an elevation of 1128 ft above mean sea level (msl). The Army prepares an ECP in order to provide the public with information relative to the environmental condition of the property, assist Federal agencies during the property screening process, provide information about completed remedial and corrective actions at the property, and to assist in determining appropriate responsibilities, asset valuation, and liabilities with other parties to a transaction.

Beaver Lake currently occupies more than 38,000 acres of Federal public lands and waters. The Lake is located in northwestern Arkansas, in Benton, Washington, Madison and Carroll Counties and it is approximately 6 miles west of Eureka Springs, Arkansas. This ECP report covers 0.37 acres of land located off a southeastern branch of Beaver Lake, called Big Clifty Creek, on northern shore. The subject property is two sections of land along a lower order branch of the creek. It is currently owned by private landowner(s). The subject property, also known as Priority Area 3, is in Carroll County near the mouth of Penitentiary Hollow, downstream from the Big Clifty recreation area and boat ramp.

This ECP report presents a summary of readily available information on the environmental conditions of, and concerns relative to, the land, facilities, and real property assets of Beaver Lake. The findings included in the report are based on a record search of historical environmental investigation reports and site historical documents, a review of aerial photography, stakeholder interviews, and a site inspection conducted 12 – 13 July 2021.

Based on the environmental conditions found and the ECP analysis, the property can be categorized as an ECP Category 1, indicating a site where no release, or disposal of hazardous substances or petroleum products or their derivatives has occurred (including no migration of these substances from adjacent properties).

2.0 Purpose

2.1 General

This environmental condition of property (ECP) report has been prepared to document the environmental conditions and provide information for the acquisition of land surrounding Beaver Lake in Benton, Washington, Madison and Carrol Counties, Arkansas. This report meets the requirements of Title 40, Code of Federal Regulations (CFR), Part 373, and United States Army Regulation (AR) 200-1 (2007), *Environmental Quality, Environmental Protection and Enhancement*. The ECP report also follows the American Society for Testing and Materials (ASTM) E1527-13 *Standard Practice for Environmental Site Assessments: Phase 1 Environmental Site Assessment Process*. The subject property in this report is subsequently categorized according to ASTM D5746 (2016) *Standard Classification of Environmental Condition of Property Area Types for Defense Base Closure and Realignment Facilities*.

The Army prepares an ECP for the following purposes:

- Provide the public with information relative to the environmental condition of the property.
- Assist Federal agencies during the property screening process.
- Provide information to prospective buyers.
- Provide information about completed remedial and corrective actions at the property.
- Assist in determining appropriate responsibilities, asset valuation, and liabilities with other parties to a transaction.

The ECP contains the information required to comply with the provisions of 40 CFR, Part 373 that require a notice to accompany contracts for the sale of, and deeds entered into the transfer of, federal property on which hazardous substances may have been stored, released or disposed. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) §120(h) stipulates that a notice is required if certain quantities of designated hazardous substances have been stored on the property.

The ECP Report is not prepared to satisfy a real property purchaser's duty to conduct an "all-appropriate inquiry" to establish an "innocent purchaser defense" to CERCLA 107 liability. Any such use of the ECP Report by any party is outside the control of the Army and beyond the scope of the ECP Report. The Army, its officers, employees, or contractors makes no warranties or representations that any ECP Report satisfies any such requirements for any party.

2.2 Scope

This ECP report covers Priority Area 3, which occupies 0.37 acres of land along Penitentiary Hollow, off Big Clifty Creek in south eastern Beaver Lake. Priority Area 3 is comprised of two segments of land, with mostly steep, rocky shoreline or bluff with healthy vegetation. In the first segment, Priority Area 3.1, a private residence is situated on the water, in the middle of a cove with a nearly vertical shoreline. There is access to the water via a boat ramp in the second segment, Priority Area 3.2. Although it wasn't explored, terrestrial access is assumed via private property from County Road 146. Areas within the lake that are not within the Priority Area will be considered adjacent property. A general site location map is provided in Figure 1, and map showing the subject property is shown in Figure 2.

Beaver Lake currently occupies more than 38,000 acres of Federal public lands and waters. The Lake is located in northwestern Arkansas, in Benton, Washington, Madison and Carroll Counties and it is approximately 6 miles west of Eureka Springs, Arkansas. This ECP report covers 0.37 acres of land located off a southeastern branch of Beaver Lake, called Big Clifty Creek, on northern shore. The subject property is two sections of land along a lower order branch of the creek. It is currently owned by private landowner(s). The subject property, also known as Priority Area 3, is in Carroll County near the mouth of Penitentiary Hollow, downstream from the Big Clifty recreation area and boat ramp.

2.3 Limitations

This ECP report presents a summary of readily available information on the environmental conditions of, and concerns relative to, the land, facilities, and real property assets of the subject property. The findings included in the report are based on a record search of available historical environmental investigation reports and site historical documents, a review of aerial photography, stakeholder interviews, and a site reconnaissance conducted 12 – 13 July 2021. Historical environmental investigation reports and site historical documents were reviewed in support of this ECP, and the information obtained from other studies is reflected within this report by reference. The ECP process recognizes that the condition of property and classification can change as historical contamination is cleaned up (if required) or if a new source of contamination is identified. Records reviewed during the assessment were accepted as accurate and a reasonable effort was made to resolve discrepancies identified during the document review.

During the ECP assessment, all available sources of information concerning both past and present environmentally significant uses of the property were reviewed. This included readily available data associated with adjacent property records; 1985, 1994, 2001, 2004, 2006, 2009, 2010, 2012, 2014, 2016, 2017, 2018, and 2020 aerial photography; personnel interviews; current and historic investigations; and topographical maps. In addition, record sources were reviewed to determine if there have been spills, leaks, discharges, leaching, underground injection, dumping, abandonment, or storage of hazardous substances or petroleum products at the subject property. The site reconnaissance and interview process included inquiries and requests into the existence and availability of records that support the environmental condition of the property. The site reconnaissance included a Visual Site Inspection (VSI) of the subject property. No sampling or analysis was conducted during this survey.

2.4 Report Organization

The remainder of this ECP report is organized as follows:

Section 3 – Property Description: This section provides location and description of the subject property; an overview of historical and current land uses; and a description of the environmental setting of the lake area, including climate, topography, geology, and demography.

Section 4 – Survey Methodology: This section describes the methods used to obtain the information for this ECP Report such as the development of study sections, the VSI, aerial photography analysis, records review, interviews, and data management.

Section 5 – Environmental Conditions: This section provides the existing environmental information. The findings are organized by relevant environmental "issues," including permits and licenses, cleanup activities, hazardous substances, petroleum and related products, asbestos, lead-based paint (LBP), radioactive materials, landfills, explosive contaminated structures, radon, pesticides, and polychlorinated biphenyls (PCBs). This section also includes adjacent property descriptions.

Section 6 – Evaluation and Conclusions: This section provides a summary of the subject property and evaluates the property for categorization as per ASTM D5746 (2016).

Section 7 – Certification: This section documents the approval of the ECP report.

Section 8 – References: This section provides an inventory of the reference material used in the preparation of this ECP Report.

Appendices: A list of appendices is provided in the Table of Contents.

3.0 Property Description

3.1 Parcel Locations and Description

Beaver Lake is located in the scenic Ozark Mountain region of northwestern Arkansas in Benton, Washington, Carroll and Madison counties. The total area currently contained in the Beaver project, including both land and water surface, consists of 38,138 acres owned in fee. Of this total, 1,432 acres are in flowage easement. The proposed Land Acquisition would include adding any land below the 1128 msl water level. The White River drainage area above Beaver Lake is approximately 1,186 square miles. When the lake is at the top of the conservation pool (elevation 1120.43 ft msl), the water area is 28,299 surface acres with 490 miles of shoreline within the lands owned in fee. The shoreline is irregular with topography primarily consisting of steep bluffs and gentle slopes.

Priority Area 3 consists of two sections of land along a southeastern branch of the lake and is approximately 0.37 acres of shoreline located South and East of the center of Beaver Lake on northern shore. The subject property is on the edge of the lake and currently owned by private landowner(s). The subject property, also known as Priority Area 3, is downstream from the Big Clifty Recreation area.

3.2 Historic Land Use

Beaver Lake is a multiple purpose water resource development project initially authorized for flood control, hydropower generation and other beneficial uses by the Flood Control Act dated 3 September 1954. The inclusion of storage in the lake for municipal and industrial water supply was authorized by the Water Supply Act of 1958. Beaver Lake is a major component of a comprehensive plan for water resource development in the White River Basin of Arkansas and Missouri. Construction of Beaver Dam was initiated in March 1960. The dam was completed in June 1966, and the powerhouse and switchyard were completed in 1965. Beaver Lake was declared operational for public use in 1965.

For Priority Area 3, the historical aerial photographs show that this area has been used for private residences as far back as 1985.

3.3 Current Land Use

Beaver Lake is located in the Ozark Highlands of Carroll, Washington, Benton, and Madison Counties. Having 490 miles of shoreline (at conservation pool) and over 28,000 water surface acres, Beaver Lake is the largest reservoir in northwest Arkansas and the first federal impoundment on the White River.

There are 12 public use areas around Beaver Lake. There are 11 parks on the lake presently operated by the Corps of Engineers. The State of Arkansas owns and operates Hobbs State Park Conservation Area, which covers 12,056 acres, and Devil's Eyebrow Natural Area, which covers 2,503 acres. Both properties are adjacent to U.S. Army Corps of Engineers (USACE) lands. There are two parks, Ventris, and Blue Springs that have been reduced to lake access only. One Park (Big Clifty) is operated by Carroll County, Arkansas.

Despite being located adjacent to the fast-growing communities of Fayetteville, Springdale, Bentonville, and Rogers, Arkansas and a regional population of over 500,000, the lake provides open spaces and a quality outdoor recreation opportunity. Many arms and coves of the lake offer secluded areas for traditional activities such as fishing, skiing, sailing and scuba diving, but also allow for passive recreation opportunities like photography and nature observation.

Priority Area 3 is currently used for residential and recreational use. There is a private residence on the water in Priority Area 3.1 and a boat ramp leading to the water in Priority Area 3.2.

3.4 Utilities

Priority area 3 has no known utilities.

3.5 Environmental Setting

3.5.1 Climate

The climate in the Beaver Lake area is classified as humid subtropical according to the Köppen climate model. A humid subtropical climate is characterized by hot, usually humid summers and mild to cool winters. The Köppen definition of this climate is for the coldest month's mean temperature to be between 26.6 °F (−3 °C) and 64.4 °F (18 °C), and the warmest month to be above 71.6 °F (22 °C). Some climatologists prefer to use 32 °F (0 °C) as the lower bound for the coldest month's mean temperature. Under the modern Trewartha climate classification, climates are termed Humid Subtropical when they have mean temperatures of 50 °F (10 °C) for eight or more months a year. In most locations classed within this system, the mean temperature of the coldest month is between 35 °F (3 °C) and 65 °F (18 °C). Some climatologists consider the Trewartha grouping of subtropical climates to be more real-world and fitting on a global scale.

While technically classified as humid subtropical, the climate in the Beaver Lake area is considered moderate. The area experiences all four seasons and does receive cold air masses from the north; however, some of the Arctic masses are blocked by the higher elevations of the Ozarks.

Average temperatures range from a high of 88 °F (31.1 °C) and low of 27 °F (-2.7 °C) in nearby Rogers, Arkansas. Extreme temperatures rarely exceed 96 °F (35.6 °C) and 13°F (-10.6 °C). Late summer is the time of maximum heat and least rainfall. During the winter months, midday temperatures in the basin are relatively warm, around 55 o to 60 o F. Some short periods of cold weather occur with temperature ranging from 0 o to 10 o F. On winter nights, temperatures from 37 o F to below freezing are common. Highest recorded temperature in Rogers, Arkansas was 114 °F (45.6 °C) (recorded in July 1954). The lowest temperature recorded was −16 °F (−26.7 °C), in February 1996.

The relative humidity typically ranges from 41% (comfortable) to 91% (very humid) over the course of the year, rarely dropping below 24% (dry) and reaching as high as 100% (very humid). The air is driest around April 9, at which time the relative humidity drops below 49% (comfortable) three days out of four; it is most humid around June 3, exceeding 87% (very humid) three days out of four.

Dew point is often a better measure of how comfortable a person will find the weather than relative humidity because it more directly relates to whether perspiration will evaporate from the skin, thereby cooling the body. Lower dew points feel drier and higher dew points feel more humid. Over the course of a year, the dew point typically varies from 19°F (dry) to 71°F (muggy) and is rarely below 4°F (dry) or above 74°F (very muggy). There are two periods in the year that are most comfortable: The first is between April 18 and June 6 and the second is between September 3 and October 23. The air feels neither too dry nor too muggy during these periods (https://weatherspark.com/averages/31495/Rogers-Arkansas-United-States).

Average annual rainfall for the Beaver Lake area is 45 inches per year. Precipitation is weakly seasonal, with a bimodal pattern: wet seasons in the spring and fall, and relatively drier summers and winters, but some rain in all months. The spring wet season is more pronounced than fall, with the highest rainfall typically occurring in May. The average annual snowfall for the Beaver area is about 12 inches. Snowpacks are usually short lived and are not commonly a concern for flooding.

Climate change is an area of concern due to the potential for effects on many aspects of the environment, especially those related to water resources. The U.S. Global Change Research Program (USGCRP) summarized information regarding climate change and its potential effects in regional assessments (http://www.globalchange.gov/publications/reports/scientific-assessments/us-impacts). In the Midwest,

which extends from Minnesota to Missouri, extreme events such as heat waves, droughts and heavy rainfall events are projected to occur more frequently. Should these events become significant enough to impact the operation of Beaver Lake, the Master Plan and associated documents (i.e., Operations Management Plan and Shoreline Management Plan) would be reviewed and revised, if necessary.

3.5.2 Topography, Geology, and Soils

The depositional environment of the rocks found in the Arkansas Ozarks is one of a relatively shallow continental shelf, sloping toward deeper water generally toward the south. This shelf emerged many times during the Paleozoic resulting in numerous unconformities throughout the sequence. The Ozark Plateaus region of Arkansas is made up of generally flat-lying Paleozoic age strata divided into three plateau surfaces. The lowest and northern-most plateau is the Salem Plateau. The Springfield Plateau stands above the Salem a few hundred feet and is generally capped by lower Mississippian age limestones and cherts. The southernmost and highest plateau of the Ozarks is the Boston Mountains. All of these plateaus are deeply dissected by numerous streams throughout the area. The faulting in the Ozarks is generally normal; most faults displaying a displacement down on the southern side. However, some observations reveal that a few strike-slip faults may be present. Gentle folds are noted but are generally of very low amplitude. The depositional environment of the rocks found in the Arkansas Ozarks is one of a relatively shallow continental shelf, sloping toward deeper water generally toward the south.

Beaver Lake is part of the Springfield Plateau that occupies primarily the western and southwestern flanks of the Ozark Plateau province. The Springfield Plateau in this region rises to an elevation of approximately 1400 feet and in many areas, forms extensive plains. Hilly areas occur where rivers and their tributaries cut into the plateau surface, most notably in the vicinity of the White River and Beaver Lake. As streams like the Buffalo National River cut through the plateau down to the level of the White River, they sometimes carve spectacular bluffs.

Lower Ordovician, Middle to Upper Devonian and Lower and Upper Mississippian age strata are present around Beaver Lake. Upper Ordovician and Devonian strata crop out around Beaver Lake and its tributaries. The Lower Mississippian Boone Formation comprises the surface rock over the majority of the area and forms the surface of the heavily dissected Springfield Plateau. In addition to the Boone Formation, Cotter and Jefferson City formations (Jefferson City formation has not been successfully differentiated from the Cotter Formation in Arkansas), and the Powel formation, all of Ordovician age are present in the area. Formations in the Devonian strata include the Chattanooga, Clifty and Penters.

The Boone Formation consists of gray, fine- to coarse-grained fossiliferous limestone interbedded with chert. This formation caps the higher hills in the area. Since limestone is easily dissolved by water, cave and solution (karst) features are prominent. The Boone Formation is well known for dissolutional features, such as sinkholes, caves, and enlarged fissures. Surface water may drain directly into channels in limestone, where it can move rapidly and without filtration to the surface as a spring, at a location that is unpredictable without extensive testing. Therefore, water pollution problems are of particular concern in this region. The thickness of the Boone Formation is 300 to 350 feet in most of northern Arkansas, but as much as 390 feet has been reported.

The Cotter Dolomite is composed of dolostone of predominantly two types: a fine-grained, argillaceous, earthy textured, relatively soft, white to buff or gray dolostone called "cotton rock", and a more massive, medium-grained, gray dolostone that weathers to a somewhat hackly surface texture and becomes dark on exposure. The formation contains chert, some minor beds of greenish shale, and occasional thin interbedded sandstone. The thickness is about 340 feet in the vicinity of Cotter, but the interval may range up to 500 feet thick in places.

The Powell Dolomite is generally a fine-grained, light-gray to greenish-gray, limy, argillaceous dolostone with thin beds of shale, sandstone, sandy dolostone, and occasionally chert. The formation’s thickness may be as much as 215 feet but is often much thinner.

The Chattanooga Shale Formation is typically black, fissile clay shale that weathers into thin flakes. The beds are usually cut by prominent joints creating polygonal blocks upon weathering. The upper part of the formation may be slightly sandy and usually contains abundant pyrite. Thickness ranges from 0 to about 85 feet; normally averaging about 30 feet (AGS).

The strata throughout the region are nearly horizontal. One predominant geological feature of the lake area is a low, persistent, limestone bluff, which occurs just above the Ordovician- Mississippian contact.

The faulting in the Ozarks is generally normal; most faults displaying a displacement down on the southern side. Lineaments and faults characteristic of northwest Arkansas are present around Beaver Lake. The Fayetteville Fault lies beneath Beaver Lake. This fault is the west side of a graben that has down-dropped the Boone Formation to lake level. The Starkey Fault bounds the east side of the graben. Both faults trend approximately N 450E. One section of the Starkey fault trends N 60-700E. The Clantonville Lineament – Monocline is a northeast to southwest trending structural feature that extends from north of Clantonville to Ventris Hollow. The location of this feature was determined from the 1:24,000 three dimensional quadrangle and from structural disparities in the Lower Mississippian rock units. This structural feature could be responsible for the presence of lead-zinc mineralization in an old prospect near Clantonville (north of Beaver Lake). The trend of this lineament to monocline is N 30-400E. Paleokarst features within the top of the Powell Dolomite are present around Beaver Lake and coincident with a lineament in Limekiln Hollow near Garfield, northwest of Beaver Lake.

In general, the soils of the Ozark Plateaus are residual and are formed on a broad, domed, upwarp consisting mostly of limestone and dolomite. The main difference in the soils is due to different rocks from which the soils were formed. The main geologic materials are cherty limestone; cherty, very siliceous dolomite; cherty, siliceous dolomite; and alluvium, which are weathered and water transported products of the first three materials. Glade-rock soil occurs where the cherty, very siliceous dolomite is exposed to the soil formation. Dolomite is more resistant to weathering than limestone and siliceous dolomite is even more resistant, so very shallow soil results. In areas where the dolomite is less siliceous, more weathering has taken place; however, the soils produced are not as deep as soils formed by limestone.

The following eight soils associations are found in and around the Beaver project area: Captina-Nixa, Captina-Nixa-Pickwick, Clarksville-Nixa-Baxter, Corydon-Sogn, Enders-Allegheny-Mountainburg, Razort-Captina-Etowah, Linker-Apison-Hector, and Captina-Pembroke.

3.5.3 Hydrology and Groundwater

In the Interior Highlands of western and northern Arkansas ground-water supplies are more limited than in the Coastal Plain. Much of the Ozark Plateaus region is underlain by carbonate rocks, which are quite soluble in the presence of water. Solution by ground water has caused many large openings through which water passes so quickly that contaminants from the surface cannot be filtered out. Signs of these openings are caves, sink holes, springs and lost stream segments. As a consequence, the water in shallow wells may not be suitable for human consumption without treatment.

Three aquifers, which are part of the Ozark Plateaus Aquifer System, are located within northern Arkansas. The Springfield Plateau aquifer is generally under unconfined conditions, with groundwater movement occurring through fractures and solution cavities formed by dissolution of carbonate rock. Local discharge is through springs and streams. The Ozark aquifer is generally under confined conditions, especially where overlain by the units of the Ozark Confining Unit (Chattanooga Shale). Most wells in the Springfield Plateau and upper units in the Ozark aquifer yield 5-10 gpm on the average, with yields greater than 25 gpm in rare cases.

The third aquifer, the Roubidoux Formation and the Gunter Sandstone Member of the Gasconade Formation in northern Arkansas occur at greater depth and constitute the only significant aquifer system in the Ozarks. Both are permeable sandstone and carbonate units of Ordovician age. These aquifers serve as the principal source of high-quality water for many communities in northern Arkansas where surface water sources are unavailable. Together these units may yield up to 500 gpm to wells. These formations do not outcrop anywhere in Arkansas but instead outcrop in southern Missouri.

3.5.4 Water Quality

The waters of the Arkansas portion of the White River watershed have all been designated by the Arkansas Department of Environmental Quality (ADEQ) for fisheries, primary and secondary contact recreation, and domestic, agricultural, and industrial water supplies (ADEQ, 2012). Beaver Lake is classified by ADEQ as a Type A water body, which includes most larger lakes of several thousand acres in size, in upland forest dominated watersheds, having an average depth of 30 to 60 feet, and having low primary production (i.e., having a low trophic status if in natural [unpolluted] condition). Beaver Lake, like all other lakes of its size in the Ozark region, stratifies chemically and thermally in the late spring with stratification extending into late fall and early winter. During the warmer months, lake waters of the upper layer (the epilimnion) are warmer and contain more dissolved oxygen, while the denser, lower layer waters (the hypolimnion) are colder and contain very little or no dissolved oxygen, thus undesirable for fish habitat.

This undesirable water, when discharged downstream from hydropower generation, may cause some problems in the tailwaters. To combat this problem, the dissolved oxygen content is monitored, and various management measures are implemented to improve the dissolved oxygen concentration in the hydropower releases. A highly productive trout fishery has been established in the Beaver tailwaters by the Arkansas Game and Fish Commission because of the available discharge of cold water from the dam, which is reaerated by turbulence as it flows downstream.

As the stratified epilimnion cools in the late fall and winter, the layers begin to mix (de-stratify) and dissolved oxygen (DO) is more evenly distributed. This condition is more favorable to the fishery of the lake and overall water quality.

The upper 1500 acres of Beaver Lake has been listed by the Arkansas Department of Environmental Quality (ADEQ) on Arkansas' 303(d) list of impaired waters, approved by the Environmental Protection Agency (EPA), due to turbidity (ADEQ, 2008). According to the Arkansas 303(d) list, these excessive levels impact the local fisheries as well as primary contact, both designated uses of Beaver Lake. The elevated turbidity levels are due to excessive silt from surface erosion from agriculture activities, unpaved road surfaces, in-stream erosion – mainly from unstable stream banks, and any other land surface disturbing activity. The Draft 2010 Integrated Water Quality and Monitoring Report (ADEQ, 2010) added pathogen indicator bacteria as a contaminant for the same area of Beaver Lake. Surface erosion activities are listed as the probable source for this contaminant as well.

Clean Water Act requires states to list waters that do not meet Federal water quality standards or have a significant potential not to meet standards as a result of point source dischargers or non- point source run-off. Subsequent to listing on the 303(d) list, the statute requires that the states develop and set the Total Maximum Daily Load (TMDL) for water bodies on the list within 13 years. A TMDL establishes the maximum amount of a pollutant that can enter a specific water body without violating the water quality standards. Values are normally calculated amounts based on dilution and the assimilative capacity of the water body. TMDLs have not been established by ADEQ for the upper Beaver Lake area.

3.6 Biological and Cultural Resources

3.6.1 Terrestrial Ecosystems

The area surrounding Beaver Lake is mostly forested. Trees and shrubs around the lakeshore include upland oak and hickory species, persimmon, honey locust, hawthorn, dogwood, redbud, coralberry, smooth and winged sumac, and buttonbush. Frequent periods of inundation keep a thin strip of government owned lands around the lake in early stages of succession. Red cedar and short-leafed pine, the principal evergreens, are dispersed throughout the region and are found in many large, scattered groups. Ground covers consist of greenbrier, sedges, and native grasses. White-tailed deer and eastern wild turkey are common game animals found and hunted in the Beaver Lake area. Black bears have also become common in the area and are hunted on the lands around the lake. The principal small game species found in the open upland areas include bobwhite quail, cottontail rabbit, and mourning dove. Gray and fox squirrels are common in upland wooded areas. Furbearing animals found in the Beaver Lake area include coyote, red fox, gray fox, otter, mink, muskrat, beaver, bobcat, and raccoon. Habitat management that includes wildlife food plot plantings, mowing, soil disturbance, removal of exotic species and application of prescribed fire provide benefit to these populations.

The common goldeneye, hooded merganser, bufflehead, and ring-necked duck are the predominant migratory waterfowl species visiting Beaver Lake. Mallards, gadwall, and other duck species are also present; however, they are only transient visitors as their characteristic feeding habits of obtaining food from shallow waters is limited. Resident Canada geese are so numerous in many coves and recreation areas that their presence has become a nuisance.

Ring-billed gulls are seen frequently around the Beaver Lake area. Greater and lesser yellow legs, pelicans, and large flocks of horned grebes are also seen during their peak migration in the spring and fall. Beaver Lake is also one of the few places where visitors can see both the turkey vulture and the black vulture at the same time in the winter. Beaver Lake has also become a popular place that visitors come to observe bald eagles, commonly wintering 150 or more birds and hosting 5-6 breeding pairs during the nesting period of March to June. The surrounding woodlands and grasslands serve as prime nesting areas for resident and neotropical migratory songbirds.

3.6.2 Aquatic Ecosystems and Wetlands

Walleye, smallmouth bass, striped bass, hybrid white-striped bass, , and paddlefish have been introduced into Beaver Lake to add diversity to the fishery. Natural reproduction of striped 27 bass and hybrid white-striped bass does not occur in Beaver Lake. Since 2004, AGFC stocks 28 approximately 100,000 walleye, 30,000 channel catfish, 30,000 blue catfish, and 200,000 striped 29 bass each year. While natural reproduction occurs in white crappie, black crappie, largemouth 30 bass, and smallmouth bass, AGFC supplements this reproduction by occasional stockings of these 31 species. Historically, there have also been introductions of northern pike, blue catfish, lake trout, and threadfin shad.

Located within the Springfield Plateau of the Ozark Mountains region of northern Arkansas, the area surrounding Beaver Lake is characterized by limestone, dolomite, or chert geology. The many rivers and streams flowing through the region have created a landscape of level highlands dissected by rugged valleys rich in karst features such as caves and sinkholes. Associated with these streams and landscape features are a variety of wetland habitats representative of the five wetland classes occurring within the region. These wetland classes include depressions, flats, fringe, riverine, and slope. It is possible, and perhaps even likely, that all of these classes of wetlands occur in the general area of Beaver Lake. However, those most likely to occur in the area immediately surrounding the lake are fringe (most likely reservoir), riverine (most likely spring runs) and slope wetlands (most likely calcareous slope).

3.6.3 Threatened and Endangered Species

The following species listed in Table 1 are from the U.S. Fish and Wildlife Service's federally classified status list of species and the Arkansas Natural Heritage data sets which have been reported and identified on project lands. Although the bald eagle was delisted by USFWS in 2007 due to recovery of the species, both the bald and golden eagles are still protected in accordance with the Bald and Golden Eagle Protection Act. The federal Migratory Bird Treaty Act of 1918 also provides protection to certain species of migratory birds. A total of 31 bird species are currently protected under this federal statute.

Table 1: Threatened and Endangered Species

	Federal Status	**State Status/Global Rank**
Gray Bat	LE	SE / S2S3/G4
Indiana Bat	LE	SE / /S1/G2
Northern long-eared Bat	LT	SE / S1S2/ G1G2
Ozark Big-eared Bat	LT	Not listed
Little Brown Bat	-	SE / S1
Bald Eagle	*Protected under Bald and Golden Eagle Protection Act	S3B,S4N/G5
Eastern Black Rail	LT	Not listed
Piping Plover	LT	Not listed
Rufa Red Knot	LT	Not listed
Whooping Crane	Experimental Population, Non-Essential	Not listed
Ozark Cavefish	LT	SE / S1/G3
Neosho Mucket	LE	Not Listed
Rabbitsfoot mussel	LT	SE/S3/G3G4
Snuffbox Mussel	LE	Not listed
Monarch Butterfly	C	Not listed
Missouri Bladderpod	LT	S2/G3

Opaque Prairie Sedge	-	SE / S2S3G4
Yellow Coneflower	-	ST / S2G3T3
Ovate-leaf Catchfly	-	ST / S2G3
Royal Catchfly	-	ST / S2G3

FEDERAL STATUS CODES

LE = Listed Endangered; the U.S. Fish and Wildlife Service has listed this species as endangered under the Endangered Species Act.
LT = Listed Threatened; the U.S. Fish and Wildlife Service has listed this species as threatened under the Endangered Species Act.
C = Candidate Species;

STATE STATUS CODES

INV = Inventory Element; The Arkansas Natural Heritage Commission is currently conducting active inventory work on these elements. Available data suggests these elements are of conservation concern. These elements may include outstanding examples of Natural Communities, colonial bird nesting sites, outstanding scenic and geologic features as well as plants and animals, which, according to current information, may be rare, peripheral, or of an undetermined status in the state. The ANHC is gathering detailed location information on these elements.

GLOBAL RANKS

G3 = Vulnerable globally. At moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors.
G4 = Apparently secure globally. Uncommon but not rare; some cause for long-term concern due to declines or other factors.
G5 = Secure globally. Common, widespread and abundant.
T-RANKS= T subranks are given to global ranks when a subspecies, variety, or race is considered at the state level. The subrank is made up of a "T" plus a number or letter (1, 2, 3, 4, 5, H, U, X) with the same ranking rules as a full species.

STATE RANKS

S1 = Critically imperiled in the state due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors making it vulnerable to extirpation.
S2 = Imperiled in the state due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it vulnerable to extirpation.
S3 = Vulnerable in the state due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.

GENERAL RANKING NOTES

Q = A "Q" in the global rank indicates the element's taxonomic classification as a species is a matter of conjecture among scientists.

Source: Arkansas Natural Heritage Commission

3.6.4 Cultural Resources

The records search, interviews, and site inspection identified no cultural resource assessments or findings for the subject property.

During the past seventy years scientific investigation of archaeological sites in the Beaver Lake area has been carried out in several phases. In 1922 and 1923, Mark R. Harrington of Phillip Academy was the first archeologist to excavate sites on the area that is now Beaver Lake. He excavated 13 bluff shelters. Between 1928 and 1935, the work of Harrington was continued by S.C. Dellinger of the University of Arkansas Museum. Dellinger supervised the excavation of 21 rock shelters. In the early 1960's, a series of surveys were conducted by several archeologists from the University of Arkansas Museum. Today, there are 280 known archeological sites along or immediately adjacent to Beaver Lake. Of these, 271 are identified as prehistoric, seven are historic and two sites have no known cultural affiliation.

Table 2: Historical and Cultural Resources at Beaver Lake

Type of Site	Number of sites
Historic	7
Prehistoric	271
No known cultural affiliation	2
Total	280
National Register Eligibility Status	
Not Evaluated	132
Not Eligible	5
Eligible	1

4.0 Survey Methodology

4.1 Development of Study Sections

The information gathered during the development of the ECP was used to group the subject property into standardized categories using Department of Defense (DoD) guidance, and in accordance with ASTM D5746 (2016). The ECP category definitions are summarized below in Table 3.

Table 3: Definitions of ECP Categories

ECP Category	Definition
1	An area or parcel of real property where no release, or disposal of hazardous substances or petroleum products or their derivatives has occurred (including no migration of these substances from adjacent properties).
2	An area or parcel of real property where only the release or disposal of petroleum products or their derivatives has occurred.
3	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but at concentrations that do not require a removal or remedial action.
4	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, and all remedial actions necessary to protect human health and the environment have been taken.
5	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred and removal or remedial actions, or both, are under way, but all required actions have not yet been taken.
6	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but required response actions have not yet been initiated.
7	An area or parcel of real property that is unevaluated or requires additional evaluation.

The final ECP category designations for the subject property are shown in Section 6.2, Table 5.

4.2 Visual Site Inspection

A VSI was conducted on 13 July 2021 at the subject property to check for recognized environmental conditions. The VSI was conducted by Mrs. Eugenia Barnes and Mr. Robert Singleton from the U.S. Army Corps of Engineers (USACE). USACE representatives were accompanied by Mr. Michael Hurley of the USACE Beaver Lake office.

The VSI was performed from a USACE Beaver Lake Office watercraft near the bank of the subject property as a Right of Entry (ROE) was not available at the time of the inspection. At the time of

inspection, the lake water level was 1127 ft msl, conservation pool is 1121 ft msl. Priority Area 3.1 has a private residence in the center of a cove with highly vegetated, steep bluffs and rocky shoreline. Woody debris was visible near the banks of the cove and below the overhanging ledge on the bank. At the time of the investigation there was a line running overhead and across the cove, in front of the private residence, near the mouth of the cove. There was evidence of residential use higher up on the vegetated bluff ledges and in the waters of the cove. The banks were rocky with healthy vegetation and on the surrounding bluffs mineral staining is visible. No debris could be seen from the boat and no apparent signs of Hazardous, Toxic and Radioactive Waste (HTRW) were visible during the VSI.

Priority Area 3.2 has a gently sloping boat ramp leading down to the water and running parallel to the shoreline. Private residences can be seen through the vegetation, above the rocky, sloping banks. Some woody debris and erosion are visible near the water's edge. No debris could be seen from the boat and no apparent signs of HTRW were visible during the VSI.

Photos from the VSI can be found in Appendix A.

4.3 Aerial Photography Analysis

Aerial photographs were available from Google Earth maps for 1985, 1994, 2001, 2004, 2006, 2009, 2010, 2012, 2014, 2016, 2017, 2018, and 2020.

The initial aerial photographs from 1985 to 2001 area of poor quality and the area aren't discernable. The next photo from 2006 is also of poor quality but what appears to be a boat dock can be seen in the cove area of the priority area and a residence in the adjacent area to the east side of the cove. There is no change for the photographs from 2009 to 2020 however the dock and residence are more visible due to the quality of the photographs.

All aerial photographs are included in Appendix B.

4.4 Sanborn Map Review

Sanborn maps were not available for the subject property, or for the adjacent areas.

4.5 Topographic Map Review

Historical topographic maps were available from the US Geological Survey Website for the Beaver Lake area for 1900, 1901, 1945, 1949, 1954, 1957, 1958, 1964, 1985, 2011, 2014, 2017, and 2020. Several observations can be gleaned from these maps. First, the area before the lake was formed consisted of valleys with steep bluffs and hill sides around the White River and its tributaries. The historical maps show this valley and river basin from the 1900 to 1964 topographic maps. In 1985 the river and Beaver Dam at the northern end of the lake can been seen in the valley of the historical White River.

All topographic maps are included in Appendix C.

4.6 Records Review

1.1.1 Standard Environmental Record Sources

In this evaluation records, maps and other documents that provide environmental information about the project area are obtained and reviewed. A desktop records review was conducted using various sources to determine the presence of HTRW sites on or near the subject property. This search was focused on active cleanup sites and sites with a reasonable risk of HTRW release. Several databases were searched manually to narrow down the search area. These databases included the Environmental Protection Agency (EPA) Cleanups in my Community database, the EPA Envirofacts databases, the Arkansas Department of Environmental Quality's (ADEQ) web search tool of Underground Storage Tanks (UST) and Above Ground Storage Tanks (AST), and the Arkansas Department of Energy and Environment Oil and Gas Commission oil and gas well maps. The information collected from this desktop records review was

analyzed for recognized environmental conditions (RECs) that would affect the proposed project or need further investigation, given the proposed project measures. The following resources were searched.

Federal National Priorities List (NPL) – The records search did not reveal any NPL sites in the project footprint or adjacent areas. There are nine NPL sites in the state of Arkansas, none of which are located near Beaver Lake or the priority areas. This is based on a search of the EPA Superfund: National Priorities List (NPL) list.

Federal Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) List – The CERCLIS, now called the Superfund Enterprise Management System (SEMS) database, tracks hazardous waste sites where remedial action has occurred under EPA's CERCLA program. This list also includes sites that are in the screening and assessment phase for possible inclusion on the NPL. The records search of EPA's listed SEMS sites did not reveal any sites in the project footprints or adjacent areas. This is based on a search of the EPA SEMS database.

Federal No Further Remedial Action Planned (NFRAP) – The Federal NFRAP list (now known as the SEMS archive list) tracks sites where no further remedial action is planned, based on available assessments and information. The list also represents sites that were not chosen for the NPL. Further EPA assessment could possibly be ongoing, and hazardous environmental conditions may still exist; however, in the absence of remedial action and assessment data, no determination about environmental hazards can be made. The records search did not reveal any NFRAP sites in the project footprint or adjacent areas. This is based on a search of the EPA SEMS database.

Federal Resource Conservation and Recovery Act (RCRA) Corrective Action List – The records search of EPAs Cleanups in My Community showed two RCRA Corrective Actions within one mile of the project search area. No RCRA corrective actions were found to be located within one mile of the project footprint. This is based on a search of the EPA Cleanups in My Community.

State Superfund Sites - This search is to check for any state CERCLA sites in the project vicinity. The records search of state CERCLA cleanup sites did not show any sites of concern in the project or adjacent areas. This search is based on a search of the Arkansas Department of Energy and Environment data base.

State and Tribal Solid Waste Facilities/Landfill Sites – This search is designed to check any state or tribal databases for solid waste handling facilities or landfills in the project vicinity. The records search did not find any solid waste facilities or landfill sites in area of this project or adjacent areas. This is based on a search of the EPA Landfill Methane Outreach Program (LMOP) and ADEQ Permitted Solid Waste Disposal database.

State and Tribal Registered Storage Tanks – This list is a combination of the State of Arkansas registered UST and AST databases, representing sites with storage tanks registered with the State of Arkansas. The search revealed one AST within one mile of the work area or adjacent areas. This AST is not expected to impact the project due to its distance from the proposed project. These results are based on a search of the Arkansas Department of Energy and Environment Oil and Gas Commission website.

State and Tribal Voluntary Cleanup Sites – The ADEQ Elective Site Cleanup Agreement (ESCA) database identifies sites where the responsible party chooses to clean up the site themselves with ADEQ oversight. Five sites were identified from this database. None of the sites are within one mile of the work area and are therefore not expected to impact the proposed project. These results are based on a search of the ADEQ ESCA Database.

Brownfields List – A brownfield is a property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. There are no brownfield sites within one mile of the work area or adjacent areas. These results are based on a search for Brownfields sites using the EPA Envirofacts search engine.

Oil and Gas Wells – A search of the oil and gas wells in the area using the Arkansas Department of Energy and Environment Oil and Gas Commission website identifies multiple sites including oil wells, plugged oil wells, injection/disposal sites within the surrounding area. Although not classified as HTRW under USACE regulations, pipelines and oil wells play an important role in the HTRW existing conditions near the potential project area. This is because the well and/or pipeline contents could potentially leak or spill into the surrounding environment or affect the proposed project features. As a result of these findings, a thorough pipeline/well search should be initiated during design to ensure no interaction with the existing oil and gas infrastructure occurs. The Oil and Gas Commission website was used to map these findings. No oil wells or pipelines were found near the priority areas.

4.7 Interviews

Two interviews were conducted on 12 and 13 July 2021 in conjunction with the site inspection, and the following stakeholders were interviewed:

- Mr. Matthew Franklin; Natural Resource Specialist, Beaver Lake Office; Matthew.G.Franklin@usace.army.mil
- Mr. Matthew Voskamp; Natural Resource Specialist, Beaver Lake Office; Matthew.Voskamp@usace.army.mil

Information gleaned from the interviews is incorporated by way of reference throughout the report. The interview questions can be found in Figure 3.

5.0 Environmental Conditions

5.1 Environmental Permits and Licenses

5.1.1 RCRA Status

The subject property is not covered under a Resource Conservation and Recovery Act (RCRA) permit, and no hazardous waste is generated or stored on the property.

5.1.2 Solid Waste

The subject property has no active, inactive, or expired permits or licenses for solid waste disposal. No landfills exist on the property.

5.1.3 USTs/ASTs

No USTs or ASTs were found during the records search, site inspection and interviews indicated no UST/AST have been known to be located at the subject property.

5.1.4 National Pollutant Discharge Elimination System (NPDES)

Section 402 of the Clean Water Act (33 U.S.C. 1251 et. seq.) requires all facilities that discharge stormwater to acquire an NPDES that defines contaminant limits in effluent to be discharged. As per the Beaver Lake Shoreline Management Plan no discharge of any type of effluent is prohibited in the waters of Little Rock District Lakes including Beaver Lake and its tributaries.

5.1.5 Drinking Water Permits

No drinking water permits are in place at the subject property.

5.1.6 Air Permits

No air emission or air quality permits are in place at the subject property.

5.1.7 Nuclear Regulatory Commission (NRC)

The NRC is tasked with permitting the use and handling of radioactive materials and reactors. No NRC licenses are in place at the subject property.

5.1.8 Other Permits/ Licenses

The property has an erosion control permit issued by the USACE Beaver Lake office for the retaining wall.

5.2 Environmental Cleanup and Remediation

5.2.1 Installation Restoration Program

Beaver Lake is not an active military facility, and therefore would not be eligible for cleanup under the Installation Restoration Program.

5.2.2 Military Munitions Response Program

Beaver Lake is not an active military facility, and therefore would not be eligible for cleanup under the Military Munitions Restoration Program.

5.2.3 Other Environmental Investigations and Cleanups

No known environmental investigations or cleanups were found during the records search, site inspection and interviews indicated that no known investigations or cleanups are ongoing at Beaver Lake.

5.2.4 Storage, Release, and Disposal of Hazardous Substances

No releases to the environment or improper disposal of these substances were found during the records search, site inspection and interviews indicated no known improper disposal at the priority area.

5.3 Petroleum and Petroleum Products

No releases to the environment or improper disposal of petroleum products were found during the records search, site inspection and interviews indicated no known improper disposal at the priority area.

5.4 Polychlorinated Biphenyls (PCBs)

No evidence exists of the presence of PCBs on the subject property. No PCB-containing oils were found during the records search, site inspection and interviews indicated no known PCB-containing oils have been used or stored at the priority area.

5.5 Asbestos

No asbestos assessments were found during the ECP process, none were found during the records search, site inspection and interviews indicated no known asbestos containing material has been used or stored at the priority area.

5.6 Lead and Lead-Based Paint (LBP)

No lead-based paint (LBP) assessments were found during the ECP process. No LBP was found during the records search, site inspection and interviews indicated no known improper disposal at the priority area.

5.7 Radioactive Material

No radioactive material assessments were found during the ECP process. No potentially radioactive materials were identified during the VSI, and the presence of radioactive materials on the subject property is extremely unlikely.

5.8 Landfills/Dumps

No landfills or dumps were found during the records search, site inspection or interview investigation.

5.9 Munitions and Explosives of Concern (MEC) and/or Unexploded Ordnance (UXO)

No munitions, explosives, or unexploded ordinance (UXO) were found during the records search, site inspection or interview investigation.

5.10 Radon

Beaver Lake spans across Benton, Washington and Carroll Counties. Washington County is in the Environmental Protection Agency (EPA) Radon Zone 3. Counties in Radon Zone 3 are counties with predicted average indoor radon screening levels of less than 2 pCi/L (EPA, 2018). Benton and Carroll Counties are in the EPA Radon Zone 2 with a predicted average indoor radon level between 2 and 4 pCi/L (EPA, 2018). No radon assessments were found during the records search (EPA, 2019).

5.11 Pesticides

No records were found to indicate the storage, improper use, or disposal of pesticides on the subject property.

5.12 Other Identified Concerns

No significant other concerns were found during the records search, site inspection or interviews.

5.13 National Environmental Policy Act (NEPA)

As the federal agency in charge of this project USACE is in charge of coordinating National Environmental Policy Act (NEPA) compliance of 1969 (Public Law 91-190), the Council on Environmental Quality (CEQ) regulations (40 CFR 1500–1508), and the USACE implementing regulations, Policy and Procedures for Implementing NEPA, ER 200-2-2. As part of the records search and interview process recent NEPA documents were reviewed including the 2018 Draft Environmental Assessment for the Beaver Lake Master Plan Revision.

5.14 Adjacent Properties

As part of the ECP process, adjacent properties are assessed for environmental conditions, and those discovered conditions are evaluated based on the potential to affect the subject property. The nearest structure to Priority Area 3.1 is the private residence situated in the middle of it. For Priority Area 3.2, there are multiple structures or residences within 0.05 miles of the subject property and there is also a boat ramp in the middle of the area. The residences sit above the shoreline on land that appears to have cleared. The dock is first seen in 2006, along with a residence in the adjacent parcel to the east. The other

residences were visible, beginning in 2020, based on historical aerial photographs. There are additional residences in neighboring plots of land directly adjacent to Priority Area 3. The adjacent properties are unlikely to pose any HTRW concerns to the priority area.

6.0 Evaluation and Conclusions

6.1 Summary of ECP

Beaver Lake currently occupies more than 38,000 acres of Federal public lands and waters. The Lake is located in northwestern Arkansas, in Benton, Washington, Madison and Carroll Counties and it is approximately 6 miles west of Eureka Springs, Arkansas. This ECP report covers 0.37 acres of land located off a southeastern branch of Beaver Lake, called Big Clifty Creek, on northern shore. The subject property is two sections of land along a lower order branch of the creek. It is currently owned by private landowner(s). The subject property, also known as Priority Area 3, is in Carroll County near the mouth of Penitentiary Hollow, downstream from the Big Clifty recreation area and boat ramp.

This ECP report was prepared to characterize the existing environmental conditions at the subject property and is intended to be an aid in the leasing of real property. The ECP findings are based on the available sources of information concerning both past and present uses of the subject property. Information included readily available data associated with adjacent property records, aerial photography, personnel interviews, environmental programs and associated documentation, and current and historic investigations. In addition, record sources were reviewed to determine if there have been spills, leaks, discharges, leaching, underground injections, dumping, abandonments, or storage of hazardous substances or petroleum products at the installation. The VSI and interview process included inquiries and requests into the existence and availability of records that support the environmental condition of the property.

6.2 Conclusions

The subject property was classified into one of seven standard ECP area types (categories) as defined by ASTM D5746-98(2016) *Standard Classification of Environmental Condition of Property Area Types for Defense Base Closure and Realignment Facilities*. Below are the seven categories for reference.

Table 4: Definitions of ECP Categories

ECP Category	Definition
1	An area or parcel of real property where no release, or disposal of hazardous substances or petroleum products or their derivatives has occurred (including no migration of these substances from adjacent properties).
2	An area or parcel of real property where only the release or disposal of petroleum products or their derivatives has occurred.
3	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but at concentrations that do not require a removal or remedial action.
4	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, and all remedial actions necessary to protect human health and the environment have been taken.
5	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred and removal or remedial actions, or both, are under way, but all required actions have not yet been taken.

6	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but required response actions have not yet been initiated.
7	An area or parcel of real property that is unevaluated or requires additional evaluation.

Given these seven categories, the subject property is categorized below, along with the reasoning for each classification.

Table 5: Properties and ECP Categories

Acreage	ECP Category	Reasoning
0.37 ac.	1	No release or disposal of hazardous substances or petroleum products or their derivatives has occurred beyond de minimus amounts, including no migration of these substances from adjacent properties.

No release or disposal of hazardous substances or petroleum products or their derivatives has occurred beyond de minimus amounts on the subject property and no releases to the environment were observed or reported.

Asbestos assessments were not available for the subject property. It is unlikely that Asbestos Containing Material (ACM) is present but, in the future, if a building or structure will be disturbed, a licensed asbestos inspector is needed to confirm whether ACM is present or not.

7.0 Certification

I declare that, to the best of our professional knowledge and belief, we meet the definition of *Environmental professional* as defined in Part 312.10 of 40 CFR 312. We have the specific qualifications based on education, training, and experience to assess a property of the nature, history and setting of the subject property. We have developed and performed the appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312. All information/documentation provided accurately reflects the condition of the property. This report meets the DoD requirements for completion of an ECP Report.

_____ _____

Eugenia Barnes
Environmental Protection Specialist
U.S. Army Corps of Engineers
Fort Worth District

Date

_____ _____

Jennifer Jefcoat
Chemist
U.S. Army Corps of Engineers
Fort Worth District

Date

_____ _____

Hollie Eljizi
Environmental Engineer
U.S. Army Corps of Engineers
Fort Worth District

Date

8.0 References

American Society for Testing and Materials (ASTM), 2013. E1527-13, *Standard Practice for Environmental Site Assessments: Phase 1 Environmental Site Assessment Process*.

ASTM, 2016. D5746, *Standard Classification of Environmental Condition of Property Area Types for Defense Base Closure and Realignment Facilities*.

Department of the Army, 13 December 2007. Army Regulation 200-1. *Environmental Quality: Environmental Protection and Enhancement.*

Environmental Protection Agency (EPA), February 2019. *EPA Map of Radon Zones including State Radon Information and Contacts*. https://www.epa.gov/radon/find-information-about-local-radon-zones-and-state-contact-information#radonmap

Federal Emergency Management Agency (FEMA), 2019. FEMA Flood Map Service Center. https://msc.fema.gov/portal

USACE. 1993. White River Basin, Arkansas and Missouri, *Water Control Master Manual.*

USACE. 2013. Little Rock District Water Management website. Accessed at: www.swl-wc.usace.army.mil

United States Census Bureau. 2013. Easy Facts Website. Accessed at: http://www.census.gov/easystats/

USACE. 2018. Beaver Lake White River and Tributaries, *Arkansas Shoreline Management Plan.*

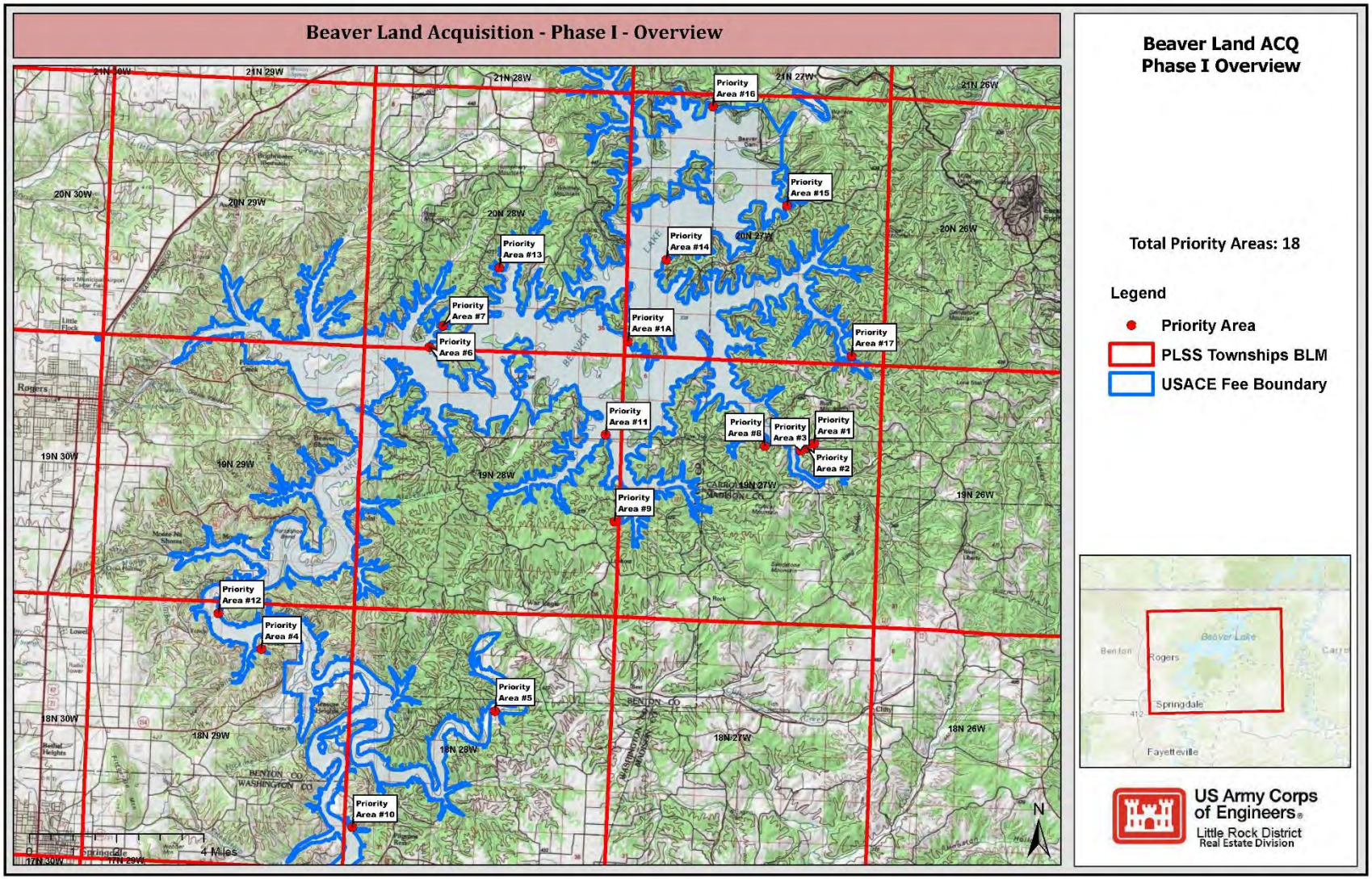
Arkansas Department of Energy and Environment Oil and Gas Commission website Accessed August 2021 at: Commission, http://www.aogc.state.ar.us/maps/googleEarth.aspx

Beaver Watershed Alliance (BWA), 2012. *Beaver Lake Watershed Protection Strategy.*

Arkansas Department of Energy and Environment for Environmental Quality website Accessed August 2021 at: https://www.adeq.state.ar.us/rst/programs/fees/facility_data.aspx

Figures

Figure 1: Beaver Lake Priority Areas



ACQ = Acquisition; PLSS = Public Land Survey System; BLM = Bureau of Land Management

Figure 2: Subject Property Detail

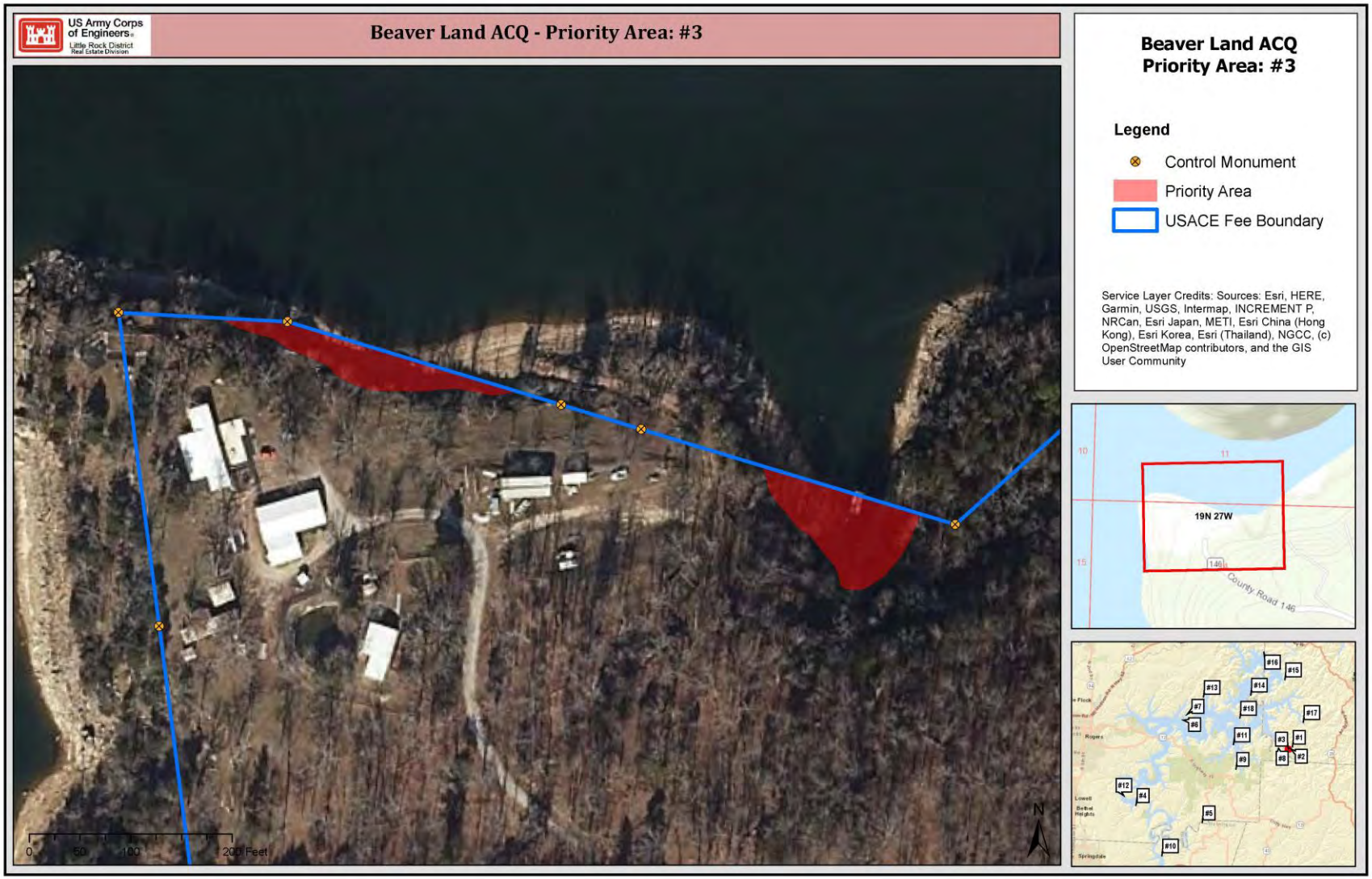


Figure 3: Interview Questions

Beaver Lake ECP
Interview Questions

1. Do you know of any environmental issues with this property?
2. Do you know of, or have access to, any reports concerning the environmental condition of this property? (i.e. site assessments, permits, storage tank registrations, safety plans, etc.) If so, would you be able to provide them? SWPPPs, SPCCs, air permits?
3. Do you know how this property has been historically used?
4. What is the property currently used for?
5. When were the site buildings constructed?
6. Are hazardous materials or petroleum products stored or used on this site? If so, what is the RCRA EPA ID? Does fueling occur on this property?
7. Do you know of any asbestos or LBP on the property or its buildings? Do you know the age of the buildings?
8. Has the site layout been manipulated in your recollection? (i.e. grading, excavation, etc.)?
9. Are there or have there been any cultural/historic items or buildings found on the property?
10. Is there anything else environmentally relevant that we should know?

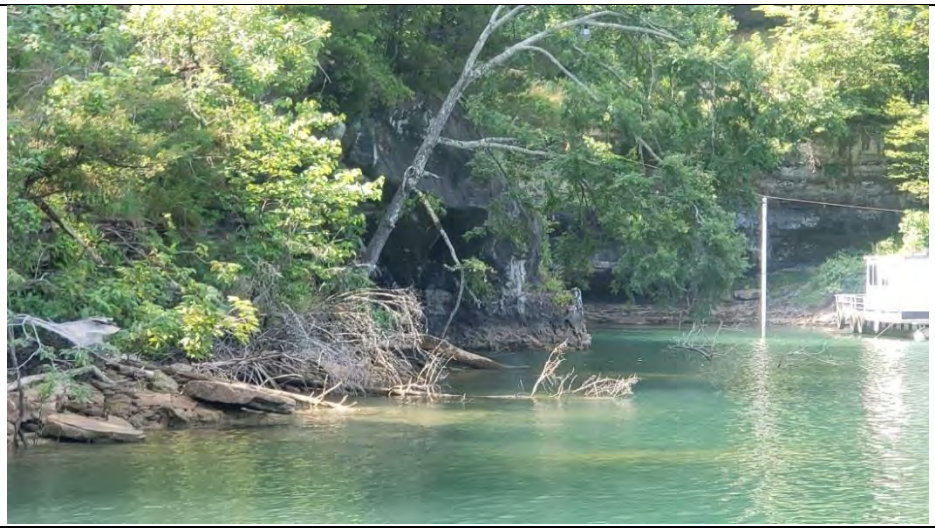
Appendix A: Visual Site Inspection Photographs

13 July 2021

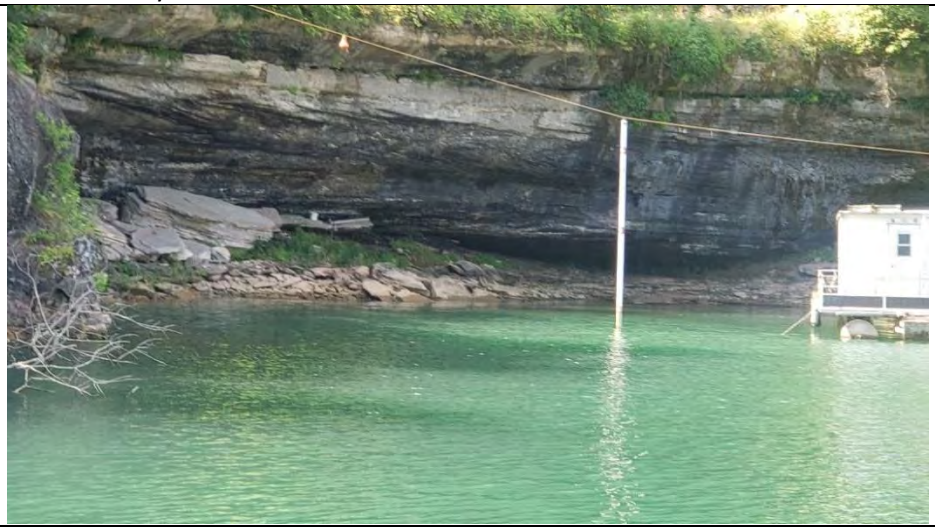
Priority Area 3.1 – Shoreline view

Priority Area 3.1 – Private residence

Priority Area 3.1 – Shoreline view



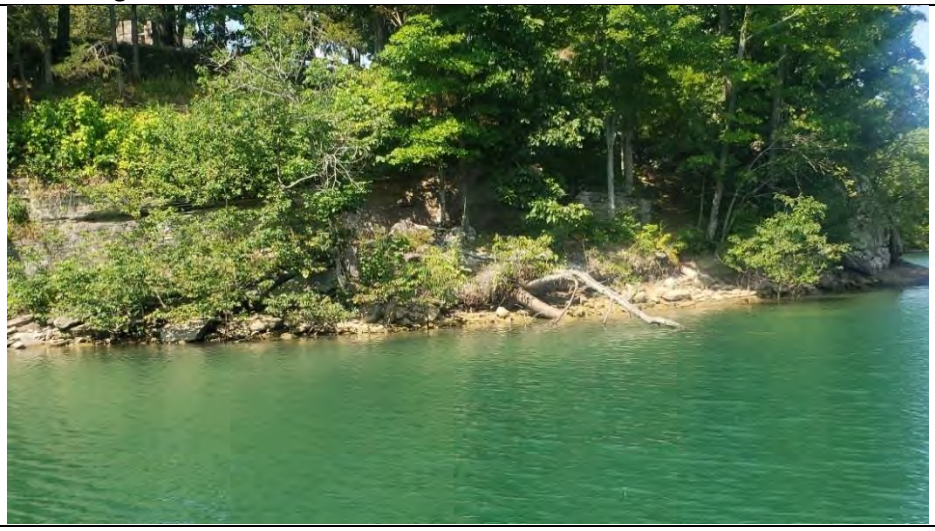
Priority Area 3.1 – Woody debris



Priority Area 3.1 – Overhanging ledge

Priority Area 3.1 – Evidence of residential use along bluff

Priority Area 3.1 – Vegetation above bluff



Priority Area 3.1 – Shoreline view

Priority Area 3.2 – Shoreline view with residences visible

Priority Area 3.2 – Shoreline view

Priority Area 3.2 – Some Erosion along shoreline

Priority Area 3.2 – Boat ramp

Priority Area 3.2 – Clarity and quality of water

Final

U.S. Army Environmental Condition of Property Report
Priority Area 4

Beaver Lake
Beaver Lake, Arkansas

August 30, 2021

Prepared For:
Beaver Lake Land Acquisition

Prepared By:
U.S. Army Corps of Engineers
Regional Planning and Environmental Center
Fort Worth District
Fort Worth, Texas

[This page is intentionally left blank.]

Table of Contents

List of Appendices:
Appendix A: Visual Site Inspection Photographs, 13 July 2021.
Appendix B: Historical Aerial Photography.
Appendix C: Historical Topographic Maps.

List of Acronyms

ACM	Asbestos-containing material
AR	Army Regulation
AST	Aboveground storage tank
ASTM	American Society for Testing and Materials
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CFR	Code of Federal Regulations
DoD	Department of Defense
ECP	Environmental Condition of Property
EDR	Environmental Data Resources, Inc.
EPA	Environmental Protection Agency
ERNS	Emergency Response Notification System
FAA	Federal Aviation Administration
HTRW	Hazardous, Toxic and Radioactive Waste
IRP	Installation Restoration Program
LBP	Lead-based Paint
LUST	Leaking underground storage tank
MEC	Munitions and Explosives of Concern
NEPA	National Environmental Policy Act
NFRAP	No Further Remedial Action Planned
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NRC	Nuclear Regulatory Commission
ODEQ	Oklahoma Department of Environmental Quality
OWS	Oil-water separator
PCB	Polychlorinated Biphenyl
POL	Petroleum, Oils, and Lubricants
RCRA	Resource Conservation and Recovery Act
SEMS	Superfund Enterprise Management System
SF	Square feet
SHWS	State Hazardous Waste Sites
SWPPP	Stormwater Pollution Prevention Plan
TSD	Transport, Storage, Disposal
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
UST	Underground storage tank
UXO	Unexploded Ordnance
VCP	Voluntary Cleanup Program
VSI	Visual site inspection

1.0 Executive Summary

This environmental condition of property (ECP) report has been prepared to document the environmental conditions and provide information for the acquisition of land that would be necessary for the operation, maintenance, and control of the Beaver Lake reservoir in Arkansas. This fee acquisition pertains to the frequently inundated land immediately surrounding the lake, below an elevation of 1128 ft above mean sea level (msl). The Army prepares an ECP in order to provide the public with information relative to the environmental condition of the property, assist Federal agencies during the property screening process, provide information about completed remedial and corrective actions at the property, and to assist in determining appropriate responsibilities, asset valuation, and liabilities with other parties to a transaction.

Beaver Lake currently occupies more than 38,000 acres of Federal public lands and waters. This ECP report covers approximately 0.6 acres of land located on the southwest edge of Beaver Lake. The subject property is on the edge of the lake and currently owned by private landowner(s). The lake is located in northwestern Arkansas, in Benton, Washington, Madison and Carroll Counties, and it is approximately 6 miles west of Eureka Springs, Arkansas. The subject property, also known as Priority Area 4, is located in a cove of Nelson Hollow in the southwestern region of the lake.

This ECP report presents a summary of readily available information on the environmental conditions of, and concerns relative to, the land, facilities, and real property assets of Beaver Lake. The findings included in the report are based on a record search of historical environmental investigation reports and site historical documents, a review of aerial photography, stakeholder interviews, and a site inspection conducted 12 – 13 July 2021.

Based on the environmental conditions found and the ECP analysis, the property can be categorized as an ECP Category 1, indicating a site where no release, or disposal of hazardous substances or petroleum products or their derivatives has occurred (including no migration of these substances from adjacent properties).

2.0 Purpose

2.1 General

This environmental condition of property (ECP) report has been prepared to document the environmental conditions and provide information for the acquisition of land surrounding Beaver Lake in Benton, Washington, Madison and Carrol Counties, Arkansas. This report meets the requirements of Title 40, Code of Federal Regulations (CFR), Part 373, and United States Army Regulation (AR) 200-1 (2007), *Environmental Quality, Environmental Protection and Enhancement*. The ECP report also follows the American Society for Testing and Materials (ASTM) E1527-13 *Standard Practice for Environmental Site Assessments: Phase 1 Environmental Site Assessment Process*. The subject property in this report is subsequently categorized according to ASTM D5746 (2016) *Standard Classification of Environmental Condition of Property Area Types for Defense Base Closure and Realignment Facilities*.

The Army prepares an ECP for the following purposes:

- Provide the public with information relative to the environmental condition of the property.
- Assist Federal agencies during the property screening process.
- Provide information to prospective buyers.
- Provide information about completed remedial and corrective actions at the property.
- Assist in determining appropriate responsibilities, asset valuation, and liabilities with other parties to a transaction.

The ECP contains the information required to comply with the provisions of 40 CFR, Part 373 that require a notice to accompany contracts for the sale of, and deeds entered into for the transfer of, federal property on which hazardous substances may have been stored, released or disposed. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) §120(h) stipulates that a notice is required if certain quantities of designated hazardous substances have been stored on the property.

The ECP Report is not prepared to satisfy a real property purchaser's duty to conduct an "all-appropriate inquiry" to establish an "innocent purchaser defense" to CERCLA 107 liability. Any such use of the ECP Report by any party is outside the control of the Army and beyond the scope of the ECP Report. The Army, its officers, employees or contractors makes no warranties or representations that any ECP Report satisfies any such requirements for any party.

2.2 Scope

Priority Area 4 occupies approximately 0.63 acres of land. This ECP report covers 0.63 acres of land located within the region of the lake. Priority Area 4 is comprised of a memorial commemorating Eden Bluff with possible construction, with a newly appearing dock. There is access via watercraft, with no right of entry. Areas within the lake that are not within the Priority Area will be considered adjacent property. A general site location map is provided in Figure 1, and a map showing the subject property is shown in Figure 2.

2.3 Limitations

This ECP report presents a summary of readily available information on the environmental conditions of, and concerns relative to, the land, facilities, and real property assets of the subject property. The findings included in the report are based on a record search of available historical environmental investigation reports and site historical documents, a review of aerial photography, stakeholder interviews, and a site reconnaissance conducted 12 – 13 July 2021. Historical environmental investigation reports and site historical documents were reviewed in support of this ECP, and the information obtained from other studies is reflected within this report by reference. The ECP process recognizes that the condition of property and classification can change as historical contamination is cleaned up (if required) or if a new

source of contamination is identified. Records reviewed during the assessment were accepted as accurate and a reasonable effort was made to resolve discrepancies identified during the document review.

During the ECP assessment, all available sources of information concerning both past and present environmentally significant uses of the property were reviewed. This included readily available data associated with adjacent property records; 1985, 1994, 2001, 2004, 2006, 2009, 2010, 2012, 2014, 2016, 2017, 2018, and 2020 aerial photography; personnel interviews; current and historic investigations; and topographical maps. In addition, record sources were reviewed to determine if there have been spills, leaks, discharges, leaching, underground injection, dumping, abandonment, or storage of hazardous substances or petroleum products at the subject property. The site reconnaissance and interview process included inquiries and requests into the existence and availability of records that support the environmental condition of the property. The site reconnaissance included a Visual Site Inspection (VSI) of the subject property. No sampling or analysis was conducted during this survey.

2.4 Report Organization

The remainder of this ECP report is organized as follows:

Section 3 – Property Description: This section provides location and description of the subject property; an overview of historical and current land uses; and a description of the environmental setting of the airport, including climate, topography, geology, and demography.

Section 4 – Survey Methodology: This section describes the methods used to obtain the information for this ECP Report such as the development of study sections, the VSI, aerial photography analysis, records review, interviews, and data management.

Section 5 – Environmental Conditions: This section provides the existing environmental information. The findings are organized by relevant environmental "issues," including permits and licenses, cleanup activities, hazardous substances, petroleum and related products, asbestos, lead-based paint (LBP), radioactive materials, landfills, explosive contaminated structures, radon, pesticides, and polychlorinated biphenyls (PCBs). This section also includes adjacent property descriptions.

Section 6 – Evaluation and Conclusions: This section provides a summary of the subject property and evaluates the property for categorization as per ASTM D5746 (2016).

Section 7 – Certification: This section documents the approval of the ECP report.

Section 8 – References: This section provides an inventory of the reference material used in the preparation of this ECP Report.

Appendices: A list of appendices is provided in the Table of Contents.

3.0 Property Description

3.1 Parcel Locations and Description

Beaver Lake is located in the scenic Ozark Mountain region of northwestern Arkansas in Benton, Washington, Carroll and Madison counties. The total area currently contained in the Beaver project, including both land and water surface, consists of 38,138 acres owned in fee. Of this total, 1,432 acres are in flowage easement. The proposed Land Acquisition would include adding any land below the 1128 msl water level. The White River drainage area above Beaver Lake is approximately 1,186 square miles. When the lake is at the top of the conservation pool (elevation 1120.43 ft msl), the water area is 28,299 surface acres with 490 miles of shoreline within the lands owned in fee. The shoreline is irregular with topography primarily consisting of steep bluffs and gentle slopes.

Priority Area 4 is a 0.63 acre strip of land along the lake shoreline in a cove of the Nelsons Hollow area. There is a covered boat dock located in the footprint of the priority area but is otherwise undisturbed. The subject property is on the edge of the lake and currently owned by private landowner(s).

3.2 Historic Land Use

Beaver Lake is a multiple purpose water resource development project initially authorized for flood control, hydropower generation and other beneficial uses by the Flood Control Act dated 3 September 1954. The inclusion of storage in the lake for municipal and industrial water supply was authorized by the Water Supply Act of 1958. Beaver Lake is a major component of a comprehensive plan for water resource development in the White River Basin of Arkansas and Missouri. Construction of Beaver Dam was initiated in March 1960. The dam was completed in June 1966, and the powerhouse and switchyard were completed in 1965. Beaver Lake was declared operational for public use in 1965.

The historical aerial photography shows that Priority Area 4 has been used for private residence as far back as 1994.

3.3 Current Land Use

Beaver Lake is located in the Ozark Highlands of Carroll, Washington, Benton, and Madison Counties. Having 490 miles of shoreline (at conservation pool) and over 28,000 water surface acres, Beaver Lake is the largest reservoir in northwest Arkansas and the first federal impoundment on the White River.

There are 12 public use areas around Beaver Lake. There are 11 parks on the lake presently operated by the Corps of Engineers. The State of Arkansas owns and operates Hobbs State Park Conservation Area, which covers 12,056 acres, and Devil's Eyebrow Natural Area, which covers 2,503 acres. Both properties are adjacent to USACE lands. There are two parks, Ventris, and Blue Springs that have been reduced to lake access only. One Park (Big Clifty) is operated by Carroll County, Arkansas.

Despite being located adjacent to the fast-growing communities of Fayetteville, Springdale, Bentonville, and Rogers, Arkansas and a regional population of over 500,000, the lake provides open spaces and a quality outdoor recreation opportunity. Many arms and coves of the lake offer secluded areas for traditional activities such as fishing, skiing, sailing and scuba diving, but also allow for passive recreation opportunities like photography and nature observation.

Priority Area 4 remains a private residential property.

3.4 Utilities

Priority Area 4 has no known utilities.

3.5 Environmental Setting

3.5.1 Climate

The climate in the Beaver Lake area is classified as humid subtropical according to the Köppen climate model. A humid subtropical climate is characterized by hot, usually humid summers and mild to cool winters. The Köppen definition of this climate is for the coldest month's mean temperature to be between 26.6 °F (−3 °C) and 64.4 °F (18 °C), and the warmest month to be above 71.6 °F (22 °C). Some climatologists prefer to use 32 °F (0 °C) as the lower bound for the coldest month's mean temperature. Under the modern Trewartha climate classification, climates are termed Humid Subtropical when they have mean temperatures of 50 °F (10 °C) for eight or more months a year. In most locations classed within this system, the mean temperature of the coldest month is between 35 °F (3 °C) and 65 °F (18 °C). Some climatologists consider the Trewartha grouping of subtropical climates to be more real-world and fitting on a global scale.

While technically classified as humid subtropical, the climate in the Beaver Lake area is considered moderate. The area experiences all four seasons and does receive cold air masses from the north; however, some of the Arctic masses are blocked by the higher elevations of the Ozarks.

Average temperatures range from a high of 88 °F (31.1 °C) and low of 27 °F (-2.7 °C) in nearby Rogers, Arkansas. Extreme temperatures rarely exceed 96 °F (35.6 °C) and 13°F (-10.6 °C). Late summer is the time of maximum heat and least rainfall. During the winter months, midday temperatures in the basin are relatively warm, around 55 o to 60 o F. Some short periods of cold weather occur with temperature ranging from 0 o to 10 o F. On winter nights, temperatures from 37 o F to below freezing are common. Highest recorded temperature in Rogers, Arkansas was 114 °F (45.6 °C) (recorded in July 1954). The lowest temperature recorded was −16 °F (−26.7 °C), in February 1996.

The relative humidity typically ranges from 41% (comfortable) to 91% (very humid) over the course of the year, rarely dropping below 24% (dry) and reaching as high as 100% (very humid). The air is driest around April 9, at which time the relative humidity drops below 49% (comfortable) three days out of four; it is most humid around June 3, exceeding 87% (very humid) three days out of four.

Dew point is often a better measure of how comfortable a person will find the weather than relative humidity because it more directly relates to whether perspiration will evaporate from the skin, thereby cooling the body. Lower dew points feel drier and higher dew points feel more humid. Over the course of a year, the dew point typically varies from 19°F (dry) to 71°F (muggy) and is rarely below 4°F (dry) or above 74°F (very muggy). There are two periods in the year that are most comfortable: The first is between April 18 and June 6 and the second is between September 3 and October 23. The air feels neither too dry nor too muggy during these periods (https://weatherspark.com/averages/31495/Rogers-Arkansas-United-States).

Average annual rainfall for the Beaver Lake area is 45 inches per year. Precipitation is weakly seasonal, with a bimodal pattern: wet seasons in the spring and fall, and relatively drier summers and winters, but some rain in all months. The spring wet season is more pronounced than fall, with the highest rainfall typically occurring in May. The average annual snowfall for the Beaver area is about 12 inches. Snowpacks are usually short lived and are not commonly a concern for flooding.

Climate change is an area of concern due to the potential for effects on many aspects of the environment, especially those related to water resources. The U.S. Global Change Research Program (USGCRP) summarized information regarding climate change and its potential effects in regional assessments (http://www.globalchange.gov/publications/reports/scientific-assessments/us-impacts). In the Midwest, which extends from Minnesota to Missouri, extreme events such as heat waves, droughts and heavy rainfall events are projected to occur more frequently. Should these events become significant enough to impact the operation of Beaver Lake, the Master Plan and associated documents (i.e. Operations Management Plan and Shoreline Management Plan) would be reviewed and revised, if necessary.

3.5.2 Topography, Geology, and Soils

The depositional environment of the rocks found in the Arkansas Ozarks is one of a relatively shallow continental shelf, sloping toward deeper water generally toward the south. This shelf emerged many times during the Paleozoic resulting in numerous unconformities throughout the sequence. The Ozark Plateaus region of Arkansas is made up of generally flat-lying Paleozoic age strata divided into three plateau surfaces. The lowest and northern-most plateau is the Salem Plateau. The Springfield Plateau stands above the Salem a few hundred feet and is generally capped by lower Mississippian age limestones and cherts. The southernmost and highest plateau of the Ozarks is the Boston Mountains. All of these plateaus are deeply dissected by numerous streams throughout the area. The faulting in the Ozarks is generally normal; most faults displaying a displacement down on the southern side. However, some observations reveal that a few strike-slip faults may be present. Gentle folds are noted but are generally of very low amplitude. The depositional environment of the rocks found in the Arkansas Ozarks is one of a relatively shallow continental shelf, sloping toward deeper water generally toward the south.

Beaver Lake is part of the Springfield Plateau that occupies primarily the western and southwestern flanks of the Ozark Plateau province. The Springfield Plateau in this region rises to an elevation of approximately 1400 feet and in many areas, forms extensive plains. Hilly areas occur where rivers and their tributaries cut into the plateau surface, most notably in the vicinity of the White River and Beaver Lake. As streams like the Buffalo National River cut through the plateau down to the level of the White River, they sometimes carve spectacular bluffs.

Lower Ordovician, Middle to Upper Devonian and Lower and Upper Mississippian age strata are present around Beaver Lake. Upper Ordovician and Devonian strata crop out around Beaver Lake and its tributaries. The Lower Mississippian Boone Formation comprises the surface rock over the majority of the area and forms the surface of the heavily dissected Springfield Plateau. In addition to the Boone Formation, Cotter and Jefferson City formations (Jefferson City formation has not been successfully differentiated from the Cotter Formation in Arkansas), and the Powel formation, all of Ordovician age are present in the area. Formations in the Devonian strata include the Chattanooga, Clifty and Penters.

The Boone Formation consists of gray, fine- to coarse-grained fossiliferous limestone interbedded with chert. This formation caps the higher hills in the area. Since limestone is easily dissolved by water, cave and solution (karst) features are prominent. The Boone Formation is well known for dissolutional features, such as sinkholes, caves, and enlarged fissures. Surface water may drain directly into channels in limestone, where it can move rapidly and without filtration to the surface as a spring, at a location that is unpredictable without extensive testing. Therefore, water pollution problems are of particular concern in this region. The thickness of the Boone Formation is 300 to 350 feet in most of northern Arkansas, but as much as 390 feet has been reported.

The Cotter Dolomite is composed of dolostone of predominantly two types: a fine-grained, argillaceous, earthy textured, relatively soft, white to buff or gray dolostone called "cotton rock", and a more massive, medium-grained, gray dolostone that weathers to a somewhat hackly surface texture and becomes dark on exposure. The formation contains chert, some minor beds of greenish shale, and occasional thin interbedded sandstone. The thickness is about 340 feet in the vicinity of Cotter, but the interval may range up to 500 feet thick in places.

The Powell Dolomite is generally a fine-grained, light-gray to greenish-gray, limy, argillaceous dolostone with thin beds of shale, sandstone, sandy dolostone, and occasionally chert. The formation’s thickness may be as much as 215 feet but is often much thinner.

The Chattanooga Shale Formation is typically black, fissile clay shale that weathers into thin flakes. The beds are usually cut by prominent joints creating polygonal blocks upon weathering. The upper part of the

formation may be slightly sandy and usually contains abundant pyrite. Thickness ranges from 0 to about 85 feet; normally averaging about 30 feet (AGS).

The strata throughout the region are nearly horizontal. One predominant geological feature of the lake area is a low, persistent, limestone bluff, which occurs just above the Ordovician- Mississippian contact.

The faulting in the Ozarks is generally normal; most faults displaying a displacement down on the southern side. Lineaments and faults characteristic of northwest Arkansas are present around Beaver Lake. The Fayetteville Fault lies beneath Beaver Lake. This fault is the west side of a graben that has down-dropped the Boone Formation to lake level. The Starkey Fault bounds the east side of the graben. Both faults trend approximately N 450E. One section of the Starkey fault trends N 60-700E. The Clantonville Lineament – Monocline is a northeast to southwest trending structural feature that extends from north of Clantonville to Ventris Hollow. The location of this feature was determined from the 1:24,000 three dimensional quadrangle and from structural disparities in the Lower Mississippian rock units. This structural feature could be responsible for the presence of lead-zinc mineralization in an old prospect near Clantonville (north of Beaver Lake). The trend of this lineament to monocline is N 30-400E. Paleokarst features within the top of the Powell Dolomite are present around Beaver Lake and coincident with a lineament in Limekiln Hollow near Garfield, northwest of Beaver Lake

In general, the soils of the Ozark Plateaus are residual and are formed on a broad, domed, upwarp consisting mostly of limestone and dolomite. The main difference in the soils is due to different rocks from which the soils were formed. The main geologic materials are cherty limestone; cherty, very siliceous dolomite; cherty, siliceous dolomite; and alluvium, which are weathered and water transported products of the first three materials. Glade-rock soil occurs where the cherty, very siliceous dolomite is exposed to the soil formation. Dolomite is more resistant to weathering than limestone and siliceous dolomite is even more resistant, so very shallow soil results. In areas where the dolomite is less siliceous, more weathering has taken place; however, the soils produced are not as deep as soils formed by limestone.

The following eight soils associations are found in and around the Beaver project area: Captina-Nixa, Captina-Nixa-Pickwick, Clarksville-Nixa-Baxter, Corydon-Sogn, Enders-Allegheny-Mountainburg, Razort-Captina-Etowah, Linker-Apison-Hector, and Captina-Pembroke.

3.5.3 Hydrology and Groundwater

In the Interior Highlands of western and northern Arkansas ground-water supplies are more limited than in the Coastal Plain. Much of the Ozark Plateaus region is underlain by carbonate rocks, which are quite soluble in the presence of water. Solution by ground water has caused many large openings through which water passes so quickly that contaminants from the surface cannot be filtered out. Signs of these openings are caves, sink holes, springs and lost stream segments. As a consequence, the water in shallow wells may not be suitable for human consumption without treatment.

Three aquifers, which are part of the Ozark Plateaus Aquifer System, are located within northern Arkansas. The Springfield Plateau aquifer is generally under unconfined conditions, with groundwater movement occurring through fractures and solution cavities formed by dissolution of carbonate rock. Local discharge is through springs and streams. The Ozark aquifer is generally under confined conditions, especially where overlain by the units of the Ozark Confining Unit (Chattanooga Shale). Most wells in the Springfield Plateau and upper units in the Ozark aquifer yield 5-10 gpm on the average, with yields greater than 25 gpm in rare cases.

The third aquifer, the Roubidoux Formation and the Gunter Sandstone Member of the Gasconade Formation in northern Arkansas occur at greater depth and constitute the only significant aquifer system

in the Ozarks. Both are permeable sandstone and carbonate units of Ordovician age. These aquifers serve as the principal source of high-quality water for many communities in northern Arkansas where surface water sources are unavailable. Together these units may yield up to 500 gpm to wells. These formations do not outcrop anywhere in Arkansas but instead outcrop in southern Missouri.

3.5.4 Water Quality

The waters of the Arkansas portion of the White River watershed have all been designated by the Arkansas Department of Environmental Quality (ADEQ) for fisheries, primary and secondary contact recreation, and domestic, agricultural, and industrial water supplies (ADEQ, 2012). Beaver Lake is classified by ADEQ as a Type A water body, which includes most larger lakes of several thousand acres in size, in upland forest dominated watersheds, having an average depth of 30 to 60 feet, and having low primary production (i.e., having a low trophic status if in natural [unpolluted] condition). Beaver Lake, like all other lakes of its size in the Ozark region, stratifies chemically and thermally in the late spring with stratification extending into late fall and early winter. During the warmer months, lake waters of the upper layer (the epilimnion) are warmer and contain more dissolved oxygen, while the denser, lower layer waters (the hypolimnion) are colder and contain very little or no dissolved oxygen, thus undesirable for fish habitat.

This undesirable water, when discharged downstream from hydropower generation, may cause some problems in the tailwaters. To combat this problem, the dissolved oxygen content is monitored, and various management measures are implemented to improve the dissolved oxygen concentration in the hydropower releases. A highly productive trout fishery has been established in the Beaver tailwaters by the Arkansas Game and Fish Commission because of the available discharge of cold water from the dam, which is reaerated by turbulence as it flows downstream.

As the stratified epilimnion cools in the late fall and winter, the layers begin to mix (de-stratify) and dissolved oxygen (DO) is more evenly distributed. This condition is more favorable to the fishery of the lake and overall water quality.

The upper 1500 acres of Beaver Lake has been listed by the Arkansas Department of Environmental Quality (ADEQ) on Arkansas' 303(d) list of impaired waters, approved by the Environmental Protection Agency (EPA), due to turbidity (ADEQ, 2008). According to the Arkansas 303(d) list, these excessive levels impact the local fisheries as well as primary contact, both designated uses of Beaver Lake. The elevated turbidity levels are due to excessive silt from surface erosion from agriculture activities, unpaved road surfaces, in-stream erosion – mainly from unstable stream banks, and any other land surface disturbing activity. The Draft 2010 Integrated Water Quality and Monitoring Report (ADEQ, 2010) added pathogen indicator bacteria as a contaminant for the same area of Beaver Lake. Surface erosion activities are listed as the probable source for this contaminant as well.

Clean Water Act requires states to list waters that do not meet Federal water quality standards or have a significant potential not to meet standards as a result of point source dischargers or non- point source run-off. Subsequent to listing on the 303(d) list, the statute requires that the states develop and set the Total Maximum Daily Load (TMDL) for water bodies on the list within 13 years. A TMDL establishes the maximum amount of a pollutant that can enter a specific water body without violating the water quality standards. Values are normally calculated amounts based on dilution and the assimilative capacity of the water body. TMDLs have not been established by ADEQ for the upper Beaver Lake area.

3.6 Biological and Cultural Resources

3.6.1 Terrestrial Ecosystems

The area surrounding Beaver Lake is mostly forested. Trees and shrubs around the lakeshore include upland oak and hickory species, persimmon, honey locust, hawthorn, dogwood, redbud, coralberry, smooth and winged sumac, and buttonbush. Frequent periods of inundation keep a thin strip of government owned lands around the lake in early stages of succession. Red cedar and short-leafed pine, the principal evergreens, are dispersed throughout the region and are found in many large, scattered groups. Ground covers consist of greenbrier, sedges, and native grasses. White-tailed deer and eastern wild turkey are common game animals found and hunted in the Beaver Lake area. Black bears have also become common in the area and are hunted on the lands around the lake. The principal small game species found in the open upland areas include bobwhite quail, cottontail rabbit, and mourning dove. Gray and fox squirrels are common in upland wooded areas. Furbearing animals found in the Beaver Lake area include coyote, red fox, gray fox, otter, mink, muskrat, beaver, bobcat, and raccoon. Habitat management that includes wildlife food plot plantings, mowing, soil disturbance, removal of exotic species and application of prescribed fire provide benefit to these populations.

The common goldeneye, hooded merganser, bufflehead, and ring-necked duck are the predominant migratory waterfowl species visiting Beaver Lake. Mallards, gadwall, and other duck species are also present; however, they are only transient visitors as their characteristic feeding habits of obtaining food from shallow waters is limited. Resident Canada geese are so numerous in many coves and recreation areas that their presence has become a nuisance.

Ring-billed gulls are seen frequently around the Beaver Lake area. Greater and lesser yellow legs, pelicans, and large flocks of horned grebes are also seen during their peak migration in the spring and fall. Beaver Lake is also one of the few places where visitors can see both the turkey vulture and the black vulture at the same time in the winter. Beaver Lake has also become a popular place that visitors come to observe bald eagles, commonly wintering 150 or more birds and hosting 5-6 breeding pairs during the nesting period of March to June. The surrounding woodlands and grasslands serve as prime nesting areas for resident and neotropical migratory songbirds.

3.6.2 Aquatic Ecosystems and Wetlands

Walleye, smallmouth bass, striped bass, hybrid white-striped bass, walleye, and paddlefish have been introduced into Beaver Lake to add diversity to the fishery. Natural reproduction of striped bass and hybrid white-striped bass does not occur in Beaver Lake. Since 2004, AGFC stocks approximately 100,000 walleye, 30,000 channel catfish, 30,000 blue catfish, and 200,000 striped bass each year. While natural reproduction occurs in white crappie, black crappie, largemouth bass, and smallmouth bass, AGFC supplements this reproduction by occasional stockings of these species. Historically, there have also been introductions of northern pike, blue catfish, lake trout, and threadfin shad.

Located within the Springfield Plateau of the Ozark Mountains region of northern Arkansas, the area surrounding Beaver Lake is characterized by limestone, dolomite, or chert geology. The many rivers and streams flowing through the region have created a landscape of level highlands dissected by rugged valleys rich in karst features such as caves and sinkholes. Associated with these streams and landscape features are a variety of wetland habitats representative of the five wetland classes occurring within the region. These wetland classes include depressions, flats, fringe, riverine, and slope. It is possible, and perhaps even likely, that all of these classes of wetlands occur in the general area of Beaver Lake. However, those most likely to occur in the area immediately surrounding the lake are fringe (most likely reservoir), riverine (most likely spring runs) and slope wetlands (most likely calcareous slope).

3.6.3 Threatened and Endangered Species

The following species listed in Table 1 are from the U.S. Fish and Wildlife Service's federally classified status list of species and the Arkansas Natural Heritage data sets which have been reported and identified on project lands. Although the bald eagle was delisted by USFWS in 2007 due to recovery of the species, both the bald and golden eagles are still protected in accordance with the Bald and Golden Eagle Protection Act. The federal Migratory Bird Treaty Act of 1918 also provides protection to certain species of migratory birds. A total of 31 bird species are currently protected under this federal statute.

Table 1: Threatened and Endangered Species

	Federal Status	**State Status/Global Rank**
Gray Bat	LE	SE / S2S3/G4
Indiana Bat	LE	SE / /S1/G2
Northern long-eared Bat	LT	SE / S1S2/ G1G2
Ozark Big-eared Bat	LT	Not listed
Little Brown Bat	-	SE / S1
Bald Eagle	*Protected under Bald and Golden Eagle Protection Act	S3B,S4N/G5
Eastern Black Rail	LT	Not listed
Piping Plover	LT	Not listed
Rufa Red Knot	LT	Not listed
Whooping Crane	Experimental Population, Non-Essential	Not listed
Ozark Cavefish	LT	SE / S1/G3
Neosho Mucket	LE	Not Listed
Rabbitsfoot mussel	LT	SE/S3/G3G4
Snuffbox Mussel	LE	Not listed
Monarch Butterfly	C	Not listed
Missouri Bladderpod	LT	S2/G3
Opaque Prairie Sedge	-	SE / S2S3G4

Yellow Coneflower	-	ST / S2G3T3
Ovate-leaf Catchfly	-	ST / S2G3
Royal Catchfly	-	ST / S2G3

FEDERAL STATUS CODES

LE = Listed Endangered; the U.S. Fish and Wildlife Service has listed this species as endangered under the Endangered Species Act.
LT = Listed Threatened; the U.S. Fish and Wildlife Service has listed this species as threatened under the Endangered Species Act.
C = Candidate Species;

STATE STATUS CODES

INV = Inventory Element; The Arkansas Natural Heritage Commission is currently conducting active inventory work on these elements. Available data suggests these elements are of conservation concern. These elements may include outstanding examples of Natural Communities, colonial bird nesting sites, outstanding scenic and geologic features as well as plants and animals, which, according to current information, may be rare, peripheral, or of an undetermined status in the state. The ANHC is gathering detailed location information on these elements.

GLOBAL RANKS

G3 = Vulnerable globally. At moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors.
G4 = Apparently secure globally. Uncommon but not rare; some cause for long-term concern due to declines or other factors.
G5 = Secure globally. Common, widespread and abundant.
T-RANKS= T subranks are given to global ranks when a subspecies, variety, or race is considered at the state level. The subrank is made up of a "T" plus a number or letter (1, 2, 3, 4, 5, H, U, X) with the same ranking rules as a full species.

STATE RANKS

S1 = Critically imperiled in the state due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors making it vulnerable to extirpation.
S2 = Imperiled in the state due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it vulnerable to extirpation.
S3 = Vulnerable in the state due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.

GENERAL RANKING NOTES

Q = A "Q" in the global rank indicates the element's taxonomic classification as a species is a matter of conjecture among scientists.

Source: Arkansas Natural Heritage Commission

3.6.4 Cultural Resources

The records search, interviews, and site inspection identified no cultural resource assessments or findings for the subject property.

During the past seventy years scientific investigation of archaeological sites in the Beaver Lake area has been carried out in several phases. In 1922 and 1923, Mark R. Harrington of Phillip Academy was the first archeologist to excavate sites on the area that is now Beaver Lake. He excavated 13 bluff shelters. Between 1928 and 1935, the work of Harrington was continued by S.C. Dellinger of the University of Arkansas Museum. Dellinger supervised the excavation of 21 rock shelters. In the early 1960's, a series of surveys were conducted by several archeologists from the University of Arkansas Museum. Today, there are 280 known archeological sites along or immediately adjacent to Beaver Lake. Of these, 271 are identified as prehistoric, seven are historic and two sites have no known cultural affiliation.

Table 2: Historical and Cultural Resources at Beaver Lake

Type of Site	Number of sites

Historic	7
Prehistoric	271
No known cultural affiliation	2
Total	280
National Register Eligibility Status	
Not Evaluated	132
Not Eligible	5
Eligible	1

4.0 Survey Methodology

4.1 Development of Study Sections

The information gathered during the development of the ECP was used to group the subject property into standardized categories using Department of Defense (DoD) guidance, and in accordance with ASTM D5746 (2016). The ECP category definitions are summarized below in Table 3.

Table 3: Definitions of ECP Categories

ECP Category	Definition
1	An area or parcel of real property where no release, or disposal of hazardous substances or petroleum products or their derivatives has occurred (including no migration of these substances from adjacent properties).
2	An area or parcel of real property where only the release or disposal of petroleum products or their derivatives has occurred.
3	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but at concentrations that do not require a removal or remedial action.
4	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, and all remedial actions necessary to protect human health and the environment have been taken.
5	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred and removal or remedial actions, or both, are under way, but all required actions have not yet been taken.
6	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but required response actions have not yet been initiated.
7	An area or parcel of real property that is unevaluated or requires additional evaluation.

The final ECP category designations for the subject property are shown in Section 6.2, Table 5.

4.2 Visual Site Inspection

A VSI was conducted on 13 July 2021 at the subject property, to check for recognized environmental conditions. The VSI was conducted by Mrs. Hollie Eljizi, Ms. Jennifer Jefcoat and Mr. Robert Singleton from the U.S. Army Corps of Engineers (USACE). USACE representatives were accompanied by Mr. Mathew Voskamp of the USACE Beaver Lake office.

The VSI was performed from a USACE Beaver Lake Office watercraft near the bank of the subject property as a Right of Entry (ROE) was not available at the time of the inspection. At the time of inspection, the lake level was at 1127 ft msl, full lake level is 1121 ft msl. This made part of the priority area under water during the VSI, however water clarity was good, and no debris or other concerns were seen in the water. The shoreline is a steep rocky bluff that leads to the water. At the time of inspection,

there was a memorial plaque commemorating Eden Bluff, which has cultural significance. There is also a newly appeared dock with electricity present. No apparent signs of Hazardous, Toxic and Radioactive Waste (HTRW) were visible during the VSI.

Photos from the VSI can be found in Appendix A.

4.3 Aerial Photography Analysis

Aerial photographs were available from Google Earth maps for 1985, 1994, 2001, 2004, 2006, 2009, 2010, 2012, 2014, 2016, 2017, 2018, and 2020.

The initial aerial photograph from 1985 is of poor quality and the area isn't discernable. The next photo from 1994 is also of poor quality but a residence can be seen at adjacent to the parcel. From the next photo in 2001, a boat dock can be seen in parcel. There is no change from 2004 until the 2020 photo, with the adjacent residence and boat dock still visible.

All aerial photographs are included in Appendix B.

4.4 Sanborn Map Review

Sanborn maps were not available for the subject property, or for the adjacent areas.

4.5 Topographic Map Review

Historical topographic maps were available from the US Geological Survey Website for the Beaver Lake area for 1900, 1901, 1945, 1949, 1954, 1957, 1958, 1964, 1985, 2011, 2014, 2017, and 2020. Several observations can be gleaned from these maps. First, the area before the lake was formed consisted of valleys with steep bluffs and hill sides around the White River and its tributaries. The historical maps show this valley and river basin from the 1900 to 1964 topographic maps. In 1985 the river and Beaver Dam at the northern end of the lake can been seen in the valley of the historical White River.

All topographic maps are included in Appendix C.

4.6 Records Review

4.6.1 Standard Environmental Record Sources

In this evaluation records, maps and other documents that provide environmental information about the project area are obtained and reviewed. A desktop records review was conducted using various sources to determine the presence of HTRW sites on or near the subject property. This search was focused on active cleanup sites and sites with a reasonable risk of HTRW release. Several databases were searched manually to narrow down the search area. These databases included the Environmental Protection Agency (EPA) Cleanups in my Community database, the EPA Envirofacts databases, the Arkansas Department of Environmental Quality's (ADEQ) web search tool of Underground Storage Tanks (UST) and Above Ground Storage Tanks (AST), and the Arkansas Department of Energy and Environment Oil and Gas Commission oil and gas well maps. The information collected from this desktop records review was analyzed for recognized environmental conditions (RECs) that would affect the proposed project or need further investigation, given the proposed project measures. The following resources were searched.

Federal National Priorities List (NPL) – The records search did not reveal any NPL sites in the project footprint or adjacent areas. There are nine NPL sites in the state of Arkansas, none of which are located near Beaver Lake or the priority areas. This is based on a search of the EPA Superfund: National Priorities List (NPL) list.

Federal Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) List – The CERCLIS, now called the Superfund Enterprise Management System (SEMS)

database, tracks hazardous waste sites where remedial action has occurred under EPA's CERCLA program. This list also includes sites that are in the screening and assessment phase for possible inclusion on the NPL. The records search of EPA's listed SEMS sites did not reveal any sites in the project footprints or adjacent areas. This is based on a search of the EPA SEMS database.

Federal No Further Remedial Action Planned (NFRAP) – The Federal NFRAP list (now known as the SEMS archive list) tracks sites where no further remedial action is planned, based on available assessments and information. The list also represents sites that were not chosen for the NPL. Further EPA assessment could possibly be ongoing, and hazardous environmental conditions may still exist; however, in the absence of remedial action and assessment data, no determination about environmental hazards can be made. The records search did not reveal any NFRAP sites in the project footprint or adjacent areas. This is based on a search of the EPA SEMS database.

Federal Resource Conservation and Recovery Act (RCRA) Corrective Action List – The records search of EPAs Cleanups in My Community showed two RCRA Corrective Actions within one mile of the project search area. No RCRA corrective actions were found to be located within one mile of the project footprint. This is based on a search of the EPA Cleanups in My Community.

State Superfund Sites - This search is to check for any state CERCLA sites in the project vicinity. The records search of state CERCLA cleanup sites did not show any sites of concern in the project or adjacent areas. This search is based on a search of the Arkansas Department of Energy and Environment data base.

State and Tribal Solid Waste Facilities/Landfill Sites – This search is designed to check any state or tribal databases for solid waste handling facilities or landfills in the project vicinity. The records search did not find any solid waste facilities or landfill sites in area of this project or adjacent areas. This is based on a search of the EPA Landfill Methane Outreach Program (LMOP) and ADEQ Permitted Solid Waste Disposal database.

State and Tribal Registered Storage Tanks – This list is a combination of the State of Arkansas registered UST and AST databases, representing sites with storage tanks registered with the State of Arkansas. The search revealed one AST within one mile of the work area or adjacent areas. This AST is not expected to impact the project due to its distance from the proposed project. These results are based on a search of the Arkansas Department of Energy and Environment Oil and Gas Commission website.

State and Tribal Voluntary Cleanup Sites – The ADEQ Elective Site Cleanup Agreement (ESCA) database identifies sites where the responsible party chooses to clean up the site themselves with ADEQ oversight. Five sites were identified from this database. None of the sites are within one mile of the work area and are therefore not expected to impact the proposed project. These results are based on a search of the ADEQ ESCA Database.

Brownfields List – A brownfield is a property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. There are no brownfield sites within one mile of the work area or adjacent areas. These results are based on a search for Brownfields sites using the EPA Envirofacts search engine.

Oil and Gas Wells – A search of the oil and gas wells in the area using the Arkansas Department of Energy and Environment Oil and Gas Commission website identifies multiple sites including oil wells, plugged oil wells, injection/disposal sites within the surrounding area. Although not classified as HTRW under USACE regulations, pipelines and oil wells play an important role in the HTRW existing

conditions near the potential project area. This is because the well and/or pipeline contents could potentially leak or spill into the surrounding environment or affect the proposed project features. As a result of these findings, a thorough pipeline/well search should be initiated during design to ensure no interaction with the existing oil and gas infrastructure occurs. The Oil and Gas Commission website was used to map these findings. No oil wells or pipelines were found near the priority areas.

4.7 Interviews

Two interviews were conducted on 12 and 13 July 2021 in conjunction with the site inspection, and the following stakeholders were interviewed:

- Mr. Matthew Franklin; Natural Resource Specialist, Beaver Lake Office; Matthew.G.Franklin@usace.army.mil
- Mr. Matthew Voskamp; Natural Resource Specialist, Beaver Lake Office; Matthew.Voskamp@usace.army.mil

Information gleaned from the interviews is incorporated by way of reference throughout the report. The interview questions can be found in Figure 3.

4.8 Data Management

Data obtained during the ECP assessment were provided in electronic and/or hard copy format. A complete list of documents is provided in Section 8.0.

5.0 Environmental Conditions

5.1 Environmental Permits and Licenses

5.1.1 RCRA Status

The subject property is not covered under a Resource Conservation and Recovery Act (RCRA) permit, and no hazardous waste is generated or stored on the property.

5.1.2 Solid Waste

The subject property has no active, inactive, or expired permits or licenses for solid waste disposal. No landfills exist on the property.

5.1.3 USTs/ASTs

No USTs or ASTs were found during the records search, site inspection and interviews indicated not UST/AST have been known to be located at the subject property.

5.1.4 National Pollutant Discharge Elimination System (NPDES)

Section 402 of the Clean Water Act (33 U.S.C. 1251 et. seq.) requires all facilities that discharge stormwater to acquire an NPDES that defines contaminant limits in effluent to be discharged. No permits were found using the EPA's Envirofacts database on or adjacent to the priority area.

5.1.5 Drinking Water Permits

No drinking water permits are in place at the subject property.

5.1.6 Air Permits

No air emission or air quality permits are in place at the subject property.

5.1.7 Nuclear Regulatory Commission (NRC)

The NRC is tasked with permitting the use and handling of radioactive materials and reactors. No NRC licenses are in place at the subject property.

5.1.8 Other Permits/ Licenses

No additional environmental permits or licenses were identified during records research, interviews, or the VSI.

5.2 Environmental Cleanup and Remediation

5.2.1 Installation Restoration Program

Beaver Lake is not an active military facility, and therefore would not be eligible for cleanup under the Installation Restoration Program.

5.2.2 Military Munitions Response Program

Beaver Lake is not an active military facility, and therefore would not be eligible for cleanup under the Military Munitions Restoration Program.

5.2.3 Other Environmental Investigations and Cleanups

No known environmental investigations or cleanups were found during the records search, site inspection and interviews indicated that no known investigations or cleanups are ongoing at Beaver Lake.

5.2.4 Storage, Release, and Disposal of Hazardous Substances

No releases to the environment or improper disposal of these substances were found during the records search, site inspection and interviews indicated no known improper disposal at the priority area.

5.3 Petroleum and Petroleum Products

No releases to the environment or improper disposal of petroleum products were found during the records search, site inspection and interviews indicated no known improper disposal at the priority area.

5.4 Polychlorinated Biphenyls (PCBs)

No evidence exists of the presence of PCBs on the subject property. No PCB-containing oils were found during the records search, site inspection and interviews indicated no known PCB-containing oils have been used or stored at the priority area.

5.5 Asbestos

No asbestos assessments were found during the ECP process, none were found during the records search, site inspection and interviews indicated no known asbestos containing material has been used or stored at the priority area.

5.6 Lead and Lead-Based Paint (LBP)

No lead-based paint (LBP) assessments were found during the ECP process. No LBP was found during the records search, site inspection and interviews indicated no known improper disposal at the priority area.

5.7 Radioactive Material

No radioactive material assessments were found during the ECP process. No potentially radioactive materials were identified during the VSI, and the presence of radioactive materials on the subject property is extremely unlikely.

5.8 Landfills/Dumps

No landfills or dumps were found during the records search, site inspection or interview investigation.

5.9 Munitions and Explosives of Concern (MEC) and/or Unexploded Ordnance (UXO)

No munitions, explosives, or unexploded ordinance (UXO) were found during the records search, site inspection or interview investigation.

5.10 Radon

Beaver Lake spans across Benton, Washington and Carroll Counties. Washington County is in the Environmental Protection Agency (EPA) Radon Zone 3. Counties in Radon Zone 3 are counties with predicted average indoor radon screening levels of less than 2 pCi/L (EPA, 2018). Benton and Carroll Counties are in the EPA Radon Zone 2 with a predicted average indoor radon level between 2 and 4 pCi/L (EPA, 2018). No radon assessments were found during the records search (EPA, 2019).

5.11 Pesticides

No records were found to indicate the storage, improper use, or disposal of pesticides on the subject property.

5.12 Other Identified Concerns

No significant other concerns were found during the records search, site inspection or interviews.

5.13 National Environmental Policy Act (NEPA)

As the federal agency in charge of this project, USACE is in charge of coordinating National Environmental Policy Act (NEPA) compliance of 1969 (Public Law 91-190), the Council on Environmental Quality (CEQ) regulations (40 CFR 1500–1508), and the USACE implementing regulations, Policy and Procedures for Implementing NEPA, ER 200-2-2. As part of the records search and interview process recent NEPA documents were reviewed including the 2018 Draft Environmental Assessment for the Beaver Lake Master Plan Revision.

5.14 Adjacent Properties

As part of the ECP process, adjacent properties are assessed for environmental conditions, and those discovered conditions are evaluated based on the potential to affect the subject property. The nearest structure to the priority area is a residence approximately 85 yards northeast of the shore. The residence sits just above subject property and is connected by a pathway to the boat dock located in the priority area. The residence is first seen in the 1994 historical aerial photographs. The adjacent properties are unlikely to pose any HTRW concerns to the priority area.

6.0 Evaluation and Conclusions

6.1 Summary of ECP

Beaver Lake currently occupies more than 38,000 acres of Federal public lands and waters. This ECP report covers approximately 0.63 acres of land located on the southwest edge of Beaver Lake. The subject property is on the edge of the lake and currently owned by private landowner(s). The lake is located in northwestern Arkansas, in Benton, Washington, Madison and Carroll Counties, and it is approximately 6 miles west of Eureka Springs, Arkansas. The subject property, also known as Priority Area 4, is located in a cove of Nelson Hollow in the southwestern region of the lake.

This ECP report was prepared to characterize the existing environmental conditions at the subject property and is intended to be an aid in the leasing of real property. The ECP findings are based on the available sources of information concerning both past and present uses of the subject property. Information included readily available data associated with adjacent property records, aerial photography, personnel interviews, environmental programs and associated documentation, and current and historic investigations. In addition, record sources were reviewed to determine if there have been spills, leaks, discharges, leaching, underground injections, dumping, abandonments, or storage of hazardous substances or petroleum products at the installation. The VSI and interview process included inquiries and requests into the existence and availability of records that support the environmental condition of the property.

6.2 Conclusions

The subject property was classified into one of seven standard ECP area types (categories) as defined by ASTM D5746-98(2016) *Standard Classification of Environmental Condition of Property Area Types for Defense Base Closure and Realignment Facilities*. Below are the seven categories for reference.

Table 4: Definitions of ECP Categories

ECP Category	Definition
1	An area or parcel of real property where no release, or disposal of hazardous substances or petroleum products or their derivatives has occurred (including no migration of these substances from adjacent properties).
2	An area or parcel of real property where only the release or disposal of petroleum products or their derivatives has occurred.
3	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but at concentrations that do not require a removal or remedial action.
4	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, and all remedial actions necessary to protect human health and the environment have been taken.
5	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred and removal or remedial actions, or both, are under way, but all required actions have not yet been taken.
6	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but required response actions have not yet been initiated.
7	An area or parcel of real property that is unevaluated or requires additional evaluation.

Given these seven categories, the subject property is categorized below, along with the reasoning for each classification.

Table 5: Properties and ECP Categories

Acreage	**ECP Category**	**Reasoning**
0.63 ac.	1	No release or disposal of hazardous substances or petroleum products or their derivatives has occurred beyond de minimus amounts, including no migration of these substances from adjacent properties.

No release or disposal of hazardous substances or petroleum products or their derivatives has occurred beyond de minimus amounts on the subject property and no releases to the environment were observed or reported.

Asbestos assessments were not available for the subject property. It is unlikely that Asbestos Containing Material (ACM) is present but, in the future, if a building or structure will be disturbed, a licensed asbestos inspector is needed to confirm whether ACM is present or not.

7.0 Certification

I declare that, to the best of our professional knowledge and belief, we meet the definition of *Environmental professional* as defined in Part 312.10 of 40 CFR 312. We have the specific qualifications based on education, training, and experience to assess a property of the nature, history and setting of the subject property. We have developed and performed the appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312. All information/documentation provided accurately reflects the condition of the property. This report meets the DoD requirements for completion of an ECP Report.

_____ _____

Eugenia Barnes
Environmental Protection Specialist
U.S. Army Corps of Engineers
Fort Worth District

Date

_____ _____

Hollie Eljizi
Environmental Engineer
U.S. Army Corps of Engineers
Fort Worth District

Date

_____ _____

Jennifer Jefcoat
Chemist
U.S. Army Corps of Engineers
Fort Worth District

Date

8.0 References

American Society for Testing and Materials (ASTM), 2013. E1527-13, *Standard Practice for Environmental Site Assessments: Phase 1 Environmental Site Assessment Process*.

ASTM, 2016. D5746, *Standard Classification of Environmental Condition of Property Area Types for Defense Base Closure and Realignment Facilities*.

Blackshare Environmental Solutions, 2017. *Stormwater Pollution Prevention Plan (SWPPP)*. Prepared for Lawton-Fort Sill Regional Airport.

Department of the Army, 13 December 2007. Army Regulation 200-1. *Environmental Quality: Environmental Protection and Enhancement.*

Environmental Protection Agency (EPA), February 2019. *EPA Map of Radon Zones including State Radon Information and Contacts*. https://www.epa.gov/radon/find-information-about-local-radon-zones-and-state-contact-information#radonmap

Federal Emergency Management Agency (FEMA), 2019. FEMA Flood Map Service Center. https://msc.fema.gov/portal

Natural Resources Conservation Service (NRCS), 4 February 2019. *Web Soil Survey, Comanche County, Oklahoma*. https://websoilsurvey.sc.egov.usda.gov/

USACE. 1993. White River Basin, Arkansas and Missouri, Water Control Master Manual.

USACE. 2013. Little Rock District Water Management website. Accessed at: www.swl-wc.usace.army.mil

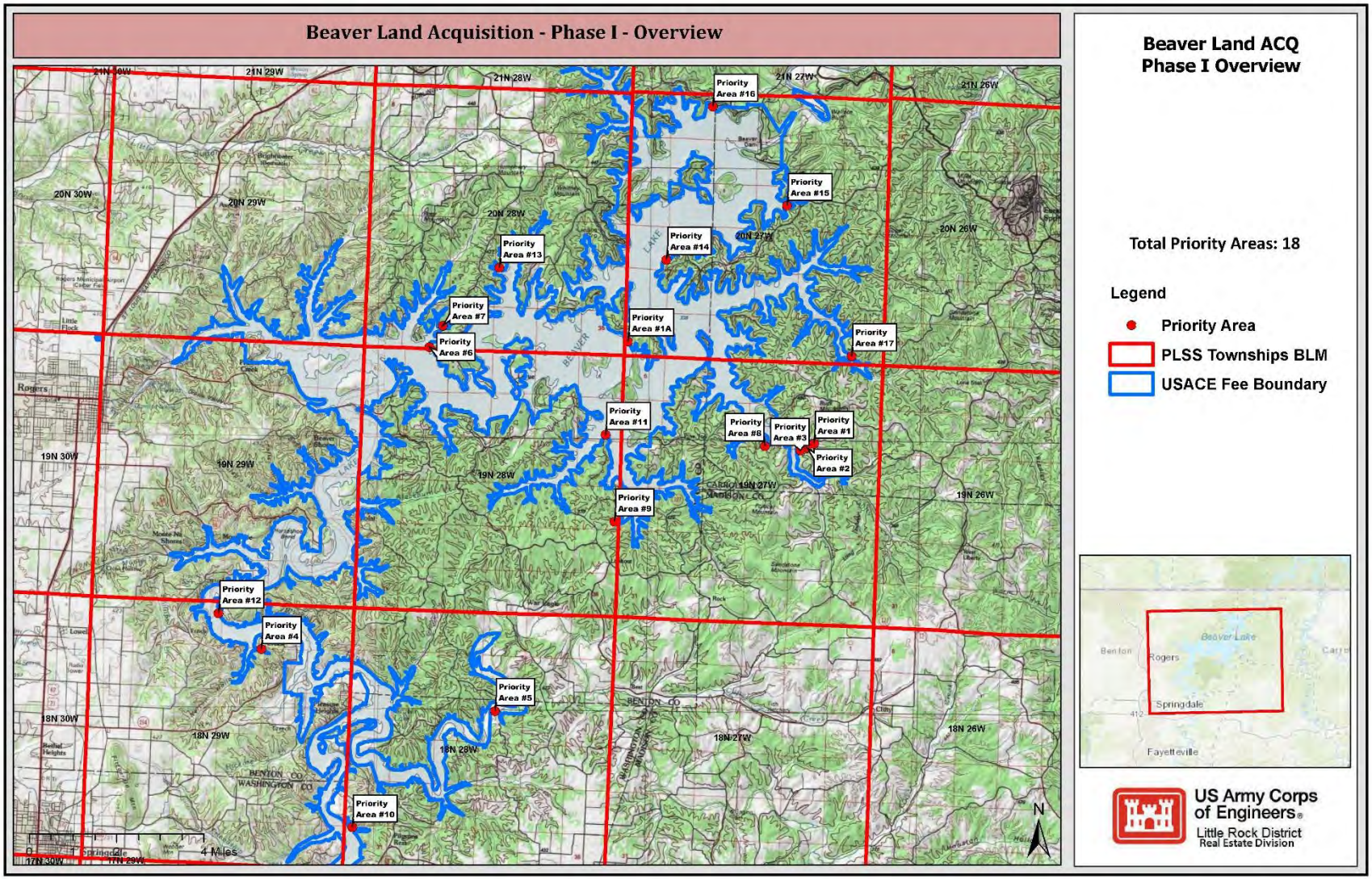
United States Census Bureau. 2013. Easy Facts Website. Accessed at: http://www.census.gov/easystats/

United States Fish and Wildlife Service (USFWS), 5 February 2019. *Lawton/Fort Sill Airport, Threatened and Endangered Species, Consultation Code: 02EKOK00-2019-SLI-0905*. Information for Planning and Consultation system. https://ecos.fws.gov/ipac/

Arkansas Department of Energy and Environment Oil and Gas Commission website accessed in August 2021 at: Commission, http://www.aogc.state.ar.us/maps/googleEarth.aspx

Figures

Figure 1: Beaver Lake Priority Areas



ACQ = Acquisition; PLSS = Public Land Survey System; BLM = Bureau of Land Management

Figure 2: Subject Property Detail

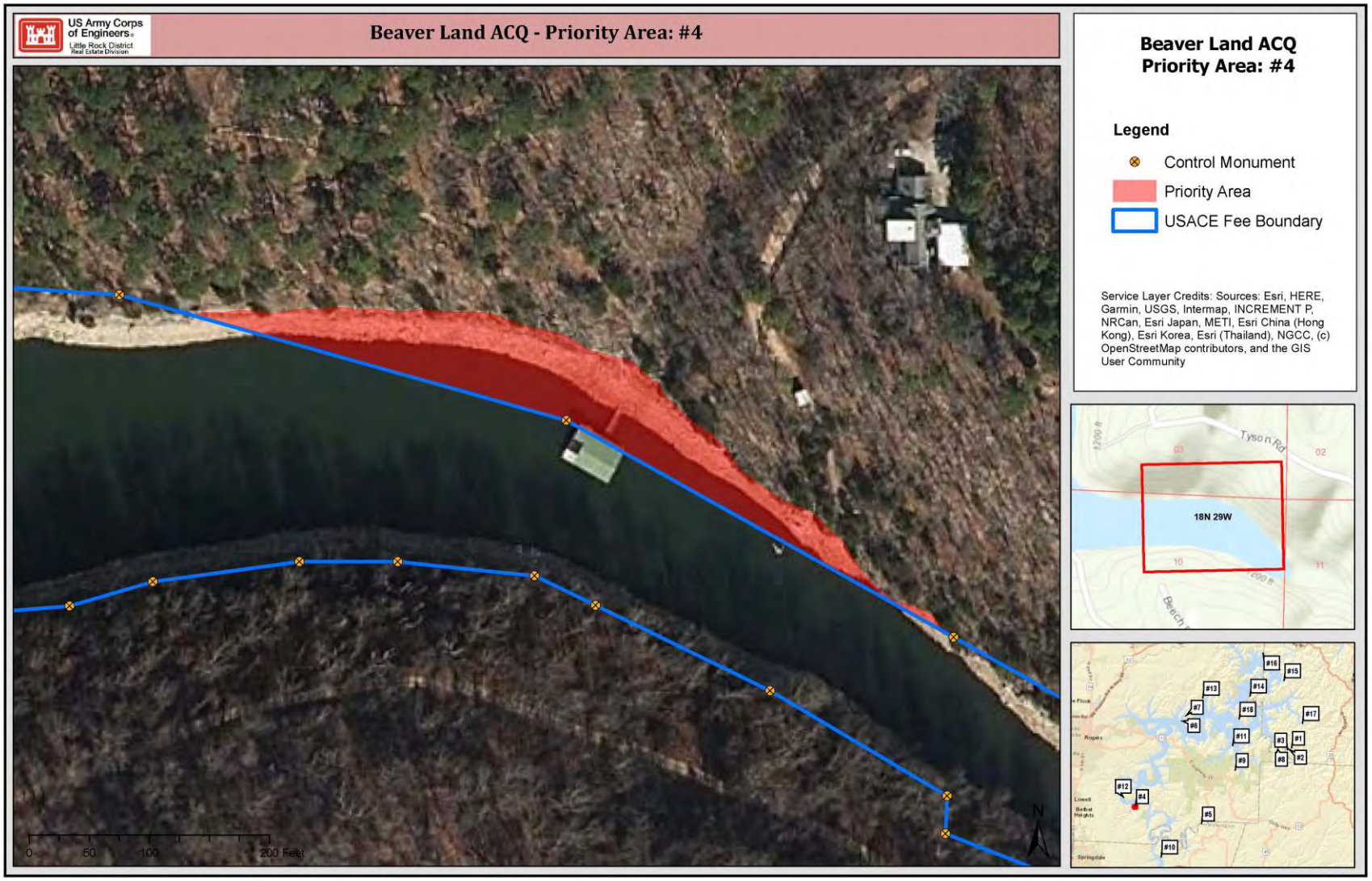


Figure 3: Interview Questions

Beaver Lake ECP
Interview Questions

1. Do you know of any environmental issues with this property?
2. Do you know of, or have access to, any reports concerning the environmental condition of this property? (i.e. site assessments, permits, storage tank registrations, safety plans, etc.) If so, would you be able to provide them? SWPPPs, SPCCs, air permits?
3. Do you know how this property has been historically used?
4. What is the property currently used for?
5. When were the site buildings constructed?
6. Are hazardous materials or petroleum products stored or used on this site? If so, what is the RCRA EPA ID? Does fueling occur on this property?
7. Do you know of any asbestos or LBP on the property or its buildings? Do you know the age of the buildings?
8. Has the site layout been manipulated in your recollection? (i.e. grading, excavation, etc.)?
9. Are there or have there been any cultural/historic items or buildings found on the property?
10. Is there anything else environmentally relevant that we should know?

Appendix A Visual Site Inspection Photographs

13 July 2021

Site 4 – View of priority area from watercraft rockface shoreline visible

Site 4 – View of priority area from watercraft rockface shoreline visible

Site 4 – View of priority area from watercraft rockface shoreline visible

Site 4 – View of priority area from watercraft rockface shoreline visible

Site 4 – Priority area shoreline and covered boat dock

Site 4 – Priority area with covered boat dock

Site 4 – Priority area shoreline and covered boat dock

Final

U.S. Army Environmental Condition of Property Report

Beaver Lake
Beaver Lake, Arkansas
Priority Area 5

August 30, 2021

Prepared For:
Beaver Lake Land Acquisition

Prepared By:
U.S. Army Corps of Engineers
Regional Planning and Environmental Center
Fort Worth District
Fort Worth, Texas

[This page is intentionally left blank.]

Table of Contents

List of Appendices:

List of Acronyms

ACM	Asbestos-containing material
AR	Army Regulation
AST	Aboveground storage tank
ASTM	American Society for Testing and Materials
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CFR	Code of Federal Regulations
DoD	Department of Defense
ECP	Environmental Condition of Property
EDR	Environmental Data Resources
EPA	Environmental Protection Agency
ERNS	Emergency Response Notification System
FAA	Federal Aviation Administration
HTRW	Hazardous, Toxic and Radioactive Waste
IRP	Installation Restoration Program
LBP	Lead-based Paint
LUST	Leaking underground storage tank
MEC	Munitions and Explosives of Concern
NEPA	National Environmental Policy Act
NFRAP	No Further Remedial Action Planned
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NRC	Nuclear Regulatory Commission
ODEQ	Oklahoma Department of Environmental Quality
OWS	Oil-water separator
PCB	Polychlorinated Biphenyl
POL	Petroleum, Oils, and Lubricants
RCRA	Resource Conservation and Recovery Act
SEMS	Superfund Enterprise Management System
SF	Square feet
SHWS	State Hazardous Waste Sites
SWPPP	Stormwater Pollution Prevention Plan
TSD	Transport, Storage, Disposal
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
UST	Underground storage tank
UXO	Unexploded Ordnance
VCP	Voluntary Cleanup Program
VSI	Visual site inspection

1.0 Executive Summary

This environmental condition of property (ECP) report has been prepared to document the environmental conditions and provide information for the acquisition of land that would be necessary for the operation, maintenance, and control of the Beaver Lake reservoir in Arkansas. This fee acquisition pertains to the frequently inundated land immediately surrounding the lake, below an elevation of 1128 ft above mean sea level (msl). The Army prepares an ECP in order to provide the public with information relative to the environmental condition of the property, assist Federal agencies during the property screening process, provide information about completed remedial and corrective actions at the property, and to assist in determining appropriate responsibilities, asset valuation, and liabilities with other parties to a transaction.

Beaver Lake currently occupies more than 38,000 acres of Federal public lands and waters. This ECP report covers 3.72 acres of land located at the southern end of Beaver Lake. The subject property is on the edge of the lake and currently owned by private landowner(s). The lake is located in northwestern Arkansas, in Benton, Washington, Madison and Carroll Counties, and it is approximately 6 miles west of Eureka Springs, Arkansas. The subject property, also known as Priority Area 5, is near the end of the War Eagle Creek region of Beaver Lake.

This ECP report presents a summary of readily available information on the environmental conditions of, and concerns relative to, the land, facilities, and real property assets of Beaver Lake. The findings included in the report are based on a record search of historical environmental investigation reports and site historical documents, a review of aerial photography, stakeholder interviews, and a site inspection conducted 12 – 13 July 2021.

Based on the environmental conditions found and the ECP analysis, the property can be categorized as an ECP Category 1, indicating a site where no release, or disposal of hazardous substances or petroleum products or their derivatives has occurred (including no migration of these substances from adjacent properties).

2.0 Purpose

2.1 General

This environmental condition of property (ECP) report has been prepared to document the environmental conditions and provide information for the acquisition of land surrounding Beaver Lake in Benton, Washington, Madison and Carrol Counties, Arkansas. This report meets the requirements of Title 40, Code of Federal Regulations (CFR), Part 373, and United States Army Regulation (AR) 200-1 (2007), *Environmental Quality, Environmental Protection and Enhancement*. The ECP report also follows the American Society for Testing and Materials (ASTM) E1527-13 *Standard Practice for Environmental Site Assessments: Phase 1 Environmental Site Assessment Process*. The subject property in this report is subsequently categorized according to ASTM D5746 (2016) *Standard Classification of Environmental Condition of Property Area Types for Defense Base Closure and Realignment Facilities*.

The Army prepares an ECP for the following purposes:

- Provide the public with information relative to the environmental condition of the property.
- Assist Federal agencies during the property screening process.
- Provide information to prospective buyers.
- Provide information about completed remedial and corrective actions at the property.
- Assist in determining appropriate responsibilities, asset valuation, and liabilities with other parties to a transaction.

The ECP contains the information required to comply with the provisions of 40 CFR, Part 373 that require a notice to accompany contracts for the sale of, and deeds entered into for the transfer of, federal property on which hazardous substances may have been stored, released or disposed. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) §120(h) stipulates that a notice is required if certain quantities of designated hazardous substances have been stored on the property.

The ECP Report is not prepared to satisfy a real property purchaser's duty to conduct an "all-appropriate inquiry" to establish an "innocent purchaser defense" to CERCLA 107 liability. Any such use of the ECP Report by any party is outside the control of the Army and beyond the scope of the ECP Report. The Army, its officers, employees or contractors makes no warranties or representations that any ECP Report satisfies any such requirements for any party.

2.2 Scope

Priority Area 5 occupies 3.72 acres of land. This ECP report covers approximately 3.72 acres of land located within the southern region of the lake. Priority Area 5 is comprised of pasture land. There is access via watercraft and, although it wasn't explored, terrestrial access via private property. Areas within the lake that are not within the Priority Area will be considered adjacent property. A general site location map is provided in Figure 1, and a map showing the subject property is shown in Figure 2.

2.3 Limitations

This ECP report presents a summary of readily available information on the environmental conditions of, and concerns relative to, the land, facilities, and real property assets of the subject property. The findings included in the report are based on a record search of available historical environmental investigation reports and site historical documents, a review of aerial photography, stakeholder interviews, and a site reconnaissance conducted 12 – 13 July 2021. Historical environmental investigation reports and site historical documents were reviewed in support of this ECP, and the information obtained from other studies is reflected within this report by reference. The ECP process recognizes that the condition of property and classification can change as historical contamination is cleaned up (if required) or if a new

source of contamination is identified. Records reviewed during the assessment were accepted as accurate and a reasonable effort was made to resolve discrepancies identified during the document review.

During the ECP assessment, all available sources of information concerning both past and present environmentally significant uses of the property were reviewed. This included readily available data associated with adjacent property records; 1985, 1994, 2001, 2004, 2006, 2009, 2010, 2012, 2014, 2016, 2017, 2018, and 2020 aerial photography; personnel interviews; current and historic investigations; and topographical maps. In addition, record sources were reviewed to determine if there have been spills, leaks, discharges, leaching, underground injection, dumping, abandonment, or storage of hazardous substances or petroleum products at the subject property. The site reconnaissance and interview process included inquiries and requests into the existence and availability of records that support the environmental condition of the property. The site reconnaissance included a Visual Site Inspection (VSI) of the subject property. No sampling or analysis was conducted during this survey.

2.4 Report Organization

The remainder of this ECP report is organized as follows:

Section 3 – Property Description: This section provides location and description of the subject property; an overview of historical and current land uses; and a description of the environmental setting of the airport, including climate, topography, geology, and demography.

Section 4 – Survey Methodology: This section describes the methods used to obtain the information for this ECP Report such as the development of study sections, the VSI, aerial photography analysis, records review, interviews, and data management.

Section 5 – Environmental Conditions: This section provides the existing environmental information. The findings are organized by relevant environmental "issues," including permits and licenses, cleanup activities, hazardous substances, petroleum and related products, asbestos, lead-based paint (LBP), radioactive materials, landfills, explosive contaminated structures, radon, pesticides, and polychlorinated biphenyls (PCBs). This section also includes adjacent property descriptions.

Section 6 – Evaluation and Conclusions: This section provides a summary of the subject property and evaluates the property for categorization as per ASTM D5746 (2016).

Section 7 – Certification: This section documents the approval of the ECP report.

Section 8 – References: This section provides an inventory of the reference material used in the preparation of this ECP Report.

Appendices: A list of appendices is provided in the Table of Contents.

3.0 Property Description

3.1 Parcel Locations and Description

Beaver Lake is located in the scenic Ozark Mountain region of northwestern Arkansas in Benton, Washington, Carroll and Madison counties. The total area currently contained in the Beaver project, including both land and water surface, consists of 38,138 acres owned in fee. Of this total, 1,432 acres are in flowage easement. The proposed Land Acquisition would include adding any land below the 1128 msl water level. The White River drainage area above Beaver Lake is approximately 1,186 square miles. When the lake is at the top of the conservation pool (elevation 1120.43 ft msl), the water area is 28,299 surface acres with 490 miles of shoreline within the lands owned in fee. The shoreline is irregular with topography primarily consisting of steep bluffs and gentle slopes.

Priority Area 5 is a 3.72 acre narrow strip of land on the shoreline in War Eagle Creek. The area is maintained pastoral land all the way to the lake shoreline. The subject property is on the edge of the lake and currently owned by private landowner(s).

3.2 Historic Land Use

Beaver Lake is a multiple purpose water resource development project initially authorized for flood control, hydropower generation and other beneficial uses by the Flood Control Act dated 3 September 1954. The inclusion of storage in the lake for municipal and industrial water supply was authorized by the Water Supply Act of 1958. Beaver Lake is a major component of a comprehensive plan for water resource development in the White River Basin of Arkansas and Missouri. Construction of Beaver Dam was initiated in March 1960. The dam was completed in June 1966, and the powerhouse and switchyard were completed in 1965. Beaver Lake was declared operational for public use in 1965.

The historical aerial photography shows that Priority Area 5 has been mowed pastoral land as far back as 1994.

3.3 Current Land Use

Beaver Lake is located in the Ozark Highlands of Carroll, Washington, Benton, and Madison Counties. Having 490 miles of shoreline (at conservation pool) and over 28,000 water surface acres, Beaver Lake is the largest reservoir in northwest Arkansas and the first federal impoundment on the White River.

There are 12 public use areas around Beaver Lake. There are 11 parks on the lake presently operated by the Corps of Engineers. The State of Arkansas owns and operates Hobbs State Park Conservation Area, which covers 12,056 acres, and Devil's Eyebrow Natural Area, which covers 2,503 acres. Both properties are adjacent to USACE lands. There are two parks, Ventris, and Blue Springs that have been reduced to lake access only. One Park (Big Clifty) is operated by Carroll County, Arkansas.

Despite being located adjacent to the fast-growing communities of Fayetteville, Springdale, Bentonville, and Rogers, Arkansas and a regional population of over 500,000, the lake provides open spaces and a quality outdoor recreation opportunity. Many arms and coves of the lake offer secluded areas for traditional activities such as fishing, skiing, sailing and scuba diving, but also allow for passive recreation opportunities like photography and nature observation.

Priority Area 5 remains pastoral farmland currently owned by a private landowner.

3.4 Utilities

Priority Area 5 has no known utilities.

3.5 Environmental Setting

3.5.1 Climate

The climate in the Beaver Lake area is classified as humid subtropical according to the Köppen climate model. A humid subtropical climate is characterized by hot, usually humid summers and mild to cool winters. The Köppen definition of this climate is for the coldest month's mean temperature to be between 26.6 °F (−3 °C) and 64.4 °F (18 °C), and the warmest month to be above 71.6 °F (22 °C). Some climatologists prefer to use 32 °F (0 °C) as the lower bound for the coldest month's mean temperature. Under the modern Trewartha climate classification, climates are termed Humid Subtropical when they have mean temperatures of 50 °F (10 °C) for eight or more months a year. In most locations classed within this system, the mean temperature of the coldest month is between 35 °F (3 °C) and 65 °F (18 °C). Some climatologists consider the Trewartha grouping of subtropical climates to be more real-world and fitting on a global scale.

While technically classified as humid subtropical, the climate in the Beaver Lake area is considered moderate. The area experiences all four seasons and does receive cold air masses from the north; however, some of the Arctic masses are blocked by the higher elevations of the Ozarks.

Average temperatures range from a high of 88 °F (31.1 °C) and low of 27 °F (-2.7 °C) in nearby Rogers, Arkansas. Extreme temperatures rarely exceed 96 °F (35.6 °C) and 13°F (-10.6 °C). Late summer is the time of maximum heat and least rainfall. During the winter months, midday temperatures in the basin are relatively warm, around 55 o to 60 o F. Some short periods of cold weather occur with temperature ranging from 0 o to 10 o F. On winter nights, temperatures from 37 o F to below freezing are common. Highest recorded temperature in Rogers, Arkansas was 114 °F (45.6 °C) (recorded in July 1954). The lowest temperature recorded was −16 °F (−26.7 °C), in February 1996.

The relative humidity typically ranges from 41% (comfortable) to 91% (very humid) over the course of the year, rarely dropping below 24% (dry) and reaching as high as 100% (very humid). The air is driest around April 9, at which time the relative humidity drops below 49% (comfortable) three days out of four; it is most humid around June 3, exceeding 87% (very humid) three days out of four.

Dew point is often a better measure of how comfortable a person will find the weather than relative humidity because it more directly relates to whether perspiration will evaporate from the skin, thereby cooling the body. Lower dew points feel drier and higher dew points feel more humid. Over the course of a year, the dew point typically varies from 19°F (dry) to 71°F (muggy) and is rarely below 4°F (dry) or above 74°F (very muggy). There are two periods in the year that are most comfortable: The first is between April 18 and June 6 and the second is between September 3 and October 23. The air feels neither too dry nor too muggy during these periods (https://weatherspark.com/averages/31495/Rogers-Arkansas-United-States).

Average annual rainfall for the Beaver Lake area is 45 inches per year. Precipitation is weakly seasonal, with a bimodal pattern: wet seasons in the spring and fall, and relatively drier summers and winters, but some rain in all months. The spring wet season is more pronounced than fall, with the highest rainfall typically occurring in May. The average annual snowfall for the Beaver area is about 12 inches. Snowpacks are usually short lived and are not commonly a concern for flooding.

Climate change is an area of concern due to the potential for effects on many aspects of the environment, especially those related to water resources. The U.S. Global Change Research Program (USGCRP) summarized information regarding climate change and its potential effects in regional assessments (http://www.globalchange.gov/publications/reports/scientific-assessments/us-impacts). In the Midwest, which extends from Minnesota to Missouri, extreme events such as heat waves, droughts and heavy rainfall events are projected to occur more frequently. Should these events become significant enough to impact the operation of Beaver Lake, the Master Plan and associated documents (i.e. Operations Management Plan and Shoreline Management Plan) would be reviewed and revised, if necessary.

3.5.2 Topography, Geology, and Soils

The depositional environment of the rocks found in the Arkansas Ozarks is one of a relatively shallow continental shelf, sloping toward deeper water generally toward the south. This shelf emerged many times during the Paleozoic resulting in numerous unconformities throughout the sequence. The Ozark Plateaus region of Arkansas is made up of generally flat-lying Paleozoic age strata divided into three plateau surfaces. The lowest and northern-most plateau is the Salem Plateau. The Springfield Plateau stands above the Salem a few hundred feet and is generally capped by lower Mississippian age limestones and cherts. The southernmost and highest plateau of the Ozarks is the Boston Mountains. All of these plateaus are deeply dissected by numerous streams throughout the area. The faulting in the Ozarks is generally normal; most faults displaying a displacement down on the southern side. However, some observations reveal that a few strike-slip faults may be present. Gentle folds are noted but are generally of very low amplitude. The depositional environment of the rocks found in the Arkansas Ozarks is one of a relatively shallow continental shelf, sloping toward deeper water generally toward the south.

Beaver Lake is part of the Springfield Plateau that occupies primarily the western and southwestern flanks of the Ozark Plateau province. The Springfield Plateau in this region rises to an elevation of approximately 1400 feet and in many areas, forms extensive plains. Hilly areas occur where rivers and their tributaries cut into the plateau surface, most notably in the vicinity of the White River and Beaver Lake. As streams like the Buffalo National River cut through the plateau down to the level of the White River, they sometimes carve spectacular bluffs.

Lower Ordovician, Middle to Upper Devonian and Lower and Upper Mississippian age strata are present around Beaver Lake. Upper Ordovician and Devonian strata crop out around Beaver Lake and its tributaries. The Lower Mississippian Boone Formation comprises the surface rock over the majority of the area and forms the surface of the heavily dissected Springfield Plateau. In addition to the Boone Formation, Cotter and Jefferson City formations (Jefferson City formation has not been successfully differentiated from the Cotter Formation in Arkansas), and the Powel formation, all of Ordovician age are present in the area. Formations in the Devonian strata include the Chattanooga, Clifty and Penters.

The Boone Formation consists of gray, fine- to coarse-grained fossiliferous limestone interbedded with chert. This formation caps the higher hills in the area. Since limestone is easily dissolved by water, cave and solution (karst) features are prominent. The Boone Formation is well known for dissolutional features, such as sinkholes, caves, and enlarged fissures. Surface water may drain directly into channels in limestone, where it can move rapidly and without filtration to the surface as a spring, at a location that is unpredictable without extensive testing. Therefore, water pollution problems are of particular concern in this region. The thickness of the Boone Formation is 300 to 350 feet in most of northern Arkansas, but as much as 390 feet has been reported.

The Cotter Dolomite is composed of dolostone of predominantly two types: a fine-grained, argillaceous, earthy textured, relatively soft, white to buff or gray dolostone called "cotton rock", and a more massive, medium-grained, gray dolostone that weathers to a somewhat hackly surface texture and becomes dark on exposure. The formation contains chert, some minor beds of greenish shale, and occasional thin interbedded sandstone. The thickness is about 340 feet in the vicinity of Cotter, but the interval may range up to 500 feet thick in places.

The Powell Dolomite is generally a fine-grained, light-gray to greenish-gray, limy, argillaceous dolostone with thin beds of shale, sandstone, sandy dolostone, and occasionally chert. The formation’s thickness may be as much as 215 feet but is often much thinner.

The Chattanooga Shale Formation is typically black, fissile clay shale that weathers into thin flakes. The beds are usually cut by prominent joints creating polygonal blocks upon weathering. The upper part of the formation may be slightly sandy and usually contains abundant pyrite. Thickness ranges from 0 to about 85 feet; normally averaging about 30 feet (AGS).

The strata throughout the region are nearly horizontal. One predominant geological feature of the lake area is a low, persistent, limestone bluff, which occurs just above the Ordovician- Mississippian contact.

The faulting in the Ozarks is generally normal; most faults displaying a displacement down on the southern side. Lineaments and faults characteristic of northwest Arkansas are present around Beaver Lake. The Fayetteville Fault lies beneath Beaver Lake. This fault is the west side of a graben that has down-dropped the Boone Formation to lake level. The Starkey Fault bounds the east side of the graben. Both faults trend approximately N 450E. One section of the Starkey fault trends N 60-700E. The Clantonville Lineament – Monocline is a northeast to southwest trending structural feature that extends from north of Clantonville to Ventris Hollow. The location of this feature was determined from the 1:24,000 three dimensional quadrangle and from structural disparities in the Lower Mississippian rock units. This structural feature could be responsible for the presence of lead-zinc mineralization in an old prospect near Clantonville (north of Beaver Lake). The trend of this lineament to monocline is N 30-400E. Paleokarst features within the top of the Powell Dolomite are present around Beaver Lake and coincident with a lineament in Limekiln Hollow near Garfield, northwest of Beaver Lake.

In general, the soils of the Ozark Plateaus are residual and are formed on a broad, domed, upwarp consisting mostly of limestone and dolomite. The main difference in the soils is due to different rocks from which the soils were formed. The main geologic materials are cherty limestone; cherty, very siliceous dolomite; cherty, siliceous dolomite; and alluvium, which are weathered and water transported products of the first three materials. Glade-rock soil occurs where the cherty, very siliceous dolomite is exposed to the soil formation. Dolomite is more resistant to weathering than limestone and siliceous dolomite is even more resistant, so very shallow soil results. In areas where the dolomite is less siliceous, more weathering has taken place; however, the soils produced are not as deep as soils formed by limestone.

The following eight soils associations are found in and around the Beaver project area: Captina-Nixa, Captina-Nixa-Pickwick, Clarksville-Nixa-Baxter, Corydon-Sogn, Enders-Allegheny-Mountainburg, Razort-Captina-Etowah, Linker-Apison-Hector, and Captina-Pembroke.

3.5.3 Hydrology and Groundwater

In the Interior Highlands of western and northern Arkansas ground-water supplies are more limited than in the Coastal Plain. Much of the Ozark Plateaus region is underlain by carbonate rocks, which are quite soluble in the presence of water. Solution by ground water has caused many large openings through which water passes so quickly that contaminants from the surface cannot be filtered out. Signs of these openings are caves, sink holes, springs and lost stream segments. As a consequence, the water in shallow wells may not be suitable for human consumption without treatment.

Three aquifers, which are part of the Ozark Plateaus Aquifer System, are located within northern Arkansas. The Springfield Plateau aquifer is generally under unconfined conditions, with groundwater movement occurring through fractures and solution cavities formed by dissolution of carbonate rock. Local discharge is through springs and streams. The Ozark aquifer is generally under confined conditions, especially where overlain by the units of the Ozark Confining Unit (Chattanooga Shale). Most wells in the Springfield Plateau and upper units in the Ozark aquifer yield 5-10 gpm on the average, with yields greater than 25 gpm in rare cases.

The third aquifer, the Roubidoux Formation and the Gunter Sandstone Member of the Gasconade Formation in northern Arkansas occur at greater depth and constitute the only significant aquifer system in the Ozarks. Both are permeable sandstone and carbonate units of Ordovician age. These aquifers serve as the principal source of high-quality water for many communities in northern Arkansas where surface water sources are unavailable. Together these units may yield up to 500 gpm to wells. These formations do not outcrop anywhere in Arkansas but instead outcrop in southern Missouri.

3.5.4 Water Quality

The waters of the Arkansas portion of the White River watershed have all been designated by the Arkansas Department of Environmental Quality (ADEQ) for fisheries, primary and secondary contact recreation, and domestic, agricultural, and industrial water supplies (ADEQ, 2012). Beaver Lake is classified by ADEQ as a Type A water body, which includes most larger lakes of several thousand acres in size, in upland forest dominated watersheds, having an average depth of 30 to 60 feet, and having low primary production (i.e., having a low trophic status if in natural [unpolluted] condition). Beaver Lake, like all other lakes of its size in the Ozark region, stratifies chemically and thermally in the late spring with stratification extending into late fall and early winter. During the warmer months, lake waters of the upper layer (the epilimnion) are warmer and contain more dissolved oxygen, while the denser, lower layer waters (the hypolimnion) are colder and contain very little or no dissolved oxygen, thus undesirable for fish habitat.

This undesirable water, when discharged downstream from hydropower generation, may cause some problems in the tailwaters. To combat this problem, the dissolved oxygen content is monitored, and various management measures are implemented to improve the dissolved oxygen concentration in the hydropower releases. A highly productive trout fishery has been established in the Beaver tailwaters by the Arkansas Game and Fish Commission because of the available discharge of cold water from the dam, which is reaerated by turbulence as it flows downstream.

As the stratified epilimnion cools in the late fall and winter, the layers begin to mix (de-stratify) and dissolved oxygen (DO) is more evenly distributed. This condition is more favorable to the fishery of the lake and overall water quality.

The upper 1500 acres of Beaver Lake has been listed by the Arkansas Department of Environmental Quality (ADEQ) on Arkansas' 303(d) list of impaired waters, approved by the Environmental Protection Agency (EPA), due to turbidity (ADEQ, 2008). According to the Arkansas 303(d) list, these excessive levels impact the local fisheries as well as primary contact, both designated uses of Beaver Lake. The elevated turbidity levels are due to excessive silt from surface erosion from agriculture activities, unpaved road surfaces, in-stream erosion – mainly from unstable stream banks, and any other land surface disturbing activity. The Draft 2010 Integrated Water Quality and Monitoring Report (ADEQ, 2010) added pathogen indicator bacteria as a contaminant for the same area of Beaver Lake. Surface erosion activities are listed as the probable source for this contaminant as well.

Clean Water Act requires states to list waters that do not meet Federal water quality standards or have a significant potential not to meet standards as a result of point source dischargers or non- point source run-off. Subsequent to listing on the 303(d) list, the statute requires that the states develop and set the Total Maximum Daily Load (TMDL) for water bodies on the list within 13 years. A TMDL establishes the maximum amount of a pollutant that can enter a specific water body without violating the water quality standards. Values are normally calculated amounts based on dilution and the assimilative capacity of the water body. TMDLs have not been established by ADEQ for the upper Beaver Lake area.

3.6 Biological and Cultural Resources

3.6.1 Terrestrial Ecosystems

The area surrounding Beaver Lake is mostly forested. Trees and shrubs around the lakeshore include upland oak and hickory species, persimmon, honey locust, hawthorn, dogwood, redbud, coralberry, smooth and winged sumac, and buttonbush. Frequent periods of inundation keep a thin strip of government owned lands around the lake in early stages of succession. Red cedar and short-leafed pine,

the principal evergreens, are dispersed throughout the region and are found in many large, scattered groups. Ground covers consist of greenbrier, sedges, and native grasses. White-tailed deer and eastern wild turkey are common game animals found and hunted in the Beaver Lake area. Black bears have also become common in the area and are hunted on the lands around the lake. The principal small game species found in the open upland areas include bobwhite quail, cottontail rabbit, and mourning dove. Gray and fox squirrels are common in upland wooded areas. Furbearing animals found in the Beaver Lake area include coyote, red fox, gray fox, otter, mink, muskrat, beaver, bobcat, and raccoon. Habitat management that includes wildlife food plot plantings, mowing, soil disturbance, removal of exotic species and application of prescribed fire provide benefit to these populations.

The common goldeneye, hooded merganser, bufflehead, and ring-necked duck are the predominant migratory waterfowl species visiting Beaver Lake. Mallards, gadwall, and other duck species are also present; however, they are only transient visitors as their characteristic feeding habits of obtaining food from shallow waters is limited. Resident Canada geese are so numerous in many coves and recreation areas that their presence has become a nuisance.

Ring-billed gulls are seen frequently around the Beaver Lake area. Greater and lesser yellow legs, pelicans, and large flocks of horned grebes are also seen during their peak migration in the spring and fall. Beaver Lake is also one of the few places where visitors can see both the turkey vulture and the black vulture at the same time in the winter. Beaver Lake has also become a popular place that visitors come to observe bald eagles, commonly wintering 150 or more birds and hosting 5-6 breeding pairs during the nesting period of March to June. The surrounding woodlands and grasslands serve as prime nesting areas for resident and neotropical migratory songbirds.

3.6.2 Aquatic Ecosystems and Wetlands

Walleye, smallmouth bass, striped bass, hybrid white-striped bass, walleye, and paddlefish have been introduced into Beaver Lake to add diversity to the fishery. Natural reproduction of striped bass and hybrid white-striped bass does not occur in Beaver Lake. Since 2004, AGFC stocks approximately 100,000 walleye, 30,000 channel catfish, 30,000 blue catfish, and 200,000 striped bass each year. While natural reproduction occurs in white crappie, black crappie, largemouth bass, and smallmouth bass, AGFC supplements this reproduction by occasional stockings of these species. Historically, there have also been introductions of northern pike, blue catfish, lake trout, and threadfin shad.

Located within the Springfield Plateau of the Ozark Mountains region of northern Arkansas, the area surrounding Beaver Lake is characterized by limestone, dolomite, or chert geology. The many rivers and streams flowing through the region have created a landscape of level highlands dissected by rugged valleys rich in karst features such as caves and sinkholes. Associated with these streams and landscape features are a variety of wetland habitats representative of the five wetland classes occurring within the region. These wetland classes include depressions, flats, fringe, riverine, and slope. It is possible, and perhaps even likely, that all of these classes of wetlands occur in the general area of Beaver Lake. However, those most likely to occur in the area immediately surrounding the lake are fringe (most likely reservoir), riverine (most likely spring runs) and slope wetlands (most likely calcareous slope).

3.6.3 Threatened and Endangered Species

The following species listed in Table 1 are from the U.S. Fish and Wildlife Service's federally classified status list of species and the Arkansas Natural Heritage data sets which have been reported and identified on project lands. Although the bald eagle was delisted by USFWS in 2007 due to recovery of the species, both the bald and golden eagles are still protected in accordance with the Bald and Golden Eagle Protection Act. The federal Migratory Bird Treaty Act of 1918 also provides protection to certain species of migratory birds. A total of 31 bird species are currently protected under this federal statute.

Table 1: Threatened and Endangered Species

	Federal Status	State Status/Global Rank
Gray Bat	LE	SE / S2S3/G4
Indiana Bat	LE	SE / /S1/G2
Northern long-eared Bat	LT	SE / S1S2/ G1G2
Ozark Big-eared Bat	LT	Not listed
Little Brown Bat	-	SE / S1
Bald Eagle	*Protected under Bald and Golden Eagle Protection Act	S3B,S4N/G5
Eastern Black Rail	LT	Not listed
Piping Plover	LT	Not listed
Rufa Red Knot	LT	Not listed
Whooping Crane	Experimental Population, Non-Essential	Not listed
Ozark Cavefish	LT	SE / S1/G3
Neosho Mucket	LE	Not Listed
Rabbitsfoot mussel	LT	SE/S3/G3G4
Snuffbox Mussel	LE	Not listed
Monarch Butterfly	C	Not listed
Missouri Bladderpod	LT	S2/G3
Opaque Prairie Sedge	-	SE / S2S3G4
Yellow Coneflower	-	ST / S2G3T3
Ovate-leaf Catchfly	-	ST / S2G3
Royal Catchfly	-	ST / S2G3

FEDERAL STATUS CODES

LE = Listed Endangered; the U.S. Fish and Wildlife Service has listed this species as endangered under the Endangered Species Act.
LT = Listed Threatened; the U.S. Fish and Wildlife Service has listed this species as threatened under the Endangered Species Act.
C = Candidate Species;

STATE STATUS CODES

INV = Inventory Element; The Arkansas Natural Heritage Commission is currently conducting active inventory work on these elements. Available data suggests these elements are of conservation concern. These elements may include outstanding examples of Natural Communities, colonial bird nesting sites, outstanding scenic and geologic features as well as plants and animals, which, according to current information, may be rare, peripheral, or of an undetermined status in the state. The ANHC is gathering detailed location information on these elements.

GLOBAL RANKS

G3 = Vulnerable globally. At moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors.
G4 = Apparently secure globally. Uncommon but not rare; some cause for long-term concern due to declines or other factors.
G5 = Secure globally. Common, widespread and abundant.
T-RANKS= T subranks are given to global ranks when a subspecies, variety, or race is considered at the state level. The subrank is made up of a "T" plus a number or letter (1, 2, 3, 4, 5, H, U, X) with the same ranking rules as a full species.

STATE RANKS

S1 = Critically imperiled in the state due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors making it vulnerable to extirpation.
S2 = Imperiled in the state due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it vulnerable to extirpation.
S3 = Vulnerable in the state due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.

GENERAL RANKING NOTES

Q = A "Q" in the global rank indicates the element's taxonomic classification as a species is a matter of conjecture among scientists.

Source: Arkansas Natural Heritage Commission

3.6.4 Cultural Resources

The records search, interviews, and site inspection identified no cultural resource assessments or findings for the subject property.

During the past seventy years scientific investigation of archaeological sites in the Beaver Lake area has been carried out in several phases. In 1922 and 1923, Mark R. Harrington of Phillip Academy was the first archeologist to excavate sites on the area that is now Beaver Lake. He excavated 13 bluff shelters. Between 1928 and 1935, the work of Harrington was continued by S.C. Dellinger of the University of Arkansas Museum. Dellinger supervised the excavation of 21 rock shelters. In the early 1960's, a series of surveys were conducted by several archeologists from the University of Arkansas Museum. Today, there are 280 known archeological sites along or immediately adjacent to Beaver Lake. Of these, 271 are identified as prehistoric, seven are historic and two sites have no known cultural affiliation.

Table 2: Historical and Cultural Resources at Beaver Lake

Type of Site	Number of sites
Historic	7
Prehistoric	271
No known cultural affiliation	2
Total	280
National Register Eligibility Status	
Not Evaluated	132

Not Eligible	5
Eligible	1

4.0 Survey Methodology

4.1 Development of Study Sections

The information gathered during the development of the ECP was used to group the subject property into standardized categories using Department of Defense (DoD) guidance, and in accordance with ASTM D5746 (2016). The ECP category definitions are summarized below in Table 3.

Table 3: Definitions of ECP Categories

ECP Category	Definition
1	An area or parcel of real property where no release, or disposal of hazardous substances or petroleum products or their derivatives has occurred (including no migration of these substances from adjacent properties).
2	An area or parcel of real property where only the release or disposal of petroleum products or their derivatives has occurred.
3	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but at concentrations that do not require a removal or remedial action.
4	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, and all remedial actions necessary to protect human health and the environment have been taken.
5	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred and removal or remedial actions, or both, are under way, but all required actions have not yet been taken.
6	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but required response actions have not yet been initiated.
7	An area or parcel of real property that is unevaluated or requires additional evaluation.

The final ECP category designations for the subject property are shown in Section 6.2, Table 6.

4.2 Visual Site Inspection

A VSI was conducted on 13 July 2021 at the subject property, in order to check for recognized environmental conditions. The VSI was conducted by Ms. Jennifer Jefcoat, Mrs. Hollie Eljizi, Mr. Robert Singleton and Ms. Eugenia Barnes from the U.S. Army Corps of Engineers (USACE). USACE representatives were accompanied by Mr. Matthew Voskamp of the Beaver Lake office.

Accompanied by Mr. Voskamp, Mrs. Eljizi and Ms. Jefcoat approached the parcel of land and no ROE was granted. At the time of inspection, the lake level was at 1127 ft msl, conservation pool lake level is 1121 ft msl. The parcel of land was used for pastoral purposes, with cows all through the field and in the water. The water where the cows were had more opacity and turbidity than the surrounding areas. This brings the point of possibility of unsanitary water in the area and therefore contaminating nearby water sources.

The land components of the parcel seemed pristine, with no pollution or HTRW remnants. No deliberate clearing of land was present other than for the cow occupancy. Due to having no ROE for this parcel of land, the only VSI was from the watercraft.

Photos from the VSI can be found in Appendix A.

4.3 Aerial Photography Analysis

Aerial photographs were available from Google Earth maps for 1985, 1994, 2001, 2004, 2006, 2009, 2010, 2012, 2014, 2016, 2017, 2018, and 2020.

The initial aerial photograph from 1985 is of poor quality and the area isn't discernable. The next photo from 1994 is also of poor quality, but what appears to be a dirt road can be seen in the adjacent area. The area has some trees near the bank, while the rest of the adjacent area is mowed or pastureland. There is no change from 2001 to 2014 apart from some livestock that can be seen in pasture area. The next photo in 2016 shows a metal roof structure adjacent to the property, but there is no change from the 2017 to the 2020 photographs.

All aerial photographs are included in Appendix B.

4.4 Sanborn Map Review

Sanborn maps were not available for the subject property or the adjacent areas.

4.5 Topographic Map Review

Historical topographic maps were available from the US Geological Survey Website for the Beaver Lake area for EDR Report for 1900, 1901, 1945, 1949, 1954, 1957, 1958, 1964, 1985, 2011, 2014, 2017, and 2020. Several observations can be gleaned from these maps. First, the area before the lake was formed consisted of valleys with steep bluffs and hill sides around the White River and its tributaries. The historical maps show this valley and river basin from the 1900 to 1964 topographic maps. In 1985 the river and Beaver Dam at the northern end of the lake can been seen in the valley of the historical White River.

All topographic maps are included in Appendix C.

4.6 Records Review

4.6.1 Standard Environmental Record Sources

In this evaluation records, maps and other documents that provide environmental information about the project area are obtained and reviewed. A desktop records review was conducted using various sources to determine the presence of HTRW sites on or near the subject property. This search was focused on active cleanup sites and sites with a reasonable risk of HTRW release. Several databases were searched manually to narrow down the search area. These databases included the Environmental Protection Agency (EPA) Cleanups in my Community database, the EPA Envirofacts databases, the Arkansas Department of Environmental Quality's (ADEQ) web search tool of Underground Storage Tanks (UST) and Above Ground Storage Tanks (AST), and the Arkansas Department of Energy and Environment Oil and Gas Commission oil and gas well maps. The information collected from this desktop records review was analyzed for recognized environmental conditions (RECs) that would affect the proposed project or need further investigation, given the proposed project measures. The following resources were searched.

Federal National Priorities List (NPL) – The records search did not reveal any NPL sites in the project footprint or adjacent areas. There are nine NPL sites in the state of Arkansas, none of which are located near Beaver Lake or the priority areas. This is based on a search of the EPA Superfund: National Priorities List (NPL) list.

Federal Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) List – The CERCLIS, now called the Superfund Enterprise Management System (SEMS) database, tracks hazardous waste sites where remedial action has occurred under EPA's CERCLA program. This list also includes sites that are in the screening and assessment phase for possible inclusion

on the NPL. The records search of EPA's listed SEMS sites did not reveal any sites in the project footprints or adjacent areas. This is based on a search of the EPA SEMS database.

Federal No Further Remedial Action Planned (NFRAP) – The Federal NFRAP list (now known as the SEMS archive list) tracks sites where no further remedial action is planned, based on available assessments and information. The list also represents sites that were not chosen for the NPL. Further EPA assessment could possibly be ongoing, and hazardous environmental conditions may still exist; however, in the absence of remedial action and assessment data, no determination about environmental hazards can be made. The records search did not reveal any NFRAP sites in the project footprint or adjacent areas. This is based on a search of the EPA SEMS database.

Federal Resource Conservation and Recovery Act (RCRA) Corrective Action List – The records search of EPAs Cleanups in My Community showed two RCRA Corrective Actions within one mile of the project search area. No RCRA corrective actions were found to be located within one mile of the project footprint. This is based on a search of the EPA Cleanups in My Community.

State Superfund Sites - This search is to check for any state CERCLA sites in the project vicinity. The records search of state CERCLA cleanup sites did not show any sites of concern in the project or adjacent areas. This search is based on a search of the Arkansas Department of Energy and Environment data base.

State and Tribal Solid Waste Facilities/Landfill Sites – This search is designed to check any state or tribal databases for solid waste handling facilities or landfills in the project vicinity. The records search did not find any solid waste facilities or landfill sites in area of this project or adjacent areas. This is based on a search of the EPA Landfill Methane Outreach Program (LMOP) and ADEQ Permitted Solid Waste Disposal database.

State and Tribal Registered Storage Tanks – This list is a combination of the State of Arkansas registered UST and AST databases, representing sites with storage tanks registered with the State of Arkansas. The search revealed one AST within one mile of the work area or adjacent areas. This AST is not expected to impact the project due to its distance from the proposed project. These results are based on a search of the Arkansas Department of Energy and Environment Oil and Gas Commission website.

State and Tribal Voluntary Cleanup Sites – The ADEQ Elective Site Cleanup Agreement (ESCA) database identifies sites where the responsible party chooses to clean up the site themselves with ADEQ oversight. Five sites were identified from this database. None of the sites are within one mile of the work area and are therefore not expected to impact the proposed project. These results are based on a search of the ADEQ ESCA Database.

Brownfields List – A brownfield is a property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. There are no brownfield sites within one mile of the work area or adjacent areas. These results are based on a search for Brownfields sites using the EPA Envirofacts search engine.

Oil and Gas Wells – A search of the oil and gas wells in the area using the Arkansas Department of Energy and Environment Oil and Gas Commission website identifies multiple sites including oil wells, plugged oil wells, injection/disposal sites within the surrounding area. Although not classified as HTRW under USACE regulations, pipelines and oil wells play an important role in the HTRW existing conditions near the potential project area. This is because the well and/or pipeline contents could potentially leak or spill into the surrounding environment or affect the proposed project features. As a

result of these findings, a thorough pipeline/well search should be initiated during design to ensure no interaction with the existing oil and gas infrastructure occurs. The Oil and Gas Commission website was used to map these findings. No oil wells or pipelines were found near the priority areas.

4.7 Interviews

Two interviews were conducted on 12 and 13 July 2021 in conjunction with the site inspection, and the following stakeholders were interviewed:

- Mr. Matthew Franklin; Natural Resource Specialist, Beaver Lake Office; Matthew.G.Franklin@usace.army.mil
- Mr. Matthew Voskamp; Natural Resource Specialist, Beaver Lake Office; Matthew.Voskamp@usace.army.mil

Information gleaned from the interviews is incorporated by way of reference throughout the report. The interview questions can be found in Figure 3.

4.8 Data Management

Data obtained during the ECP assessment were provided in electronic and/or hard copy format. A complete list of documents is provided in Section 8.0.

5.0 Environmental Conditions

5.1 Environmental Permits and Licenses

5.1.1 RCRA Status

The subject property is not covered under a Resource Conservation and Recovery Act (RCRA) permit, and no hazardous waste is generated or stored on the property.

5.1.2 Solid Waste

The subject property has no active, inactive, or expired permits or licenses for solid waste disposal. No landfills exist on the property.

5.1.3 USTs/ASTs

No USTs or ASTs were found during the records search, site inspection and interviews indicated no UST/AST have been known to be located at the subject property.

5.1.4 National Pollutant Discharge Elimination System (NPDES)

Section 402 of the Clean Water Act (33 U.S.C. 1251 et. seq.) requires all facilities that discharge stormwater to acquire an NPDES that defines contaminant limits in effluent to be discharged. No permits were found using the EPA's Envirofacts database on or adjacent to the priority area.

5.1.5 Drinking Water Permits

No drinking water permits are in place at the subject property.

5.1.6 Air Permits

No air emission or air quality permits are in place at the subject property.

5.1.7 Nuclear Regulatory Commission (NRC)

The NRC is tasked with permitting the use and handling of radioactive materials and reactors. No NRC licenses are in place at the subject property.

5.1.8 Other Permits/ Licenses

No additional environmental permits or licenses were identified during records research, interviews, or the VSI.

5.2 Environmental Cleanup and Remediation

5.2.1 Installation Restoration Program

Beaver Lake is not an active military facility, and therefore would not be eligible for cleanup under the Installation Restoration Program.

5.2.2 Military Munitions Response Program

Beaver Lake is not an active military facility, and therefore would not be eligible for cleanup under the Military Munitions Restoration Program.

5.2.3 Other Environmental Investigations and Cleanups

No known environmental investigations or cleanups were found during the records search, site inspection and interviews indicated that no known investigations or cleanups are ongoing at Beaver Lake.

5.2.4 Storage, Release, and Disposal of Hazardous Substances

No releases to the environment or improper disposal of these substances were found during the records search, site inspection and interviews indicated no known improper disposal at the priority area.

5.3 Petroleum and Petroleum Products

No releases to the environment or improper disposal of petroleum products were found during the records search, site inspection and interviews indicated no known improper disposal at the priority area.

5.4 Polychlorinated Biphenyls (PCBs)

No evidence exists of the presence of PCBs on the subject property. No PCB-containing oils were found during the records search, site inspection and interviews indicated no known PCB-containing oils have been used or stored at the priority area.

5.5 Asbestos

No asbestos assessments were found during the ECP process, none were found during the records search, site inspection and interviews indicated no known asbestos containing material has been used or stored at the priority area.

5.6 Lead and Lead-Based Paint (LBP)

No lead-based paint (LBP) assessments were found during the ECP process. No LBP was found during the records search, site inspection and interviews indicated no known improper disposal at the priority area.

5.7 Radioactive Material

No radioactive material assessments were found during the ECP process. No potentially radioactive materials were identified during the VSI, and the presence of radioactive materials on the subject property is extremely unlikely.

5.8 Landfills/Dumps

No landfills or dumps were found during the records search, site inspection or interview investigation.

5.9 Munitions and Explosives of Concern (MEC) and/or Unexploded Ordnance (UXO)

No munitions, explosives, or unexploded ordinance (UXO) were found during the records search, site inspection or interview investigation.

5.10 Radon

Beaver Lake spans across Benton, Washington and Carroll Counties. Washington County is in the Environmental Protection Agency (EPA) Radon Zone 3. Counties in Radon Zone 3 are counties with predicted average indoor radon screening levels of less than 2 pCi/L (EPA, 2018). Benton and Carroll Counties are in the EPA Radon Zone 2 with a predicted average indoor radon level between 2 and 4 pCi/L (EPA, 2018). No radon assessments were found during the records search (EPA, 2019).

5.11 Pesticides

No records were found to indicate the storage, improper use, or disposal of pesticides on the subject property.

5.12 Other Identified Concerns

No significant other concerns were found during the records search, site inspection or interviews.

5.13 National Environmental Policy Act (NEPA)

As the federal agency in charge of this project, USACE is in charge of coordinating National Environmental Policy Act (NEPA) compliance of 1969 (Public Law 91-190), the Council on Environmental Quality (CEQ) regulations (40 CFR 1500–1508), and the USACE implementing regulations, Policy and Procedures for Implementing NEPA, ER 200-2-2. As part of the records search and interview process recent NEPA documents were reviewed including the 2018 Draft Environmental Assessment for the Beaver Lake Master Plan Revision.

5.14 Adjacent Properties

As part of the ECP process, adjacent properties are assessed for environmental conditions, and those discovered conditions are evaluated based on the potential to affect the subject property. The nearest structure to the priority area is a metal building located immediately adjacent to the shore. The metal structure appears to be a livestock loafing shed and can first seen in the 2016 historical aerial photographs. The adjacent properties are unlikely to pose any HTRW concerns to the priority area.

6.0 Evaluation and Conclusions

6.1 Summary of ECP

Beaver Lake currently occupies more than 38,000 acres of Federal public lands and waters. This ECP report covers 3.72 acres of land located at the southern end of Beaver Lake. The subject property is on the edge of the lake and currently owned by private landowner(s). The lake is located in northwestern Arkansas, in Benton, Washington, Madison and Carroll Counties, and it is approximately 6 miles west of Eureka Springs, Arkansas. The subject property, also known as Priority Area 5, is near the end of the War Eagle Creek region of Beaver Lake.

This ECP report was prepared to characterize the existing environmental conditions at the subject property and is intended to be an aid in the leasing of real property. The ECP findings are based on the available sources of information concerning both past and present uses of the subject property. Information included readily available data associated with adjacent property records, aerial photography,

personnel interviews, environmental programs and associated documentation, and current and historic investigations. In addition, record sources were reviewed to determine if there have been spills, leaks, discharges, leaching, underground injections, dumping, abandonments, or storage of hazardous substances or petroleum products at the installation. The VSI and interview process included inquiries and requests into the existence and availability of records that support the environmental condition of the property.

6.2 Conclusions

The subject property was classified into one of seven standard ECP area types (categories) as defined by ASTM D5746-98(2016) *Standard Classification of Environmental Condition of Property Area Types for Defense Base Closure and Realignment Facilities*. Below are the seven categories for reference.

Table 4: Definitions of ECP Categories

ECP Category	Definition
1	An area or parcel of real property where no release, or disposal of hazardous substances or petroleum products or their derivatives has occurred (including no migration of these substances from adjacent properties).
2	An area or parcel of real property where only the release or disposal of petroleum products or their derivatives has occurred.
3	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but at concentrations that do not require a removal or remedial action.
4	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, and all remedial actions necessary to protect human health and the environment have been taken.
5	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred and removal or remedial actions, or both, are under way, but all required actions have not yet been taken.
6	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but required response actions have not yet been initiated.
7	An area or parcel of real property that is unevaluated or requires additional evaluation.

Given these seven categories, the subject property is categorized below, along with the reasoning for each classification.

Table 5: Properties and ECP Categories

Acreage	ECP Category	Reasoning
3.72 ac.	1	No release or disposal of hazardous substances or petroleum products or their derivatives has occurred beyond de minimus amounts, including no migration of these substances from adjacent properties.

No release or disposal of hazardous substances or petroleum products or their derivatives has occurred beyond de minimus amounts on the subject property and no releases to the environment were observed or reported.

Asbestos assessments were not available for the subject property. It is unlikely that Asbestos Containing Material (ACM) is present but, in the future, if a building or structure will be disturbed, a licensed asbestos inspector is needed to confirm whether ACM is present or not.

7.0 Certification

I declare that, to the best of our professional knowledge and belief, we meet the definition of *Environmental professional* as defined in Part 312.10 of 40 CFR 312. We have the specific qualifications based on education, training, and experience to assess a property of the nature, history and setting of the subject property. We have developed and performed the appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312. All information/documentation provided accurately reflects the condition of the property. This report meets the DoD requirements for completion of an ECP Report.

_____ _____

Eugenia Barnes
Environmental Protection Specialist
U.S. Army Corps of Engineers
Fort Worth District

Date

_____ _____

Hollie Eljizi
Environmental Engineer
U.S. Army Corps of Engineers
Fort Worth District

Date

_____ _____

Jennifer Jefcoat
Chemist
U.S. Army Corps of Engineers
Fort Worth District

Date

8.0 References

American Society for Testing and Materials (ASTM), 2013. E1527-13, *Standard Practice for Environmental Site Assessments: Phase 1 Environmental Site Assessment Process*.

ASTM, 2016. D5746, *Standard Classification of Environmental Condition of Property Area Types for Defense Base Closure and Realignment Facilities*.

Department of the Army, 13 December 2007. Army Regulation 200-1. *Environmental Quality: Environmental Protection and Enhancement.*

Environmental Protection Agency (EPA), February 2019. *EPA Map of Radon Zones including State Radon Information and Contacts*. https://www.epa.gov/radon/find-information-about-local-radon-zones-and-state-contact-information#radonmap

Federal Emergency Management Agency (FEMA), 2019. FEMA Flood Map Service Center. https://msc.fema.gov/portal

USACE. 1993. White River Basin, Arkansas and Missouri, *Water Control Master Manual.*

USACE. 2013. Little Rock District Water Management website. Accessed at: www.swl-wc.usace.army.mil

United States Census Bureau. 2013. Easy Facts Website. Accessed at: http://www.census.gov/easystats/

USACE. 2018. Beaver Lake White River and Tributaries, *Arkansas Shoreline Management Plan.*

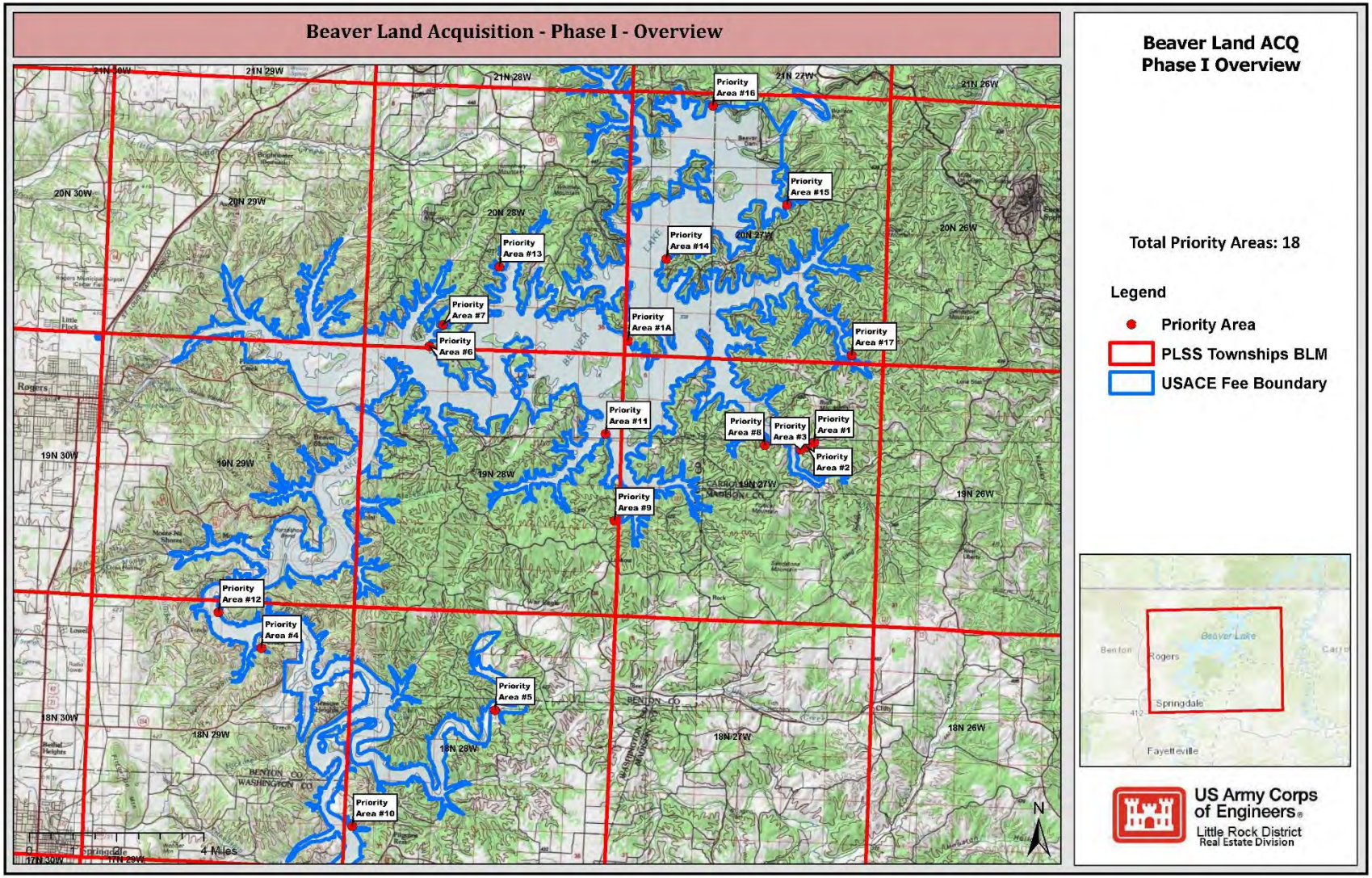
Arkansas Department of Energy and Environment Oil and Gas website Accessed August 2021 at: Commission, http://www.aogc.state.ar.us/maps/googleEarth.aspx

Beaver Watershed Alliance (BWA), 2012. *Beaver Lake Watershed Protection Strategy.*

Arkansas Department of Energy and Environment Environmental Quality website Accessed August 2021 at: https://www.adeq.state.ar.us/rst/programs/fees/facility_data.aspx

Figures

Figure 1: Beaver Lake Priority Areas



ACQ = Acquisition; PLSS = Public Land Survey System; BLM = Bureau of Land Management

Figure 2: Priority Area Detail

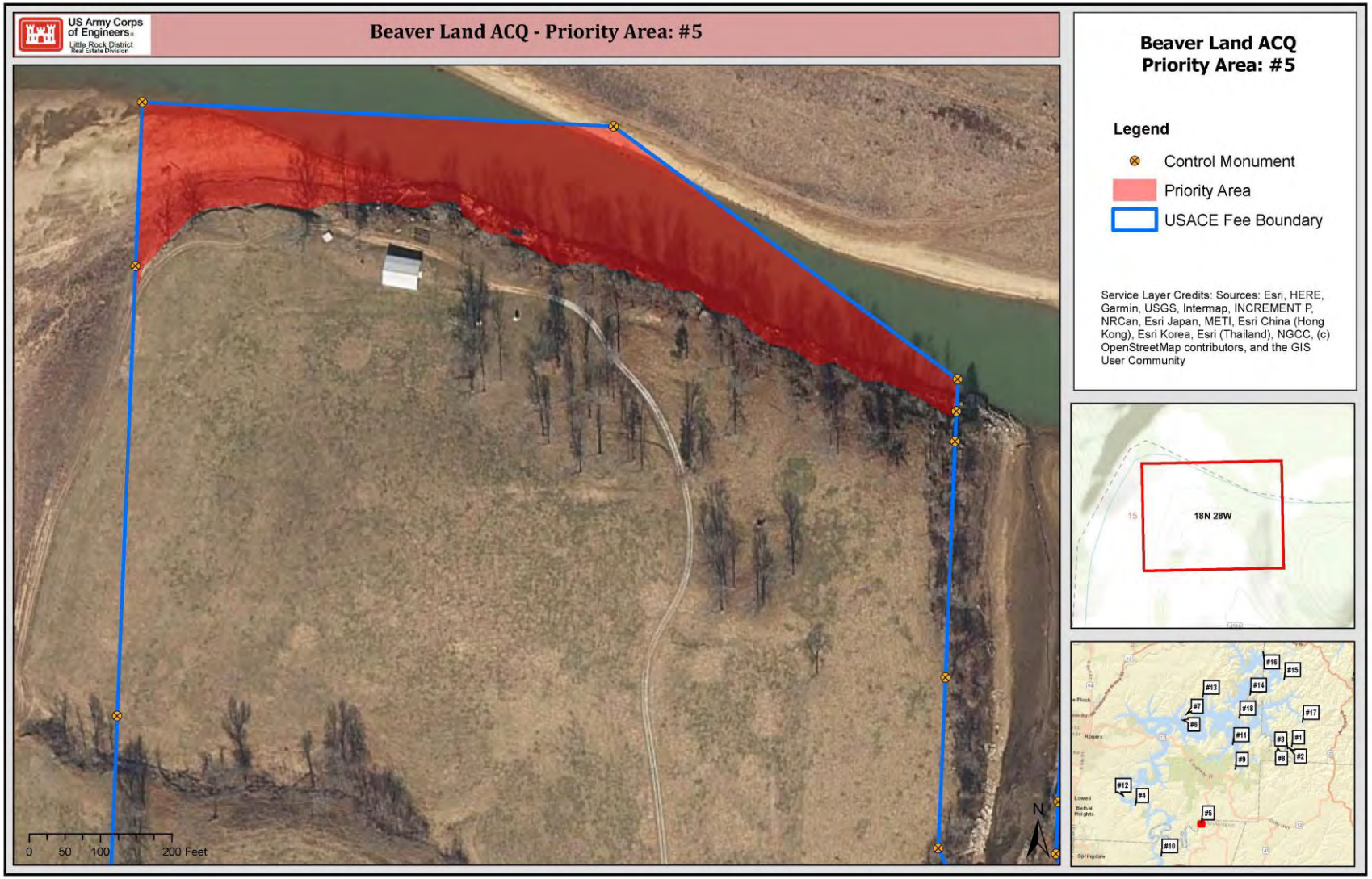


Figure 3: Interview Questions

Beaver Lake ECP
Interview Questions

1. Do you know of any environmental issues with this property?
2. Do you know of, or have access to, any reports concerning the environmental condition of this property? (i.e. site assessments, permits, storage tank registrations, safety plans, etc.) If so, would you be able to provide them? SWPPPs, SPCCs, air permits?
3. Do you know how this property has been historically used?
4. What is the property currently used for?
5. When were the site buildings constructed?
6. Are hazardous materials or petroleum products stored or used on this site? If so, what is the RCRA EPA ID? Does fueling occur on this property?
7. Do you know of any asbestos or LBP on the property or its buildings? Do you know the age of the buildings?
8. Has the site layout been manipulated in your recollection? (i.e. grading, excavation, etc.)?
9. Are there or have there been any cultural/historic items or buildings found on the property?
10. Is there anything else environmentally relevant that we should know?

Appendix A Visual Site Inspection Photographs

13 July 2021

Priority Area 5 – Livestock present at priority area

Priority Area 5 – View of priority area from watercraft

Priority Area 5 – View of priority area from watercraft

Priority Area 5 – Portion of adjacent structure can be seen

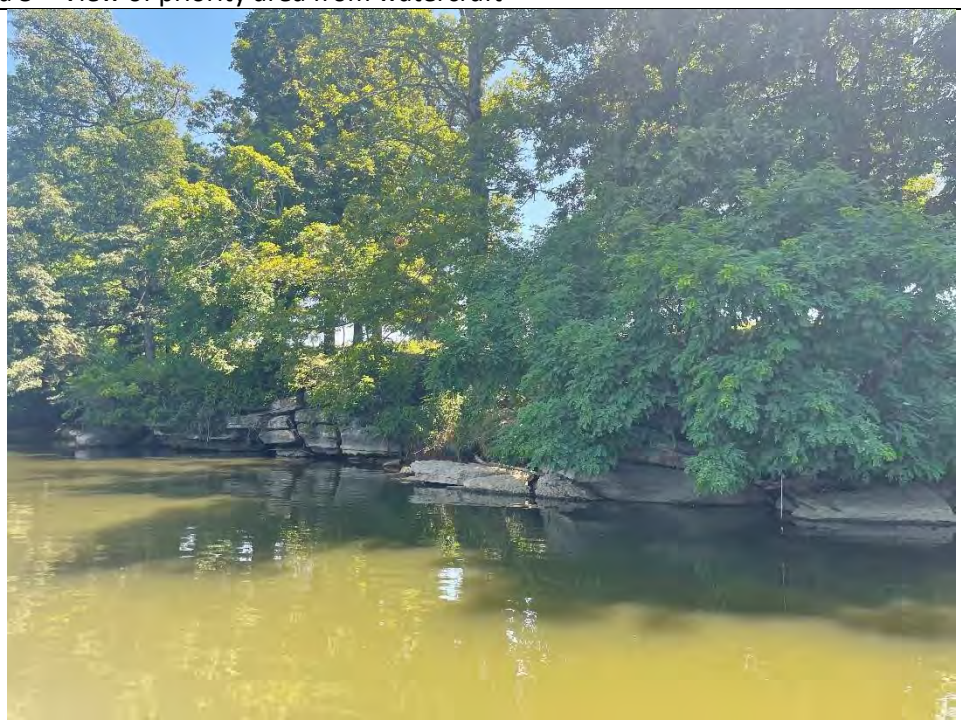
Priority Area 5 – View of priority area from watercraft

Priority Area 5 – View of priority area from watercraft

Priority Area 5 – View of priority area from watercraft

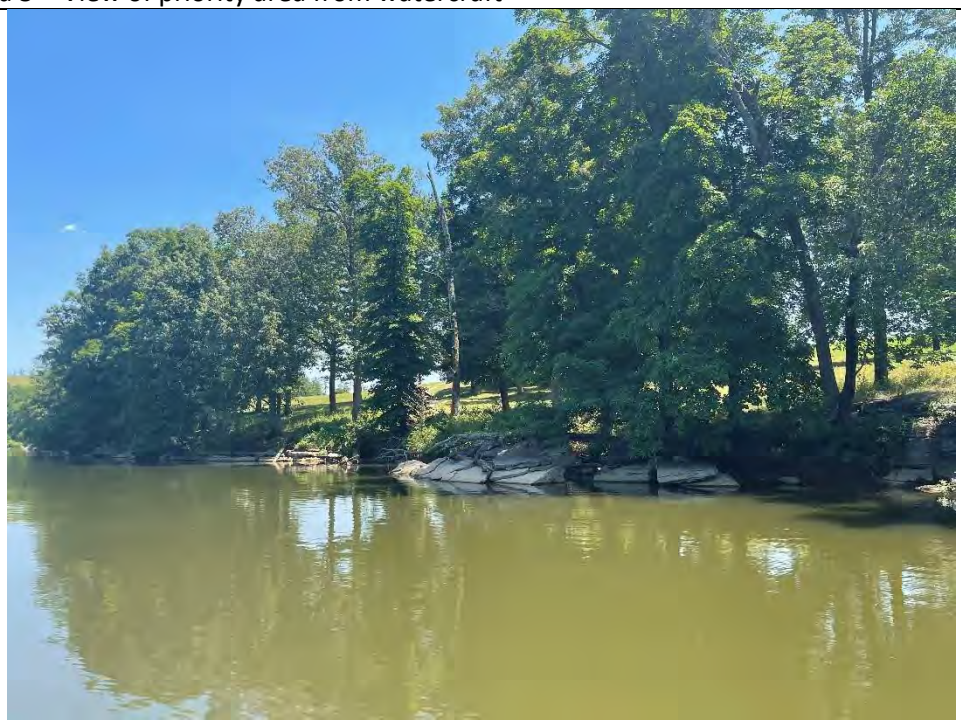
Priority Area 5 – View of priority area from watercraft

Priority Area 5 – View of priority area from watercraft



Priority Area 5 – View of priority area from watercraft

Priority Area 5 – View of priority area from watercraft



Priority Area 5 – View of priority area from watercraft

Priority Area 5 – View of priority area from watercraft

Priority Area 5 – View of priority area from watercraft

Final

U.S. Army Environmental Condition of Property Report
Priority Area 6

Beaver Lake
Beaver Lake, Arkansas

August 30, 2021

Prepared For:
Beaver Lake Land Acquisition

Prepared By:
U.S. Army Corps of Engineers
Regional Planning and Environmental Center
Fort Worth District
Fort Worth, Texas

[This page is intentionally left blank.]

Table of Contents

List of Appendices:
Appendix A: Visual Site Inspection Photographs, 12 July 2021.
Appendix B: Historical Aerial Photography.
Appendix C: Historical Topographic Maps.

List of Acronyms

ACM	Asbestos-containing material
AR	Army Regulation
AST	Aboveground storage tank
ASTM	American Society for Testing and Materials
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CFR	Code of Federal Regulations
DoD	Department of Defense
ECP	Environmental Condition of Property
EDR	Environmental Data Resources, Inc.
EPA	Environmental Protection Agency
ERNS	Emergency Response Notification System
FAA	Federal Aviation Administration
HTRW	Hazardous, Toxic and Radioactive Waste
IRP	Installation Restoration Program
LBP	Lead-based Paint
LUST	Leaking underground storage tank
MEC	Munitions and Explosives of Concern
NEPA	National Environmental Policy Act
NFRAP	No Further Remedial Action Planned
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NRC	Nuclear Regulatory Commission
ODEQ	Oklahoma Department of Environmental Quality
OWS	Oil-water separator
PCB	Polychlorinated Biphenyl
POL	Petroleum, Oils, and Lubricants
RCRA	Resource Conservation and Recovery Act
SEMS	Superfund Enterprise Management System
SF	Square feet
SHWS	State Hazardous Waste Sites
SWPPP	Stormwater Pollution Prevention Plan
TSD	Transport, Storage, Disposal
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
UST	Underground storage tank
UXO	Unexploded Ordnance
VCP	Voluntary Cleanup Program
VSI	Visual site inspection

1.0 Executive Summary

This environmental condition of property (ECP) report has been prepared to document the environmental conditions and provide information for the acquisition of land that would be necessary for the operation, maintenance, and control of the Beaver Lake reservoir in Arkansas. This fee acquisition pertains to the frequently inundated land immediately surrounding the lake, below an elevation of 1128 ft above mean sea level (msl). The Army prepares an ECP in order to provide the public with information relative to the environmental condition of the property, assist Federal agencies during the property screening process, provide information about completed remedial and corrective actions at the property, and to assist in determining appropriate responsibilities, asset valuation, and liabilities with other parties to a transaction.

Beaver Lake currently occupies more than 38,000 acres of Federal public lands and waters. This ECP report covers a narrow 0.55 acre parcel of land located near the center of Beaver Lake on western shore. The subject property is on the edge of the lake and currently owned by private landowner(s). The lake is located in northwestern Arkansas, in Benton, Washington, Madison and Carroll Counties, and it is approximately 6 miles west of Eureka Springs, Arkansas. The subject property, also known as Priority Area 6, is at the eastern opening of the Little Venice cove, opposite the Ventris public use area and boat ramp.

This ECP report presents a summary of readily available information on the environmental conditions of, and concerns relative to, the land, facilities, and real property assets of Beaver Lake. The findings included in the report are based on a record search of historical environmental investigation reports and site historical documents, a review of aerial photography, stakeholder interviews, and a site inspection conducted 12 – 13 July 2021.

Based on the environmental conditions found and the ECP analysis, the property can be categorized as an ECP Category 1, indicating a site where no release, or disposal of hazardous substances or petroleum products or their derivatives has occurred (including no migration of these substances from adjacent properties).

2.0 Purpose

2.1 General

This environmental condition of property (ECP) report has been prepared to document the environmental conditions and provide information for the acquisition of land surrounding Beaver Lake in Benton, Washington, Madison and Carrol Counties, Arkansas. This report meets the requirements of Title 40, Code of Federal Regulations (CFR), Part 373, and United States Army Regulation (AR) 200-1 (2007), *Environmental Quality, Environmental Protection and Enhancement*. The ECP report also follows the American Society for Testing and Materials (ASTM) E1527-13 *Standard Practice for Environmental Site Assessments: Phase 1 Environmental Site Assessment Process*. The subject property in this report is subsequently categorized according to ASTM D5746 (2016) *Standard Classification of Environmental Condition of Property Area Types for Defense Base Closure and Realignment Facilities*.

The Army prepares an ECP for the following purposes:

- Provide the public with information relative to the environmental condition of the property.
- Assist Federal agencies during the property screening process.
- Provide information to prospective buyers.
- Provide information about completed remedial and corrective actions at the property.
- Assist in determining appropriate responsibilities, asset valuation, and liabilities with other parties to a transaction.

The ECP contains the information required to comply with the provisions of 40 CFR, Part 373 that require a notice to accompany contracts for the sale of, and deeds entered into for the transfer of, federal property on which hazardous substances may have been stored, released or disposed. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) §120(h) stipulates that a notice is required if certain quantities of designated hazardous substances have been stored on the property.

The ECP Report is not prepared to satisfy a real property purchaser's duty to conduct an "all-appropriate inquiry" to establish an "innocent purchaser defense" to CERCLA 107 liability. Any such use of the ECP Report by any party is outside the control of the Army and beyond the scope of the ECP Report. The Army, its officers, employees, or contractors makes no warranties or representations that any ECP Report satisfies any such requirements for any party.

2.2 Scope

Priority Area 6 occupies 0.55 acres of land. This ECP report covers a narrow strip of land approximately 0.55 acres at the opening of Little Ventris cove on Beaver Lake. There is access via watercraft and although it wasn't explored terrestrial access via private property from Oakcove Ln. Areas within the lake that are not within the Priority Area will be considered adjacent property. A general site location map is provided in Figure 1, and a map showing the subject property is shown in Figure 2.

2.3 Limitations

This ECP report presents a summary of readily available information on the environmental conditions of, and concerns relative to, the land, facilities, and real property assets of the subject property. The findings included in the report are based on a record search of available historical environmental investigation reports and site historical documents, a review of aerial photography, stakeholder interviews, and a site reconnaissance conducted 12 – 13 July 2021. Historical environmental investigation reports and site historical documents were reviewed in support of this ECP, and the information obtained from other studies is reflected within this report by reference. The ECP process recognizes that the condition of property and classification can change as historical contamination is cleaned up (if required) or if a new

source of contamination is identified. Records reviewed during the assessment were accepted as accurate and a reasonable effort was made to resolve discrepancies identified during the document review.

During the ECP assessment, all available sources of information concerning both past and present environmentally significant uses of the property were reviewed. This included readily available data associated with adjacent property records; 1985, 1994, 2001, 2004, 2006, 2009, 2010, 2012, 2014, 2016, 2017, 2018, and 2020 aerial photography; personnel interviews; current and historic investigations; and topographical maps. In addition, record sources were reviewed to determine if there have been spills, leaks, discharges, leaching, underground injection, dumping, abandonment, or storage of hazardous substances or petroleum products at the subject property. The site reconnaissance and interview process included inquiries and requests into the existence and availability of records that support the environmental condition of the property. The site reconnaissance included a Visual Site Inspection (VSI) of the subject property. No sampling or analysis was conducted during this survey.

2.4 Report Organization

The remainder of this ECP report is organized as follows:

Section 3 – Property Description: This section provides location and description of the subject property; an overview of historical and current land uses; and a description of the environmental setting of the lake area, including climate, topography, geology, and demography.

Section 4 – Survey Methodology: This section describes the methods used to obtain the information for this ECP Report such as the development of study sections, the VSI, aerial photography analysis, records review, interviews, and data management.

Section 5 – Environmental Conditions: This section provides the existing environmental information. The findings are organized by relevant environmental "issues," including permits and licenses, cleanup activities, hazardous substances, petroleum and related products, asbestos, lead-based paint (LBP), radioactive materials, landfills, explosive contaminated structures, radon, pesticides, and polychlorinated biphenyls (PCBs). This section also includes adjacent property descriptions.

Section 6 – Evaluation and Conclusions: This section provides a summary of the subject property and evaluates the property for categorization as per ASTM D5746 (2016).

Section 7 – Certification: This section documents the approval of the ECP report.

Section 8 – References: This section provides an inventory of the reference material used in the preparation of this ECP Report.

Appendices: A list of appendices is provided in the Table of Contents.

3.0 Property Description

3.1 Parcel Locations and Description

Beaver Lake is located in the scenic Ozark Mountain region of northwestern Arkansas in Benton, Washington, Carroll and Madison counties. The total area currently contained in the Beaver project, including both land and water surface, consists of 38,138 acres owned in fee. Of this total, 1,432 acres are in flowage easement. The proposed Land Acquisition would include adding any land below the 1128 msl water level. The White River drainage area above Beaver Lake is approximately 1,186 square miles. When the lake is at the top of the conservation pool (elevation 1120.43 ft msl), the water area is 28,299 surface acres with 490 miles of shoreline within the lands owned in fee. The shoreline is irregular with topography primarily consisting of steep bluffs and gentle slopes.

Priority Area 6 is a 0.55 acre narrow rectangular strip of land along the shoreline at the western opening of Little Ventris Cove. The area is immediately adjacent to three residences. A concrete platform sits withing the priority area for private use. The priority area is on the edge of the lake and currently owed by private landowner(s).

3.2 Historic Land Use

Beaver Lake is a multiple purpose water resource development project initially authorized for flood control, hydropower generation and other beneficial uses by the Flood Control Act dated 3 September 1954. The inclusion of storage in the lake for municipal and industrial water supply was authorized by the Water Supply Act of 1958. Beaver Lake is a major component of a comprehensive plan for water resource development in the White River Basin of Arkansas and Missouri. Construction of Beaver Dam was initiated in March 1960. The dam was completed in June 1966, and the powerhouse and switchyard were completed in 1965. Beaver Lake was declared operational for public use in 1965.

For Priority Area 6, the historical aerial photography shows that this area has been used for private since 2001. Prior to that no structures were present on or adjacent to the priority area.

3.3 Current Land Use

Beaver Lake is located in the Ozark Highlands of Carroll, Washington, Benton, and Madison Counties. Having 490 miles of shoreline (at conservation pool) and over 28,000 water surface acres, Beaver Lake is the largest reservoir in northwest Arkansas and the first federal impoundment on the White River.

There are 12 public use areas around Beaver Lake. There are 11 parks on the lake presently operated by the Corps of Engineers. The State of Arkansas owns and operates Hobbs State Park Conservation Area, which covers 12,056 acres, and Devil's Eyebrow Natural Area, which covers 2,503 acres. Both properties are adjacent to USACE lands. There are two parks, Ventris, and Blue Springs that have been reduced to lake access only. One Park (Big Clifty) is operated by Carroll County, Arkansas.

Despite being located adjacent to the fast-growing communities of Fayetteville, Springdale, Bentonville, and Rogers, Arkansas and a regional population of over 500,000, the lake provides open spaces and a quality outdoor recreation opportunity. Many arms and coves of the lake offer secluded areas for traditional activities such as fishing, skiing, sailing and scuba diving, but also allow for passive recreation opportunities like photography and nature observation.

Priority Area 6 is currently owned by three private landowners.

3.4 Utilities

Priority Area 6 has no known utilities.

3.5 Environmental Setting

3.5.1 Climate

The climate in the Beaver Lake area is classified as humid subtropical according to the Köppen climate model. A humid subtropical climate is characterized by hot, usually humid summers and mild to cool winters. The Köppen definition of this climate is for the coldest month's mean temperature to be between 26.6 °F (−3 °C) and 64.4 °F (18 °C), and the warmest month to be above 71.6 °F (22 °C). Some climatologists prefer to use 32 °F (0 °C) as the lower bound for the coldest month's mean temperature. Under the modern Trewartha climate classification, climates are termed Humid Subtropical when they have mean temperatures of 50 °F (10 °C) for eight or more months a year. In most locations classed within this system, the mean temperature of the coldest month is between 35 °F (3 °C) and 65 °F (18 °C). Some climatologists consider the Trewartha grouping of subtropical climates to be more real-world and fitting on a global scale.

While technically classified as humid subtropical, the climate in the Beaver Lake area is considered moderate. The area experiences all four seasons and does receive cold air masses from the north; however, some of the Arctic masses are blocked by the higher elevations of the Ozarks.

Average temperatures range from a high of 88 °F (31.1 °C) and low of 27 °F (-2.7 °C) in nearby Rogers, Arkansas. Extreme temperatures rarely exceed 96 °F (35.6 °C) and 13°F (-10.6 °C). Late summer is the time of maximum heat and least rainfall. During the winter months, midday temperatures in the basin are relatively warm, around 55 o to 60 o F. Some short periods of cold weather occur with temperature ranging from 0 o to 10 o F. On winter nights, temperatures from 37 o F to below freezing are common. Highest recorded temperature in Rogers, Arkansas was 114 °F (45.6 °C) (recorded in July 1954). The lowest temperature recorded was −16 °F (−26.7 °C), in February 1996.

The relative humidity typically ranges from 41% (comfortable) to 91% (very humid) over the course of the year, rarely dropping below 24% (dry) and reaching as high as 100% (very humid). The air is driest around April 9, at which time the relative humidity drops below 49% (comfortable) three days out of four; it is most humid around June 3, exceeding 87% (very humid) three days out of four.

Dew point is often a better measure of how comfortable a person will find the weather than relative humidity because it more directly relates to whether perspiration will evaporate from the skin, thereby cooling the body. Lower dew points feel drier and higher dew points feel more humid. Over the course of a year, the dew point typically varies from 19°F (dry) to 71°F (muggy) and is rarely below 4°F (dry) or above 74°F (very muggy). There are two periods in the year that are most comfortable: The first is between April 18 and June 6 and the second is between September 3 and October 23. The air feels neither too dry nor too muggy during these periods (https://weatherspark.com/averages/31495/Rogers-Arkansas-United-States).

Average annual rainfall for the Beaver Lake area is 45 inches per year. Precipitation is weakly seasonal, with a bimodal pattern: wet seasons in the spring and fall, and relatively drier summers and winters, but some rain in all months. The spring wet season is more pronounced than fall, with the highest rainfall typically occurring in May. The average annual snowfall for the Beaver area is about 12 inches. Snowpacks are usually short lived and are not commonly a concern for flooding.

Climate change is an area of concern due to the potential for effects on many aspects of the environment, especially those related to water resources. The U.S. Global Change Research Program (USGCRP) summarized information regarding climate change and its potential effects in regional assessments (http://www.globalchange.gov/publications/reports/scientific-assessments/us-impacts). In the Midwest, which extends from Minnesota to Missouri, extreme events such as heat waves, droughts and heavy rainfall events are projected to occur more frequently. Should these events become significant enough to impact the operation of Beaver Lake, the Master Plan and associated documents (i.e. Operations Management Plan and Shoreline Management Plan) would be reviewed and revised, if necessary.

3.5.2 Topography, Geology, and Soils

The depositional environment of the rocks found in the Arkansas Ozarks is one of a relatively shallow continental shelf, sloping toward deeper water generally toward the south. This shelf emerged many times during the Paleozoic resulting in numerous unconformities throughout the sequence. The Ozark Plateaus region of Arkansas is made up of generally flat-lying Paleozoic age strata divided into three plateau surfaces. The lowest and northern-most plateau is the Salem Plateau. The Springfield Plateau stands above the Salem a few hundred feet and is generally capped by lower Mississippian age limestones and cherts. The southernmost and highest plateau of the Ozarks is the Boston Mountains. All of these plateaus are deeply dissected by numerous streams throughout the area. The faulting in the Ozarks is generally normal; most faults displaying a displacement down on the southern side. However, some observations reveal that a few strike-slip faults may be present. Gentle folds are noted but are generally of very low amplitude. The depositional environment of the rocks found in the Arkansas Ozarks is one of a relatively shallow continental shelf, sloping toward deeper water generally toward the south.

Beaver Lake is part of the Springfield Plateau that occupies primarily the western and southwestern flanks of the Ozark Plateau province. The Springfield Plateau in this region rises to an elevation of approximately 1400 feet and in many areas, forms extensive plains. Hilly areas occur where rivers and their tributaries cut into the plateau surface, most notably in the vicinity of the White River and Beaver Lake. As streams like the Buffalo National River cut through the plateau down to the level of the White River, they sometimes carve spectacular bluffs.

Lower Ordovician, Middle to Upper Devonian and Lower and Upper Mississippian age strata are present around Beaver Lake. Upper Ordovician and Devonian strata crop out around Beaver Lake and its tributaries. The Lower Mississippian Boone Formation comprises the surface rock over the majority of the area and forms the surface of the heavily dissected Springfield Plateau. In addition to the Boone Formation, Cotter and Jefferson City formations (Jefferson City formation has not been successfully differentiated from the Cotter Formation in Arkansas), and the Powel formation, all of Ordovician age are present in the area. Formations in the Devonian strata include the Chattanooga, Clifty and Penters.

The Boone Formation consists of gray, fine- to coarse-grained fossiliferous limestone interbedded with chert. This formation caps the higher hills in the area. Since limestone is easily dissolved by water, cave and solution (karst) features are prominent. The Boone Formation is well known for dissolutional features, such as sinkholes, caves, and enlarged fissures. Surface water may drain directly into channels in limestone, where it can move rapidly and without filtration to the surface as a spring, at a location that is unpredictable without extensive testing. Therefore, water pollution problems are of particular concern in this region. The thickness of the Boone Formation is 300 to 350 feet in most of northern Arkansas, but as much as 390 feet has been reported.

The Cotter Dolomite is composed of dolostone of predominantly two types: a fine-grained, argillaceous, earthy textured, relatively soft, white to buff or gray dolostone called "cotton rock", and a more massive, medium-grained, gray dolostone that weathers to a somewhat hackly surface texture and becomes dark on exposure. The formation contains chert, some minor beds of greenish shale, and occasional thin interbedded sandstone. The thickness is about 340 feet in the vicinity of Cotter, but the interval may range up to 500 feet thick in places.

The Powell Dolomite is generally a fine-grained, light-gray to greenish-gray, limy, argillaceous dolostone with thin beds of shale, sandstone, sandy dolostone, and occasionally chert. The formation’s thickness may be as much as 215 feet but is often much thinner.

The Chattanooga Shale Formation is typically black, fissile clay shale that weathers into thin flakes. The beds are usually cut by prominent joints creating polygonal blocks upon weathering. The upper part of the formation may be slightly sandy and usually contains abundant pyrite. Thickness ranges from 0 to about 85 feet; normally averaging about 30 feet (AGS).

The strata throughout the region are nearly horizontal. One predominant geological feature of the lake area is a low, persistent, limestone bluff, which occurs just above the Ordovician- Mississippian contact.

The faulting in the Ozarks is generally normal; most faults displaying a displacement down on the southern side. Lineaments and faults characteristic of northwest Arkansas are present around Beaver Lake. The Fayetteville Fault lies beneath Beaver Lake. This fault is the west side of a graben that has down-dropped the Boone Formation to lake level. The Starkey Fault bounds the east side of the graben. Both faults trend approximately N 450E. One section of the Starkey fault trends N 60-700E. The Clantonville Lineament – Monocline is a northeast to southwest trending structural feature that extends from north of Clantonville to Ventris Hollow. The location of this feature was determined from the 1:24,000 three dimensional quadrangle and from structural disparities in the Lower Mississippian rock units. This structural feature could be responsible for the presence of lead-zinc mineralization in an old prospect near Clantonville (north of Beaver Lake). The trend of this lineament to monocline is N 30-400E. Paleokarst features within the top of the Powell Dolomite are present around Beaver Lake and coincident with a lineament in Limekiln Hollow near Garfield, northwest of Beaver Lake.

In general, the soils of the Ozark Plateaus are residual and are formed on a broad, domed, upwarp consisting mostly of limestone and dolomite. The main difference in the soils is due to different rocks from which the soils were formed. The main geologic materials are cherty limestone; cherty, very siliceous dolomite; cherty, siliceous dolomite; and alluvium, which are weathered and water transported products of the first three materials. Glade-rock soil occurs where the cherty, very siliceous dolomite is exposed to the soil formation. Dolomite is more resistant to weathering than limestone and siliceous dolomite is even more resistant, so very shallow soil results. In areas where the dolomite is less siliceous, more weathering has taken place; however, the soils produced are not as deep as soils formed by limestone.

The following eight soils associations are found in and around the Beaver project area: Captina-Nixa, Captina-Nixa-Pickwick, Clarksville-Nixa-Baxter, Corydon-Sogn, Enders-Allegheny-Mountainburg, Razort-Captina-Etowah, Linker-Apison-Hector, and Captina-Pembroke.

3.5.3 Hydrology and Groundwater

In the Interior Highlands of western and northern Arkansas ground-water supplies are more limited than in the Coastal Plain. Much of the Ozark Plateaus region is underlain by carbonate rocks, which are quite soluble in the presence of water. Solution by ground water has caused many large openings through which water passes so quickly that contaminants from the surface cannot be filtered out. Signs of these openings are caves, sink holes, springs and lost stream segments. As a consequence, the water in shallow wells may not be suitable for human consumption without treatment.

Three aquifers, which are part of the Ozark Plateaus Aquifer System, are located within northern Arkansas. The Springfield Plateau aquifer is generally under unconfined conditions, with groundwater movement occurring through fractures and solution cavities formed by dissolution of carbonate rock. Local discharge is through springs and streams. The Ozark aquifer is generally under confined conditions, especially where overlain by the units of the Ozark Confining Unit (Chattanooga Shale). Most wells in the Springfield Plateau and upper units in the Ozark aquifer yield 5-10 gpm on the average, with yields greater than 25 gpm in rare cases.

The third aquifer, the Roubidoux Formation and the Gunter Sandstone Member of the Gasconade Formation in northern Arkansas occur at greater depth and constitute the only significant aquifer system in the Ozarks. Both are permeable sandstone and carbonate units of Ordovician age. These aquifers serve as the principal source of high-quality water for many communities in northern Arkansas where surface

water sources are unavailable. Together these units may yield up to 500 gpm to wells. These formations do not outcrop anywhere in Arkansas but instead outcrop in 1 southern Missouri.

3.5.4 Water Quality

The waters of the Arkansas portion of the White River watershed have all been designated by the Arkansas Department of Environmental Quality (ADEQ) for fisheries, primary and secondary contact recreation, and domestic, agricultural, and industrial water supplies (ADEQ, 2012). Beaver Lake is classified by ADEQ as a Type A water body, which includes most larger lakes of several thousand acres in size, in upland forest dominated watersheds, having an average depth of 30 to 60 feet, and having low primary production (i.e., having a low trophic status if in natural [unpolluted] condition). Beaver Lake, like all other lakes of its size in the Ozark region, stratifies chemically and thermally in the late spring with stratification extending into late fall and early winter. During the warmer months, lake waters of the upper layer (the epilimnion) are warmer and contain more dissolved oxygen, while the denser, lower layer waters (the hypolimnion) are colder and contain very little or no dissolved oxygen, thus undesirable for fish habitat.

This undesirable water, when discharged downstream from hydropower generation, may cause some problems in the tailwaters. To combat this problem, the dissolved oxygen content is monitored, and various management measures are implemented to improve the dissolved oxygen concentration in the hydropower releases. A highly productive trout fishery has been established in the Beaver tailwaters by the Arkansas Game and Fish Commission because of the available discharge of cold water from the dam, which is reaerated by turbulence as it flows downstream.

As the stratified epilimnion cools in the late fall and winter, the layers begin to mix (de-stratify) and dissolved oxygen (DO) is more evenly distributed. This condition is more favorable to the fishery of the lake and overall water quality.

The upper 1500 acres of Beaver Lake has been listed by the Arkansas Department of Environmental Quality (ADEQ) on Arkansas' 303(d) list of impaired waters, approved by the Environmental Protection Agency (EPA), due to turbidity (ADEQ, 2008). According to the Arkansas 303(d) list, these excessive levels impact the local fisheries as well as primary contact, both designated uses of Beaver Lake. The elevated turbidity levels are due to excessive silt from surface erosion from agriculture activities, unpaved road surfaces, in-stream erosion – mainly from unstable stream banks, and any other land surface disturbing activity. The Draft 2010 Integrated Water Quality and Monitoring Report (ADEQ, 2010) added pathogen indicator bacteria as a contaminant for the same area of Beaver Lake. Surface erosion activities are listed as the probable source for this contaminant as well.

Clean Water Act requires states to list waters that do not meet Federal water quality standards or have a significant potential not to meet standards as a result of point source dischargers or non- point source run-off. Subsequent to listing on the 303(d) list, the statute requires that the states develop and set the Total Maximum Daily Load (TMDL) for water bodies on the list within 13 years. A TMDL establishes the maximum amount of a pollutant that can enter a specific water body without violating the water quality standards. Values are normally calculated amounts based 39 on dilution and the assimilative capacity of the water body. TMDLs have not been established by ADEQ for the upper Beaver Lake area.

3.6 Biological and Cultural Resources

3.6.1 Terrestrial Ecosystems

The area surrounding Beaver Lake is mostly forested. Trees and shrubs around the lakeshore include upland oak and hickory species, persimmon, honey locust, hawthorn, dogwood, redbud, coralberry, smooth and winged sumac, and buttonbush. Frequent periods of inundation keep a thin strip of government owned lands around the lake in early stages of succession. Red cedar and short-leafed pine, the principal evergreens, are dispersed throughout the region and are found in many large, scattered groups. Ground covers consist of greenbrier, sedges, and native grasses. White-tailed deer and eastern wild turkey are common game animals found and hunted in the Beaver Lake area. Black bears have also become common in the area and are hunted on the lands around the lake. The principal small game species found in the open upland areas include bobwhite quail, cottontail rabbit, and mourning dove. Gray and fox squirrels are common in upland wooded areas. Furbearing animals found in the Beaver Lake area include coyote, red fox, gray fox, otter, mink, muskrat, beaver, bobcat, and raccoon. Habitat management that includes wildlife food plot plantings, mowing, soil disturbance, removal of exotic species and application of prescribed fire provide benefit to these populations.

The common goldeneye, hooded merganser, bufflehead, and ring-necked duck are the predominant migratory waterfowl species visiting Beaver Lake. Mallards, gadwall, and other duck species are also present; however, they are only transient visitors as their characteristic feeding habits of obtaining food from shallow waters is limited. Resident Canada geese are so numerous in many coves and recreation areas that their presence has become a nuisance.

Ring-billed gulls are seen frequently around the Beaver Lake area. Greater and lesser yellow legs, pelicans, and large flocks of horned grebes are also seen during their peak migration in the spring and fall. Beaver Lake is also one of the few places where visitors can see both the turkey vulture and the black vulture at the same time in the winter. Beaver Lake has also become a popular place that visitors come to observe bald eagles, commonly wintering 150 or more birds and hosting 5-6 breeding pairs during the nesting period of March to June. The surrounding woodlands and grasslands serve as prime nesting areas for resident and neotropical migratory songbirds.

3.6.2 Aquatic Ecosystems and Wetlands

Walleye, smallmouth bass, striped bass, hybrid white-striped bass, walleye, and paddlefish have been introduced into Beaver Lake to add diversity to the fishery. Natural reproduction of striped bass and hybrid white-striped bass does not occur in Beaver Lake. Since 2004, AGFC stocks approximately 100,000 walleye, 30,000 channel catfish, 30,000 blue catfish, and 200,000 striped bass each year. While natural reproduction occurs in white crappie, black crappie, largemouth bass, and smallmouth bass, AGFC supplements this reproduction by occasional stockings of these species. Historically, there have also been introductions of northern pike, blue catfish, lake trout, and threadfin shad.

Located within the Springfield Plateau of the Ozark Mountains region of northern Arkansas, the area surrounding Beaver Lake is characterized by limestone, dolomite, or chert geology. The many rivers and streams flowing through the region have created a landscape of level highlands dissected by rugged valleys rich in karst features such as caves and sinkholes. Associated with these streams and landscape features are a variety of wetland habitats representative of the five wetland classes occurring within the region. These wetland classes include depressions, flats, fringe, riverine, and slope. It is possible, and perhaps even likely, that all of these classes of wetlands occur in the general area of Beaver Lake. However, those most likely to occur in the area immediately surrounding the lake are fringe (most likely reservoir), riverine (most likely spring runs) and slope wetlands (most likely calcareous slope).

3.6.3 Threatened and Endangered Species

The following species listed in Table 1 are from the U.S. Fish and Wildlife Service's federally classified status list of species and the Arkansas Natural Heritage data sets which have been reported and identified on project lands. Although the bald eagle was delisted by USFWS in 2007 due to recovery of the species, both the bald and golden eagles are still protected in accordance with the Bald and Golden Eagle Protection Act. The federal Migratory Bird Treaty Act of 1918 also provides protection to certain species of migratory birds. A total of 31 bird species are currently protected under this federal statute.

Table 1: Threatened and Endangered Species

	Federal Status	**State Status/Global Rank**
Gray Bat	LE	SE / S2S3/G4
Indiana Bat	LE	SE / /S1/G2
Northern long-eared Bat	LT	SE / S1S2/ G1G2
Ozark Big-eared Bat	LT	Not listed
Little Brown Bat	-	SE / S1
Bald Eagle	*Protected under Bald and Golden Eagle Protection Act	S3B,S4N/G5
Eastern Black Rail	LT	Not listed
Piping Plover	LT	Not listed
Rufa Red Knot	LT	Not listed
Whooping Crane	Experimental Population, Non-Essential	Not listed
Ozark Cavefish	LT	SE / S1/G3
Neosho Mucket	LE	Not Listed
Rabbitsfoot mussel	LT	SE/S3/G3G4
Snuffbox Mussel	LE	Not listed
Monarch Butterfly	C	Not listed
Missouri Bladderpod	LT	S2/G3

Opaque Prairie Sedge	-	SE / S2S3G4
Yellow Coneflower	-	ST / S2G3T3
Ovate-leaf Catchfly	-	ST / S2G3
Royal Catchfly	-	ST / S2G3

FEDERAL STATUS CODES

LE = Listed Endangered; the U.S. Fish and Wildlife Service has listed this species as endangered under the Endangered Species Act.
LT = Listed Threatened; the U.S. Fish and Wildlife Service has listed this species as threatened under the Endangered Species Act.
C = Candidate Species;

STATE STATUS CODES

INV = Inventory Element; The Arkansas Natural Heritage Commission is currently conducting active inventory work on these elements. Available data suggests these elements are of conservation concern. These elements may include outstanding examples of Natural Communities, colonial bird nesting sites, outstanding scenic and geologic features as well as plants and animals, which, according to current information, may be rare, peripheral, or of an undetermined status in the state. The ANHC is gathering detailed location information on these elements.

GLOBAL RANKS

G3 = Vulnerable globally. At moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors.
G4 = Apparently secure globally. Uncommon but not rare; some cause for long-term concern due to declines or other factors.
G5 = Secure globally. Common, widespread and abundant.
T-RANKS= T subranks are given to global ranks when a subspecies, variety, or race is considered at the state level. The subrank is made up of a "T" plus a number or letter (1, 2, 3, 4, 5, H, U, X) with the same ranking rules as a full species.

STATE RANKS

S1 = Critically imperiled in the state due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors making it vulnerable to extirpation.
S2 = Imperiled in the state due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it vulnerable to extirpation.
S3 = Vulnerable in the state due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.

GENERAL RANKING NOTES

Q = A "Q" in the global rank indicates the element's taxonomic classification as a species is a matter of conjecture among scientists.

Source: Arkansas Natural Heritage Commission

3.6.4 Cultural Resources

The records search, interviews, and site inspection identified no cultural resource assessments or findings for the subject property.

During the past seventy years scientific investigation of archaeological sites in the Beaver Lake area has been carried out in several phases. In 1922 and 1923, Mark R. Harrington of Phillip Academy was the first archeologist to excavate sites on the area that is now Beaver Lake. He excavated 13 bluff shelters. Between 1928 and 1935, the work of Harrington was continued by S.C. Dellinger of the University of Arkansas Museum. Dellinger supervised the excavation of 21 rock shelters. In the early 1960's, a series of surveys were conducted by several archeologists from the University of Arkansas Museum. Today, there are 280 known archeological sites along or immediately adjacent to Beaver Lake. Of these, 271 are identified as prehistoric, seven are historic and two sites have no known cultural affiliation.

Table 2: Historical and Cultural Resources at Beaver Lake

Type of Site	Number of sites
Historic	7
Prehistoric	271
No known cultural affiliation	2
Total	280
National Register Eligibility Status	
Not Evaluated	132
Not Eligible	5
Eligible	1

4.0 Survey Methodology

4.1 Development of Study Sections

The information gathered during the development of the ECP was used to group the subject property into standardized categories using Department of Defense (DoD) guidance, and in accordance with ASTM D5746 (2016). The ECP category definitions are summarized below in Table 3.

Table 3: Definitions of ECP Categories

ECP Category	Definition
1	An area or parcel of real property where no release, or disposal of hazardous substances or petroleum products or their derivatives has occurred (including no migration of these substances from adjacent properties).
2	An area or parcel of real property where only the release or disposal of petroleum products or their derivatives has occurred.
3	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but at concentrations that do not require a removal or remedial action.
4	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, and all remedial actions necessary to protect human health and the environment have been taken.
5	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred and removal or remedial actions, or both, are under way, but all required actions have not yet been taken.
6	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but required response actions have not yet been initiated.
7	An area or parcel of real property that is unevaluated or requires additional evaluation.

The final ECP category designations for the subject property are shown in Section 6.2, Table 5.

4.2 Visual Site Inspection

A VSI was conducted on 12 July 2021 at the subject property to check for recognized environmental conditions. The VSI was conducted by Mrs. Hollie Eljizi, Ms. Jennifer Jeffcoat and Mr. Robert Singleton from the U.S. Army Corps of Engineers (USACE). USACE representatives were accompanied by Mr. Mathew Voskamp of the USACE Beaver Lake office.

The VSI was performed from a USACE Beaver Lake Office watercraft near the bank of the subject property as a Right of Entry (ROE) was not available at the time of the inspection. On the day of the VSI,

the lake water level was 1126.79 ft. msl. At the time of inspection, minor debris could be seen from the boat including a piece of encapsulated foam and a beach ball. Sections of the priority area have significant bank soil erosion with bare earth visible. The other areas were rocky with fallen wood debris on the shoreline. No apparent signs of Hazardous, Toxic and Radioactive Waste (HTRW) were visible during the VSI. Photos from the VSI can be found in Appendix A.

4.3 Aerial Photography Analysis

Aerial photographs were available from Google Earth maps for 1985, 1994, 2001, 2004, 2006, 2009, 2010, 2012, 2014, 2016, 2017, 2018, and 2020.

Site 6

The initial aerial photograph from 1985 is of poor quality and the area isn't discernable. The next photo from 1994 is also of poor quality but it appears that there are no structures on or adjacent to the property. The next photo from 2001 shows two residences adjacent to the property with a road that connects them and the local road on the northern side. A boat dock is immediately adjacent to the priority area on the southern side, along with what appears to be an empty retaining wall within the priority area boundary (see photos in Appendix A). There is no change in the 2004 photo, but the next photo from 2006 shows a third residence just south of the existing two, and two additional boat docks adjacent to the priority area on the southern side. There is no change in the photos from 2009 to 2020.

All aerial photographs are included in Appendix B.

4.4 Sanborn Map Review

Sanborn maps were not available for the subject property, or for the adjacent areas.

4.5 Topographic Map Review

Historical topographic maps were available from the US Geological Survey Website for the Beaver Lake area for 1900, 1901, 1945, 1949, 1954, 1957, 1958, 1964, 1985, 2011, 2014, 2017, and 2020. Several observations can be gleaned from these maps. First, the area before the lake was formed consisted of valleys with steep bluffs and hill sides around the White River and its tributaries. The historical maps show this valley and river basin from the 1900 to 1964 topographic maps. In 1985 the river and Beaver Dam at the northern end of the lake can been seen in the valley of the historical White River.

All topographic maps are included in Appendix C.

4.6 Records Review

4.6.1 Standard Environmental Record Sources

In this evaluation records, maps and other documents that provide environmental information about the project area are obtained and reviewed. A desktop records review was conducted using various sources to determine the presence of HTRW sites on or near the subject property. This search was focused on active cleanup sites and sites with a reasonable risk of HTRW release. Several databases were searched manually to narrow down the search area. These databases included the Environmental Protection Agency (EPA) Cleanups in my Community database, the EPA Envirofacts databases, the Arkansas Department of Environmental Quality's (ADEQ) web search tool of Underground Storage Tanks (UST) and Above Ground Storage Tanks (AST), and the Arkansas Department of Energy and Environment Oil and Gas Commission oil and gas well maps. The information collected from this desktop records review was analyzed for recognized environmental conditions (RECs) that would affect the proposed project or need further investigation, given the proposed project measures. The following resources were searched.

Federal National Priorities List (NPL) – The records search did not reveal any NPL sites in the project footprint or adjacent areas. There are nine NPL sites in the state of Arkansas, none of which are located near Beaver Lake or the priority areas. This is based on a search of the EPA Superfund: National Priorities List (NPL) list.

Federal Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) List – The CERCLIS, now called the Superfund Enterprise Management System (SEMS) database, tracks hazardous waste sites where remedial action has occurred under EPA's CERCLA program. This list also includes sites that are in the screening and assessment phase for possible inclusion on the NPL. The records search of EPA's listed SEMS sites did not reveal any sites in the project footprints or adjacent areas. This is based on a search of the EPA SEMS database.

Federal No Further Remedial Action Planned (NFRAP) – The Federal NFRAP list (now known as the SEMS archive list) tracks sites where no further remedial action is planned, based on available assessments and information. The list also represents sites that were not chosen for the NPL. Further EPA assessment could possibly be ongoing, and hazardous environmental conditions may still exist; however, in the absence of remedial action and assessment data, no determination about environmental hazards can be made. The records search did not reveal any NFRAP sites in the project footprint or adjacent areas. This is based on a search of the EPA SEMS database.

Federal Resource Conservation and Recovery Act (RCRA) Corrective Action List – The records search of EPAs Cleanups in My Community showed two RCRA Corrective Actions within one mile of the project search area. No RCRA corrective actions were found to be located within one mile of the project footprint. This is based on a search of the EPA Cleanups in My Community.

State Superfund Sites - This search is to check for any state CERCLA sites in the project vicinity. The records search of state CERCLA cleanup sites did not show any sites of concern in the project or adjacent areas. This search is based on a search of the Arkansas Department of Energy and Environment data base.

State and Tribal Solid Waste Facilities/Landfill Sites – This search is designed to check any state or tribal databases for solid waste handling facilities or landfills in the project vicinity. The records search did not find any solid waste facilities or landfill sites in area of this project or adjacent areas. This is based on a search of the EPA Landfill Methane Outreach Program (LMOP) and ADEQ Permitted Solid Waste Disposal database.

State and Tribal Registered Storage Tanks – This list is a combination of the State of Arkansas registered UST and AST databases, representing sites with storage tanks registered with the State of Arkansas. The search revealed one AST within one mile of the work area or adjacent areas. This AST is not expected to impact the project due to its distance from the proposed project. These results are based on a search of the Arkansas Department of Energy and Environment Oil and Gas Commission website.

State and Tribal Voluntary Cleanup Sites – The ADEQ Elective Site Cleanup Agreement (ESCA) database identifies sites where the responsible party chooses to clean up the site themselves with ADEQ oversight. Five sites were identified from this database. None of the sites are within one mile of the work area and are therefore not expected to impact the proposed project. These results are based on a search of the ADEQ ESCA Database.

Brownfields List – A brownfield is a property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant.

There are no brownfield sites within one mile of the work area or adjacent areas. These results are based on a search for Brownfields sites using the EPA Envirofacts search engine.

Oil and Gas Wells – A search of the oil and gas wells in the area using the Arkansas Department of Energy and Environment Oil and Gas Commission website identifies multiple sites including oil wells, plugged oil wells, injection/disposal sites within the surrounding area. Although not classified as HTRW under USACE regulations, pipelines and oil wells play an important role in the HTRW existing conditions near the potential project area. This is because the well and/or pipeline contents could potentially leak or spill into the surrounding environment or affect the proposed project features. As a result of these findings, a thorough pipeline/well search should be initiated during design to ensure no interaction with the existing oil and gas infrastructure occurs. The Oil and Gas Commission website was used to map these findings. No oil wells or pipelines were found near the priority areas.

4.7 Interviews

Two interviews were conducted on 12 and 13 July 2021 in conjunction with the site inspection, and the following stakeholders were interviewed:

- Mr. Matthew Franklin; Natural Resource Specialist, Beaver Lake Office; Matthew.G.Franklin@usace.army.mil
- Mr. Matthew Voskamp; Natural Resource Specialist, Beaver Lake Office; Matthew.Voskamp@usace.army.mil

Information gleaned from the interviews is incorporated by way of reference throughout the report. The interview questions can be found in Figure 3.

5.0 Environmental Conditions

5.1 Environmental Permits and Licenses

5.1.1 RCRA Status

The subject property is not covered under a Resource Conservation and Recovery Act (RCRA) permit, and no hazardous waste is generated or stored on the property.

5.1.2 Solid Waste

The subject property has no active, inactive, or expired permits or licenses for solid waste disposal. No landfills exist on the property.

5.1.3 USTs/ASTs

No USTs or ASTs were found during the records search, site inspection and interviews indicated no UST/AST have been known to be located at the subject property.

5.1.4 National Pollutant Discharge Elimination System (NPDES)

Section 402 of the Clean Water Act (33 U.S.C. 1251 et. seq.) requires all facilities that discharge stormwater to acquire an NPDES that defines contaminant limits in effluent to be discharged. No permits were found using the EPA's Envirofacts database on or adjacent to the priority area.

5.1.5 Drinking Water Permits

No drinking water permits are in place at the subject property.

5.1.6 Air Permits

No air emission or air quality permits are in place at the subject property.

5.1.7 Nuclear Regulatory Commission (NRC)

The NRC is tasked with permitting the use and handling of radioactive materials and reactors. No NRC licenses are in place at the subject property.

5.1.8 Other Permits/ Licenses

The property has an erosion control permit issued by the USACE Beaver Lake office for the retaining wall.

5.2 Environmental Cleanup and Remediation

5.2.1 Installation Restoration Program

Beaver Lake is not an active military facility, and therefore would not be eligible for cleanup under the Installation Restoration Program.

5.2.2 Military Munitions Response Program

Beaver Lake is not an active military facility, and therefore would not be eligible for cleanup under the Military Munitions Restoration Program.

5.2.3 Other Environmental Investigations and Cleanups

No known environmental investigations or cleanups were found during the records search, site inspection and interviews indicated that no known investigations or cleanups are ongoing at Beaver Lake.

5.2.4 Storage, Release, and Disposal of Hazardous Substances

No releases to the environment or improper disposal of these substances were found during the records search, site inspection and interviews indicated no known improper disposal at the priority area.

5.3 Petroleum and Petroleum Products

No releases to the environment or improper disposal of petroleum products were found during the records search, site inspection and interviews indicated no known improper disposal at the priority area.

5.4 Polychlorinated Biphenyls (PCBs)

No evidence exists of the presence of PCBs on the subject property. No PCB-containing oils were found during the records search, site inspection and interviews indicated no known PCB-containing oils have been used or stored at the priority area.

5.5 Asbestos

No asbestos assessments were found during the ECP process, none were found during the records search, site inspection and interviews indicated no known asbestos containing material has been used or stored at the priority area.

5.6 Lead and Lead-Based Paint (LBP)

No lead-based paint (LBP) assessments were found during the ECP process. No LBP was found during the records search, site inspection and interviews indicated no known improper disposal at the priority area.

5.7 Radioactive Material

No radioactive material assessments were found during the ECP process. No potentially radioactive materials were identified during the VSI, and the presence of radioactive materials on the subject property is extremely unlikely.

5.8 Landfills/Dumps

No landfills or dumps were found during the records search, site inspection or interview investigation.

5.9 Munitions and Explosives of Concern (MEC) and/or Unexploded Ordnance (UXO)

No munitions, explosives, or unexploded ordinance (UXO) were found during the records search, site inspection or interview investigation.

5.10 Radon

Beaver Lake spans across Benton, Washington and Carroll Counties. Washington County is in the Environmental Protection Agency (EPA) Radon Zone 3. Counties in Radon Zone 3 are counties with predicted average indoor radon screening levels of less than 2 pCi/L (EPA, 2018). Benton and Carroll Counties are in the EPA Radon Zone 2 with a predicted average indoor radon level between 2 and 4 pCi/L (EPA, 2018). No radon assessments were found during the records search (EPA, 2019).

5.11 Pesticides

No records were found to indicate the storage, improper use, or disposal of pesticides on the subject property.

5.12 Other Identified Concerns

No significant other concerns were found during the records search, site inspection or interviews.

5.13 National Environmental Policy Act (NEPA)

As the federal agency in charge of this project, USACE is in charge of coordinating National Environmental Policy Act (NEPA) compliance of 1969 (Public Law 91-190), the Council on Environmental Quality (CEQ) regulations (40 CFR 1500–1508), and the USACE implementing regulations, Policy and Procedures for Implementing NEPA, ER 200-2-2. As part of the records search and interview process recent NEPA documents were reviewed including the 2018 Draft Environmental Assessment for the Beaver Lake Master Plan Revision.

5.14 Adjacent Properties

As part of the ECP process, adjacent properties are assessed for environmental conditions, and those discovered conditions are evaluated based on the potential to affect the subject property. The nearest structure to the priority area is a residence approximately 0.2 miles east. The residence sits on a small peninsula with a small cove separating it from the subject property peninsula. The residence is first seen in the 2012 historical aerial photographs. The adjacent properties are unlikely to pose any HTRW concerns to the priority area.

6.0 Evaluation and Conclusions

6.1 Summary of ECP

Beaver Lake currently occupies more than 38,000 acres of Federal public lands and waters. This ECP report covers a narrow 0.55 acre parcel of land located near the center of Beaver Lake on western shore. The subject property is on the edge of the lake and currently owned by private landowner(s). The lake is located in northwestern Arkansas, in Benton, Washington, Madison and Carroll Counties, and it is approximately 6 miles west of Eureka Springs, Arkansas. The subject property, also known as Priority Area 6, is at the eastern opening of the Little Venice cove, opposite the Ventris public use area and boat ramp.

This ECP report was prepared to characterize the existing environmental conditions at the subject property and is intended to be an aid in the leasing of real property. The ECP findings are based on the available sources of information concerning both past and present uses of the subject property. Information included readily available data associated with adjacent property records, aerial photography, personnel interviews, environmental programs and associated documentation, and current and historic investigations. In addition, record sources were reviewed to determine if there have been spills, leaks, discharges, leaching, underground injections, dumping, abandonments, or storage of hazardous substances or petroleum products at the installation. The VSI and interview process included inquiries and requests into the existence and availability of records that support the environmental condition of the property.

6.2 Conclusions

The subject property was classified into one of seven standard ECP area types (categories) as defined by ASTM D5746-98(2016) *Standard Classification of Environmental Condition of Property Area Types for Defense Base Closure and Realignment Facilities*. Below are the seven categories for reference.

Table 4: Definitions of ECP Categories

ECP Category	Definition
1	An area or parcel of real property where no release, or disposal of hazardous substances or petroleum products or their derivatives has occurred (including no migration of these substances from adjacent properties).
2	An area or parcel of real property where only the release or disposal of petroleum products or their derivatives has occurred.
3	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but at concentrations that do not require a removal or remedial action.
4	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, and all remedial actions necessary to protect human health and the environment have been taken.
5	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred and removal or remedial actions, or both, are under way, but all required actions have not yet been taken.
6	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but required response actions have not yet been initiated.
7	An area or parcel of real property that is unevaluated or requires additional evaluation.

Given these seven categories, the subject property is categorized below, along with the reasoning for each classification.

Table 5: Properties and ECP Categories

Acreage	ECP Category	Reasoning
0.55 ac.	1	No release or disposal of hazardous substances or petroleum products or their derivatives has occurred beyond de minimus amounts, including no migration of these substances from adjacent properties.

No release or disposal of hazardous substances or petroleum products or their derivatives has occurred beyond de minimus amounts on the subject property and no releases to the environment were observed or reported.

Asbestos assessments were not available for the subject property. It is unlikely that Asbestos Containing Material (ACM) is present but, in the future, if a building or structure will be disturbed, a licensed asbestos inspector is needed to confirm whether ACM is present or not.

7.0 Certification

I declare that, to the best of our professional knowledge and belief, we meet the definition of *Environmental professional* as defined in Part 312.10 of 40 CFR 312. We have the specific qualifications based on education, training, and experience to assess a property of the nature, history and setting of the subject property. We have developed and performed the appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312. All information/documentation provided accurately reflects the condition of the property. This report meets the DoD requirements for completion of an ECP Report.

_____ _____

Eugenia Barnes
Environmental Protection Specialist
U.S. Army Corps of Engineers
Fort Worth District

Date

_____ _____

Hollie Eljizi
Environmental Engineer
U.S. Army Corps of Engineers
Fort Worth District

Date

_____ _____

Jennifer Jefcoat
Chemist
U.S. Army Corps of Engineers
Fort Worth District

Date

8.0 References

American Society for Testing and Materials (ASTM), 2013. E1527-13, *Standard Practice for Environmental Site Assessments: Phase 1 Environmental Site Assessment Process*.

ASTM, 2016. D5746, *Standard Classification of Environmental Condition of Property Area Types for Defense Base Closure and Realignment Facilities*.

Department of the Army, 13 December 2007. Army Regulation 200-1. *Environmental Quality: Environmental Protection and Enhancement.*

Environmental Protection Agency (EPA), February 2019. *EPA Map of Radon Zones including State Radon Information and Contacts*. https://www.epa.gov/radon/find-information-about-local-radon-zones-and-state-contact-information#radonmap

Federal Emergency Management Agency (FEMA), 2019. FEMA Flood Map Service Center. https://msc.fema.gov/portal

USACE. 1993. White River Basin, Arkansas and Missouri, *Water Control Master Manual.*

USACE. 2013. Little Rock District Water Management website. Accessed at: www.swl-wc.usace.army.mil

United States Census Bureau. 2013. Easy Facts Website. Accessed at: http://www.census.gov/easystats/

USACE. 2018. Beaver Lake White River and Tributaries, *Arkansas Shoreline Management Plan.*

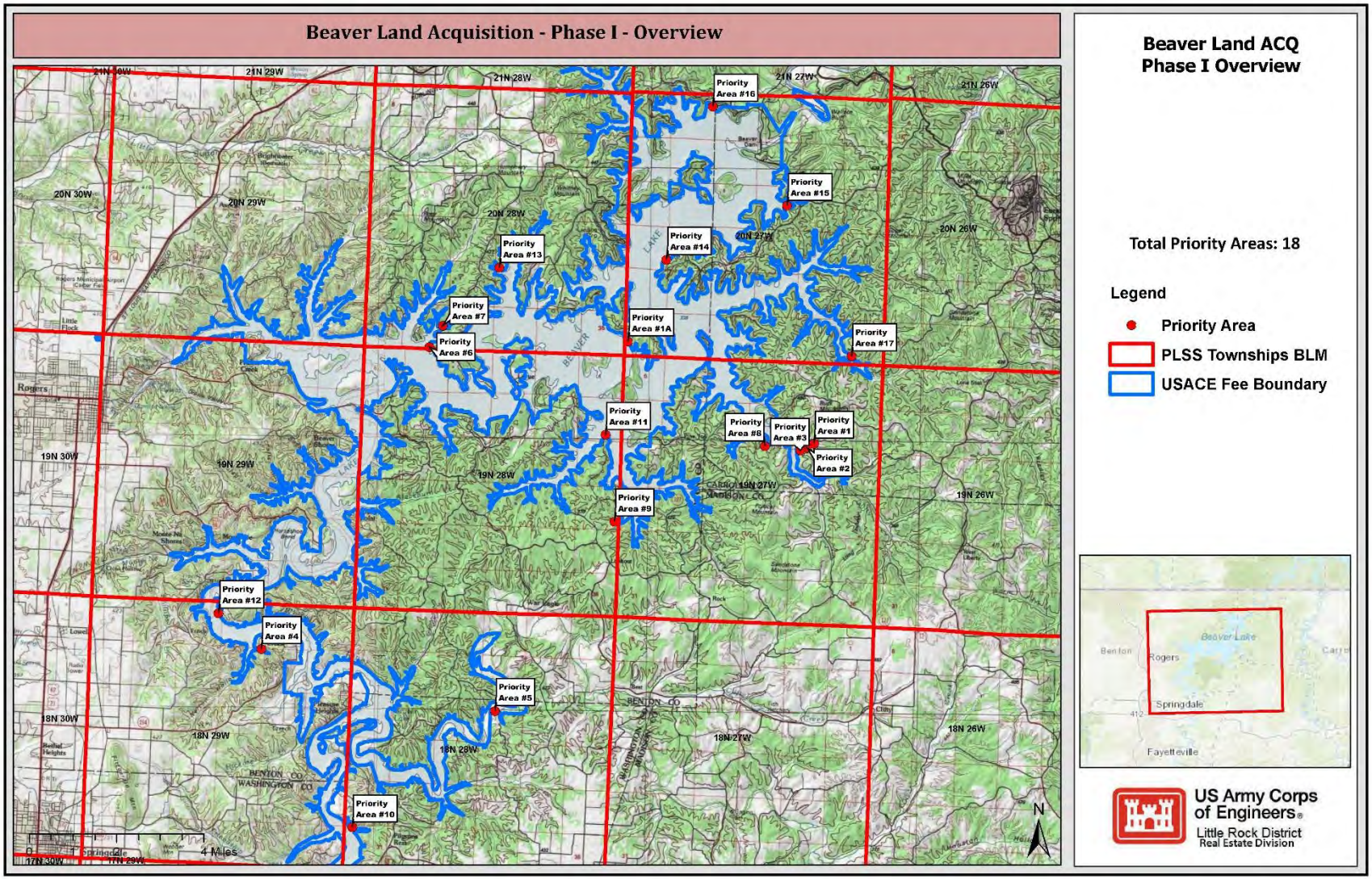
Arkansas Department of Energy and Environment Oil and Gas Commission website accessed August 2021 at: Commission, http://www.aogc.state.ar.us/maps/googleEarth.aspx

Beaver Watershed Alliance (BWA), 2012. *Beaver Lake Watershed Protection Strategy.*

Arkansas Department of Energy and Environment, Division of Environmental Quality website accessed August 2021 at: https://www.adeq.state.ar.us/rst/programs/fees/facility_data.aspx

Figures

Figure 1: Beaver Lake Priority Areas



ACQ = Acquisition; PLSS = Public Land Survey System; BLM = Bureau of Land Management

Figure 2: Subject Property Detail

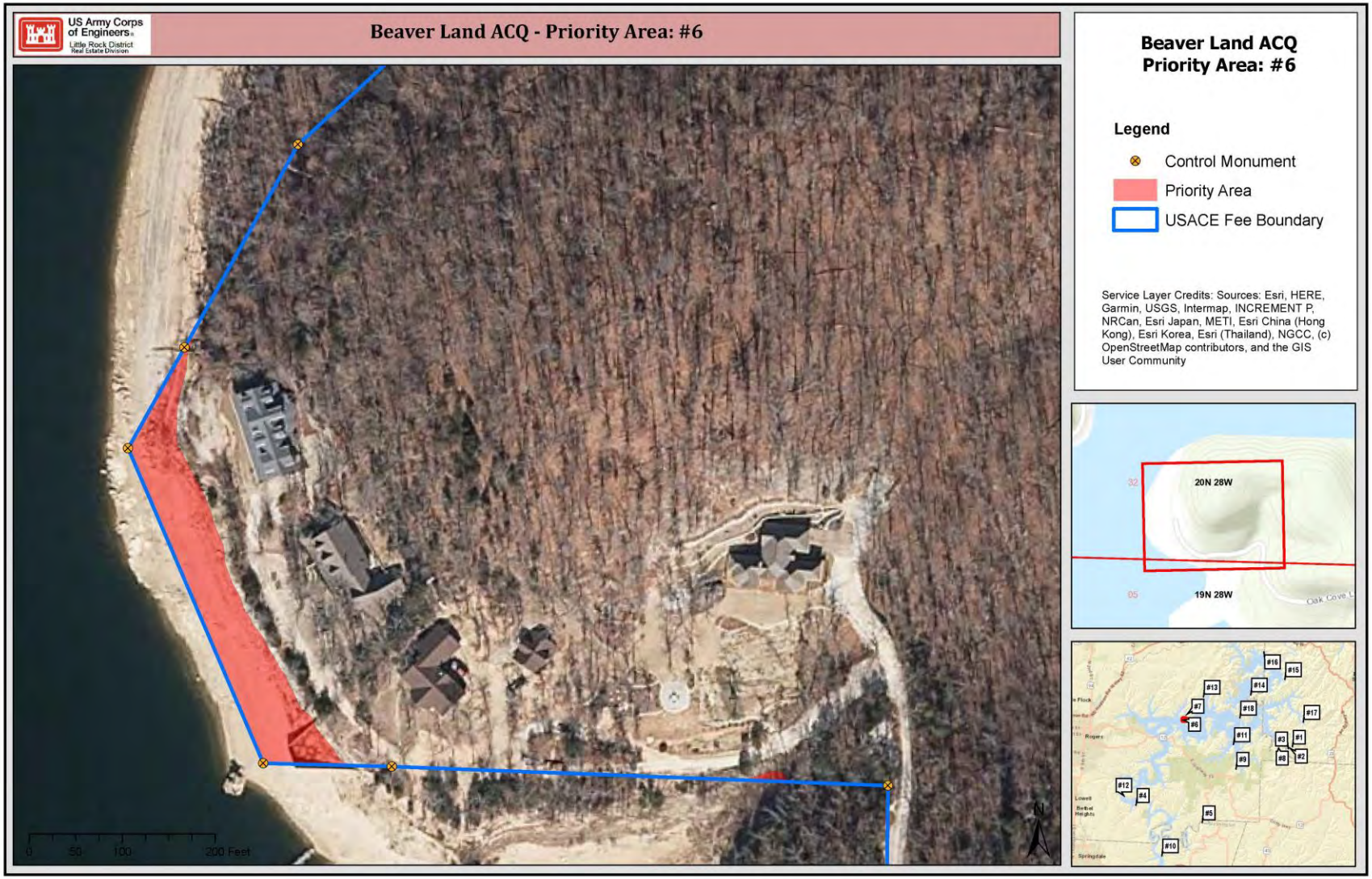


Figure 3: Interview Questions

Beaver Lake ECP
Interview Questions

1. Do you know of any environmental issues with this property?
2. Do you know of, or have access to, any reports concerning the environmental condition of this property? (i.e. site assessments, permits, storage tank registrations, safety plans, etc.) If so, would you be able to provide them? SWPPPs, SPCCs, air permits?
3. Do you know how this property has been historically used?
4. What is the property currently used for?
5. When were the site buildings constructed?
6. Are hazardous materials or petroleum products stored or used on this site? If so, what is the RCRA EPA ID? Does fueling occur on this property?
7. Do you know of any asbestos or LBP on the property or its buildings? Do you know the age of the buildings?
8. Has the site layout been manipulated in your recollection? (i.e. grading, excavation, etc.)?
9. Are there or have there been any cultural/historic items or buildings found on the property?
10. Is there anything else environmentally relevant that we should know?

Appendix A Visual Site Inspection Photographs

12 July 2021

Priority Area 6 – Bank stabilization can be seen, USACE Beaver Lake Office erosion permit

Priority Area 6 – Bank stabilization can be seen, USACE Beaver Lake Office erosion permit

Priority Area 6 – Bank stabilization can be seen, USACE Beaver Lake Office erosion permit

Priority Area 6 – Bank stabilization can be seen, USACE Beaver Lake Office erosion permit

Final

U.S. Army Environmental Condition of Property Report
Priority Area 7

Beaver Lake
Beaver Lake, Arkansas

August 30, 2021

Prepared For:
Beaver Lake Land Acquisition

Prepared By:
U.S. Army Corps of Engineers
Regional Planning and Environmental Center
Fort Worth District
Fort Worth, Texas

[This page is intentionally left blank.]

Table of Contents

List of Appendices:
Appendix A: Visual Site Inspection Photographs, 12 July 2021.
Appendix B: Historical Aerial Photography.
Appendix C: Historical Topographic Maps.

List of Acronyms

ACM	Asbestos-containing material
AR	Army Regulation
AST	Aboveground storage tank
ASTM	American Society for Testing and Materials
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CFR	Code of Federal Regulations
DoD	Department of Defense
ECP	Environmental Condition of Property
EDR	Environmental Data Resources, Inc.
EPA	Environmental Protection Agency
ERNS	Emergency Response Notification System
FAA	Federal Aviation Administration
HTRW	Hazardous, Toxic and Radioactive Waste
IRP	Installation Restoration Program
LBP	Lead-based Paint
LUST	Leaking underground storage tank
MEC	Munitions and Explosives of Concern
NEPA	National Environmental Policy Act
NFRAP	No Further Remedial Action Planned
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NRC	Nuclear Regulatory Commission
ODEQ	Oklahoma Department of Environmental Quality
OWS	Oil-water separator
PCB	Polychlorinated Biphenyl
POL	Petroleum, Oils, and Lubricants
RCRA	Resource Conservation and Recovery Act
SEMS	Superfund Enterprise Management System
SF	Square feet
SHWS	State Hazardous Waste Sites
SWPPP	Stormwater Pollution Prevention Plan
TSD	Transport, Storage, Disposal
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
UST	Underground storage tank
UXO	Unexploded Ordnance
VCP	Voluntary Cleanup Program
VSI	Visual site inspection

1.0 Executive Summary

This environmental condition of property (ECP) report has been prepared to document the environmental conditions and provide information for the acquisition of land that would be necessary for the operation, maintenance, and control of the Beaver Lake reservoir in Arkansas. This fee acquisition pertains to the frequently inundated land immediately surrounding the lake, below an elevation of 1128 ft above mean sea level (msl). The Army prepares an ECP in order to provide the public with information relative to the environmental condition of the property, assist Federal agencies during the property screening process, provide information about completed remedial and corrective actions at the property, and to assist in determining appropriate responsibilities, asset valuation, and liabilities with other parties to a transaction.

Beaver Lake currently occupies more than 38,000 acres of Federal public lands and waters. This ECP report covers a parcel that consists of two sections totaling 0.94 acres of land located near the center of Beaver Lake on western shore. The subject property is on the edge of the lake and currently owned by private landowner(s). The lake is located in northwestern Arkansas, in Benton, Washington, Madison and Carroll Counties, and it is approximately 6 miles west of Eureka Springs, Arkansas. The subject property, also known as Priority Area 7, is located in Little Ventrice cove.

This ECP report presents a summary of readily available information on the environmental conditions of, and concerns relative to, the land, facilities, and real property assets of Beaver Lake. The findings included in the report are based on a record search of historical environmental investigation reports and site historical documents, a review of aerial photography, stakeholder interviews, and a site inspection conducted 12 – 13 July 2021.

Based on the environmental conditions found and the ECP analysis, the property can be categorized as an ECP Category 1, indicating a site where no release, or disposal of hazardous substances or petroleum products or their derivatives has occurred (including no migration of these substances from adjacent properties).

2.0 Purpose

2.1 General

This environmental condition of property (ECP) report has been prepared to document the environmental conditions and provide information for the acquisition of land surrounding Beaver Lake in Benton, Washington, Madison and Carrol Counties, Arkansas. This report meets the requirements of Title 40, Code of Federal Regulations (CFR), Part 373, and United States Army Regulation (AR) 200-1 (2007), *Environmental Quality, Environmental Protection and Enhancement*. The ECP report also follows the American Society for Testing and Materials (ASTM) E1527-13 *Standard Practice for Environmental Site Assessments: Phase 1 Environmental Site Assessment Process*. The subject property in this report is subsequently categorized according to ASTM D5746 (2016) *Standard Classification of Environmental Condition of Property Area Types for Defense Base Closure and Realignment Facilities*.

The Army prepares an ECP for the following purposes:

- Provide the public with information relative to the environmental condition of the property.
- Assist Federal agencies during the property screening process.
- Provide information to prospective buyers.
- Provide information about completed remedial and corrective actions at the property.
- Assist in determining appropriate responsibilities, asset valuation, and liabilities with other parties to a transaction.

The ECP contains the information required to comply with the provisions of 40 CFR, Part 373 that require a notice to accompany contracts for the sale of, and deeds entered into for the transfer of, federal property on which hazardous substances may have been stored, released or disposed. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) §120(h) stipulates that a notice is required if certain quantities of designated hazardous substances have been stored on the property.

The ECP Report is not prepared to satisfy a real property purchaser's duty to conduct an "all-appropriate inquiry" to establish an "innocent purchaser defense" to CERCLA 107 liability. Any such use of the ECP Report by any party is outside the control of the Army and beyond the scope of the ECP Report. The Army, its officers, employees, or contractors makes no warranties or representations that any ECP Report satisfies any such requirements for any party.

2.2 Scope

Priority Area 7 occupies 0.94 acres of land. This ECP report covers 0.94 acres of land located on a peninsula between adjacent to the Slate Gap Wildlife Management Area on Beaver Lake. Priority Area 7 is comprised of two wooded shoreline narrow strips of land separated by about 120 yards. There is access via watercraft and although it wasn't explored, terrestrial access via private property from Hinchingbrooke Ln. Areas within the lake that are not within the Priority Area will be considered adjacent property. A general site location map is provided in Figure 1, and a map showing the subject property is shown in Figure 2.

Beaver Lake currently occupies more than 38,000 acres of Federal public lands and waters. This ECP report covers two narrow strips of land that total 0.94 acres. The subject property is on the edge of the lake and currently owned by private landowner(s). The lake is located in northwestern Arkansas, in Benton, Washington, Madison and Carroll Counties, and it is approximately 6 miles west of Eureka Springs, Arkansas. The subject property, also known as Priority Area 7, is located near the back of the Little Ventris cove.

2.3 Limitations

This ECP report presents a summary of readily available information on the environmental conditions of, and concerns relative to, the land, facilities, and real property assets of the subject property. The findings included in the report are based on a record search of available historical environmental investigation reports and site historical documents, a review of aerial photography, stakeholder interviews, and a site reconnaissance conducted 12 – 13 July 2021. Historical environmental investigation reports and site historical documents were reviewed in support of this ECP, and the information obtained from other studies is reflected within this report by reference. The ECP process recognizes that the condition of property and classification can change as historical contamination is cleaned up (if required) or if a new source of contamination is identified. Records reviewed during the assessment were accepted as accurate and a reasonable effort was made to resolve discrepancies identified during the document review.

During the ECP assessment, all available sources of information concerning both past and present environmentally significant uses of the property were reviewed. This included readily available data associated with adjacent property records; 1985, 1994, 2001, 2004, 2006, 2009, 2010, 2012, 2014, 2016, 2017, 2018, and 2020 aerial photography; personnel interviews; current and historic investigations; and topographical maps. In addition, record sources were reviewed to determine if there have been spills, leaks, discharges, leaching, underground injection, dumping, abandonment, or storage of hazardous substances or petroleum products at the subject property. The site reconnaissance and interview process included inquiries and requests into the existence and availability of records that support the environmental condition of the property. The site reconnaissance included a Visual Site Inspection (VSI) of the subject property. No sampling or analysis was conducted during this survey.

2.4 Report Organization

The remainder of this ECP report is organized as follows:

Section 3 – Property Description: This section provides location and description of the subject property; an overview of historical and current land uses; and a description of the environmental setting of the lake area, including climate, topography, geology, and demography.

Section 4 – Survey Methodology: This section describes the methods used to obtain the information for this ECP Report such as the development of study sections, the VSI, aerial photography analysis, records review, interviews, and data management.

Section 5 – Environmental Conditions: This section provides the existing environmental information. The findings are organized by relevant environmental "issues," including permits and licenses, cleanup activities, hazardous substances, petroleum and related products, asbestos, lead-based paint (LBP), radioactive materials, landfills, explosive contaminated structures, radon, pesticides, and polychlorinated biphenyls (PCBs). This section also includes adjacent property descriptions.

Section 6 – Evaluation and Conclusions: This section provides a summary of the subject property and evaluates the property for categorization as per ASTM D5746 (2016).

Section 7 – Certification: This section documents the approval of the ECP report.

Section 8 – References: This section provides an inventory of the reference material used in the preparation of this ECP Report.

Appendices: A list of appendices is provided in the Table of Contents.

3.0 Property Description

3.1 Parcel Locations and Description

Beaver Lake is located in the scenic Ozark Mountain region of northwestern Arkansas in Benton, Washington, Carroll and Madison counties. The total area currently contained in the Beaver project, including both land and water surface, consists of 38,138 acres owned in fee. Of this total, 1,432 acres are in flowage easement. The proposed Land Acquisition would include adding any land below the 1128 msl water level. The White River drainage area above Beaver Lake is approximately 1,186 square miles. When the lake is at the top of the conservation pool (elevation 1120.43 feet above mean sea level), the water area is 28,299 surface acres with 490 miles of shoreline within the lands owned in fee. The shoreline is irregular with topography primarily consisting of steep bluffs and gentle slopes.

Priority Area 7 is a narrow irregularly shaped piece of land separated into two parcels totaling 0.94 acres along the lake shoreline near the Ventris recreation area in Little Ventris Cove. The area is undisturbed forest with no structures or visible vehicle or pedestrian pathways. The subject property is on the edge of the lake and currently owned by private landowner(s).

3.2 Historic Land Use

Beaver Lake is a multiple purpose water resource development project initially authorized for flood control, hydropower generation and other beneficial uses by the Flood Control Act dated 3 September 1954. The inclusion of storage in the lake for municipal and industrial water supply was authorized by the Water Supply Act of 1958. Beaver Lake is a major component of a comprehensive plan for water resource development in the White River Basin of Arkansas and Missouri. Construction of Beaver Dam was initiated in March 1960. The dam was completed in June 1966, and the powerhouse and switchyard were completed in 1965. Beaver Lake was declared operational for public use in 1965.

For Priority Area 7, the historical aerial photography shows that this area has been used for private residences as far back as 2001 although no residence structures are present on or immediately adjacent to the priority area.

3.3 Current Land Use

Beaver Lake is located in the Ozark Highlands of Carroll, Washington, Benton, and Madison Counties. Having 490 miles of shoreline (at conservation pool) and over 28,000 water surface acres, Beaver Lake is the largest reservoir in northwest Arkansas and the first federal impoundment on the White River.

There are 12 public use areas around Beaver Lake. There are 11 parks on the lake presently operated by the Corps of Engineers. The State of Arkansas owns and operates Hobbs State Park Conservation Area, which covers 12,056 acres, and Devil's Eyebrow Natural Area, which covers 2,503 acres. Both properties are adjacent to USACE lands. There are two parks, Ventris, and Blue Springs that have been reduced to lake access only. One Park (Big Clifty) is operated by Carroll County, Arkansas.

Despite being located adjacent to the fast-growing communities of Fayetteville, Springdale, Bentonville, and Rogers, Arkansas and a regional population of over 500,000, the lake provides open spaces and a quality outdoor recreation opportunity. Many arms and coves of the lake offer secluded areas for traditional activities such as fishing, skiing, sailing and scuba diving, but also allow for passive recreation opportunities like photography and nature observation.

Priority Area 7 remains an undeveloped forested area currently owned by private landowners. Residences are located about 200 yards from the priority area.

3.4 Utilities

Priority Area 7 has no known utilities.

3.5 Environmental Setting

3.5.1 Climate

The climate in the Beaver Lake area is classified as humid subtropical according to the Köppen climate model. A humid subtropical climate is characterized by hot, usually humid summers and mild to cool winters. The Köppen definition of this climate is for the coldest month's mean temperature to be between 26.6 °F (−3 °C) and 64.4 °F (18 °C), and the warmest month to be above 71.6 °F (22 °C). Some climatologists prefer to use 32 °F (0 °C) as the lower bound for the coldest month's mean temperature. Under the modern Trewartha climate classification, climates are termed Humid Subtropical when they have mean temperatures of 50 °F (10 °C) for eight or more months a year. In most locations classed within this system, the mean temperature of the coldest month is between 35 °F (3 °C) and 65 °F (18 °C). Some climatologists consider the Trewartha grouping of subtropical climates to be more real-world and fitting on a global scale.

While technically classified as humid subtropical, the climate in the Beaver Lake area is considered moderate. The area experiences all four seasons and does receive cold air masses from the north; however, some of the Arctic masses are blocked by the higher elevations of the Ozarks.

Average temperatures range from a high of 88 °F (31.1 °C) and low of 27 °F (-2.7 °C) in nearby Rogers, Arkansas. Extreme temperatures rarely exceed 96 °F (35.6 °C) and 13°F (-10.6 °C). Late summer is the time of maximum heat and least rainfall. During the winter months, midday temperatures in the basin are relatively warm, around 55 o to 60 o F. Some short periods of cold weather occur with temperature ranging from 0 o to 10 o F. On winter nights, temperatures from 37 o F to below freezing are common. Highest recorded temperature in Rogers, Arkansas was 114 °F (45.6 °C) (recorded in July 1954). The lowest temperature recorded was −16 °F (−26.7 °C), in February 1996.

The relative humidity typically ranges from 41% (comfortable) to 91% (very humid) over the course of the year, rarely dropping below 24% (dry) and reaching as high as 100% (very humid). The air is driest around April 9, at which time the relative humidity drops below 49% (comfortable) three days out of four; it is most humid around June 3, exceeding 87% (very humid) three days out of four.

Dew point is often a better measure of how comfortable a person will find the weather than relative humidity because it more directly relates to whether perspiration will evaporate from the skin, thereby cooling the body. Lower dew points feel drier and higher dew points feel more humid. Over the course of a year, the dew point typically varies from 19°F (dry) to 71°F (muggy) and is rarely below 4°F (dry) or above 74°F (very muggy). There are two periods in the year that are most comfortable: The first is between April 18 and June 6 and the second is between September 3 and October 23. The air feels neither too dry nor too muggy during these periods (https://weatherspark.com/averages/31495/Rogers-Arkansas-United-States).

Average annual rainfall for the Beaver Lake area is 45 inches per year. Precipitation is weakly seasonal, with a bimodal pattern: wet seasons in the spring and fall, and relatively drier summers and winters, but some rain in all months. The spring wet season is more pronounced than fall, with the highest rainfall typically occurring in May. The average annual snowfall for the Beaver area is about 12 inches. Snowpacks are usually short lived and are not commonly a concern for flooding.

Climate change is an area of concern due to the potential for effects on many aspects of the environment, especially those related to water resources. The U.S. Global Change Research Program (USGCRP) summarized information regarding climate change and its potential effects in regional assessments (http://www.globalchange.gov/publications/reports/scientific-assessments/us-impacts). In the Midwest,

which extends from Minnesota to Missouri, extreme events such as heat waves, droughts and heavy rainfall events are projected to occur more frequently. Should these events become significant enough to impact the operation of Beaver Lake, the Master Plan and associated documents (i.e. Operations Management Plan and Shoreline Management Plan) would be reviewed and revised, if necessary.

3.5.2 Topography, Geology, and Soils

The depositional environment of the rocks found in the Arkansas Ozarks is one of a relatively shallow continental shelf, sloping toward deeper water generally toward the south. This shelf emerged many times during the Paleozoic resulting in numerous unconformities throughout the sequence. The Ozark Plateaus region of Arkansas is made up of generally flat-lying Paleozoic age strata divided into three plateau surfaces. The lowest and northern-most plateau is the Salem Plateau. The Springfield Plateau stands above the Salem a few hundred feet and is generally capped by lower Mississippian age limestones and cherts. The southernmost and highest plateau of the Ozarks is the Boston Mountains. All of these plateaus are deeply dissected by numerous streams throughout the area. The faulting in the Ozarks is generally normal; most faults displaying a displacement down on the southern side. However, some observations reveal that a few strike-slip faults may be present. Gentle folds are noted but are generally of very low amplitude. The depositional environment of the rocks found in the Arkansas Ozarks is one of a relatively shallow continental shelf, sloping toward deeper water generally toward the south.

Beaver Lake is part of the Springfield Plateau that occupies primarily the western and southwestern flanks of the Ozark Plateau province. The Springfield Plateau in this region rises to an elevation of approximately 1400 feet and in many areas, forms extensive plains. Hilly areas occur where rivers and their tributaries cut into the plateau surface, most notably in the vicinity of the White River and Beaver Lake. As streams like the Buffalo National River cut through the plateau down to the level of the White River, they sometimes carve spectacular bluffs.

Lower Ordovician, Middle to Upper Devonian and Lower and Upper Mississippian age strata are present around Beaver Lake. Upper Ordovician and Devonian strata crop out around Beaver Lake and its tributaries. The Lower Mississippian Boone Formation comprises the surface rock over the majority of the area and forms the surface of the heavily dissected Springfield Plateau. In addition to the Boone Formation, Cotter and Jefferson City formations (Jefferson City formation has not been successfully differentiated from the Cotter Formation in Arkansas), and the Powel formation, all of Ordovician age are present in the area. Formations in the Devonian strata include the Chattanooga, Clifty and Penters.

The Boone Formation consists of gray, fine- to coarse-grained fossiliferous limestone interbedded with chert. This formation caps the higher hills in the area. Since limestone is easily dissolved by water, cave and solution (karst) features are prominent. The Boone Formation is well known for dissolutional features, such as sinkholes, caves, and enlarged fissures. Surface water may drain directly into channels in limestone, where it can move rapidly and without filtration to the surface as a spring, at a location that is unpredictable without extensive testing. Therefore, water pollution problems are of particular concern in this region. The thickness of the Boone Formation is 300 to 350 feet in most of northern Arkansas, but as much as 390 feet has been reported.

The Cotter Dolomite is composed of dolostone of predominantly two types: a fine-grained, argillaceous, earthy textured, relatively soft, white to buff or gray dolostone called "cotton rock", and a more massive, medium-grained, gray dolostone that weathers to a somewhat hackly surface texture and becomes dark on exposure. The formation contains chert, some minor beds of greenish shale, and occasional thin interbedded sandstone. The thickness is about 340 feet in the vicinity of Cotter, but the interval may range up to 500 feet thick in places.

The Powell Dolomite is generally a fine-grained, light-gray to greenish-gray, limy, argillaceous dolostone with thin beds of shale, sandstone, sandy dolostone, and occasionally chert. The formation's thickness may be as much as 215 feet but is often much thinner.

The Chattanooga Shale Formation is typically black, fissile clay shale that weathers into thin flakes. The beds are usually cut by prominent joints creating polygonal blocks upon weathering. The upper part of the formation may be slightly sandy and usually contains abundant pyrite. Thickness ranges from 0 to about 85 feet; normally averaging about 30 feet (AGS).

The strata throughout the region are nearly horizontal. One predominant geological feature of the lake area is a low, persistent, limestone bluff, which occurs just above the Ordovician- Mississippian contact.

The faulting in the Ozarks is generally normal; most faults displaying a displacement down on the southern side. Lineaments and faults characteristic of northwest Arkansas are present around Beaver Lake. The Fayetteville Fault lies beneath Beaver Lake. This fault is the west side of a graben that has down-dropped the Boone Formation to lake level. The Starkey Fault bounds the east side of the graben. Both faults trend approximately N 450E. One section of the Starkey fault trends N 60-700E. The Clantonville Lineament – Monocline is a northeast to southwest trending structural feature that extends from north of Clantonville to Ventris Hollow. The location of this feature was determined from the 1:24,000 three dimensional quadrangle and from structural disparities in the Lower Mississippian rock units. This structural feature could be responsible for the presence of lead-zinc mineralization in an old prospect near Clantonville (north of Beaver Lake). The trend of this lineament to monocline is N 30-400E. Paleokarst features within the top of the Powell Dolomite are present around Beaver Lake and coincident with a lineament in Limekiln Hollow near Garfield, northwest of Beaver Lake.

In general, the soils of the Ozark Plateaus are residual and are formed on a broad, domed, upwarp consisting mostly of limestone and dolomite. The main difference in the soils is due to different rocks from which the soils were formed. The main geologic materials are cherty limestone; cherty, very siliceous dolomite; cherty, siliceous dolomite; and alluvium, which are weathered and water transported products of the first three materials. Glade-rock soil occurs where the cherty, very siliceous dolomite is exposed to the soil formation. Dolomite is more resistant to weathering than limestone and siliceous dolomite is even more resistant, so very shallow soil results. In areas where the dolomite is less siliceous, more weathering has taken place; however, the soils produced are not as deep as soils formed by limestone.

The following eight soils associations are found in and around the Beaver project area: Captina-Nixa, Captina-Nixa-Pickwick, Clarksville-Nixa-Baxter, Corydon-Sogn, Enders-Allegheny-Mountainburg, Razort-Captina-Etowah, Linker-Apison-Hector, and Captina-Pembroke.

3.5.3 Hydrology and Groundwater

In the Interior Highlands of western and northern Arkansas ground-water supplies are more limited than in the Coastal Plain. Much of the Ozark Plateaus region is underlain by carbonate rocks, which are quite soluble in the presence of water. Solution by ground water has caused many large openings through which water passes so quickly that contaminants from the surface cannot be filtered out. Signs of these openings are caves, sink holes, springs and lost stream segments. As a consequence, the water in shallow wells may not be suitable for human consumption without treatment.

Three aquifers, which are part of the Ozark Plateaus Aquifer System, are located within northern Arkansas. The Springfield Plateau aquifer is generally under unconfined conditions, with groundwater movement occurring through fractures and solution cavities formed by dissolution of carbonate rock. Local discharge is through springs and streams. The Ozark aquifer is generally under confined conditions, especially where overlain by the units of the Ozark Confining Unit (Chattanooga Shale). Most wells in the Springfield Plateau and upper units in the Ozark aquifer yield 5 -10 gpm on the average, with yields greater than 25 gpm in rare cases.

The third aquifer, the Roubidoux Formation and the Gunter Sandstone Member of the Gasconade Formation in northern Arkansas occur at greater depth and constitute the only significant aquifer system in the Ozarks. Both are permeable sandstone and carbonate units of Ordovician age. These aquifers serve as the principal source of high-quality water for many communities in northern Arkansas where surface water sources are unavailable. Together these units may yield up to 500 gpm to wells. These formations do not outcrop anywhere in Arkansas but instead outcrop in 1 southern Missouri.

3.5.4 Water Quality

The waters of the Arkansas portion of the White River watershed have all been designated by the Arkansas Department of Environmental Quality (ADEQ) for fisheries, primary and secondary contact recreation, and domestic, agricultural, and industrial water supplies (ADEQ, 2012). Beaver Lake is classified by ADEQ as a Type A water body, which includes most larger lakes of several thousand acres in size, in upland forest dominated watersheds, having an average depth of 30 to 60 feet, and having low primary production (i.e., having a low trophic status if in natural [unpolluted] condition). Beaver Lake, like all other lakes of its size in the Ozark region, stratifies chemically and thermally in the late spring with stratification extending into late fall and early winter. During the warmer months, lake waters of the upper layer (the epilimnion) are warmer and contain more dissolved oxygen, while the denser, lower layer waters (the hypolimnion) are colder and contain very little or no dissolved oxygen, thus undesirable for fish habitat.

This undesirable water, when discharged downstream from hydropower generation, may cause some problems in the tailwaters. To combat this problem, the dissolved oxygen content is monitored, and various management measures are implemented to improve the dissolved oxygen concentration in the hydropower releases. A highly productive trout fishery has been established in the Beaver tailwaters by the Arkansas Game and Fish Commission because of the available discharge of cold water from the dam, which is reaerated by turbulence as it flows downstream.

As the stratified epilimnion cools in the late fall and winter, the layers begin to mix (de-stratify) and dissolved oxygen (DO) is more evenly distributed. This condition is more favorable to the fishery of the lake and overall water quality.

The upper 1500 acres of Beaver Lake has been listed by the Arkansas Department of Environmental Quality (ADEQ) on Arkansas' 303(d) list of impaired waters, approved by the Environmental Protection Agency (EPA), due to turbidity (ADEQ, 2008). According to the Arkansas 303(d) list, these excessive levels impact the local fisheries as well as primary contact, both designated uses of Beaver Lake. The elevated turbidity levels are due to excessive silt from surface erosion from agriculture activities, unpaved road surfaces, in-stream erosion – mainly from unstable stream banks, and any other land surface disturbing activity. The Draft 2010 Integrated Water Quality and Monitoring Report (ADEQ, 2010) added pathogen indicator bacteria as a contaminant for the same area of Beaver Lake. Surface erosion activities are listed as the probable source for this contaminant as well.

Clean Water Act requires states to list waters that do not meet Federal water quality standards or have a significant potential not to meet standards as a result of point source dischargers or non- point source run-off. Subsequent to listing on the 303(d) list, the statute requires that the states develop and set the Total Maximum Daily Load (TMDL) for water bodies on the list within 13 years. A TMDL establishes the maximum amount of a pollutant that can enter a specific water body without violating the water quality standards. Values are normally calculated amounts based 39 on dilution and the assimilative capacity of the water body. TMDLs have not been established by ADEQ for the upper Beaver Lake area.

3.6 Biological and Cultural Resources

3.6.1 Terrestrial Ecosystems

The area surrounding Beaver Lake is mostly forested. Trees and shrubs around the lakeshore include upland oak and hickory species, persimmon, honey locust, hawthorn, dogwood, redbud, coralberry, smooth and winged sumac, and buttonbush. Frequent periods of inundation keep a thin strip of government owned lands around the lake in early stages of succession. Red cedar and short-leafed pine, the principal evergreens, are dispersed throughout the region and are found in many large, scattered groups. Ground covers consist of greenbrier, sedges, and native grasses. White-tailed deer and eastern wild turkey are common game animals found and hunted in the Beaver Lake area. Black bears have also become common in the area and are hunted on the lands around the lake. The principal small game species found in the open upland areas include bobwhite quail, cottontail rabbit, and mourning dove. Gray and fox squirrels are common in upland wooded areas. Furbearing animals found in the Beaver Lake area include coyote, red fox, gray fox, otter, mink, muskrat, beaver, bobcat, and raccoon. Habitat management that includes wildlife food plot plantings, mowing, soil disturbance, removal of exotic species and application of prescribed fire provide benefit to these populations.

The common goldeneye, hooded merganser, bufflehead, and ring-necked duck are the predominant migratory waterfowl species visiting Beaver Lake. Mallards, gadwall, and other duck species are also present; however, they are only transient visitors as their characteristic feeding habits of obtaining food from shallow waters is limited. Resident Canada geese are so numerous in many coves and recreation areas that their presence has become a nuisance.

Ring-billed gulls are seen frequently around the Beaver Lake area. Greater and lesser yellow legs, pelicans, and large flocks of horned grebes are also seen during their peak migration in the spring and fall. Beaver Lake is also one of the few places where visitors can see both the turkey vulture and the black vulture at the same time in the winter. Beaver Lake has also become a popular place that visitors come to observe bald eagles, commonly wintering 150 or more birds and hosting 5 -6 breeding pairs during the nesting period of March to June. The surrounding woodlands and grasslands serve as prime nesting areas for resident and neotropical migratory songbirds.

3.6.2 Aquatic Ecosystems and Wetlands

Walleye, smallmouth bass, striped bass, hybrid white-striped bass, walleye, and paddlefish have been introduced into Beaver Lake to add diversity to the fishery. Natural reproduction of striped bass and hybrid white-striped bass does not occur in Beaver Lake. Since 2004, AGFC stocks approximately 100,000 walleye, 30,000 channel catfish, 30,000 blue catfish, and 200,000 striped bass each year. While natural reproduction occurs in white crappie, black crappie, largemouth bass, and smallmouth bass, AGFC supplements this reproduction by occasional stockings of these species. Historically, there have also been introductions of northern pike, blue catfish, lake trout, and threadfin shad.

Located within the Springfield Plateau of the Ozark Mountains region of northern Arkansas, the area surrounding Beaver Lake is characterized by limestone, dolomite, or chert geology. The many rivers and streams flowing through the region have created a landscape of level highlands dissected by rugged valleys rich in karst features such as caves and sinkholes. Associated with these streams and landscape features are a variety of wetland habitats representative of the five wetland classes occurring within the region. These wetland classes include depressions, flats, fringe, riverine, and slope. It is possible, and perhaps even likely, that all of these classes of wetlands occur in the general area of Beaver Lake. However, those most likely to occur in the area immediately surrounding the lake are fringe (most likely reservoir), riverine (most likely spring runs) and slope wetlands (most likely calcareous slope).

3.6.3 Threatened and Endangered Species

The following species listed in Table 1 are from the U.S. Fish and Wildlife Service's federally classified status list of species and the Arkansas Natural Heritage data sets which have been reported and identified on project lands. Although the bald eagle was delisted by USFWS in 2007 due to recovery of the species, both the bald and golden eagles are still protected in accordance with the Bald and Golden Eagle Protection Act. The federal Migratory Bird Treaty Act of 1918 also provides protection to certain species of migratory birds. A total of 31 bird species are currently protected under this federal statute.

Table 1: Threatened and Endangered Species

	Federal Status	**State Status/Global Rank**
Gray Bat	LE	SE / S2S3/G4
Indiana Bat	LE	SE / /S1/G2
Northern long-eared Bat	LT	SE / S1S2/ G1G2
Ozark Big-eared Bat	LT	Not listed
Little Brown Bat	-	SE / S1
Bald Eagle	*Protected under Bald and Golden Eagle Protection Act	S3B,S4N/G5
Eastern Black Rail	LT	Not listed
Piping Plover	LT	Not listed
Rufa Red Knot	LT	Not listed
Whooping Crane	Experimental Population, Non-Essential	Not listed
Ozark Cavefish	LT	SE / S1/G3
Neosho Mucket	LE	Not Listed
Rabbitsfoot mussel	LT	SE/S3/G3G4
Snuffbox Mussel	LE	Not listed
Monarch Butterfly	C	Not listed
Missouri Bladderpod	LT	S2/G3
Opaque Prairie Sedge	-	SE / S2S3G4
Yellow Coneflower	-	ST / S2G3T3
Ovate-leaf Catchfly	-	ST / S2G3
Royal Catchfly	-	ST / S2G3

FEDERAL STATUS CODES

LE = Listed Endangered; the U.S. Fish and Wildlife Service has listed this species as endangered under the Endangered Species Act.

LT = Listed Threatened; the U.S. Fish and Wildlife Service has listed this species as threatened under the Endangered Species Act.

C = Candidate Species;

STATE STATUS CODES

INV = Inventory Element; The Arkansas Natural Heritage Commission is currently conducting active inventory work on these elements. Available data suggests these elements are of conservation concern. These elements may include outstanding examples of Natural Communities, colonial bird nesting sites, outstanding scenic and geologic features as well as plants and animals, which, according to current information, may be rare, peripheral, or of an undetermined status in the state. The ANHC is gathering detailed location information on these elements.

GLOBAL RANKS

G3 = Vulnerable globally. At moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors.

G4 = Apparently secure globally. Uncommon but not rare; some cause for long-term concern due to declines or other factors.

G5 = Secure globally. Common, widespread and abundant.

T-RANKS= T subranks are given to global ranks when a subspecies, variety, or race is considered at the state level. The subrank is made up of a "T" plus a number or letter (1, 2, 3, 4, 5, H, U, X) with the same ranking rules as a full species.

STATE RANKS

S1 = Critically imperiled in the state due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors making it vulnerable to extirpation.

S2 = Imperiled in the state due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it vulnerable to extirpation.

S3 = Vulnerable in the state due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.

GENERAL RANKING NOTES

Q = A "Q" in the global rank indicates the element's taxonomic classification as a species is a matter of conjecture among scientists.

Source: Arkansas Natural Heritage Commission

3.6.4 Cultural Resources

The records search, interviews, and site inspection identified no cultural resource assessments or findings for the subject property.

During the past seventy years scientific investigation of archaeological sites in the Beaver Lake area has been carried out in several phases. In 1922 and 1923, Mark R. Harrington of Phillip Academy was the first archeologist to excavate sites on the area that is now Beaver Lake. He excavated 13 bluff shelters. Between 1928 and 1935, the work of Harrington was continued by S.C. Dellinger of the University of Arkansas Museum. Dellinger supervised the excavation of 21 rock shelters. In the early 1960's, a series of surveys were conducted by several archeologists from the University of Arkansas Museum. Today, there are 280 known archeological sites along or immediately adjacent to Beaver Lake. Of these, 271 are identified as prehistoric, seven are historic and two sites have no known cultural affiliation.

Table 2: Historical and Cultural Resources at Beaver Lake

Type of Site	Number of sites
Historic	7
Prehistoric	271
No known cultural affiliation	2
Total	280
National Register Eligibility Status	
Not Evaluated	132
Not Eligible	5
Eligible	1

4.0 Survey Methodology

4.1 Development of Study Sections

The information gathered during the development of the ECP was used to group the subject property into standardized categories using Department of Defense (DoD) guidance, and in accordance with ASTM D5746 (2016). The ECP category definitions are summarized below in Table 3.

Table 3: Definitions of ECP Categories

ECP Category	Definition
1	An area or parcel of real property where no release, or disposal of hazardous substances or petroleum products or their derivatives has occurred (including no migration of these substances from adjacent properties).
2	An area or parcel of real property where only the release or disposal of petroleum products or their derivatives has occurred.
3	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but at concentrations that do not require a removal or remedial action.
4	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, and all remedial actions necessary to protect human health and the environment have been taken.
5	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred and removal or remedial actions, or both, are under way, but all required actions have not yet been taken.

6	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but required response actions have not yet been initiated.
7	An area or parcel of real property that is unevaluated or requires additional evaluation.

The final ECP category designations for the subject property are shown in Section 6.2, Table 5.

4.2 Visual Site Inspection

A VSI was conducted on 12 July 2021 at the subject property to check for recognized environmental conditions. The VSI was conducted by Mrs. Hollie Eljizi, Ms. Jennifer Jeffcoat and Mr. Robert Singleton from the U.S. Army Corps of Engineers (USACE). USACE representatives were accompanied by Mr. Mathew Voskamp of the USACE Beaver Lake office.

The VSI was performed from a USACE Beaver Lake Office watercraft near the bank of the subject property as a Right of Entry (ROE) was not available at the time of the inspection. At the time of inspection, the lake level was at 1127 feet above sea level, conservation poollake level is 1121 feet above sea level. This made part of the priority area under water during the VSI, however water clarity was good, and no debris or other concerns were seen in the water. The shoreline consisted of steep rock formations with clearly visible horizontal strata. Due to the topography of the shoreline terrestrial access would not have been practical. No apparent signs of Hazardous, Toxic and Radioactive Waste (HTRW) were visible during the VSI.

Photos from the VSI can be found in Appendix A.

4.3 Aerial Photography Analysis

Aerial photographs were available from Google Earth maps for 1985, 1994, 2001, 2004, 2006, 2009, 2010, 2012, 2014, 2016, 2017, 2018, and 2020.

The initial aerial photograph from 1985 is of poor quality and the area isn't discernable. The next photo from 1994 shows an undisturbed forested area. There is no change in the next photos from 2001 to 2014. In 2016, north of the priority area there is an area cleared of trees and a cleared road to that area at the top of the hill north of the parcel. In the 2017 photo a residence can be seen in the cleared area, along with a cleared path to a small structure between the residence and parcel. There is no change in the 2018 photo, but the next photo from 2020 shows a second residence with a road from the 2017 residence near the eastern end of the priority area closer to the lake shore.

All aerial photographs are included in Appendix A.

4.4 Sanborn Map Review

Sanborn maps were not available for the subject property, or for the adjacent areas.

4.5 Topographic Map Review

Historical topographic maps were available from the US Geological Survey Website for the Beaver Lake area for 1900, 1901, 1945, 1949, 1954, 1957, 1958, 1964, 1985, 2011, 2014, 2017, and 2020. Several observations can be gleaned from these maps. First, the area before the lake was formed consisted of valleys with steep bluffs and hill sides around the White River and its tributaries. The historical maps show this valley and river basin from the 1900 to 1964 topographic maps. In 1985 the river and Beaver Dam at the northern end of the lake can been seen in the valley of the historical White River.

All topographic maps are included in Appendix C.

4.6 Records Review

4.6.1 Standard Environmental Record Sources

In this evaluation records, maps and other documents that provide environmental information about the project area are obtained and reviewed. A desktop records review was conducted using various sources to determine the presence of HTRW sites on or near the subject property. This search was focused on active cleanup sites and sites with a reasonable risk of HTRW release. Several databases were searched manually to narrow down the search area. These databases included the Environmental Protection Agency (EPA) Cleanups in my Community database, the EPA Envirofacts databases, the Arkansas Department of Environmental Quality's (ADEQ) web search tool of Underground Storage Tanks (UST) and Above Ground Storage Tanks (AST), and the Arkansas Department of Energy and Environment Oil and Gas Commission oil and gas well maps. The information collected from this desktop records review was analyzed for recognized environmental conditions (RECs) that would affect the proposed project or need further investigation, given the proposed project measures. The following resources were searched.

Federal National Priorities List (NPL) – The records search did not reveal any NPL sites in the project footprint or adjacent areas. There are nine NPL sites in the state of Arkansas, none of which are located near Beaver Lake or the priority areas. This is based on a search of the EPA Superfund: National Priorities List (NPL) list.

Federal Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) List – The CERCLIS, now called the Superfund Enterprise Management System (SEMS) database, tracks hazardous waste sites where remedial action has occurred under EPA's CERCLA program. This list also includes sites that are in the screening and assessment phase for possible inclusion on the NPL. The records search of EPA's listed SEMS sites did not reveal any sites in the project footprints or adjacent areas. This is based on a search of the EPA SEMS database.

Federal No Further Remedial Action Planned (NFRAP) – The Federal NFRAP list (now known as the SEMS archive list) tracks sites where no further remedial action is planned, based on available assessments and information. The list also represents sites that were not chosen for the NPL. Further EPA assessment could possibly be ongoing, and hazardous environmental conditions may still exist; however, in the absence of remedial action and assessment data, no determination about environmental hazards can be made. The records search did not reveal any NFRAP sites in the project footprint or adjacent areas. This is based on a search of the EPA SEMS database.

Federal Resource Conservation and Recovery Act (RCRA) Corrective Action List – The records search of EPAs Cleanups in My Community showed two RCRA Corrective Actions within one mile of the project search area. No RCRA corrective actions were found to be located within one mile of the project footprint. This is based on a search of the EPA Cleanups in My Community.

State Superfund Sites - This search is to check for any state CERCLA sites in the project vicinity. The records search of state CERCLA cleanup sites did not show any sites of concern in the project or adjacent areas. This search is based on a search of the Arkansas Department of Energy and Environment data base.

State and Tribal Solid Waste Facilities/Landfill Sites – This search is designed to check any state or tribal databases for solid waste handling facilities or landfills in the project vicinity. The records search did not find any solid waste facilities or landfill sites in area of this project or adjacent areas. This is based on a search of the EPA Landfill Methane Outreach Program (LMOP) and ADEQ Permitted Solid Waste Disposal database.

State and Tribal Registered Storage Tanks – This list is a combination of the State of Arkansas registered UST and AST databases, representing sites with storage tanks registered with the State of Arkansas. The search revealed one AST within one mile of the work area or adjacent areas. This AST is not expected to impact the project due to its distance from the proposed project. These results are based on a search of the Arkansas Department of Energy and Environment Oil and Gas Commission website.

State and Tribal Voluntary Cleanup Sites – The ADEQ Elective Site Cleanup Agreement (ESCA) database identifies sites where the responsible party chooses to clean up the site themselves with ADEQ oversight. Five sites were identified from this database. None of the sites are within one mile of the work area and are therefore not expected to impact the proposed project. These results are based on a search of the ADEQ ESCA Database.

Brownfields List – A brownfield is a property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. There are no brownfield sites within one mile of the work area or adjacent areas. These results are based on a search for Brownfields sites using the EPA Envirofacts search engine.

Oil and Gas Wells – A search of the oil and gas wells in the area using the Arkansas Department of Energy and Environment Oil and Gas Commission website identifies multiple sites including oil wells, plugged oil wells, injection/disposal sites within the surrounding area. Although not classified as HTRW under USACE regulations, pipelines and oil wells play an important role in the HTRW existing conditions near the potential project area. This is because the well and/or pipeline contents could potentially leak or spill into the surrounding environment or affect the proposed project features. As a result of these findings, a thorough pipeline/well search should be initiated during design to ensure no interaction with the existing oil and gas infrastructure occurs. The Oil and Gas Commission website was used to map these findings. No oil wells or pipelines were found near the priority areas.

4.7 Interviews

Two interviews were conducted on 12 and 13 July 2021 in conjunction with the site inspection, and the following stakeholders were interviewed:

- Mr. Matthew Franklin; Natural Resource Specialist, Beaver Lake Office; Matthew.G.Franklin@usace.army.mil
- Mr. Matthew Voskamp; Natural Resource Specialist, Beaver Lake Office; Matthew.Voskamp@usace.army.mil

Information gleaned from the interviews is incorporated by way of reference throughout the report. The interview questions can be found in Figure 3.

5.0 Environmental Conditions

5.1 Environmental Permits and Licenses

5.1.1 RCRA Status

The subject property is not covered under a Resource Conservation and Recovery Act (RCRA) permit, and no hazardous waste is generated or stored on the property.

5.1.2 Solid Waste

The subject property has no active, inactive, or expired permits or licenses for solid waste disposal. No landfills exist on the property.

5.1.3 USTs/ASTs

No USTs or ASTs were found during the records search, site inspection and interviews indicated no UST/AST have been known to be located at the subject property.

5.1.4 National Pollutant Discharge Elimination System (NPDES)

Section 402 of the Clean Water Act (33 U.S.C. 1251 et. seq.) requires all facilities that discharge stormwater to acquire an NPDES that defines contaminant limits in effluent to be discharged. No permits were found using the EPA's Envirofacts database on or adjacent to the priority area.

5.1.5 Drinking Water Permits

No drinking water permits are in place at the subject property.

5.1.6 Air Permits

No air emission or air quality permits are in place at the subject property.

5.1.7 Nuclear Regulatory Commission (NRC)

The NRC is tasked with permitting the use and handling of radioactive materials and reactors. No NRC licenses are in place at the subject property.

5.1.8 Other Permits/ Licenses

No other permits were found during the records search.

5.2 Environmental Cleanup and Remediation

5.2.1 Installation Restoration Program

Beaver Lake is not an active military facility, and therefore would not be eligible for cleanup under the Installation Restoration Program.

5.2.2 Military Munitions Response Program

Beaver Lake is not an active military facility, and therefore would not be eligible for cleanup under the Military Munitions Restoration Program.

5.2.3 Other Environmental Investigations and Cleanups

No known environmental investigations or cleanups were found during the records search, site inspection and interviews indicated that no known investigations or cleanups are ongoing at Beaver Lake.

5.2.4 Storage, Release, and Disposal of Hazardous Substances

No releases to the environment or improper disposal of these substances were found during the records search, site inspection and interviews indicated no known improper disposal at the priority area.

5.3 Petroleum and Petroleum Products

No releases to the environment or improper disposal of petroleum products were found during the records search, site inspection and interviews indicated no known improper disposal at the priority area.

5.4 Polychlorinated Biphenyls (PCBs)

No evidence exists of the presence of PCBs on the subject property. No PCB-containing oils were found during the records search, site inspection and interviews indicated no known PCB-containing oils have been used or stored at the priority area.

5.5 Asbestos

No asbestos assessments were found during the ECP process, none were found during the records search, site inspection and interviews indicated no known asbestos containing material has been used or stored at the priority area.

5.6 Lead and Lead-Based Paint (LBP)

No lead-based paint (LBP) assessments were found during the ECP process. No LBP was found during the records search, site inspection and interviews indicated no known improper disposal at the priority area.

5.7 Radioactive Material

No radioactive material assessments were found during the ECP process. No potentially radioactive materials were identified during the VSI, and the presence of radioactive materials on the subject property is extremely unlikely.

5.8 Landfills/Dumps

No landfills or dumps were found during the records search, site inspection or interview investigation.

5.9 Munitions and Explosives of Concern (MEC) and/or Unexploded Ordnance (UXO)

No munitions, explosives, or unexploded ordinance (UXO) were found during the records search, site inspection or interview investigation.

5.10 Radon

Beaver Lake spans across Benton, Washington and Carroll Counties. Washington County is in the Environmental Protection Agency (EPA) Radon Zone 3. Counties in Radon Zone 3 are counties with predicted average indoor radon screening levels of less than 2 pCi/L (EPA, 2018). Benton and Carroll Counties are in the EPA Radon Zone 2 with a predicted average indoor radon level between 2 and 4 pCi/L (EPA, 2018). No radon assessments were found during the records search (EPA, 2019).

5.11 Pesticides

No records were found to indicate the storage, improper use, or disposal of pesticides on the subject property.

5.12 Other Identified Concerns

No significant other concerns were found during the records search, site inspection or interviews.

5.13 National Environmental Policy Act (NEPA)

As the federal agency in charge of this project, USACE is in charge of coordinating National Environmental Policy Act (NEPA) compliance of 1969 (Public Law 91-190), the Council on Environmental Quality (CEQ) regulations (40 CFR 1500–1508), and the USACE implementing regulations, Policy and Procedures for Implementing NEPA, ER 200-2-2. As part of the records search and interview process recent NEPA documents were reviewed including the 2018 Draft Environmental Assessment for the Beaver Lake Master Plan Revision.

5.14 Adjacent Properties

As part of the ECP process, adjacent properties are assessed for environmental conditions, and those discovered conditions are evaluated based on the potential to affect the subject property. The nearest structure to the priority area is a residence approximately 0.2 miles north. The residence sits above the priority area approximately 200 yards north of the shore. The residence is first seen in the 2012 historical aerial photographs. The adjacent properties are unlikely to pose any HTRW concerns to the priority area.

6.0 Evaluation and Conclusions

6.1 Summary of ECP

Beaver Lake currently occupies more than 38,000 acres of Federal public lands and waters. This ECP report covers a parcel that consists of two sections totaling 0.94 acres of land located near the center of Beaver Lake on western shore. The subject property is on the edge of the lake and currently owned by private landowner(s). The lake is located in northwestern Arkansas, in Benton, Washington, Madison and Carroll Counties, and it is approximately 6 miles west of Eureka Springs, Arkansas. The subject property, also known as Priority Area 7, is located in Little Ventrice cove.

This ECP report was prepared to characterize the existing environmental conditions at the subject property and is intended to be an aid in the leasing of real property. The ECP findings are based on the available sources of information concerning both past and present uses of the subject property. Information included readily available data associated with adjacent property records, aerial photography, personnel interviews, environmental programs and associated documentation, and current and historic investigations. In addition, record sources were reviewed to determine if there have been spills, leaks, discharges, leaching, underground injections, dumping, abandonments, or storage of hazardous substances or petroleum products at the installation. The VSI and interview process included inquiries and requests into the existence and availability of records that support the environmental condition of the property.

6.2 Conclusions

The subject property was classified into one of seven standard ECP area types (categories) as defined by ASTM D5746-98(2016) *Standard Classification of Environmental Condition of Property Area Types for Defense Base Closure and Realignment Facilities*. Below are the seven categories for reference.

Table 4: Definitions of ECP Categories

ECP Category	Definition
1	An area or parcel of real property where no release, or disposal of hazardous substances or petroleum products or their derivatives has occurred (including no migration of these substances from adjacent properties).
2	An area or parcel of real property where only the release or disposal of petroleum products or their derivatives has occurred.
3	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but at concentrations that do not require a removal or remedial action.
4	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, and all remedial actions necessary to protect human health and the environment have been taken.

5	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred and removal or remedial actions, or both, are under way, but all required actions have not yet been taken.
6	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but required response actions have not yet been initiated.
7	An area or parcel of real property that is unevaluated or requires additional evaluation.

Given these seven categories, the subject property is categorized below, along with the reasoning for each classification.

Table 5: Properties and ECP Categories

Acreage	ECP Category	Reasoning
0.94 ac.	1	No release or disposal of hazardous substances or petroleum products or their derivatives has occurred beyond de minimus amounts, including no migration of these substances from adjacent properties.

No release or disposal of hazardous substances or petroleum products or their derivatives has occurred beyond de minimus amounts on the subject property and no releases to the environment were observed or reported.

Asbestos assessments were not available for the subject property. It is unlikely that Asbestos Containing Material (ACM) is present but, in the future, if a building or structure will be disturbed, a licensed asbestos inspector is needed to confirm whether ACM is present or not.

7.0 Certification

I declare that, to the best of our professional knowledge and belief, we meet the definition of *Environmental professional* as defined in Part 312.10 of 40 CFR 312. We have the specific qualifications based on education, training, and experience to assess a property of the nature, history and setting of the subject property. We have developed and performed the appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312. All information/documentation provided accurately reflects the condition of the property. This report meets the DoD requirements for completion of an ECP Report.

_____ _____

Eugenia Barnes
Environmental Protection Specialist
U.S. Army Corps of Engineers
Fort Worth District

Date

_____ _____

Jennifer Jefcoat
Chemist
U.S. Army Corps of Engineers
Fort Worth District

Date

_____ _____

Hollie Eljizi
Environmental Engineer
U.S. Army Corps of Engineers
Fort Worth District

Date

8.0 References

American Society for Testing and Materials (ASTM), 2013. E1527-13, *Standard Practice for Environmental Site Assessments: Phase 1 Environmental Site Assessment Process*.

ASTM, 2016. D5746, *Standard Classification of Environmental Condition of Property Area Types for Defense Base Closure and Realignment Facilities*.

Department of the Army, 13 December 2007. Army Regulation 200-1. *Environmental Quality: Environmental Protection and Enhancement.*

Environmental Protection Agency (EPA), February 2019. *EPA Map of Radon Zones including State Radon Information and Contacts*. https://www.epa.gov/radon/find-information-about-local-radon-zones-and-state-contact-information#radonmap

Federal Emergency Management Agency (FEMA), 2019. FEMA Flood Map Service Center. https://msc.fema.gov/portal

USACE. 1993. White River Basin, Arkansas and Missouri, *Water Control Master Manual.*

USACE. 2013. Little Rock District Water Management website. Accessed at: www.swl-wc.usace.army.mil

United States Census Bureau. 2013. Easy Facts Website. Accessed at: http://www.census.gov/easystats/

USACE. 2018. Beaver Lake White River and Tributaries, *Arkansas Shoreline Management Plan.*

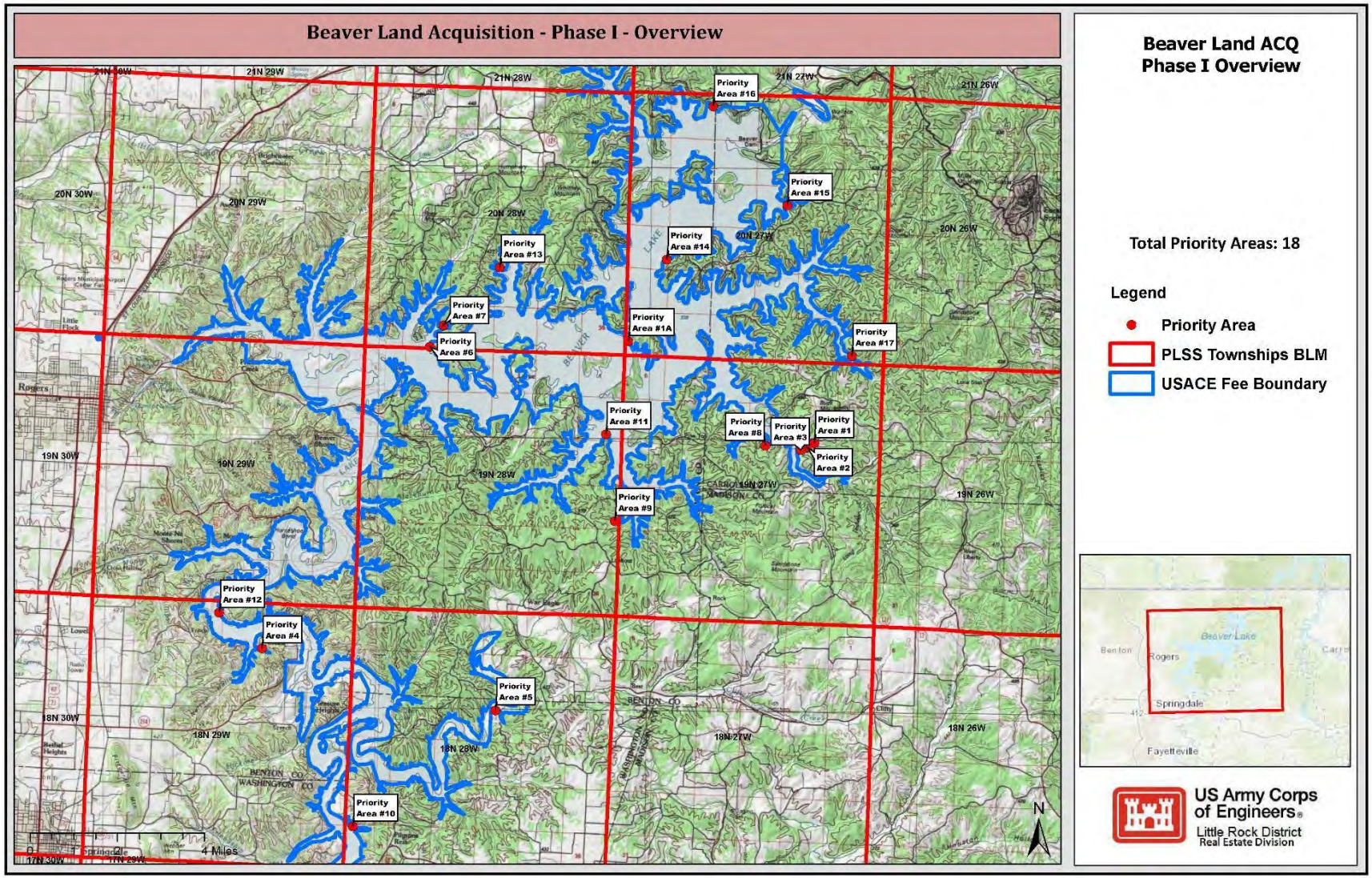
Arkansas Department of Energy and Environment Oil and Gas Commission website accessed August 2021 at: Commission, http://www.aogc.state.ar.us/maps/googleEarth.aspx

Beaver Watershed Alliance (BWA), 2012. *Beaver Lake Watershed Protection Strategy.*

Arkansas Department of Energy and Environment, Division of Environmental Quality website accessed August 2021 at: https://www.adeq.state.ar.us/rst/programs/fees/facility_data.aspx

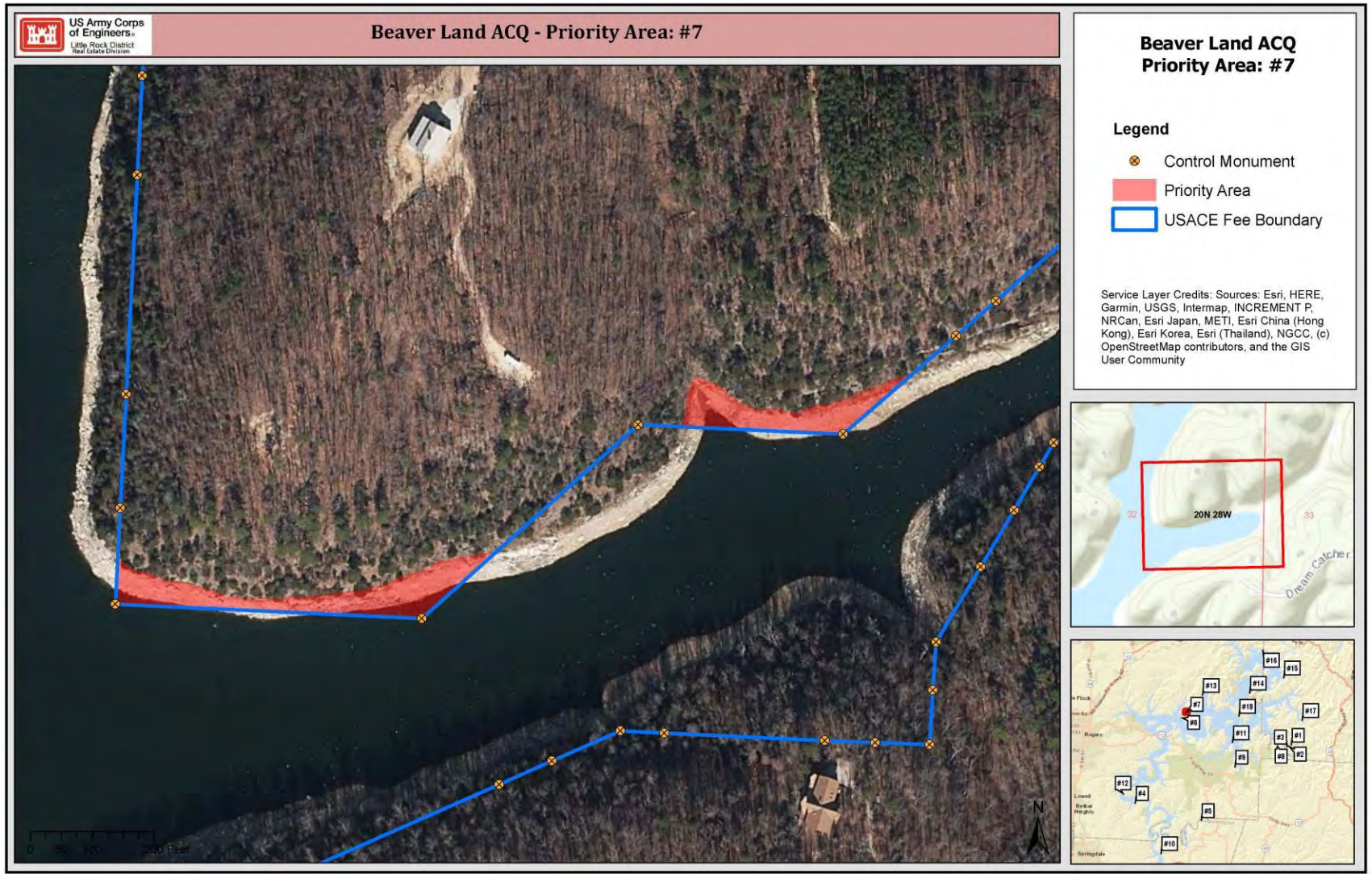
Figures

Figure 1: Beaver Lake Priority Areas



ACQ = Acquisition; PLSS = Public Land Survey System; BLM = Bureau of Land Management

Figure 2: Subject Property Detail



399083Figure 3: Interview Questions

Beaver Lake ECP
Interview Questions

1. Do you know of any environmental issues with this property?
2. Do you know of, or have access to, any reports concerning the environmental condition of this property? (i.e. site assessments, permits, storage tank registrations, safety plans, etc.) If so, would you be able to provide them? SWPPPs, SPCCs, air permits?
3. Do you know how this property has been historically used?
4. What is the property currently used for?
5. When were the site buildings constructed?
6. Are hazardous materials or petroleum products stored or used on this site? If so, what is the RCRA EPA ID? Does fueling occur on this property?
7. Do you know of any asbestos or LBP on the property or its buildings? Do you know the age of the buildings?
8. Has the site layout been manipulated in your recollection? (i.e. grading, excavation, etc.)?
9. Are there or have there been any cultural/historic items or buildings found on the property?
10. Is there anything else environmentally relevant that we should know?

Appendix A Visual Site Inspection Photographs
12 July 2021.

Priority Area 7 – Rocky bluff view from watercraft

Priority Area 7 – Rocky bluff view from watercraft

Priority Area 7 – Rocky bluff view from watercraft

Priority Area 7 – Rocky bluff view from watercraft

Final

U.S. Army Environmental Condition of Property Report
Priority Area 8

Beaver Lake
Beaver Lake, Arkansas

August 30, 2021

Prepared For:
Beaver Lake Land Acquisition

Prepared By:
U.S. Army Corps of Engineers
Regional Planning and Environmental Center
Fort Worth District
Fort Worth, Texas

[This page is intentionally left blank.]

Table of Contents

List of Appendices:
Appendix A: Visual Site Inspection Photographs, 13 July 2021.
Appendix B: Historical Aerial Photography.
Appendix C: Historical Topographic Maps.

List of Acronyms

ACM	Asbestos-containing material
AR	Army Regulation
AST	Aboveground storage tank
ASTM	American Society for Testing and Materials
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CFR	Code of Federal Regulations
DoD	Department of Defense
ECP	Environmental Condition of Property
EDR	Environmental Data Resources
EPA	Environmental Protection Agency
ERNS	Emergency Response Notification System
HTRW	Hazardous, Toxic and Radioactive Waste
IRP	Installation Restoration Program
LBP	Lead-based Paint
LUST	Leaking underground storage tank
MEC	Munitions and Explosives of Concern
NEPA	National Environmental Policy Act
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NRC	Nuclear Regulatory Commission
ODEQ	Oklahoma Department of Environmental Quality
OWS	Oil-water separator
PCB	Polychlorinated Biphenyl
POL	Petroleum, Oils, and Lubricants
RCRA	Resource Conservation and Recovery Act
SEMS	Superfund Enterprise Management System
SF	Square feet
SHWS	State Hazardous Waste Sites
SWPPP	Stormwater Pollution Prevention Plan
TSD	Transport, Storage, Disposal
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
UST	Underground storage tank
UXO	Unexploded Ordnance
VCP	Voluntary Cleanup Program
VSI	Visual site inspection

1.0 Executive Summary

This environmental condition of property (ECP) report has been prepared to document the environmental conditions and provide information for the acquisition of land that would be necessary for the operation, maintenance, and control of the Beaver Lake reservoir in Arkansas. This fee acquisition pertains to the frequently inundated land immediately surrounding the lake, below an elevation of 1128 ft above mean sea level (msl). The Army prepares an ECP in order to provide the public with information relative to the environmental condition of the property, assist Federal agencies during the property screening process, provide information about completed remedial and corrective actions at the property, and to assist in determining appropriate responsibilities, asset valuation, and liabilities with other parties to a transaction.

Beaver Lake currently occupies more than 38,000 acres of Federal public lands and waters. The Lake is located in northwestern Arkansas, in Benton, Washington, Madison and Carroll Counties and it is approximately 6 miles west of Eureka Springs, Arkansas. This ECP report covers 0.28 acres of land located off a southeastern branch of Beaver Lake, called Big Clifty Creek, on primarily eastern shore. The subject property is the end of a cove along a lower order branch of the creek. It is currently owned by private landowner(s). The subject property, also known as Priority Area 8, is in Benton County, downstream and across from the Big Clifty recreation area and boat ramp.

This ECP report presents a summary of readily available information on the environmental conditions of, and concerns relative to, the land, facilities, and real property assets of Beaver Lake. The findings included in the report are based on a record search of historical environmental investigation reports and site historical documents, a review of aerial photography, stakeholder interviews, and a site inspection conducted 12 – 13 July 2021.

Based on the environmental conditions found and the ECP analysis, the property can be categorized as an ECP Category 1, indicating a site where no release, or disposal of hazardous substances or petroleum products or their derivatives has occurred (including no migration of these substances from adjacent properties).

2.0 Purpose

2.1 General

This environmental condition of property (ECP) report has been prepared to document the environmental conditions and provide information for the acquisition of land surrounding Beaver Lake in Benton, Washington, Madison and Carrol Counties, Arkansas. This report meets the requirements of Title 40, Code of Federal Regulations (CFR), Part 373, and United States Army Regulation (AR) 200-1 (2007), *Environmental Quality, Environmental Protection and Enhancement*. The ECP report also follows the American Society for Testing and Materials (ASTM) E1527-13 *Standard Practice for Environmental Site Assessments: Phase 1 Environmental Site Assessment Process*. The subject property in this report is subsequently categorized according to ASTM D5746 (2016) *Standard Classification of Environmental Condition of Property Area Types for Defense Base Closure and Realignment Facilities*.

The Army prepares an ECP for the following purposes:

- Provide the public with information relative to the environmental condition of the property.
- Assist Federal agencies during the property screening process.
- Provide information to prospective buyers.
- Provide information about completed remedial and corrective actions at the property.
- Assist in determining appropriate responsibilities, asset valuation, and liabilities with other parties to a transaction.

The ECP contains the information required to comply with the provisions of 40 CFR, Part 373 that require a notice to accompany contracts for the sale of, and deeds entered into the transfer of, federal property on which hazardous substances may have been stored, released or disposed. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) §120(h) stipulates that a notice is required if certain quantities of designated hazardous substances have been stored on the property.

The ECP Report is not prepared to satisfy a real property purchaser's duty to conduct an "all-appropriate inquiry" to establish an "innocent purchaser defense" to CERCLA 107 liability. Any such use of the ECP Report by any party is outside the control of the Army and beyond the scope of the ECP Report. The Army, its officers, employees, or contractors makes no warranties or representations that any ECP Report satisfies any such requirements for any party.

2.2 Scope

This ECP report covers Priority Area 8, which occupies 0.28 acres of land in a cove south of Big Clifty boat ramp, further downstream is Penitentiary Hollow on the other side of Big Clifty Creek in south eastern Beaver Lake. Priority Area 8 is the end of a cove with mostly rocky overhanging shoreline with healthy vegetation growing above. There is a privately owned boat situated on the water, beside a dock and a concrete boat ramp. Terrestrial access is assumed via private property from County Road 602 and Hamley Rd. Areas within the lake that are not within the Priority Area will be considered adjacent property. A general site location map is provided in Figure 1, and map showing the subject property is shown in Figure 2.

Beaver Lake currently occupies more than 38,000 acres of Federal public lands and waters. The Lake is located in northwestern Arkansas, in Benton, Washington, Madison and Carroll Counties and it is approximately 6 miles west of Eureka Springs, Arkansas. This ECP report covers 0.28 acres of land located off a southeastern branch of Beaver Lake, called Big Clifty Creek, on primarily eastern shore. The subject property is the end of a cove along a lower order branch of the creek. It is currently owned by private landowner(s). The subject property, also known as Priority Area 8, is in Benton County, downstream and across from the Big Clifty recreation area and boat ramp.

2.3 Limitations

This ECP report presents a summary of readily available information on the environmental conditions of, and concerns relative to, the land, facilities, and real property assets of the subject property. The findings included in the report are based on a record search of available historical environmental investigation reports and site historical documents, a review of aerial photography, stakeholder interviews, and a site reconnaissance conducted 12 – 13 July 2021. Historical environmental investigation reports and site historical documents were reviewed in support of this ECP, and the information obtained from other studies is reflected within this report by reference. The ECP process recognizes that the condition of property and classification can change as historical contamination is cleaned up (if required) or if a new source of contamination is identified. Records reviewed during the assessment were accepted as accurate and a reasonable effort was made to resolve discrepancies identified during the document review.

During the ECP assessment, all available sources of information concerning both past and present environmentally significant uses of the property were reviewed. This included readily available data associated with adjacent property records; 1985, 1994, 2001, 2004, 2006, 2009, 2010, 2012, 2014, 2016, 2017, 2018, and 2020 aerial photography; personnel interviews; current and historic investigations; and topographical maps. In addition, record sources were reviewed to determine if there have been spills, leaks, discharges, leaching, underground injection, dumping, abandonment, or storage of hazardous substances or petroleum products at the subject property. The site reconnaissance and interview process included inquiries and requests into the existence and availability of records that support the environmental condition of the property. The site reconnaissance included a Visual Site Inspection (VSI) of the subject property. No sampling or analysis was conducted during this survey.

2.4 Report Organization

The remainder of this ECP report is organized as follows:

Section 3 – Property Description: This section provides location and description of the subject property; an overview of historical and current land uses; and a description of the environmental setting of the lake area, including climate, topography, geology, and demography.

Section 4 – Survey Methodology: This section describes the methods used to obtain the information for this ECP Report such as the development of study sections, the VSI, aerial photography analysis, records review, interviews, and data management.

Section 5 – Environmental Conditions: This section provides the existing environmental information. The findings are organized by relevant environmental "issues," including permits and licenses, cleanup activities, hazardous substances, petroleum and related products, asbestos, lead-based paint (LBP), radioactive materials, landfills, explosive contaminated structures, radon, pesticides, and polychlorinated biphenyls (PCBs). This section also includes adjacent property descriptions.

Section 6 – Evaluation and Conclusions: This section provides a summary of the subject property and evaluates the property for categorization as per ASTM D5746 (2016).

Section 7 – Certification: This section documents the approval of the ECP report.

Section 8 – References: This section provides an inventory of the reference material used in the preparation of this ECP Report.

Appendices: A list of appendices is provided in the Table of Contents.

3.0 Property Description

3.1 Parcel Locations and Description

Beaver Lake is located in the scenic Ozark Mountain region of northwestern Arkansas in Benton, Washington, Carroll and Madison counties. The total area currently contained in the Beaver project, including both land and water surface, consists of 38,138 acres owned in fee. Of this total, 1,432 acres are in flowage easement. The proposed Land Acquisition would include adding any land below the 1128 msl water level. The White River drainage area above Beaver Lake is approximately 1,186 square miles. When the lake is at the top of the conservation pool (elevation 1120.43 feet above mean sea level), the water area is 28,299 surface acres with 490 miles of shoreline within the lands owned in fee. The shoreline is irregular with topography primarily consisting of steep bluffs and gentle slopes.

Priority Area 8 is the end of a cove along a southeastern branch of the lake and is approximately 0.28 acres of shoreline located South and East of the center of Beaver Lake on northern shore. The subject property is on the edge of the lake and currently owned by private landowner(s). The subject property, also known as Priority Area 8, is downstream from the Big Clifty Recreation area and directly south of the Big Clifty boat ramp.

3.2 Historic Land Use

Beaver Lake is a multiple purpose water resource development project initially authorized for flood control, hydropower generation and other beneficial uses by the Flood Control Act dated 3 September 1954. The inclusion of storage in the lake for municipal and industrial water supply was authorized by the Water Supply Act of 1958. Beaver Lake is a major component of a comprehensive plan for water resource development in the White River Basin of Arkansas and Missouri. Construction of Beaver Dam was initiated in March 1960. The dam was completed in June 1966, and the powerhouse and switchyard were completed in 1965. Beaver Lake was declared operational for public use in 1965.

For Priority Area 8, the historical aerial photographs show that this area has been used for private residential use since at least 2009.

3.3 Current Land Use

Beaver Lake is located in the Ozark Highlands of Carroll, Washington, Benton, and Madison Counties. Having 490 miles of shoreline (at conservation pool) and over 28,000 water surface acres, Beaver Lake is the largest reservoir in northwest Arkansas and the first federal impoundment on the White River.

There are 12 public use areas around Beaver Lake. There are 11 parks on the lake presently operated by the Corps of Engineers. The State of Arkansas owns and operates Hobbs State Park Conservation Area, which covers 12,056 acres, and Devil's Eyebrow Natural Area, which covers 2,503 acres. Both properties are adjacent to U.S. Army Corps of Engineers (USACE) lands. There are two parks, Ventris, and Blue Springs that have been reduced to lake access only. One Park (Big Clifty) is operated by Carroll County, Arkansas.

Despite being located adjacent to the fast-growing communities of Fayetteville, Springdale, Bentonville, and Rogers, Arkansas and a regional population of over 500,000, the lake provides open spaces and a quality outdoor recreation opportunity. Many arms and coves of the lake offer secluded areas for traditional activities such as fishing, skiing, sailing and scuba diving, but also allow for passive recreation opportunities like photography and nature observation.

Priority Area 8 is currently used for residential and recreational use. There is a private residence on the subject property and a boat ramp leading to the water.

3.4 Utilities

Priority area 8 has no known utilities.

3.5 Environmental Setting

3.5.1 Climate

The climate in the Beaver Lake area is classified as humid subtropical according to the Köppen climate model. A humid subtropical climate is characterized by hot, usually humid summers and mild to cool winters. The Köppen definition of this climate is for the coldest month's mean temperature to be between 26.6 °F (−3 °C) and 64.4 °F (18 °C), and the warmest month to be above 71.6 °F (22 °C). Some climatologists prefer to use 32 °F (0 °C) as the lower bound for the coldest month's mean temperature. Under the modern Trewartha climate classification, climates are termed Humid Subtropical when they have mean temperatures of 50 °F (10 °C) for eight or more months a year. In most locations classed within this system, the mean temperature of the coldest month is between 35 °F (3 °C) and 65 °F (18 °C). Some climatologists consider the Trewartha grouping of subtropical climates to be more real-world and fitting on a global scale.

While technically classified as humid subtropical, the climate in the Beaver Lake area is considered moderate. The area experiences all four seasons and does receive cold air masses from the north; however, some of the Arctic masses are blocked by the higher elevations of the Ozarks.

Average temperatures range from a high of 88 °F (31.1 °C) and low of 27 °F (-2.7 °C) in nearby Rogers, Arkansas. Extreme temperatures rarely exceed 96 °F (35.6 °C) and 13°F (-10.6 °C). Late summer is the time of maximum heat and least rainfall. During the winter months, midday temperatures in the basin are relatively warm, around 55 o to 60 o F. Some short periods of cold weather occur with temperature ranging from 0 o to 10 o F. On winter nights, temperatures from 37 o F to below freezing are common. Highest recorded temperature in Rogers, Arkansas was 114 °F (45.6 °C) (recorded in July 1954). The lowest temperature recorded was −16 °F (−26.7 °C), in February 1996.

The relative humidity typically ranges from 41% (comfortable) to 91% (very humid) over the course of the year, rarely dropping below 24% (dry) and reaching as high as 100% (very humid). The air is driest around April 9, at which time the relative humidity drops below 49% (comfortable) three days out of four; it is most humid around June 3, exceeding 87% (very humid) three days out of four.

Dew point is often a better measure of how comfortable a person will find the weather than relative humidity because it more directly relates to whether perspiration will evaporate from the skin, thereby cooling the body. Lower dew points feel drier and higher dew points feel more humid. Over the course of a year, the dew point typically varies from 19°F (dry) to 71°F (muggy) and is rarely below 4°F (dry) or above 74°F (very muggy). There are two periods in the year that are most comfortable: The first is between April 18 and June 6 and the second is between September 3 and October 23. The air feels neither too dry nor too muggy during these periods (https://weatherspark.com/averages/31495/Rogers-Arkansas-United-States).

Average annual rainfall for the Beaver Lake area is 45 inches per year. Precipitation is weakly seasonal, with a bimodal pattern: wet seasons in the spring and fall, and relatively drier summers and winters, but some rain in all months. The spring wet season is more pronounced than fall, with the highest rainfall typically occurring in May. The average annual snowfall for the Beaver area is about 12 inches. Snowpacks are usually short lived and are not commonly a concern for flooding.

Climate change is an area of concern due to the potential for effects on many aspects of the environment, especially those related to water resources. The U.S. Global Change Research Program (USGCRP) summarized information regarding climate change and its potential effects in regional assessments (http://www.globalchange.gov/publications/reports/scientific-assessments/us-impacts). In the Midwest,

which extends from Minnesota to Missouri, extreme events such as heat waves, droughts and heavy rainfall events are projected to occur more frequently. Should these events become significant enough to impact the operation of Beaver Lake, the Master Plan and associated documents (i.e., Operations Management Plan and Shoreline Management Plan) would be reviewed and revised, if necessary.

3.5.2 Topography, Geology, and Soils

The depositional environment of the rocks found in the Arkansas Ozarks is one of a relatively shallow continental shelf, sloping toward deeper water generally toward the south. This shelf emerged many times during the Paleozoic resulting in numerous unconformities throughout the sequence. The Ozark Plateaus region of Arkansas is made up of generally flat-lying Paleozoic age strata divided into three plateau surfaces. The lowest and northern-most plateau is the Salem Plateau. The Springfield Plateau stands above the Salem a few hundred feet and is generally capped by lower Mississippian age limestones and cherts. The southernmost and highest plateau of the Ozarks is the Boston Mountains. All of these plateaus are deeply dissected by numerous streams throughout the area. The faulting in the Ozarks is generally normal; most faults displaying a displacement down on the southern side. However, some observations reveal that a few strike-slip faults may be present. Gentle folds are noted but are generally of very low amplitude. The depositional environment of the rocks found in the Arkansas Ozarks is one of a relatively shallow continental shelf, sloping toward deeper water generally toward the south.

Beaver Lake is part of the Springfield Plateau that occupies primarily the western and southwestern flanks of the Ozark Plateau province. The Springfield Plateau in this region rises to an elevation of approximately 1400 feet and in many areas, forms extensive plains. Hilly areas occur where rivers and their tributaries cut into the plateau surface, most notably in the vicinity of the White River and Beaver Lake. As streams like the Buffalo National River cut through the plateau down to the level of the White River, they sometimes carve spectacular bluffs.

Lower Ordovician, Middle to Upper Devonian and Lower and Upper Mississippian age strata are present around Beaver Lake. Upper Ordovician and Devonian strata crop out around Beaver Lake and its tributaries. The Lower Mississippian Boone Formation comprises the surface rock over the majority of the area and forms the surface of the heavily dissected Springfield Plateau. In addition to the Boone Formation, Cotter and Jefferson City formations (Jefferson City formation has not been successfully differentiated from the Cotter Formation in Arkansas), and the Powel formation, all of Ordovician age are present in the area. Formations in the Devonian strata include the Chattanooga, Clifty and Penters.

The Boone Formation consists of gray, fine- to coarse-grained fossiliferous limestone interbedded with chert. This formation caps the higher hills in the area. Since limestone is easily dissolved by water, cave and solution (karst) features are prominent. The Boone Formation is well known for dissolutional features, such as sinkholes, caves, and enlarged fissures. Surface water may drain directly into channels in limestone, where it can move rapidly and without filtration to the surface as a spring, at a location that is unpredictable without extensive testing. Therefore, water pollution problems are of particular concern in this region. The thickness of the Boone Formation is 300 to 350 feet in most of northern Arkansas, but as much as 390 feet has been reported.

The Cotter Dolomite is composed of dolostone of predominantly two types: a fine-grained, argillaceous, earthy textured, relatively soft, white to buff or gray dolostone called "cotton rock", and a more massive, medium-grained, gray dolostone that weathers to a somewhat hackly surface texture and becomes dark on exposure. The formation contains chert, some minor beds of greenish shale, and occasional thin interbedded sandstone. The thickness is about 340 feet in the vicinity of Cotter, but the interval may range up to 500 feet thick in places.

The Powell Dolomite is generally a fine-grained, light gray to greenish-gray, limy, argillaceous dolostone with thin beds of shale, sandstone, sandy dolostone, and occasionally chert. The formation’s thickness may be as much as 215 feet but is often much thinner.

The Chattanooga Shale Formation is typically black, fissile clay shale that weathers into thin flakes. The beds are usually cut by prominent joints creating polygonal blocks upon weathering. The upper part of the formation may be slightly sandy and usually contains abundant pyrite. Thickness ranges from 0 to about 85 feet; normally averaging about 30 feet (AGS).

The strata throughout the region are nearly horizontal. One predominant geological feature of the lake area is a low, persistent, limestone bluff, which occurs just above the Ordovician- Mississippian contact.

The faulting in the Ozarks is generally normal; most faults displaying a displacement down on the southern side. Lineaments and faults characteristic of northwest Arkansas are present around Beaver Lake. The Fayetteville Fault lies beneath Beaver Lake. This fault is the west side of a graben that has downdropped the Boone Formation to lake level. The Starkey Fault bounds the east side of the graben. Both faults trend approximately N 450E. One section of the Starkey fault trends N 60-700E. The Clantonville Lineament – Monocline is a northeast to southwest trending structural feature that extends from north of Clantonville to Ventris Hollow. The location of this feature was determined from the 1:24,000 three-dimensional quadrangle and from structural disparities in the Lower Mississippian rock units. This structural feature could be responsible for the presence of lead-zinc mineralization in an old prospect near Clantonville (north of Beaver Lake). The trend of this lineament to monocline is N 30-400E. Paleokarst features within the top of the Powell Dolomite are present around Beaver Lake and coincident with a lineament in Limekiln Hollow near Garfield, northwest of Beaver Lake.

In general, the soils of the Ozark Plateaus are residual and are formed on a broad, domed, upwarp consisting mostly of limestone and dolomite. The main difference in the soils is due to different rocks from which the soils were formed. The main geologic materials are cherty limestone; cherty, very siliceous dolomite; cherty, siliceous dolomite; and alluvium, which are weathered, and water transported products of the first three materials. Glade-rock soil occurs where the cherty, very siliceous dolomite is exposed to the soil formation. Dolomite is more resistant to weathering than limestone and siliceous dolomite is even more resistant, so very shallow soil results. In areas where the dolomite is less siliceous, more weathering has taken place; however, the soils produced are not as deep as soils formed by limestone.

The following eight soils associations are found in and around the Beaver project area: Captina-Nixa, Captina-Nixa-Pickwick, Clarksville-Nixa-Baxter, Corydon-Sogn, Enders-Allegheny-Mountainburg, Razort-Captina-Etowah, Linker-Apison-Hector, and Captina-Pembroke.

3.5.3 Hydrology and Groundwater

In the Interior Highlands of western and northern Arkansas ground-water supplies are more limited than in the Coastal Plain. Much of the Ozark Plateaus region is underlain by carbonate rocks, which are quite soluble in the presence of water. Solution by ground water has caused many large openings through which water passes so quickly that contaminants from the surface cannot be filtered out. Signs of these openings are caves, sink holes, springs and lost stream segments. As a consequence, the water in shallow wells may not be suitable for human consumption without treatment.

Three aquifers, which are part of the Ozark Plateaus Aquifer System, are located within northern Arkansas. The Springfield Plateau aquifer is generally under unconfined conditions, with groundwater movement occurring through fractures and solution cavities formed by dissolution of carbonate rock. Local discharge is through springs and streams. The Ozark aquifer is generally under confined conditions, especially where overlain by the units of the Ozark Confining Unit (Chattanooga Shale). Most wells in the Springfield Plateau and upper units in the Ozark aquifer yield 5-10 gpm on the average, with yields greater than 25 gpm in rare cases.

The third aquifer, the Roubidoux Formation and the Gunter Sandstone Member of the Gasconade Formation in northern Arkansas occur at greater depth and constitute the only significant aquifer system in the Ozarks. Both are permeable sandstone and carbonate units of Ordovician age. These aquifers serve as the principal source of high-quality water for many communities in northern Arkansas where surface water sources are unavailable. Together these units may yield up to 500 gpm to wells. These formations do not outcrop anywhere in Arkansas but instead outcrop in 1 southern Missouri.

3.5.4 Water Quality

The waters of the Arkansas portion of the White River watershed have all been designated by the Arkansas Department of Environmental Quality (ADEQ) for fisheries, primary and secondary contact recreation, and domestic, agricultural, and industrial water supplies (ADEQ, 2012). Beaver Lake is classified by ADEQ as a Type A water body, which includes most larger lakes of several thousand acres in size, in upland forest dominated watersheds, having an average depth of 30 to 60 feet, and having low primary production (i.e., having a low trophic status if in natural [unpolluted] condition). Beaver Lake, like all other lakes of its size in the Ozark region, stratifies chemically and thermally in the late spring with stratification extending into late fall and early winter. During the warmer months, lake waters of the upper layer (the epilimnion) are warmer and contain more dissolved oxygen, while the denser, lower layer waters (the hypolimnion) are colder and contain very little or no dissolved oxygen, thus undesirable for fish habitat.

This undesirable water, when discharged downstream from hydropower generation, may cause some problems in the tailwaters. To combat this problem, the dissolved oxygen content is monitored, and various management measures are implemented to improve the dissolved oxygen concentration in the hydropower releases. A highly productive trout fishery has been established in the Beaver tailwaters by the Arkansas Game and Fish Commission because of the available discharge of cold water from the dam, which is reaerated by turbulence as it flows downstream.

As the stratified epilimnion cools in the late fall and winter, the layers begin to mix (de-stratify), and dissolved oxygen (DO) is more evenly distributed. This condition is more favorable to the fishery of the lake and overall water quality.

The upper 1500 acres of Beaver Lake has been listed by the Arkansas Department of Environmental Quality (ADEQ) on Arkansas' 303(d) list of impaired waters, approved by the Environmental Protection Agency (EPA), due to turbidity (ADEQ, 2008). According to the Arkansas 303(d) list, these excessive levels impact the local fisheries as well as primary contact, both designated uses of Beaver Lake. The elevated turbidity levels are due to excessive silt from surface erosion from agriculture activities, unpaved road surfaces, in-stream erosion – mainly from unstable stream banks, and any other land surface disturbing activity. The Draft 2010 Integrated Water Quality and Monitoring Report (ADEQ, 2010) added pathogen indicator bacteria as a contaminant for the same area of Beaver Lake. Surface erosion activities are listed as the probable source for this contaminant as well.

Clean Water Act requires states to list waters that do not meet Federal water quality standards or have a significant potential not to meet standards as a result of point source dischargers or non- point source run-off. Subsequent to listing on the 303(d) list, the statute requires that the states develop and set the Total Maximum Daily Load (TMDL) for water bodies on the list within 13 years. A TMDL establishes the maximum amount of a pollutant that can enter a specific water body without violating the water quality standards. Values are normally calculated amounts based on dilution and the assimilative capacity of the water body. TMDLs have not been established by ADEQ for the upper Beaver Lake area.

3.6 Biological and Cultural Resources

3.6.1 Terrestrial Ecosystems

The area surrounding Beaver Lake is mostly forested. Trees and shrubs around the lakeshore include upland oak and hickory species, persimmon, honey locust, hawthorn, dogwood, redbud, coralberry, smooth and winged sumac, and buttonbush. Frequent periods of inundation keep a thin strip of government owned lands around the lake in early stages of succession. Red cedar and short-leafed pine, the principal evergreens, are dispersed throughout the region and are found in many large, scattered groups. Ground covers consist of greenbrier, sedges, and native grasses. White-tailed deer and eastern wild turkey are common game animals found and hunted in the Beaver Lake area. Black bears have also become common in the area and are hunted on the lands around the lake. The principal small game species found in the open upland areas include bobwhite quail, cottontail rabbit, and mourning dove. Gray and fox squirrels are common in upland wooded areas. Furbearing animals found in the Beaver Lake area include coyote, red fox, gray fox, otter, mink, muskrat, beaver, bobcat, and raccoon. Habitat management that includes wildlife food plot plantings, mowing, soil disturbance, removal of exotic species and application of prescribed fire provide benefit to these populations.

The common goldeneye, hooded merganser, bufflehead, and ring-necked duck are the predominant migratory waterfowl species visiting Beaver Lake. Mallards, gadwall, and other duck species are also present; however, they are only transient visitors as their characteristic feeding habits of obtaining food from shallow waters is limited. Resident Canada geese are so numerous in many coves and recreation areas that their presence has become a nuisance.

Ring-billed gulls are seen frequently around the Beaver Lake area. Greater and lesser yellow legs, pelicans, and large flocks of horned grebes are also seen during their peak migration in the spring and fall. Beaver Lake is also one of the few places where visitors can see both the turkey vulture and the black vulture at the same time in the winter. Beaver Lake has also become a popular place that visitors come to observe bald eagles, commonly wintering 150 or more birds and hosting 5-6 breeding pairs during the nesting period of March to June. The surrounding woodlands and grasslands serve as prime nesting areas for resident and neotropical migratory songbirds.

3.6.2 Aquatic Ecosystems and Wetlands

Walleye, smallmouth bass, striped bass, hybrid white-striped bass, and paddlefish have been introduced into Beaver Lake to add diversity to the fishery. Natural reproduction of striped bass and hybrid white-striped bass does not occur in Beaver Lake. Since 2004, AGFC stocks approximately 100,000 walleye, 30,000 channel catfish, 30,000 blue catfish, and 200,000 striped bass each year. While natural reproduction occurs in white crappie, black crappie, largemouth bass, and smallmouth bass, AGFC supplements this reproduction by occasional stockings of these species. Historically, there have also been introductions of northern pike, blue catfish, lake trout, and threadfin shad.

Located within the Springfield Plateau of the Ozark Mountains region of northern Arkansas, the area surrounding Beaver Lake is characterized by limestone, dolomite, or chert geology. The many rivers and streams flowing through the region have created a landscape of level highlands dissected by rugged valleys rich in karst features such as caves and sinkholes. Associated with these streams and landscape features are a variety of wetland habitats representative of the five wetland classes occurring within the region. These wetland classes include depressions, flats, fringe, riverine, and slope. It is possible, and perhaps even likely, that all of these classes of wetlands occur in the general area of Beaver Lake. However, those most likely to occur in the area immediately surrounding the lake are fringe (most likely reservoir), riverine (most likely spring runs) and slope wetlands (most likely calcareous slope).

3.6.3 Threatened and Endangered Species

The following species listed in Table 1 are from the U.S. Fish and Wildlife Service's federally classified status list of species and the Arkansas Natural Heritage data sets which have been reported and identified on project lands. Although the bald eagle was delisted by USFWS in 2007 due to recovery of the species, both the bald and golden eagles are still protected in accordance with the Bald and Golden Eagle Protection Act. The federal Migratory Bird Treaty Act of 1918 also provides protection to certain species of migratory birds. A total of 31 bird species are currently protected under this federal statute.

Table 1: Threatened and Endangered Species

	Federal Status	**State Status/Global Rank**
Gray Bat	LE	SE / S2S3/G4
Indiana Bat	LE	SE / /S1/G2
Northern long-eared Bat	LT	SE / S1S2/ G1G2
Ozark Big-eared Bat	LT	Not listed
Little Brown Bat	-	SE / S1
Bald Eagle	*Protected under Bald and Golden Eagle Protection Act	S3B,S4N/G5
Eastern Black Rail	LT	Not listed
Piping Plover	LT	Not listed
Rufa Red Knot	LT	Not listed
Whooping Crane	Experimental Population, Non-Essential	Not listed
Ozark Cavefish	LT	SE / S1/G3
Neosho Mucket	LE	Not Listed
Rabbitsfoot mussel	LT	SE/S3/G3G4
Snuffbox Mussel	LE	Not listed
Monarch Butterfly	C	Not listed
Missouri Bladderpod	LT	S2/G3

Opaque Prairie Sedge	-	SE / S2S3G4
Yellow Coneflower	-	ST / S2G3T3
Ovate-leaf Catchfly	-	ST / S2G3
Royal Catchfly	-	ST / S2G3

FEDERAL STATUS CODES

LE = Listed Endangered; the U.S. Fish and Wildlife Service has listed this species as endangered under the Endangered Species Act.
LT = Listed Threatened; the U.S. Fish and Wildlife Service has listed this species as threatened under the Endangered Species Act.
C = Candidate Species;

STATE STATUS CODES

INV = Inventory Element; The Arkansas Natural Heritage Commission is currently conducting active inventory work on these elements. Available data suggests these elements are of conservation concern. These elements may include outstanding examples of Natural Communities, colonial bird nesting sites, outstanding scenic and geologic features as well as plants and animals, which, according to current information, may be rare, peripheral, or of an undetermined status in the state. The ANHC is gathering detailed location information on these elements.

GLOBAL RANKS

G3 = Vulnerable globally. At moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors.
G4 = Apparently secure globally. Uncommon but not rare; some cause for long-term concern due to declines or other factors.
G5 = Secure globally. Common, widespread and abundant.
T-RANKS= T subranks are given to global ranks when a subspecies, variety, or race is considered at the state level. The subrank is made up of a "T" plus a number or letter (1, 2, 3, 4, 5, H, U, X) with the same ranking rules as a full species.

STATE RANKS

S1 = Critically imperiled in the state due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors making it vulnerable to extirpation.
S2 = Imperiled in the state due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it vulnerable to extirpation.
S3 = Vulnerable in the state due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.

GENERAL RANKING NOTES

Q = A "Q" in the global rank indicates the element's taxonomic classification as a species is a matter of conjecture among scientists.

Source: Arkansas Natural Heritage Commission

3.6.4 Cultural Resources

The records search, interviews, and site inspection identified no cultural resource assessments or findings for the subject property.

During the past seventy years scientific investigation of archaeological sites in the Beaver Lake area has been carried out in several phases. In 1922 and 1923, Mark R. Harrington of Phillip Academy was the first archeologist to excavate sites on the area that is now Beaver Lake. He excavated 13 bluff shelters. Between 1928 and 1935, the work of Harrington was continued by S.C. Dellinger of the University of Arkansas Museum. Dellinger supervised the excavation of 21 rock shelters. In the early 1960's, a series of surveys were conducted by several archeologists from the University of Arkansas Museum. Today, there are 280 known archeological sites along or immediately adjacent to Beaver Lake. Of these, 271 are identified as prehistoric, seven are historic and two sites have no known cultural affiliation.

Table 2: Historical and Cultural Resources at Beaver Lake

Type of Site	Number of sites
Historic	7
Prehistoric	271
No known cultural affiliation	2
Total	280
National Register Eligibility Status	
Not Evaluated	132
Not Eligible	5
Eligible	1

4.0 Survey Methodology

4.1 Development of Study Sections

The information gathered during the development of the ECP was used to group the subject property into standardized categories using Department of Defense (DoD) guidance, and in accordance with ASTM D5746 (2016). The ECP category definitions are summarized below in Table 3.

Table 3: Definitions of ECP Categories

ECP Category	Definition
1	An area or parcel of real property where no release, or disposal of hazardous substances or petroleum products or their derivatives has occurred (including no migration of these substances from adjacent properties).
2	An area or parcel of real property where only the release or disposal of petroleum products or their derivatives has occurred.
3	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but at concentrations that do not require a removal or remedial action.
4	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, and all remedial actions necessary to protect human health and the environment have been taken.
5	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred and removal or remedial actions, or both, are under way, but all required actions have not yet been taken.
6	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but required response actions have not yet been initiated.
7	An area or parcel of real property that is unevaluated or requires additional evaluation.

The final ECP category designations for the subject property are shown in Section 6.2, Table 5.

4.2 Visual Site Inspection

A VSI was conducted on 13 July 2021 at the subject property to check for recognized environmental conditions. The VSI was conducted by Mrs. Eugenia Barnes and Mr. Robert Singleton from the U.S. Army Corps of Engineers (USACE). USACE representatives were accompanied by Mr. Michael Hurley of the USACE Beaver Lake office.

The VSI was performed from a USACE Beaver Lake Office watercraft near the bank of the subject property as a Right of Entry (ROE) was not available at the time of the inspection. At the time of

inspection, the lake water level was 1127 feet above sea level, conservation pool is 1121 feet above sea level. Priority Area 8 has a private watercraft situated in the center of a cove with vegetated, overhanging ledges and rocky shoreline. Woody debris was visible near the banks of the cove and below the overhanging ledge on the bank. At the time of the investigation there was a line running overhead and across the cove, in front of the private watercraft, across the width of the cove and over to the boat ramp. There was signage indicating private residential use. The banks were rocky with healthy vegetation and on the surrounding bluffs mineral staining is visible. No debris could be seen from the boat and no apparent signs of Hazardous, Toxic and Radioactive Waste (HTRW) were visible during the VSI.

Photos from the VSI can be found in Appendix A.

4.3 Aerial Photography Analysis

Aerial photographs were available from Google Earth maps for 1985, 1994, 2001, 2004, 2006, 2009, 2010, 2012, 2014, 2016, 2017, 2018, and 2020.

The initial aerial photograph from 1985 is of poor quality and the area isn't discernable. The next photo from 1994 is also of poor quality but it can be seen that the area is treed and undisturbed with the exception of some trails around the parcel. There is no discernable change in the 2001 photo, but in the next photo from 2004 it appears that a dirt road has been cleared with a boat slip into the lake within the priority area boundary. There is no change in 2006, and in the next photo from 2009 shows a small structure on the road to the boat slip immediately adjacent to the parcel. There is no change in the photos from 2010 to 2020.

All aerial photographs are included in Appendix B.

4.4 Sanborn Map Review

Sanborn maps were not available for the subject property, or for the adjacent areas.

4.5 Topographic Map Review

Historical topographic maps were available from the US Geological Survey Website for the Beaver Lake area for 1900, 1901, 1945, 1949, 1954, 1957, 1958, 1964, 1985, 2011, 2014, 2017, and 2020. Several observations can be gleaned from these maps. First, the area before the lake was formed consisted of valleys with steep bluffs and hill sides around the White River and its tributaries. The historical maps show this valley and river basin from the 1900 to 1964 topographic maps. In 1985 the river and Beaver Dam at the northern end of the lake can been seen in the valley of the historical White River.

All topographic maps are included in Appendix C.

4.6 Records Review

4.6.1 Standard Environmental Record Sources

In this evaluation records, maps and other documents that provide environmental information about the project area are obtained and reviewed. A desktop records review was conducted using various sources to determine the presence of HTRW sites on or near the subject property. This search was focused on active cleanup sites and sites with a reasonable risk of HTRW release. Several databases were searched manually to narrow down the search area. These databases included the Environmental Protection Agency (EPA) Cleanups in my Community database, the EPA Envirofacts databases, the Arkansas Department of Environmental Quality's (ADEQ) web search tool of Underground Storage Tanks (UST) and Above Ground Storage Tanks (AST), and the Arkansas Department of Energy and Environment Oil and Gas Commission oil and gas well maps. The information collected from this desktop records review was analyzed for recognized environmental conditions (RECs) that would affect the proposed project or need further investigation, given the proposed project measures. The following resources were searched.

Federal National Priorities List (NPL) – The records search did not reveal any NPL sites in the project footprint or adjacent areas. There are nine NPL sites in the state of Arkansas, none of which are located near Beaver Lake or the priority areas. This is based on a search of the EPA Superfund: National Priorities List (NPL) list.

Federal Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) List – The CERCLIS, now called the Superfund Enterprise Management System (SEMS) database, tracks hazardous waste sites where remedial action has occurred under EPA's CERCLA program. This list also includes sites that are in the screening and assessment phase for possible inclusion on the NPL. The records search of EPA's listed SEMS sites did not reveal any sites in the project footprints or adjacent areas. This is based on a search of the EPA SEMS database.

Federal No Further Remedial Action Planned (NFRAP) – The Federal NFRAP list (now known as the SEMS archive list) tracks sites where no further remedial action is planned, based on available assessments and information. The list also represents sites that were not chosen for the NPL. Further EPA assessment could possibly be ongoing, and hazardous environmental conditions may still exist; however, in the absence of remedial action and assessment data, no determination about environmental hazards can be made. The records search did not reveal any NFRAP sites in the project footprint or adjacent areas. This is based on a search of the EPA SEMS database.

Federal Resource Conservation and Recovery Act (RCRA) Corrective Action List – The records search of EPAs Cleanups in My Community showed two RCRA Corrective Actions within one mile of the project search area. No RCRA corrective actions were found to be located within one mile of the project footprint. This is based on a search of the EPA Cleanups in My Community.

State Superfund Sites - This search is to check for any state CERCLA sites in the project vicinity. The records search of state CERCLA cleanup sites did not show any sites of concern in the project or adjacent areas. This search is based on a search of the Arkansas Department of Energy and Environment data base.

State and Tribal Solid Waste Facilities/Landfill Sites – This search is designed to check any state or tribal databases for solid waste handling facilities or landfills in the project vicinity. The records search did not find any solid waste facilities or landfill sites in area of this project or adjacent areas. This is based on a search of the EPA Landfill Methane Outreach Program (LMOP) and ADEQ Permitted Solid Waste Disposal database.

State and Tribal Registered Storage Tanks – This list is a combination of the State of Arkansas registered UST and AST databases, representing sites with storage tanks registered with the State of Arkansas. The search revealed one AST within one mile of the work area or adjacent areas. This AST is not expected to impact the project due to its distance from the proposed project. These results are based on a search of the Arkansas Department of Energy and Environment Oil and Gas Commission website.

State and Tribal Voluntary Cleanup Sites – The ADEQ Elective Site Cleanup Agreement (ESCA) database identifies sites where the responsible party chooses to clean up the site themselves with ADEQ oversight. Five sites were identified from this database. None of the sites are within one mile of the work area and are therefore not expected to impact the proposed project. These results are based on a search of the ADEQ ESCA Database.

Brownfields List – A brownfield is a property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant.

There are no brownfield sites within one mile of the work area or adjacent areas. These results are based on a search for Brownfields sites using the EPA Envirofacts search engine.

Oil and Gas Wells – A search of the oil and gas wells in the area using the Arkansas Department of Energy and Environment Oil and Gas Commission website identifies multiple sites including oil wells, plugged oil wells, injection/disposal sites within the surrounding area. Although not classified as HTRW under USACE regulations, pipelines and oil wells play an important role in the HTRW existing conditions near the potential project area. This is because the well and/or pipeline contents could potentially leak or spill into the surrounding environment or affect the proposed project features. As a result of these findings, a thorough pipeline/well search should be initiated during design to ensure no interaction with the existing oil and gas infrastructure occurs. The Oil and Gas Commission website was used to map these findings. No oil wells or pipelines were found near the priority areas.

4.7 Interviews

Two interviews were conducted on 12 and 13 July 2021 in conjunction with the site inspection, and the following stakeholders were interviewed:

- Mr. Matthew Franklin; Natural Resource Specialist, Beaver Lake Office; Matthew.G.Franklin@usace.army.mil
- Mr. Matthew Voskamp; Natural Resource Specialist, Beaver Lake Office; Matthew.Voskamp@usace.army.mil

Information gleaned from the interviews is incorporated by way of reference throughout the report. The interview questions can be found in Figure 3.

5.0 Environmental Conditions

5.1 Environmental Permits and Licenses

5.1.1 RCRA Status

The subject property is not covered under a Resource Conservation and Recovery Act (RCRA) permit, and no hazardous waste is generated or stored on the property.

5.1.2 Solid Waste

The subject property has no active, inactive, or expired permits or licenses for solid waste disposal. No landfills exist on the property.

5.1.3 USTs/ASTs

No USTs or ASTs were found during the records search, site inspection and interviews indicated no UST/AST have been known to be located at the subject property.

5.1.4 National Pollutant Discharge Elimination System (NPDES)

Section 402 of the Clean Water Act (33 U.S.C. 1251 et. seq.) requires all facilities that discharge stormwater to acquire an NPDES that defines contaminant limits in effluent to be discharged. As per the Beaver Lake Shoreline Management Plan no discharge of any type of effluent is prohibited in the waters of Little Rock District Lakes including Beaver Lake and its tributaries.

5.1.5 Drinking Water Permits

No drinking water permits are in place at the subject property.

5.1.6 Air Permits

No air emission or air quality permits are in place at the subject property.

5.1.7 Nuclear Regulatory Commission (NRC)

The NRC is tasked with permitting the use and handling of radioactive materials and reactors. No NRC licenses are in place at the subject property.

5.1.8 Other Permits/ Licenses

The property has an erosion control permit issued by the USACE Beaver Lake office for the retaining wall.

5.2 Environmental Cleanup and Remediation

5.2.1 Installation Restoration Program

Beaver Lake is not an active military facility, and therefore would not be eligible for cleanup under the Installation Restoration Program.

5.2.2 Military Munitions Response Program

Beaver Lake is not an active military facility, and therefore would not be eligible for cleanup under the Military Munitions Restoration Program.

5.2.3 Other Environmental Investigations and Cleanups

No known environmental investigations or cleanups were found during the records search, site inspection and interviews indicated that no known investigations or cleanups are ongoing at Beaver Lake.

5.2.4 Storage, Release, and Disposal of Hazardous Substances

No releases to the environment or improper disposal of these substances were found during the records search, site inspection and interviews indicated no known improper disposal at the priority area.

5.3 Petroleum and Petroleum Products

No releases to the environment or improper disposal of petroleum products were found during the records search, site inspection and interviews indicated no known improper disposal at the priority area.

5.4 Polychlorinated Biphenyls (PCBs)

No evidence exists of the presence of PCBs on the subject property. No PCB-containing oils were found during the records search, site inspection and interviews indicated no known PCB-containing oils have been used or stored at the priority area.

5.5 Asbestos

No asbestos assessments were found during the ECP process, none were found during the records search, site inspection and interviews indicated no known asbestos containing material has been used or stored at the priority area.

5.6 Lead and Lead-Based Paint (LBP)

No lead-based paint (LBP) assessments were found during the ECP process. No LBP was found during the records search, site inspection and interviews indicated no known improper disposal at the priority area.

5.7 Radioactive Material

No radioactive material assessments were found during the ECP process. No potentially radioactive materials were identified during the VSI, and the presence of radioactive materials on the subject property is extremely unlikely.

5.8 Landfills/Dumps

No landfills or dumps were found during the records search, site inspection or interview investigation.

5.9 Munitions and Explosives of Concern (MEC) and/or Unexploded Ordnance (UXO)

No munitions, explosives, or unexploded ordinance (UXO) were found during the records search, site inspection or interview investigation.

5.10 Radon

Beaver Lake spans across Benton, Washington and Carroll Counties. Washington County is in the Environmental Protection Agency (EPA) Radon Zone 3. Counties in Radon Zone 3 are counties with predicted average indoor radon screening levels of less than 2 pCi/L (EPA, 2018). Benton and Carroll Counties are in the EPA Radon Zone 2 with a predicted average indoor radon level between 2 and 4 pCi/L (EPA, 2018). No radon assessments were found during the records search (EPA, 2019).

5.11 Pesticides

No records were found to indicate the storage, improper use, or disposal of pesticides on the subject property.

5.12 Other Identified Concerns

No significant other concerns were found during the records search, site inspection or interviews.

5.13 National Environmental Policy Act (NEPA)

As the federal agency in charge of this project USACE is in charge of coordinating National Environmental Policy Act (NEPA) compliance of 1969 (Public Law 91-190), the Council on Environmental Quality (CEQ) regulations (40 CFR 1500–1508), and the USACE implementing regulations, Policy and Procedures for Implementing NEPA, ER 200-2-2. As part of the records search and interview process recent NEPA documents were reviewed including the 2018 Draft Environmental Assessment for the Beaver Lake Master Plan Revision.

5.14 Adjacent Properties

As part of the ECP process, adjacent properties are assessed for environmental conditions, and those discovered conditions are evaluated based on the potential to affect the subject property. The nearest structure to Priority Area 8 is the private residence situated 0.01 miles to the west. The paved boat ramp and docking area are also residential use additions to the subject area. The boat ramp is an erosion control structure and provides stability to the bank of the cove. There are multiple structures or residences in the surrounding parcels, with a roadway that runs north to south along the edge of the water and continues south of the subject property. Based on historical aerial photographs. There are additional residences in neighboring plots of land directly adjacent to Priority Area 8. The adjacent properties are unlikely to pose any HTRW concerns to the priority area.

6.0 Evaluation and Conclusions

6.1 Summary of ECP

Beaver Lake currently occupies more than 38,000 acres of Federal public lands and waters. The Lake is located in northwestern Arkansas, in Benton, Washington, Madison and Carroll Counties and it is approximately 6 miles west of Eureka Springs, Arkansas. This ECP report covers 0.28 acres of land located off a southeastern branch of Beaver Lake, called Big Clifty Creek, on primarily eastern shore. The subject property is the end of a cove along a lower order branch of the creek. It is currently owned by private landowner(s). The subject property, also known as Priority Area 8, is in Benton County, downstream and across from the Big Clifty recreation area and boat ramp.

This ECP report was prepared to characterize the existing environmental conditions at the subject property and is intended to be an aid in the leasing of real property. The ECP findings are based on the available sources of information concerning both past and present uses of the subject property. Information included readily available data associated with adjacent property records, aerial photography, personnel interviews, environmental programs and associated documentation, and current and historic investigations. In addition, record sources were reviewed to determine if there have been spills, leaks, discharges, leaching, underground injections, dumping, abandonments, or storage of hazardous substances or petroleum products at the installation. The VSI and interview process included inquiries and requests into the existence and availability of records that support the environmental condition of the property.

6.2 Conclusions

The subject property was classified into one of seven standard ECP area types (categories) as defined by ASTM D5746-98(2016) *Standard Classification of Environmental Condition of Property Area Types for Defense Base Closure and Realignment Facilities*. Below are the seven categories for reference.

Table 4: Definitions of ECP Categories

ECP Category	Definition
1	An area or parcel of real property where no release, or disposal of hazardous substances or petroleum products or their derivatives has occurred (including no migration of these substances from adjacent properties).
2	An area or parcel of real property where only the release or disposal of petroleum products or their derivatives has occurred.
3	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but at concentrations that do not require a removal or remedial action.
4	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, and all remedial actions necessary to protect human health and the environment have been taken.
5	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred and removal or remedial actions, or both, are under way, but all required actions have not yet been taken.
6	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but required response actions have not yet been initiated.
7	An area or parcel of real property that is unevaluated or requires additional evaluation.

Given these seven categories, the subject property is categorized below, along with the reasoning for each classification.

Table 5: Properties and ECP Categories

Acreage	ECP Category	Reasoning
0.28 ac.	1	No release or disposal of hazardous substances or petroleum products or their derivatives has occurred beyond de minimus amounts, including no migration of these substances from adjacent properties.

No release or disposal of hazardous substances or petroleum products or their derivatives has occurred beyond de minimus amounts on the subject property and no releases to the environment were observed or reported.

Asbestos assessments were not available for the subject property. It is unlikely that Asbestos Containing Material (ACM) is present but, in the future, if a building or structure will be disturbed, a licensed asbestos inspector is needed to confirm whether ACM is present or not.

7.0 Certification

I declare that, to the best of our professional knowledge and belief, we meet the definition of *Environmental professional* as defined in Part 312.10 of 40 CFR 312. We have the specific qualifications based on education, training, and experience to assess a property of the nature, history and setting of the subject property. We have developed and performed the appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312. All information/documentation provided accurately reflects the condition of the property. This report meets the DoD requirements for completion of an ECP Report.

_____ _____

Eugenia Barnes
Environmental Protection Specialist
U.S. Army Corps of Engineers
Fort Worth District

Date

_____ _____

Jennifer Jefcoat
Chemist
U.S. Army Corps of Engineers
Fort Worth District

Date

_____ _____

Hollie Eljizi
Environmental Engineer
U.S. Army Corps of Engineers
Fort Worth District

Date

8.0 References

American Society for Testing and Materials (ASTM), 2013. E1527-13, *Standard Practice for Environmental Site Assessments: Phase 1 Environmental Site Assessment Process*.

ASTM, 2016. D5746, *Standard Classification of Environmental Condition of Property Area Types for Defense Base Closure and Realignment Facilities*.

Department of the Army, 13 December 2007. Army Regulation 200-1. *Environmental Quality: Environmental Protection and Enhancement.*

Environmental Protection Agency (EPA), February 2019. *EPA Map of Radon Zones including State Radon Information and Contacts*. https://www.epa.gov/radon/find-information-about-local-radon-zones-and-state-contact-information#radonmap

Federal Emergency Management Agency (FEMA), 2019. FEMA Flood Map Service Center. https://msc.fema.gov/portal

USACE. 1993. White River Basin, Arkansas and Missouri, *Water Control Master Manual.*

USACE. 2013. Little Rock District Water Management website. Accessed at: www.swl-wc.usace.army.mil

United States Census Bureau. 2013. Easy Facts Website. Accessed at: http://www.census.gov/easystats/

USACE. 2018. Beaver Lake White River and Tributaries, *Arkansas Shoreline Management Plan.*

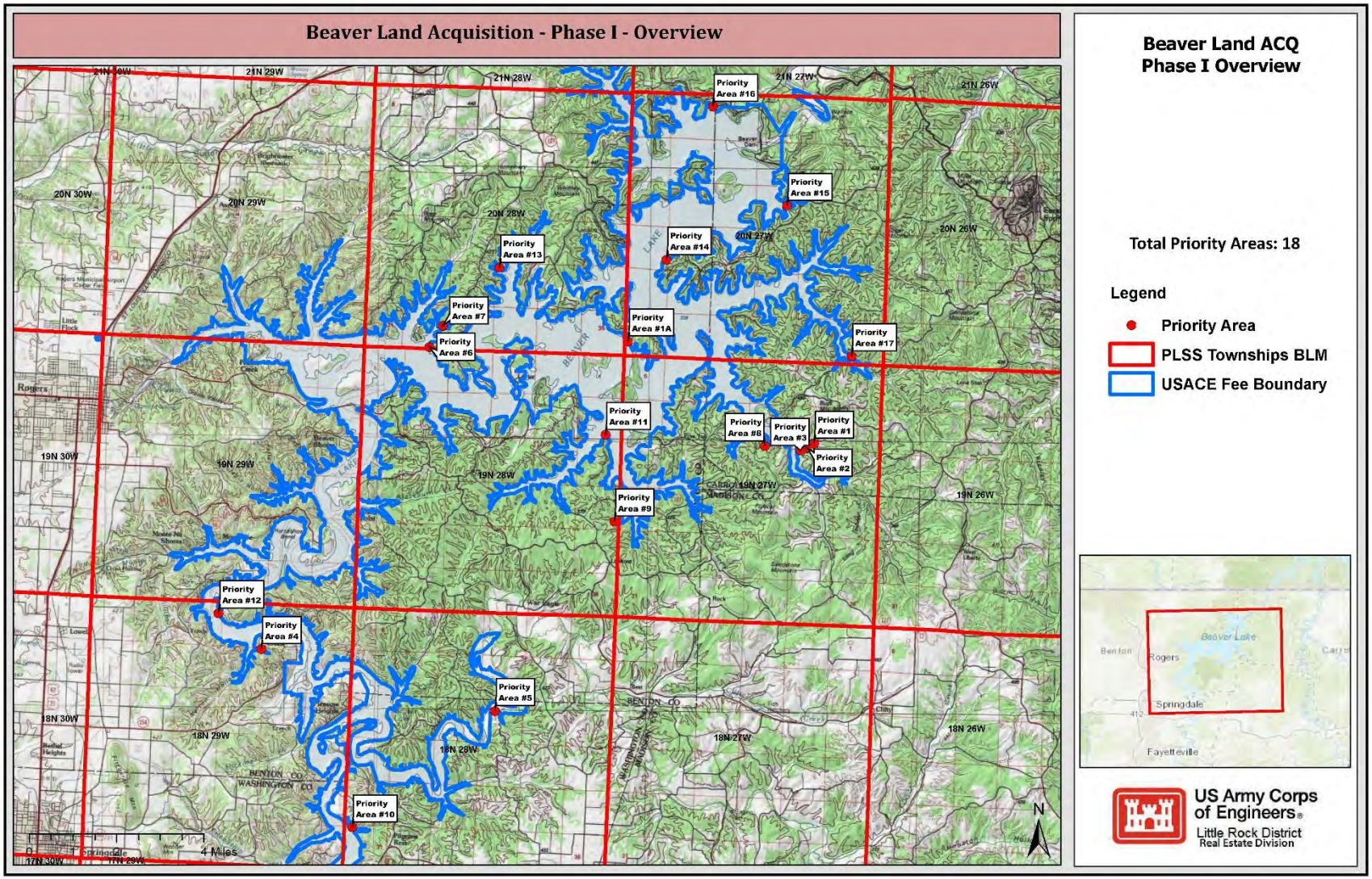
Arkansas Department of Energy and Environment Oil and Gas Commission website Accessed August 2021 at: Commission, http://www.aogc.state.ar.us/maps/googleEarth.aspx

Beaver Watershed Alliance (BWA), 2012. *Beaver Lake Watershed Protection Strategy.*

Arkansas Department of Energy and Environment Division of Environmental Quality Website Accessed August 2021 at: https://www.adeq.state.ar.us/rst/programs/fees/facility_data.aspx

Figures

Figure 1: Beaver Lake Priority Areas



ACQ = Acquisition; PLSS = Public Land Survey System; BLM = Bureau of Land Management

Figure 2: Subject Property Detail

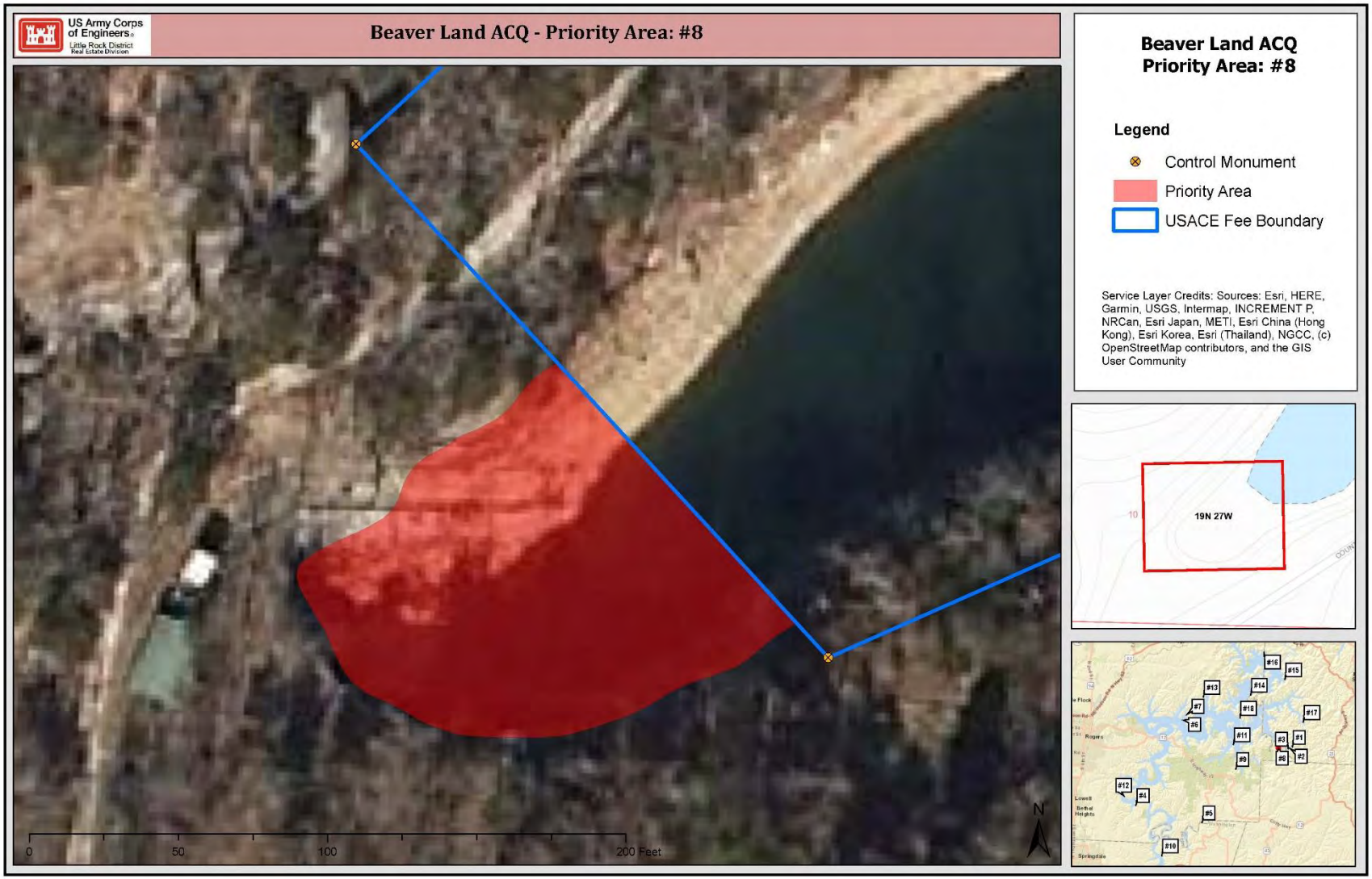


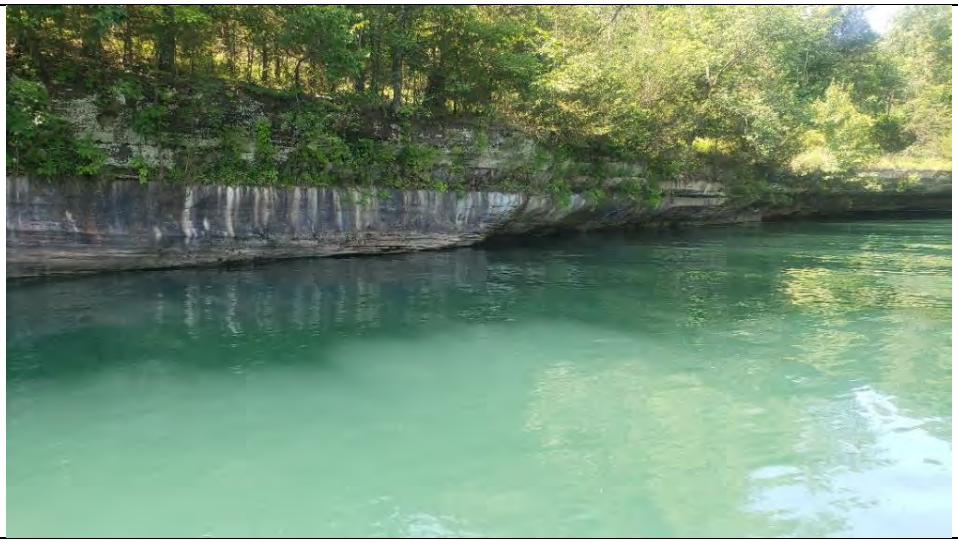
Figure 3: Interview Questions

Beaver Lake ECP
Interview Questions

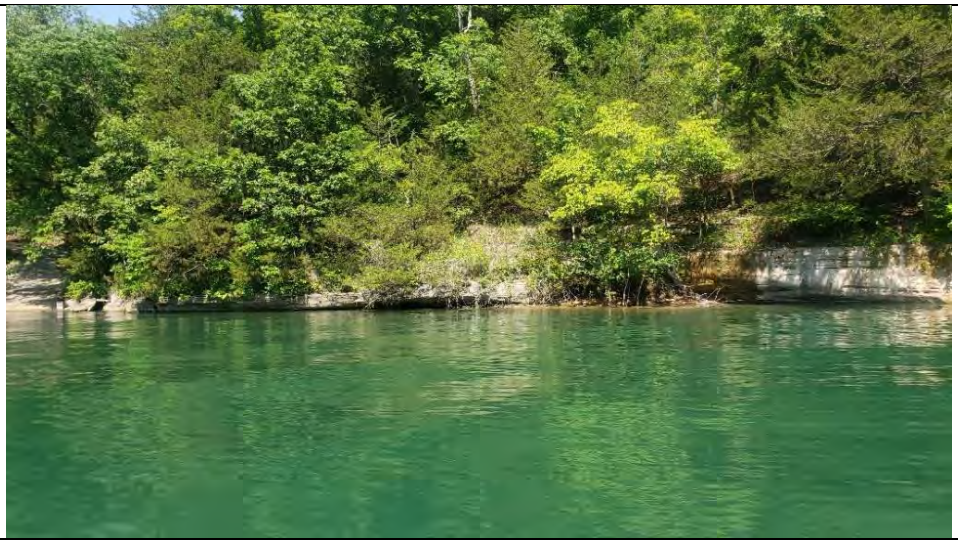
1. Do you know of any environmental issues with this property?
2. Do you know of, or have access to, any reports concerning the environmental condition of this property? (i.e., site assessments, permits, storage tank registrations, safety plans, etc.) If so, would you be able to provide them? SWPPPs, SPCCs, air permits?
3. Do you know how this property has been historically used?
4. What is the property currently used for?
5. When were the site buildings constructed?
6. Are hazardous materials or petroleum products stored or used on this site? If so, what is the RCRA EPA ID? Does fueling occur on this property?
7. Do you know of any asbestos or LBP on the property or its buildings? Do you know the age of the buildings?
8. Has the site layout been manipulated in your recollection? (i.e., grading, excavation, etc.)?
9. Are there or have there been any cultural/historic items or buildings found on the property?
10. Is there anything else environmentally relevant that we should know?

Appendix A: Visual Site Inspection Photographs

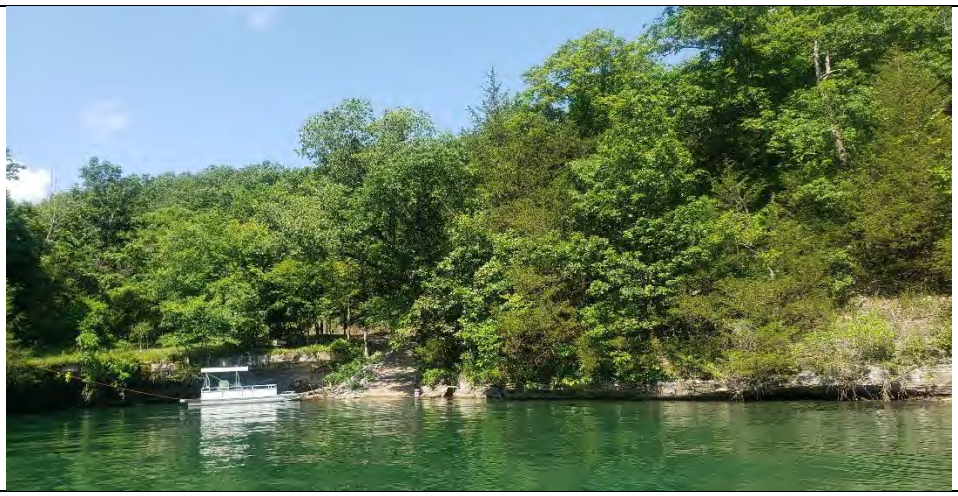
13 July 2021



Priority Area 8 – Shoreline view

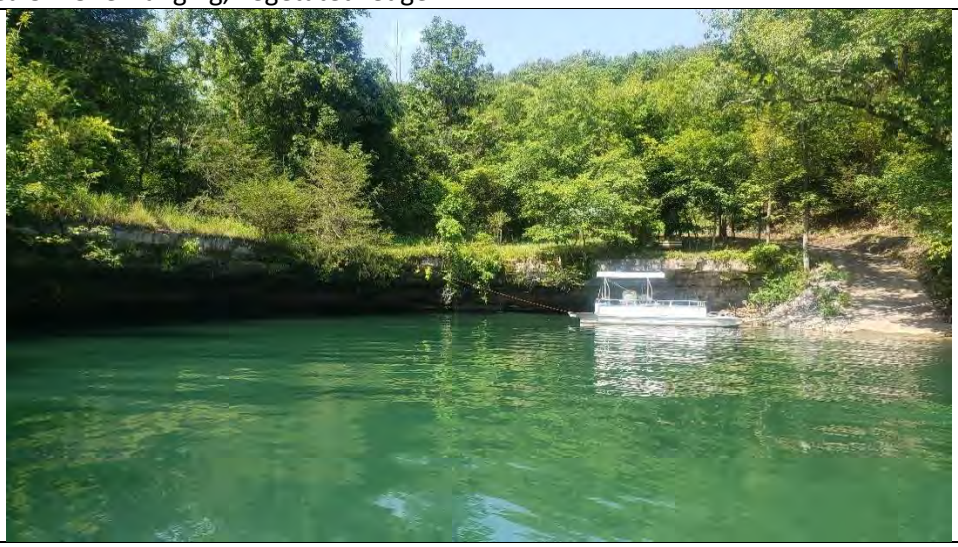


Priority Area 8 – Some erosion of rocky banks, woody debris



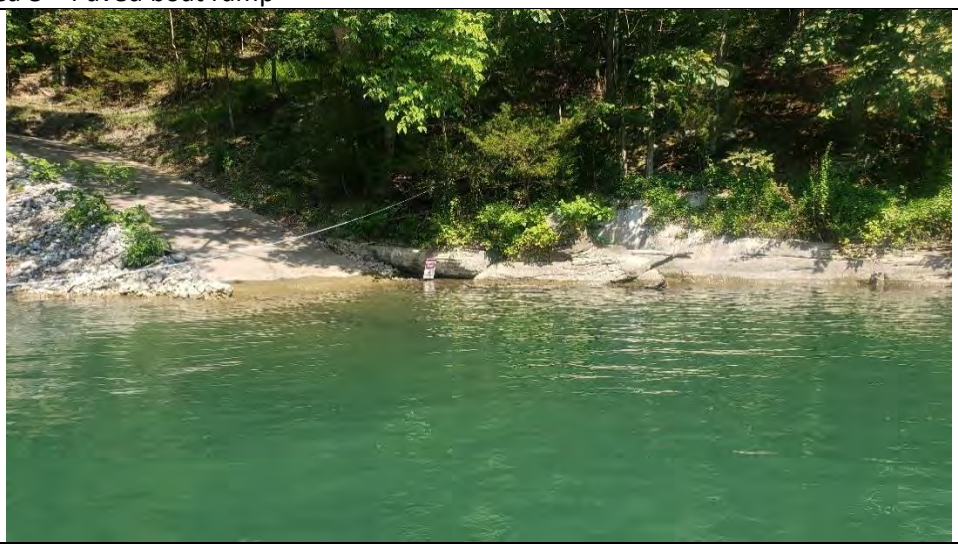
Priority Area 8 – Private residential use and boat ramp

Priority Area 8 – Overhanging, vegetated ledge

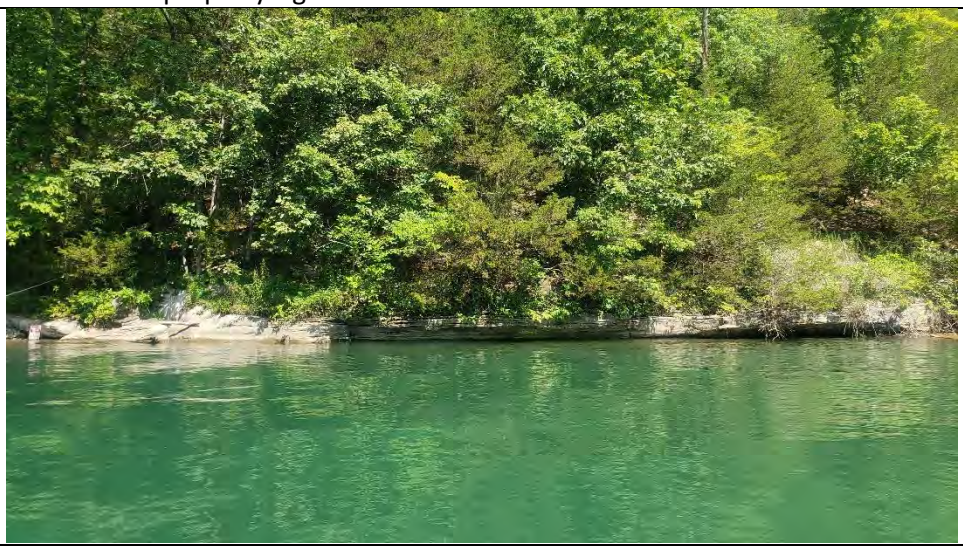


Priority Area 8 – Line running across cove

Priority Area 8 – Paved boat ramp



Priority Area 8 – Private property signs



Priority Area 8 – Vegetated shoreline

Final

U.S. Army Environmental Condition of Property Report
Priority Area 9

Beaver Lake
Beaver Lake, Arkansas

August 30, 2021

Prepared For:
Beaver Lake Land Acquisition

Prepared By:
U.S. Army Corps of Engineers
Regional Planning and Environmental Center
Fort Worth District
Fort Worth, Texas

[This page is intentionally left blank.]

Table of Contents

List of Appendices:
Appendix A: Visual Site Inspection Photographs, 13 July 2021.
Appendix B: Historical Aerial Photography.
Appendix C: Historical Topographic Maps.

List of Acronyms

ACM	Asbestos-containing material
AR	Army Regulation
AST	Aboveground storage tank
ASTM	American Society for Testing and Materials
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CFR	Code of Federal Regulations
DoD	Department of Defense
ECP	Environmental Condition of Property
EDR	Environmental Data Resources
EPA	Environmental Protection Agency
ERNS	Emergency Response Notification System
HTRW	Hazardous, Toxic and Radioactive Waste
IRP	Installation Restoration Program
LBP	Lead-based Paint
LUST	Leaking underground storage tank
MEC	Munitions and Explosives of Concern
NEPA	National Environmental Policy Act
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NRC	Nuclear Regulatory Commission
ODEQ	Oklahoma Department of Environmental Quality
OWS	Oil-water separator
PCB	Polychlorinated Biphenyl
POL	Petroleum, Oils, and Lubricants
RCRA	Resource Conservation and Recovery Act
SEMS	Superfund Enterprise Management System
SF	Square feet
SHWS	State Hazardous Waste Sites
SWPPP	Stormwater Pollution Prevention Plan
TSD	Transport, Storage, Disposal
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
UST	Underground storage tank
UXO	Unexploded Ordnance
VCP	Voluntary Cleanup Program
VSI	Visual site inspection

1.0 Executive Summary

This environmental condition of property (ECP) report has been prepared to document the environmental conditions and provide information for the acquisition of land that would be necessary for the operation, maintenance, and control of the Beaver Lake reservoir in Arkansas. This fee acquisition pertains to the frequently inundated land immediately surrounding the lake, below an elevation of 1128 ft above mean sea level (msl). The Army prepares an ECP in order to provide the public with information relative to the environmental condition of the property, assist Federal agencies during the property screening process, provide information about completed remedial and corrective actions at the property, and to assist in determining appropriate responsibilities, asset valuation, and liabilities with other parties to a transaction.

Beaver Lake currently occupies more than 38,000 acres of Federal public lands and waters. The Lake is located in northwestern Arkansas, in Benton, Washington, Madison and Carroll Counties and it is approximately 6 miles west of Eureka Springs, Arkansas. This ECP report covers 0.65 acres of land located off of a southern branch of Beaver Lake called Devils Gap, which is downstream on Rambo Creek. It is currently owned by private landowner(s) and is home to a popular tourist attraction, War Eagle Cavern. The subject property, also known as Priority Area 9, is in Benton County, directly south of the center of Beaver Lake.

This ECP report presents a summary of readily available information on the environmental conditions of, and concerns relative to, the land, facilities, and real property assets of Beaver Lake. The findings included in the report are based on a record search of historical environmental investigation reports and site historical documents, a review of aerial photography, stakeholder interviews, and a site inspection conducted 12 – 13 July 2021.

Based on the environmental conditions found and the ECP analysis, the property can be categorized as an ECP Category 1, indicating a site where no release, or disposal of hazardous substances or petroleum products or their derivatives has occurred (including no migration of these substances from adjacent properties).

2.0 Purpose

2.1 General

This environmental condition of property (ECP) report has been prepared to document the environmental conditions and provide information for the acquisition of land surrounding Beaver Lake in Benton, Washington, Madison and Carrol Counties, Arkansas. This report meets the requirements of Title 40, Code of Federal Regulations (CFR), Part 373, and United States Army Regulation (AR) 200-1 (2007), *Environmental Quality, Environmental Protection and Enhancement*. The ECP report also follows the American Society for Testing and Materials (ASTM) E1527-13 *Standard Practice for Environmental Site Assessments: Phase 1 Environmental Site Assessment Process*. The subject property in this report is subsequently categorized according to ASTM D5746 (2016) *Standard Classification of Environmental Condition of Property Area Types for Defense Base Closure and Realignment Facilities*.

The Army prepares an ECP for the following purposes:

- Provide the public with information relative to the environmental condition of the property.
- Assist Federal agencies during the property screening process.
- Provide information to prospective buyers.
- Provide information about completed remedial and corrective actions at the property.
- Assist in determining appropriate responsibilities, asset valuation, and liabilities with other parties to a transaction.

The ECP contains the information required to comply with the provisions of 40 CFR, Part 373 that require a notice to accompany contracts for the sale of, and deeds entered into the transfer of, federal property on which hazardous substances may have been stored, released or disposed. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) §120(h) stipulates that a notice is required if certain quantities of designated hazardous substances have been stored on the property.

The ECP Report is not prepared to satisfy a real property purchaser's duty to conduct an "all-appropriate inquiry" to establish an "innocent purchaser defense" to CERCLA liability. Any such use of the ECP Report by any party is outside the control of the Army and beyond the scope of the ECP Report. The Army, its officers, employees, or contractors makes no warranties or representations that any ECP Report satisfies any such requirements for any party.

2.2 Scope

This ECP report covers Priority Area 9, which occupies 0.65 acres of land south of the center of Beaver Lake. Priority Area 9 is the end of a branching with mostly rocky overhanging shoreline with healthy vegetation growing above. There is a privately owned boat dock situated on the water, beside a paved walkway Terrestrial access is assumed via private property from Cavern Dr. or Eagle Ridge Rd. Areas within the lake that are not within the Priority Area will be considered adjacent property. A general site location map is provided in Figure 1, and map showing the subject property is shown in Figure 2.

Beaver Lake currently occupies more than 38,000 acres of Federal public lands and waters. The Lake is located in northwestern Arkansas, in Benton, Washington, Madison and Carroll Counties and it is approximately 6 miles west of Eureka Springs, Arkansas. This ECP report covers 0.65 acres of land located off of a southern branch of Beaver Lake called Devils Gap, which is downstream on Rambo Creek. It is currently owned by private landowner(s) and is home to a popular tourist attraction, War Eagle Cavern. The subject property, also known as Priority Area 9, is in Benton County, directly south of the center of Beaver Lake.

2.3 Limitations

This ECP report presents a summary of readily available information on the environmental conditions of, and concerns relative to, the land, facilities, and real property assets of the subject property. The findings included in the report are based on a record search of available historical environmental investigation reports and site historical documents, a review of aerial photography, stakeholder interviews, and a site reconnaissance conducted 12 – 13 July 2021. Historical environmental investigation reports and site historical documents were reviewed in support of this ECP, and the information obtained from other studies is reflected within this report by reference. The ECP process recognizes that the condition of property and classification can change as historical contamination is cleaned up (if required) or if a new source of contamination is identified. Records reviewed during the assessment were accepted as accurate and a reasonable effort was made to resolve discrepancies identified during the document review.

During the ECP assessment, all available sources of information concerning both past and present environmentally significant uses of the property were reviewed. This included readily available data associated with adjacent property records; 1985, 1994, 2001, 2004, 2006, 2009, 2010, 2012, 2014, 2016, 2017, 2018, and 2020 aerial photography; personnel interviews; current and historic investigations; and topographical maps. In addition, record sources were reviewed to determine if there have been spills, leaks, discharges, leaching, underground injection, dumping, abandonment, or storage of hazardous substances or petroleum products at the subject property. The site reconnaissance and interview process included inquiries and requests into the existence and availability of records that support the environmental condition of the property. The site reconnaissance included a Visual Site Inspection (VSI) of the subject property. No sampling or analysis was conducted during this survey.

2.4 Report Organization

The remainder of this ECP report is organized as follows:

Section 3 – Property Description: This section provides location and description of the subject property; an overview of historical and current land uses; and a description of the environmental setting of the lake area, including climate, topography, geology, and demography.

Section 4 – Survey Methodology: This section describes the methods used to obtain the information for this ECP Report such as the development of study sections, the VSI, aerial photography analysis, records review, interviews, and data management.

Section 5 – Environmental Conditions: This section provides the existing environmental information. The findings are organized by relevant environmental "issues," including permits and licenses, cleanup activities, hazardous substances, petroleum and related products, asbestos, lead-based paint (LBP), radioactive materials, landfills, explosive contaminated structures, radon, pesticides, and polychlorinated biphenyls (PCBs). This section also includes adjacent property descriptions.

Section 6 – Evaluation and Conclusions: This section provides a summary of the subject property and evaluates the property for categorization as per ASTM D5746 (2016).

Section 7 – Certification: This section documents the approval of the ECP report.

Section 8 – References: This section provides an inventory of the reference material used in the preparation of this ECP Report.

Appendices: A list of appendices is provided in the Table of Contents.

3.0 Property Description

3.1 Parcel Locations and Description

Beaver Lake is located in the scenic Ozark Mountain region of northwestern Arkansas in Benton, Washington, Carroll and Madison counties. The total area currently contained in the Beaver project, including both land and water surface, consists of 38,138 acres owned in fee. Of this total, 1,432 acres are in flowage easement. The proposed Land Acquisition would include adding any land below the 1128 msl water level. The White River drainage area above Beaver Lake is approximately 1,186 square miles. When the lake is at the top of the conservation pool (elevation 1120.43 feet above mean sea level), the water area is 28,299 surface acres with 490 miles of shoreline within the lands owned in fee. The shoreline is irregular with topography primarily consisting of steep bluffs and gentle slopes.

Priority Area 9 is the end of a southern branch of the lake and is approximately 0.65 acres of mostly shoreline located South of the center of Beaver Lake. The subject property is at the end of a western branch off of Devils Gap, below Rambo Creek. This waterway ends at the mouth of a cavern with steep limestone inclines. It is currently owned by private landowner(s) but is a business open to the public. The subject property, also known as Priority Area 9, is a popular tourist attraction called War Eagle Cavern.

3.2 Historic Land Use

Beaver Lake is a multiple purpose water resource development project initially authorized for flood control, hydropower generation and other beneficial uses by the Flood Control Act dated 3 September 1954. The inclusion of storage in the lake for municipal and industrial water supply was authorized by the Water Supply Act of 1958. Beaver Lake is a major component of a comprehensive plan for water resource development in the White River Basin of Arkansas and Missouri. Construction of Beaver Dam was initiated in March 1960. The dam was completed in June 1966, and the powerhouse and switchyard were completed in 1965. Beaver Lake was declared operational for public use in 1965.

For Priority Area 9, the historical aerial photographs show that this area has been used for a private tourist attraction use as far back as 1985.

3.3 Current Land Use

Beaver Lake is located in the Ozark Highlands of Carroll, Washington, Benton, and Madison Counties. Having 490 miles of shoreline (at conservation pool) and over 28,000 water surface acres, Beaver Lake is the largest reservoir in northwest Arkansas and the first federal impoundment on the White River.

There are 12 public use areas around Beaver Lake. There are 11 parks on the lake presently operated by the Corps of Engineers. The State of Arkansas owns and operates Hobbs State Park Conservation Area, which covers 12,056 acres, and Devil's Eyebrow Natural Area, which covers 2,503 acres. Both properties are adjacent to U.S. Army Corps of Engineers (USACE) lands. There are two parks, Ventris, and Blue Springs that have been reduced to lake access only. One Park (Big Clifty) is operated by Carroll County, Arkansas.

Despite being located adjacent to the fast-growing communities of Fayetteville, Springdale, Bentonville, and Rogers, Arkansas and a regional population of over 500,000, the lake provides open spaces and a quality outdoor recreation opportunity. Many arms and coves of the lake offer secluded areas for traditional activities such as fishing, skiing, sailing and scuba diving, but also allow for passive recreation opportunities like photography and nature observation.

Priority Area 9 is currently the home of War Eagle Cavern, which is a popular tourist attraction and as such, hosts many school fieldtrips. There is a boat dock on the water that leads to a paved walkway over to the cavern and then above to the facilities that house the attraction. There are visible signs of this recreational use.

3.4 Utilities

Priority area 9 has no known utilities.

3.5 Environmental Setting

3.5.1 Climate

The climate in the Beaver Lake area is classified as humid subtropical according to the Köppen climate model. A humid subtropical climate is characterized by hot, usually humid summers and mild to cool winters. The Köppen definition of this climate is for the coldest month's mean temperature to be between 26.6 °F (−3 °C) and 64.4 °F (18 °C), and the warmest month to be above 71.6 °F (22 °C). Some climatologists prefer to use 32 °F (0 °C) as the lower bound for the coldest month's mean temperature. Under the modern Trewartha climate classification, climates are termed Humid Subtropical when they have mean temperatures of 50 °F (10 °C) for eight or more months a year. In most locations classed within this system, the mean temperature of the coldest month is between 35 °F (3 °C) and 65 °F (18 °C). Some climatologists consider the Trewartha grouping of subtropical climates to be more real-world and fitting on a global scale.

While technically classified as humid subtropical, the climate in the Beaver Lake area is considered moderate. The area experiences all four seasons and does receive cold air masses from the north; however, some of the Arctic masses are blocked by the higher elevations of the Ozarks.

Average temperatures range from a high of 88 °F (31.1 °C) and low of 27 °F (-2.7 °C) in nearby Rogers, Arkansas. Extreme temperatures rarely exceed 96 °F (35.6 °C) and 13°F (-10.6 °C). Late summer is the time of maximum heat and least rainfall. During the winter months, midday temperatures in the basin are relatively warm, around 55 o to 60 o F. Some short periods of cold weather occur with temperature ranging from 0 o to 10 o F. On winter nights, temperatures from 37 o F to below freezing are common. Highest recorded temperature in Rogers, Arkansas was 114 °F (45.6 °C) (recorded in July 1954). The lowest temperature recorded was −16 °F (−26.7 °C), in February 1996.

The relative humidity typically ranges from 41% (comfortable) to 91% (very humid) over the course of the year, rarely dropping below 24% (dry) and reaching as high as 100% (very humid). The air is driest around April 9, at which time the relative humidity drops below 49% (comfortable) three days out of four; it is most humid around June 3, exceeding 87% (very humid) three days out of four.

Dew point is often a better measure of how comfortable a person will find the weather than relative humidity because it more directly relates to whether perspiration will evaporate from the skin, thereby cooling the body. Lower dew points feel drier and higher dew points feel more humid. Over the course of a year, the dew point typically varies from 19°F (dry) to 71°F (muggy) and is rarely below 4°F (dry) or above 74°F (very muggy). There are two periods in the year that are most comfortable: The first is between April 18 and June 6 and the second is between September 3 and October 23. The air feels neither too dry nor too muggy during these periods (https://weatherspark.com/averages/31495/Rogers-Arkansas-United-States).

Average annual rainfall for the Beaver Lake area is 45 inches per year. Precipitation is weakly seasonal, with a bimodal pattern: wet seasons in the spring and fall, and relatively drier summers and winters, but some rain in all months. The spring wet season is more pronounced than fall, with the highest rainfall typically occurring in May. The average annual snowfall for the Beaver area is about 12 inches. Snowpacks are usually short lived and are not commonly a concern for flooding.

Climate change is an area of concern due to the potential for effects on many aspects of the environment, especially those related to water resources. The U.S. Global Change Research Program (USGCRP) summarized information regarding climate change and its potential effects in regional assessments (http://www.globalchange.gov/publications/reports/scientific-assessments/us-impacts). In the Midwest,

which extends from Minnesota to Missouri, extreme events such as heat waves, droughts and heavy rainfall events are projected to occur more frequently. Should these events become significant enough to impact the operation of Beaver Lake, the Master Plan and associated documents (i.e., Operations Management Plan and Shoreline Management Plan) would be reviewed and revised, if necessary.

3.5.2 Topography, Geology, and Soils

The depositional environment of the rocks found in the Arkansas Ozarks is one of a relatively shallow continental shelf, sloping toward deeper water generally toward the south. This shelf emerged many times during the Paleozoic resulting in numerous unconformities throughout the sequence. The Ozark Plateaus region of Arkansas is made up of generally flat-lying Paleozoic age strata divided into three plateau surfaces. The lowest and northern-most plateau is the Salem Plateau. The Springfield Plateau stands above the Salem a few hundred feet and is generally capped by lower Mississippian age limestones and cherts. The southernmost and highest plateau of the Ozarks is the Boston Mountains. All of these plateaus are deeply dissected by numerous streams throughout the area. The faulting in the Ozarks is generally normal; most faults displaying a displacement down on the southern side. However, some observations reveal that a few strike-slip faults may be present. Gentle folds are noted but are generally of very low amplitude. The depositional environment of the rocks found in the Arkansas Ozarks is one of a relatively shallow continental shelf, sloping toward deeper water generally toward the south.

Beaver Lake is part of the Springfield Plateau that occupies primarily the western and southwestern flanks of the Ozark Plateau province. The Springfield Plateau in this region rises to an elevation of approximately 1400 feet and in many areas, forms extensive plains. Hilly areas occur where rivers and their tributaries cut into the plateau surface, most notably in the vicinity of the White River and Beaver Lake. As streams like the Buffalo National River cut through the plateau down to the level of the White River, they sometimes carve spectacular bluffs.

Lower Ordovician, Middle to Upper Devonian and Lower and Upper Mississippian age strata are present around Beaver Lake. Upper Ordovician and Devonian strata crop out around Beaver Lake and its tributaries. The Lower Mississippian Boone Formation comprises the surface rock over the majority of the area and forms the surface of the heavily dissected Springfield Plateau. In addition to the Boone Formation, Cotter and Jefferson City formations (Jefferson City formation has not been successfully differentiated from the Cotter Formation in Arkansas), and the Powel formation, all of Ordovician age are present in the area. Formations in the Devonian strata include the Chattanooga, Clifty and Penters.

The Boone Formation consists of gray, fine- to coarse-grained fossiliferous limestone interbedded with chert. This formation caps the higher hills in the area. Since limestone is easily dissolved by water, cave and solution (karst) features are prominent. The Boone Formation is well known for dissolutional features, such as sinkholes, caves, and enlarged fissures. Surface water may drain directly into channels in limestone, where it can move rapidly and without filtration to the surface as a spring, at a location that is unpredictable without extensive testing. Therefore, water pollution problems are of particular concern in this region. The thickness of the Boone Formation is 300 to 350 feet in most of northern Arkansas, but as much as 390 feet has been reported.

The Cotter Dolomite is composed of dolostone of predominantly two types: a fine-grained, argillaceous, earthy textured, relatively soft, white to buff or gray dolostone called "cotton rock", and a more massive, medium-grained, gray dolostone that weathers to a somewhat hackly surface texture and becomes dark on exposure. The formation contains chert, some minor beds of greenish shale, and occasional thin interbedded sandstone. The thickness is about 340 feet in the vicinity of Cotter, but the interval may range up to 500 feet thick in places.

The Powell Dolomite is generally a fine-grained, light gray to greenish-gray, limy, argillaceous dolostone with thin beds of shale, sandstone, sandy dolostone, and occasionally chert. The formation’s thickness may be as much as 215 feet but is often much thinner.

The Chattanooga Shale Formation is typically black, fissile clay shale that weathers into thin flakes. The beds are usually cut by prominent joints creating polygonal blocks upon weathering. The upper part of the formation may be slightly sandy and usually contains abundant pyrite. Thickness ranges from 0 to about 85 feet; normally averaging about 30 feet (AGS).

The strata throughout the region are nearly horizontal. One predominant geological feature of the lake area is a low, persistent, limestone bluff, which occurs just above the Ordovician- Mississippian contact.

The faulting in the Ozarks is generally normal; most faults displaying a displacement down on the southern side. Lineaments and faults characteristic of northwest Arkansas are present around Beaver Lake. The Fayetteville Fault lies beneath Beaver Lake. This fault is the west side of a graben that has downdropped the Boone Formation to lake level. The Starkey Fault bounds the east side of the graben. Both faults trend approximately N 450E. One section of the Starkey fault trends N 60-700E. The Clantonville Lineament – Monocline is a northeast to southwest trending structural feature that extends from north of Clantonville to Ventris Hollow. The location of this feature was determined from the 1:24,000 three-dimensional quadrangle and from structural disparities in the Lower Mississippian rock units. This structural feature could be responsible for the presence of lead-zinc mineralization in an old prospect near Clantonville (north of Beaver Lake). The trend of this lineament to monocline is N 30-400E. Paleokarst features within the top of the Powell Dolomite are present around Beaver Lake and coincident with a lineament in Limekiln Hollow near Garfield, northwest of Beaver Lake.

In general, the soils of the Ozark Plateaus are residual and are formed on a broad, domed, upwarp consisting mostly of limestone and dolomite. The main difference in the soils is due to different rocks from which the soils were formed. The main geologic materials are cherty limestone; cherty, very siliceous dolomite; cherty, siliceous dolomite; and alluvium, which are weathered, and water transported products of the first three materials. Glade-rock soil occurs where the cherty, very siliceous dolomite is exposed to the soil formation. Dolomite is more resistant to weathering than limestone and siliceous dolomite is even more resistant, so very shallow soil results. In areas where the dolomite is less siliceous, more weathering has taken place; however, the soils produced are not as deep as soils formed by limestone.

The following eight soils associations are found in and around the Beaver project area: Captina-Nixa, Captina-Nixa-Pickwick, Clarksville-Nixa-Baxter, Corydon-Sogn, Enders-Allegheny-Mountainburg, Razort-Captina-Etowah, Linker-Apison-Hector, and Captina-Pembroke.

3.5.3 Hydrology and Groundwater

In the Interior Highlands of western and northern Arkansas ground-water supplies are more limited than in the Coastal Plain. Much of the Ozark Plateaus region is underlain by carbonate rocks, which are quite soluble in the presence of water. Solution by ground water has caused many large openings through which water passes so quickly that contaminants from the surface cannot be filtered out. Signs of these openings are caves, sink holes, springs and lost stream segments. As a consequence, the water in shallow wells may not be suitable for human consumption without treatment.

Three aquifers, which are part of the Ozark Plateaus Aquifer System, are located within northern Arkansas. The Springfield Plateau aquifer is generally under unconfined conditions, with groundwater movement occurring through fractures and solution cavities formed by dissolution of carbonate rock. Local discharge is through springs and streams. The Ozark aquifer is generally under confined conditions, especially where overlain by the units of the Ozark Confining Unit (Chattanooga Shale). Most wells in the Springfield Plateau and upper units in the Ozark aquifer yield 5-10 gpm on the average, with yields greater than 25 gpm in rare cases.

The third aquifer, the Roubidoux Formation and the Gunter Sandstone Member of the Gasconade Formation in northern Arkansas occur at greater depth and constitute the only significant aquifer system in the Ozarks. Both are permeable sandstone and carbonate units of Ordovician age. These aquifers serve as the principal source of high-quality water for many communities in northern Arkansas where surface water sources are unavailable. Together these units may yield up to 500 gpm to wells. These formations do not outcrop anywhere in Arkansas but instead outcrop in southern Missouri.

3.5.4 Water Quality

The waters of the Arkansas portion of the White River watershed have all been designated by the Arkansas Department of Environmental Quality (ADEQ) for fisheries, primary and secondary contact recreation, and domestic, agricultural, and industrial water supplies (ADEQ, 2012). Beaver Lake is classified by ADEQ as a Type A water body, which includes most larger lakes of several thousand acres in size, in upland forest dominated watersheds, having an average depth of 30 to 60 feet, and having low primary production (i.e., having a low trophic status if in natural [unpolluted] condition). Beaver Lake, like all other lakes of its size in the Ozark region, stratifies chemically and thermally in the late spring with stratification extending into late fall and early winter. During the warmer months, lake waters of the upper layer (the epilimnion) are warmer and contain more dissolved oxygen, while the denser, lower layer waters (the hypolimnion) are colder and contain very little or no dissolved oxygen, thus undesirable for fish habitat.

This undesirable water, when discharged downstream from hydropower generation, may cause some problems in the tailwaters. To combat this problem, the dissolved oxygen content is monitored, and various management measures are implemented to improve the dissolved oxygen concentration in the hydropower releases. A highly productive trout fishery has been established in the Beaver tailwaters by the Arkansas Game and Fish Commission because of the available discharge of cold water from the dam, which is reaerated by turbulence as it flows downstream.

As the stratified epilimnion cools in the late fall and winter, the layers begin to mix (de-stratify) and dissolved oxygen (DO) is more evenly distributed. This condition is more favorable to the fishery of the lake and overall water quality.

The upper 1500 acres of Beaver Lake has been listed by the Arkansas Department of Environmental Quality (ADEQ) on Arkansas' 303(d) list of impaired waters, approved by the Environmental Protection Agency (EPA), due to turbidity (ADEQ, 2008). According to the Arkansas 303(d) list, these excessive levels impact the local fisheries as well as primary contact, both designated uses of Beaver Lake. The elevated turbidity levels are due to excessive silt from surface erosion from agriculture activities, unpaved road surfaces, in-stream erosion – mainly from unstable stream banks, and any other land surface disturbing activity. The Draft 2010 Integrated Water Quality and Monitoring Report (ADEQ, 2010) added pathogen indicator bacteria as a contaminant for the same area of Beaver Lake. Surface erosion activities are listed as the probable source for this contaminant as well.

Clean Water Act requires states to list waters that do not meet Federal water quality standards or have a significant potential not to meet standards as a result of point source dischargers or non- point source run-off. Subsequent to listing on the 303(d) list, the statute requires that the states develop and set the Total Maximum Daily Load (TMDL) for water bodies on the list within 13 years. A TMDL establishes the maximum amount of a pollutant that can enter a specific water body without violating the water quality standards. Values are normally calculated amounts based on dilution and the assimilative capacity of the water body. TMDLs have not been established by ADEQ for the upper Beaver Lake area.

3.6 Biological and Cultural Resources

3.6.1 Terrestrial Ecosystems

The area surrounding Beaver Lake is mostly forested. Trees and shrubs around the lakeshore include upland oak and hickory species, persimmon, honey locust, hawthorn, dogwood, redbud, coralberry, smooth and winged sumac, and buttonbush. Frequent periods of inundation keep a thin strip of government owned lands around the lake in early stages of succession. Red cedar and short-leafed pine, the principal evergreens, are dispersed throughout the region and are found in many large, scattered groups. Ground covers consist of greenbrier, sedges, and native grasses. White-tailed deer and eastern wild turkey are common game animals found and hunted in the Beaver Lake area. Black bears have also become common in the area and are hunted on the lands around the lake. The principal small game species found in the open upland areas include bobwhite quail, cottontail rabbit, and mourning dove. Gray and fox squirrels are common in upland wooded areas. Furbearing animals found in the Beaver Lake area include coyote, red fox, gray fox, otter, mink, muskrat, beaver, bobcat, and raccoon. Habitat management that includes wildlife food plot plantings, mowing, soil disturbance, removal of exotic species and application of prescribed fire provide benefit to these populations.

The common goldeneye, hooded merganser, bufflehead, and ring-necked duck are the predominant migratory waterfowl species visiting Beaver Lake. Mallards, gadwall, and other duck species are also present; however, they are only transient visitors as their characteristic feeding habits of obtaining food from shallow waters is limited. Resident Canada geese are so numerous in many coves and recreation areas that their presence has become a nuisance.

Ring-billed gulls are seen frequently around the Beaver Lake area. Greater and lesser yellow legs, pelicans, and large flocks of horned grebes are also seen during their peak migration in the spring and fall. Beaver Lake is also one of the few places where visitors can see both the turkey vulture and the black vulture at the same time in the winter. Beaver Lake has also become a popular place that visitors come to observe bald eagles, commonly wintering 150 or more birds and hosting 5-6 breeding pairs during the nesting period of March to June. The surrounding woodlands and grasslands serve as prime nesting areas for resident and neotropical migratory songbirds.

3.6.2 Aquatic Ecosystems and Wetlands

Walleye, smallmouth bass, striped bass, hybrid white-striped bass, walleye, and paddlefish have been introduced into Beaver Lake to add diversity to the fishery. Natural reproduction of striped bass and hybrid white-striped bass does not occur in Beaver Lake. Since 2004, AGFC stocks approximately 100,000 walleye, 30,000 channel catfish, 30,000 blue catfish, and 200,000 striped bass each year. While natural reproduction occurs in white crappie, black crappie, largemouth bass, and smallmouth bass, AGFC supplements this reproduction by occasional stockings of these species. Historically, there have also been introductions of northern pike, blue catfish, lake trout, and threadfin shad.

Located within the Springfield Plateau of the Ozark Mountains region of northern Arkansas, the area surrounding Beaver Lake is characterized by limestone, dolomite, or chert geology. The many rivers and streams flowing through the region have created a landscape of level highlands dissected by rugged valleys rich in karst features such as caves and sinkholes. Associated with these streams and landscape features are a variety of wetland habitats representative of the five wetland classes occurring within the region. These wetland classes include depressions, flats, fringe, riverine, and slope. It is possible, and perhaps even likely, that all of these classes of wetlands occur in the general area of Beaver Lake. However, those most likely to occur in the area immediately surrounding the lake are fringe (most likely reservoir), riverine (most likely spring runs) and slope wetlands (most likely calcareous slope).

3.6.3 Threatened and Endangered Species

The following species listed in Table 1 are from the U.S. Fish and Wildlife Service's federally classified status list of species and the Arkansas Natural Heritage data sets which have been reported and identified on project lands. Although the bald eagle was delisted by USFWS in 2007 due to recovery of the species, both the bald and golden eagles are still protected in accordance with the Bald and Golden Eagle Protection Act. The federal Migratory Bird Treaty Act of 1918 also provides protection to certain species of migratory birds. A total of 31 bird species are currently protected under this federal statute.

Table 1: Threatened and Endangered Species

	Federal Status	**State Status/Global Rank**
Gray Bat	LE	SE / S2S3/G4
Indiana Bat	LE	SE / /S1/G2
Northern long-eared Bat	LT	SE / S1S2/ G1G2
Ozark Big-eared Bat	LT	Not listed
Little Brown Bat	-	SE / S1
Bald Eagle	*Protected under Bald and Golden Eagle Protection Act	S3B,S4N/G5
Eastern Black Rail	LT	Not listed
Piping Plover	LT	Not listed
Rufa Red Knot	LT	Not listed
Whooping Crane	Experimental Population, Non-Essential	Not listed
Ozark Cavefish	LT	SE / S1/G3
Neosho Mucket	LE	Not Listed
Rabbitsfoot mussel	LT	SE/S3/G3G4
Snuffbox Mussel	LE	Not listed
Monarch Butterfly	C	Not listed
Missouri Bladderpod	LT	S2/G3

Opaque Prairie Sedge	-	SE / S2S3G4
Yellow Coneflower	-	ST / S2G3T3
Ovate-leaf Catchfly	-	ST / S2G3
Royal Catchfly	-	ST / S2G3

FEDERAL STATUS CODES

LE = Listed Endangered; the U.S. Fish and Wildlife Service has listed this species as endangered under the Endangered Species Act.
LT = Listed Threatened; the U.S. Fish and Wildlife Service has listed this species as threatened under the Endangered Species Act.
C = Candidate Species;

STATE STATUS CODES

INV = Inventory Element; The Arkansas Natural Heritage Commission is currently conducting active inventory work on these elements. Available data suggests these elements are of conservation concern. These elements may include outstanding examples of Natural Communities, colonial bird nesting sites, outstanding scenic and geologic features as well as plants and animals, which, according to current information, may be rare, peripheral, or of an undetermined status in the state. The ANHC is gathering detailed location information on these elements.

GLOBAL RANKS

G3 = Vulnerable globally. At moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors.
G4 = Apparently secure globally. Uncommon but not rare; some cause for long-term concern due to declines or other factors.
G5 = Secure globally. Common, widespread and abundant.
T-RANKS= T subranks are given to global ranks when a subspecies, variety, or race is considered at the state level. The subrank is made up of a "T" plus a number or letter (1, 2, 3, 4, 5, H, U, X) with the same ranking rules as a full species.

STATE RANKS

S1 = Critically imperiled in the state due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors making it vulnerable to extirpation.
S2 = Imperiled in the state due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it vulnerable to extirpation.
S3 = Vulnerable in the state due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.

GENERAL RANKING NOTES

Q = A "Q" in the global rank indicates the element's taxonomic classification as a species is a matter of conjecture among scientists.

Source: Arkansas Natural Heritage Commission

3.6.4 Cultural Resources

The records search, interviews, and site inspection identified no cultural resource assessments or findings for the subject property.

During the past seventy years scientific investigation of archaeological sites in the Beaver Lake area has been carried out in several phases. In 1922 and 1923, Mark R. Harrington of Phillip Academy was the first archeologist to excavate sites on the area that is now Beaver Lake. He excavated 13 bluff shelters. Between 1928 and 1935, the work of Harrington was continued by S.C. Dellinger of the University of Arkansas Museum. Dellinger supervised the excavation of 21 rock shelters. In the early 1960's, a series of surveys were conducted by several archeologists from the University of Arkansas Museum. Today, there are 280 known archeological sites along or immediately adjacent to Beaver Lake. Of these, 271 are identified as prehistoric, seven are historic and two sites have no known cultural affiliation.

Table 2: Historical and Cultural Resources at Beaver Lake

Type of Site	Number of sites
Historic	7
Prehistoric	271
No known cultural affiliation	2
Total	280
National Register Eligibility Status	
Not Evaluated	132
Not Eligible	5
Eligible	1

4.0 Survey Methodology

4.1 Development of Study Sections

The information gathered during the development of the ECP was used to group the subject property into standardized categories using Department of Defense (DoD) guidance, and in accordance with ASTM D5746 (2016). The ECP category definitions are summarized below in Table 3.

Table 3: Definitions of ECP Categories

ECP Category	Definition
1	An area or parcel of real property where no release, or disposal of hazardous substances or petroleum products or their derivatives has occurred (including no migration of these substances from adjacent properties).
2	An area or parcel of real property where only the release or disposal of petroleum products or their derivatives has occurred.
3	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but at concentrations that do not require a removal or remedial action.
4	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, and all remedial actions necessary to protect human health and the environment have been taken.
5	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred and removal or remedial actions, or both, are under way, but all required actions have not yet been taken.
6	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but required response actions have not yet been initiated.
7	An area or parcel of real property that is unevaluated or requires additional evaluation.

The final ECP category designations for the subject property are shown in Section 6.2, Table 5.

4.2 Visual Site Inspection

A VSI was conducted on 13 July 2021 at the subject property, to check for recognized environmental conditions. The VSI was conducted by Mrs. Eugenia Barnes and Mr. Robert Singleton from the U.S. Army Corps of Engineers (USACE). USACE representatives were accompanied by Mr. Michael Hurley of the USACE Beaver Lake office.

The VSI was performed from a USACE Beaver Lake Office watercraft and on foot as we were granted a tour of the subject property at the time of the inspection. Also, at the time of inspection, the lake water

level was 1126.79 ft. msl. Priority Area 9 has a private dock situated at the end of a western branch off of Devils Gap, with vegetated banks and rocky shoreline. Woody debris was visible near the banks of the cove and on the bank. There was signage indicating the recreational use. The banks were rocky with healthy vegetation and limestone was visible. A healthy fish habitat was observed with an abundant variety of fish noted. The entrance to the cavern was markedly cooler than the outside ambient temperature. The water was clear to a depth of approximately 1.5ft and no discoloration or abnormalities were noted. During the interview with the staff member from the cavern, it was noted that they continue to have visitors on a regular basis. There were also areas where customers could feed fish if desired and signs to indicate possible critter holes. No debris could be seen from the boat and no apparent signs of HTRW were visible during the VSI.

Photos from the VSI can be found in Appendix A.

4.3 Aerial Photography Analysis

Aerial photographs were available from Google Earth maps for 1985, 1994, 2001, 2004, 2006, 2009, 2010, 2012, 2014, 2016, 2017, 2018, and 2020.

The initial aerial photograph from 1985 is of poor quality and the area isn't discernable The next photo from 1994 is also of poor quality but it appears there is a structure just southwest of the priority area. There are also, two boat docks and residences down the lake about 200 yards from the parcel. The next photo from 2001 is of poor quality but appears to show the same structure. The 2004 photo is clearer, so a second smaller structure, a parking lot, and cleared pathways can be seen in the adjacent property. Leading from the previously mentioned structure, around the adjacent property, the 2006 photo shows an additional structure on the adjacent property with a parking lot, there is no change in the 2009 photo, the 2010 photo shows the same structures and paved areas but also appears to have a small boat dock just west of the priority area boundary. In the 2012 photo two small additional structures can be seen near the priority area boundary with pathways leading to the mouth of the caverns. There is no change in the photos from 2014 to 2017. In the next photo, from 2018 an additional structure attached to the structure that first appeared in the 2001 photo, there is no change in the 2020 photo.

All aerial photographs are included in Appendix B.

4.4 Sanborn Map Review

Sanborn maps were not available for the subject property, or for the adjacent areas.

4.5 Topographic Map Review

Historical topographic maps were available from the US Geological Survey Website for the Beaver Lake area for 1900, 1901, 1945, 1949, 1954, 1957, 1958, 1964, 1985, 2011, 2014, 2017, and 2020. Several observations can be gleaned from these maps. First, the area before the lake was formed consisted of valleys with steep bluffs and hill sides around the White River and its tributaries. The historical maps show this valley and river basin from the 1900 to 1964 topographic maps. In 1985 the river and Beaver Dam at the northern end of the lake can been seen in the valley of the historical White River.

All topographic maps are included in Appendix C.

4.6 Records Review

4.6.1 Standard Environmental Record Sources

In this evaluation records, maps and other documents that provide environmental information about the project area are obtained and reviewed. A desktop records review was conducted using various sources to determine the presence of HTRW sites on or near the subject property. This search was focused on active cleanup sites and sites with a reasonable risk of HTRW release. Several databases were searched

manually to narrow down the search area. These databases included the Environmental Protection Agency (EPA) Cleanups in my Community database, the EPA Envirofacts databases, the Arkansas Department of Environmental Quality's (ADEQ) web search tool of Underground Storage Tanks (UST) and Above Ground Storage Tanks (AST), and the Arkansas Department of Energy and Environment Oil and Gas Commission oil and gas well maps. The information collected from this desktop records review was analyzed for recognized environmental conditions (RECs) that would affect the proposed project or need further investigation, given the proposed project measures. The following resources were searched.

Federal National Priorities List (NPL) – The records search did not reveal any NPL sites in the project footprint or adjacent areas. There are nine NPL sites in the state of Arkansas, none of which are located near Beaver Lake or the priority areas. This is based on a search of the EPA Superfund: National Priorities List (NPL) list.

Federal Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) List – The CERCLIS, now called the Superfund Enterprise Management System (SEMS) database, tracks hazardous waste sites where remedial action has occurred under EPA's CERCLA program. This list also includes sites that are in the screening and assessment phase for possible inclusion on the NPL. The records search of EPA's listed SEMS sites did not reveal any sites in the project footprints or adjacent areas. This is based on a search of the EPA SEMS database.

Federal No Further Remedial Action Planned (NFRAP) – The Federal NFRAP list (now known as the SEMS archive list) tracks sites where no further remedial action is planned, based on available assessments and information. The list also represents sites that were not chosen for the NPL. Further EPA assessment could possibly be ongoing, and hazardous environmental conditions may still exist; however, in the absence of remedial action and assessment data, no determination about environmental hazards can be made. The records search did not reveal any NFRAP sites in the project footprint or adjacent areas. This is based on a search of the EPA SEMS database.

Federal Resource Conservation and Recovery Act (RCRA) Corrective Action List – The records search of EPAs Cleanups in My Community showed two RCRA Corrective Actions within one mile of the project search area. No RCRA corrective actions were found to be located within one mile of the project footprint. This is based on a search of the EPA Cleanups in My Community.

State Superfund Sites - This search is to check for any state CERCLA sites in the project vicinity. The records search of state CERCLA cleanup sites did not show any sites of concern in the project or adjacent areas. This search is based on a search of the Arkansas Department of Energy and Environment data base.

State and Tribal Solid Waste Facilities/Landfill Sites – This search is designed to check any state or tribal databases for solid waste handling facilities or landfills in the project vicinity. The records search did not find any solid waste facilities or landfill sites in area of this project or adjacent areas. This is based on a search of the EPA Landfill Methane Outreach Program (LMOP) and ADEQ Permitted Solid Waste Disposal database.

State and Tribal Registered Storage Tanks – This list is a combination of the State of Arkansas registered UST and AST databases, representing sites with storage tanks registered with the State of Arkansas. The search revealed one AST within one mile of the work area or adjacent areas. This AST is not expected to impact the project due to its distance from the proposed project. These results are based on a search of the Arkansas Department of Energy and Environment Oil and Gas Commission website.

State and Tribal Voluntary Cleanup Sites – The ADEQ Elective Site Cleanup Agreement (ESCA) database identifies sites where the responsible party chooses to clean up the site themselves with ADEQ oversight. Five sites were identified from this database. None of the sites are within one mile of the work area and are therefore not expected to impact the proposed project. These results are based on a search of the ADEQ ESCA Database.

Brownfields List – A brownfield is a property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. There are no brownfield sites within one mile of the work area or adjacent areas. These results are based on a search for Brownfields sites using the EPA Envirofacts search engine.

Oil and Gas Wells – A search of the oil and gas wells in the area using the Arkansas Department of Energy and Environment Oil and Gas Commission website identifies multiple sites including oil wells, plugged oil wells, injection/disposal sites within the surrounding area. Although not classified as HTRW under USACE regulations, pipelines and oil wells play an important role in the HTRW existing conditions near the potential project area. This is because the well and/or pipeline contents could potentially leak or spill into the surrounding environment or affect the proposed project features. As a result of these findings, a thorough pipeline/well search should be initiated during design to ensure no interaction with the existing oil and gas infrastructure occurs. The Oil and Gas Commission website was used to map these findings. No oil wells or pipelines were found near the priority areas.

4.7 Interviews

Two interviews were conducted on 12 and 13 July 2021 in conjunction with the site inspection, and the following stakeholders were interviewed:

- Mr. Matthew Franklin; Natural Resource Specialist, Beaver Lake Office; Matthew.G.Franklin@usace.army.mil
- Mr. Matthew Voskamp; Natural Resource Specialist, Beaver Lake Office; Matthew.Voskamp@usace.army.mil

Information gleaned from the interviews is incorporated by way of reference throughout the report. The interview questions can be found in Figure 3.

5.0 Environmental Conditions

5.1 Environmental Permits and Licenses

5.1.1 RCRA Status

The subject property is not covered under a Resource Conservation and Recovery Act (RCRA) permit, and no hazardous waste is generated or stored on the property.

5.1.2 Solid Waste

The subject property has no active, inactive, or expired permits or licenses for solid waste disposal. No landfills exist on the property.

5.1.3 USTs/ASTs

No USTs or ASTs were found during the records search, site inspection and interviews indicated no UST/AST have been known to be located at the subject property.

5.1.4 National Pollutant Discharge Elimination System (NPDES)

Section 402 of the Clean Water Act (33 U.S.C. 1251 et. seq.) requires all facilities that discharge stormwater to acquire an NPDES that defines contaminant limits in effluent to be discharged. As per the Beaver Lake Shoreline Management Plan no discharge of any type of effluent is prohibited in the waters of Little Rock District Lakes including Beaver Lake and its tributaries.

5.1.5 Drinking Water Permits

No drinking water permits are in place at the subject property.

5.1.6 Air Permits

No air emission or air quality permits are in place at the subject property.

5.1.7 Nuclear Regulatory Commission (NRC)

The NRC is tasked with permitting the use and handling of radioactive materials and reactors. No NRC licenses are in place at the subject property.

5.1.8 Other Permits/ Licenses

The property has an erosion control permit issued by the USACE Beaver Lake office for the retaining wall.

5.2 Environmental Cleanup and Remediation

5.2.1 Installation Restoration Program

Beaver Lake is not an active military facility, and therefore would not be eligible for cleanup under the Installation Restoration Program.

5.2.2 Military Munitions Response Program

Beaver Lake is not an active military facility, and therefore would not be eligible for cleanup under the Military Munitions Restoration Program.

5.2.3 Other Environmental Investigations and Cleanups

No known environmental investigations or cleanups were found during the records search, site inspection and interviews indicated that no known investigations or cleanups are ongoing at Beaver Lake.

5.2.4 Storage, Release, and Disposal of Hazardous Substances

No releases to the environment or improper disposal of these substances were found during the records search, site inspection and interviews indicated no known improper disposal at the priority area.

5.3 Petroleum and Petroleum Products

No releases to the environment or improper disposal of petroleum products were found during the records search, site inspection and interviews indicated no known improper disposal at the priority area.

5.4 Polychlorinated Biphenyls (PCBs)

No evidence exists of the presence of PCBs on the subject property. No PCB-containing oils were found during the records search, site inspection and interviews indicated no known PCB-containing oils have been used or stored at the priority area.

5.5 Asbestos

No asbestos assessments were found during the ECP process, none were found during the records search, site inspection and interviews indicated no known asbestos containing material has been used or stored at the priority area.

5.6 Lead and Lead-Based Paint (LBP)

No lead-based paint (LBP) assessments were found during the ECP process. No LBP was found during the records search, site inspection and interviews indicated no known improper disposal at the priority area.

5.7 Radioactive Material

No radioactive material assessments were found during the ECP process. No potentially radioactive materials were identified during the VSI, and the presence of radioactive materials on the subject property is extremely unlikely.

5.8 Landfills/Dumps

No landfills or dumps were found during the records search, site inspection or interview investigation.

5.9 Munitions and Explosives of Concern (MEC) and/or Unexploded Ordnance (UXO)

No munitions, explosives, or unexploded ordinance (UXO) were found during the records search, site inspection or interview investigation.

5.10 Radon

Beaver Lake spans across Benton, Washington and Carroll Counties. Washington County is in the Environmental Protection Agency (EPA) Radon Zone 3. Counties in Radon Zone 3 are counties with predicted average indoor radon screening levels of less than 2 pCi/L (EPA, 2018). Benton and Carroll Counties are in the EPA Radon Zone 2 with a predicted average indoor radon level between 2 and 4 pCi/L (EPA, 2018). No radon assessments were found during the records search (EPA, 2019).

5.11 Pesticides

No records were found to indicate the storage, improper use, or disposal of pesticides on the subject property.

5.12 Other Identified Concerns

No significant other concerns were found during the records search, site inspection or interviews.

5.13 National Environmental Policy Act (NEPA)

As the federal agency in charge of this project USACE is in charge of coordinating National Environmental Policy Act (NEPA) compliance of 1969 (Public Law 91-190), the Council on Environmental Quality (CEQ) regulations (40 CFR 1500–1508), and the USACE implementing regulations, Policy and Procedures for Implementing NEPA, ER 200-2-2. As part of the records search and interview process recent NEPA documents were reviewed including the 2018 Draft Environmental Assessment for the Beaver Lake Master Plan Revision.

5.14 Adjacent Properties

As part of the ECP process, adjacent properties are assessed for environmental conditions, and those discovered conditions are evaluated based on the potential to affect the subject property. The nearest structure to Priority Area 9 is the structure situated 0.04 miles to the south. The paved walkway that leads to the boat docking area is also part of the recreation use additions to the subject area. The boat dock includes signage. There are multiple structures or residences in the surrounding parcels, with multiple roadways and paths that run all different directions across the peninsular point as well as the area around the attraction. There are additional residences in neighboring plots of land directly adjacent to Priority Area 9. The adjacent properties are unlikely to pose any HTRW concerns to the priority area.

6.0 Evaluation and Conclusions

6.1 Summary of ECP

Beaver Lake currently occupies more than 38,000 acres of Federal public lands and waters. The Lake is located in northwestern Arkansas, in Benton, Washington, Madison and Carroll Counties and it is approximately 6 miles west of Eureka Springs, Arkansas. This ECP report covers 0.65 acres of land located off of a southern branch of Beaver Lake called Devils Gap, which is downstream on Rambo Creek. It is currently owned by private landowner(s) and is home to a popular tourist attraction, War Eagle Cavern. The subject property, also known as Priority Area 9, is in Benton County, directly south of the center of Beaver Lake.

This ECP report was prepared to characterize the existing environmental conditions at the subject property and is intended to be an aid in the leasing of real property. The ECP findings are based on the available sources of information concerning both past and present uses of the subject property. Information included readily available data associated with adjacent property records, aerial photography, personnel interviews, environmental programs and associated documentation, and current and historic investigations. In addition, record sources were reviewed to determine if there have been spills, leaks, discharges, leaching, underground injections, dumping, abandonments, or storage of hazardous substances or petroleum products at the installation. The VSI and interview process included inquiries and requests into the existence and availability of records that support the environmental condition of the property.

6.2 Conclusions

The subject property was classified into one of seven standard ECP area types (categories) as defined by ASTM D5746-98(2016) *Standard Classification of Environmental Condition of Property Area Types for Defense Base Closure and Realignment Facilities*. Below are the seven categories for reference.

Table 4: Definitions of ECP Categories

ECP Category	Definition
1	An area or parcel of real property where no release, or disposal of hazardous substances or petroleum products or their derivatives has occurred (including no migration of these substances from adjacent properties).
2	An area or parcel of real property where only the release or disposal of petroleum products or their derivatives has occurred.
3	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but at concentrations that do not require a removal or remedial action.

4	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, and all remedial actions necessary to protect human health and the environment have been taken.
5	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred and removal or remedial actions, or both, are under way, but all required actions have not yet been taken.
6	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but required response actions have not yet been initiated.
7	An area or parcel of real property that is unevaluated or requires additional evaluation.

Given these seven categories, the subject property is categorized below, along with the reasoning for each classification.

Table 5: Properties and ECP Categories

Acreage	ECP Category	Reasoning
0.65 ac.	1	No release or disposal of hazardous substances or petroleum products or their derivatives has occurred beyond de minimus amounts, including no migration of these substances from adjacent properties.

No release or disposal of hazardous substances or petroleum products or their derivatives has occurred beyond de minimus amounts on the subject property and no releases to the environment were observed or reported.

Asbestos assessments were not available for the subject property. It is unlikely that ACM is present but, in the future, if a building or structure will be disturbed, a licensed asbestos inspector is needed to confirm whether ACM is present or not.

7.0 Certification

I declare that, to the best of our professional knowledge and belief, we meet the definition of *Environmental professional* as defined in Part 312.10 of 40 CFR 312. We have the specific qualifications based on education, training, and experience to assess a property of the nature, history and setting of the subject property. We have developed and performed the appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312. All information/documentation provided accurately reflects the condition of the property. This report meets the DoD requirements for completion of an ECP Report.

_____ _____

Eugenia Barnes
Environmental Protection Specialist
U.S. Army Corps of Engineers
Fort Worth District

Date

_____ _____

Jennifer Jefcoat
Chemist
U.S. Army Corps of Engineers
Fort Worth District

Date

_____ _____

Hollie Eljizi
Environmental Engineer
U.S. Army Corps of Engineers
Fort Worth District

Date

8.0 References

American Society for Testing and Materials (ASTM), 2013. E1527-13, *Standard Practice for Environmental Site Assessments: Phase 1 Environmental Site Assessment Process*.

ASTM, 2016. D5746, *Standard Classification of Environmental Condition of Property Area Types for Defense Base Closure and Realignment Facilities*.

Department of the Army, 13 December 2007. Army Regulation 200-1. *Environmental Quality: Environmental Protection and Enhancement.*

Environmental Protection Agency (EPA), February 2019. *EPA Map of Radon Zones including State Radon Information and Contacts*. https://www.epa.gov/radon/find-information-about-local-radon-zones-and-state-contact-information#radonmap

Federal Emergency Management Agency (FEMA), 2019. FEMA Flood Map Service Center. https://msc.fema.gov/portal

USACE. 1993. White River Basin, Arkansas and Missouri, *Water Control Master Manual.*

USACE. 2013. Little Rock District Water Management website. Accessed at: www.swl-wc.usace.army.mil

United States Census Bureau. 2013. Easy Facts Website. Accessed at: http://www.census.gov/easystats/

USACE. 2018. Beaver Lake White River and Tributaries, *Arkansas Shoreline Management Plan.*

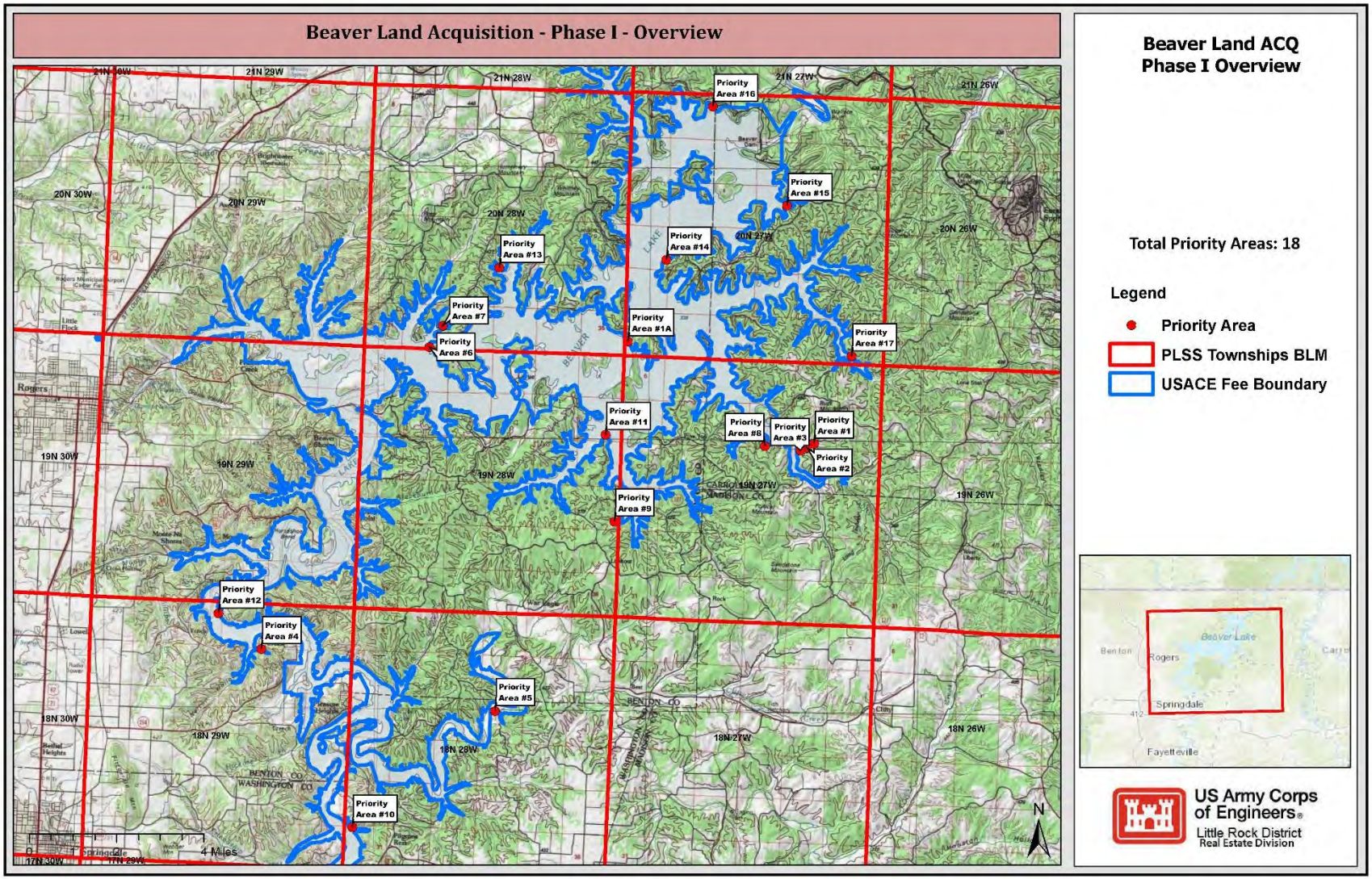
Arkansas Department of Energy and Environment Oil and Gas Commission website Accessed August 2021 at: Commission, http://www.aogc.state.ar.us/maps/googleEarth.aspx

Beaver Watershed Alliance (BWA), 2012. *Beaver Lake Watershed Protection Strategy.*

Arkansas Department of Energy and Environment Division of Environmental Quality website Accessed August 2021 at: https://www.adeq.state.ar.us/rst/programs/fees/facility_data.aspx

Figures

Figure 1: Beaver Lake Priority Areas



ACQ = Acquisition; PLSS = Public Land Survey System; BLM = Bureau of Land Management

Figure 2: Subject Property Detail

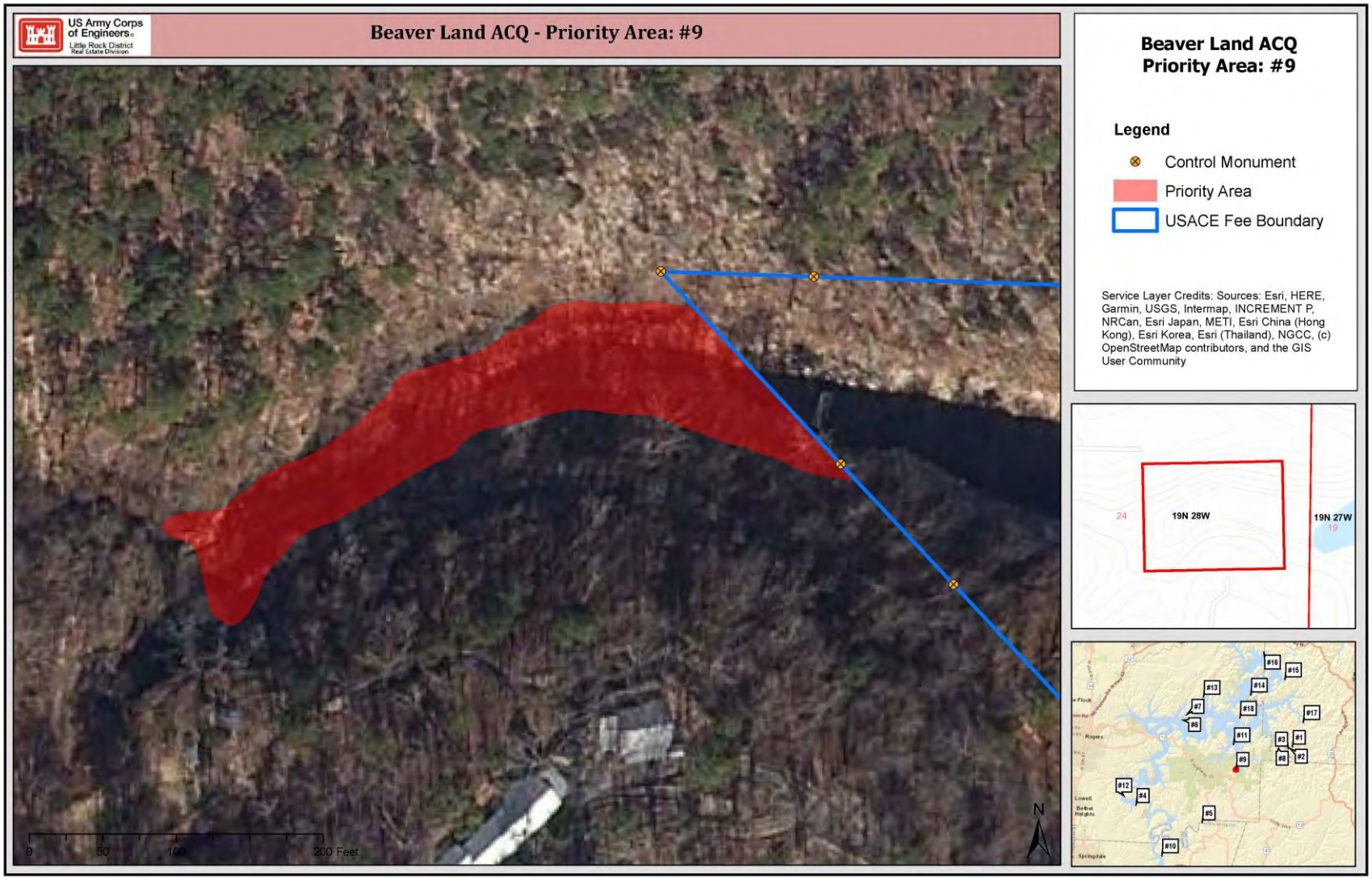


Figure 3: Interview Questions

Beaver Lake ECP
Interview Questions

1. Do you know of any environmental issues with this property?
2. Do you know of, or have access to, any reports concerning the environmental condition of this property? (i.e., site assessments, permits, storage tank registrations, safety plans, etc.) If so, would you be able to provide them? SWPPPs, SPCCs, air permits?
3. Do you know how this property has been historically used?
4. What is the property currently used for?
5. When were the site buildings constructed?
6. Are hazardous materials or petroleum products stored or used on this site? If so, what is the RCRA EPA ID? Does fueling occur on this property?
7. Do you know of any asbestos or LBP on the property or its buildings? Do you know the age of the buildings?
8. Has the site layout been manipulated in your recollection? (i.e., grading, excavation, etc.)?
9. Are there or have there been any cultural/historic items or buildings found on the property?
10. Is there anything else environmentally relevant that we should know?

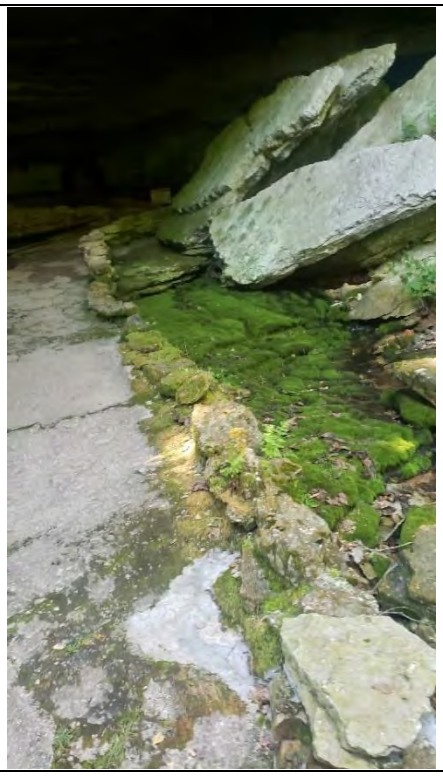
Appendix A: Visual Priority Area Inspection Photographs

13 July 2021

Priority Area 9 – Shoreline view

Priority Area 9 – Images of vegetated banks

Priority Area 9 – Images of walkway along banks

Priority Area 9 – Images near the mouth of the cavern

Priority Area 9 – Images of vegetated banks and limestone

Priority Area 9 – Images near mouth of cavern

Priority Area 9 – (left) Image showing water quality (right) Image of walkway along bank

Priority Area 9 – (left) Healthy vegetation above rocky bank overhang (right) Vegetated banks

Priority Area 9 – Healthy water and habitat quality

Priority Area 9 – Signage for establishment

Final

U.S. Army Environmental Condition of Property Report
Priority Area 10

Beaver Lake
Beaver Lake, Arkansas

August 30, 2021

Prepared For:
Beaver Lake Land Acquisition

Prepared By:
U.S. Army Corps of Engineers
Regional Planning and Environmental Center
Fort Worth District
Fort Worth, Texas

[This page is intentionally left blank.]

Table of Contents

List of Appendices:

List of Acronyms

ACM	Asbestos-containing material
AR	Army Regulation
AST	Aboveground storage tank
ASTM	American Society for Testing and Materials
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CFR	Code of Federal Regulations
DoD	Department of Defense
ECP	Environmental Condition of Property
EDR	Environmental Data Resources
EPA	Environmental Protection Agency
ERNS	Emergency Response Notification System
HTRW	Hazardous, Toxic and Radioactive Waste
IRP	Installation Restoration Program
LBP	Lead-based Paint
LUST	Leaking underground storage tank
MEC	Munitions and Explosives of Concern
NEPA	National Environmental Policy Act
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NRC	Nuclear Regulatory Commission
ODEQ	Oklahoma Department of Environmental Quality
OWS	Oil-water separator
PCB	Polychlorinated Biphenyl
POL	Petroleum, Oils, and Lubricants
RCRA	Resource Conservation and Recovery Act
SEMS	Superfund Enterprise Management System
SF	Square feet
SHWS	State Hazardous Waste Sites
SWPPP	Stormwater Pollution Prevention Plan
TSD	Transport, Storage, Disposal
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
UST	Underground storage tank
UXO	Unexploded Ordnance
VCP	Voluntary Cleanup Program
VSI	Visual site inspection

1.0 Executive Summary

This environmental condition of property (ECP) report has been prepared to document the environmental conditions and provide information for the acquisition of land that would be necessary for the operation, maintenance, and control of the Beaver Lake reservoir in Arkansas. This fee acquisition pertains to the frequently inundated land immediately surrounding the lake, below an elevation of 1128 ft above mean sea level (msl). The Army prepares an ECP in order to provide the public with information relative to the environmental condition of the property, assist Federal agencies during the property screening process, provide information about completed remedial and corrective actions at the property, and to assist in determining appropriate responsibilities, asset valuation, and liabilities with other parties to a transaction.

Beaver Lake currently occupies more than 38,000 acres of Federal public lands and waters. This ECP report covers approximately 1.3 acres of land located on the far south edge of Beaver Lake. The subject property is on the edge of the lake and currently owned by private landowner(s). The lake is located in northwestern Arkansas, in Benton, Washington, Madison and Carroll Counties and it is approximately 6 miles west of Eureka Springs, Arkansas. The subject property, also known as Priority Area 10, is in the far south region of the lake in the southern White River region.

This ECP report presents a summary of readily available information on the environmental conditions of, and concerns relative to, the land, facilities, and real property assets of Beaver Lake. The findings included in the report are based on a record search of historical environmental investigation reports and site historical documents, a review of aerial photography, stakeholder interviews, and a site inspection conducted 12 – 13 July 2021.

Based on the environmental conditions found and the ECP analysis, the property can be categorized as an ECP Category 1, indicating a site where no release, or disposal of hazardous substances or petroleum products or their derivatives has occurred (including no migration of these substances from adjacent properties).

2.0 Purpose

2.1 General

This environmental condition of property (ECP) report has been prepared to document the environmental conditions and provide information for the acquisition of land surrounding Beaver Lake in Benton, Washington, Madison and Carroll Counties, Arkansas. This report meets the requirements of Title 40, Code of Federal Regulations (CFR), Part 373, and United States Army Regulation (AR) 200-1 (2007), *Environmental Quality, Environmental Protection and Enhancement*. The ECP report also follows the American Society for Testing and Materials (ASTM) E1527-13 *Standard Practice for Environmental Site Assessments: Phase 1 Environmental Site Assessment Process*. The subject property in this report is subsequently categorized according to ASTM D5746 (2016) *Standard Classification of Environmental Condition of Property Area Types for Defense Base Closure and Realignment Facilities*.

The Army prepares an ECP for the following purposes:

- Provide the public with information relative to the environmental condition of the property.
- Assist Federal agencies during the property screening process.
- Provide information to prospective buyers.
- Provide information about completed remedial and corrective actions at the property.
- Assist in determining appropriate responsibilities, asset valuation, and liabilities with other parties to a transaction.

The ECP contains the information required to comply with the provisions of 40 CFR, Part 373 that require a notice to accompany contracts for the sale of, and deeds entered into for the transfer of, federal property on which hazardous substances may have been stored, released or disposed. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) §120(h) stipulates that a notice is required if certain quantities of designated hazardous substances have been stored on the property.

The ECP Report is not prepared to satisfy a real property purchaser's duty to conduct an "all-appropriate inquiry" to establish an "innocent purchaser defense" to CERCLA 107 liability. Any such use of the ECP Report by any party is outside the control of the Army and beyond the scope of the ECP Report. The Army, its officers, employees or contractors makes no warranties or representations that any ECP Report satisfies any such requirements for any party.

2.2 Scope

Priority Area 10 occupies approximately 1.3 acres of land. This ECP report covers those 1.3 acres of land located within the far south region of the lake. Priority Area 10 is comprised of very high, rocky bluffs and clear water surrounding the land. There is access via watercraft near the land of interest, but due to the steepness and height of bluffs, access to land via watercraft is difficult. Areas within the lake that are not within the Priority Area will be considered adjacent property. A general site location map is provided in Figure 1, and a map showing the subject property is shown in Figure 2.

2.3 Limitations

This ECP report presents a summary of readily available information on the environmental conditions of, and concerns relative to, the land, facilities, and real property assets of the subject property. The findings included in the report are based on a record search of available historical environmental investigation reports and site historical documents, a review of aerial photography, stakeholder interviews, and a site reconnaissance conducted 12 – 13 July 2021. Historical environmental investigation reports and site historical documents were reviewed in support of this ECP, and the information obtained from other studies is reflected within this report by reference. The ECP process recognizes that the condition of property and classification can change as historical contamination is cleaned up (if required) or if a new

source of contamination is identified. Records reviewed during the assessment were accepted as accurate and a reasonable effort was made to resolve discrepancies identified during the document review.

During the ECP assessment, all available sources of information concerning both past and present environmentally significant uses of the property were reviewed. This included readily available data associated with adjacent property records; 1985, 1994, 2001, 2004, 2006, 2009, 2010, 2012, 2014, 2016, 2017, 2018, and 2020 aerial photography; personnel interviews; current and historic investigations; and topographical maps. In addition, record sources were reviewed to determine if there have been spills, leaks, discharges, leaching, underground injection, dumping, abandonment, or storage of hazardous substances or petroleum products at the subject property. The site reconnaissance and interview process included inquiries and requests into the existence and availability of records that support the environmental condition of the property. The site reconnaissance included a Visual Site Inspection (VSI) of the subject property. No sampling or analysis was conducted during this survey.

2.4 Report Organization

The remainder of this ECP report is organized as follows:

Section 3 – Property Description: This section provides location and description of the subject property; an overview of historical and current land uses; and a description of the environmental setting of the airport, including climate, topography, geology, and demography.

Section 4 – Survey Methodology: This section describes the methods used to obtain the information for this ECP Report such as the development of study sections, the VSI, aerial photography analysis, records review, interviews, and data management.

Section 5 – Environmental Conditions: This section provides the existing environmental information. The findings are organized by relevant environmental "issues," including permits and licenses, cleanup activities, hazardous substances, petroleum and related products, asbestos, lead-based paint (LBP), radioactive materials, landfills, explosive contaminated structures, radon, pesticides, and polychlorinated biphenyls (PCBs). This section also includes adjacent property descriptions.

Section 6 – Evaluation and Conclusions: This section provides a summary of the subject property and evaluates the property for categorization as per ASTM D5746 (2016).

Section 7 – Certification: This section documents the approval of the ECP report.

Section 8 – References: This section provides an inventory of the reference material used in the preparation of this ECP Report.

Appendices: A list of appendices is provided in the Table of Contents.

3.0 Property Description

3.1 Parcel Locations and Description

Beaver Lake is located in the scenic Ozark Mountain region of northwestern Arkansas in Benton, Washington, Carroll and Madison counties. The total area currently contained in the Beaver project, including both land and water surface, consists of 38,138 acres owned in fee. Of this total, 1,432 acres are in flowage easement. The proposed Land Acquisition would include adding any land below the 1128 msl water level. The White River drainage area above Beaver Lake is approximately 1,186 square miles. When the lake is at the top of the conservation pool (elevation 1120.43 ft msl), the water area is 28,299 surface acres with 490 miles of shoreline within the lands owned in fee. The shoreline is irregular with topography primarily consisting of steep bluffs and gentle slopes.

Priority Area 10 is a 1.3 acre narrow strip of land along the lake shoreline in the White River portion of the lake between Friendship Creek and Brush Creek. The area is undisturbed and forested with no residential structures in the immediate area. Mowed pastureland is located approximately 100 yards inland from the priority area. The subject property is on the edge of the lake and currently owned by private landowner(s).

3.2 Historic Land Use

Beaver Lake is a multiple purpose water resource development project initially authorized for flood control, hydropower generation and other beneficial uses by the Flood Control Act dated 3 September 1954. The inclusion of storage in the lake for municipal and industrial water supply was authorized by the Water Supply Act of 1958. Beaver Lake is a major component of a comprehensive plan for water resource development in the White River Basin of Arkansas and Missouri. Construction of Beaver Dam was initiated in March 1960. The dam was completed in June 1966, and the powerhouse and switchyard were completed in 1965. Beaver Lake was declared operational for public use in 1965.

The historical aerial photography shows that Priority Area 10 has been largely undisturbed in the immediate area with some mowed pastureland approximately 100 yards inland as far back as 1994.

3.3 Current Land Use

Beaver Lake is located in the Ozark Highlands of Carroll, Washington, Benton, and Madison Counties. Having 490 miles of shoreline (at conservation pool) and over 28,000 water surface acres, Beaver Lake is the largest reservoir in northwest Arkansas and the first federal impoundment on the White River.

There are 12 public use areas around Beaver Lake. There are 11 parks on the lake presently operated by the Corps of Engineers. The State of Arkansas owns and operates Hobbs State Park Conservation Area, which covers 12,056 acres, and Devil's Eyebrow Natural Area, which covers 2,503 acres. Both properties are adjacent to USACE lands. There are two parks, Ventris, and Blue Springs that have been reduced to lake access only. One Park (Big Clifty) is operated by Carroll County, Arkansas.

Despite being located adjacent to the fast-growing communities of Fayetteville, Springdale, Bentonville, and Rogers, Arkansas and a regional population of over 500,000, the lake provides open spaces and a quality outdoor recreation opportunity. Many arms and coves of the lake offer secluded areas for traditional activities such as fishing, skiing, sailing and scuba diving, but also allow for passive recreation opportunities like photography and nature observation.

Priority Area 4 remains a private property with some adjacent pastureland.

3.4 Utilities

Priority Area 10 has no known utilities.

3.5 Environmental Setting

3.5.1 Climate

The climate in the Beaver Lake area is classified as humid subtropical according to the Köppen climate model. A humid subtropical climate is characterized by hot, usually humid summers and mild to cool winters. The Köppen definition of this climate is for the coldest month's mean temperature to be between 26.6 °F (−3 °C) and 64.4 °F (18 °C), and the warmest month to be above 71.6 °F (22 °C). Some climatologists prefer to use 32 °F (0 °C) as the lower bound for the coldest month's mean temperature. Under the modern Trewartha climate classification, climates are termed Humid Subtropical when they have mean temperatures of 50 °F (10 °C) for eight or more months a year. In most locations classed within this system, the mean temperature of the coldest month is between 35 °F (3 °C) and 65 °F (18 °C). Some climatologists consider the Trewartha grouping of subtropical climates to be more real-world and fitting on a global scale.

While technically classified as humid subtropical, the climate in the Beaver Lake area is considered moderate. The area experiences all four seasons and does receive cold air masses from the north; however, some of the Arctic masses are blocked by the higher elevations of the Ozarks.

Average temperatures range from a high of 88 °F (31.1 °C) and low of 27 °F (-2.7 °C) in nearby Rogers, Arkansas. Extreme temperatures rarely exceed 96 °F (35.6 °C) and 13°F (-10.6 °C). Late summer is the time of maximum heat and least rainfall. During the winter months, midday temperatures in the basin are relatively warm, around 55 o to 60 o F. Some short periods of cold weather occur with temperature ranging from 0 o to 10 o F. On winter nights, temperatures from 37 o F to below freezing are common. Highest recorded temperature in Rogers, Arkansas was 114 °F (45.6 °C) (recorded in July 1954). The lowest temperature recorded was −16 °F (−26.7 °C), in February 1996.

The relative humidity typically ranges from 41% (comfortable) to 91% (very humid) over the course of the year, rarely dropping below 24% (dry) and reaching as high as 100% (very humid). The air is driest around April 9, at which time the relative humidity drops below 49% (comfortable) three days out of four; it is most humid around June 3, exceeding 87% (very humid) three days out of four.

Dew point is often a better measure of how comfortable a person will find the weather than relative humidity because it more directly relates to whether perspiration will evaporate from the skin, thereby cooling the body. Lower dew points feel drier and higher dew points feel more humid. Over the course of a year, the dew point typically varies from 19°F (dry) to 71°F (muggy) and is rarely below 4°F (dry) or above 74°F (very muggy). There are two periods in the year that are most comfortable: The first is between April 18 and June 6 and the second is between September 3 and October 23. The air feels neither too dry nor too muggy during these periods (https://weatherspark.com/averages/31495/Rogers-Arkansas-United-States).

Average annual rainfall for the Beaver Lake area is 45 inches per year. Precipitation is weakly seasonal, with a bimodal pattern: wet seasons in the spring and fall, and relatively drier summers and winters, but some rain in all months. The spring wet season is more pronounced than fall, with the highest rainfall typically occurring in May. The average annual snowfall for the Beaver area is about 12 inches. Snowpacks are usually short lived and are not commonly a concern for flooding.

Climate change is an area of concern due to the potential for effects on many aspects of the environment, especially those related to water resources. The U.S. Global Change Research Program (USGCRP) summarized information regarding climate change and its potential effects in regional assessments (http://www.globalchange.gov/publications/reports/scientific-assessments/us-impacts). In the Midwest, which extends from Minnesota to Missouri, extreme events such as heat waves, droughts and heavy rainfall events are projected to occur more frequently. Should these events become significant enough to impact the operation of Beaver Lake, the Master Plan and associated documents (i.e. Operations Management Plan and Shoreline Management Plan) would be reviewed and revised, if necessary.

3.5.2 Topography, Geology, and Soils

The depositional environment of the rocks found in the Arkansas Ozarks is one of a relatively shallow continental shelf, sloping toward deeper water generally toward the south. This shelf emerged many times during the Paleozoic resulting in numerous unconformities throughout the sequence. The Ozark Plateaus region of Arkansas is made up of generally flat-lying Paleozoic age strata divided into three plateau surfaces. The lowest and northern-most plateau is the Salem Plateau. The Springfield Plateau stands above the Salem a few hundred feet and is generally capped by lower Mississippian age limestones and cherts. The southernmost and highest plateau of the Ozarks is the Boston Mountains. All of these plateaus are deeply dissected by numerous streams throughout the area. The faulting in the Ozarks is generally normal; most faults displaying a displacement down on the southern side. However, some observations reveal that a few strike-slip faults may be present. Gentle folds are noted but are generally of very low amplitude. The depositional environment of the rocks found in the Arkansas Ozarks is one of a relatively shallow continental shelf, sloping toward deeper water generally toward the south.

Beaver Lake is part of the Springfield Plateau that occupies primarily the western and southwestern flanks of the Ozark Plateau province. The Springfield Plateau in this region rises to an elevation of approximately 1400 feet and in many areas, forms extensive plains. Hilly areas occur where rivers and their tributaries cut into the plateau surface, most notably in the vicinity of the White River and Beaver Lake. As streams like the Buffalo National River cut through the plateau down to the level of the White River, they sometimes carve spectacular bluffs.

Lower Ordovician, Middle to Upper Devonian and Lower and Upper Mississippian age strata are present around Beaver Lake. Upper Ordovician and Devonian strata crop out around Beaver Lake and its tributaries. The Lower Mississippian Boone Formation comprises the surface rock over the majority of the area and forms the surface of the heavily dissected Springfield Plateau. In addition to the Boone Formation, Cotter and Jefferson City formations (Jefferson City formation has not been successfully differentiated from the Cotter Formation in Arkansas), and the Powel formation, all of Ordovician age are present in the area. Formations in the Devonian strata include the Chattanooga, Clifty and Penters.

The Boone Formation consists of gray, fine- to coarse-grained fossiliferous limestone interbedded with chert. This formation caps the higher hills in the area. Since limestone is easily dissolved by water, cave and solution (karst) features are prominent. The Boone Formation is well known for dissolutional features, such as sinkholes, caves, and enlarged fissures. Surface water may drain directly into channels in limestone, where it can move rapidly and without filtration to the surface as a spring, at a location that is unpredictable without extensive testing. Therefore, water pollution problems are of particular concern in this region. The thickness of the Boone Formation is 300 to 350 feet in most of northern Arkansas, but as much as 390 feet has been reported.

The Cotter Dolomite is composed of dolostone of predominantly two types: a fine-grained, argillaceous, earthy textured, relatively soft, white to buff or gray dolostone called "cotton rock", and a more massive, medium-grained, gray dolostone that weathers to a somewhat hackly surface texture and becomes dark on exposure. The formation contains chert, some minor beds of greenish shale, and occasional thin interbedded sandstone. The thickness is about 340 feet in the vicinity of Cotter, but the interval may range up to 500 feet thick in places.

The Powell Dolomite is generally a fine-grained, light-gray to greenish-gray, limy, argillaceous dolostone with thin beds of shale, sandstone, sandy dolostone, and occasionally chert. The formation’s thickness may be as much as 215 feet but is often much thinner.

The Chattanooga Shale Formation is typically black, fissile clay shale that weathers into thin flakes. The beds are usually cut by prominent joints creating polygonal blocks upon weathering. The upper part of the formation may be slightly sandy and usually contains abundant pyrite. Thickness ranges from 0 to about 85 feet; normally averaging about 30 feet (AGS).

The strata throughout the region are nearly horizontal. One predominant geological feature of the lake area is a low, persistent, limestone bluff, which occurs just above the Ordovician-2 Mississippian contact.

The faulting in the Ozarks is generally normal; most faults displaying a displacement down on the southern side. Lineaments and faults characteristic of northwest Arkansas are present around Beaver Lake. The Fayetteville Fault lies beneath Beaver Lake. This fault is the west side of a graben that has down-dropped the Boone Formation to lake level. The Starkey Fault bounds the east side of the graben. Both faults trend approximately N 450E. One section of the Starkey fault trends N 60-700E. The Clantonville Lineament – Monocline is a northeast to southwest trending structural feature that extends from north of Clantonville to Ventris Hollow. The location of this feature was determined from the 1:24,000 three dimensional quadrangle and from structural disparities in the Lower Mississippian rock units. This structural feature could be responsible for the presence of lead-zinc mineralization in an old prospect near Clantonville (north of Beaver Lake). The trend of this lineament to monocline is N 30-400E. Paleokarst features within the top of the Powell Dolomite are present around Beaver Lake and coincident with a lineament in Limekiln Hollow near Garfield, northwest of Beaver Lake.

In general, the soils of the Ozark Plateaus are residual and are formed on a broad, domed, upwarp consisting mostly of limestone and dolomite. The main difference in the soils is due to different rocks from which the soils were formed. The main geologic materials are cherty limestone; cherty, very siliceous dolomite; cherty, siliceous dolomite; and alluvium, which are weathered and water transported products of the first three materials. Glade-rock soil occurs where the cherty, very siliceous dolomite is exposed to the soil formation. Dolomite is more resistant to weathering than limestone and siliceous dolomite is even more resistant, so very shallow soil results. In areas where the dolomite is less siliceous, more weathering has taken place; however, the soils produced are not as deep as soils formed by limestone.

The following eight soils associations are found in and around the Beaver project area: Captina-Nixa, Captina-Nixa-Pickwick, Clarksville-Nixa-Baxter, Corydon-Sogn, Enders-Allegheny-Mountainburg, Razort-Captina-Etowah, Linker-Apison-Hector, and Captina-Pembroke.

3.5.3 Hydrology and Groundwater

In the Interior Highlands of western and northern Arkansas ground-water supplies are more limited than in the Coastal Plain. Much of the Ozark Plateaus region is underlain by carbonate rocks, which are quite soluble in the presence of water. Solution by ground water has caused many large openings through which water passes so quickly that contaminants from the surface cannot be filtered out. Signs of these openings are caves, sink holes, springs and lost stream segments. As a consequence, the water in shallow wells may not be suitable for human consumption without treatment.

Three aquifers, which are part of the Ozark Plateaus Aquifer System, are located within northern Arkansas. The Springfield Plateau aquifer is generally under unconfined conditions, with groundwater movement occurring through fractures and solution cavities formed by dissolution of carbonate rock. Local discharge is through springs and streams. The Ozark aquifer is generally under confined conditions, especially where overlain by the units of the Ozark Confining Unit (Chattanooga Shale). Most wells in the Springfield Plateau and upper units in the Ozark aquifer yield 5-10 gpm on the average, with yields greater than 25 gpm in rare cases.

The third aquifer, the Roubidoux Formation and the Gunter Sandstone Member of the Gasconade Formation in northern Arkansas occur at greater depth and constitute the only significant aquifer system in the Ozarks. Both are permeable sandstone and carbonate units of Ordovician age. These aquifers serve as the principal source of high-quality water for many communities in northern Arkansas where surface

water sources are unavailable. Together these units may yield up to 500 gpm to wells. These formations do not outcrop anywhere in Arkansas but instead outcrop in southern Missouri.

3.5.4 Water Quality

The waters of the Arkansas portion of the White River watershed have all been designated by the Arkansas Department of Environmental Quality (ADEQ) for fisheries, primary and secondary contact recreation, and domestic, agricultural, and industrial water supplies (ADEQ, 2012). Beaver Lake is classified by ADEQ as a Type A water body, which includes most larger lakes of several thousand acres in size, in upland forest dominated watersheds, having an average depth of 30 to 60 feet, and having low primary production (i.e., having a low trophic status if in natural [unpolluted] condition). Beaver Lake, like all other lakes of its size in the Ozark region, stratifies chemically and thermally in the late spring with stratification extending into late fall and early winter. During the warmer months, lake waters of the upper layer (the epilimnion) are warmer and contain more dissolved oxygen, while the denser, lower layer waters (the hypolimnion) are colder and contain very little or no dissolved oxygen, thus undesirable for fish habitat.

This undesirable water, when discharged downstream from hydropower generation, may cause some problems in the tailwaters. To combat this problem, the dissolved oxygen content is monitored, and various management measures are implemented to improve the dissolved oxygen concentration in the hydropower releases. A highly productive trout fishery has been established in the Beaver tailwaters by the Arkansas Game and Fish Commission because of the available discharge of cold water from the dam, which is reaerated by turbulence as it flows downstream.

As the stratified epilimnion cools in the late fall and winter, the layers begin to mix (de-stratify) and dissolved oxygen (DO) is more evenly distributed. This condition is more favorable to the fishery of the lake and overall water quality.

The upper 1500 acres of Beaver Lake has been listed by the Arkansas Department of Environmental Quality (ADEQ) on Arkansas' 303(d) list of impaired waters, approved by the Environmental Protection Agency (EPA), due to turbidity (ADEQ, 2008). According to the Arkansas 303(d) list, these excessive levels impact the local fisheries as well as primary contact, both designated uses of Beaver Lake. The elevated turbidity levels are due to excessive silt from surface erosion from agriculture activities, unpaved road surfaces, in-stream erosion – mainly from unstable stream banks, and any other land surface disturbing activity. The Draft 2010 Integrated Water Quality and Monitoring Report (ADEQ, 2010) added pathogen indicator bacteria as a contaminant for the same area of Beaver Lake. Surface erosion activities are listed as the probable source for this contaminant as well.

Clean Water Act requires states to list waters that do not meet Federal water quality standards or have a significant potential not to meet standards as a result of point source dischargers or non- point source run-off. Subsequent to listing on the 303(d) list, the statute requires that the states develop and set the Total Maximum Daily Load (TMDL) for water bodies on the list within 13 years. A TMDL establishes the maximum amount of a pollutant that can enter a specific water body without violating the water quality standards. Values are normally calculated amounts based on dilution and the assimilative capacity of the water body. TMDLs have not been established by ADEQ for the upper Beaver Lake area.

3.6 Biological and Cultural Resources

3.6.1 Terrestrial Ecosystems

The area surrounding Beaver Lake is mostly forested. Trees and shrubs around the lakeshore include upland oak and hickory species, persimmon, honey locust, hawthorn, dogwood, redbud, coralberry, smooth and winged sumac, and buttonbush. Frequent periods of inundation keep a thin strip of government owned lands around the lake in early stages of succession. Red cedar and short-leafed pine, the principal evergreens, are dispersed throughout the region and are found in many large, scattered groups. Ground covers consist of greenbrier, sedges, and native grasses. White-tailed deer and eastern wild turkey are common game animals found and hunted in the Beaver Lake area. Black bears have also become common in the area and are hunted on the lands around the lake. The principal small game species found in the open upland areas include bobwhite quail, cottontail rabbit, and mourning dove. Gray and fox squirrels are common in upland wooded areas. Furbearing animals found in the Beaver Lake area include coyote, red fox, gray fox, otter, mink, muskrat, beaver, bobcat, and raccoon. Habitat management that includes wildlife food plot plantings, mowing, soil disturbance, removal of exotic species and application of prescribed fire provide benefit to these populations.

The common goldeneye, hooded merganser, bufflehead, and ring-necked duck are the predominant migratory waterfowl species visiting Beaver Lake. Mallards, gadwall, and other duck species are also present; however, they are only transient visitors as their characteristic feeding habits of obtaining food from shallow waters is limited. Resident Canada geese are so numerous in many coves and recreation areas that their presence has become a nuisance.

Ring-billed gulls are seen frequently around the Beaver Lake area. Greater and lesser yellow legs, pelicans, and large flocks of horned grebes are also seen during their peak migration in the spring and fall. Beaver Lake is also one of the few places where visitors can see both the turkey vulture and the black vulture at the same time in the winter. Beaver Lake has also become a popular place that visitors come to observe bald eagles, commonly wintering 150 or more birds and hosting 5-6 breeding pairs during the nesting period of March to June. The surrounding woodlands and grasslands serve as prime nesting areas for resident and neotropical migratory songbirds.

3.6.2 Aquatic Ecosystems and Wetlands

Walleye, smallmouth bass, striped bass, hybrid white-striped bass, walleye, and paddlefish have been introduced into Beaver Lake to add diversity to the fishery. Natural reproduction of striped bass and hybrid white-striped bass does not occur in Beaver Lake. Since 2004, AGFC stocks approximately 100,000 walleye, 30,000 channel catfish, 30,000 blue catfish, and 200,000 striped bass each year. While natural reproduction occurs in white crappie, black crappie, largemouth bass, and smallmouth bass, AGFC supplements this reproduction by occasional stockings of these species. Historically, there have also been introductions of northern pike, blue catfish, lake trout, and threadfin shad.

Located within the Springfield Plateau of the Ozark Mountains region of northern Arkansas, the area surrounding Beaver Lake is characterized by limestone, dolomite, or chert geology. The many rivers and streams flowing through the region have created a landscape of level highlands dissected by rugged valleys rich in karst features such as caves and sinkholes. Associated with these streams and landscape features are a variety of wetland habitats representative of the five wetland classes occurring within the region. These wetland classes include depressions, flats, fringe, riverine, and slope. It is possible, and perhaps even likely, that all of these classes of wetlands occur in the general area of Beaver Lake. However, those most likely to occur in the area immediately surrounding the lake are fringe (most likely reservoir), riverine (most likely spring runs) and slope wetlands (most likely calcareous slope).

3.6.3 Threatened and Endangered Species

The following species listed in Table 1 are from the U.S. Fish and Wildlife Service's federally classified status list of species and the Arkansas Natural Heritage data sets which have been reported and identified on project lands. Although the bald eagle was delisted by USFWS in 2007 due to recovery of the species, both the bald and golden eagles are still protected in accordance with the Bald and Golden Eagle Protection Act. The federal Migratory Bird Treaty Act of 1918 also provides protection to certain species of migratory birds. A total of 31 bird species are currently protected under this federal statute.

Table 1: Threatened and Endangered Species

	Federal Status	**State Status/Global Rank**
Gray Bat	LE	SE / S2S3/G4
Indiana Bat	LE	SE / /S1/G2
Northern long-eared Bat	LT	SE / S1S2/ G1G2
Ozark Big-eared Bat	LT	Not listed
Little Brown Bat	-	SE / S1
Bald Eagle	*Protected under Bald and Golden Eagle Protection Act	S3B,S4N/G5
Eastern Black Rail	LT	Not listed
Piping Plover	LT	Not listed
Rufa Red Knot	LT	Not listed
Whooping Crane	Experimental Population, Non-Essential	Not listed
Ozark Cavefish	LT	SE / S1/G3
Neosho Mucket	LE	Not Listed
Rabbitsfoot mussel	LT	SE/S3/G3G4
Snuffbox Mussel	LE	Not listed
Monarch Butterfly	C	Not listed
Missouri Bladderpod	LT	S2/G3
Opaque Prairie Sedge	-	SE / S2S3G4
Yellow Coneflower	-	ST / S2G3T3
Ovate-leaf Catchfly	-	ST / S2G3
Royal Catchfly	-	ST / S2G3

FEDERAL STATUS CODES

LE = Listed Endangered; the U.S. Fish and Wildlife Service has listed this species as endangered under the Endangered Species Act.

LT = Listed Threatened; the U.S. Fish and Wildlife Service has listed this species as threatened under the Endangered Species Act.

C = Candidate Species;

STATE STATUS CODES

INV = Inventory Element; The Arkansas Natural Heritage Commission is currently conducting active inventory work on these elements. Available data suggests these elements are of conservation concern. These elements may include outstanding examples of Natural Communities, colonial bird nesting sites, outstanding scenic and geologic features as well as plants and animals, which, according to current information, may be rare, peripheral, or of an undetermined status in the state. The ANHC is gathering detailed location information on these elements.

GLOBAL RANKS

G3 = Vulnerable globally. At moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors.

G4 = Apparently secure globally. Uncommon but not rare; some cause for long-term concern due to declines or other factors.

G5 = Secure globally. Common, widespread and abundant.

T-RANKS= T subranks are given to global ranks when a subspecies, variety, or race is considered at the state level. The subrank is made up of a "T" plus a number or letter (1, 2, 3, 4, 5, H, U, X) with the same ranking rules as a full species.

STATE RANKS

S1 = Critically imperiled in the state due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors making it vulnerable to extirpation.

S2 = Imperiled in the state due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it vulnerable to extirpation.

S3 = Vulnerable in the state due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.

GENERAL RANKING NOTES

Q = A "Q" in the global rank indicates the element's taxonomic classification as a species is a matter of conjecture among scientists.

Source: Arkansas Natural Heritage Commission

3.6.4 Cultural Resources

The records search, interviews, and site inspection identified no cultural resource assessments or findings for the subject property.

During the past seventy years scientific investigation of archaeological sites in the Beaver Lake area has been carried out in several phases. In 1922 and 1923, Mark R. Harrington of Phillip Academy was the first archeologist to excavate sites on the area that is now Beaver Lake. He excavated 13 bluff shelters. Between 1928 and 1935, the work of Harrington was continued by S.C. Dellinger of the University of Arkansas Museum. Dellinger supervised the excavation of 21 rock shelters. In the early 1960's, a series of surveys were conducted by several archeologists from the University of Arkansas Museum. Today, there are 280 known archeological sites along or immediately adjacent to Beaver Lake. Of these, 271 are identified as prehistoric, seven are historic and two sites have no known cultural affiliation.

Table 2: Historical and Cultural Resources at Beaver Lake

Type of Site	Number of sites
Historic	7
Prehistoric	271
No known cultural affiliation	2
Total	280
National Register Eligibility Status	
Not Evaluated	132
Not Eligible	5
Eligible	1

4.0 Survey Methodology

4.1 Development of Study Sections

The information gathered during the development of the ECP was used to group the subject property into standardized categories using Department of Defense (DoD) guidance, and in accordance with ASTM D5746 (2016). The ECP category definitions are summarized below in Table 3.

Table 3: Definitions of ECP Categories

ECP Category	Definition
1	An area or parcel of real property where no release, or disposal of hazardous substances or petroleum products or their derivatives has occurred (including no migration of these substances from adjacent properties).
2	An area or parcel of real property where only the release or disposal of petroleum products or their derivatives has occurred.
3	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but at concentrations that do not require a removal or remedial action.
4	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, and all remedial actions necessary to protect human health and the environment have been taken.
5	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred and removal or remedial actions, or both, are under way, but all required actions have not yet been taken.

6	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but required response actions have not yet been initiated.
7	An area or parcel of real property that is unevaluated or requires additional evaluation.

The final ECP category designations for the subject property are shown in Section 6.2, Table 6.

4.2 Visual Site Inspection

A VSI was conducted on 13 July 2021 at the subject property to check for recognized environmental conditions. The VSI was conducted by Mrs. Hollie Eljizi, Ms. Jennifer Jefcoat and Mr. Robert Singleton from the U.S. Army Corps of Engineers (USACE). USACE representatives were accompanied by Mr. Mathew Voskamp of the USACE Beaver Lake office.

The VSI was performed from a USACE Beaver Lake Office watercraft near the bank of the subject property as a Right of Entry (ROE) was not available at the time of the inspection. At the time of inspection, the lake level was at 1127 ft msl. This made part of the priority area under water during the VSI, however water clarity was good, and no debris or other concerns were seen in the water. At the time of inspection, minor debris can be seen from the boat, but the bluffs were very high and steep, with clean and mostly clear water. Parts of the shoreline had a significant bank soil erosion and other parts were rocky with fallen trees. No apparent signs of Hazardous, Toxic and Radioactive Waste (HTRW) were visible during the VSI.

Pictures from the VSI can be found in Appendix A.

4.3 Aerial Photography Analysis

Aerial photographs were available from Google Earth maps for 1985, 1994, 2001, 2004, 2006, 2009, 2010, 2012, 2014, 2016, 2017, 2018, and 2020.

The initial aerial photograph from 1985 is of poor quality and the area isn't discernable. The next photo from 1994 is also of poor quality, but it can be seen that the priority area and immediately surrounding area appear to be undisturbed forested area, with some cleared area at the peak of the hill about 100 yards north of the priority area and bank. There is no change in the photos from 2001 to 2020. The priority area is still undisturbed forested area, with some cleared maintained, presumably pasture, land approximately 100 yards north of the bank.

All aerial photographs are included in Appendix B.

4.4 Sanborn Map Review

Sanborn maps were not available for the subject property, or for the adjacent areas.

4.5 Topographic Map Review

Historical topographic maps were available from the US Geological Survey Website for the Beaver Lake area for EDR Report for 1900, 1901, 1945, 1949, 1954, 1957, 1958, 1964, 1985, 2011, 2014, 2017, and 2020. Several observations can be gleaned from these maps. First, the area before the lake was formed consisted of valleys with steep bluffs and hill sides around the White River and its tributaries. The historical maps show this valley and river basin from the 1900 to 1964 topographic maps. In 1985 the river and Beaver Dam at the northern end of the lake can been seen in the valley of the historical White River.

All topographic maps are included in Appendix C.

4.6 Records Review

4.6.1 Standard Environmental Record Sources

In this evaluation records, maps and other documents that provide environmental information about the project area are obtained and reviewed. A desktop records review was conducted using various sources to determine the presence of HTRW sites on or near the subject property. This search was focused on active cleanup sites and sites with a reasonable risk of HTRW release. Several databases were searched manually to narrow down the search area. These databases included the Environmental Protection Agency (EPA) Cleanups in my Community database, the EPA Envirofacts databases, the Arkansas Department of Environmental Quality's (ADEQ) web search tool of Underground Storage Tanks (UST) and Above Ground Storage Tanks (AST), and the Arkansas Department of Energy and Environment Oil and Gas Commission oil and gas well maps. The information collected from this desktop records review was analyzed for recognized environmental conditions (RECs) that would affect the proposed project or need further investigation, given the proposed project measures. The following resources were searched.

Federal National Priorities List (NPL) – The records search did not reveal any NPL sites in the project footprint or adjacent areas. There are nine NPL sites in the state of Arkansas, none of which are located near Beaver Lake or the priority areas. This is based on a search of the EPA Superfund: National Priorities List (NPL) list.

Federal Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) List – The CERCLIS, now called the Superfund Enterprise Management System (SEMS) database, tracks hazardous waste sites where remedial action has occurred under EPA's CERCLA program. This list also includes sites that are in the screening and assessment phase for possible inclusion on the NPL. The records search of EPA's listed SEMS sites did not reveal any sites in the project footprints or adjacent areas. This is based on a search of the EPA SEMS database.

Federal No Further Remedial Action Planned (NFRAP) – The Federal NFRAP list (now known as the SEMS archive list) tracks sites where no further remedial action is planned, based on available assessments and information. The list also represents sites that were not chosen for the NPL. Further EPA assessment could possibly be ongoing, and hazardous environmental conditions may still exist; however, in the absence of remedial action and assessment data, no determination about environmental hazards can be made. The records search did not reveal any NFRAP sites in the project footprint or adjacent areas. This is based on a search of the EPA SEMS database.

Federal Resource Conservation and Recovery Act (RCRA) Corrective Action List – The records search of EPAs Cleanups in My Community showed two RCRA Corrective Actions within one mile of the project search area. No RCRA corrective actions were found to be located within one mile of the project footprint. This is based on a search of the EPA Cleanups in My Community.

State Superfund Sites - This search is to check for any state CERCLA sites in the project vicinity. The records search of state CERCLA cleanup sites did not show any sites of concern in the project or adjacent areas. This search is based on a search of the Arkansas Department of Energy and Environment data base.

State and Tribal Solid Waste Facilities/Landfill Sites – This search is designed to check any state or tribal databases for solid waste handling facilities or landfills in the project vicinity. The records search did not find any solid waste facilities or landfill sites in area of this project or adjacent areas. This is based on a search of the EPA Landfill Methane Outreach Program (LMOP) and ADEQ Permitted Solid Waste Disposal database.

State and Tribal Registered Storage Tanks – This list is a combination of the State of Arkansas registered UST and AST databases, representing sites with storage tanks registered with the State of Arkansas. The search revealed one AST within one mile of the work area or adjacent areas. This AST is not expected to impact the project due to its distance from the proposed project. These results are based on a search of the Arkansas Department of Energy and Environment Oil and Gas Commission website.

State and Tribal Voluntary Cleanup Sites – The ADEQ Elective Site Cleanup Agreement (ESCA) database identifies sites where the responsible party chooses to clean up the site themselves with ADEQ oversight. Five sites were identified from this database. None of the sites are within one mile of the work area and are therefore not expected to impact the proposed project. These results are based on a search of the ADEQ ESCA Database.

Brownfields List – A brownfield is a property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. There are no brownfield sites within one mile of the work area or adjacent areas. These results are based on a search for Brownfields sites using the EPA Envirofacts search engine.

Oil and Gas Wells – A search of the oil and gas wells in the area using the Arkansas Department of Energy and Environment Oil and Gas Commission website identifies multiple sites including oil wells, plugged oil wells, injection/disposal sites within the surrounding area. Although not classified as HTRW under USACE regulations, pipelines and oil wells play an important role in the HTRW existing conditions near the potential project area. This is because the well and/or pipeline contents could potentially leak or spill into the surrounding environment or affect the proposed project features. As a result of these findings, a thorough pipeline/well search should be initiated during design to ensure no interaction with the existing oil and gas infrastructure occurs. The Oil and Gas Commission website was used to map these findings. No oil wells or pipelines were found near the priority areas.

4.7 Interviews

Two interviews were conducted on 12 and 13 July 2021 in conjunction with the site inspection, and the following stakeholders were interviewed:

- Mr. Matthew Franklin; Natural Resource Specialist, Beaver Lake Office; Matthew.G.Franklin@usace.army.mil
- Mr. Matthew Voskamp; Natural Resource Specialist, Beaver Lake Office; Matthew.Voskamp@usace.army.mil

Information gleaned from the interviews is incorporated by way of reference throughout the report. The interview questions can be found in Figure 3.

4.8 Data Management

Data obtained during the ECP assessment were provided in electronic and/or hard copy format. A complete list of documents is provided in Section 8.0.

5.0 Environmental Conditions

5.1 Environmental Permits and Licenses

5.1.1 RCRA Status

The subject property is not covered under a Resource Conservation and Recovery Act (RCRA) permit, and no hazardous waste is generated or stored on the property.

5.1.2 Solid Waste

The subject property has no active, inactive, or expired permits or licenses for solid waste disposal. No landfills exist on the property.

5.1.3 USTs/ASTs

No USTs or ASTs were found during the records search, site inspection and interviews indicated no UST/AST have been known to be located at the subject property.

5.1.4 National Pollutant Discharge Elimination System (NPDES)

Section 402 of the Clean Water Act (33 U.S.C. 1251 et. seq.) requires all facilities that discharge stormwater to acquire an NPDES that defines contaminant limits in effluent to be discharged. No permits were found using the EPA's Envirofacts database on or adjacent to the priority area.

5.1.5 Drinking Water Permits

No drinking water permits are in place at the subject property.

5.1.6 Air Permits

No air emission or air quality permits are in place at the subject property.

5.1.7 Nuclear Regulatory Commission (NRC)

The NRC is tasked with permitting the use and handling of radioactive materials and reactors. No NRC licenses are in place at the subject property.

5.1.8 Other Permits/ Licenses

No additional environmental permits or licenses were identified during records research, interviews, or the VSI.

5.2 Environmental Cleanup and Remediation

5.2.1 Installation Restoration Program

Beaver Lake is not an active military facility, and therefore would not be eligible for cleanup under the Installation Restoration Program.

5.2.2 Military Munitions Response Program

Beaver Lake is not an active military facility, and therefore would not be eligible for cleanup under the Military Munitions Restoration Program.

5.2.3 Other Environmental Investigations and Cleanups

No known environmental investigations or cleanups were found during the records search, site inspection and interviews indicated that no known investigations or cleanups are ongoing at Beaver Lake.

5.2.4 Storage, Release, and Disposal of Hazardous Substances

No releases to the environment or improper disposal of these substances were found during the records search, site inspection and interviews indicated no known improper disposal at the priority area.

5.3 Petroleum and Petroleum Products

No releases to the environment or improper disposal of petroleum products were found during the records search, site inspection and interviews indicated no known improper disposal at the priority area.

5.4 Polychlorinated Biphenyls (PCBs)

No evidence exists of the presence of PCBs on the subject property. No PCB-containing oils were found during the records search, site inspection and interviews indicated no known PCB-containing oils have been used or stored at the priority area.

5.5 Asbestos

No asbestos assessments were found during the ECP process, none were found during the records search, site inspection and interviews indicated no known asbestos containing material has been used or stored at the priority area.

5.6 Lead and Lead-Based Paint (LBP)

No lead-based paint (LBP) assessments were found during the ECP process. No LBP was found during the records search, site inspection and interviews indicated no known improper disposal at the priority area.

5.7 Radioactive Material

No radioactive material assessments were found during the ECP process. No potentially radioactive materials were identified during the VSI, and the presence of radioactive materials on the subject property is extremely unlikely.

5.8 Landfills/Dumps

No landfills or dumps were found during the records search, site inspection or interview investigation.

5.9 Munitions and Explosives of Concern (MEC) and/or Unexploded Ordnance (UXO)

No munitions, explosives, or unexploded ordinance (UXO) were found during the records search, site inspection or interview investigation.

5.10 Radon

Beaver Lake spans across Benton, Washington and Carroll Counties. Washington County is in the Environmental Protection Agency (EPA) Radon Zone 3. Counties in Radon Zone 3 are counties with predicted average indoor radon screening levels of less than 2 pCi/L (EPA, 2018). Benton and Carroll Counties are in the EPA Radon Zone 2 with a predicted average indoor radon level between 2 and 4 pCi/L (EPA, 2018). No radon assessments were found during the records search (EPA, 2019).

5.11 Pesticides

No records were found to indicate the storage, improper use, or disposal of pesticides on the subject property.

5.12 Other Identified Concerns

No significant other concerns were found during the records search, site inspection or interviews.

5.13 National Environmental Policy Act (NEPA)

As the federal agency in charge of this project USACE is in charge of coordinating National Environmental Policy Act (NEPA) compliance of 1969 (Public Law 91-190), the Council on Environmental Quality (CEQ) regulations (40 CFR 1500–1508), and the USACE implementing regulations, Policy and Procedures for Implementing NEPA, ER 200-2-2. As part of the records search

and interview process recent NEPA documents were reviewed including the 2018 Draft Environmental Assessment for the Beaver Lake Master Plan Revision.

5.14 Adjacent Properties

As part of the ECP process, adjacent properties are assessed for environmental conditions, and those discovered conditions are evaluated based on the potential to affect the subject property. The nearest structure to the priority area is a residence approximately 0.6 miles away to the southeast. The adjacent area is mostly forested with some maintained pastures to the north of the priority area. The adjacent properties are unlikely to pose any HTRW concerns to the priority area.

6.0 Evaluation and Conclusions

6.1 Summary of ECP

Beaver Lake currently occupies more than 38,000 acres of Federal public lands and waters. This ECP report covers approximately 1.3 acres of land located on the far south edge of Beaver Lake. The subject property is on the edge of the lake and currently owned by private landowner(s). The lake is located in northwestern Arkansas, in Benton, Washington, Madison and Carroll Counties, and it is approximately 6 miles west of Eureka Springs, Arkansas. The subject property, also known as Priority Area 10, is in the far south region of the lake in the southern White River region.

This ECP report was prepared to characterize the existing environmental conditions at the subject property and is intended to be an aid in the leasing of real property. The ECP findings are based on the available sources of information concerning both past and present uses of the subject property. Information included readily available data associated with adjacent property records, aerial photography, personnel interviews, environmental programs and associated documentation, and current and historic investigations. In addition, record sources were reviewed to determine if there have been spills, leaks, discharges, leaching, underground injections, dumping, abandonments, or storage of hazardous substances or petroleum products at the installation. The VSI and interview process included inquiries and requests into the existence and availability of records that support the environmental condition of the property.

6.2 Conclusions

The subject property was classified into one of seven standard ECP area types (categories) as defined by ASTM D5746-98(2016) *Standard Classification of Environmental Condition of Property Area Types for Defense Base Closure and Realignment Facilities*. Below are the seven categories for reference.

Table 4: Definitions of ECP Categories

ECP Category	Definition
1	An area or parcel of real property where no release, or disposal of hazardous substances or petroleum products or their derivatives has occurred (including no migration of these substances from adjacent properties).
2	An area or parcel of real property where only the release or disposal of petroleum products or their derivatives has occurred.
3	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but at concentrations that do not require a removal or remedial action.
4	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, and all remedial actions necessary to protect human health and the environment have been taken.

5	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred and removal or remedial actions, or both, are under way, but all required actions have not yet been taken.
6	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but required response actions have not yet been initiated.
7	An area or parcel of real property that is unevaluated or requires additional evaluation.

Given these seven categories, the subject property is categorized below, along with the reasoning for each classification.

Table 5: Properties and ECP Categories

Acreage	**ECP Category**	**Reasoning**
1.3 ac.	1	No release or disposal of hazardous substances or petroleum products or their derivatives has occurred beyond de minimus amounts, including no migration of these substances from adjacent properties.

No release or disposal of hazardous substances or petroleum products or their derivatives has occurred beyond de minimus amounts on the subject property and no releases to the environment were observed or reported.

Asbestos assessments were not available for the subject property. It is unlikely that Asbestos Containing Material (ACM) is present but, in the future, if a building or structure will be disturbed, a licensed asbestos inspector is needed to confirm whether ACM is present or not.

7.0 Certification

I declare that, to the best of our professional knowledge and belief, we meet the definition of *Environmental professional* as defined in Part 312.10 of 40 CFR 312. We have the specific qualifications based on education, training, and experience to assess a property of the nature, history and setting of the subject property. We have developed and performed the appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312. All information/documentation provided accurately reflects the condition of the property. This report meets the DoD requirements for completion of an ECP Report.

_____ _____

Eugenia Barnes
Environmental Protection Specialist
U.S. Army Corps of Engineers
Fort Worth District

Date

_____ _____

Hollie Eljizi
Environmental Engineer
U.S. Army Corps of Engineers
Fort Worth District

Date

_____ _____

Jennifer Jefcoat
Chemist
U.S. Army Corps of Engineers
Fort Worth District

Date

8.0 References

American Society for Testing and Materials (ASTM), 2013. E1527-13, *Standard Practice for Environmental Site Assessments: Phase 1 Environmental Site Assessment Process*.

ASTM, 2016. D5746, *Standard Classification of Environmental Condition of Property Area Types for Defense Base Closure and Realignment Facilities*.

Department of the Army, 13 December 2007. Army Regulation 200-1. *Environmental Quality: Environmental Protection and Enhancement.*

Environmental Protection Agency (EPA), February 2019. *EPA Map of Radon Zones including State Radon Information and Contacts*. https://www.epa.gov/radon/find-information-about-local-radon-zones-and-state-contact-information#radonmap

Federal Emergency Management Agency (FEMA), 2019. FEMA Flood Map Service Center. https://msc.fema.gov/portal

USACE. 1993. White River Basin, Arkansas and Missouri, *Water Control Master Manual.*

USACE. 2013. Little Rock District Water Management website. Accessed at: www.swl-wc.usace.army.mil

United States Census Bureau. 2013. Easy Facts Website. Accessed at: http://www.census.gov/easystats/

USACE. 2018. Beaver Lake White River and Tributaries, *Arkansas Shoreline Management Plan.*

Arkansas Department of Energy and Environment Oil and Gas website Accessed August 2021 at: Commission, http://www.aogc.state.ar.us/maps/googleEarth.aspx

Beaver Watershed Alliance (BWA), 2012. *Beaver Lake Watershed Protection Strategy.*

Arkansas Department of Energy and Environment Environmental Quality website Accessed August 2021 at: https://www.adeq.state.ar.us/rst/programs/fees/facility_data.aspx

Figures

Figure 1: Beaver Lake Priority Areas

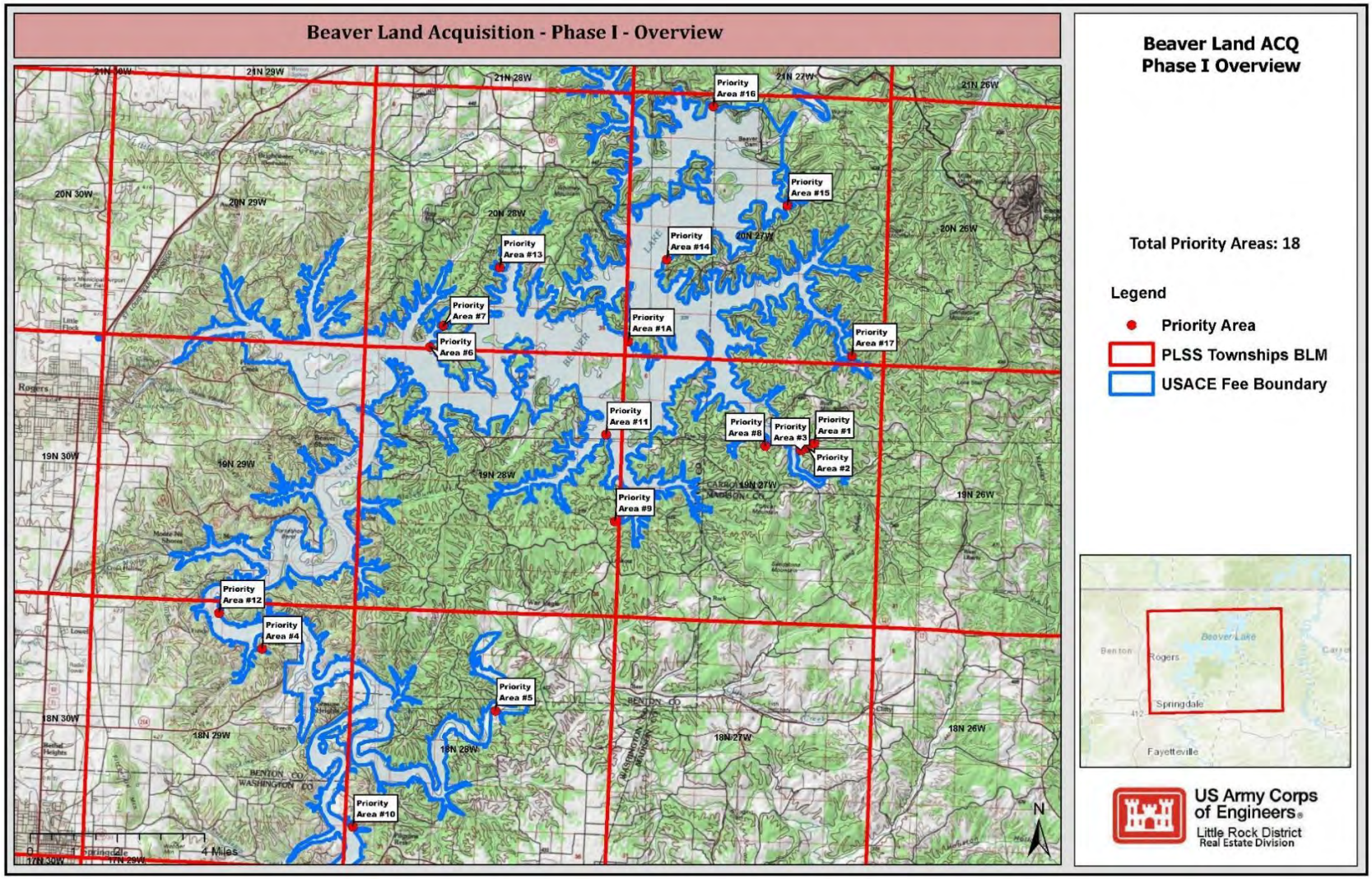


Figure 2: Subject Property Detail

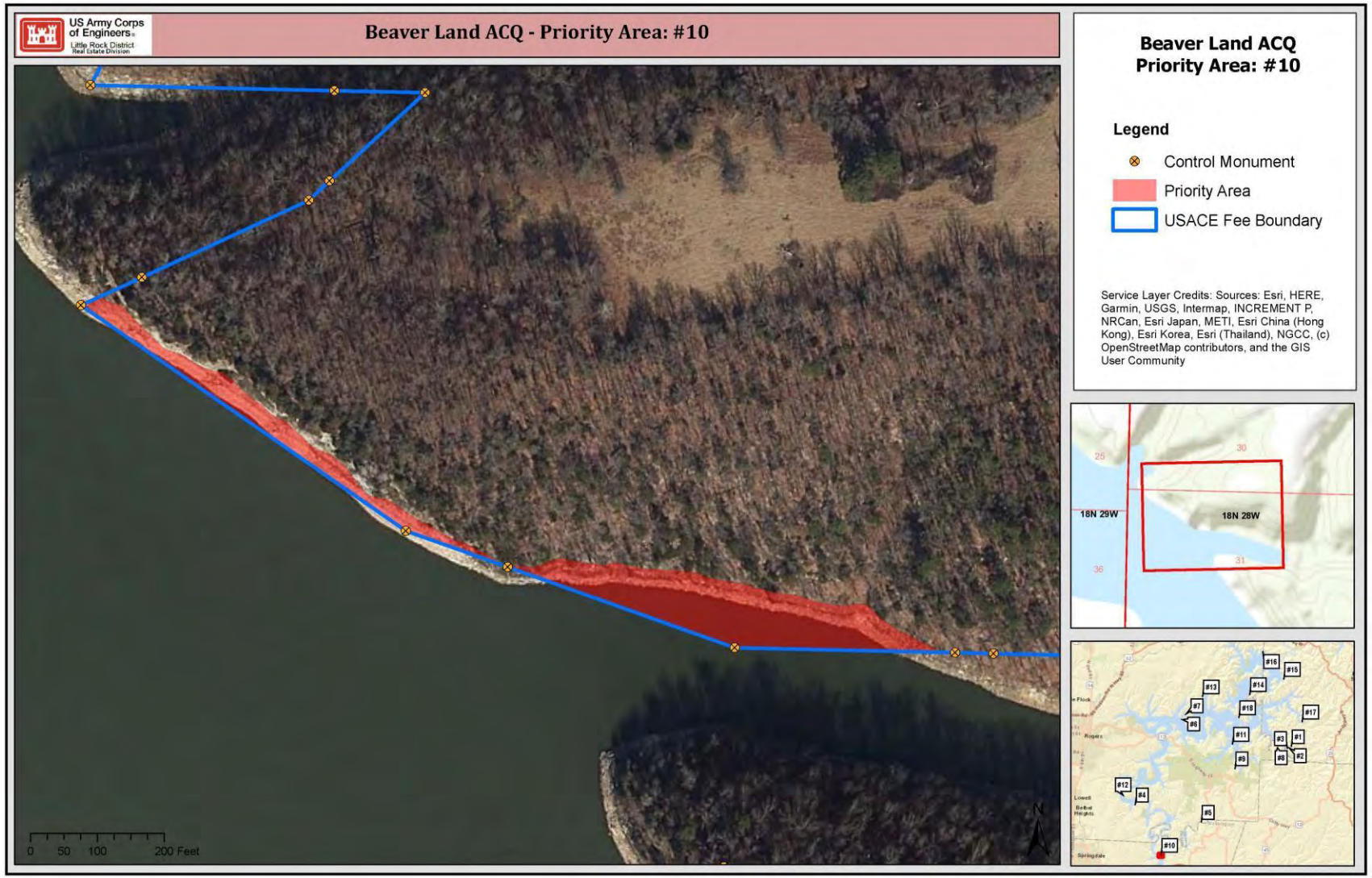


Figure 3: Interview Questions

Beaver Lake ECP
Interview Questions

1. Do you know of any environmental issues with this property?
2. Do you know of, or have access to, any reports concerning the environmental condition of this property? (i.e. site assessments, permits, storage tank registrations, safety plans, etc.) If so, would you be able to provide them? SWPPPs, SPCCs, air permits?
3. Do you know how this property has been historically used?
4. What is the property currently used for?
5. When were the site buildings constructed?
6. Are hazardous materials or petroleum products stored or used on this site? If so, what is the RCRA EPA ID? Does fueling occur on this property?
7. Do you know of any asbestos or LBP on the property or its buildings? Do you know the age of the buildings?
8. Has the site layout been manipulated in your recollection? (i.e. grading, excavation, etc.)?
9. Are there or have there been any cultural/historic items or buildings found on the property?
10. Is there anything else environmentally relevant that we should know?

Appendix A Visual Site Inspection Photographs

12 July 2021

Priority Area 10 – View of priority area from watercraft

Priority Area 10 – Portions of the priority area have rocky bluffs leading into the lake

Priority Area 10 – View of priority area from watercraft

Priority Area 10 – View of priority area from watercraft

Priority Area 10 – Fallen trees on priority area

Priority Area 10 – Rock strata on priority area edge

Priority Area 10 – View of priority area from watercraft

Priority Area 10 – View of priority area from watercraft

Final

U.S. Army Environmental Condition of Property Report
Priority Area 11

Beaver Lake
Beaver Lake, Arkansas

August 30, 2021

Prepared For:
Beaver Lake Land Acquisition

Prepared By:
U.S. Army Corps of Engineers
Regional Planning and Environmental Center
Fort Worth District
Fort Worth, Texas

[This page is intentionally left blank.]

Table of Contents

List of Appendices:
Appendix A: Visual Site Inspection Photographs, 12 July 2021.
Appendix B: Historical Aerial Photography.
Appendix C: Historical Topographic Maps.

List of Acronyms

ACM	Asbestos-containing material
AR	Army Regulation
AST	Aboveground storage tank
ASTM	American Society for Testing and Materials
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CFR	Code of Federal Regulations
DoD	Department of Defense
ECP	Environmental Condition of Property
EDR	Environmental Data Resources
EPA	Environmental Protection Agency
ERNS	Emergency Response Notification System
FAA	Federal Aviation Administration
HTRW	Hazardous, Toxic and Radioactive Waste
IRP	Installation Restoration Program
LBP	Lead-based Paint
LUST	Leaking underground storage tank
MEC	Munitions and Explosives of Concern
NEPA	National Environmental Policy Act
NFRAP	No Further Remedial Action Planned
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NRC	Nuclear Regulatory Commission
ODEQ	Oklahoma Department of Environmental Quality
OWS	Oil-water separator
PCB	Polychlorinated Biphenyl
POL	Petroleum, Oils, and Lubricants
RCRA	Resource Conservation and Recovery Act
SEMS	Superfund Enterprise Management System
SF	Square feet
SHWS	State Hazardous Waste Sites
SWPPP	Stormwater Pollution Prevention Plan
TSD	Transport, Storage, Disposal
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
UST	Underground storage tank
UXO	Unexploded Ordnance
VCP	Voluntary Cleanup Program
VSI	Visual site inspection

1.0 Executive Summary

This environmental condition of property (ECP) report has been prepared to document the environmental conditions and provide information for the acquisition of land that would be necessary for the operation, maintenance, and control of the Beaver Lake reservoir in Arkansas. This fee acquisition pertains to the frequently inundated land immediately surrounding the lake, below an elevation of 1128 ft above mean sea level (msl). The Army prepares an ECP in order to provide the public with information relative to the environmental condition of the property, assist Federal agencies during the property screening process, provide information about completed remedial and corrective actions at the property, and to assist in determining appropriate responsibilities, asset valuation, and liabilities with other parties to a transaction.

Beaver Lake currently occupies more than 38,000 acres of Federal public lands and waters. This ECP report covers a triangular parcel of 0.70 acres located near the center of Beaver Lake on eastern shore. The subject property is on the edge of the lake and currently owned by private landowner(s). The Lake is located in northwestern Arkansas, in Benton, Washington, Madison and Carroll Counties and it is approximately 6 miles west of Eureka Springs, Arkansas. The subject property, also known as Priority Area 11, is at the end of a peninsula between Van Hollow and Rambo Creek.

This ECP report presents a summary of readily available information on the environmental conditions of, and concerns relative to, the land, facilities, and real property assets of Beaver Lake. The findings included in the report are based on a record search of historical environmental investigation reports and site historical documents, a review of aerial photography, stakeholder interviews, and a site inspection conducted 12 – 13 July 2021.

Based on the environmental conditions found and the ECP analysis, the property can be categorized as an ECP Category 1, indicating a site where no release, or disposal of hazardous substances or petroleum products or their derivatives has occurred (including no migration of these substances from adjacent properties).

2.0 Purpose

2.1 General

This environmental condition of property (ECP) report has been prepared to document the environmental conditions and provide information for the acquisition of land surrounding Beaver Lake in Benton, Washington, Madison and Carrol Counties, Arkansas. This report meets the requirements of Title 40, Code of Federal Regulations (CFR), Part 373, and United States Army Regulation (AR) 200-1 (2007), *Environmental Quality, Environmental Protection and Enhancement*. The ECP report also follows the American Society for Testing and Materials (ASTM) E1527-13 *Standard Practice for Environmental Site Assessments: Phase 1 Environmental Site Assessment Process*. The subject property in this report is subsequently categorized according to ASTM D5746 (2016) *Standard Classification of Environmental Condition of Property Area Types for Defense Base Closure and Realignment Facilities*.

The Army prepares an ECP for the following purposes:

- Provide the public with information relative to the environmental condition of the property.
- Assist Federal agencies during the property screening process.
- Provide information to prospective buyers.
- Provide information about completed remedial and corrective actions at the property.
- Assist in determining appropriate responsibilities, asset valuation, and liabilities with other parties to a transaction.

The ECP contains the information required to comply with the provisions of 40 CFR, Part 373 that require a notice to accompany contracts for the sale of, and deeds entered into for the transfer of, federal property on which hazardous substances may have been stored, released or disposed. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) §120(h) stipulates that a notice is required if certain quantities of designated hazardous substances have been stored on the property.

The ECP Report is not prepared to satisfy a real property purchaser's duty to conduct an "all-appropriate inquiry" to establish an "innocent purchaser defense" to CERCLA 107 liability. Any such use of the ECP Report by any party is outside the control of the Army and beyond the scope of the ECP Report. The Army, its officers, employees, or contractors makes no warranties or representations that any ECP Report satisfies any such requirements for any party.

2.2 Scope

Priority Area 11 occupies 0.70 acres of land. This ECP report covers 0.70 acres of land located on a peninsula between Van Hollow and Rambo Creek on Beaver Lake. Priority Area 11 is a small triangular shaped parcel of wooded near the end of a peninsula. There is access via watercraft and although it wasn't explored terrestrial access via private property from Huckleberry Hills Rd. Areas within the lake that are not within the Priority Area will be considered adjacent property. A general site location map is provided in Figure 1, and a map showing the subject property is shown in Figure 2.

2.3 Limitations

This ECP report presents a summary of readily available information on the environmental conditions of, and concerns relative to, the land, facilities, and real property assets of the subject property. The findings included in the report are based on a record search of available historical environmental investigation reports and site historical documents, a review of aerial photography, stakeholder interviews, and a site reconnaissance conducted 12 – 13 July 2021. Historical environmental investigation reports and site historical documents were reviewed in support of this ECP, and the information obtained from other studies is reflected within this report by reference. The ECP process recognizes that the condition of property and classification can change as historical contamination is cleaned up (if required) or if a new

source of contamination is identified. Records reviewed during the assessment were accepted as accurate and a reasonable effort was made to resolve discrepancies identified during the document review.

During the ECP assessment, all available sources of information concerning both past and present environmentally significant uses of the property were reviewed. This included readily available data associated with adjacent property records; 1985, 1994, 2001, 2004, 2006, 2009, 2010, 2012, 2014, 2016, 2017, 2018, and 2020 aerial photography; personnel interviews; current and historic investigations; and topographical maps. In addition, record sources were reviewed to determine if there have been spills, leaks, discharges, leaching, underground injection, dumping, abandonment, or storage of hazardous substances or petroleum products at the subject property. The site reconnaissance and interview process included inquiries and requests into the existence and availability of records that support the environmental condition of the property. The site reconnaissance included a Visual Site Inspection (VSI) of the subject property. No sampling or analysis was conducted during this survey.

2.4 Report Organization

The remainder of this ECP report is organized as follows:

Section 3 – Property Description: This section provides location and description of the subject property; an overview of historical and current land uses; and a description of the environmental setting of the lake area, including climate, topography, geology, and demography.

Section 4 – Survey Methodology: This section describes the methods used to obtain the information for this ECP Report such as the development of study sections, the VSI, aerial photography analysis, records review, interviews, and data management.

Section 5 – Environmental Conditions: This section provides the existing environmental information. The findings are organized by relevant environmental "issues," including permits and licenses, cleanup activities, hazardous substances, petroleum and related products, asbestos, lead-based paint (LBP), radioactive materials, landfills, explosive contaminated structures, radon, pesticides, and polychlorinated biphenyls (PCBs). This section also includes adjacent property descriptions.

Section 6 – Evaluation and Conclusions: This section provides a summary of the subject property and evaluates the property for categorization as per ASTM D5746 (2016).

Section 7 – Certification: This section documents the approval of the ECP report.

Section 8 – References: This section provides an inventory of the reference material used in the preparation of this ECP Report.

Appendices: A list of appendices is provided in the Table of Contents.

3.0 Property Description

3.1 Parcel Locations and Description

Beaver Lake is located in the scenic Ozark Mountain region of northwestern Arkansas in Benton, Washington, Carroll and Madison counties. The total area currently contained in the Beaver project, including both land and water surface, consists of 38,138 acres owned in fee. Of this total, 1,432 acres are in flowage easement. The proposed Land Acquisition would include adding any land below the 1128 msl water level. The White River drainage area above Beaver Lake is approximately 1,186 square miles. When the lake is at the top of the conservation pool (elevation 1120.43 ft msl), the water area is 28,299 surface acres with 490 miles of shoreline within the lands owned in fee. The shoreline is irregular with topography primarily consisting of steep bluffs and gentle slopes.

Priority Area 11 is a 0.70 acre triangular shaped parcel of wooded land located at the end of a peninsula that sits between Van Hollow and Rambo Creek. The area is undisturbed forest with no structures or visible vehicle or pedestrian pathways. The shoreline is a rock bluff with a drop off that is under water at the conservation pool level.

3.2 Historic Land Use

Beaver Lake is a multiple purpose water resource development project initially authorized for flood control, hydropower generation and other beneficial uses by the Flood Control Act dated 3 September 1954. The inclusion of storage in the lake for municipal and industrial water supply was authorized by the Water Supply Act of 1958. Beaver Lake is a major component of a comprehensive plan for water resource development in the White River Basin of Arkansas and Missouri. Construction of Beaver Dam was initiated in March 1960. The dam was completed in June 1966, and the powerhouse and switchyard were completed in 1965. Beaver Lake was declared operational for public use in 1965.

The historical aerial photography shows that Priority Area 11 has been undisturbed forested land as far back as 1994 and nearby residential structures as far back as 2016.

3.3 Current Land Use

Beaver Lake is located in the Ozark Highlands of Carroll, Washington, Benton, and Madison Counties. Having 490 miles of shoreline (at conservation pool) and over 28,000 water surface acres, Beaver Lake is the largest reservoir in northwest Arkansas and the first federal impoundment on the White River.

There are 12 public use areas around Beaver Lake. There are 11 parks on the lake presently operated by the Corps of Engineers. The State of Arkansas owns and operates Hobbs State Park Conservation Area, which covers 12,056 acres, and Devil's Eyebrow Natural Area, which covers 2,503 acres. Both properties are adjacent to USACE lands. There are two parks, Ventris, and Blue Springs that have been reduced to lake access only. One Park (Big Clifty) is operated by Carroll County, Arkansas.

Despite being located adjacent to the fast-growing communities of Fayetteville, Springdale, Bentonville, and Rogers, Arkansas and a regional population of over 500,000, the lake provides open spaces and a quality outdoor recreation opportunity. Many arms and coves of the lake offer secluded areas for traditional activities such as fishing, skiing, sailing and scuba diving, but also allow for passive recreation opportunities like photography and nature observation.

Priority Area 14 remains an undeveloped forested area with residences approximately 100 yards inland from the shoreline.

3.4 Utilities

Priority Area 11 has no known utilities.

3.5 Environmental Setting

3.5.1 Climate

The climate in the Beaver Lake area is classified as humid subtropical according to the Köppen climate model. A humid subtropical climate is characterized by hot, usually humid summers and mild to cool winters. The Köppen definition of this climate is for the coldest month's mean temperature to be between 26.6 °F (−3 °C) and 64.4 °F (18 °C), and the warmest month to be above 71.6 °F (22 °C). Some climatologists prefer to use 32 °F (0 °C) as the lower bound for the coldest month's mean temperature. Under the modern Trewartha climate classification, climates are termed Humid Subtropical when they have mean temperatures of 50 °F (10 °C) for eight or more months a year. In most locations classed within this system, the mean temperature of the coldest month is between 35 °F (3 °C) and 65 °F (18 °C). Some climatologists consider the Trewartha grouping of subtropical climates to be more real-world and fitting on a global scale.

While technically classified as humid subtropical, the climate in the Beaver Lake area is considered moderate. The area experiences all four seasons and does receive cold air masses from the north; however, some of the Arctic masses are blocked by the higher elevations of the Ozarks.

Average temperatures range from a high of 88 °F (31.1 °C) and low of 27 °F (-2.7 °C) in nearby Rogers, Arkansas. Extreme temperatures rarely exceed 96 °F (35.6 °C) and 13°F (-10.6 °C). Late summer is the time of maximum heat and least rainfall. During the winter months, midday temperatures in the basin are relatively warm, around 55 o to 60 o F. Some short periods of cold weather occur with temperature ranging from 0 o to 10 o F. On winter nights, temperatures from 37 o F to below freezing are common. Highest recorded temperature in Rogers, Arkansas was 114 °F (45.6 °C) (recorded in July 1954). The lowest temperature recorded was −16 °F (−26.7 °C), in February 1996.

The relative humidity typically ranges from 41% (comfortable) to 91% (very humid) over the course of the year, rarely dropping below 24% (dry) and reaching as high as 100% (very humid). The air is driest around April 9, at which time the relative humidity drops below 49% (comfortable) three days out of four; it is most humid around June 3, exceeding 87% (very humid) three days out of four.

Dew point is often a better measure of how comfortable a person will find the weather than relative humidity because it more directly relates to whether perspiration will evaporate from the skin, thereby cooling the body. Lower dew points feel drier and higher dew points feel more humid. Over the course of a year, the dew point typically varies from 19°F (dry) to 71°F (muggy) and is rarely below 4°F (dry) or above 74°F (very muggy). There are two periods in the year that are most comfortable: The first is between April 18 and June 6 and the second is between September 3 and October 23. The air feels neither too dry nor too muggy during these periods (https://weatherspark.com/averages/31495/Rogers-Arkansas-United-States).

Average annual rainfall for the Beaver Lake area is 45 inches per year. Precipitation is weakly seasonal, with a bimodal pattern: wet seasons in the spring and fall, and relatively drier summers and winters, but some rain in all months. The spring wet season is more pronounced than fall, with the highest rainfall typically occurring in May. The average annual snowfall for the Beaver area is about 12 inches. Snowpacks are usually short lived and are not commonly a concern for flooding.

Climate change is an area of concern due to the potential for effects on many aspects of the environment, especially those related to water resources. The U.S. Global Change Research Program (USGCRP) summarized information regarding climate change and its potential effects in regional assessments (http://www.globalchange.gov/publications/reports/scientific-assessments/us-impacts). In the Midwest, which extends from Minnesota to Missouri, extreme events such as heat waves, droughts and heavy rainfall events are projected to occur more frequently. Should these events become significant enough to impact the operation of Beaver Lake, the Master Plan and associated documents (i.e. Operations Management Plan and Shoreline Management Plan) would be reviewed and revised, if necessary.

3.5.2 Topography, Geology, and Soils

The depositional environment of the rocks found in the Arkansas Ozarks is one of a relatively shallow continental shelf, sloping toward deeper water generally toward the south. This shelf emerged many times during the Paleozoic resulting in numerous unconformities throughout the sequence. The Ozark Plateaus region of Arkansas is made up of generally flat-lying Paleozoic age strata divided into three plateau surfaces. The lowest and northern-most plateau is the Salem Plateau. The Springfield Plateau stands above the Salem a few hundred feet and is generally capped by lower Mississippian age limestones and cherts. The southernmost and highest plateau of the Ozarks is the Boston Mountains. All of these plateaus are deeply dissected by numerous streams throughout the area. The faulting in the Ozarks is generally normal; most faults displaying a displacement down on the southern side. However, some observations reveal that a few strike-slip faults may be present. Gentle folds are noted but are generally of very low amplitude. The depositional environment of the rocks found in the Arkansas Ozarks is one of a relatively shallow continental shelf, sloping toward deeper water generally toward the south.

Beaver Lake is part of the Springfield Plateau that occupies primarily the western and southwestern flanks of the Ozark Plateau province. The Springfield Plateau in this region rises to an elevation of approximately 1400 feet and in many areas, forms extensive plains. Hilly areas occur where rivers and their tributaries cut into the plateau surface, most notably in the vicinity of the White River and Beaver Lake. As streams like the Buffalo National River cut through the plateau down to the level of the White River, they sometimes carve spectacular bluffs.

Lower Ordovician, Middle to Upper Devonian and Lower and Upper Mississippian age strata are present around Beaver Lake. Upper Ordovician and Devonian strata crop out around Beaver Lake and its tributaries. The Lower Mississippian Boone Formation comprises the surface rock over the majority of the area and forms the surface of the heavily dissected Springfield Plateau. In addition to the Boone Formation, Cotter and Jefferson City formations (Jefferson City formation has not been successfully differentiated from the Cotter Formation in Arkansas), and the Powel formation, all of Ordovician age are present in the area. Formations in the Devonian strata include the Chattanooga, Clifty and Penters.

The Boone Formation consists of gray, fine- to coarse-grained fossiliferous limestone interbedded with chert. This formation caps the higher hills in the area. Since limestone is easily dissolved by water, cave and solution (karst) features are prominent. The Boone Formation is well known for dissolutional features, such as sinkholes, caves, and enlarged fissures. Surface water may drain directly into channels in limestone, where it can move rapidly and without filtration to the surface as a spring, at a location that is unpredictable without extensive testing. Therefore, water pollution problems are of particular concern in this region. The thickness of the Boone Formation is 300 to 350 feet in most of northern Arkansas, but as much as 390 feet has been reported.

The Cotter Dolomite is composed of dolostone of predominantly two types: a fine-grained, argillaceous, earthy textured, relatively soft, white to buff or gray dolostone called "cotton rock", and a more massive, medium-grained, gray dolostone that weathers to a somewhat hackly surface texture and becomes dark on exposure. The formation contains chert, some minor beds of greenish shale, and occasional thin interbedded sandstone. The thickness is about 340 feet in the vicinity of Cotter, but the interval may range up to 500 feet thick in places.

The Powell Dolomite is generally a fine-grained, light-gray to greenish-gray, limy, argillaceous dolostone with thin beds of shale, sandstone, sandy dolostone, and occasionally chert. The formation’s thickness may be as much as 215 feet but is often much thinner.

The Chattanooga Shale Formation is typically black, fissile clay shale that weathers into thin flakes. The beds are usually cut by prominent joints creating polygonal blocks upon weathering. The upper part of the formation may be slightly sandy and usually contains abundant pyrite. Thickness ranges from 0 to about 85 feet; normally averaging about 30 feet (AGS).

The strata throughout the region are nearly horizontal. One predominant geological feature of the lake area is a low, persistent, limestone bluff, which occurs just above the Ordovician- Mississippian contact.

The faulting in the Ozarks is generally normal; most faults displaying a displacement down on the southern side. Lineaments and faults characteristic of northwest Arkansas are present around Beaver Lake. The Fayetteville Fault lies beneath Beaver Lake. This fault is the west side of a graben that has down-dropped the Boone Formation to lake level. The Starkey Fault bounds the east side of the graben. Both faults trend approximately N 450E. One section of the Starkey fault trends N 60-700E. The Clantonville Lineament – Monocline is a northeast to southwest trending structural feature that extends from north of Clantonville to Ventris Hollow. The location of this feature was determined from the 1:24,000 three dimensional quadrangle and from structural disparities in the Lower Mississippian rock units. This structural feature could be responsible for the presence of lead-zinc mineralization in an old prospect near Clantonville (north of Beaver Lake). The trend of this lineament to monocline is N 30-400E. Paleokarst features within the top of the Powell Dolomite are present around Beaver Lake and coincident with a lineament in Limekiln Hollow near Garfield, northwest of Beaver Lake.

In general, the soils of the Ozark Plateaus are residual and are formed on a broad, domed, upwarp consisting mostly of limestone and dolomite. The main difference in the soils is due to different rocks from which the soils were formed. The main geologic materials are cherty limestone; cherty, very siliceous dolomite; cherty, siliceous dolomite; and alluvium, which are weathered and water transported products of the first three materials. Glade-rock soil occurs where the cherty, very siliceous dolomite is exposed to the soil formation. Dolomite is more resistant to weathering than limestone and siliceous dolomite is even more resistant, so very shallow soil results. In areas where the dolomite is less siliceous, more weathering has taken place; however, the soils produced are not as deep as soils formed by limestone.

The following eight soils associations are found in and around the Beaver project area: Captina-Nixa, Captina-Nixa-Pickwick, Clarksville-Nixa-Baxter, Corydon-Sogn, Enders-Allegheny-Mountainburg, Razort-Captina-Etowah, Linker-Apison-Hector, and Captina-Pembroke.

3.5.3 Hydrology and Groundwater

In the Interior Highlands of western and northern Arkansas ground-water supplies are more limited than in the Coastal Plain. Much of the Ozark Plateaus region is underlain by carbonate rocks, which are quite soluble in the presence of water. Solution by ground water has caused many large openings through which water passes so quickly that contaminants from the surface cannot be filtered out. Signs of these openings are caves, sink holes, springs and lost stream segments. As a consequence, the water in shallow wells may not be suitable for human consumption without treatment.

Three aquifers, which are part of the Ozark Plateaus Aquifer System, are located within northern Arkansas. The Springfield Plateau aquifer is generally under unconfined conditions, with groundwater movement occurring through fractures and solution cavities formed by dissolution of carbonate rock. Local discharge is through springs and streams. The Ozark aquifer is generally under confined conditions, especially where overlain by the units of the Ozark Confining Unit (Chattanooga Shale). Most wells in the Springfield Plateau and upper units in the Ozark aquifer yield 5-10 gpm on the average, with yields greater than 25 gpm in rare cases.

The third aquifer, the Roubidoux Formation and the Gunter Sandstone Member of the Gasconade Formation in northern Arkansas occur at greater depth and constitute the only significant aquifer system in the Ozarks. Both are permeable sandstone and carbonate units of Ordovician age. These aquifers serve as the principal source of high-quality water for many communities in northern Arkansas where surface

water sources are unavailable. Together these units may yield up to 500 gpm to wells. These formations do not outcrop anywhere in Arkansas but instead outcrop in southern Missouri.

3.5.4 Water Quality

The waters of the Arkansas portion of the White River watershed have all been designated by the Arkansas Department of Environmental Quality (ADEQ) for fisheries, primary and secondary contact recreation, and domestic, agricultural, and industrial water supplies (ADEQ, 2012). Beaver Lake is classified by ADEQ as a Type A water body, which includes most larger lakes of several thousand acres in size, in upland forest dominated watersheds, having an average depth of 30 to 60 feet, and having low primary production (i.e., having a low trophic status if in natural [unpolluted] condition). Beaver Lake, like all other lakes of its size in the Ozark region, stratifies chemically and thermally in the late spring with stratification extending into late fall and early winter. During the warmer months, lake waters of the upper layer (the epilimnion) are warmer and contain more dissolved oxygen, while the denser, lower layer waters (the hypolimnion) are colder and contain very little or no dissolved oxygen, thus undesirable for fish habitat.

This undesirable water, when discharged downstream from hydropower generation, may cause some problems in the tailwaters. To combat this problem, the dissolved oxygen content is monitored, and various management measures are implemented to improve the dissolved oxygen concentration in the hydropower releases. A highly productive trout fishery has been established in the Beaver tailwaters by the Arkansas Game and Fish Commission because of the available discharge of cold water from the dam, which is reaerated by turbulence as it flows downstream.

As the stratified epilimnion cools in the late fall and winter, the layers begin to mix (de-stratify) and dissolved oxygen (DO) is more evenly distributed. This condition is more favorable to the fishery of the lake and overall water quality.

The upper 1500 acres of Beaver Lake has been listed by the Arkansas Department of Environmental Quality (ADEQ) on Arkansas' 303(d) list of impaired waters, approved by the Environmental Protection Agency (EPA), due to turbidity (ADEQ, 2008). According to the Arkansas 303(d) list, these excessive levels impact the local fisheries as well as primary contact, both designated uses of Beaver Lake. The elevated turbidity levels are due to excessive silt from surface erosion from agriculture activities, unpaved road surfaces, in-stream erosion – mainly from unstable stream banks, and any other land surface disturbing activity. The Draft 2010 Integrated Water Quality and Monitoring Report (ADEQ, 2010) added pathogen indicator bacteria as a contaminant for the same area of Beaver Lake. Surface erosion activities are listed as the probable source for this contaminant as well.

Clean Water Act requires states to list waters that do not meet Federal water quality standards or have a significant potential not to meet standards as a result of point source dischargers or non- point source run-off. Subsequent to listing on the 303(d) list, the statute requires that the states develop and set the Total Maximum Daily Load (TMDL) for water bodies on the list within 13 years. A TMDL establishes the maximum amount of a pollutant that can enter a specific water body without violating the water quality standards. Values are normally calculated amounts based on dilution and the assimilative capacity of the water body. TMDLs have not been established by ADEQ for the upper Beaver Lake area.

3.6 Biological and Cultural Resources

3.6.1 Terrestrial Ecosystems

The area surrounding Beaver Lake is mostly forested. Trees and shrubs around the lakeshore include upland oak and hickory species, persimmon, honey locust, hawthorn, dogwood, redbud, coralberry, smooth and winged sumac, and buttonbush. Frequent periods of inundation keep a thin strip of government owned lands around the lake in early stages of succession. Red cedar and short-leafed pine, the principal evergreens, are dispersed throughout the region and are found in many large, scattered groups. Ground covers consist of greenbrier, sedges, and native grasses. White-tailed deer and eastern wild turkey are common game animals found and hunted in the Beaver Lake area. Black bears have also become common in the area and are hunted on the lands around the lake. The principal small game species found in the open upland areas include bobwhite quail, cottontail rabbit, and mourning dove. Gray and fox squirrels are common in upland wooded areas. Furbearing animals found in the Beaver Lake area include coyote, red fox, gray fox, otter, mink, muskrat, beaver, bobcat, and raccoon. Habitat management that includes wildlife food plot plantings, mowing, soil disturbance, removal of exotic species and application of prescribed fire provide benefit to these populations.

The common goldeneye, hooded merganser, bufflehead, and ring-necked duck are the predominant migratory waterfowl species visiting Beaver Lake. Mallards, gadwall, and other duck species are also present; however, they are only transient visitors as their characteristic feeding habits of obtaining food from shallow waters is limited. Resident Canada geese are so numerous in many coves and recreation areas that their presence has become a nuisance.

Ring-billed gulls are seen frequently around the Beaver Lake area. Greater and lesser yellow legs, pelicans, and large flocks of horned grebes are also seen during their peak migration in the spring and fall. Beaver Lake is also one of the few places where visitors can see both the turkey vulture and the black vulture at the same time in the winter. Beaver Lake has also become a popular place that visitors come to observe bald eagles, commonly wintering 150 or more birds and hosting 5-6 breeding pairs during the nesting period of March to June. The surrounding woodlands and grasslands serve as prime nesting areas for resident and neotropical migratory songbirds.

3.6.2 Aquatic Ecosystems and Wetlands

Walleye, smallmouth bass, striped bass, hybrid white-striped bass, walleye, and paddlefish have been introduced into Beaver Lake to add diversity to the fishery. Natural reproduction of striped bass and hybrid white-striped bass does not occur in Beaver Lake. Since 2004, AGFC stocks approximately 100,000 walleye, 30,000 channel catfish, 30,000 blue catfish, and 200,000 striped bass each year. While natural reproduction occurs in white crappie, black crappie, largemouth bass, and smallmouth bass, AGFC supplements this reproduction by occasional stockings of these species. Historically, there have also been introductions of northern pike, blue catfish, lake trout, and threadfin shad.

Located within the Springfield Plateau of the Ozark Mountains region of northern Arkansas, the area surrounding Beaver Lake is characterized by limestone, dolomite, or chert geology. The many rivers and streams flowing through the region have created a landscape of level highlands dissected by rugged valleys rich in karst features such as caves and sinkholes. Associated with these streams and landscape features are a variety of wetland habitats representative of the five wetland classes occurring within the region. These wetland classes include depressions, flats, fringe, riverine, and slope. It is possible, and perhaps even likely, that all of these classes of wetlands occur in the general area of Beaver Lake. However, those most likely to occur in the area immediately surrounding the lake are fringe (most likely reservoir), riverine (most likely spring runs) and slope wetlands (most likely calcareous slope).

3.6.3 Threatened and Endangered Species

The following species listed in Table 1 are from the U.S. Fish and Wildlife Service's federally classified status list of species and the Arkansas Natural Heritage data sets which have been reported and identified on project lands. Although the bald eagle was delisted by USFWS in 2007 due to recovery of the species, both the bald and golden eagles are still protected in accordance with the Bald and Golden Eagle Protection Act. The federal Migratory Bird Treaty Act of 1918 also provides protection to certain species of migratory birds. A total of 31 bird species are currently protected under this federal statute.

Table 1: Threatened and Endangered Species

	Federal Status	**State Status/Global Rank**
Gray Bat	LE	SE / S2S3/G4
Indiana Bat	LE	SE / /S1/G2
Northern long-eared Bat	LT	SE / S1S2/ G1G2
Ozark Big-eared Bat	LT	Not listed
Little Brown Bat	-	SE / S1
Bald Eagle	*Protected under Bald and Golden Eagle Protection Act	S3B,S4N/G5
Eastern Black Rail	LT	Not listed
Piping Plover	LT	Not listed
Rufa Red Knot	LT	Not listed
Whooping Crane	Experimental Population, Non-Essential	Not listed
Ozark Cavefish	LT	SE / S1/G3
Neosho Mucket	LE	Not Listed
Rabbitsfoot mussel	LT	SE/S3/G3G4
Snuffbox Mussel	LE	Not listed
Monarch Butterfly	C	Not listed
Missouri Bladderpod	LT	S2/G3
Opaque Prairie Sedge	-	SE / S2S3G4
Yellow Coneflower	-	ST / S2G3T3
Ovate-leaf Catchfly	-	ST / S2G3
Royal Catchfly	-	ST / S2G3

FEDERAL STATUS CODES

LE = Listed Endangered; the U.S. Fish and Wildlife Service has listed this species as endangered under the Endangered Species Act.

LT = Listed Threatened; the U.S. Fish and Wildlife Service has listed this species as threatened under the Endangered Species Act.

C = Candidate Species;

STATE STATUS CODES

INV = Inventory Element; The Arkansas Natural Heritage Commission is currently conducting active inventory work on these elements. Available data suggests these elements are of conservation concern. These elements may include outstanding examples of Natural Communities, colonial bird nesting sites, outstanding scenic and geologic features as well as plants and animals, which, according to current information, may be rare, peripheral, or of an undetermined status in the state. The ANHC is gathering detailed location information on these elements.

GLOBAL RANKS

G3 = Vulnerable globally. At moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors.

G4 = Apparently secure globally. Uncommon but not rare; some cause for long-term concern due to declines or other factors.

G5 = Secure globally. Common, widespread and abundant.

T-RANKS= T subranks are given to global ranks when a subspecies, variety, or race is considered at the state level. The subrank is made up of a "T" plus a number or letter (1, 2, 3, 4, 5, H, U, X) with the same ranking rules as a full species.

STATE RANKS

S1 = Critically imperiled in the state due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors making it vulnerable to extirpation.

S2 = Imperiled in the state due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it vulnerable to extirpation.

S3 = Vulnerable in the state due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.

GENERAL RANKING NOTES

Q = A "Q" in the global rank indicates the element's taxonomic classification as a species is a matter of conjecture among scientists.

Source: Arkansas Natural Heritage Commission

3.6.4 Cultural Resources

The records search, interviews, and site inspection identified no cultural resource assessments or findings for the subject property.

During the past seventy years scientific investigation of archaeological sites in the Beaver Lake area has been carried out in several phases. In 1922 and 1923, Mark R. Harrington of Phillip Academy was the first archeologist to excavate sites on the area that is now Beaver Lake. He excavated 13 bluff shelters. Between 1928 and 1935, the work of Harrington was continued by S.C. Dellinger of the University of Arkansas Museum. Dellinger supervised the excavation of 21 rock shelters. In the early 1960's, a series of surveys were conducted by several archeologists from the University of Arkansas Museum. Today, there are 280 known archeological sites along or immediately adjacent to Beaver Lake. Of these, 271 are identified as prehistoric, seven are historic and two sites have no known cultural affiliation.

Table 2: Historical and Cultural Resources at Beaver Lake

Type of Site	Number of sites
Historic	7
Prehistoric	271
No known cultural affiliation	2
Total	280
National Register Eligibility Status	
Not Evaluated	132
Not Eligible	5
Eligible	1

4.0 Survey Methodology

4.1 Development of Study Sections

The information gathered during the development of the ECP was used to group the subject property into standardized categories using Department of Defense (DoD) guidance, and in accordance with ASTM D5746 (2016). The ECP category definitions are summarized below in Table 3.

Table 3: Definitions of ECP Categories

ECP Category	Definition
1	An area or parcel of real property where no release, or disposal of hazardous substances or petroleum products or their derivatives has occurred (including no migration of these substances from adjacent properties).
2	An area or parcel of real property where only the release or disposal of petroleum products or their derivatives has occurred.
3	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but at concentrations that do not require a removal or remedial action.
4	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, and all remedial actions necessary to protect human health and the environment have been taken.
5	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred and removal or remedial actions, or both, are under way, but all required actions have not yet been taken.

6	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but required response actions have not yet been initiated.
7	An area or parcel of real property that is unevaluated or requires additional evaluation.

The final ECP category designations for the subject property are shown in Section 6.2, Table 5.

4.2 Visual Site Inspection

A VSI was conducted on 12 July 2021 at the subject property to check for recognized environmental conditions. The VSI was conducted by Mrs. Hollie Eljizi, Ms. Jennifer Jeffcoat and Mr. Robert Singleton from the U.S. Army Corps of Engineers (USACE). USACE representatives were accompanied by Mr. Mathew Voskamp of the USACE Beaver Lake office.

The VSI was performed from a USACE Beaver Lake Office watercraft near the bank of the subject property as a Right of Entry (ROE) was not available at the time of the inspection. At the time of inspection, the lake level was at 1127 ft msl, while conservation pool lake level is 1121 ft msl. This made part of the priority area under water during the VSI, however water clarity was good, and no debris or other concerns were seen in the water. The shoreline consisted of a rock bluff with a drop off that was under water at the conservation pool level. The water quality was such that the bluff could be seen from the watercraft. The shoreline that could be seen was treed with some fallen wood debris and a single panel of plywood. No apparent signs of Hazardous, Toxic and Radioactive Waste (HTRW) were visible during the VSI.

Photos from the VSI can be found in Appendix A.

4.3 Aerial Photography Analysis

Aerial photographs were available from Google Earth maps for 1985, 1994, 2001, 2004, 2006, 2009, 2010, 2012, 2014, 2016, 2017, 2018, and 2020.

The initial aerial photograph from 1985 is of poor quality and the area isn't discernable. The next photo from 1994 shows an undisturbed forested area, and there is no change in the next photos from 2001 to 2014. In 2016 north of the priority area there is an area cleared of trees and a cleared road to that area at the top of the hill north of the parcel. In the 2017 photo a residence can be seen in the cleared area along with a cleared path to a small structure between the residence and parcel. There is no change in the 2018 photo, but the next photo from 2020 shows a second residence with a road from the 2017 residence near the eastern end of the priority area closer to the lake shore.

All aerial photographs are included in Appendix B.

4.4 Sanborn Map Review

Sanborn maps were not available for the subject property, or for the adjacent areas.

4.5 Topographic Map Review

Historical topographic maps were available from the US Geological Survey Website for the Beaver Lake area for 1900, 1901, 1945, 1949, 1954, 1957, 1958, 1964, 1985, 2011, 2014, 2017, and 2020. Several observations can be gleaned from these maps. First, the area before the lake was formed consisted of valleys with steep bluffs and hill sides around the White River and its tributaries. The historical maps show this valley and river basin from the 1900 to 1964 topographic maps. In 1985 the river and Beaver Dam at the northern end of the lake can been seen in the valley of the historical White River.

All topographic maps are included in Appendix C.

4.6 Records Review

4.6.1 Standard Environmental Record Sources

In this evaluation records, maps and other documents that provide environmental information about the project area are obtained and reviewed. A desktop records review was conducted using various sources to determine the presence of HTRW sites on or near the subject property. This search was focused on active cleanup sites and sites with a reasonable risk of HTRW release. Several databases were searched manually to narrow down the search area. These databases included the Environmental Protection Agency (EPA) Cleanups in my Community database, the EPA Envirofacts databases, the Arkansas Department of Environmental Quality's (ADEQ) web search tool of Underground Storage Tanks (UST) and Above Ground Storage Tanks (AST), and the Arkansas Department of Energy and Environment Oil and Gas Commission oil and gas well maps. The information collected from this desktop records review was analyzed for recognized environmental conditions (RECs) that would affect the proposed project or need further investigation, given the proposed project measures. The following resources were searched.

Federal National Priorities List (NPL) – The records search did not reveal any NPL sites in the project footprint or adjacent areas. There are nine NPL sites in the state of Arkansas, none of which are located near Beaver Lake or the priority areas. This is based on a search of the EPA Superfund: National Priorities List (NPL) list.

Federal Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) List – The CERCLIS, now called the Superfund Enterprise Management System (SEMS) database, tracks hazardous waste sites where remedial action has occurred under EPA's CERCLA program. This list also includes sites that are in the screening and assessment phase for possible inclusion on the NPL. The records search of EPA's listed SEMS sites did not reveal any sites in the project footprints or adjacent areas. This is based on a search of the EPA SEMS database.

Federal No Further Remedial Action Planned (NFRAP) – The Federal NFRAP list (now known as the SEMS archive list) tracks sites where no further remedial action is planned, based on available assessments and information. The list also represents sites that were not chosen for the NPL. Further EPA assessment could possibly be ongoing, and hazardous environmental conditions may still exist; however, in the absence of remedial action and assessment data, no determination about environmental hazards can be made. The records search did not reveal any NFRAP sites in the project footprint or adjacent areas. This is based on a search of the EPA SEMS database.

Federal Resource Conservation and Recovery Act (RCRA) Corrective Action List – The records search of EPAs Cleanups in My Community showed two RCRA Corrective Actions within one mile of the project search area. No RCRA corrective actions were found to be located within one mile of the project footprint. This is based on a search of the EPA Cleanups in My Community.

State Superfund Sites - This search is to check for any state CERCLA sites in the project vicinity. The records search of state CERCLA cleanup sites did not show any sites of concern in the project or adjacent areas. This search is based on a search of the Arkansas Department of Energy and Environment data base.

State and Tribal Solid Waste Facilities/Landfill Sites – This search is designed to check any state or tribal databases for solid waste handling facilities or landfills in the project vicinity. The records search did not find any solid waste facilities or landfill sites in area of this project or adjacent areas. This is based on a search of the EPA Landfill Methane Outreach Program (LMOP) and ADEQ Permitted Solid Waste Disposal database.

State and Tribal Registered Storage Tanks – This list is a combination of the State of Arkansas registered UST and AST databases, representing sites with storage tanks registered with the State of Arkansas. The search revealed one AST within one mile of the work area or adjacent areas. This AST is not expected to impact the project due to its distance from the proposed project. These results are based on a search of the Arkansas Department of Energy and Environment Oil and Gas Commission website.

State and Tribal Voluntary Cleanup Sites – The ADEQ Elective Site Cleanup Agreement (ESCA) database identifies sites where the responsible party chooses to clean up the site themselves with ADEQ oversight. Five sites were identified from this database. None of the sites are within one mile of the work area and are therefore not expected to impact the proposed project. These results are based on a search of the ADEQ ESCA Database.

Brownfields List – A brownfield is a property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. There are no brownfield sites within one mile of the work area or adjacent areas. These results are based on a search for Brownfields sites using the EPA Envirofacts search engine.

Oil and Gas Wells – A search of the oil and gas wells in the area using the Arkansas Department of Energy and Environment Oil and Gas Commission website identifies multiple sites including oil wells, plugged oil wells, injection/disposal sites within the surrounding area. Although not classified as HTRW under USACE regulations, pipelines and oil wells play an important role in the HTRW existing conditions near the potential project area. This is because the well and/or pipeline contents could potentially leak or spill into the surrounding environment or affect the proposed project features. As a result of these findings, a thorough pipeline/well search should be initiated during design to ensure no interaction with the existing oil and gas infrastructure occurs. The Oil and Gas Commission website was used to map these findings. No oil wells or pipelines were found near the priority areas.

4.7 Interviews

Two interviews were conducted on 12 and 13 July 2021 in conjunction with the site inspection, and the following stakeholders were interviewed:

- Mr. Matthew Franklin; Natural Resource Specialist, Beaver Lake Office; Matthew.G.Franklin@usace.army.mil
- Mr. Matthew Voskamp; Natural Resource Specialist, Beaver Lake Office; Matthew.Voskamp@usace.army.mil

Information gleaned from the interviews is incorporated by way of reference throughout the report. The interview questions can be found in Figure 3.

5.0 Environmental Conditions

5.1 Environmental Permits and Licenses

5.1.1 RCRA Status

The subject property is not covered under a Resource Conservation and Recovery Act (RCRA) permit, and no hazardous waste is generated or stored on the property.

5.1.2 Solid Waste

The subject property has no active, inactive, or expired permits or licenses for solid waste disposal. No landfills exist on the property.

5.1.3 USTs/ASTs

No USTs or ASTs were found during the records search, site inspection and interviews indicated no UST/AST have been known to be located at the subject property.

5.1.4 National Pollutant Discharge Elimination System (NPDES)

Section 402 of the Clean Water Act (33 U.S.C. 1251 et. seq.) requires all facilities that discharge stormwater to acquire an NPDES that defines contaminant limits in effluent to be discharged. No permits were found using the EPA's Envirofacts database on or adjacent to the priority area.

5.1.5 Drinking Water Permits

No drinking water permits are in place at the subject property.

5.1.6 Air Permits

No air emission or air quality permits are in place at the subject property.

5.1.7 Nuclear Regulatory Commission (NRC)

The NRC is tasked with permitting the use and handling of radioactive materials and reactors. No NRC licenses are in place at the subject property.

5.1.8 Other Permits/ Licenses

No other permits were found during the records search.

5.2 Environmental Cleanup and Remediation

5.2.1 Installation Restoration Program

Beaver Lake is not an active military facility, and therefore would not be eligible for cleanup under the Installation Restoration Program.

5.2.2 Military Munitions Response Program

Beaver Lake is not an active military facility, and therefore would not be eligible for cleanup under the Military Munitions Restoration Program.

5.2.3 Other Environmental Investigations and Cleanups

No known environmental investigations or cleanups were found during the records search, site inspection and interviews indicated that no known investigations or cleanups are ongoing at Beaver Lake.

5.2.4 Storage, Release, and Disposal of Hazardous Substances

No releases to the environment or improper disposal of these substances were found during the records search, site inspection and interviews indicated no known improper disposal at the priority area.

5.3 Petroleum and Petroleum Products

No releases to the environment or improper disposal of petroleum products were found during the records search, site inspection and interviews indicated no known improper disposal at the priority area.

5.4 Polychlorinated Biphenyls (PCBs)

No evidence exists of the presence of PCBs on the subject property. No PCB-containing oils were found during the records search, site inspection and interviews indicated no known PCB-containing oils have been used or stored at the priority area.

5.5 Asbestos

No asbestos assessments were found during the ECP process, none were found during the records search, site inspection and interviews indicated no known asbestos containing material has been used or stored at the priority area.

5.6 Lead and Lead-Based Paint (LBP)

No lead-based paint (LBP) assessments were found during the ECP process. No LBP was found during the records search, site inspection and interviews indicated no known improper disposal at the priority area.

5.7 Radioactive Material

No radioactive material assessments were found during the ECP process. No potentially radioactive materials were identified during the VSI, and the presence of radioactive materials on the subject property is extremely unlikely.

5.8 Landfills/Dumps

No landfills or dumps were found during the records search, site inspection or interview investigation.

5.9 Munitions and Explosives of Concern (MEC) and/or Unexploded Ordnance (UXO)

No munitions, explosives, or unexploded ordinance (UXO) were found during the records search, site inspection or interview investigation.

5.10 Radon

Beaver Lake spans across Benton, Washington and Carroll Counties. Washington County is in the Environmental Protection Agency (EPA) Radon Zone 3. Counties in Radon Zone 3 are counties with predicted average indoor radon screening levels of less than 2 pCi/L (EPA, 2018). Benton and Carroll Counties are in the EPA Radon Zone 2 with a predicted average indoor radon level between 2 and 4 pCi/L (EPA, 2018). No radon assessments were found during the records search (EPA, 2019).

5.11 Pesticides

No records were found to indicate the storage, improper use, or disposal of pesticides on the subject property.

5.12 Other Identified Concerns

No significant other concerns were found during the records search, site inspection or interviews.

5.13 National Environmental Policy Act (NEPA)

As the federal agency in charge of this project, USACE is in charge of coordinating National Environmental Policy Act (NEPA) compliance of 1969 (Public Law 91-190), the Council on Environmental Quality (CEQ) regulations (40 CFR 1500–1508), and the USACE implementing regulations, Policy and Procedures for Implementing NEPA, ER 200-2-2. As part of the records search and interview process recent NEPA documents were reviewed, including the 2018 Draft Environmental Assessment for the Beaver Lake Master Plan Revision.

5.14 Adjacent Properties

As part of the ECP process, adjacent properties are assessed for environmental conditions, and those discovered conditions are evaluated based on the potential to affect the subject property. The nearest structure to the priority area is a residence immediately adjacent to the property. The residence sits approximately 100 yards inland from the priority area. The residence is first seen in the 1994 historical aerial photographs. The adjacent properties are unlikely to pose any HTRW concerns to the priority area.

6.0 Evaluation and Conclusions

6.1 Summary of ECP

Beaver Lake currently occupies more than 38,000 acres of Federal public lands and waters. This ECP report covers a parcel of 0.70 acres located near the center of Beaver Lake on eastern shore. The subject property is on the edge of the lake and currently owned by private landowner(s). The lake is located in northwestern Arkansas, in Benton, Washington, Madison and Carroll Counties, and it is approximately 6 miles west of Eureka Springs, Arkansas. The subject property, also known as Priority Area 11, is at the end of a peninsula between Van Hollow and Rambo Creek.

This ECP report was prepared to characterize the existing environmental conditions at the subject property and is intended to be an aid in the leasing of real property. The ECP findings are based on the available sources of information concerning both past and present uses of the subject property. Information included readily available data associated with adjacent property records, aerial photography, personnel interviews, environmental programs and associated documentation, and current and historic investigations. In addition, record sources were reviewed to determine if there have been spills, leaks, discharges, leaching, underground injections, dumping, abandonments, or storage of hazardous substances or petroleum products at the installation. The VSI and interview process included inquiries and requests into the existence and availability of records that support the environmental condition of the property.

6.2 Conclusions

The subject property was classified into one of seven standard ECP area types (categories) as defined by ASTM D5746-98(2016) *Standard Classification of Environmental Condition of Property Area Types for Defense Base Closure and Realignment Facilities*. Below are the seven categories for reference.

Table 4: Definitions of ECP Categories

ECP Category	Definition
1	An area or parcel of real property where no release, or disposal of hazardous substances or petroleum products or their derivatives has occurred (including no migration of these substances from adjacent properties).
2	An area or parcel of real property where only the release or disposal of petroleum products or their derivatives has occurred.
3	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but at concentrations that do not require a removal or remedial action.
4	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, and all remedial actions necessary to protect human health and the environment have been taken.
5	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred and removal or remedial actions, or both, are under way, but all required actions have not yet been taken.

6	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but required response actions have not yet been initiated.
7	An area or parcel of real property that is unevaluated or requires additional evaluation.

Given these seven categories, the subject property is categorized below, along with the reasoning for each classification.

Table 5: Properties and ECP Categories

Acreage	ECP Category	Reasoning
0.70 ac.	1	No release or disposal of hazardous substances or petroleum products or their derivatives has occurred beyond de minimus amounts, including no migration of these substances from adjacent properties.

No release or disposal of hazardous substances or petroleum products or their derivatives has occurred beyond de minimus amounts on the subject property and no releases to the environment were observed or reported.

Asbestos assessments were not available for the subject property. It is unlikely that Asbestos Containing Material (ACM) is present but, in the future, if a building or structure will be disturbed, a licensed asbestos inspector is needed to confirm whether ACM is present or not.

7.0 Certification

I declare that, to the best of our professional knowledge and belief, we meet the definition of *Environmental professional* as defined in Part 312.10 of 40 CFR 312. We have the specific qualifications based on education, training, and experience to assess a property of the nature, history and setting of the subject property. We have developed and performed the appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312. All information/documentation provided accurately reflects the condition of the property. This report meets the DoD requirements for completion of an ECP Report.

_____ _____

Eugenia Barnes
Environmental Protection Specialist
U.S. Army Corps of Engineers
Fort Worth District

Date

_____ _____

Jennifer Jefcoat
Chemist
U.S. Army Corps of Engineers
Fort Worth District

Date

_____ _____

Hollie Eljizi
Environmental Engineer
U.S. Army Corps of Engineers
Fort Worth District

Date

8.0 References

American Society for Testing and Materials (ASTM), 2013. E1527-13, *Standard Practice for Environmental Site Assessments: Phase 1 Environmental Site Assessment Process*.

ASTM, 2016. D5746, *Standard Classification of Environmental Condition of Property Area Types for Defense Base Closure and Realignment Facilities*.

Department of the Army, 13 December 2007. Army Regulation 200-1. *Environmental Quality: Environmental Protection and Enhancement.*

Environmental Protection Agency (EPA), February 2019. *EPA Map of Radon Zones including State Radon Information and Contacts*. https://www.epa.gov/radon/find-information-about-local-radon-zones-and-state-contact-information#radonmap

Federal Emergency Management Agency (FEMA), 2019. FEMA Flood Map Service Center. https://msc.fema.gov/portal

USACE. 1993. White River Basin, Arkansas and Missouri, *Water Control Master Manual.*

USACE. 2013. Little Rock District Water Management website. Accessed at: www.swl-wc.usace.army.mil

United States Census Bureau. 2013. Easy Facts Website. Accessed at: http://www.census.gov/easystats/

USACE. 2018. Beaver Lake White River and Tributaries, *Arkansas Shoreline Management Plan.*

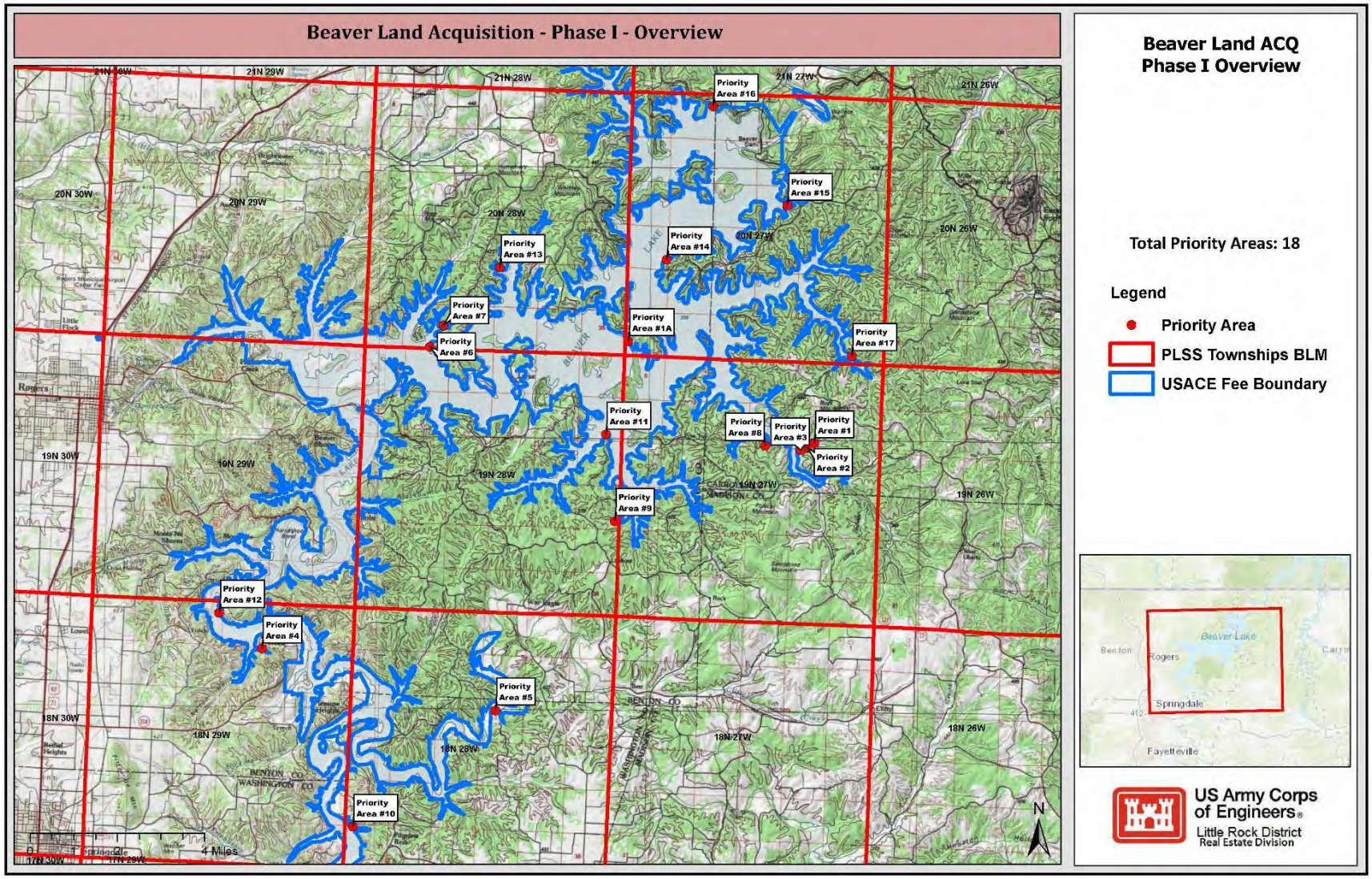
Arkansas Department of Energy and Environment Oil and Gas Commission website, accessed August 2021 at: Commission, http://www.aogc.state.ar.us/maps/googleEarth.aspx

Beaver Watershed Alliance (BWA), 2012. *Beaver Lake Watershed Protection Strategy.*

Arkansas Department of Energy and Environment, Division of Environmental Quality website, accessed August 2021 at: https://www.adeq.state.ar.us/rst/programs/fees/facility_data.aspx

Figures

Figure 1: Beaver Lake Priority Areas



ACQ = Acquisition; PLSS = Public Land Survey System; BLM = Bureau of Land Management

Figure 2: Subject Property Detail

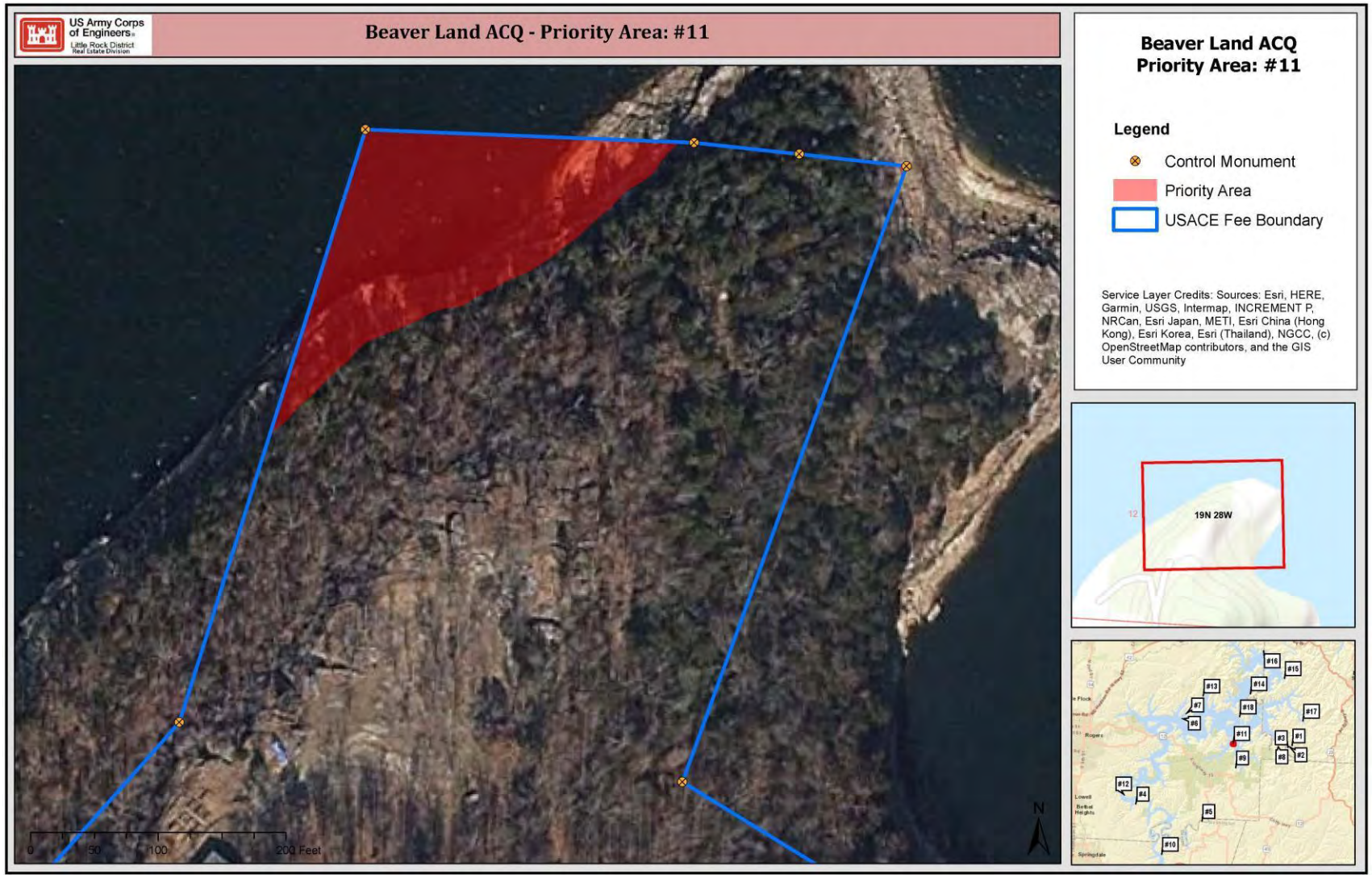


Figure 3: Interview Questions

Beaver Lake ECP
Interview Questions

1. Do you know of any environmental issues with this property?
2. Do you know of, or have access to, any reports concerning the environmental condition of this property? (i.e. site assessments, permits, storage tank registrations, safety plans, etc.) If so, would you be able to provide them? SWPPPs, SPCCs, air permits?
3. Do you know how this property has been historically used?
4. What is the property currently used for?
5. When were the site buildings constructed?
6. Are hazardous materials or petroleum products stored or used on this site? If so, what is the RCRA EPA ID? Does fueling occur on this property?
7. Do you know of any asbestos or LBP on the property or its buildings? Do you know the age of the buildings?
8. Has the site layout been manipulated in your recollection? (i.e. grading, excavation, etc.)?
9. Are there or have there been any cultural/historic items or buildings found on the property?
10. Is there anything else environmentally relevant that we should know?

Appendix A Visual Site Inspection Photographs

12 July 2021

Priority Area 11 – View of priority area from watercraft

Priority Area 11 – View of priority area from watercraft

Priority Area 11 – View of priority area from watercraft

Priority Area 11 – View of priority area from watercraft

Priority Area 11 – Good water clarity near priority area

Priority Area 11 – Fallen trees on priority area

Priority Area 11 – Fallen trees on priority area

Priority Area 11 – Debris seen at priority area

Priority Area 11 – View of priority area from watercraft

Priority Area 11 – View of priority area from watercraft

Priority Area 11 – View of priority area from watercraft

Final

U.S. Army Environmental Condition of Property Report

Beaver Lake
Beaver Lake, Arkansas
Priority Area 12

August 30, 2021

Prepared For:
Beaver Lake Land Acquisition

Prepared By:
U.S. Army Corps of Engineers
Regional Planning and Environmental Center
Fort Worth District
Fort Worth, Texas

[This page is intentionally left blank.]

Table of Contents

List of Appendices:

List of Acronyms

ACM	Asbestos-containing material
AR	Army Regulation
AST	Aboveground storage tank
ASTM	American Society for Testing and Materials
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CFR	Code of Federal Regulations
DoD	Department of Defense
ECP	Environmental Condition of Property
EDR	Environmental Data Resources
EPA	Environmental Protection Agency
ERNS	Emergency Response Notification System
FAA	Federal Aviation Administration
HTRW	Hazardous, Toxic and Radioactive Waste
IRP	Installation Restoration Program
LBP	Lead-based Paint
LUST	Leaking underground storage tank
MEC	Munitions and Explosives of Concern
NEPA	National Environmental Policy Act
NFRAP	No Further Remedial Action Planned
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NRC	Nuclear Regulatory Commission
ODEQ	Oklahoma Department of Environmental Quality
OWS	Oil-water separator
PCB	Polychlorinated Biphenyl
POL	Petroleum, Oils, and Lubricants
RCRA	Resource Conservation and Recovery Act
SEMS	Superfund Enterprise Management System
SF	Square feet
SHWS	State Hazardous Waste Sites
SWPPP	Stormwater Pollution Prevention Plan
TSD	Transport, Storage, Disposal
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
UST	Underground storage tank
UXO	Unexploded Ordnance
VCP	Voluntary Cleanup Program
VSI	Visual site inspection

1.0 Executive Summary

This environmental condition of property (ECP) report has been prepared to document the environmental conditions and provide information for the acquisition of land that would be necessary for the operation, maintenance, and control of the Beaver Lake reservoir in Arkansas. This fee acquisition pertains to the frequently inundated land immediately surrounding the lake, below an elevation of 1128 ft above mean sea level (msl). The Army prepares an ECP in order to provide the public with information relative to the environmental condition of the property, assist Federal agencies during the property screening process, provide information about completed remedial and corrective actions at the property, and to assist in determining appropriate responsibilities, asset valuation, and liabilities with other parties to a transaction.

Beaver Lake currently occupies more than 38,000 acres of Federal public lands and waters. This ECP report covers approximately 0.3 acres of land located on the southwestern edge of Beaver Lake. The subject property is on the edge of the lake and currently owned by private landowner(s). The Lake is located in northwestern Arkansas, in Benton, Washington, Madison and Carroll Counties, and it is approximately 6 miles west of Eureka Springs, Arkansas. The subject property, also known as Priority Area 12, is in the White River channel at the southwestern region of the lake.

This ECP report presents a summary of readily available information on the environmental conditions of, and concerns relative to, the land, facilities, and real property assets of Beaver Lake. The findings included in the report are based on a record search of historical environmental investigation reports and site historical documents, a review of aerial photography, stakeholder interviews, and a site inspection conducted 12 – 13 July 2021.

Based on the environmental conditions found and the ECP analysis, the property can be categorized as an ECP Category 1, indicating a site where no release, or disposal of hazardous substances or petroleum products or their derivatives has occurred (including no migration of these substances from adjacent properties).

2.0 Purpose

2.1 General

This environmental condition of property (ECP) report has been prepared to document the environmental conditions and provide information for the acquisition of land surrounding Beaver Lake in Benton, Washington, Madison and Carrol Counties, Arkansas. This report meets the requirements of Title 40, Code of Federal Regulations (CFR), Part 373, and United States Army Regulation (AR) 200-1 (2007), *Environmental Quality, Environmental Protection and Enhancement*. The ECP report also follows the American Society for Testing and Materials (ASTM) E1527-13 *Standard Practice for Environmental Site Assessments: Phase 1 Environmental Site Assessment Process*. The subject property in this report is subsequently categorized according to ASTM D5746 (2016) *Standard Classification of Environmental Condition of Property Area Types for Defense Base Closure and Realignment Facilities*.

The Army prepares an ECP for the following purposes:

- Provide the public with information relative to the environmental condition of the property.
- Assist Federal agencies during the property screening process.
- Provide information to prospective buyers.
- Provide information about completed remedial and corrective actions at the property.
- Assist in determining appropriate responsibilities, asset valuation, and liabilities with other parties to a transaction.

The ECP contains the information required to comply with the provisions of 40 CFR, Part 373 that require a notice to accompany contracts for the sale of, and deeds entered into for the transfer of, federal property on which hazardous substances may have been stored, released or disposed. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) §120(h) stipulates that a notice is required if certain quantities of designated hazardous substances have been stored on the property.

The ECP Report is not prepared to satisfy a real property purchaser's duty to conduct an "all-appropriate inquiry" to establish an "innocent purchaser defense" to CERCLA 107 liability. Any such use of the ECP Report by any party is outside the control of the Army and beyond the scope of the ECP Report. The Army, its officers, employees or contractors makes no warranties or representations that any ECP Report satisfies any such requirements for any party.

2.2 Scope

Priority Area 12 occupies approximately 0.3 acres of land. This ECP report covers 0.3 acres of land located within the southwestern region of the lake. Priority Area 12 is comprised of a USACE building and a private residence in the higher elevated area. There is access via watercraft and possibly a roadway from another part of the property. Areas within the lake that are not within the Priority Area will be considered adjacent property. A general site location map is provided in Figure 1, and a map showing the subject property is shown in Figure 2.

2.3 Limitations

This ECP report presents a summary of readily available information on the environmental conditions of, and concerns relative to, the land, facilities, and real property assets of the subject property. The findings included in the report are based on a record search of available historical environmental investigation reports and site historical documents, a review of aerial photography, stakeholder interviews, and a site reconnaissance conducted 12 – 13 July 2021. Historical environmental investigation reports and site historical documents were reviewed in support of this ECP, and the information obtained from other studies is reflected within this report by reference. The ECP process recognizes that the condition of property and classification can change as historical contamination is cleaned up (if required) or if a new

source of contamination is identified. Records reviewed during the assessment were accepted as accurate and a reasonable effort was made to resolve discrepancies identified during the document review.

During the ECP assessment, all available sources of information concerning both past and present environmentally significant uses of the property were reviewed. This included readily available data associated with adjacent property records; 1985, 1994, 2001, 2004, 2006, 2009, 2010, 2012, 2014, 2016, 2017, 2018, and 2020 aerial photography; personnel interviews; current and historic investigations; and topographical maps. In addition, record sources were reviewed to determine if there have been spills, leaks, discharges, leaching, underground injection, dumping, abandonment, or storage of hazardous substances or petroleum products at the subject property. The site reconnaissance and interview process included inquiries and requests into the existence and availability of records that support the environmental condition of the property. The site reconnaissance included a Visual Site Inspection (VSI) of the subject property. No sampling or analysis was conducted during this survey.

2.4 Report Organization

The remainder of this ECP report is organized as follows:

Section 3 – Property Description: This section provides location and description of the subject property; an overview of historical and current land uses; and a description of the environmental setting of the airport, including climate, topography, geology, and demography.

Section 4 – Survey Methodology: This section describes the methods used to obtain the information for this ECP Report such as the development of study sections, the VSI, aerial photography analysis, records review, interviews, and data management.

Section 5 – Environmental Conditions: This section provides the existing environmental information. The findings are organized by relevant environmental "issues," including permits and licenses, cleanup activities, hazardous substances, petroleum and related products, asbestos, lead-based paint (LBP), radioactive materials, landfills, explosive contaminated structures, radon, pesticides, and polychlorinated biphenyls (PCBs). This section also includes adjacent property descriptions.

Section 6 – Evaluation and Conclusions: This section provides a summary of the subject property and evaluates the property for categorization as per ASTM D5746 (2016).

Section 7 – Certification: This section documents the approval of the ECP report.

Section 8 – References: This section provides an inventory of the reference material used in the preparation of this ECP Report.

Appendices: A list of appendices is provided in the Table of Contents.

3.0 Property Description

3.1 Parcel Locations and Description

Beaver Lake is located in the scenic Ozark Mountain region of northwestern Arkansas in Benton, Washington, Carroll and Madison counties. The total area currently contained in the Beaver project, including both land and water surface, consists of 38,138 acres owned in fee. Of this total, 1,432 acres are in flowage easement. The proposed Land Acquisition would include adding any land below the 1128 msl water level. The White River drainage area above Beaver Lake is approximately 1,186 square miles. When the lake is at the top of the conservation pool (elevation 1120.43 ft msl), the water area is 28,299 surface acres with 490 miles of shoreline within the lands owned in fee. The shoreline is irregular with topography primarily consisting of steep bluffs and gentle slopes.

Priority Area 12 is a 0.30 acre triangular shaped piece of land along the lake shoreline in the southern part of the lake. The area is treed with residential structure immediately adjacent to the priority area. The subject property is on the edge of the lake and currently owned by private landowner(s).

3.2 Historic Land Use

Beaver Lake is a multiple purpose water resource development project initially authorized for flood control, hydropower generation and other beneficial uses by the Flood Control Act dated 3 September 1954. The inclusion of storage in the lake for municipal and industrial water supply was authorized by the Water Supply Act of 1958. Beaver Lake is a major component of a comprehensive plan for water resource development in the White River Basin of Arkansas and Missouri. Construction of Beaver Dam was initiated in March 1960. The dam was completed in June 1966, and the powerhouse and switchyard were completed in 1965. Beaver Lake was declared operational for public use in 1965.

The historical aerial photography shows that Priority Area 12 has been used for private residences as far back as 1994.

3.3 Current Land Use

Beaver Lake is located in the Ozark Highlands of Carroll, Washington, Benton, and Madison Counties. Having 490 miles of shoreline (at conservation pool) and over 28,000 water surface acres, Beaver Lake is the largest reservoir in northwest Arkansas and the first federal impoundment on the White River.

There are 12 public use areas around Beaver Lake. There are 11 parks on the lake presently operated by the Corps of Engineers. The State of Arkansas owns and operates Hobbs State Park Conservation Area, which covers 12,056 acres, and Devil's Eyebrow Natural Area, which covers 2,503 acres. Both properties are adjacent to USACE lands. There are two parks, Ventris, and Blue Springs that have been reduced to lake access only. One Park (Big Clifty) is operated by Carroll County, Arkansas.

Despite being located adjacent to the fast-growing communities of Fayetteville, Springdale, Bentonville, and Rogers, Arkansas and a regional population of over 500,000, the lake provides open spaces and a quality outdoor recreation opportunity. Many arms and coves of the lake offer secluded areas for traditional activities such as fishing, skiing, sailing and scuba diving, but also allow for passive recreation opportunities like photography and nature observation.

Priority Area 12 remains a residential property and is currently owned by a private landowner.

3.4 Utilities

Priority Area 12 has no known utilities.

3.5 Environmental Setting

3.5.1 Climate

The climate in the Beaver Lake area is classified as humid subtropical according to the Köppen climate model. A humid subtropical climate is characterized by hot, usually humid summers and mild to cool winters. The Köppen definition of this climate is for the coldest month's mean temperature to be between 26.6 °F (−3 °C) and 64.4 °F (18 °C), and the warmest month to be above 71.6 °F (22 °C). Some climatologists prefer to use 32 °F (0 °C) as the lower bound for the coldest month's mean temperature. Under the modern Trewartha climate classification, climates are termed Humid Subtropical when they have mean temperatures of 50 °F (10 °C) for eight or more months a year. In most locations classed within this system, the mean temperature of the coldest month is between 35 °F (3 °C) and 65 °F (18 °C). Some climatologists consider the Trewartha grouping of subtropical climates to be more real-world and fitting on a global scale.

While technically classified as humid subtropical, the climate in the Beaver Lake area is considered moderate. The area experiences all four seasons and does receive cold air masses from the north; however, some of the Arctic masses are blocked by the higher elevations of the Ozarks.

Average temperatures range from a high of 88 °F (31.1 °C) and low of 27 °F (-2.7 °C) in nearby Rogers, Arkansas. Extreme temperatures rarely exceed 96 °F (35.6 °C) and 13°F (-10.6 °C). Late summer is the time of maximum heat and least rainfall. During the winter months, midday temperatures in the basin are relatively warm, around 55 o to 60 o F. Some short periods of cold weather occur with temperature ranging from 0 o to 10 o F. On winter nights, temperatures from 37 o F to below freezing are common. Highest recorded temperature in Rogers, Arkansas was 114 °F (45.6 °C) (recorded in July 1954). The lowest temperature recorded was −16 °F (−26.7 °C), in February 1996.

The relative humidity typically ranges from 41% (comfortable) to 91% (very humid) over the course of the year, rarely dropping below 24% (dry) and reaching as high as 100% (very humid). The air is driest around April 9, at which time the relative humidity drops below 49% (comfortable) three days out of four; it is most humid around June 3, exceeding 87% (very humid) three days out of four.

Dew point is often a better measure of how comfortable a person will find the weather than relative humidity because it more directly relates to whether perspiration will evaporate from the skin, thereby cooling the body. Lower dew points feel drier and higher dew points feel more humid. Over the course of a year, the dew point typically varies from 19°F (dry) to 71°F (muggy) and is rarely below 4°F (dry) or above 74°F (very muggy). There are two periods in the year that are most comfortable: The first is between April 18 and June 6 and the second is between September 3 and October 23. The air feels neither too dry nor too muggy during these periods (https://weatherspark.com/averages/31495/Rogers-Arkansas-United-States).

Average annual rainfall for the Beaver Lake area is 45 inches per year. Precipitation is weakly seasonal, with a bimodal pattern: wet seasons in the spring and fall, and relatively drier summers and winters, but some rain in all months. The spring wet season is more pronounced than fall, with the highest rainfall typically occurring in May. The average annual snowfall for the Beaver area is about 12 inches. Snowpacks are usually short lived and are not commonly a concern for flooding.

Climate change is an area of concern due to the potential for effects on many aspects of the environment, especially those related to water resources. The U.S. Global Change Research Program (USGCRP) summarized information regarding climate change and its potential effects in regional assessments (http://www.globalchange.gov/publications/reports/scientific-assessments/us-impacts). In the Midwest, which extends from Minnesota to Missouri, extreme events such as heat waves, droughts and heavy rainfall events are projected to occur more frequently. Should these events become significant enough to impact the operation of Beaver Lake, the Master Plan and associated documents (i.e. Operations Management Plan and Shoreline Management Plan) would be reviewed and revised, if necessary.

3.5.2 Topography, Geology, and Soils

The depositional environment of the rocks found in the Arkansas Ozarks is one of a relatively shallow continental shelf, sloping toward deeper water generally toward the south. This shelf emerged many times during the Paleozoic resulting in numerous unconformities throughout the sequence. The Ozark Plateaus region of Arkansas is made up of generally flat-lying Paleozoic age strata divided into three plateau surfaces. The lowest and northern-most plateau is the Salem Plateau. The Springfield Plateau stands above the Salem a few hundred feet and is generally capped by lower Mississippian age limestones and cherts. The southernmost and highest plateau of the Ozarks is the Boston Mountains. All of these plateaus are deeply dissected by numerous streams throughout the area. The faulting in the Ozarks is generally normal; most faults displaying a displacement down on the southern side. However, some observations reveal that a few strike-slip faults may be present. Gentle folds are noted but are generally of very low amplitude. The depositional environment of the rocks found in the Arkansas Ozarks is one of a relatively shallow continental shelf, sloping toward deeper water generally toward the south.

Beaver Lake is part of the Springfield Plateau that occupies primarily the western and southwestern flanks of the Ozark Plateau province. The Springfield Plateau in this region rises to an elevation of approximately 1400 feet and in many areas, forms extensive plains. Hilly areas occur where rivers and their tributaries cut into the plateau surface, most notably in the vicinity of the White River and Beaver Lake. As streams like the Buffalo National River cut through the plateau down to the level of the White River, they sometimes carve spectacular bluffs.

Lower Ordovician, Middle to Upper Devonian and Lower and Upper Mississippian age strata are present around Beaver Lake. Upper Ordovician and Devonian strata crop out around Beaver Lake and its tributaries. The Lower Mississippian Boone Formation comprises the surface rock over the majority of the area and forms the surface of the heavily dissected Springfield Plateau. In addition to the Boone Formation, Cotter and Jefferson City formations (Jefferson City formation has not been successfully differentiated from the Cotter Formation in Arkansas), and the Powel formation, all of Ordovician age are present in the area. Formations in the Devonian strata include the Chattanooga, Clifty and Penters.

The Boone Formation consists of gray, fine- to coarse-grained fossiliferous limestone interbedded with chert. This formation caps the higher hills in the area. Since limestone is easily dissolved by water, cave and solution (karst) features are prominent. The Boone Formation is well known for dissolutional features, such as sinkholes, caves, and enlarged fissures. Surface water may drain directly into channels in limestone, where it can move rapidly and without filtration to the surface as a spring, at a location that is unpredictable without extensive testing. Therefore, water pollution problems are of particular concern in this region. The thickness of the Boone Formation is 300 to 350 feet in most of northern Arkansas, but as much as 390 feet has been reported.

The Cotter Dolomite is composed of dolostone of predominantly two types: a fine-grained, argillaceous, earthy textured, relatively soft, white to buff or gray dolostone called "cotton rock", and a more massive, medium-grained, gray dolostone that weathers to a somewhat hackly surface texture and becomes dark on exposure. The formation contains chert, some minor beds of greenish shale, and occasional thin interbedded sandstone. The thickness is about 340 feet in the vicinity of Cotter, but the interval may range up to 500 feet thick in places.

The Powell Dolomite is generally a fine-grained, light-gray to greenish-gray, limy, argillaceous dolostone with thin beds of shale, sandstone, sandy dolostone, and occasionally chert. The formation’s thickness may be as much as 215 feet but is often much thinner.

The Chattanooga Shale Formation is typically black, fissile clay shale that weathers into thin flakes. The beds are usually cut by prominent joints creating polygonal blocks upon weathering. The upper part of the

formation may be slightly sandy and usually contains abundant pyrite. Thickness ranges from 0 to about 85 feet; normally averaging about 30 feet (AGS).

The strata throughout the region are nearly horizontal. One predominant geological feature of the lake area is a low, persistent, limestone bluff, which occurs just above the Ordovician-2 Mississippian contact.

The faulting in the Ozarks is generally normal; most faults displaying a displacement down on the southern side. Lineaments and faults characteristic of northwest Arkansas are present around Beaver Lake. The Fayetteville Fault lies beneath Beaver Lake. This fault is the west side of a graben that has down-dropped the Boone Formation to lake level. The Starkey Fault bounds the east side of the graben. Both faults trend approximately N 450E. One section of the Starkey fault trends N 60-700E. The Clantonville Lineament – Monocline is a northeast to southwest trending structural feature that extends from north of Clantonville to Ventris Hollow. The location of this feature was determined from the 1:24,000 three dimensional quadrangle and from structural disparities in the Lower Mississippian rock units. This structural feature could be responsible for the presence of lead-zinc mineralization in an old prospect near Clantonville (north of Beaver Lake). The trend of this lineament to monocline is N 30-400E. Paleokarst features within the top of the Powell Dolomite are present around Beaver Lake and coincident with a lineament in Limekiln Hollow near Garfield, northwest of Beaver Lake.

In general, the soils of the Ozark Plateaus are residual and are formed on a broad, domed, upwarp consisting mostly of limestone and dolomite. The main difference in the soils is due to different rocks from which the soils were formed. The main geologic materials are cherty limestone; cherty, very siliceous dolomite; cherty, siliceous dolomite; and alluvium, which are weathered and water transported products of the first three materials. Glade-rock soil occurs where the cherty, very siliceous dolomite is exposed to the soil formation. Dolomite is more resistant to weathering than limestone and siliceous dolomite is even more resistant, so very shallow soil results. In areas where the dolomite is less siliceous, more weathering has taken place; however, the soils produced are not as deep as soils formed by limestone.

The following eight soils associations are found in and around the Beaver project area: Captina-Nixa, Captina-Nixa-Pickwick, Clarksville-Nixa-Baxter, Corydon-Sogn, Enders-Allegheny-Mountainburg, Razort-Captina-Etowah, Linker-Apison-Hector, and Captina-Pembroke.

3.5.3 Hydrology and Groundwater

In the Interior Highlands of western and northern Arkansas ground-water supplies are more limited than in the Coastal Plain. Much of the Ozark Plateaus region is underlain by carbonate rocks, which are quite soluble in the presence of water. Solution by ground water has caused many large openings through which water passes so quickly that contaminants from the surface cannot be filtered out. Signs of these openings are caves, sink holes, springs and lost stream segments. As a consequence, the water in shallow wells may not be suitable for human consumption without treatment.

Three aquifers, which are part of the Ozark Plateaus Aquifer System, are located within northern Arkansas. The Springfield Plateau aquifer is generally under unconfined conditions, with groundwater movement occurring through fractures and solution cavities formed by dissolution of carbonate rock. Local discharge is through springs and streams. The Ozark aquifer is generally under confined conditions, especially where overlain by the units of the Ozark Confining Unit (Chattanooga Shale). Most wells in the Springfield Plateau and upper units in the Ozark aquifer yield 5-10 gpm on the average, with yields greater than 25 gpm in rare cases.

The third aquifer, the Roubidoux Formation and the Gunter Sandstone Member of the Gasconade Formation in northern Arkansas occur at greater depth and constitute the only significant aquifer system in the Ozarks. Both are permeable sandstone and carbonate units of Ordovician age. These aquifers serve as the principal source of high-quality water for many communities in northern Arkansas where surface

water sources are unavailable. Together these units may yield up to 500 gpm to wells. These formations do not outcrop anywhere in Arkansas but instead outcrop in southern Missouri.

3.5.4 Water Quality

The waters of the Arkansas portion of the White River watershed have all been designated by the Arkansas Department of Environmental Quality (ADEQ) for fisheries, primary and secondary contact recreation, and domestic, agricultural, and industrial water supplies (ADEQ, 2012). Beaver Lake is classified by ADEQ as a Type A water body, which includes most larger lakes of several thousand acres in size, in upland forest dominated watersheds, having an average depth of 30 to 60 feet, and having low primary production (i.e., having a low trophic status if in natural [unpolluted] condition). Beaver Lake, like all other lakes of its size in the Ozark region, stratifies chemically and thermally in the late spring with stratification extending into late fall and early winter. During the warmer months, lake waters of the upper layer (the epilimnion) are warmer and contain more dissolved oxygen, while the denser, lower layer waters (the hypolimnion) are colder and contain very little or no dissolved oxygen, thus undesirable for fish habitat.

This undesirable water, when discharged downstream from hydropower generation, may cause some problems in the tailwaters. To combat this problem, the dissolved oxygen content is monitored, and various management measures are implemented to improve the dissolved oxygen concentration in the hydropower releases. A highly productive trout fishery has been established in the Beaver tailwaters by the Arkansas Game and Fish Commission because of the available discharge of cold water from the dam, which is reaerated by turbulence as it flows downstream.

As the stratified epilimnion cools in the late fall and winter, the layers begin to mix (de-stratify) and dissolved oxygen (DO) is more evenly distributed. This condition is more favorable to the fishery of the lake and overall water quality.

The upper 1500 acres of Beaver Lake has been listed by the Arkansas Department of Environmental Quality (ADEQ) on Arkansas' 303(d) list of impaired waters, approved by the Environmental Protection Agency (EPA), due to turbidity (ADEQ, 2008). According to the Arkansas 303(d) list, these excessive levels impact the local fisheries as well as primary contact, both designated uses of Beaver Lake. The elevated turbidity levels are due to excessive silt from surface erosion from agriculture activities, unpaved road surfaces, in-stream erosion – mainly from unstable stream banks, and any other land surface disturbing activity. The Draft 2010 Integrated Water Quality and Monitoring Report (ADEQ, 2010) added pathogen indicator bacteria as a contaminant for the same area of Beaver Lake. Surface erosion activities are listed as the probable source for this contaminant as well.

Clean Water Act requires states to list waters that do not meet Federal water quality standards or have a significant potential not to meet standards as a result of point source dischargers or non- point source run-off. Subsequent to listing on the 303(d) list, the statute requires that the states develop and set the Total Maximum Daily Load (TMDL) for water bodies on the list within 13 years. A TMDL establishes the maximum amount of a pollutant that can enter a specific water body without violating the water quality standards. Values are normally calculated amounts based on dilution and the assimilative capacity of the water body. TMDLs have not been established by ADEQ for the upper Beaver Lake area.

3.6 Biological and Cultural Resources

3.6.1 Terrestrial Ecosystems

The area surrounding Beaver Lake is mostly forested. Trees and shrubs around the lakeshore include upland oak and hickory species, persimmon, honey locust, hawthorn, dogwood, redbud, coralberry, smooth and winged sumac, and buttonbush. Frequent periods of inundation keep a thin strip of government owned lands around the lake in early stages of succession. Red cedar and short-leafed pine, the principal evergreens, are dispersed throughout the region and are found in many large, scattered groups. Ground covers consist of greenbrier, sedges, and native grasses. White-tailed deer and eastern wild turkey are common game animals found and hunted in the Beaver Lake area. Black bears have also become common in the area and are hunted on the lands around the lake. The principal small game species found in the open upland areas include bobwhite quail, cottontail rabbit, and mourning dove. Gray and fox squirrels are common in upland wooded areas. Furbearing animals found in the Beaver Lake area include coyote, red fox, gray fox, otter, mink, muskrat, beaver, bobcat, and raccoon. Habitat management that includes wildlife food plot plantings, mowing, soil disturbance, removal of exotic species and application of prescribed fire provide benefit to these populations.

The common goldeneye, hooded merganser, bufflehead, and ring-necked duck are the predominant migratory waterfowl species visiting Beaver Lake. Mallards, gadwall, and other duck species are also present; however, they are only transient visitors as their characteristic feeding habits of obtaining food from shallow waters is limited. Resident Canada geese are so numerous in many coves and recreation areas that their presence has become a nuisance.

Ring-billed gulls are seen frequently around the Beaver Lake area. Greater and lesser yellow legs, pelicans, and large flocks of horned grebes are also seen during their peak migration in the spring and fall. Beaver Lake is also one of the few places where visitors can see both the turkey vulture and the black vulture at the same time in the winter. Beaver Lake has also become a popular place that visitors come to observe bald eagles, commonly wintering 150 or more birds and hosting 5-6 breeding pairs during the nesting period of March to June. The surrounding woodlands and grasslands serve as prime nesting areas for resident and neotropical migratory songbirds.

3.6.2 Aquatic Ecosystems and Wetlands

Walleye, smallmouth bass, striped bass, hybrid white-striped bass, walleye, and paddlefish have been introduced into Beaver Lake to add diversity to the fishery. Natural reproduction of striped bass and hybrid white-striped bass does not occur in Beaver Lake. Since 2004, AGFC stocks approximately 100,000 walleye, 30,000 channel catfish, 30,000 blue catfish, and 200,000 striped bass each year. While natural reproduction occurs in white crappie, black crappie, largemouth bass, and smallmouth bass, AGFC supplements this reproduction by occasional stockings of these species. Historically, there have also been introductions of northern pike, blue catfish, lake trout, and threadfin shad.

Located within the Springfield Plateau of the Ozark Mountains region of northern Arkansas, the area surrounding Beaver Lake is characterized by limestone, dolomite, or chert geology. The many rivers and streams flowing through the region have created a landscape of level highlands dissected by rugged valleys rich in karst features such as caves and sinkholes. Associated with these streams and landscape features are a variety of wetland habitats representative of the five wetland classes occurring within the region. These wetland classes include depressions, flats, fringe, riverine, and slope. It is possible, and perhaps even likely, that all of these classes of wetlands occur in the general area of Beaver Lake. However, those most likely to occur in the area immediately surrounding the lake are fringe (most likely reservoir), riverine (most likely spring runs) and slope wetlands (most likely calcareous slope).

3.6.3 Threatened and Endangered Species

The following species listed in Table 1 are from the U.S. Fish and Wildlife Service's federally classified status list of species and the Arkansas Natural Heritage data sets which have been reported and identified on project lands. Although the bald eagle was delisted by USFWS in 2007 due to recovery of the species, both the bald and golden eagles are still protected in accordance with the Bald and Golden Eagle Protection Act. The federal Migratory Bird Treaty Act of 1918 also provides protection to certain species of migratory birds. A total of 31 bird species are currently protected under this federal statute.

Table 1: Threatened and Endangered Species

	Federal Status	**State Status/Global Rank**
Gray Bat	LE	SE / S2S3/G4
Indiana Bat	LE	SE / /S1/G2
Northern long-eared Bat	LT	SE / S1S2/ G1G2
Ozark Big-eared Bat	LT	Not listed
Little Brown Bat	-	SE / S1
Bald Eagle	*Protected under Bald and Golden Eagle Protection Act	S3B,S4N/G5
Eastern Black Rail	LT	Not listed
Piping Plover	LT	Not listed
Rufa Red Knot	LT	Not listed
Whooping Crane	Experimental Population, Non-Essential	Not listed
Ozark Cavefish	LT	SE / S1/G3
Neosho Mucket	LE	Not Listed
Rabbitsfoot mussel	LT	SE/S3/G3G4
Snuffbox Mussel	LE	Not listed
Monarch Butterfly	C	Not listed
Missouri Bladderpod	LT	S2/G3
Opaque Prairie Sedge	-	SE / S2S3G4

Yellow Coneflower	-	ST / S2G3T3
Ovate-leaf Catchfly	-	ST / S2G3
Royal Catchfly	-	ST / S2G3

FEDERAL STATUS CODES

LE = Listed Endangered; the U.S. Fish and Wildlife Service has listed this species as endangered under the Endangered Species Act.
LT = Listed Threatened; the U.S. Fish and Wildlife Service has listed this species as threatened under the Endangered Species Act.
C = Candidate Species;

STATE STATUS CODES

INV = Inventory Element; The Arkansas Natural Heritage Commission is currently conducting active inventory work on these elements. Available data suggests these elements are of conservation concern. These elements may include outstanding examples of Natural Communities, colonial bird nesting sites, outstanding scenic and geologic features as well as plants and animals, which, according to current information, may be rare, peripheral, or of an undetermined status in the state. The ANHC is gathering detailed location information on these elements.

GLOBAL RANKS

G3 = Vulnerable globally. At moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors.
G4 = Apparently secure globally. Uncommon but not rare; some cause for long-term concern due to declines or other factors.
G5 = Secure globally. Common, widespread and abundant.
T-RANKS= T subranks are given to global ranks when a subspecies, variety, or race is considered at the state level. The subrank is made up of a "T" plus a number or letter (1, 2, 3, 4, 5, H, U, X) with the same ranking rules as a full species.

STATE RANKS

S1 = Critically imperiled in the state due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors making it vulnerable to extirpation.
S2 = Imperiled in the state due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it vulnerable to extirpation.
S3 = Vulnerable in the state due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.

GENERAL RANKING NOTES

Q = A "Q" in the global rank indicates the element's taxonomic classification as a species is a matter of conjecture among scientists.

Source: Arkansas Natural Heritage Commission

3.6.4 Cultural Resources

The records search, interviews, and site inspection identified no cultural resource assessments or findings for the subject property.

During the past seventy years scientific investigation of archaeological sites in the Beaver Lake area has been carried out in several phases. In 1922 and 1923, Mark R. Harrington of Phillip Academy was the first archeologist to excavate sites on the area that is now Beaver Lake. He excavated 13 bluff shelters. Between 1928 and 1935, the work of Harrington was continued by S.C. Dellinger of the University of Arkansas Museum. Dellinger supervised the excavation of 21 rock shelters. In the early 1960's, a series of surveys were conducted by several archeologists from the University of Arkansas Museum. Today, there are 280 known archeological sites along or immediately adjacent to Beaver Lake. Of these, 271 are identified as prehistoric, seven are historic and two sites have no known cultural affiliation.

Table 2: Historical and Cultural Resources at Beaver Lake

Type of Site	Number of sites

Historic	7
Prehistoric	271
No known cultural affiliation	2
Total	280
National Register Eligibility Status	
Not Evaluated	132
Not Eligible	5
Eligible	1

4.0 Survey Methodology

4.1 Development of Study Sections

The information gathered during the development of the ECP was used to group the subject property into standardized categories using Department of Defense (DoD) guidance, and in accordance with ASTM D5746 (2016). The ECP category definitions are summarized below in Table 2.

Table 3: Definitions of ECP Categories

ECP Category	Definition
1	An area or parcel of real property where no release, or disposal of hazardous substances or petroleum products or their derivatives has occurred (including no migration of these substances from adjacent properties).
2	An area or parcel of real property where only the release or disposal of petroleum products or their derivatives has occurred.
3	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but at concentrations that do not require a removal or remedial action.
4	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, and all remedial actions necessary to protect human health and the environment have been taken.
5	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred and removal or remedial actions, or both, are under way, but all required actions have not yet been taken.
6	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but required response actions have not yet been initiated.
7	An area or parcel of real property that is unevaluated or requires additional evaluation.

The final ECP category designations for the subject property are shown in Section 6.2, Table 6.

4.2 Visual Site Inspection

A VSI was conducted on 13 July 2021 at the subject property, to check for recognized environmental conditions. The VSI was conducted by Mrs. Hollie Eljizi, Ms. Jennifer Jefcoat and Mr. Robert Singleton from the U.S. Army Corps of Engineers (USACE). USACE representatives were accompanied by Mr. Mathew Voskamp of the USACE Beaver Lake office.

The VSI was performed from a USACE Beaver Lake Office watercraft near the bank of the subject property as a Right of Entry (ROE) was not available at the time of the inspection. At the time of inspection, the lake level was at 1127 ft msl, conservation pool lake level is 1121 ft msl. This made part of the priority area under water during the VSI, however water clarity was good, and no debris or other concerns were seen in the water. At the time of inspection, minor debris could be seen from the boat

including a tent and a used rope. Parts of the had a significant bank soil erosion and other parts were rocky with fallen trees. No apparent signs of HTRW were visible during the VSI.

Photos from the VSI can be found in Appendix A.

4.3 Aerial Photography Analysis

Aerial photographs were available from Google Earth maps for 1985, 1994, 2001, 2004, 2006, 2009, 2010, 2012, 2014, 2016, 2017, 2018, and 2020.

The initial aerial photograph from 1985 is of poor quality and the area isn't discernable. The next photo from 1994 is also of poor quality, but a residence can be seen immediately adjacent to the parcel. In the next photo from 2001 an additional residence can be seen just northeast of the priority area, along with a boat dock just north of the parcel. In the next photo from 2004 the residences can be seen with more clarity, and it appears there are multiple residences in a cul-de-sac at the property northeast of the parcel. There is no change in the following photos from 2006 to 2014. In the next photo from 2016, a small residence or structure can be seen beyond the cul-de-sac, nearer to the bank north of the parcel. There are no changes in the 2018 to 2020 photos.

All aerial photographs are included in Appendix B.

4.4 Sanborn Map Review

Sanborn maps were not available for the subject property or the adjacent areas.

4.5 Topographic Map Review

Historical topographic maps were available from the US Geological Survey Website for the Beaver Lake area for EDR Report for 1900, 1901, 1945, 1949, 1954, 1957, 1958, 1964, 1985, 2011, 2014, 2017, and 2020. Several observations can be gleaned from these maps. First, the area before the lake was formed consisted of valleys with steep bluffs and hill sides around the White River and its tributaries. The historical maps show this valley and river basin from the 1900 to 1964 topographic maps. In 1985 the river and Beaver Dam at the northern end of the lake can been seen in the valley of the historical White River.

All topographic maps are included in Appendix C.

4.6 Records Review

4.6.1 Standard Environmental Record Sources

In this evaluation records, maps and other documents that provide environmental information about the project area are obtained and reviewed. A desktop records review was conducted using various sources to determine the presence of HTRW sites on or near the subject property. This search was focused on active cleanup sites and sites with a reasonable risk of HTRW release. Several databases were searched manually to narrow down the search area. These databases included the Environmental Protection Agency (EPA) Cleanups in my Community database, the EPA Envirofacts databases, the Arkansas Department of Environmental Quality's (ADEQ) web search tool of Underground Storage Tanks (UST) and Above Ground Storage Tanks (AST), and the Arkansas Department of Energy and Environment Oil and Gas Commission oil and gas well maps. The information collected from this desktop records review was analyzed for recognized environmental conditions (RECs) that would affect the proposed project or need further investigation, given the proposed project measures. The following resources were searched.

Federal National Priorities List (NPL) – The records search did not reveal any NPL sites in the project footprint or adjacent areas. There are nine NPL sites in the state of Arkansas, none of which are located

near Beaver Lake or the priority areas. This is based on a search of the EPA Superfund: National Priorities List (NPL) list.

Federal Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) List – The CERCLIS, now called the Superfund Enterprise Management System (SEMS) database, tracks hazardous waste sites where remedial action has occurred under EPA's CERCLA program. This list also includes sites that are in the screening and assessment phase for possible inclusion on the NPL. The records search of EPA's listed SEMS sites did not reveal any sites in the project footprints or adjacent areas. This is based on a search of the EPA SEMS database.

Federal No Further Remedial Action Planned (NFRAP) – The Federal NFRAP list (now known as the SEMS archive list) tracks sites where no further remedial action is planned, based on available assessments and information. The list also represents sites that were not chosen for the NPL. Further EPA assessment could possibly be ongoing, and hazardous environmental conditions may still exist; however, in the absence of remedial action and assessment data, no determination about environmental hazards can be made. The records search did not reveal any NFRAP sites in the project footprint or adjacent areas. This is based on a search of the EPA SEMS database.

Federal Resource Conservation and Recovery Act (RCRA) Corrective Action List – The records search of EPAs Cleanups in My Community showed two RCRA Corrective Actions within one mile of the project search area. No RCRA corrective actions were found to be located within one mile of the project footprint. This is based on a search of the EPA Cleanups in My Community.

State Superfund Sites - This search is to check for any state CERCLA sites in the project vicinity. The records search of state CERCLA cleanup sites did not show any sites of concern in the project or adjacent areas. This search is based on a search of the Arkansas Department of Energy and Environment data base.

State and Tribal Solid Waste Facilities/Landfill Sites – This search is designed to check any state or tribal databases for solid waste handling facilities or landfills in the project vicinity. The records search did not find any solid waste facilities or landfill sites in area of this project or adjacent areas. This is based on a search of the EPA Landfill Methane Outreach Program (LMOP) and ADEQ Permitted Solid Waste Disposal database.

State and Tribal Registered Storage Tanks – This list is a combination of the State of Arkansas registered UST and AST databases, representing sites with storage tanks registered with the State of Arkansas. The search revealed one AST within one mile of the work area or adjacent areas. This AST is not expected to impact the project due to its distance from the proposed project. These results are based on a search of the Arkansas Department of Energy and Environment Oil and Gas Commission website.

State and Tribal Voluntary Cleanup Sites – The ADEQ Elective Site Cleanup Agreement (ESCA) database identifies sites where the responsible party chooses to clean up the site themselves with ADEQ oversight. Five sites were identified from this database. None of the sites are within one mile of the work area and are therefore not expected to impact the proposed project. These results are based on a search of the ADEQ ESCA Database.

Brownfields List – A brownfield is a property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. There are no brownfield sites within one mile of the work area or adjacent areas. These results are based on a search for Brownfields sites using the EPA Envirofacts search engine.

Oil and Gas Wells – A search of the oil and gas wells in the area using the Arkansas Department of Energy and Environment Oil and Gas Commission website identifies multiple sites including oil wells, plugged oil wells, injection/disposal sites within the surrounding area. Although not classified as HTRW under USACE regulations, pipelines and oil wells play an important role in the HTRW existing conditions near the potential project area. This is because the well and/or pipeline contents could potentially leak or spill into the surrounding environment or affect the proposed project features. As a result of these findings, a thorough pipeline/well search should be initiated during design to ensure no interaction with the existing oil and gas infrastructure occurs. The Oil and Gas Commission website was used to map these findings. No oil wells or pipelines were found near the priority areas.

4.7 Interviews

Two interviews were conducted on 12 and 13 July 2021 in conjunction with the site inspection, and the following stakeholders were interviewed:

- Mr. Matthew Franklin; Natural Resource Specialist, Beaver Lake Office; Matthew.G.Franklin@usace.army.mil
- Mr. Matthew Voskamp; Natural Resource Specialist, Beaver Lake Office; Matthew.Voskamp@usace.army.mil

Information gleaned from the interviews is incorporated by way of reference throughout the report. The interview questions can be found in Figure 3.

4.8 Data Management

Data obtained during the ECP assessment were provided in electronic and/or hard copy format. A complete list of documents is provided in Section 8.0.

5.0 Environmental Conditions

5.1 Environmental Permits and Licenses

5.1.1 RCRA Status

The subject property is not covered under a Resource Conservation and Recovery Act (RCRA) permit, and no hazardous waste is generated or stored on the property.

5.1.2 Solid Waste

The subject property has no active, inactive, or expired permits or licenses for solid waste disposal. No landfills exist on the property.

5.1.3 USTs/ASTs

No USTs or ASTs were found during the records search, site inspection and interviews indicated no UST/AST have been known to be located at the subject property.

5.1.4 National Pollutant Discharge Elimination System (NPDES)

Section 402 of the Clean Water Act (33 U.S.C. 1251 et. seq.) requires all facilities that discharge stormwater to acquire an NPDES that defines contaminant limits in effluent to be discharged. No permits were found using the EPA's Envirofacts database on or adjacent to the priority area.

5.1.5 Drinking Water Permits

No drinking water permits are in place at the subject property.

5.1.6 Air Permits

No air emission or air quality permits are in place at the subject property.

5.1.7 Nuclear Regulatory Commission (NRC)

The NRC is tasked with permitting the use and handling of radioactive materials and reactors. No NRC licenses are in place at the subject property.

5.1.8 Other Permits/ Licenses

No additional environmental permits or licenses were identified during records research, interviews, or the VSI.

5.2 Environmental Cleanup and Remediation

5.2.1 Installation Restoration Program

Beaver Lake is not an active military facility, and therefore would not be eligible for cleanup under the Installation Restoration Program.

5.2.2 Military Munitions Response Program

Beaver Lake is not an active military facility, and therefore would not be eligible for cleanup under the Military Munitions Restoration Program.

5.2.3 Other Environmental Investigations and Cleanups

No known environmental investigations or cleanups were found during the records search, site inspection and interviews indicated that no known investigations or cleanups are ongoing at Beaver Lake.

5.2.4 Storage, Release, and Disposal of Hazardous Substances

No releases to the environment or improper disposal of these substances were found during the records search, site inspection and interviews indicated no known improper disposal at the priority area.

5.3 Petroleum and Petroleum Products

No releases to the environment or improper disposal of petroleum products were found during the records search, site inspection and interviews indicated no known improper disposal at the priority area.

5.4 Polychlorinated Biphenyls (PCBs)

No evidence exists of the presence of PCBs on the subject property. No PCB-containing oils were found during the records search, site inspection and interviews indicated no known PCB-containing oils have been used or stored at the priority area.

5.5 Asbestos

No asbestos assessments were found during the ECP process, none were found during the records search, site inspection and interviews indicated no known asbestos containing material has been used or stored at the priority area.

5.6 Lead and Lead-Based Paint (LBP)

No lead-based paint (LBP) assessments were found during the ECP process. No LBP was found during the records search, site inspection and interviews indicated no known improper disposal at the priority area.

5.7 Radioactive Material

No radioactive material assessments were found during the ECP process. No potentially radioactive materials were identified during the VSI, and the presence of radioactive materials on the subject property is extremely unlikely.

5.8 Landfills/Dumps

No landfills or dumps were found during the records search, site inspection or interview investigation.

5.9 Munitions and Explosives of Concern (MEC) and/or Unexploded Ordnance (UXO)

No munitions, explosives, or unexploded ordinance (UXO) were found during the records search, site inspection or interview investigation.

5.10 Radon

Beaver Lake spans across Benton, Washington and Carroll Counties. Washington County is in the Environmental Protection Agency (EPA) Radon Zone 3. Counties in Radon Zone 3 are counties with predicted average indoor radon screening levels of less than 2 pCi/L (EPA, 2018). Benton and Carroll Counties are in the EPA Radon Zone 2 with a predicted average indoor radon level between 2 and 4 pCi/L (EPA, 2018). No radon assessments were found during the records search (EPA, 2019).

5.11 Pesticides

No records were found to indicate the storage, improper use, or disposal of pesticides on the subject property.

5.12 Other Identified Concerns

No significant other concerns were found during the records search, site inspection or interviews.

5.13 National Environmental Policy Act (NEPA)

As the federal agency in charge of this project, USACE is in charge of coordinating National Environmental Policy Act (NEPA) compliance of 1969 (Public Law 91-190), the Council on Environmental Quality (CEQ) regulations (40 CFR 1500–1508), and the USACE implementing regulations, Policy and Procedures for Implementing NEPA, ER 200-2-2. As part of the records search and interview process recent NEPA documents were reviewed including the 2018 Draft Environmental Assessment for the Beaver Lake Master Plan Revision.

5.14 Adjacent Properties

As part of the ECP process, adjacent properties are assessed for environmental conditions, and those discovered conditions are evaluated based on the potential to affect the subject property. The nearest structure to the priority area is a residence approximately 95 yards east of the shore. The residence sits just above the priority area and is first seen in the 1994 historical aerial photographs. The adjacent properties are unlikely to pose any HTRW concerns to the priority area.

6.0 Evaluation and Conclusions

6.1 Summary of ECP

Beaver Lake currently occupies more than 38,000 acres of Federal public lands and waters. This ECP report covers approximately 0.3 acres of land located on the southwestern edge of Beaver Lake. The

subject property is on the edge of the lake and currently owned by private landowner(s). The lake is located in northwestern Arkansas, in Benton, Washington, Madison and Carroll Counties, and it is approximately 6 miles west of Eureka Springs, Arkansas. The subject property, also known as Priority Area 12, is in the White River channel at the southwestern region of the lake.

This ECP report was prepared to characterize the existing environmental conditions at the subject property and is intended to be an aid in the leasing of real property. The ECP findings are based on the available sources of information concerning both past and present uses of the subject property. Information included readily available data associated with adjacent property records, aerial photography, personnel interviews, environmental programs and associated documentation, and current and historic investigations. In addition, record sources were reviewed to determine if there have been spills, leaks, discharges, leaching, underground injections, dumping, abandonments, or storage of hazardous substances or petroleum products at the installation. The VSI and interview process included inquiries and requests into the existence and availability of records that support the environmental condition of the property.

6.2 Conclusions

The subject property was classified into one of seven standard ECP area types (categories) as defined by ASTM D5746-98(2016) *Standard Classification of Environmental Condition of Property Area Types for Defense Base Closure and Realignment Facilities*. Below are the seven categories for reference.

Table 4: Definitions of ECP Categories

ECP Category	Definition
1	An area or parcel of real property where no release, or disposal of hazardous substances or petroleum products or their derivatives has occurred (including no migration of these substances from adjacent properties).
2	An area or parcel of real property where only the release or disposal of petroleum products or their derivatives has occurred.
3	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but at concentrations that do not require a removal or remedial action.
4	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, and all remedial actions necessary to protect human health and the environment have been taken.
5	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred and removal or remedial actions, or both, are under way, but all required actions have not yet been taken.
6	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but required response actions have not yet been initiated.
7	An area or parcel of real property that is unevaluated or requires additional evaluation.

Given these seven categories, the subject property is categorized below, along with the reasoning for each classification.

Table 5: Properties and ECP Categories

Acreage	ECP Category	Reasoning
0.3 ac.	1	No release or disposal of hazardous substances or petroleum products or their derivatives has occurred beyond de minimus

		amounts, including no migration of these substances from adjacent properties.

No release or disposal of hazardous substances or petroleum products or their derivatives has occurred beyond de minimus amounts on the subject property and no releases to the environment were observed or reported.

Asbestos assessments were not available for the subject property. It is unlikely that Asbestos Containing Material (ACM) is present but, in the future, if a building or structure will be disturbed, a licensed asbestos inspector is needed to confirm whether ACM is present or not.

7.0 Certification

I declare that, to the best of our professional knowledge and belief, we meet the definition of *Environmental professional* as defined in Part 312.10 of 40 CFR 312. We have the specific qualifications based on education, training, and experience to assess a property of the nature, history and setting of the subject property. We have developed and performed the appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312. All information/documentation provided accurately reflects the condition of the property. This report meets the DoD requirements for completion of an ECP Report.

_____ _____

Eugenia Barnes
Environmental Protection Specialist
U.S. Army Corps of Engineers
Fort Worth District

Date

_____ _____

Hollie Eljizi
Environmental Engineer
U.S. Army Corps of Engineers
Fort Worth District

Date

_____ _____

Jennifer Jefcoat
Chemist
U.S. Army Corps of Engineers
Fort Worth District

Date

8.0 References

American Society for Testing and Materials (ASTM), 2013. E1527-13, *Standard Practice for Environmental Site Assessments: Phase 1 Environmental Site Assessment Process*.

ASTM, 2016. D5746, *Standard Classification of Environmental Condition of Property Area Types for Defense Base Closure and Realignment Facilities*.

Department of the Army, 13 December 2007. Army Regulation 200-1. *Environmental Quality: Environmental Protection and Enhancement.*

Environmental Protection Agency (EPA), February 2019. *EPA Map of Radon Zones including State Radon Information and Contacts*. https://www.epa.gov/radon/find-information-about-local-radon-zones-and-state-contact-information#radonmap

Federal Emergency Management Agency (FEMA), 2019. FEMA Flood Map Service Center. https://msc.fema.gov/portal

USACE. 1993. White River Basin, Arkansas and Missouri, *Water Control Master Manual.*

USACE. 2013. Little Rock District Water Management website. Accessed at: www.swl-wc.usace.army.mil

United States Census Bureau. 2013. Easy Facts Website. Accessed at: http://www.census.gov/easystats/

USACE. 2018. Beaver Lake White River and Tributaries, *Arkansas Shoreline Management Plan.*

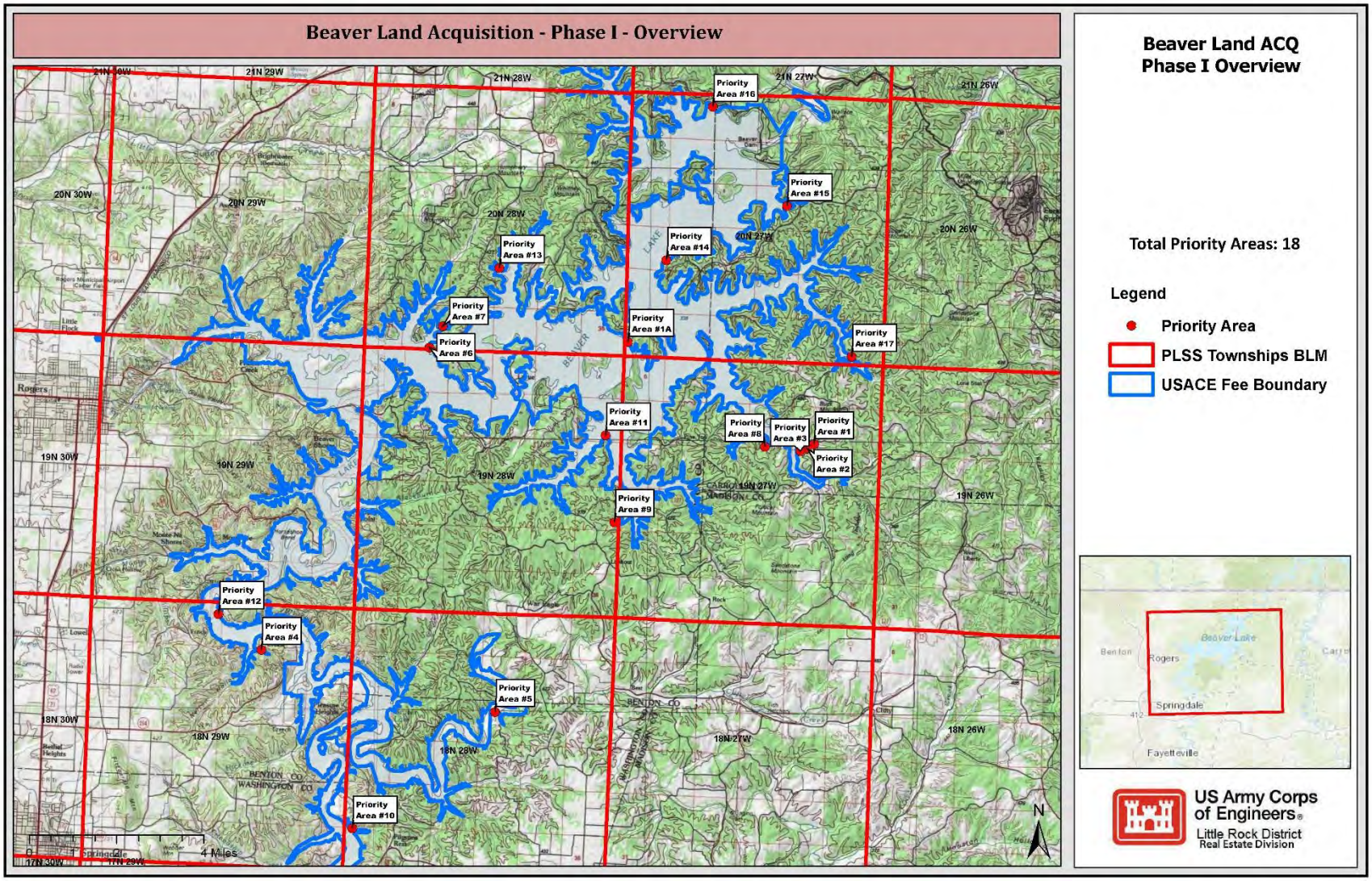
Arkansas Department of Energy and Environment Oil and Gas website Accessed August 2021 at: Commission, http://www.aogc.state.ar.us/maps/googleEarth.aspx

Beaver Watershed Alliance (BWA), 2012. *Beaver Lake Watershed Protection Strategy.*

Arkansas Department of Energy and Environment Environmental Quality website Accessed August 2021 at: https://www.adeq.state.ar.us/rst/programs/fees/facility_data.aspx

Figures

Figure 1: Beaver Lake Priority Areas



ACQ = Acquisition; PLSS = Public Land Survey System; BLM = Bureau of Land Management

Figure 2: Subject Property Detail

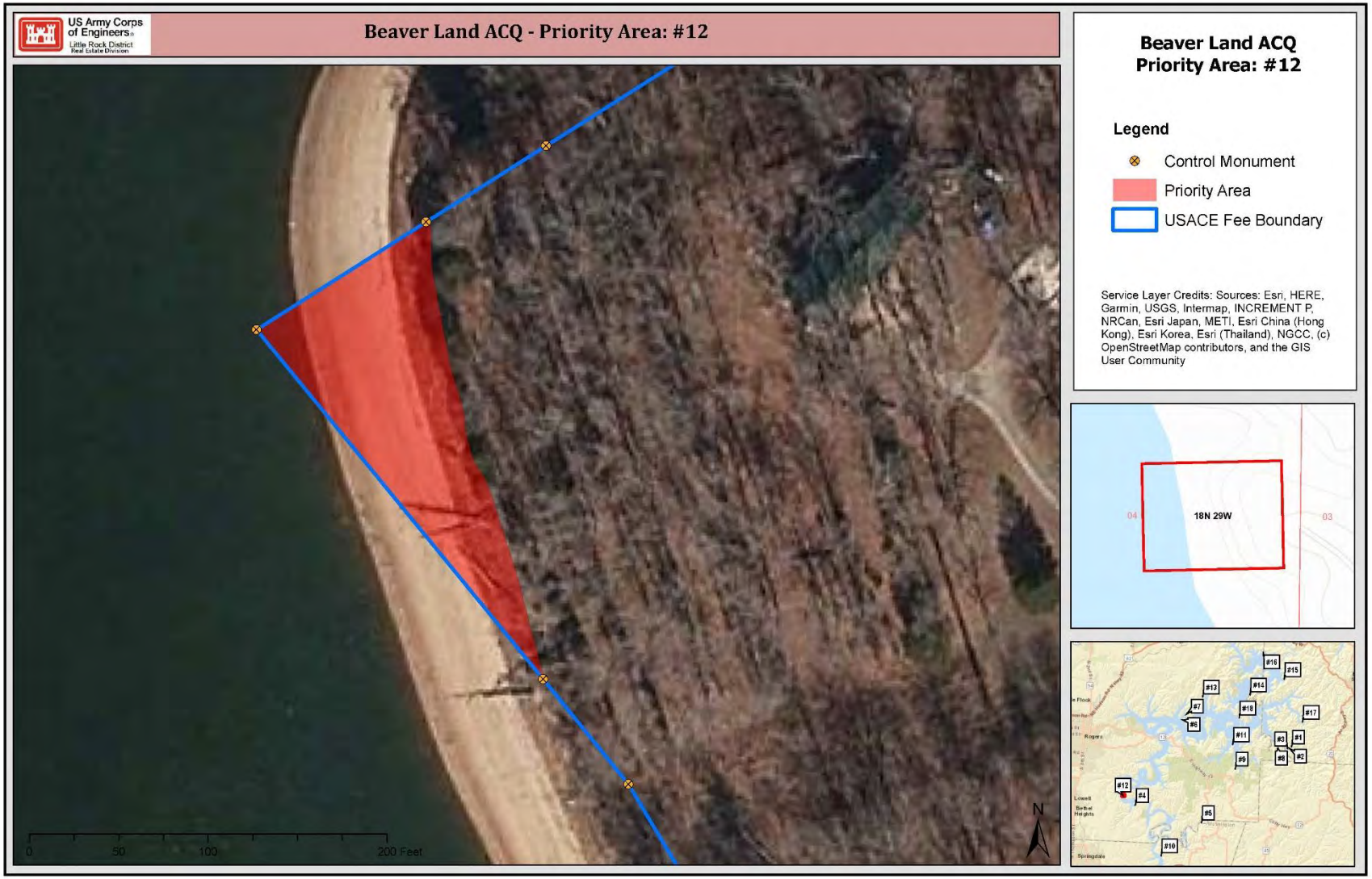


Figure 3: Interview Questions

Beaver Lake ECP
Interview Questions

1. Do you know of any environmental issues with this property?
2. Do you know of, or have access to, any reports concerning the environmental condition of this property? (i.e. site assessments, permits, storage tank registrations, safety plans, etc.) If so, would you be able to provide them? SWPPPs, SPCCs, air permits?
3. Do you know how this property has been historically used?
4. What is the property currently used for?
5. When were the site buildings constructed?
6. Are hazardous materials or petroleum products stored or used on this site? If so, what is the RCRA EPA ID? Does fueling occur on this property?
7. Do you know of any asbestos or LBP on the property or its buildings? Do you know the age of the buildings?
8. Has the site layout been manipulated in your recollection? (i.e. grading, excavation, etc.)?
9. Are there or have there been any cultural/historic items or buildings found on the property?
10. Is there anything else environmentally relevant that we should know?

Appendix A Visual Site Inspection Photographs

13 July 2021

Priority Area 12 – View of priority area shoreline

Priority Area 12 – View of priority area shoreline

Priority Area 12 – View of priority area shoreline

Priority Area 12 - USACE Marker on Priority Area property

Final

U.S. Army Environmental Condition of Property Report
Priority Area 13

Beaver Lake
Beaver Lake, Arkansas

August 30, 2021

Prepared For:
Beaver Lake Land Acquisition

Prepared By:
U.S. Army Corps of Engineers
Regional Planning and Environmental Center
Fort Worth District
Fort Worth, Texas

[This page is intentionally left blank.]

Table of Contents

List of Appendices:
Appendix A: Visual Site Inspection Photographs, 12 July 2021.
Appendix B: Historical Aerial Photography.
Appendix C: Historical Topographic Maps.

List of Acronyms

ACM	Asbestos-containing material
AR	Army Regulation
AST	Aboveground storage tank
ASTM	American Society for Testing and Materials
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CFR	Code of Federal Regulations
DoD	Department of Defense
ECP	Environmental Condition of Property
EDR	Environmental Data Resources
EPA	Environmental Protection Agency
ERNS	Emergency Response Notification System
FAA	Federal Aviation Administration
HTRW	Hazardous, Toxic and Radioactive Waste
IRP	Installation Restoration Program
LBP	Lead-based Paint
LUST	Leaking underground storage tank
MEC	Munitions and Explosives of Concern
NEPA	National Environmental Policy Act
NFRAP	No Further Remedial Action Planned
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NRC	Nuclear Regulatory Commission
ODEQ	Oklahoma Department of Environmental Quality
OWS	Oil-water separator
PCB	Polychlorinated Biphenyl
POL	Petroleum, Oils, and Lubricants
RCRA	Resource Conservation and Recovery Act
SEMS	Superfund Enterprise Management System
SF	Square feet
SHWS	State Hazardous Waste Sites
SWPPP	Stormwater Pollution Prevention Plan
TSD	Transport, Storage, Disposal
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
UST	Underground storage tank
UXO	Unexploded Ordnance
VCP	Voluntary Cleanup Program
VSI	Visual site inspection

1.0 Executive Summary

This environmental condition of property (ECP) report has been prepared to document the environmental conditions and provide information for the acquisition of land that would be necessary for the operation, maintenance, and control of the Beaver Lake reservoir in Arkansas. This fee acquisition pertains to the frequently inundated land immediately surrounding the lake, below an elevation of 1128 ft above mean sea level (msl). The Army prepares an ECP in order to provide the public with information relative to the environmental condition of the property, assist Federal agencies during the property screening process, provide information about completed remedial and corrective actions at the property, and to assist in determining appropriate responsibilities, asset valuation, and liabilities with other parties to a transaction.

Beaver Lake currently occupies more than 38,000 acres of Federal public lands and waters. This ECP report covers a 1.08 acre narrow strip of land located near the center of Beaver Lake on western shore. The subject property is on the edge of the lake and currently owned by private landowner(s). The Lake is located in northwestern Arkansas, in Benton, Washington, Madison and Carroll Counties and it is approximately 6 miles west of Eureka Springs, Arkansas. The subject property, also known as Priority Area 13, is located in the Fords Creek cove.

This ECP report presents a summary of readily available information on the environmental conditions of, and concerns relative to, the land, facilities, and real property assets of Beaver Lake. The findings included in the report are based on a record search of historical environmental investigation reports and site historical documents, a review of aerial photography, stakeholder interviews, and a site inspection conducted 12 – 13 July 2021.

Based on the environmental conditions found and the ECP analysis, the property can be categorized as an ECP Category 1, indicating a site where no release, or disposal of hazardous substances or petroleum products or their derivatives has occurred (including no migration of these substances from adjacent properties).

2.0 Purpose

2.1 General

This environmental condition of property (ECP) report has been prepared to document the environmental conditions and provide information for the acquisition of land surrounding Beaver Lake in Benton, Washington, Madison and Carrol Counties, Arkansas. This report meets the requirements of Title 40, Code of Federal Regulations (CFR), Part 373, and United States Army Regulation (AR) 200-1 (2007), *Environmental Quality, Environmental Protection and Enhancement*. The ECP report also follows the American Society for Testing and Materials (ASTM) E1527-13 *Standard Practice for Environmental Site Assessments: Phase 1 Environmental Site Assessment Process*. The subject property in this report is subsequently categorized according to ASTM D5746 (2016) *Standard Classification of Environmental Condition of Property Area Types for Defense Base Closure and Realignment Facilities*.

The Army prepares an ECP for the following purposes:

- Provide the public with information relative to the environmental condition of the property.
- Assist Federal agencies during the property screening process.
- Provide information to prospective buyers.
- Provide information about completed remedial and corrective actions at the property.
- Assist in determining appropriate responsibilities, asset valuation, and liabilities with other parties to a transaction.

The ECP contains the information required to comply with the provisions of 40 CFR, Part 373 that require a notice to accompany contracts for the sale of, and deeds entered into for the transfer of, federal property on which hazardous substances may have been stored, released or disposed. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) §120(h) stipulates that a notice is required if certain quantities of designated hazardous substances have been stored on the property.

The ECP Report is not prepared to satisfy a real property purchaser's duty to conduct an "all-appropriate inquiry" to establish an "innocent purchaser defense" to CERCLA 107 liability. Any such use of the ECP Report by any party is outside the control of the Army and beyond the scope of the ECP Report. The Army, its officers, employees, or contractors makes no warranties or representations that any ECP Report satisfies any such requirements for any party.

2.2 Scope

Priority Area 13 occupies 1.08 acres of land. This ECP report covers 1.08 acres of land located in the Fords Creek cove on Beaver Lake. Priority Area 13 is comprised of a narrow wooded strip of land. There is access via watercraft and although it wasn't explored potential terrestrial access via private Ventris Road. Areas within the lake that are not within the Priority Area will be considered adjacent property. A general site location map is provided in Figure 1, and a map showing the subject property is shown in Figure 2.

2.3 Limitations

This ECP report presents a summary of readily available information on the environmental conditions of, and concerns relative to, the land, facilities, and real property assets of the subject property. The findings included in the report are based on a record search of available historical environmental investigation reports and site historical documents, a review of aerial photography, stakeholder interviews, and a site reconnaissance conducted 12 – 13 July 2021. Historical environmental investigation reports and site historical documents were reviewed in support of this ECP, and the information obtained from other studies is reflected within this report by reference. The ECP process recognizes that the condition of property and classification can change as historical contamination is cleaned up (if required) or if a new

source of contamination is identified. Records reviewed during the assessment were accepted as accurate and a reasonable effort was made to resolve discrepancies identified during the document review.

During the ECP assessment, all available sources of information concerning both past and present environmentally significant uses of the property were reviewed. This included readily available data associated with adjacent property records; 1985, 1994, 2001, 2004, 2006, 2009, 2010, 2012, 2014, 2016, 2017, 2018, and 2020 aerial photography; personnel interviews; current and historic investigations; and topographical maps. In addition, record sources were reviewed to determine if there have been spills, leaks, discharges, leaching, underground injection, dumping, abandonment, or storage of hazardous substances or petroleum products at the subject property. The site reconnaissance and interview process included inquiries and requests into the existence and availability of records that support the environmental condition of the property. The site reconnaissance included a Visual Site Inspection (VSI) of the subject property. No sampling or analysis was conducted during this survey.

2.4 Report Organization

The remainder of this ECP report is organized as follows:

Section 3 – Property Description: This section provides location and description of the subject property; an overview of historical and current land uses; and a description of the environmental setting of the lake area, including climate, topography, geology, and demography.

Section 4 – Survey Methodology: This section describes the methods used to obtain the information for this ECP Report such as the development of study sections, the VSI, aerial photography analysis, records review, interviews, and data management.

Section 5 – Environmental Conditions: This section provides the existing environmental information. The findings are organized by relevant environmental "issues," including permits and licenses, cleanup activities, hazardous substances, petroleum and related products, asbestos, lead-based paint (LBP), radioactive materials, landfills, explosive contaminated structures, radon, pesticides, and polychlorinated biphenyls (PCBs). This section also includes adjacent property descriptions.

Section 6 – Evaluation and Conclusions: This section provides a summary of the subject property and evaluates the property for categorization as per ASTM D5746 (2016).

Section 7 – Certification: This section documents the approval of the ECP report.

Section 8 – References: This section provides an inventory of the reference material used in the preparation of this ECP Report.

Appendices: A list of appendices is provided in the Table of Contents.

3.0 Property Description

3.1 Parcel Locations and Description

Beaver Lake is located in the scenic Ozark Mountain region of northwestern Arkansas in Benton, Washington, Carroll and Madison counties. The total area currently contained in the Beaver project, including both land and water surface, consists of 38,138 acres owned in fee. Of this total, 1,432 acres are in flowage easement. The proposed Land Acquisition would include adding any land below the 1128 msl water level. The White River drainage area above Beaver Lake is approximately 1,186 square miles. When the lake is at the top of the conservation pool (elevation 1120.43 ft msl), the water area is 28,299 surface acres with 490 miles of shoreline within the lands owned in fee. The shoreline is irregular with topography primarily consisting of steep bluffs and gentle slopes.

Priority Area 13 is a long narrow strip of land in a cove of Fords Creek near the center area of the lake. The area is undisturbed forest with no structures or visible vehicle or pedestrian pathways. The subject property is on the edge of the lake and currently owned by private landowner(s).

3.2 Historic Land Use

Beaver Lake is a multiple purpose water resource development project initially authorized for flood control, hydropower generation and other beneficial uses by the Flood Control Act dated 3 September 1954. The inclusion of storage in the lake for municipal and industrial water supply was authorized by the Water Supply Act of 1958. Beaver Lake is a major component of a comprehensive plan for water resource development in the White River Basin of Arkansas and Missouri. Construction of Beaver Dam was initiated in March 1960. The dam was completed in June 1966, and the powerhouse and switchyard were completed in 1965. Beaver Lake was declared operational for public use in 1965.

The historical aerial photography shows that Priority Area 13 area has been used for private residences as far back as 2001 although no residence structures are present on or immediately adjacent to the priority area.

3.3 Current Land Use

Beaver Lake is located in the Ozark Highlands of Carroll, Washington, Benton, and Madison Counties. Having 490 miles of shoreline (at conservation pool) and over 28,000 water surface acres, Beaver Lake is the largest reservoir in northwest Arkansas and the first federal impoundment on the White River.

There are 12 public use areas around Beaver Lake. There are 11 parks on the lake presently operated by the Corps of Engineers. The State of Arkansas owns and operates Hobbs State Park Conservation Area, which covers 12,056 acres, and Devil's Eyebrow Natural Area, which covers 2,503 acres. Both properties are adjacent to USACE lands. There are two parks, Ventris, and Blue Springs that have been reduced to lake access only. One Park (Big Clifty) is operated by Carroll County, Arkansas.

Despite being located adjacent to the fast-growing communities of Fayetteville, Springdale, Bentonville, and Rogers, Arkansas and a regional population of over 500,000, the lake provides open spaces and a quality outdoor recreation opportunity. Many arms and coves of the lake offer secluded areas for traditional activities such as fishing, skiing, sailing and scuba diving, but also allow for passive recreation opportunities like photography and nature observation.

Priority Area 13 remains an undeveloped forested area currently owned by private landowners.

3.4 Utilities

Priority Area 13 has no known utilities.

3.5 Environmental Setting

3.5.1 Climate

The climate in the Beaver Lake area is classified as humid subtropical according to the Köppen climate model. A humid subtropical climate is characterized by hot, usually humid summers and mild to cool winters. The Köppen definition of this climate is for the coldest month's mean temperature to be between 26.6 °F (−3 °C) and 64.4 °F (18 °C), and the warmest month to be above 71.6 °F (22 °C). Some climatologists prefer to use 32 °F (0 °C) as the lower bound for the coldest month's mean temperature. Under the modern Trewartha climate classification, climates are termed Humid Subtropical when they have mean temperatures of 50 °F (10 °C) for eight or more months a year. In most locations classed within this system, the mean temperature of the coldest month is between 35 °F (3 °C) and 65 °F (18 °C). Some climatologists consider the Trewartha grouping of subtropical climates to be more real-world and fitting on a global scale.

While technically classified as humid subtropical, the climate in the Beaver Lake area is considered moderate. The area experiences all four seasons and does receive cold air masses from the north; however, some of the Arctic masses are blocked by the higher elevations of the Ozarks.

Average temperatures range from a high of 88 °F (31.1 °C) and low of 27 °F (-2.7 °C) in nearby Rogers, Arkansas. Extreme temperatures rarely exceed 96 °F (35.6 °C) and 13°F (-10.6 °C). Late summer is the time of maximum heat and least rainfall. During the winter months, midday temperatures in the basin are relatively warm, around 55 to 60 °F. Some short periods of cold weather occur with temperature ranging from 0°to 10°F. On winter nights, temperatures from 37 o F to below freezing are common. Highest recorded temperature in Rogers, Arkansas was 114 °F (45.6 °C) (recorded in July 1954). The lowest temperature recorded was −16 °F (−26.7 °C), in February 1996.

The relative humidity typically ranges from 41% (comfortable) to 91% (very humid) over the course of the year, rarely dropping below 24% (dry) and reaching as high as 100% (very humid). The air is driest around April 9, at which time the relative humidity drops below 49% (comfortable) three days out of four; it is most humid around June 3, exceeding 87% (very humid) three days out of four.

Dew point is often a better measure of how comfortable a person will find the weather than relative humidity because it more directly relates to whether perspiration will evaporate from the skin, thereby cooling the body. Lower dew points feel drier and higher dew points feel more humid. Over the course of a year, the dew point typically varies from 19°F (dry) to 71°F (muggy) and is rarely below 4°F (dry) or above 74°F (very muggy). There are two periods in the year that are most comfortable: The first is between April 18 and June 6 and the second is between September 3 and October 23. The air feels neither too dry nor too muggy during these periods (https://weatherspark.com/averages/31495/Rogers-Arkansas-United-States).

Average annual rainfall for the Beaver Lake area is 45 inches per year. Precipitation is weakly seasonal, with a bimodal pattern: wet seasons in the spring and fall, and relatively drier summers and winters, but some rain in all months. The spring wet season is more pronounced than fall, with the highest rainfall typically occurring in May. The average annual snowfall for the Beaver area is about 12 inches. Snowpacks are usually short lived and are not commonly a concern for flooding.

Climate change is an area of concern due to the potential for effects on many aspects of the environment, especially those related to water resources. The U.S. Global Change Research Program (USGCRP) summarized information regarding climate change and its potential effects in regional assessments (http://www.globalchange.gov/publications/reports/scientific-assessments/us-impacts). In the Midwest, which extends from Minnesota to Missouri, extreme events such as heat waves, droughts and heavy rainfall events are projected to occur more frequently. Should these events become significant enough to impact the operation of Beaver Lake, the Master Plan and associated documents (i.e. Operations Management Plan and Shoreline Management Plan) would be reviewed and revised, if necessary.

3.5.2 Topography, Geology, and Soils

The depositional environment of the rocks found in the Arkansas Ozarks is one of a relatively shallow continental shelf, sloping toward deeper water generally toward the south. This shelf emerged many times during the Paleozoic resulting in numerous unconformities throughout the sequence. The Ozark Plateaus region of Arkansas is made up of generally flat-lying Paleozoic age strata divided into three plateau surfaces. The lowest and northern-most plateau is the Salem Plateau. The Springfield Plateau stands above the Salem a few hundred feet and is generally capped by lower Mississippian age limestones and cherts. The southernmost and highest plateau of the Ozarks is the Boston Mountains. All of these plateaus are deeply dissected by numerous streams throughout the area. The faulting in the Ozarks is generally normal; most faults displaying a displacement down on the southern side. However, some observations reveal that a few strike-slip faults may be present. Gentle folds are noted but are generally of very low amplitude. The depositional environment of the rocks found in the Arkansas Ozarks is one of a relatively shallow continental shelf, sloping toward deeper water generally toward the south.

Beaver Lake is part of the Springfield Plateau that occupies primarily the western and southwestern flanks of the Ozark Plateau province. The Springfield Plateau in this region rises to an elevation of approximately 1400 feet and in many areas, forms extensive plains. Hilly areas occur where rivers and their tributaries cut into the plateau surface, most notably in the vicinity of the White River and Beaver Lake. As streams like the Buffalo National River cut through the plateau down to the level of the White River, they sometimes carve spectacular bluffs.

Lower Ordovician, Middle to Upper Devonian and Lower and Upper Mississippian age strata are present around Beaver Lake. Upper Ordovician and Devonian strata crop out around Beaver Lake and its tributaries. The Lower Mississippian Boone Formation comprises the surface rock over the majority of the area and forms the surface of the heavily dissected Springfield Plateau. In addition to the Boone Formation, Cotter and Jefferson City formations (Jefferson City formation has not been successfully differentiated from the Cotter Formation in Arkansas), and the Powel formation, all of Ordovician age are present in the area. Formations in the Devonian strata include the Chattanooga, Clifty and Penters.

The Boone Formation consists of gray, fine- to coarse-grained fossiliferous limestone interbedded with chert. This formation caps the higher hills in the area. Since limestone is easily dissolved by water, cave and solution (karst) features are prominent. The Boone Formation is well known for dissolutional features, such as sinkholes, caves, and enlarged fissures. Surface water may drain directly into channels in limestone, where it can move rapidly and without filtration to the surface as a spring, at a location that is unpredictable without extensive testing. Therefore, water pollution problems are of particular concern in this region. The thickness of the Boone Formation is 300 to 350 feet in most of northern Arkansas, but as much as 390 feet has been reported.

The Cotter Dolomite is composed of dolostone of predominantly two types: a fine-grained, argillaceous, earthy textured, relatively soft, white to buff or gray dolostone called "cotton rock", and a more massive, medium-grained, gray dolostone that weathers to a somewhat hackly surface texture and becomes dark on exposure. The formation contains chert, some minor beds of greenish shale, and occasional thin interbedded sandstone. The thickness is about 340 feet in the vicinity of Cotter, but the interval may range up to 500 feet thick in places.

The Powell Dolomite is generally a fine-grained, light-gray to greenish-gray, limy, argillaceous dolostone with thin beds of shale, sandstone, sandy dolostone, and occasionally chert. The formation’s thickness may be as much as 215 feet but is often much thinner.

The Chattanooga Shale Formation is typically black, fissile clay shale that weathers into thin flakes. The beds are usually cut by prominent joints creating polygonal blocks upon weathering. The upper part of the formation may be slightly sandy and usually contains abundant pyrite. Thickness ranges from 0 to about 85 feet; normally averaging about 30 feet (AGS).

The strata throughout the region are nearly horizontal. One predominant geological feature of the lake area is a low, persistent, limestone bluff, which occurs just above the Ordovician- Mississippian contact.

The faulting in the Ozarks is generally normal; most faults displaying a displacement down on the southern side. Lineaments and faults characteristic of northwest Arkansas are present around Beaver Lake. The Fayetteville Fault lies beneath Beaver Lake. This fault is the west side of a graben that has down-dropped the Boone Formation to lake level. The Starkey Fault bounds the east side of the graben. Both faults trend approximately N 450E. One section of the Starkey fault trends N 60-700E. The Clantonville Lineament – Monocline is a northeast to southwest trending structural feature that extends from north of Clantonville to Ventris Hollow. The location of this feature was determined from the 1:24,000 three dimensional quadrangle and from structural disparities in the Lower Mississippian rock units. This structural feature could be responsible for the presence of lead-zinc mineralization in an old prospect near Clantonville (north of Beaver Lake). The trend of this lineament to monocline is N 30-400E. Paleokarst features within the top of the Powell Dolomite are present around Beaver Lake and coincident with a lineament in Limekiln Hollow near Garfield, northwest of Beaver Lake.

In general, the soils of the Ozark Plateaus are residual and are formed on a broad, domed, upwarp consisting mostly of limestone and dolomite. The main difference in the soils is due to different rocks from which the soils were formed. The main geologic materials are cherty limestone; cherty, very siliceous dolomite; cherty, siliceous dolomite; and alluvium, which are weathered and water transported products of the first three materials. Glade-rock soil occurs where the cherty, very siliceous dolomite is exposed to the soil formation. Dolomite is more resistant to weathering than limestone and siliceous dolomite is even more resistant, so very shallow soil results. In areas where the dolomite is less siliceous, more weathering has taken place; however, the soils produced are not as deep as soils formed by limestone.

The following eight soils associations are found in and around the Beaver project area: Captina-Nixa, Captina-Nixa-Pickwick, Clarksville-Nixa-Baxter, Corydon-Sogn, Enders-Allegheny-Mountainburg, Razort-Captina-Etowah, Linker-Apison-Hector, and Captina-Pembroke.

3.5.3 Hydrology and Groundwater

In the Interior Highlands of western and northern Arkansas ground-water supplies are more limited than in the Coastal Plain. Much of the Ozark Plateaus region is underlain by carbonate rocks, which are quite soluble in the presence of water. Solution by ground water has caused many large openings through which water passes so quickly that contaminants from the surface cannot be filtered out. Signs of these openings are caves, sink holes, springs and lost stream segments. As a consequence, the water in shallow wells may not be suitable for human consumption without treatment.

Three aquifers, which are part of the Ozark Plateaus Aquifer System, are located within northern Arkansas. The Springfield Plateau aquifer is generally under unconfined conditions, with groundwater movement occurring through fractures and solution cavities formed by dissolution of carbonate rock. Local discharge is through springs and streams. The Ozark aquifer is generally under confined conditions, especially where overlain by the units of the Ozark Confining Unit (Chattanooga Shale). Most wells in the Springfield Plateau and upper units in the Ozark aquifer yield 5-10 gpm on the average, with yields greater than 25 gpm in rare cases.

The third aquifer, the Roubidoux Formation and the Gunter Sandstone Member of the Gasconade Formation in northern Arkansas occur at greater depth and constitute the only significant aquifer system in the Ozarks. Both are permeable sandstone and carbonate units of Ordovician age. These aquifers serve as the principal source of high-quality water for many communities in northern Arkansas where surface

water sources are unavailable. Together these units may yield up to 500 gpm to wells. These formations do not outcrop anywhere in Arkansas but instead outcrop in 1 southern Missouri.

3.5.4 Water Quality

The waters of the Arkansas portion of the White River watershed have all been designated by the Arkansas Department of Environmental Quality (ADEQ) for fisheries, primary and secondary contact recreation, and domestic, agricultural, and industrial water supplies (ADEQ, 2012). Beaver Lake is classified by ADEQ as a Type A water body, which includes most larger lakes of several thousand acres in size, in upland forest dominated watersheds, having an average depth of 30 to 60 feet, and having low primary production (i.e., having a low trophic status if in natural [unpolluted] condition). Beaver Lake, like all other lakes of its size in the Ozark region, stratifies chemically and thermally in the late spring with stratification extending into late fall and early winter. During the warmer months, lake waters of the upper layer (the epilimnion) are warmer and contain more dissolved oxygen, while the denser, lower layer waters (the hypolimnion) are colder and contain very little or no dissolved oxygen, thus undesirable for fish habitat.

This undesirable water, when discharged downstream from hydropower generation, may cause some problems in the tailwaters. To combat this problem, the dissolved oxygen content is monitored, and various management measures are implemented to improve the dissolved oxygen concentration in the hydropower releases. A highly productive trout fishery has been established in the Beaver tailwaters by the Arkansas Game and Fish Commission because of the available discharge of cold water from the dam, which is reaerated by turbulence as it flows downstream.

As the stratified epilimnion cools in the late fall and winter, the layers begin to mix (de-stratify) and dissolved oxygen (DO) is more evenly distributed. This condition is more favorable to the fishery of the lake and overall water quality.

The upper 1500 acres of Beaver Lake has been listed by the Arkansas Department of Environmental Quality (ADEQ) on Arkansas' 303(d) list of impaired waters, approved by the Environmental Protection Agency (EPA), due to turbidity (ADEQ, 2008). According to the Arkansas 303(d) list, these excessive levels impact the local fisheries as well as primary contact, both designated uses of Beaver Lake. The elevated turbidity levels are due to excessive silt from surface erosion from agriculture activities, unpaved road surfaces, in-stream erosion – mainly from unstable stream banks, and any other land surface disturbing activity. The Draft 2010 Integrated Water Quality and Monitoring Report (ADEQ, 2010) added pathogen indicator bacteria as a contaminant for the same area of Beaver Lake. Surface erosion activities are listed as the probable source for this contaminant as well.

Clean Water Act requires states to list waters that do not meet Federal water quality standards or have a significant potential not to meet standards as a result of point source dischargers or non- point source run-off. Subsequent to listing on the 303(d) list, the statute requires that the states develop and set the Total Maximum Daily Load (TMDL) for water bodies on the list within 13 years. A TMDL establishes the maximum amount of a pollutant that can enter a specific water body without violating the water quality standards. Values are normally calculated amounts based on dilution and the assimilative capacity of the water body. TMDLs have not been established by ADEQ for the upper Beaver Lake area.

3.6 Biological and Cultural Resources

3.6.1 Terrestrial Ecosystems

The area surrounding Beaver Lake is mostly forested. Trees and shrubs around the lakeshore include upland oak and hickory species, persimmon, honey locust, hawthorn, dogwood, redbud, coralberry, smooth and winged sumac, and buttonbush. Frequent periods of inundation keep a thin strip of government owned lands around the lake in early stages of succession. Red cedar and short-leafed pine, the principal evergreens, are dispersed throughout the region and are found in many large, scattered groups. Ground covers consist of greenbrier, sedges, and native grasses. White-tailed deer and eastern wild turkey are common game animals found and hunted in the Beaver Lake area. Black bears have also become common in the area and are hunted on the lands around the lake. The principal small game species found in the open upland areas include bobwhite quail, cottontail rabbit, and mourning dove. Gray and fox squirrels are common in upland wooded areas. Furbearing animals found in the Beaver Lake area include coyote, red fox, gray fox, otter, mink, muskrat, beaver, bobcat, and raccoon. Habitat management that includes wildlife food plot plantings, mowing, soil disturbance, removal of exotic species and application of prescribed fire provide benefit to these populations.

The common goldeneye, hooded merganser, bufflehead, and ring-necked duck are the predominant migratory waterfowl species visiting Beaver Lake. Mallards, gadwall, and other duck species are also present; however, they are only transient visitors as their characteristic feeding habits of obtaining food from shallow waters is limited. Resident Canada geese are so numerous in many coves and recreation areas that their presence has become a nuisance.

Ring-billed gulls are seen frequently around the Beaver Lake area. Greater and lesser yellow legs, pelicans, and large flocks of horned grebes are also seen during their peak migration in the spring and fall. Beaver Lake is also one of the few places where visitors can see both the turkey vulture and the black vulture at the same time in the winter. Beaver Lake has also become a popular place that visitors come to observe bald eagles, commonly wintering 150 or more birds and hosting 5-6 breeding pairs during the nesting period of March to June. The surrounding woodlands and grasslands serve as prime nesting areas for resident and neotropical migratory songbirds.

3.6.2 Aquatic Ecosystems and Wetlands

Walleye, smallmouth bass, striped bass, hybrid white-striped bass, walleye, and paddlefish have been introduced into Beaver Lake to add diversity to the fishery. Natural reproduction of striped bass and hybrid white-striped bass does not occur in Beaver Lake. Since 2004, AGFC stocks approximately 100,000 walleye, 30,000 channel catfish, 30,000 blue catfish, and 200,000 striped bass each year. While natural reproduction occurs in white crappie, black crappie, largemouth bass, and smallmouth bass, AGFC supplements this reproduction by occasional stockings of these species. Historically, there have also been introductions of northern pike, blue catfish, lake trout, and threadfin shad.

Located within the Springfield Plateau of the Ozark Mountains region of northern Arkansas, the area surrounding Beaver Lake is characterized by limestone, dolomite, or chert geology. The many rivers and streams flowing through the region have created a landscape of level highlands dissected by rugged valleys rich in karst features such as caves and sinkholes. Associated with these streams and landscape features are a variety of wetland habitats representative of the five wetland classes occurring within the region. These wetland classes include depressions, flats, fringe, riverine, and slope. It is possible, and perhaps even likely, that all of these classes of wetlands occur in the general area of Beaver Lake. However, those most likely to occur in the area immediately surrounding the lake are fringe (most likely reservoir), riverine (most likely spring runs) and slope wetlands (most likely calcareous slope).

3.6.3 Threatened and Endangered Species

The following species listed in Table 1 are from the U.S. Fish and Wildlife Service's federally classified status list of species and the Arkansas Natural Heritage data sets which have been reported and identified on project lands. Although the bald eagle was delisted by USFWS in 2007 due to recovery of the species, both the bald and golden eagles are still protected in accordance with the Bald and Golden Eagle Protection Act. The federal Migratory Bird Treaty Act of 1918 also provides protection to certain species of migratory birds. A total of 31 bird species are currently protected under this federal statute.

Table 1: Threatened and Endangered Species

	Federal Status	**State Status/Global Rank**
Gray Bat	LE	SE / S2S3/G4
Indiana Bat	LE	SE / /S1/G2
Northern long-eared Bat	LT	SE / S1S2/ G1G2
Ozark Big-eared Bat	LT	Not listed
Little Brown Bat	-	SE / S1
Bald Eagle	*Protected under Bald and Golden Eagle Protection Act	S3B,S4N/G5
Eastern Black Rail	LT	Not listed
Piping Plover	LT	Not listed
Rufa Red Knot	LT	Not listed
Whooping Crane	Experimental Population, Non-Essential	Not listed
Ozark Cavefish	LT	SE / S1/G3
Neosho Mucket	LE	Not Listed
Rabbitsfoot mussel	LT	SE/S3/G3G4
Snuffbox Mussel	LE	Not listed
Monarch Butterfly	C	Not listed
Missouri Bladderpod	LT	S2/G3
Opaque Prairie Sedge	-	SE / S2S3G4

Yellow Coneflower	-	ST / S2G3T3
Ovate-leaf Catchfly	-	ST / S2G3
Royal Catchfly	-	ST / S2G3

FEDERAL STATUS CODES

LE = Listed Endangered; the U.S. Fish and Wildlife Service has listed this species as endangered under the Endangered Species Act.
LT = Listed Threatened; the U.S. Fish and Wildlife Service has listed this species as threatened under the Endangered Species Act.
C = Candidate Species;

STATE STATUS CODES

INV = Inventory Element; The Arkansas Natural Heritage Commission is currently conducting active inventory work on these elements. Available data suggests these elements are of conservation concern. These elements may include outstanding examples of Natural Communities, colonial bird nesting sites, outstanding scenic and geologic features as well as plants and animals, which, according to current information, may be rare, peripheral, or of an undetermined status in the state. The ANHC is gathering detailed location information on these elements.

GLOBAL RANKS

G3 = Vulnerable globally. At moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors.
G4 = Apparently secure globally. Uncommon but not rare; some cause for long-term concern due to declines or other factors.
G5 = Secure globally. Common, widespread and abundant.
T-RANKS= T subranks are given to global ranks when a subspecies, variety, or race is considered at the state level. The subrank is made up of a "T" plus a number or letter (1, 2, 3, 4, 5, H, U, X) with the same ranking rules as a full species.

STATE RANKS

S1 = Critically imperiled in the state due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors making it vulnerable to extirpation.
S2 = Imperiled in the state due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it vulnerable to extirpation.
S3 = Vulnerable in the state due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.

GENERAL RANKING NOTES

Q = A "Q" in the global rank indicates the element's taxonomic classification as a species is a matter of conjecture among scientists.

Source: Arkansas Natural Heritage Commission

3.6.3 Cultural Resources

The records search, interviews, and site inspection identified no cultural resource assessments or findings for the subject property.

During the past seventy years scientific investigation of archaeological sites in the Beaver Lake area has been carried out in several phases. In 1922 and 1923, Mark R. Harrington of Phillip Academy was the first archeologist to excavate sites on the area that is now Beaver Lake. He excavated 13 bluff shelters. Between 1928 and 1935, the work of Harrington was continued by S.C. Dellinger of the University of Arkansas Museum. Dellinger supervised the excavation of 21 rock shelters. In the early 1960's, a series of surveys were conducted by several archeologists from the University of Arkansas Museum. Today, there are 280 known archeological sites along or immediately adjacent to Beaver Lake. Of these, 271 are identified as prehistoric, seven are historic and two sites have no known cultural affiliation.

Table 2: Historical and Cultural Resources at Beaver Lake

Type of Site	Number of sites
Historic	7

Prehistoric	271
No known cultural affiliation	2
Total	280
National Register Eligibility Status	
Not Evaluated	132
Not Eligible	5
Eligible	1

4.0 Survey Methodology

4.1 Development of Study Sections

The information gathered during the development of the ECP was used to group the subject property into standardized categories using Department of Defense (DoD) guidance, and in accordance with ASTM D5746 (2016). The ECP category definitions are summarized below in Table 3.

Table 3: Definitions of ECP Categories

ECP Category	Definition
1	An area or parcel of real property where no release, or disposal of hazardous substances or petroleum products or their derivatives has occurred (including no migration of these substances from adjacent properties).
2	An area or parcel of real property where only the release or disposal of petroleum products or their derivatives has occurred.
3	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but at concentrations that do not require a removal or remedial action.
4	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, and all remedial actions necessary to protect human health and the environment have been taken.
5	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred and removal or remedial actions, or both, are under way, but all required actions have not yet been taken.
6	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but required response actions have not yet been initiated.
7	An area or parcel of real property that is unevaluated or requires additional evaluation.

The final ECP category designations for the subject property are shown in Section 6.2, Table 5.

4.2 Visual Site Inspection

A VSI was conducted on 12 July 2021 at the subject property to check for recognized environmental conditions. The VSI was conducted by Mrs. Hollie Eljizi, Ms. Jennifer Jeffcoat and Mr. Robert Singleton from the U.S. Army Corps of Engineers (USACE). USACE representatives were accompanied by Mr. Mathew Voskamp of the USACE Beaver Lake office.

The VSI was performed from a USACE Beaver Lake Office watercraft near the bank of the subject property as a Right of Entry (ROE) was not available at the time of the inspection. At the time of inspection, the lake level was at 1127 ft msl, conservation pool lake level is 1121 ft msl. This made part of the priority area under water during the VSI, however water clarity was good, and no debris or other concerns were seen in the water. The shoreline was treed and rocky with a slight slope into the lake. Dead

tree trunks remained in the water near the shoreline left from when the lake was commissioned. No apparent signs of Hazardous, Toxic and Radioactive Waste (HTRW) were visible during the VSI.

Photos from the VSI can be found in Appendix A.

4.3 Aerial Photography Analysis

Aerial photographs were available from Google Earth maps for 1985, 1994, 2001, 2004, 2006, 2009, 2010, 2012, 2014, 2016, 2017, 2018, and 2020.

The initial aerial photograph from 1985 is of poor quality and the area isn't discernable. The next photo from 1994 is also of poor quality, but it appears that a small boat dock is located in the priority area boundaries. In the next photo from 2001 the small boat dock is no longer there and there are two small docks on the opposite side of the cove from the parcel. There is no change in the photos from 2004 to 2020.

All aerial photographs are included in Appendix A.

4.4 Sanborn Map Review

Sanborn maps were not available for the subject property, or for the adjacent areas.

4.5 Topographic Map Review

Historical topographic maps were available from the US Geological Survey Website for the Beaver Lake area for 1900, 1901, 1945, 1949, 1954, 1957, 1958, 1964, 1985, 2011, 2014, 2017, and 2020. Several observations can be gleaned from these maps. First, the area before the lake was formed consisted of valleys with steep bluffs and hill sides around the White River and its tributaries. The historical maps show this valley and river basin from the 1900 to 1964 topographic maps. In 1985 the river and Beaver Dam at the northern end of the lake can been seen in the valley of the historical White River.

All topographic maps are included in Appendix C.

4.6 Records Review

1.1.1 Standard Environmental Record Sources

In this evaluation records, maps and other documents that provide environmental information about the project area are obtained and reviewed. A desktop records review was conducted using various sources to determine the presence of HTRW sites on or near the subject property. This search was focused on active cleanup sites and sites with a reasonable risk of HTRW release. Several databases were searched manually to narrow down the search area. These databases included the Environmental Protection Agency (EPA) Cleanups in my Community database, the EPA Envirofacts databases, the Arkansas Department of Environmental Quality's (ADEQ) web search tool of Underground Storage Tanks (UST) and Above Ground Storage Tanks (AST), and the Arkansas Department of Energy and Environment Oil and Gas Commission oil and gas well maps. The information collected from this desktop records review was analyzed for recognized environmental conditions (RECs) that would affect the proposed project or need further investigation, given the proposed project measures. The following resources were searched.

Federal National Priorities List (NPL) – The records search did not reveal any NPL sites in the project footprint or adjacent areas. There are nine NPL sites in the state of Arkansas, none of which are located near Beaver Lake or the priority areas. This is based on a search of the EPA Superfund: National Priorities List (NPL) list.

Federal Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) List – The CERCLIS, now called the Superfund Enterprise Management System (SEMS)

database, tracks hazardous waste sites where remedial action has occurred under EPA's CERCLA program. This list also includes sites that are in the screening and assessment phase for possible inclusion on the NPL. The records search of EPA's listed SEMS sites did not reveal any sites in the project footprints or adjacent areas. This is based on a search of the EPA SEMS database.

Federal No Further Remedial Action Planned (NFRAP) – The Federal NFRAP list (now known as the SEMS archive list) tracks sites where no further remedial action is planned, based on available assessments and information. The list also represents sites that were not chosen for the NPL. Further EPA assessment could possibly be ongoing, and hazardous environmental conditions may still exist; however, in the absence of remedial action and assessment data, no determination about environmental hazards can be made. The records search did not reveal any NFRAP sites in the project footprint or adjacent areas. This is based on a search of the EPA SEMS database.

Federal Resource Conservation and Recovery Act (RCRA) Corrective Action List – The records search of EPAs Cleanups in My Community showed two RCRA Corrective Actions within one mile of the project search area. No RCRA corrective actions were found to be located within one mile of the project footprint. This is based on a search of the EPA Cleanups in My Community.

State Superfund Sites - This search is to check for any state CERCLA sites in the project vicinity. The records search of state CERCLA cleanup sites did not show any sites of concern in the project or adjacent areas. This search is based on a search of the Arkansas Department of Energy and Environment data base.

State and Tribal Solid Waste Facilities/Landfill Sites – This search is designed to check any state or tribal databases for solid waste handling facilities or landfills in the project vicinity. The records search did not find any solid waste facilities or landfill sites in area of this project or adjacent areas. This is based on a search of the EPA Landfill Methane Outreach Program (LMOP) and ADEQ Permitted Solid Waste Disposal database.

State and Tribal Registered Storage Tanks – This list is a combination of the State of Arkansas registered UST and AST databases, representing sites with storage tanks registered with the State of Arkansas. The search revealed one AST within one mile of the work area or adjacent areas. This AST is not expected to impact the project due to its distance from the proposed project. These results are based on a search of the Arkansas Department of Energy and Environment Oil and Gas Commission website.

State and Tribal Voluntary Cleanup Sites – The ADEQ Elective Site Cleanup Agreement (ESCA) database identifies sites where the responsible party chooses to clean up the site themselves with ADEQ oversight. Five sites were identified from this database. None of the sites are within one mile of the work area and are therefore not expected to impact the proposed project. These results are based on a search of the ADEQ ESCA Database.

Brownfields List – A brownfield is a property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. There are no brownfield sites within one mile of the work area or adjacent areas. These results are based on a search for Brownfields sites using the EPA Envirofacts search engine.

Oil and Gas Wells – A search of the oil and gas wells in the area using the Arkansas Department of Energy and Environment Oil and Gas Commission website identifies multiple sites including oil wells, plugged oil wells, injection/disposal sites within the surrounding area. Although not classified as HTRW under USACE regulations, pipelines and oil wells play an important role in the HTRW existing

conditions near the potential project area. This is because the well and/or pipeline contents could potentially leak or spill into the surrounding environment or affect the proposed project features. As a result of these findings, a thorough pipeline/well search should be initiated during design to ensure no interaction with the existing oil and gas infrastructure occurs. The Oil and Gas Commission website was used to map these findings. No oil wells or pipelines were found near the priority areas.

4.7 Interviews

Two interviews were conducted on 12 and 13 July 2021 in conjunction with the site inspection, and the following stakeholders were interviewed:

- Mr. Matthew Franklin; Natural Resource Specialist, Beaver Lake Office; Matthew.G.Franklin@usace.army.mil
- Mr. Matthew Voskamp; Natural Resource Specialist, Beaver Lake Office; Matthew.Voskamp@usace.army.mil

Information gleaned from the interviews is incorporated by way of reference throughout the report. The interview questions can be found in Figure 3.

5.0 Environmental Conditions

5.1 Environmental Permits and Licenses

5.1.1 RCRA Status

The subject property is not covered under a Resource Conservation and Recovery Act (RCRA) permit, and no hazardous waste is generated or stored on the property.

5.1.2 Solid Waste

The subject property has no active, inactive, or expired permits or licenses for solid waste disposal. No landfills exist on the property.

5.1.3 USTs/ASTs

No USTs or ASTs were found during the records search, site inspection and interviews indicated no UST/AST have been known to be located at the subject property.

5.1.4 National Pollutant Discharge Elimination System (NPDES)

Section 402 of the Clean Water Act (33 U.S.C. 1251 et. seq.) requires all facilities that discharge stormwater to acquire an NPDES that defines contaminant limits in effluent to be discharged. No permits were found using the EPA's Envirofacts database on or adjacent to the priority area.

5.1.5 Drinking Water Permits

No drinking water permits are in place at the subject property.

5.1.6 Air Permits

No air emission or air quality permits are in place at the subject property.

5.1.7 Nuclear Regulatory Commission (NRC)

The NRC is tasked with permitting the use and handling of radioactive materials and reactors. No NRC licenses are in place at the subject property.

5.1.8 Other Permits/ Licenses

No other permits were found during the records search.

5.2 Environmental Cleanup and Remediation

5.2.1 Installation Restoration Program

Beaver Lake is not an active military facility, and therefore would not be eligible for cleanup under the Installation Restoration Program.

5.2.2 Military Munitions Response Program

Beaver Lake is not an active military facility, and therefore would not be eligible for cleanup under the Military Munitions Restoration Program.

5.2.3 Other Environmental Investigations and Cleanups

No known environmental investigations or cleanups were found during the records search, site inspection and interviews indicated that no known investigations or cleanups are ongoing at Beaver Lake.

5.2.4 Storage, Release, and Disposal of Hazardous Substances

No releases to the environment or improper disposal of these substances were found during the records search, site inspection and interviews indicated no known improper disposal at the priority area.

5.3 Petroleum and Petroleum Products

No releases to the environment or improper disposal of petroleum products were found during the records search, site inspection and interviews indicated no known improper disposal at the priority area.

5.4 Polychlorinated Biphenyls (PCBs)

No evidence exists of the presence of PCBs on the subject property. No PCB-containing oils were found during the records search, site inspection and interviews indicated no known PCB-containing oils have been used or stored at the priority area.

5.5 Asbestos

No asbestos assessments were found during the ECP process, none were found during the records search, site inspection and interviews indicated no known asbestos containing material has been used or stored at the priority area.

5.6 Lead and Lead-Based Paint (LBP)

No lead-based paint (LBP) assessments were found during the ECP process. No LBP was found during the records search, site inspection and interviews indicated no known improper disposal at the priority area.

5.7 Radioactive Material

No radioactive material assessments were found during the ECP process. No potentially radioactive materials were identified during the VSI, and the presence of radioactive materials on the subject property is extremely unlikely.

5.8 Landfills/Dumps

No landfills or dumps were found during the records search, site inspection or interview investigation.

5.9 Munitions and Explosives of Concern (MEC) and/or Unexploded Ordnance (UXO)

No munitions, explosives, or unexploded ordinance (UXO) were found during the records search, site inspection or interview investigation.

5.10 Radon

Beaver Lake spans across Benton, Washington and Carroll Counties. Washington County is in the Environmental Protection Agency (EPA) Radon Zone 3. Counties in Radon Zone 3 are counties with predicted average indoor radon screening levels of less than 2 pCi/L (EPA, 2018). Benton and Carroll Counties are in the EPA Radon Zone 2 with a predicted average indoor radon level between 2 and 4 pCi/L (EPA, 2018). No radon assessments were found during the records search (EPA, 2019).

5.11 Pesticides

No records were found to indicate the storage, improper use, or disposal of pesticides on the subject property.

5.12 Other Identified Concerns

No significant other concerns were found during the records search, site inspection or interviews.

5.13 National Environmental Policy Act (NEPA)

As the federal agency in charge of this project, USACE is in charge of coordinating National Environmental Policy Act (NEPA) compliance of 1969 (Public Law 91-190), the Council on Environmental Quality (CEQ) regulations (40 CFR 1500–1508), and the USACE implementing regulations, Policy and Procedures for Implementing NEPA, ER 200-2-2. As part of the records search and interview process recent NEPA documents were reviewed including the 2018 Draft Environmental Assessment for the Beaver Lake Master Plan Revision.

5.14 Adjacent Properties

As part of the ECP process, adjacent properties are assessed for environmental conditions, and those discovered conditions are evaluated based on the potential to affect the subject property. There are no structures immediately adjacent to the priority area. The nearest structure is approximately 0.15 miles southwest on the opposite side of the cove from the subject property. The residence is first seen in the 1994 historical aerial photographs. The adjacent properties are unlikely to pose any HTRW concerns to the priority area.

6.0 Evaluation and Conclusions

6.1 Summary of ECP

Beaver Lake currently occupies more than 38,000 acres of Federal public lands and waters. This ECP report covers a 1.08 acre narrow strip of land located near the center of Beaver Lake on western shore. The subject property is on the edge of the lake and currently owned by private landowner(s). The lake is located in northwestern Arkansas, in Benton, Washington, Madison and Carroll Counties, and it is approximately 6 miles west of Eureka Springs, Arkansas. The subject property, also known as Priority Area 13, is located in the Fords Creek cove.

This ECP report was prepared to characterize the existing environmental conditions at the subject property and is intended to be an aid in the leasing of real property. The ECP findings are based on the available sources of information concerning both past and present uses of the subject property.

Information included readily available data associated with adjacent property records, aerial photography, personnel interviews, environmental programs and associated documentation, and current and historic investigations. In addition, record sources were reviewed to determine if there have been spills, leaks, discharges, leaching, underground injections, dumping, abandonments, or storage of hazardous substances or petroleum products at the installation. The VSI and interview process included inquiries and requests into the existence and availability of records that support the environmental condition of the property.

6.2 Conclusions

The subject property was classified into one of seven standard ECP area types (categories) as defined by ASTM D5746-98(2016) *Standard Classification of Environmental Condition of Property Area Types for Defense Base Closure and Realignment Facilities*. Below are the seven categories for reference.

Table 4: Definitions of ECP Categories

ECP Category	Definition
1	An area or parcel of real property where no release, or disposal of hazardous substances or petroleum products or their derivatives has occurred (including no migration of these substances from adjacent properties).
2	An area or parcel of real property where only the release or disposal of petroleum products or their derivatives has occurred.
3	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but at concentrations that do not require a removal or remedial action.
4	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, and all remedial actions necessary to protect human health and the environment have been taken.
5	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred and removal or remedial actions, or both, are under way, but all required actions have not yet been taken.
6	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but required response actions have not yet been initiated.
7	An area or parcel of real property that is unevaluated or requires additional evaluation.

Given these seven categories, the subject property is categorized below, along with the reasoning for each classification.

Table 5: Properties and ECP Categories

Acreage	ECP Category	Reasoning
1.08 ac.	1	No release or disposal of hazardous substances or petroleum products or their derivatives has occurred beyond de minimus amounts, including no migration of these substances from adjacent properties.

No release or disposal of hazardous substances or petroleum products or their derivatives has occurred beyond de minimus amounts on the subject property and no releases to the environment were observed or reported.

Asbestos assessments were not available for the subject property. It is unlikely that Asbestos Containing Material (ACM) is present but, in the future, if a building or structure will be disturbed, a licensed asbestos inspector is needed to confirm whether ACM is present or not.

7.0 Certification

I declare that, to the best of our professional knowledge and belief, we meet the definition of *Environmental professional* as defined in Part 312.10 of 40 CFR 312. We have the specific qualifications based on education, training, and experience to assess a property of the nature, history and setting of the subject property. We have developed and performed the appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312. All information/documentation provided accurately reflects the condition of the property. This report meets the DoD requirements for completion of an ECP Report.

_____ _____

Eugenia Barnes
Environmental Protection Specialist
U.S. Army Corps of Engineers
Fort Worth District

Date

_____ _____

Hollie Eljizi
Environmental Engineer
U.S. Army Corps of Engineers
Fort Worth District

Date

_____ _____

Jennifer Jefcoat
Chemist
U.S. Army Corps of Engineers
Fort Worth District

Date

8.0 References

American Society for Testing and Materials (ASTM), 2013. E1527-13, *Standard Practice for Environmental Site Assessments: Phase 1 Environmental Site Assessment Process*.

ASTM, 2016. D5746, *Standard Classification of Environmental Condition of Property Area Types for Defense Base Closure and Realignment Facilities*.

Department of the Army, 13 December 2007. Army Regulation 200-1. *Environmental Quality: Environmental Protection and Enhancement.*

Environmental Protection Agency (EPA), February 2019. *EPA Map of Radon Zones including State Radon Information and Contacts*. https://www.epa.gov/radon/find-information-about-local-radon-zones-and-state-contact-information#radonmap

Federal Emergency Management Agency (FEMA), 2019. FEMA Flood Map Service Center. https://msc.fema.gov/portal

USACE. 1993. White River Basin, Arkansas and Missouri, *Water Control Master Manual.*

USACE. 2013. Little Rock District Water Management website. Accessed at: www.swl-wc.usace.army.mil

United States Census Bureau. 2013. Easy Facts Website. Accessed at: http://www.census.gov/easystats/

USACE. 2018. Beaver Lake White River and Tributaries, *Arkansas Shoreline Management Plan.*

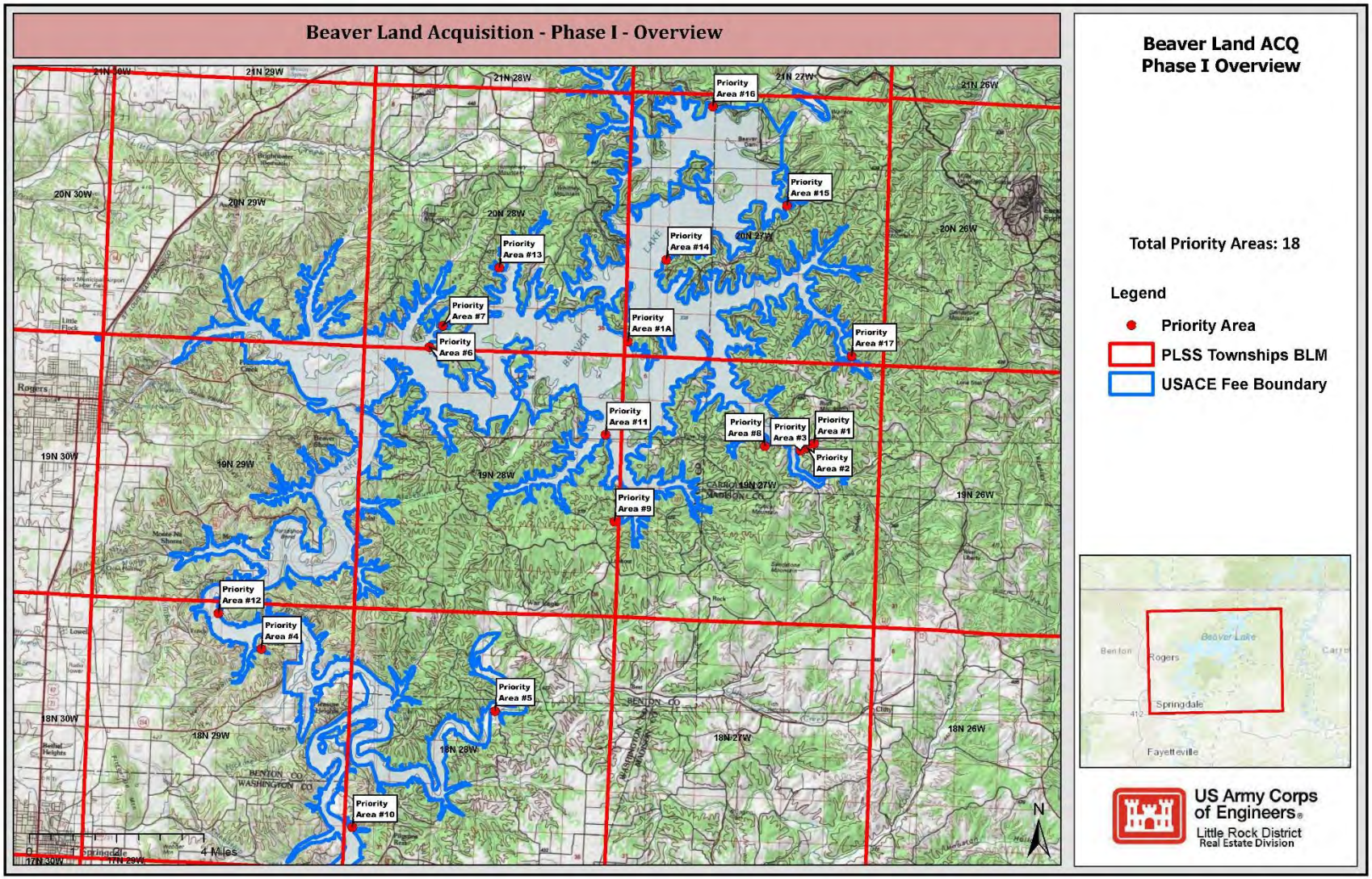
Arkansas Department of Energy and Environment Oil and Gas Commission website accessed August 2021 at: Commission, http://www.aogc.state.ar.us/maps/googleEarth.aspx

Beaver Watershed Alliance (BWA), 2012. *Beaver Lake Watershed Protection Strategy.*

Arkansas Department of Energy and Environment, Division of Environmental Quality website accessed August 2021 at: https://www.adeq.state.ar.us/rst/programs/fees/facility_data.aspx

Figures

Figure 1: Beaver Lake Priority Areas



ACQ = Acquisition; PLSS = Public Land Survey System; BLM = Bureau of Land Management

Figure 2: Subject Property Detail

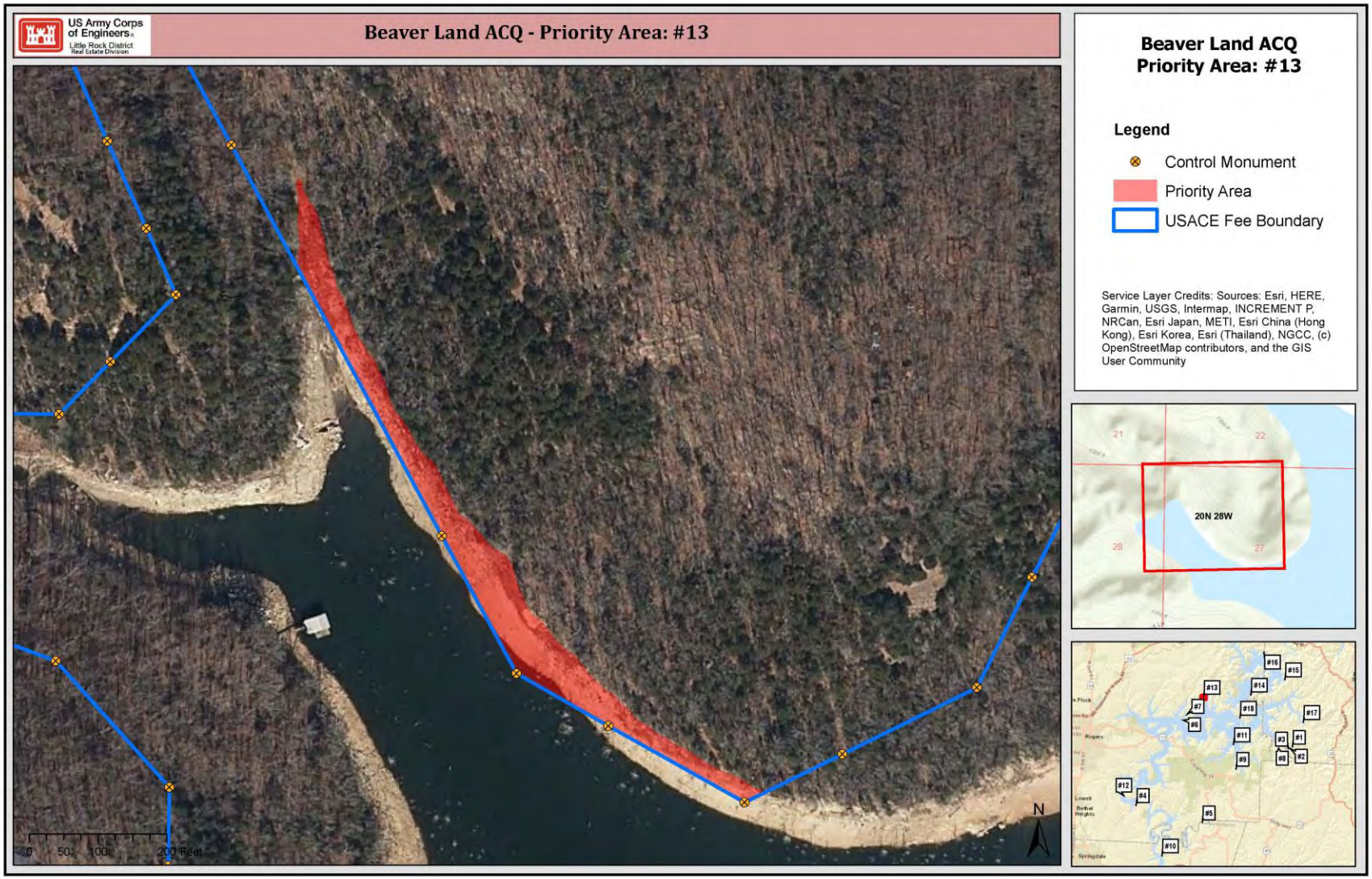


Figure 3: Interview Questions

Beaver Lake ECP
Interview Questions

1. Do you know of any environmental issues with this property?
2. Do you know of, or have access to, any reports concerning the environmental condition of this property? (i.e. site assessments, permits, storage tank registrations, safety plans, etc.) If so, would you be able to provide them? SWPPPs, SPCCs, air permits?
3. Do you know how this property has been historically used?
4. What is the property currently used for?
5. When were the site buildings constructed?
6. Are hazardous materials or petroleum products stored or used on this site? If so, what is the RCRA EPA ID? Does fueling occur on this property?
7. Do you know of any asbestos or LBP on the property or its buildings? Do you know the age of the buildings?
8. Has the site layout been manipulated in your recollection? (i.e. grading, excavation, etc.)?
9. Are there or have there been any cultural/historic items or buildings found on the property?
10. Is there anything else environmentally relevant that we should know?

Appendix A Visual Site Inspection Photographs

12 July 2021

Priority Area 13 – Priority area seen from watercraft

Priority Area 13 – Priority area seen from watercraft

Priority Area 13 – Priority area seen from watercraft

Priority Area 13 – Priority area seen from watercraft

Priority Area 13 – Priority area seen from watercraft

Final

U.S. Army Environmental Condition of Property Report
Priority Area 14

Beaver Lake
Beaver Lake, Arkansas

August 30, 2021

Prepared For:
Beaver Lake Land Acquisition

Prepared By:
U.S. Army Corps of Engineers
Regional Planning and Environmental Center
Fort Worth District
Fort Worth, Texas

[This page is intentionally left blank.]

Table of Contents

List of Appendices:

List of Acronyms

ACM	Asbestos-containing material
AR	Army Regulation
AST	Aboveground storage tank
ASTM	American Society for Testing and Materials
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CFR	Code of Federal Regulations
DoD	Department of Defense
ECP	Environmental Condition of Property
EDR	Environmental Data Resources, Inc.
EPA	Environmental Protection Agency
ERNS	Emergency Response Notification System
FAA	Federal Aviation Administration
HTRW	Hazardous, Toxic and Radioactive Waste
IRP	Installation Restoration Program
LBP	Lead-based Paint
LUST	Leaking underground storage tank
MEC	Munitions and Explosives of Concern
NEPA	National Environmental Policy Act
NFRAP	No Further Remedial Action Planned
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NRC	Nuclear Regulatory Commission
ODEQ	Oklahoma Department of Environmental Quality
OWS	Oil-water separator
PCB	Polychlorinated Biphenyl
POL	Petroleum, Oils, and Lubricants
RCRA	Resource Conservation and Recovery Act
SEMS	Superfund Enterprise Management System
SF	Square feet
SHWS	State Hazardous Waste Sites
SWPPP	Stormwater Pollution Prevention Plan
TSD	Transport, Storage, Disposal
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
UST	Underground storage tank
UXO	Unexploded Ordnance
VCP	Voluntary Cleanup Program
VSI	Visual site inspection

1.0 Executive Summary

This environmental condition of property (ECP) report has been prepared to document the environmental conditions and provide information for the acquisition of land that would be necessary for the operation, maintenance, and control of the Beaver Lake reservoir in Arkansas. This fee acquisition pertains to the frequently inundated land immediately surrounding the lake, below an elevation of 1128 ft above mean sea level (msl). The Army prepares an ECP in order to provide the public with information relative to the environmental condition of the property, assist Federal agencies during the property screening process, provide information about completed remedial and corrective actions at the property, and to assist in determining appropriate responsibilities, asset valuation, and liabilities with other parties to a transaction.

Beaver Lake currently occupies more than 38,000 acres of Federal public lands and waters. This ECP report covers a parcel of land consisting of two segments totaling 0.94 acres located near the center of Beaver Lake on the western shore. The subject property is on the edge of the lake and currently owned by private landowner(s). The Lake is located in northwestern Arkansas, in Benton, Washington, Madison and Carroll Counties and it is approximately 6 miles west of Eureka Springs, Arkansas. The subject property, also known as Priority Area 14, is located directly across the lake from Fish Trap Hollow and approximately 0.6 miles south east of Starkey Public use area.

This ECP report presents a summary of readily available information on the environmental conditions of, and concerns relative to, the land, facilities, and real property assets of Beaver Lake. The findings included in the report are based on a record search of historical environmental investigation reports and site historical documents, a review of aerial photography, stakeholder interviews, and a site inspection conducted 12 – 13 July 2021.

Based on the environmental conditions found and the ECP analysis, the property can be categorized as an ECP Category 1, indicating a site where no release, or disposal of hazardous substances or petroleum products or their derivatives has occurred (including no migration of these substances from adjacent properties).

2.0 Purpose

2.1 General

This environmental condition of property (ECP) report has been prepared to document the environmental conditions and provide information for the acquisition of land surrounding Beaver Lake in Benton, Washington, Madison and Carrol Counties, Arkansas. This report meets the requirements of Title 40, Code of Federal Regulations (CFR), Part 373, and United States Army Regulation (AR) 200-1 (2007), *Environmental Quality, Environmental Protection and Enhancement*. The ECP report also follows the American Society for Testing and Materials (ASTM) E1527-13 *Standard Practice for Environmental Site Assessments: Phase 1 Environmental Site Assessment Process*. The subject property in this report is subsequently categorized according to ASTM D5746 (2016) *Standard Classification of Environmental Condition of Property Area Types for Defense Base Closure and Realignment Facilities*.

The Army prepares an ECP for the following purposes:

- Provide the public with information relative to the environmental condition of the property.
- Assist Federal agencies during the property screening process.
- Provide information to prospective buyers.
- Provide information about completed remedial and corrective actions at the property.
- Assist in determining appropriate responsibilities, asset valuation, and liabilities with other parties to a transaction.

The ECP contains the information required to comply with the provisions of 40 CFR, Part 373 that require a notice to accompany contracts for the sale of, and deeds entered into the transfer of, federal property on which hazardous substances may have been stored, released or disposed. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) §120(h) stipulates that a notice is required if certain quantities of designated hazardous substances have been stored on the property.

The ECP Report is not prepared to satisfy a real property purchaser's duty to conduct an "all-appropriate inquiry" to establish an "innocent purchaser defense" to CERCLA 107 liability. Any such use of the ECP Report by any party is outside the control of the Army and beyond the scope of the ECP Report. The Army, its officers, employees, or contractors makes no warranties or representations that any ECP Report satisfies any such requirements for any party.

2.2 Scope

Priority Area 14 occupies 0.94 acres of land. This ECP report covers 0.94 acres of land located near the center of Beaver Lake approximately 0.6 miles south east of the Starkey Public use area and Starkey Hollow. Priority Area 14 is comprised of two segments, a narrow-wooded strip of land and a small triangular parcel just south of the Starkey Public use area. There is access via watercraft and although it wasn't explored potential terrestrial access via private property from Point Mirage Rd. Areas within the lake that are not within the Priority Area will be considered adjacent property. A general site location map is provided in Figure 1, and map showing the subject property are shown in Figure 2.

2.3 Limitations

This ECP report presents a summary of readily available information on the environmental conditions of, and concerns relative to, the land, facilities, and real property assets of the subject property. The findings included in the report are based on a record search of available historical environmental investigation reports and site historical documents, a review of aerial photography, stakeholder interviews, and a site reconnaissance conducted 12 – 13 July 2021. Historical environmental investigation reports and site historical documents were reviewed in support of this ECP, and the information obtained from other studies is reflected within this report by reference. The ECP process recognizes that the condition of

property and classification can change as historical contamination is cleaned up (if required) or if a new source of contamination is identified. Records reviewed during the assessment were accepted as accurate and a reasonable effort was made to resolve discrepancies identified during the document review.

During the ECP assessment, all available sources of information concerning both past and present environmentally significant uses of the property were reviewed. This included readily available data associated with adjacent property records; 1985, 1994, 2001, 2004, 2006, 2009, 2010, 2012, 2014, 2016, 2017, 2018, and 2020 aerial photography; personnel interviews; current and historic investigations; and topographical maps. In addition, record sources were reviewed to determine if there have been spills, leaks, discharges, leaching, underground injection, dumping, abandonment, or storage of hazardous substances or petroleum products at the subject property. The site reconnaissance and interview process included inquiries and requests into the existence and availability of records that support the environmental condition of the property. The site reconnaissance included a Visual Site Inspection (VSI) of the subject property. No sampling or analysis was conducted during this survey.

2.4 Report Organization

The remainder of this ECP report is organized as follows:

Section 3 – Property Description: This section provides location and description of the subject property; an overview of historical and current land uses; and a description of the environmental setting of the lake area, including climate, topography, geology, and demography.

Section 4 – Survey Methodology: This section describes the methods used to obtain the information for this ECP Report such as the development of study sections, the VSI, aerial photography analysis, records review, interviews, and data management.

Section 5 – Environmental Conditions: This section provides the existing environmental information. The findings are organized by relevant environmental "issues," including permits and licenses, cleanup activities, hazardous substances, petroleum and related products, asbestos, lead-based paint (LBP), radioactive materials, landfills, explosive contaminated structures, radon, pesticides, and polychlorinated biphenyls (PCBs). This section also includes adjacent property descriptions.

Section 6 – Evaluation and Conclusions: This section provides a summary of the subject property and evaluates the property for categorization as per ASTM D5746 (2016).

Section 7 – Certification: This section documents the approval of the ECP report.

Section 8 – References: This section provides an inventory of the reference material used in the preparation of this ECP Report.

Appendices: A list of appendices is provided in the Table of Contents.

3.0 Property Description

3.1 Parcel Locations and Description

Beaver Lake is located in the scenic Ozark Mountain region of northwestern Arkansas in Benton, Washington, Carroll and Madison counties. The total area currently contained in the Beaver project, including both land and water surface, consists of 38,138 acres owned in fee. Of this total, 1,432 acres are in flowage easement. The proposed Land Acquisition would include adding any land below the 1128 msl water level. The White River drainage area above Beaver Lake is approximately 1,186 square miles. When the lake is at the top of the conservation pool (elevation 1120.43 feet above mean sea level), the water area is 28,299 surface acres with 490 miles of shoreline within the lands owned in fee. The shoreline is irregular with topography primarily consisting of steep bluffs and gentle slopes.

Priority Area 14 is irregularly shaped and divided into two parcels totaling 0.94 acres along the lake shoreline near the Starkey recreation area. The area is undisturbed forest with no structures, visible vehicle or pedestrian pathways. The subject property is on the edge of the lake and is currently owned by private landowner(s).

3.2 Historic Land Use

Beaver Lake is a multiple purpose water resource development project initially authorized for flood control, hydropower generation and other beneficial uses by the Flood Control Act dated 3 September 1954. The inclusion of storage in the lake for municipal and industrial water supply was authorized by the Water Supply Act of 1958. Beaver Lake is a major component of a comprehensive plan for water resource development in the White River Basin of Arkansas and Missouri. Construction of Beaver Dam was initiated in March 1960. The dam was completed in June 1966, and the powerhouse and switchyard were completed in 1965. Beaver Lake was declared operational for public use in 1965.

For Priority Area 14, the historical aerial photography shows that this area has been undisturbed with adjacent private residences as far back as 1994.

3.3 Current Land Use

Beaver Lake is located in the Ozark Highlands of Carroll, Washington, Benton, and Madison Counties. Having 490 miles of shoreline (at conservation pool) and over 28,000 water surface acres, Beaver Lake is the largest reservoir in northwest Arkansas and the first federal impoundment on the White River.

There are 12 public use areas around Beaver Lake. There are 11 parks on the lake presently operated by the Corps of Engineers. The State of Arkansas owns and operates Hobbs State Park Conservation Area, which covers 12,056 acres, and Devil's Eyebrow Natural Area, which covers 2,503 acres. Both properties are adjacent to USACE lands. There are two parks, Ventris, and Blue Springs that have been reduced to lake access only. One Park (Big Clifty) is operated by Carroll County, Arkansas.

Despite being located adjacent to the fast-growing communities of Fayetteville, Springdale, Bentonville, and Rogers, Arkansas and a regional population of over 500,000, the lake provides open spaces and a quality outdoor recreation opportunity. Many arms and coves of the lake offer secluded areas for traditional activities such as fishing, skiing, sailing and scuba diving, but also allow for passive recreation opportunities like photography and nature observation.

Priority Area 14 remains an undeveloped forested area currently owned by private landowners.

3.4 Utilities

Priority Area 14 has no known utilities.

3.5 Environmental Setting

3.5.1 Climate

The climate in the Beaver Lake area is classified as humid subtropical according to the Köppen climate model. A humid subtropical climate is characterized by hot, usually humid summers and mild to cool winters. The Köppen definition of this climate is for the coldest month's mean temperature to be between 26.6 °F (−3 °C) and 64.4 °F (18 °C), and the warmest month to be above 71.6 °F (22 °C). Some climatologists prefer to use 32 °F (0 °C) as the lower bound for the coldest month's mean temperature. Under the modern Trewartha climate classification, climates are termed Humid Subtropical when they have mean temperatures of 50 °F (10 °C) for eight or more months a year. In most locations classed within this system, the mean temperature of the coldest month is between 35 °F (3 °C) and 65 °F (18 °C). Some climatologists consider the Trewartha grouping of subtropical climates to be more real-world and fitting on a global scale.

While technically classified as humid subtropical, the climate in the Beaver Lake area is considered moderate. The area experiences all four seasons and does receive cold air masses from the north; however, some of the Arctic masses are blocked by the higher elevations of the Ozarks.

Average temperatures range from a high of 88 °F (31.1 °C) and low of 27 °F (-2.7 °C) in nearby Rogers, Arkansas. Extreme temperatures rarely exceed 96 °F (35.6 °C) and 13°F (-10.6 °C). Late summer is the time of maximum heat and least rainfall. During the winter months, midday temperatures in the basin are relatively warm, around 55 to 60 °F. Some short periods of cold weather occur with temperature ranging from 0°to 10°F. On winter nights, temperatures from 37 o F to below freezing are common. Highest recorded temperature in Rogers, Arkansas was 114 °F (45.6 °C) (recorded in July 1954). The lowest temperature recorded was −16 °F (−26.7 °C), in February 1996.

The relative humidity typically ranges from 41% (comfortable) to 91% (very humid) over the course of the year, rarely dropping below 24% (dry) and reaching as high as 100% (very humid). The air is driest around April 9, at which time the relative humidity drops below 49% (comfortable) three days out of four; it is most humid around June 3, exceeding 87% (very humid) three days out of four.

Dew point is often a better measure of how comfortable a person will find the weather than relative humidity because it more directly relates to whether perspiration will evaporate from the skin, thereby cooling the body. Lower dew points feel drier and higher dew points feel more humid. Over the course of a year, the dew point typically varies from 19°F (dry) to 71°F (muggy) and is rarely below 4°F (dry) or above 74°F (very muggy). There are two periods in the year that are most comfortable: The first is between April 18 and June 6 and the second is between September 3 and October 23. The air feels neither too dry nor too muggy during these periods (https://weatherspark.com/averages/31495/Rogers-Arkansas-United-States).

Average annual rainfall for the Beaver Lake area is 45 inches per year. Precipitation is weakly seasonal, with a bimodal pattern: wet seasons in the spring and fall, and relatively drier summers and winters, but some rain in all months. The spring wet season is more pronounced than fall, with the highest rainfall typically occurring in May. The average annual snowfall for the Beaver area is about 12 inches. Snowpacks are usually short lived and are not commonly a concern for flooding.

Climate change is an area of concern due to the potential for effects on many aspects of the environment, especially those related to water resources. The U.S. Global Change Research Program (USGCRP) summarized information regarding climate change and its potential effects in regional assessments (http://www.globalchange.gov/publications/reports/scientific-assessments/us-impacts). In the Midwest, which extends from Minnesota to Missouri, extreme events such as heat waves, droughts and heavy rainfall events are projected to occur more frequently. Should these events become significant enough to impact the operation of Beaver Lake, the Master Plan and associated documents (i.e. Operations Management Plan and Shoreline Management Plan) would be reviewed and revised, if necessary.

3.5.2 Topography, Geology, and Soils

The depositional environment of the rocks found in the Arkansas Ozarks is one of a relatively shallow continental shelf, sloping toward deeper water generally toward the south. This shelf emerged many times during the Paleozoic resulting in numerous unconformities throughout the sequence. The Ozark Plateaus region of Arkansas is made up of generally flat-lying Paleozoic age strata divided into three plateau surfaces. The lowest and northern-most plateau is the Salem Plateau. The Springfield Plateau stands above the Salem a few hundred feet and is generally capped by lower Mississippian age limestones and cherts. The southernmost and highest plateau of the Ozarks is the Boston Mountains. All of these plateaus are deeply dissected by numerous streams throughout the area. The faulting in the Ozarks is generally normal; most faults displaying a displacement down on the southern side. However, some observations reveal that a few strike-slip faults may be present. Gentle folds are noted but are generally of very low amplitude. The depositional environment of the rocks found in the Arkansas Ozarks is one of a relatively shallow continental shelf, sloping toward deeper water generally toward the south.

Beaver Lake is part of the Springfield Plateau that occupies primarily the western and southwestern flanks of the Ozark Plateau province. The Springfield Plateau in this region rises to an elevation of approximately 1400 feet and in many areas, forms extensive plains. Hilly areas occur where rivers and their tributaries cut into the plateau surface, most notably in the vicinity of the White River and Beaver Lake. As streams like the Buffalo National River cut through the plateau down to the level of the White River, they sometimes carve spectacular bluffs.

Lower Ordovician, Middle to Upper Devonian and Lower and Upper Mississippian age strata are present around Beaver Lake. Upper Ordovician and Devonian strata crop out around Beaver Lake and its tributaries. The Lower Mississippian Boone Formation comprises the surface rock over the majority of the area and forms the surface of the heavily dissected Springfield Plateau. In addition to the Boone Formation, Cotter and Jefferson City formations (Jefferson City formation has not been successfully differentiated from the Cotter Formation in Arkansas), and the Powel formation, all of Ordovician age are present in the area. Formations in the Devonian strata include the Chattanooga, Clifty and Penters.

The Boone Formation consists of gray, fine- to coarse-grained fossiliferous limestone interbedded with chert. This formation caps the higher hills in the area. Since limestone is easily dissolved by water, cave and solution (karst) features are prominent. The Boone Formation is well known for dissolutional features, such as sinkholes, caves, and enlarged fissures. Surface water may drain directly into channels in limestone, where it can move rapidly and without filtration to the surface as a spring, at a location that is unpredictable without extensive testing. Therefore, water pollution problems are of particular concern in this region. The thickness of the Boone Formation is 300 to 350 feet in most of northern Arkansas, but as much as 390 feet has been reported.

The Cotter Dolomite is composed of dolostone of predominantly two types: a fine-grained, argillaceous, earthy textured, relatively soft, white to buff or gray dolostone called "cotton rock", and a more massive, medium-grained, gray dolostone that weathers to a somewhat hackly surface texture and becomes dark on exposure. The formation contains chert, some minor beds of greenish shale, and occasional thin interbedded sandstone. The thickness is about 340 feet in the vicinity of Cotter, but the interval may range up to 500 feet thick in places.

The Powell Dolomite is generally a fine-grained, light-gray to greenish-gray, limy, argillaceous dolostone with thin beds of shale, sandstone, sandy dolostone, and occasionally chert. The formation’s thickness may be as much as 215 feet but is often much thinner.

The Chattanooga Shale Formation is typically black, fissile clay shale that weathers into thin flakes. The beds are usually cut by prominent joints creating polygonal blocks upon weathering. The upper part of the formation may be slightly sandy and usually contains abundant pyrite. Thickness ranges from 0 to about 85 feet; normally averaging about 30 feet (AGS).

The strata throughout the region are nearly horizontal. One predominant geological feature of the lake area is a low, persistent, limestone bluff, which occurs just above the Ordovician- Mississippian contact.

The faulting in the Ozarks is generally normal; most faults displaying a displacement down on the southern side. Lineaments and faults characteristic of northwest Arkansas are present around Beaver Lake. The Fayetteville Fault lies beneath Beaver Lake. This fault is the west side of a graben that has down-dropped the Boone Formation to lake level. The Starkey Fault bounds the east side of the graben. Both faults trend approximately N 450E. One section of the Starkey fault trends N 60-700E. The Clantonville Lineament – Monocline is a northeast to southwest trending structural feature that extends from north of Clantonville to Ventris Hollow. The location of this feature was determined from the 1:24,000 three dimensional quadrangle and from structural disparities in the Lower Mississippian rock units. This structural feature could be responsible for the presence of lead-zinc mineralization in an old prospect near Clantonville (north of Beaver Lake). The trend of this lineament to monocline is N 30-400E. Paleokarst features within the top of the Powell Dolomite are present around Beaver Lake and coincident with a lineament in Limekiln Hollow near Garfield, northwest of Beaver Lake.

In general, the soils of the Ozark Plateaus are residual and are formed on a broad, domed, upwarp consisting mostly of limestone and dolomite. The main difference in the soils is due to different rocks from which the soils were formed. The main geologic materials are cherty limestone; cherty, very siliceous dolomite; cherty, siliceous dolomite; and alluvium, which are weathered and water transported products of the first three materials. Glade-rock soil occurs where the cherty, very siliceous dolomite is exposed to the soil formation. Dolomite is more resistant to weathering than limestone and siliceous dolomite is even more resistant, so very shallow soil results. In areas where the dolomite is less siliceous, more weathering has taken place; however, the soils produced are not as deep as soils formed by limestone.

The following eight soils associations are found in and around the Beaver project area: Captina-Nixa, Captina-Nixa-Pickwick, Clarksville-Nixa-Baxter, Corydon-Sogn, Enders-Allegheny-Mountainburg, Razort-Captina-Etowah, Linker-Apison-Hector, and Captina-Pembroke.

3.5.3 Hydrology and Groundwater

In the Interior Highlands of western and northern Arkansas ground-water supplies are more limited than in the Coastal Plain. Much of the Ozark Plateaus region is underlain by carbonate rocks, which are quite soluble in the presence of water. Solution by ground water has caused many large openings through which water passes so quickly that contaminants from the surface cannot be filtered out. Signs of these openings are caves, sink holes, springs and lost stream segments. As a consequence, the water in shallow wells may not be suitable for human consumption without treatment.

Three aquifers, which are part of the Ozark Plateaus Aquifer System, are located within northern Arkansas. The Springfield Plateau aquifer is generally under unconfined conditions, with groundwater movement occurring through fractures and solution cavities formed by dissolution of carbonate rock. Local discharge is through springs and streams. The Ozark aquifer is generally under confined conditions, especially where overlain by the units of the Ozark Confining Unit (Chattanooga Shale). Most wells in the Springfield Plateau and upper units in the Ozark aquifer yield 5-10 gpm on the average, with yields greater than 25 gpm in rare cases.

The third aquifer, the Roubidoux Formation and the Gunter Sandstone Member of the Gasconade Formation in northern Arkansas occur at greater depth and constitute the only significant aquifer system in the Ozarks. Both are permeable sandstone and carbonate units of Ordovician age. These aquifers serve as the principal source of high-quality water for many communities in northern Arkansas where surface

water sources are unavailable. Together these units may yield up to 500 gpm to wells. These formations do not outcrop anywhere in Arkansas but instead outcrop in 1 southern Missouri.

3.5.4 Water Quality

The waters of the Arkansas portion of the White River watershed have all been designated by the Arkansas Department of Environmental Quality (ADEQ) for fisheries, primary and secondary contact recreation, and domestic, agricultural, and industrial water supplies (ADEQ, 2012). Beaver Lake is classified by ADEQ as a Type A water body, which includes most larger lakes of several thousand acres in size, in upland forest dominated watersheds, having an average depth of 30 to 60 feet, and having low primary production (i.e., having a low trophic status if in natural [unpolluted] condition). Beaver Lake, like all other lakes of its size in the Ozark region, stratifies chemically and thermally in the late spring with stratification extending into late fall and early winter. During the warmer months, lake waters of the upper layer (the epilimnion) are warmer and contain more dissolved oxygen, while the denser, lower layer waters (the hypolimnion) are colder and contain very little or no dissolved oxygen, thus undesirable for fish habitat.

This undesirable water, when discharged downstream from hydropower generation, may cause some problems in the tailwaters. To combat this problem, the dissolved oxygen content is monitored and various management measures are implemented to improve the dissolved oxygen concentration in the hydropower releases. A highly productive trout fishery has been established in the Beaver tailwaters by the Arkansas Game and Fish Commission because of the available discharge of cold water from the dam, which is reaerated by turbulence as it flows downstream.

As the stratified epilimnion cools in the late fall and winter, the layers begin to mix (de-stratify) and dissolved oxygen (DO) is more evenly distributed. This condition is more favorable to the fishery of the lake and overall water quality.

The upper 1500 acres of Beaver Lake has been listed by the Arkansas Department of Environmental Quality (ADEQ) on Arkansas' 303(d) list of impaired waters, approved by the Environmental Protection Agency (EPA), due to turbidity (ADEQ, 2008). According to the Arkansas 303(d) list, these excessive levels impact the local fisheries as well as primary contact, both designated uses of Beaver Lake. The elevated turbidity levels are due to excessive silt from surface erosion from agriculture activities, unpaved road surfaces, in-stream erosion – mainly from unstable stream banks, and any other land surface disturbing activity. The Draft 2010 Integrated Water Quality and Monitoring Report (ADEQ, 2010) added pathogen indicator bacteria as a contaminant for the same area of Beaver Lake. Surface erosion activities are listed as the probable source for this contaminant as well.

Clean Water Act requires states to list waters that do not meet Federal water quality standards or have a significant potential not to meet standards as a result of point source dischargers or non- point source run-off. Subsequent to listing on the 303(d) list, the statute requires that the states develop and set the Total Maximum Daily Load (TMDL) for water bodies on the list within 13 years. A TMDL establishes the maximum amount of a pollutant that can enter a specific water body without violating the water quality standards. Values are normally calculated amounts based on dilution and the assimilative capacity of the water body. TMDLs have not been established by ADEQ for the upper Beaver Lake area.

3.6 Biological and Cultural Resources

3.6.1 Terrestrial Ecosystems

The area surrounding Beaver Lake is mostly forested. Trees and shrubs around the lakeshore include upland oak and hickory species, persimmon, honey locust, hawthorn, dogwood, redbud, coralberry, smooth and winged sumac, and buttonbush. Frequent periods of inundation keep a thin strip of government owned lands around the lake in early stages of succession. Red cedar and short-leafed pine, the principal evergreens, are dispersed throughout the region and are found in many large, scattered groups. Ground covers consist of greenbrier, sedges, and native grasses. White-tailed deer and eastern wild turkey are common game animals found and hunted in the Beaver Lake area. Black bears have also become common in the area and are hunted on the lands around the lake. The principal small game species found in the open upland areas include bobwhite quail, cottontail rabbit, and mourning dove. Gray and fox squirrels are common in upland wooded areas. Furbearing animals found in the Beaver Lake area include coyote, red fox, gray fox, otter, mink, muskrat, beaver, bobcat, and raccoon. Habitat management that includes wildlife food plot plantings, mowing, soil disturbance, removal of exotic species and application of prescribed fire provide benefit to these populations.

The common goldeneye, hooded merganser, bufflehead, and ring-necked duck are the predominant migratory waterfowl species visiting Beaver Lake. Mallards, gadwall, and other duck species are also present; however, they are only transient visitors as their characteristic feeding habits of obtaining food from shallow waters is limited. Resident Canada geese are so numerous in many coves and recreation areas that their presence has become a nuisance.

Ring-billed gulls are seen frequently around the Beaver Lake area. Greater and lesser yellow legs, pelicans, and large flocks of horned grebes are also seen during their peak migration in the spring and fall. Beaver Lake is also one of the few places where visitors can see both the turkey vulture and the black vulture at the same time in the winter. Beaver Lake has also become a popular place that visitors come to observe bald eagles, commonly wintering 150 or more birds and hosting 5-6 breeding pairs during the nesting period of March to June. The surrounding woodlands and grasslands serve as prime nesting areas for resident and neotropical migratory songbirds.

3.6.2 Aquatic Ecosystems and Wetlands

Walleye, smallmouth bass, striped bass, hybrid white-striped bass, and paddlefish have been introduced into Beaver Lake to add diversity to the fishery. Natural reproduction of striped bass and hybrid white-striped bass does not occur in Beaver Lake. Since 2004, AGFC stocks approximately 100,000 walleye, 30,000 channel catfish, 30,000 blue catfish, and 200,000 striped bass each year. While natural reproduction occurs in white crappie, black crappie, largemouth bass, and smallmouth bass, AGFC supplements this reproduction by occasional stockings of these species. Historically, there have also been introductions of northern pike, blue catfish, lake trout, and threadfin shad.

Located within the Springfield Plateau of the Ozark Mountains region of northern Arkansas, the area surrounding Beaver Lake is characterized by limestone, dolomite, or chert geology. The many rivers and streams flowing through the region have created a landscape of level highlands dissected by rugged valleys rich in karst features such as caves and sinkholes. Associated with these streams and landscape features are a variety of wetland habitats representative of the five wetland classes occurring within the region. These wetland classes include depressions, flats, fringe, riverine, and slope. It is possible, and perhaps even likely, that all of these classes of wetlands occur in the general area of Beaver Lake. However, those most likely to occur in the area immediately surrounding the lake are fringe (most likely reservoir), riverine (most likely spring runs) and slope wetlands (most likely calcareous slope).

3.6.3 Threatened and Endangered Species

The following species listed in Table 1 are from the U.S. Fish and Wildlife Service's federally classified status list of species and the Arkansas Natural Heritage data sets which have been reported and identified on project lands. Although the bald eagle was delisted by USFWS in 2007 due to recovery of the species, both the bald and golden eagles are still protected in accordance with the Bald and Golden Eagle Protection Act. The federal Migratory Bird Treaty Act of 1918 also provides protection to certain species of migratory birds. A total of 31 bird species are currently protected under this federal statute.

Table 1: Threatened and Endangered Species

	Federal Status	**State Status/Global Rank**
Gray Bat	LE	SE / S2S3/G4
Indiana Bat	LE	SE / /S1/G2
Northern long-eared Bat	LT	SE / S1S2/ G1G2
Ozark Big-eared Bat	LT	Not listed
Little Brown Bat	-	SE / S1
Bald Eagle	*Protected under Bald and Golden Eagle Protection Act	S3B,S4N/G5
Eastern Black Rail	LT	Not listed
Piping Plover	LT	Not listed
Rufa Red Knot	LT	Not listed
Whooping Crane	Experimental Population, Non-Essential	Not listed
Ozark Cavefish	LT	SE / S1/G3
Neosho Mucket	LE	Not Listed
Rabbitsfoot mussel	LT	SE/S3/G3G4
Snuffbox Mussel	LE	Not listed
Monarch Butterfly	C	Not listed
Missouri Bladderpod	LT	S2/G3
Opaque Prairie Sedge	-	SE / S2S3G4

Yellow Coneflower	-	ST / S2G3T3
Ovate-leaf Catchfly	-	ST / S2G3
Royal Catchfly	-	ST / S2G3

FEDERAL STATUS CODES

LE = Listed Endangered; the U.S. Fish and Wildlife Service has listed this species as endangered under the Endangered Species Act.
LT = Listed Threatened; the U.S. Fish and Wildlife Service has listed this species as threatened under the Endangered Species Act.
C = Candidate Species;

STATE STATUS CODES

INV = Inventory Element; The Arkansas Natural Heritage Commission is currently conducting active inventory work on these elements. Available data suggests these elements are of conservation concern. These elements may include outstanding examples of Natural Communities, colonial bird nesting sites, outstanding scenic and geologic features as well as plants and animals, which, according to current information, may be rare, peripheral, or of an undetermined status in the state. The ANHC is gathering detailed location information on these elements.

GLOBAL RANKS

G3 = Vulnerable globally. At moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors.
G4 = Apparently secure globally. Uncommon but not rare; some cause for long-term concern due to declines or other factors.
G5 = Secure globally. Common, widespread and abundant.
T-RANKS= T subranks are given to global ranks when a subspecies, variety, or race is considered at the state level. The subrank is made up of a "T" plus a number or letter (1, 2, 3, 4, 5, H, U, X) with the same ranking rules as a full species.

STATE RANKS

S1 = Critically imperiled in the state due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors making it vulnerable to extirpation.
S2 = Imperiled in the state due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it vulnerable to extirpation.
S3 = Vulnerable in the state due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.

GENERAL RANKING NOTES

Q = A "Q" in the global rank indicates the element's taxonomic classification as a species is a matter of conjecture among scientists.

Source: Arkansas Natural Heritage Commission

3.6.4 Cultural Resources

The records search, interviews, and site inspection identified no cultural resource assessments or findings for the subject property.

During the past seventy years scientific investigation of archaeological sites in the Beaver Lake area has been carried out in several phases. In 1922 and 1923, Mark R. Harrington of Phillip Academy was the first archeologist to excavate sites on the area that is now Beaver Lake. He excavated 13 bluff shelters. Between 1928 and 1935, the work of Harrington was continued by S.C. Dellinger of the University of Arkansas Museum. Dellinger supervised the excavation of 21 rock shelters. In the early 1960's, a series of surveys were conducted by several archeologists from the University of Arkansas Museum. Today, there are 280 known archeological sites along or immediately adjacent to Beaver Lake. Of these, 271 are identified as prehistoric, seven are historic and two sites have no known cultural affiliation.

Table 2: Historical and Cultural Resources at Beaver Lake

Type of Site	Number of sites
Historic	7

Prehistoric	271
No known cultural affiliation	2
Total	280
National Register Eligibility Status	
Not Evaluated	132
Not Eligible	5
Eligible	1

4.0 Survey Methodology

4.1 Development of Study Sections

The information gathered during the development of the ECP was used to group the subject property into standardized categories using Department of Defense (DoD) guidance, and in accordance with ASTM D5746 (2016). The ECP category definitions are summarized below in Table 3.

Table 3: Definitions of ECP Categories

ECP Category	Definition
1	An area or parcel of real property where no release, or disposal of hazardous substances or petroleum products or their derivatives has occurred (including no migration of these substances from adjacent properties).
2	An area or parcel of real property where only the release or disposal of petroleum products or their derivatives has occurred.
3	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but at concentrations that do not require a removal or remedial action.
4	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, and all remedial actions necessary to protect human health and the environment have been taken.
5	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred and removal or remedial actions, or both, are under way, but all required actions have not yet been taken.
6	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but required response actions have not yet been initiated.
7	An area or parcel of real property that is unevaluated or requires additional evaluation.

The final ECP category designations for the subject property are shown in Section 6.2, Table 5.

4.2 Visual Site Inspection

A VSI was conducted on 13 July 2021 at the subject property to check for recognized environmental conditions. The VSI was conducted by Mrs. Hollie Eljizi, Ms. Jennifer Jeffcoat and Mr. Robert Singleton from the U.S. Army Corps of Engineers (USACE). USACE representatives were accompanied by Mr. Mathew Voskamp of the USACE Beaver Lake office.

The VSI was performed from a USACE Beaver Lake Office watercraft near the bank of the subject property as a Right of Entry (ROE) was not available at the time of the inspection. At the time of inspection, the lake level was at 1127 feet above sea level, conservation pool lake level is 1121 feet above sea level. This made part of the priority area under water during the VSI, however water clarity was good, and no debris or other concerns were seen in the water. The shoreline was treed with a rocky bluff into the

lake that led into the lake. No apparent signs of Hazardous, Toxic and Radioactive Waste (HTRW) were visible during the VSI.

Photos from the VSI can be found in Appendix A.

4.3 Aerial Photography Analysis

Aerial photographs were available from Google Earth maps for 1985, 1994, 2001, 2004, 2006, 2009, 2010, 2012, 2014, 2016, 2017, 2018, and 2020.

The initial aerial photograph from 1985 is of poor quality and the area isn't discernable. The next photo form 1994 is also of poor quality but a residence can be seen at the top of the hill on the adjacent property approximately 125 yards from the parcel. There is no discernable change from the 2001 to 2020 photos. Because the image from 2009 is clear and the deciduous vegetation has lost its leaves a trail from the residence to the bank area near the priority area can be seen.

All aerial photographs are included in Appendix B.

4.4 Sanborn Map Review

Sanborn maps were not available for the subject property, or for the adjacent areas.

4.5 Topographic Map Review

Historical topographic maps were available from the US Geological Survey Website for the Beaver Lake area for 1900, 1901, 1945, 1949, 1954, 1957, 1958, 1964, 1985, 2011, 2014, 2017, and 2020. Several observations can be gleaned from these maps. First, the area before the lake was formed consisted of valleys with steep bluffs and hill sides around the White River and its tributaries. The historical maps show this valley and river basin from the 1900 to 1964 topographic maps. In 1985 the river and Beaver Dam at the northern end of the lake can been seen in the valley of the historical White River.

All topographic maps are included in Appendix C.

4.6 Records Review

4.6.1 Standard Environmental Record Sources

In this evaluation records, maps and other documents that provide environmental information about the project area are obtained and reviewed. A desktop records review was conducted using various sources to determine the presence of HTRW sites on or near the subject property. This search was focused on active cleanup sites and sites with a reasonable risk of HTRW release. Several databases were searched manually to narrow down the search area. These databases included the Environmental Protection Agency (EPA) Cleanups in my Community database, the EPA Envirofacts databases, the Arkansas Department of Environmental Quality's (ADEQ) web search tool of Underground Storage Tanks (UST) and Above Ground Storage Tanks (AST), and the Arkansas Department of Energy and Environment Oil and Gas Commission oil and gas well maps. The information collected from this desktop records review was analyzed for recognized environmental conditions (RECs) that would affect the proposed project or need further investigation, given the proposed project measures. The following resources were searched.

Federal National Priorities List (NPL) – The records search did not reveal any NPL sites in the project footprint or adjacent areas. There are nine NPL sites in the state of Arkansas, none of which are located near Beaver Lake or the priority areas. This is based on a search of the EPA Superfund: National Priorities List (NPL) list.

Federal Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) List – The CERCLIS, now called the Superfund Enterprise Management System (SEMS)

database, tracks hazardous waste sites where remedial action has occurred under EPA's CERCLA program. This list also includes sites that are in the screening and assessment phase for possible inclusion on the NPL. The records search of EPA's listed SEMS sites did not reveal any sites in the project footprints or adjacent areas. This is based on a search of the EPA SEMS database.

Federal No Further Remedial Action Planned (NFRAP) – The Federal NFRAP list (now known as the SEMS archive list) tracks sites where no further remedial action is planned, based on available assessments and information. The list also represents sites that were not chosen for the NPL. Further EPA assessment could possibly be ongoing, and hazardous environmental conditions may still exist; however, in the absence of remedial action and assessment data, no determination about environmental hazards can be made. The records search did not reveal any NFRAP sites in the project footprint or adjacent areas. This is based on a search of the EPA SEMS database.

Federal Resource Conservation and Recovery Act (RCRA) Corrective Action List – The records search of EPAs Cleanups in My Community showed two RCRA Corrective Actions within one mile of the project search area. No RCRA corrective actions were found to be located within one mile of the project footprint. This is based on a search of the EPA Cleanups in My Community.

State Superfund Sites - This search is to check for any state CERCLA sites in the project vicinity. The records search of state CERCLA cleanup sites did not show any sites of concern in the project or adjacent areas. This search is based on a search of the Arkansas Department of Energy and Environment data base.

State and Tribal Solid Waste Facilities/Landfill Sites – This search is designed to check any state or tribal databases for solid waste handling facilities or landfills in the project vicinity. The records search did not find any solid waste facilities or landfill sites in area of this project or adjacent areas. This is based on a search of the EPA Landfill Methane Outreach Program (LMOP) and ADEQ Permitted Solid Waste Disposal database.

State and Tribal Registered Storage Tanks – This list is a combination of the State of Arkansas registered UST and AST databases, representing sites with storage tanks registered with the State of Arkansas. The search revealed one AST within one mile of the work area or adjacent areas. This AST is not expected to impact the project due to its distance from the proposed project. These results are based on a search of the Arkansas Department of Energy and Environment Oil and Gas Commission website.

State and Tribal Voluntary Cleanup Sites – The ADEQ Elective Site Cleanup Agreement (ESCA) database identifies sites where the responsible party chooses to clean up the site themselves with ADEQ oversight. Five sites were identified from this database. None of the sites are within one mile of the work area and are therefore not expected to impact the proposed project. These results are based on a search of the ADEQ ESCA Database.

Brownfields List – A brownfield is a property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. There are no brownfield sites within one mile of the work area or adjacent areas. These results are based on a search for Brownfields sites using the EPA Envirofacts search engine.

Oil and Gas Wells – A search of the oil and gas wells in the area using the Arkansas Department of Energy and Environment Oil and Gas Commission website identifies multiple sites including oil wells, plugged oil wells, injection/disposal sites within the surrounding area. Although not classified as HTRW under USACE regulations, pipelines and oil wells play an important role in the HTRW existing

conditions near the potential project area. This is because the well and/or pipeline contents could potentially leak or spill into the surrounding environment or affect the proposed project features. As a result of these findings, a thorough pipeline/well search should be initiated during design to ensure no interaction with the existing oil and gas infrastructure occurs. The Oil and Gas Commission website was used to map these findings. No oil wells or pipelines were found near the priority areas.

4.7 Interviews

Two interviews were conducted on 12 and 13 July 2021 in conjunction with the site inspection, and the following stakeholders were interviewed:

- Mr. Matthew Franklin; Natural Resource Specialist, Beaver Lake Office; Matthew.G.Franklin@usace.army.mil
- Mr. Matthew Voskamp; Natural Resource Specialist, Beaver Lake Office; Matthew.Voskamp@usace.army.mil

Information gleaned from the interviews is incorporated by way of reference throughout the report. The interview questions can be found in Figure 3.

5.0 Environmental Conditions

5.1 Environmental Permits and Licenses

5.1.1 RCRA Status

The subject property is not covered under a Resource Conservation and Recovery Act (RCRA) permit, and no hazardous waste is generated or stored on the property.

5.1.2 Solid Waste

The subject property has no active, inactive, or expired permits or licenses for solid waste disposal. No landfills exist on the property.

5.1.3 USTs/ASTs

No USTs or ASTs were found during the records search, site inspection and interviews indicated not UST/AST have been known to be located at the subject property.

5.1.4 National Pollutant Discharge Elimination System (NPDES)

Section 402 of the Clean Water Act (33 U.S.C. 1251 et. seq.) requires all facilities that discharge stormwater to acquire an NPDES that defines contaminant limits in effluent to be discharged. No permits were found using the EPA's Envirofacts database on or adjacent to the priority area.

5.1.5 Drinking Water Permits

No drinking water permits are in place at the subject property.

5.1.6 Air Permits

No air emission or air quality permits are in place at the subject property.

5.1.7 Nuclear Regulatory Commission (NRC)

The NRC is tasked with permitting the use and handling of radioactive materials and reactors. No NRC licenses are in place at the subject property.

5.1.8 Other Permits/ Licenses

No other permits were found during the records search.

5.2 Environmental Cleanup and Remediation

5.2.1 Installation Restoration Program

Beaver Lake is not an active military facility, and therefore would not be eligible for cleanup under the Installation Restoration Program.

5.2.2 Military Munitions Response Program

Beaver Lake is not an active military facility, and therefore would not be eligible for cleanup under the Military Munitions Restoration Program.

5.2.3 Other Environmental Investigations and Cleanups

No known environmental investigations or cleanups were found during the records search, site inspection and interviews indicated that no known investigations or cleanups are ongoing at Beaver Lake.

5.2.4 Storage, Release, and Disposal of Hazardous Substances

No releases to the environment or improper disposal of these substances were found during the records search, site inspection and interviews indicated no known improper disposal at the priority area.

5.3 Petroleum and Petroleum Products

No releases to the environment or improper disposal of petroleum products were found during the records search, site inspection and interviews indicated no known improper disposal at the priority area.

5.4 Polychlorinated Biphenyls (PCBs)

No evidence exists of the presence of PCBs on the subject property. No PCB-containing oils were found during the records search, site inspection and interviews indicated no known PCB-containing oils have been used or stored at the priority area.

5.5 Asbestos

No asbestos assessments were found during the ECP process, none were found during the records search, site inspection and interviews indicated no known asbestos containing material has been used or stored at the priority area.

5.6 Lead and Lead-Based Paint (LBP)

No lead-based paint (LBP) assessments were found during the ECP process. No LBP was found during the records search, site inspection and interviews indicated no known improper disposal at the priority area.

5.7 Radioactive Material

No radioactive material assessments were found during the ECP process. No potentially radioactive materials were identified during the VSI, and the presence of radioactive materials on the subject property is extremely unlikely.

5.8 Landfills/Dumps

No landfills or dumps were found during the records search, site inspection or interview investigation.

5.9 Munitions and Explosives of Concern (MEC) and/or Unexploded Ordnance (UXO)

No munitions, explosives, or unexploded ordinance (UXO) were found during the records search, site inspection or interview investigation.

5.10 Radon

Beaver Lake spans across Benton, Washington and Carroll Counties. Washington County is in the Environmental Protection Agency (EPA) Radon Zone 3. Counties in Radon Zone 3 are counties with predicted average indoor radon screening levels of less than 2 pCi/L (EPA, 2018). Benton and Carroll Counties are in the EPA Radon Zone 2 with a predicted average indoor radon level between 2 and 4 pCi/L (EPA, 2018). No radon assessments were found during the records search (EPA, 2019).

5.11 Pesticides

No records were found to indicate the storage, improper use, or disposal of pesticides on the subject property.

5.12 Other Identified Concerns

No significant other concerns were found during the records search, site inspection or interviews.

5.13 National Environmental Policy Act (NEPA)

As the federal agency in charge of this project USACE is in charge of coordinating National Environmental Policy Act (NEPA) compliance of 1969 (Public Law 91-190), the Council on Environmental Quality (CEQ) regulations (40 CFR 1500–1508), and the USACE implementing regulations, Policy and Procedures for Implementing NEPA, ER 200-2-2. As part of the records search and interview process recent NEPA documents were reviewed including the 2018 Draft Environmental Assessment for the Beaver Lake Master Plan Revision.

5.14 Adjacent Properties

As part of the ECP process, adjacent properties are assessed for environmental conditions, and those discovered conditions are evaluated based on the potential to affect the subject property. There are no structures immediately adjacent to the priority area. The nearest structures are residences approximately 0.20 miles south east inland from the priority area. The residences are first seen in the 1994 historical aerial photographs. The adjacent properties are unlikely to pose any HTRW concerns to the priority area.

6.0 Evaluation and Conclusions

6.1 Summary of ECP

Beaver Lake currently occupies more than 38,000 acres of Federal public lands and waters. This ECP report covers a 0.94 acre narrow strip of land located at the northern end of Beaver Lake. The subject property is on the edge of the lake and currently owned by private landowner(s). The Lake is located in northwestern Arkansas, in Benton, Washington, Madison and Carroll Counties and it is approximately 6 miles west of Eureka Springs, Arkansas. The subject property, also known as Priority Area 14, is located directly across the lake from Fish Trap Hollow and approximately 0.6 miles south east of Starkey Public use area.

This ECP report was prepared to characterize the existing environmental conditions at the subject property and is intended to be an aid in the leasing of real property. The ECP findings are based on the available sources of information concerning both past and present uses of the subject property.

Information included readily available data associated with adjacent property records, aerial photography, personnel interviews, environmental programs and associated documentation, and current and historic investigations. In addition, record sources were reviewed to determine if there have been spills, leaks, discharges, leaching, underground injections, dumping, abandonments, or storage of hazardous substances or petroleum products at the installation. The VSI and interview process included inquiries and requests into the existence and availability of records that support the environmental condition of the property.

6.2 Conclusions

The subject property was classified into one of seven standard ECP area types (categories) as defined by ASTM D5746-98(2016) *Standard Classification of Environmental Condition of Property Area Types for Defense Base Closure and Realignment Facilities*. Below are the seven categories for reference.

Table 4: Definitions of ECP Categories

ECP Category	Definition
1	An area or parcel of real property where no release, or disposal of hazardous substances or petroleum products or their derivatives has occurred (including no migration of these substances from adjacent properties).
2	An area or parcel of real property where only the release or disposal of petroleum products or their derivatives has occurred.
3	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but at concentrations that do not require a removal or remedial action.
4	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, and all remedial actions necessary to protect human health and the environment have been taken.
5	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred and removal or remedial actions, or both, are under way, but all required actions have not yet been taken.
6	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but required response actions have not yet been initiated.
7	An area or parcel of real property that is unevaluated or requires additional evaluation.

Given these seven categories, the subject property is categorized below, along with the reasoning for each classification.

Table 5: Properties and ECP Categories

Acreage	ECP Category	Reasoning
0.94 ac.	1	No release or disposal of hazardous substances or petroleum products or their derivatives has occurred beyond de minimus amounts, including no migration of these substances from adjacent properties.

No release or disposal of hazardous substances or petroleum products or their derivatives has occurred beyond de minimus amounts on the subject property and no releases to the environment were observed or reported.

Asbestos assessments were not available for the subject property. It is unlikely that Asbestos Containing Material (ACM) is present but, in the future, if a building or structure will be disturbed, a licensed asbestos inspector is needed to confirm whether ACM is present or not.

7.0 Certification

I declare that, to the best of our professional knowledge and belief, we meet the definition of *Environmental professional* as defined in Part 312.10 of 40 CFR 312. We have the specific qualifications based on education, training, and experience to assess a property of the nature, history and setting of the subject property. We have developed and performed the appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312. All information/documentation provided accurately reflects the condition of the property. This report meets the DoD requirements for completion of an ECP Report.

_____ _____

Eugenia Barnes
Environmental Protection Specialist
U.S. Army Corps of Engineers
Fort Worth District

Date

_____ _____

Hollie Eljizi
Environmental Engineer
U.S. Army Corps of Engineers
Fort Worth District

Date

_____ _____

Jennifer Jefcoat
Chemist
U.S. Army Corps of Engineers
Fort Worth District

Date

8.0 References

American Society for Testing and Materials (ASTM), 2013. E1527-13, *Standard Practice for Environmental Site Assessments: Phase 1 Environmental Site Assessment Process*.

ASTM, 2016. D5746, *Standard Classification of Environmental Condition of Property Area Types for Defense Base Closure and Realignment Facilities*.

Department of the Army, 13 December 2007. Army Regulation 200-1. *Environmental Quality: Environmental Protection and Enhancement.*

Environmental Protection Agency (EPA), February 2019. *EPA Map of Radon Zones including State Radon Information and Contacts*. https://www.epa.gov/radon/find-information-about-local-radon-zones-and-state-contact-information#radonmap

Federal Emergency Management Agency (FEMA), 2019. FEMA Flood Map Service Center. https://msc.fema.gov/portal

USACE. 1993. White River Basin, Arkansas and Missouri, *Water Control Master Manual.*

USACE. 2013. Little Rock District Water Management website. Accessed at: www.swl-wc.usace.army.mil

United States Census Bureau. 2013. Easy Facts Website. Accessed at: http://www.census.gov/easystats/

USACE. 2018. Beaver Lake White River and Tributaries, *Arkansas Shoreline Management Plan.*

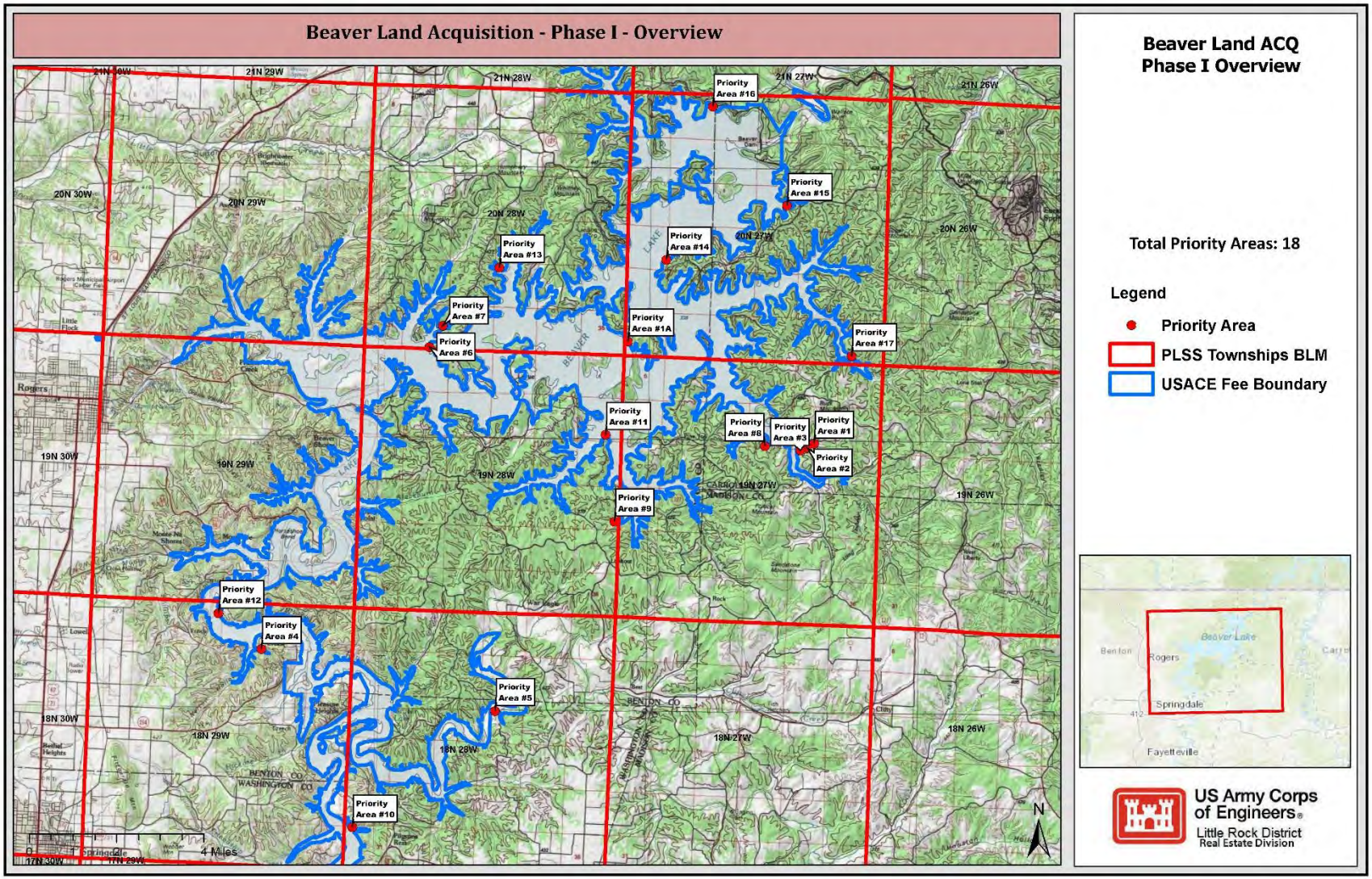
Arkansas Department of Energy and Environment Oil and Gas website Accessed August 2021 at: Commission, http://www.aogc.state.ar.us/maps/googleEarth.aspx

Beaver Watershed Alliance (BWA), 2012. *Beaver Lake Watershed Protection Strategy.*

Arkansas Department of Energy and Environment Environmental Quality website Accessed August 2021 at: https://www.adeq.state.ar.us/rst/programs/fees/facility_data.aspx

Figures

Figure 1: Beaver Lake Priority Areas



ACQ = Acquisition; PLSS = Public Land Survey System; BLM = Bureau of Land Management

Figure 2: Subject Property Detail

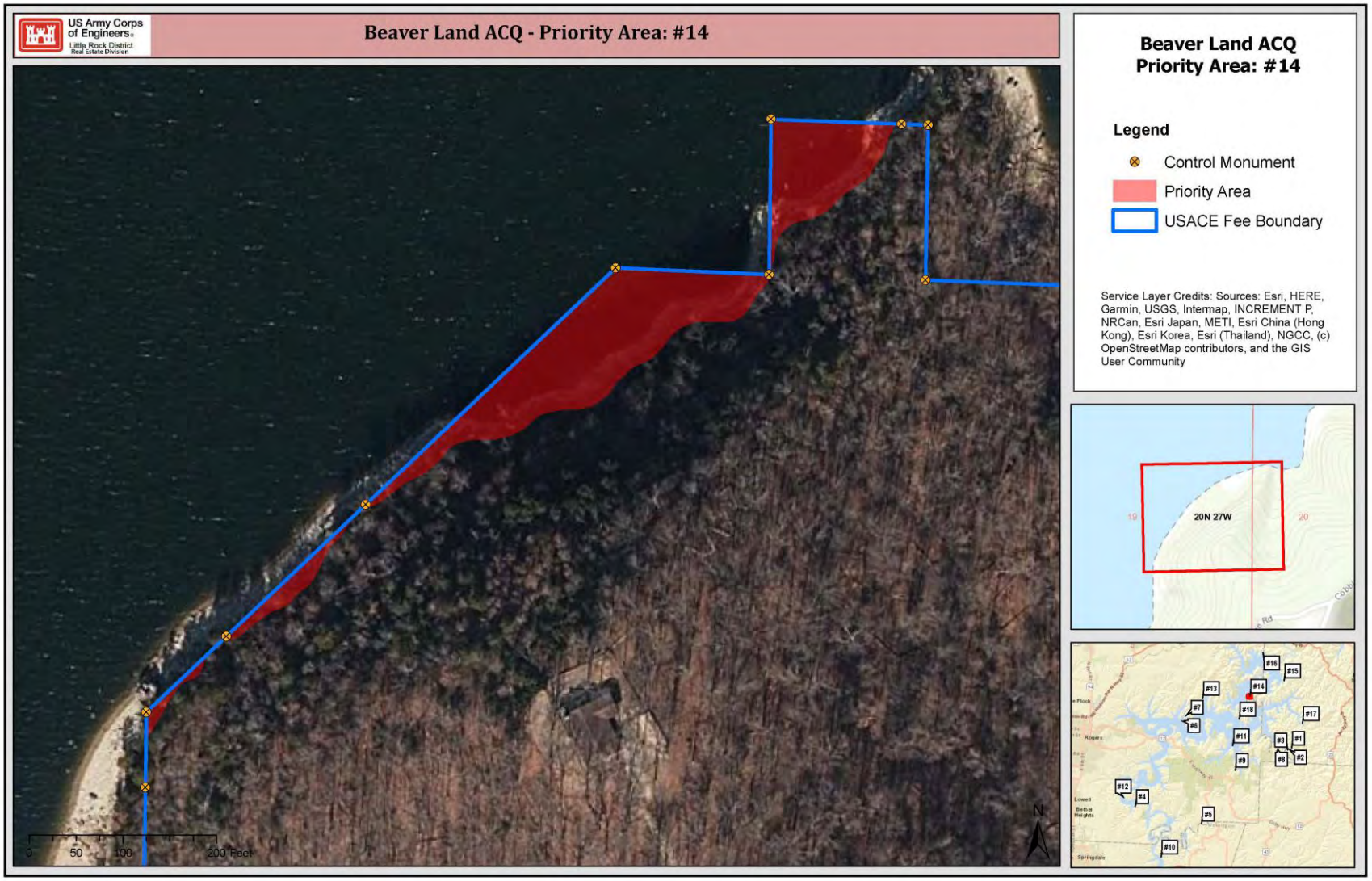


Figure 3: Interview Questions

Beaver Lake ECP
Interview Questions

1. Do you know of any environmental issues with this property?
2. Do you know of, or have access to, any reports concerning the environmental condition of this property? (i.e. site assessments, permits, storage tank registrations, safety plans, etc.) If so, would you be able to provide them? SWPPPs, SPCCs, air permits?
3. Do you know how this property has been historically used?
4. What is the property currently used for?
5. When were the site buildings constructed?
6. Are hazardous materials or petroleum products stored or used on this site? If so, what is the RCRA EPA ID? Does fueling occur on this property?
7. Do you know of any asbestos or LBP on the property or its buildings? Do you know the age of the buildings?
8. Has the site layout been manipulated in your recollection? (i.e. grading, excavation, etc.)?
9. Are there or have there been any cultural/historic items or buildings found on the property?
10. Is there anything else environmentally relevant that we should know?

Appendix A Visual Site Inspection Photographs

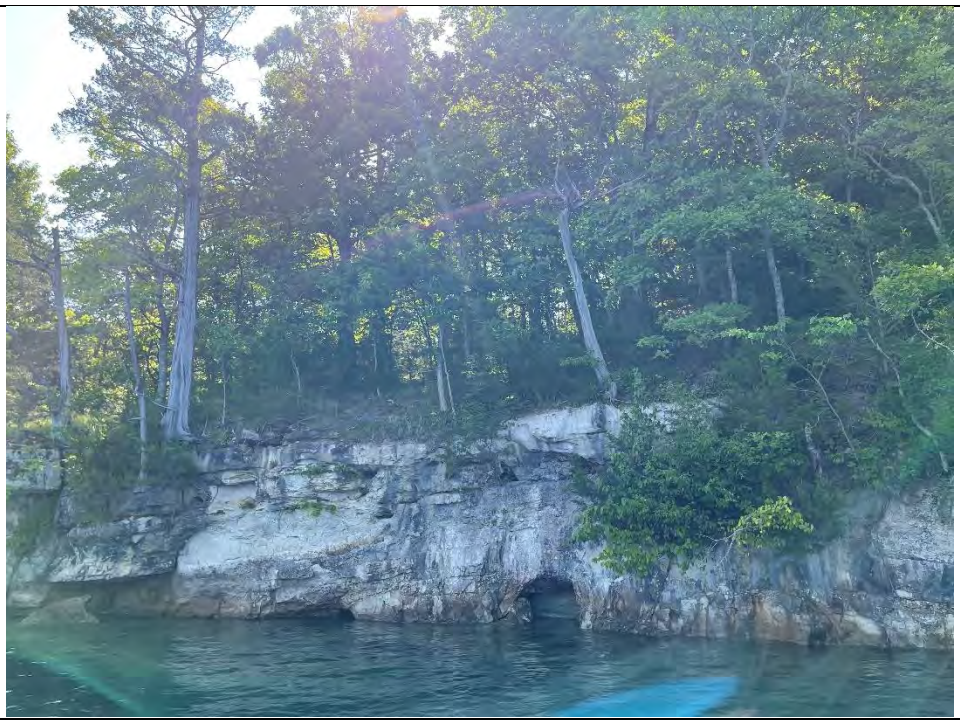
13 July 2021

Priority Area 14 – View of priority area from watercraft

Priority Area 14 – View of priority area from watercraft

Priority Area 14 – View of priority area from watercraft

Priority Area 14 – View of priority area from watercraft



Priority Area 14 – View of priority area from watercraft

Priority Area 14 – View of priority area from watercraft

Priority Area 14 – View of priority area from watercraft

Final

U.S. Army Environmental Condition of Property Report
Priority Area 15

Beaver Lake
Beaver Lake, Arkansas

August 30, 2021

Prepared For:
Beaver Lake Land Acquisition

Prepared By:
U.S. Army Corps of Engineers
Regional Planning and Environmental Center
Fort Worth District
Fort Worth, Texas

[This page is intentionally left blank.]

Table of Contents

List of Appendices:
Appendix A: Visual Site Inspection Photographs, 13 July 2019.
Appendix B: Historical Aerial Photography.
Appendix C: Historical Topographic Maps.

List of Acronyms

ACM	Asbestos-containing material
AR	Army Regulation
AST	Aboveground storage tank
ASTM	American Society for Testing and Materials
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CFR	Code of Federal Regulations
DoD	Department of Defense
ECP	Environmental Condition of Property
EDR	Environmental Data Resources, Inc.
EPA	Environmental Protection Agency
ERNS	Emergency Response Notification System
FAA	Federal Aviation Administration
HTRW	Hazardous, Toxic and Radioactive Waste
IRP	Installation Restoration Program
LBP	Lead-based Paint
LUST	Leaking underground storage tank
MEC	Munitions and Explosives of Concern
NEPA	National Environmental Policy Act
NFRAP	No Further Remedial Action Planned
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NRC	Nuclear Regulatory Commission
ODEQ	Oklahoma Department of Environmental Quality
OWS	Oil-water separator
PCB	Polychlorinated Biphenyl
POL	Petroleum, Oils, and Lubricants
RCRA	Resource Conservation and Recovery Act
SEMS	Superfund Enterprise Management System
SF	Square feet
SHWS	State Hazardous Waste Sites
SWPPP	Stormwater Pollution Prevention Plan
TSD	Transport, Storage, Disposal
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
UST	Underground storage tank
UXO	Unexploded Ordnance
VCP	Voluntary Cleanup Program
VSI	Visual site inspection

1.0 Executive Summary

This environmental condition of property (ECP) report has been prepared to document the environmental conditions and provide information for the acquisition of land that would be necessary for the operation, maintenance, and control of the Beaver Lake reservoir in Arkansas. This fee acquisition pertains to the frequently inundated land immediately surrounding the lake, below an elevation of 1128 ft above mean sea level (msl). The Army prepares an ECP in order to provide the public with information relative to the environmental condition of the property, assist Federal agencies during the property screening process, provide information about completed remedial and corrective actions at the property, and to assist in determining appropriate responsibilities, asset valuation, and liabilities with other parties to a transaction.

Beaver Lake currently occupies more than 38,000 acres of Federal public lands and waters. This ECP report covers a 0.47 acre strip of land located near the northwestern part of Beaver Lake. The subject property is on the edge of the lake and currently owned by private landowner(s). The Lake is located in northwestern Arkansas, in Benton, Washington, Madison and Carroll Counties and it is approximately 6 miles west of Eureka Springs, Arkansas. The subject property, also known as Priority Area 15, is located at the Honey Creek area south of the Dam Site overlook.

This ECP report presents a summary of readily available information on the environmental conditions of, and concerns relative to, the land, facilities, and real property assets of Beaver Lake. The findings included in the report are based on a record search of historical environmental investigation reports and site historical documents, a review of aerial photography, stakeholder interviews, and a site inspection conducted 12 – 13 July 2021.

Based on the environmental conditions found and the ECP analysis, the property can be categorized as an ECP Category 1, indicating a site where no release, or disposal of hazardous substances or petroleum products or their derivatives has occurred (including no migration of these substances from adjacent properties).

2.0 Purpose

2.1 General

This environmental condition of property (ECP) report has been prepared to document the environmental conditions and provide information for the acquisition of land surrounding Beaver Lake in Benton, Washington, Madison and Carrol Counties, Arkansas. This report meets the requirements of Title 40, Code of Federal Regulations (CFR), Part 373, and United States Army Regulation (AR) 200-1 (2007), *Environmental Quality, Environmental Protection and Enhancement*. The ECP report also follows the American Society for Testing and Materials (ASTM) E1527-13 *Standard Practice for Environmental Site Assessments: Phase 1 Environmental Site Assessment Process*. The subject property in this report is subsequently categorized according to ASTM D5746 (2016) *Standard Classification of Environmental Condition of Property Area Types for Defense Base Closure and Realignment Facilities*.

The Army prepares an ECP for the following purposes:

- Provide the public with information relative to the environmental condition of the property.
- Assist Federal agencies during the property screening process.
- Provide information to prospective buyers.
- Provide information about completed remedial and corrective actions at the property.
- Assist in determining appropriate responsibilities, asset valuation, and liabilities with other parties to a transaction.

The ECP contains the information required to comply with the provisions of 40 CFR, Part 373 that require a notice to accompany contracts for the sale of, and deeds entered into the transfer of, federal property on which hazardous substances may have been stored, released or disposed. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) §120(h) stipulates that a notice is required if certain quantities of designated hazardous substances have been stored on the property.

The ECP Report is not prepared to satisfy a real property purchaser's duty to conduct an "all-appropriate inquiry" to establish an "innocent purchaser defense" to CERCLA 107 liability. Any such use of the ECP Report by any party is outside the control of the Army and beyond the scope of the ECP Report. The Army, its officers, employees, or contractors makes no warranties or representations that any ECP Report satisfies any such requirements for any party.

2.2 Scope

Priority Area 15 occupies 0.47 acres of land. This ECP report covers 0.47 acres of land located on the northeastern part of Beaver Lake south of the Dam Site Overlook and east of the Dam Site Wildlife Management Area. Priority Area 15 is a wooded strip of at the end of a small peninsula. There is access via watercraft and although it wasn't explored potential terrestrial access via private property from South Bayshore Rd. Areas within the lake that are not within the Priority Area will be considered adjacent property. A general site location map is provided in Figure 1, and map showing the subject property are shown in Figure 2.

Beaver Lake currently occupies more than 38,000 acres of Federal public lands and waters. This ECP report covers a 0.47 acre strip of land located near the northeastern part of Beaver Lake. The subject property is on the edge of the lake and currently owned by private landowner(s). The Lake is located in northwestern Arkansas, in Benton, Washington, Madison and Carroll Counties and it is approximately 6 miles west of Eureka Springs, Arkansas. The subject property, also known as Priority Area 15, is located at the Honey Creek area south of the Dam Site overlook.

2.3 Limitations

This ECP report presents a summary of readily available information on the environmental conditions of, and concerns relative to, the land, facilities, and real property assets of the subject property. The findings included in the report are based on a record search of available historical environmental investigation reports and site historical documents, a review of aerial photography, stakeholder interviews, and a site reconnaissance conducted 12 – 13 July 2021. Historical environmental investigation reports and site historical documents were reviewed in support of this ECP, and the information obtained from other studies is reflected within this report by reference. The ECP process recognizes that the condition of property and classification can change as historical contamination is cleaned up (if required) or if a new source of contamination is identified. Records reviewed during the assessment were accepted as accurate and a reasonable effort was made to resolve discrepancies identified during the document review.

During the ECP assessment, all available sources of information concerning both past and present environmentally significant uses of the property were reviewed. This included readily available data associated with adjacent property records; 1985, 1994, 2001, 2004, 2006, 2009, 2010, 2012, 2014, 2016, 2017, 2018, and 2020 aerial photography; personnel interviews; current and historic investigations; and topographical maps. In addition, record sources were reviewed to determine if there have been spills, leaks, discharges, leaching, underground injection, dumping, abandonment, or storage of hazardous substances or petroleum products at the subject property. The site reconnaissance and interview process included inquiries and requests into the existence and availability of records that support the environmental condition of the property. The site reconnaissance included a Visual Site Inspection (VSI) of the subject property. No sampling or analysis was conducted during this survey.

2.4 Report Organization

The remainder of this ECP report is organized as follows:

Section 3 – Property Description: This section provides location and description of the subject property; an overview of historical and current land uses; and a description of the environmental setting of the lake area, including climate, topography, geology, and demography.

Section 4 – Survey Methodology: This section describes the methods used to obtain the information for this ECP Report such as the development of study sections, the VSI, aerial photography analysis, records review, interviews, and data management.

Section 5 – Environmental Conditions: This section provides the existing environmental information. The findings are organized by relevant environmental "issues," including permits and licenses, cleanup activities, hazardous substances, petroleum and related products, asbestos, lead-based paint (LBP), radioactive materials, landfills, explosive contaminated structures, radon, pesticides, and polychlorinated biphenyls (PCBs). This section also includes adjacent property descriptions.

Section 6 – Evaluation and Conclusions: This section provides a summary of the subject property and evaluates the property for categorization as per ASTM D5746 (2016).

Section 7 – Certification: This section documents the approval of the ECP report.

Section 8 – References: This section provides an inventory of the reference material used in the preparation of this ECP Report.

Appendices: A list of appendices is provided in the Table of Contents.

3.0 Property Description

3.1 Parcel Locations and Description

Beaver Lake is located in the scenic Ozark Mountain region of northwestern Arkansas in Benton, Washington, Carroll and Madison counties. The total area currently contained in the Beaver project, including both land and water surface, consists of 38,138 acres owned in fee. Of this total, 1,432 acres are in flowage easement. The proposed Land Acquisition would include adding any land below the 1128 msl water level. The White River drainage area above Beaver Lake is approximately 1,186 square miles. When the lake is at the top of the conservation pool (elevation 1120.43 feet above mean sea level), the water area is 28,299 surface acres with 490 miles of shoreline within the lands owned in fee. The shoreline is irregular with topography primarily consisting of steep bluffs and gentle slopes.

Priority Area 15 is a .047 acre irregularly shaped strip of land along the shoreline near the northern end of the lake in a cove of Honey Creek just south of the Dam Site Overlook. The priority area is at the end of a short peninsula in a residential area off of South Bayshore Rd.

3.2 Historic Land Use

Beaver Lake is a multiple purpose water resource development project initially authorized for flood control, hydropower generation and other beneficial uses by the Flood Control Act dated 3 September 1954. The inclusion of storage in the lake for municipal and industrial water supply was authorized by the Water Supply Act of 1958. Beaver Lake is a major component of a comprehensive plan for water resource development in the White River Basin of Arkansas and Missouri. Construction of Beaver Dam was initiated in March 1960. The dam was completed in June 1966, and the powerhouse and switchyard were completed in 1965. Beaver Lake was declared operational for public use in 1965.

For Priority Area 15, the historical aerial photographs show that this area has been used for private residences since 1994.

3.3 Current Land Use

Beaver Lake is located in the Ozark Highlands of Carroll, Washington, Benton, and Madison Counties. Having 490 miles of shoreline (at conservation pool) and over 28,000 water surface acres, Beaver Lake is the largest reservoir in northwest Arkansas and the first federal impoundment on the White River.

There are 12 public use areas around Beaver Lake. There are 11 parks on the lake presently operated by the Corps of Engineers. The State of Arkansas owns and operates Hobbs State Park Conservation Area, which covers 12,056 acres, and Devil's Eyebrow Natural Area, which covers 2,503 acres. Both properties are adjacent to USACE lands. There are two parks, Ventris, and Blue Springs that have been reduced to lake access only. One Park (Big Clifty) is operated by Carroll County, Arkansas.

Despite being located adjacent to the fast-growing communities of Fayetteville, Springdale, Bentonville, and Rogers, Arkansas and a regional population of over 500,000, the lake provides open spaces and a quality outdoor recreation opportunity. Many arms and coves of the lake offer secluded areas for traditional activities such as fishing, skiing, sailing and scuba diving, but also allow for passive recreation opportunities like photography and nature observation.

The Priority Area 15 is currently owned by three separate private landowners.

3.4 Utilities

Priority area fourteen has no known utilities.

3.5 Environmental Setting

3.5.1 Climate

The climate in the Beaver Lake area is classified as humid subtropical according to the Köppen climate model. A humid subtropical climate is characterized by hot, usually humid summers and mild to cool winters. The Köppen definition of this climate is for the coldest month's mean temperature to be between 26.6 °F (−3 °C) and 64.4 °F (18 °C), and the warmest month to be above 71.6 °F (22 °C). Some climatologists prefer to use 32 °F (0 °C) as the lower bound for the coldest month's mean temperature. Under the modern Trewartha climate classification, climates are termed Humid Subtropical when they have mean temperatures of 50 °F (10 °C) for eight or more months a year. In most locations classed within this system, the mean temperature of the coldest month is between 35 °F (3 °C) and 65 °F (18 °C). Some climatologists consider the Trewartha grouping of subtropical climates to be more real-world and fitting on a global scale.

While technically classified as humid subtropical, the climate in the Beaver Lake area is considered moderate. The area experiences all four seasons and does receive cold air masses from the north; however, some of the Arctic masses are blocked by the higher elevations of the Ozarks.

Average temperatures range from a high of 88 °F (31.1 °C) and low of 27 °F (-2.7 °C) in nearby Rogers, Arkansas. Extreme temperatures rarely exceed 96 °F (35.6 °C) and 13°F (-10.6 °C). Late summer is the time of maximum heat and least rainfall. During the winter months, midday temperatures in the basin are relatively warm, around 55 to 60 °F. Some short periods of cold weather occur with temperature ranging from 0°to 10°F. On winter nights, temperatures from 37 o F to below freezing are common. Highest recorded temperature in Rogers, Arkansas was 114 °F (45.6 °C) (recorded in July 1954). The lowest temperature recorded was −16 °F (−26.7 °C), in February 1996.

The relative humidity typically ranges from 41% (comfortable) to 91% (very humid) over the course of the year, rarely dropping below 24% (dry) and reaching as high as 100% (very humid). The air is driest around April 9, at which time the relative humidity drops below 49% (comfortable) three days out of four; it is most humid around June 3, exceeding 87% (very humid) three days out of four.

Dew point is often a better measure of how comfortable a person will find the weather than relative humidity because it more directly relates to whether perspiration will evaporate from the skin, thereby cooling the body. Lower dew points feel drier and higher dew points feel more humid. Over the course of a year, the dew point typically varies from 19°F (dry) to 71°F (muggy) and is rarely below 4°F (dry) or above 74°F (very muggy). There are two periods in the year that are most comfortable: The first is between April 18 and June 6 and the second is between September 3 and October 23. The air feels neither too dry nor too muggy during these periods (https://weatherspark.com/averages/31495/Rogers-Arkansas-United-States).

Average annual rainfall for the Beaver Lake area is 45 inches per year. Precipitation is weakly seasonal, with a bimodal pattern: wet seasons in the spring and fall, and relatively drier summers and winters, but some rain in all months. The spring wet season is more pronounced than fall, with the highest rainfall typically occurring in May. The average annual snowfall for the Beaver area is about 12 inches. Snowpacks are usually short lived and are not commonly a concern for flooding.

Climate change is an area of concern due to the potential for effects on many aspects of the environment, especially those related to water resources. The U.S. Global Change Research Program (USGCRP) summarized information regarding climate change and its potential effects in regional assessments (http://www.globalchange.gov/publications/reports/scientific-assessments/us-impacts). In the Midwest, which extends from Minnesota to Missouri, extreme events such as heat waves, droughts and heavy rainfall events are projected to occur more frequently. Should these events become significant enough to impact the operation of Beaver Lake, the Master Plan and associated documents (i.e. Operations Management Plan and Shoreline Management Plan) would be reviewed and revised, if necessary.

3.5.2 Topography, Geology, and Soils

The depositional environment of the rocks found in the Arkansas Ozarks is one of a relatively shallow continental shelf, sloping toward deeper water generally toward the south. This shelf emerged many times during the Paleozoic resulting in numerous unconformities throughout the sequence. The Ozark Plateaus region of Arkansas is made up of generally flat-lying Paleozoic age strata divided into three plateau surfaces. The lowest and northern-most plateau is the Salem Plateau. The Springfield Plateau stands above the Salem a few hundred feet and is generally capped by lower Mississippian age limestones and cherts. The southernmost and highest plateau of the Ozarks is the Boston Mountains. All of these plateaus are deeply dissected by numerous streams throughout the area. The faulting in the Ozarks is generally normal; most faults displaying a displacement down on the southern side. However, some observations reveal that a few strike-slip faults may be present. Gentle folds are noted but are generally of very low amplitude. The depositional environment of the rocks found in the Arkansas Ozarks is one of a relatively shallow continental shelf, sloping toward deeper water generally toward the south.

Beaver Lake is part of the Springfield Plateau that occupies primarily the western and southwestern flanks of the Ozark Plateau province. The Springfield Plateau in this region rises to an elevation of approximately 1400 feet and in many areas, forms extensive plains. Hilly areas occur where rivers and their tributaries cut into the plateau surface, most notably in the vicinity of the White River and Beaver Lake. As streams like the Buffalo National River cut through the plateau down to the level of the White River, they sometimes carve spectacular bluffs.

Lower Ordovician, Middle to Upper Devonian and Lower and Upper Mississippian age strata are present around Beaver Lake. Upper Ordovician and Devonian strata crop out around Beaver Lake and its tributaries. The Lower Mississippian Boone Formation comprises the surface rock over the majority of the area and forms the surface of the heavily dissected Springfield Plateau. In addition to the Boone Formation, Cotter and Jefferson City formations (Jefferson City formation has not been successfully differentiated from the Cotter Formation in Arkansas), and the Powel formation, all of Ordovician age are present in the area. Formations in the Devonian strata include the Chattanooga, Clifty and Penters.

The Boone Formation consists of gray, fine- to coarse-grained fossiliferous limestone interbedded with chert. This formation caps the higher hills in the area. Since limestone is easily dissolved by water, cave and solution (karst) features are prominent. The Boone Formation is well known for dissolutional features, such as sinkholes, caves, and enlarged fissures. Surface water may drain directly into channels in limestone, where it can move rapidly and without filtration to the surface as a spring, at a location that is unpredictable without extensive testing. Therefore, water pollution problems are of particular concern in this region. The thickness of the Boone Formation is 300 to 350 feet in most of northern Arkansas, but as much as 390 feet has been reported.

The Cotter Dolomite is composed of dolostone of predominantly two types: a fine-grained, argillaceous, earthy textured, relatively soft, white to buff or gray dolostone called "cotton rock", and a more massive, medium-grained, gray dolostone that weathers to a somewhat hackly surface texture and becomes dark on exposure. The formation contains chert, some minor beds of greenish shale, and occasional thin interbedded sandstone. The thickness is about 340 feet in the vicinity of Cotter, but the interval may range up to 500 feet thick in places.

The Powell Dolomite is generally a fine-grained, light-gray to greenish-gray, limy, argillaceous dolostone with thin beds of shale, sandstone, sandy dolostone, and occasionally chert. The formation’s thickness may be as much as 215 feet but is often much thinner.

The Chattanooga Shale Formation is typically black, fissile clay shale that weathers into thin flakes. The beds are usually cut by prominent joints creating polygonal blocks upon weathering. The upper part of the formation may be slightly sandy and usually contains abundant pyrite. Thickness ranges from 0 to about 85 feet; normally averaging about 30 feet (AGS).

The strata throughout the region are nearly horizontal. One predominant geological feature of the lake area is a low, persistent, limestone bluff, which occurs just above the Ordovician- Mississippian contact.

The faulting in the Ozarks is generally normal; most faults displaying a displacement down on the southern side. Lineaments and faults characteristic of northwest Arkansas are present around Beaver Lake. The Fayetteville Fault lies beneath Beaver Lake. This fault is the west side of a graben that has down-dropped the Boone Formation to lake level. The Starkey Fault bounds the east side of the graben. Both faults trend approximately N 450E. One section of the Starkey fault trends N 60-700E. The Clantonville Lineament – Monocline is a northeast to southwest trending structural feature that extends from north of Clantonville to Ventris Hollow. The location of this feature was determined from the 1:24,000 three dimensional quadrangle and from structural disparities in the Lower Mississippian rock units. This structural feature could be responsible for the presence of lead-zinc mineralization in an old prospect near Clantonville (north of Beaver Lake). The trend of this lineament to monocline is N 30-400E. Paleokarst features within the top of the Powell Dolomite are present around Beaver Lake and coincident with a lineament in Limekiln Hollow near Garfield, northwest of Beaver Lake.

In general, the soils of the Ozark Plateaus are residual and are formed on a broad, domed, upwarp consisting mostly of limestone and dolomite. The main difference in the soils is due to different rocks from which the soils were formed. The main geologic materials are cherty limestone; cherty, very siliceous dolomite; cherty, siliceous dolomite; and alluvium, which are weathered and water transported products of the first three materials. Glade-rock soil occurs where the cherty, very siliceous dolomite is exposed to the soil formation. Dolomite is more resistant to weathering than limestone and siliceous dolomite is even more resistant, so very shallow soil results. In areas where the dolomite is less siliceous, more weathering has taken place; however, the soils produced are not as deep as soils formed by limestone.

The following eight soils associations are found in and around the Beaver project area: Captina-Nixa, Captina-Nixa-Pickwick, Clarksville-Nixa-Baxter, Corydon-Sogn, Enders-Allegheny-Mountainburg, Razort-Captina-Etowah, Linker-Apison-Hector, and Captina-Pembroke.

3.5.3 Hydrology and Groundwater

In the Interior Highlands of western and northern Arkansas ground-water supplies are more limited than in the Coastal Plain. Much of the Ozark Plateaus region is underlain by carbonate rocks, which are quite soluble in the presence of water. Solution by ground water has caused many large openings through which water passes so quickly that contaminants from the surface cannot be filtered out. Signs of these openings are caves, sink holes, springs and lost stream segments. As a consequence, the water in shallow wells may not be suitable for human consumption without treatment.

Three aquifers, which are part of the Ozark Plateaus Aquifer System, are located within northern Arkansas. The Springfield Plateau aquifer is generally under unconfined conditions, with groundwater movement occurring through fractures and solution cavities formed by dissolution of carbonate rock. Local discharge is through springs and streams. The Ozark aquifer is generally under confined conditions, especially where overlain by the units of the Ozark Confining Unit (Chattanooga Shale). Most wells in the Springfield Plateau and upper units in the Ozark aquifer yield 5-10 gpm on the average, with yields greater than 25 gpm in rare cases.

The third aquifer, the Roubidoux Formation and the Gunter Sandstone Member of the Gasconade Formation in northern Arkansas occur at greater depth and constitute the only significant aquifer system in the Ozarks. Both are permeable sandstone and carbonate units of Ordovician age. These aquifers serve as the principal source of high-quality water for many communities in northern Arkansas where surface

water sources are unavailable. Together these units may yield up to 500 gpm to wells. These formations do not outcrop anywhere in Arkansas but instead outcrop in southern Missouri.

3.5.4 Water Quality

The waters of the Arkansas portion of the White River watershed have all been designated by the Arkansas Department of Environmental Quality (ADEQ) for fisheries, primary and secondary contact recreation, and domestic, agricultural, and industrial water supplies (ADEQ, 2012). Beaver Lake is classified by ADEQ as a Type A water body, which includes most larger lakes of several thousand acres in size, in upland forest dominated watersheds, having an average depth of 30 to 60 feet, and having low primary production (i.e., having a low trophic status if in natural [unpolluted] condition). Beaver Lake, like all other lakes of its size in the Ozark region, stratifies chemically and thermally in the late spring with stratification extending into late fall and early winter. During the warmer months, lake waters of the upper layer (the epilimnion) are warmer and contain more dissolved oxygen, while the denser, lower layer waters (the hypolimnion) are colder and contain very little or no dissolved oxygen, thus undesirable for fish habitat.

This undesirable water, when discharged downstream from hydropower generation, may cause some problems in the tailwaters. To combat this problem, the dissolved oxygen content is monitored and various management measures are implemented to improve the dissolved oxygen concentration in the hydropower releases. A highly productive trout fishery has been established in the Beaver tailwaters by the Arkansas Game and Fish Commission because of the available discharge of cold water from the dam, which is reaerated by turbulence as it flows downstream.

As the stratified epilimnion cools in the late fall and winter, the layers begin to mix (de-stratify) and dissolved oxygen (DO) is more evenly distributed. This condition is more favorable to the fishery of the lake and overall water quality.

The upper 1500 acres of Beaver Lake has been listed by the Arkansas Department of Environmental Quality (ADEQ) on Arkansas' 303(d) list of impaired waters, approved by the Environmental Protection Agency (EPA), due to turbidity (ADEQ, 2008). According to the Arkansas 303(d) list, these excessive levels impact the local fisheries as well as primary contact, both designated uses of Beaver Lake. The elevated turbidity levels are due to excessive silt from surface erosion from agriculture activities, unpaved road surfaces, in-stream erosion – mainly from unstable stream banks, and any other land surface disturbing activity. The Draft 2010 Integrated Water Quality and Monitoring Report (ADEQ, 2010) added pathogen indicator bacteria as a contaminant for the same area of Beaver Lake. Surface erosion activities are listed as the probable source for this contaminant as well.

Clean Water Act requires states to list waters that do not meet Federal water quality standards or have a significant potential not to meet standards as a result of point source dischargers or non- point source run-off. Subsequent to listing on the 303(d) list, the statute requires that the states develop and set the Total Maximum Daily Load (TMDL) for water bodies on the list within 13 years. A TMDL establishes the maximum amount of a pollutant that can enter a specific water body without violating the water quality standards. Values are normally calculated amounts based on dilution and the assimilative capacity of the water body. TMDLs have not been established by ADEQ for the upper Beaver Lake area.

3.6 Biological and Cultural Resources

3.6.1 Terrestrial Ecosystems

The area surrounding Beaver Lake is mostly forested. Trees and shrubs around the lakeshore include upland oak and hickory species, persimmon, honey locust, hawthorn, dogwood, redbud, coralberry, smooth and winged sumac, and buttonbush. Frequent periods of inundation keep a thin strip of government owned lands around the lake in early stages of succession. Red cedar and short-leafed pine, the principal evergreens, are dispersed throughout the region and are found in many large, scattered groups. Ground covers consist of greenbrier, sedges, and native grasses. White-tailed deer and eastern wild turkey are common game animals found and hunted in the Beaver Lake area. Black bears have also become common in the area and are hunted on the lands around the lake. The principal small game species found in the open upland areas include bobwhite quail, cottontail rabbit, and mourning dove. Gray and fox squirrels are common in upland wooded areas. Furbearing animals found in the Beaver Lake area include coyote, red fox, gray fox, otter, mink, muskrat, beaver, bobcat, and raccoon. Habitat management that includes wildlife food plot plantings, mowing, soil disturbance, removal of exotic species and application of prescribed fire provide benefit to these populations.

The common goldeneye, hooded merganser, bufflehead, and ring-necked duck are the predominant migratory waterfowl species visiting Beaver Lake. Mallards, gadwall, and other duck species are also present; however, they are only transient visitors as their characteristic feeding habits of obtaining food from shallow waters is limited. Resident Canada geese are so numerous in many coves and recreation areas that their presence has become a nuisance.

Ring-billed gulls are seen frequently around the Beaver Lake area. Greater and lesser yellow legs, pelicans, and large flocks of horned grebes are also seen during their peak migration in the spring and fall. Beaver Lake is also one of the few places where visitors can see both the turkey vulture and the black vulture at the same time in the winter. Beaver Lake has also become a popular place that visitors come to observe bald eagles, commonly wintering 150 or more birds and hosting 5-6 breeding pairs during the nesting period of March to June. The surrounding woodlands and grasslands serve as prime nesting areas for resident and neotropical migratory songbirds.

3.6.2 Aquatic Ecosystems and Wetlands

Walleye, smallmouth bass, striped bass, hybrid white-striped bass, and paddlefish have been introduced into Beaver Lake to add diversity to the fishery. Natural reproduction of striped bass and hybrid white-striped bass does not occur in Beaver Lake. Since 2004, AGFC stocks approximately 100,000 walleye, 30,000 channel catfish, 30,000 blue catfish, and 200,000 striped bass each year. While natural reproduction occurs in white crappie, black crappie, largemouth bass, and smallmouth bass, AGFC supplements this reproduction by occasional stockings of these species. Historically, there have also been introductions of northern pike, blue catfish, lake trout, and threadfin shad.

Located within the Springfield Plateau of the Ozark Mountains region of northern Arkansas, the area surrounding Beaver Lake is characterized by limestone, dolomite, or chert geology. The many rivers and streams flowing through the region have created a landscape of level highlands dissected by rugged valleys rich in karst features such as caves and sinkholes. Associated with these streams and landscape features are a variety of wetland habitats representative of the five wetland classes occurring within the region. These wetland classes include depressions, flats, fringe, riverine, and slope. It is possible, and perhaps even likely, that all of these classes of wetlands occur in the general area of Beaver Lake. However, those most likely to occur in the area immediately surrounding the lake are fringe (most likely reservoir), riverine (most likely spring runs) and slope wetlands (most likely calcareous slope).

3.6.3 Threatened and Endangered Species

The following species listed in Table 1 are from the U.S. Fish and Wildlife Service's federally classified status list of species and the Arkansas Natural Heritage data sets which have been reported and identified on project lands. Although the bald eagle was delisted by USFWS in 2007 due to recovery of the species, both the bald and golden eagles are still protected in accordance with the Bald and Golden Eagle Protection Act. The federal Migratory Bird Treaty Act of 1918 also provides protection to certain species of migratory birds. A total of 31 bird species are currently protected under this federal statute.

Table 1: Threatened and Endangered Species

	Federal Status	**State Status/Global Rank**
Gray Bat	LE	SE / S2S3/G4
Indiana Bat	LE	SE / /S1/G2
Northern long-eared Bat	LT	SE / S1S2/ G1G2
Ozark Big-eared Bat	LT	Not listed
Little Brown Bat	-	SE / S1
Bald Eagle	*Protected under Bald and Golden Eagle Protection Act	S3B,S4N/G5
Eastern Black Rail	LT	Not listed
Piping Plover	LT	Not listed
Rufa Red Knot	LT	Not listed
Whooping Crane	Experimental Population, Non-Essential	Not listed
Ozark Cavefish	LT	SE / S1/G3
Neosho Mucket	LE	Not Listed
Rabbitsfoot mussel	LT	SE/S3/G3G4
Snuffbox Mussel	LE	Not listed
Monarch Butterfly	C	Not listed
Missouri Bladderpod	LT	S2/G3
Opaque Prairie Sedge	-	SE / S2S3G4
Yellow Coneflower	-	ST / S2G3T3
Ovate-leaf Catchfly	-	ST / S2G3
Royal Catchfly	-	ST / S2G3

FEDERAL STATUS CODES

LE = Listed Endangered; the U.S. Fish and Wildlife Service has listed this species as endangered under the Endangered Species Act.

LT = Listed Threatened; the U.S. Fish and Wildlife Service has listed this species as threatened under the Endangered Species Act.

C = Candidate Species;

STATE STATUS CODES

INV = Inventory Element; The Arkansas Natural Heritage Commission is currently conducting active inventory work on these elements. Available data suggests these elements are of conservation concern. These elements may include outstanding examples of Natural Communities, colonial bird nesting sites, outstanding scenic and geologic features as well as plants and animals, which, according to current information, may be rare, peripheral, or of an undetermined status in the state. The ANHC is gathering detailed location information on these elements.

GLOBAL RANKS

G3 = Vulnerable globally. At moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors.

G4 = Apparently secure globally. Uncommon but not rare; some cause for long-term concern due to declines or other factors.

G5 = Secure globally. Common, widespread and abundant.

T-RANKS= T subranks are given to global ranks when a subspecies, variety, or race is considered at the state level. The subrank is made up of a "T" plus a number or letter (1, 2, 3, 4, 5, H, U, X) with the same ranking rules as a full species.

STATE RANKS

S1 = Critically imperiled in the state due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors making it vulnerable to extirpation.

S2 = Imperiled in the state due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it vulnerable to extirpation.

S3 = Vulnerable in the state due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.

GENERAL RANKING NOTES

Q = A "Q" in the global rank indicates the element's taxonomic classification as a species is a matter of conjecture among scientists.

Source: Arkansas Natural Heritage Commission

3.6.4 Cultural Resources

The records search, interviews, and site inspection identified no cultural resource assessments or findings for the subject property.

During the past seventy years scientific investigation of archaeological sites in the Beaver Lake area has been carried out in several phases. In 1922 and 1923, Mark R. Harrington of Phillip Academy was the first archeologist to excavate sites on the area that is now Beaver Lake. He excavated 13 bluff shelters. Between 1928 and 1935, the work of Harrington was continued by S.C. Dellinger of the University of Arkansas Museum. Dellinger supervised the excavation of 21 rock shelters. In the early 1960's, a series of surveys were conducted by several archeologists from the University of Arkansas Museum. Today, there are 280 known archeological sites along or immediately adjacent to Beaver Lake. Of these, 271 are identified as prehistoric, seven are historic and two sites have no known cultural affiliation.

Table 2: Historical and Cultural Resources at Beaver Lake

Type of Site	Number of sites
Historic	7
Prehistoric	271
No known cultural affiliation	2
Total	280
National Register Eligibility Status	
Not Evaluated	132
Not Eligible	5
Eligible	1

4.0 Survey Methodology

4.1 Development of Study Sections

The information gathered during the development of the ECP was used to group the subject property into standardized categories using Department of Defense (DoD) guidance, and in accordance with ASTM D5746 (2016). The ECP category definitions are summarized below in Table 3.

Table 3: Definitions of ECP Categories

ECP Category	Definition
1	An area or parcel of real property where no release, or disposal of hazardous substances or petroleum products or their derivatives has occurred (including no migration of these substances from adjacent properties).
2	An area or parcel of real property where only the release or disposal of petroleum products or their derivatives has occurred.
3	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but at concentrations that do not require a removal or remedial action.
4	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, and all remedial actions necessary to protect human health and the environment have been taken.
5	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred and removal or remedial actions, or both, are under way, but all required actions have not yet been taken.

6	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but required response actions have not yet been initiated.
7	An area or parcel of real property that is unevaluated or requires additional evaluation.

The final ECP category designations for the subject property are shown in Section 6.2, Table 5.

4.2 Visual Site Inspection

A VSI was conducted on 13 July 2021 at the subject property to check for recognized environmental conditions. The VSI was conducted by Mrs. Hollie Eljizi, Ms. Jennifer Jeffcoat and Mr. Robert Singleton from the U.S. Army Corps of Engineers (USACE). USACE representatives were accompanied by Mr. Mathew Voskamp of the USACE Beaver Lake office.

The VSI was performed from a USACE Beaver Lake Office watercraft near the bank of the subject property as a Right of Entry (ROE) was not available at the time of the inspection. At the time of inspection, the lake level was at 1127 feet above sea level, full lake level is 1121 feet above sea level. This made part of the priority area under water during the VSI, however water clarity was good, and no debris or other concerns were seen in the water. A covered boat dock was observed at the priority area and several boat dock adjacent to the area. No apparent signs of Hazardous, Toxic and Radioactive Waste (HTRW) were visible during the VSI.

Photos from the VSI can be found in Appendix A.

4.3 Aerial Photography Analysis

Aerial photographs were available from Google Earth maps for 1985, 1994, 2001, 2004, 2006, 2009, 2010, 2012, 2014, 2016, 2017, 2018, and 2020.

The initial aerial photograph from 1985 is of poor quality and the area isn't discernable. The next photo form 1994 is also of poor quality but a residence just south of the priority area can be seen with a boat dock along with a small dock on the opposite side of the cove from the parcel. The next photo from 2001 three additional small docks can be seen near the first dock on the opposite side of the cove from the priority area with appears to be three residences at the crest of the hill above them. The next photo from 2006 shows another larger boat dock and another residence on the opposite side of the cove of the parcel. There is no significant change in the photos from 2008 to 2018. The last available photo from 2020 the foundation for a boat dock can be seen with in the priority area boundaries.

All aerial photographs are included in Appendix B.

4.4 Sanborn Map Review

Sanborn maps were not available for the subject property, or for the adjacent areas.

4.5 Topographic Map Review

Historical topographic maps were available from the US Geological Survey Website for the Beaver Lake area for 1900, 1901, 1945, 1949, 1954, 1957, 1958, 1964, 1985, 2011, 2014, 2017, and 2020. Several observations can be gleaned from these maps. First, the area before the lake was formed consisted of valleys with steep bluffs and hill sides around the White River and its tributaries. The historical maps show this valley and river basin from the 1900 to 1964 topographic maps. In 1985 the river and Beaver Dam at the northern end of the lake can been seen in the valley of the historical White River.

All topographic maps are included in Appendix C.

4.6 Records Review

4.6.1 Standard Environmental Record Sources

In this evaluation records, maps and other documents that provide environmental information about the project area are obtained and reviewed. A desktop records review was conducted using various sources to determine the presence of HTRW sites on or near the subject property. This search was focused on active cleanup sites and sites with a reasonable risk of HTRW release. Several databases were searched manually to narrow down the search area. These databases included the Environmental Protection Agency (EPA) Cleanups in my Community database, the EPA Envirofacts databases, the Arkansas Department of Environmental Quality's (ADEQ) web search tool of Underground Storage Tanks (UST) and Above Ground Storage Tanks (AST), and the Arkansas Department of Energy and Environment Oil and Gas Commission oil and gas well maps. The information collected from this desktop records review was analyzed for recognized environmental conditions (RECs) that would affect the proposed project or need further investigation, given the proposed project measures. The following resources were searched.

Federal National Priorities List (NPL) – The records search did not reveal any NPL sites in the project footprint or adjacent areas. There are nine NPL sites in the state of Arkansas, none of which are located near Beaver Lake or the priority areas. This is based on a search of the EPA Superfund: National Priorities List (NPL) list.

Federal Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) List – The CERCLIS, now called the Superfund Enterprise Management System (SEMS) database, tracks hazardous waste sites where remedial action has occurred under EPA's CERCLA program. This list also includes sites that are in the screening and assessment phase for possible inclusion on the NPL. The records search of EPA's listed SEMS sites did not reveal any sites in the project footprints or adjacent areas. This is based on a search of the EPA SEMS database.

Federal No Further Remedial Action Planned (NFRAP) – The Federal NFRAP list (now known as the SEMS archive list) tracks sites where no further remedial action is planned, based on available assessments and information. The list also represents sites that were not chosen for the NPL. Further EPA assessment could possibly be ongoing, and hazardous environmental conditions may still exist; however, in the absence of remedial action and assessment data, no determination about environmental hazards can be made. The records search did not reveal any NFRAP sites in the project footprint or adjacent areas. This is based on a search of the EPA SEMS database.

Federal Resource Conservation and Recovery Act (RCRA) Corrective Action List – The records search of EPAs Cleanups in My Community showed two RCRA Corrective Actions within one mile of the project search area. No RCRA corrective actions were found to be located within one mile of the project footprint. This is based on a search of the EPA Cleanups in My Community.

State Superfund Sites - This search is to check for any state CERCLA sites in the project vicinity. The records search of state CERCLA cleanup sites did not show any sites of concern in the project or adjacent areas. This search is based on a search of the Arkansas Department of Energy and Environment data base.

State and Tribal Solid Waste Facilities/Landfill Sites – This search is designed to check any state or tribal databases for solid waste handling facilities or landfills in the project vicinity. The records search did not find any solid waste facilities or landfill sites in area of this project or adjacent areas. This is based on a search of the EPA Landfill Methane Outreach Program (LMOP) and ADEQ Permitted Solid Waste Disposal database.

State and Tribal Registered Storage Tanks – This list is a combination of the State of Arkansas registered UST and AST databases, representing sites with storage tanks registered with the State of Arkansas. The search revealed one AST within one mile of the work area or adjacent areas. This AST is not expected to impact the project due to its distance from the proposed project. These results are based on a search of the Arkansas Department of Energy and Environment Oil and Gas Commission website.

State and Tribal Voluntary Cleanup Sites – The ADEQ Elective Site Cleanup Agreement (ESCA) database identifies sites where the responsible party chooses to clean up the site themselves with ADEQ oversight. Five sites were identified from this database. None of the sites are within one mile of the work area and are therefore not expected to impact the proposed project. These results are based on a search of the ADEQ ESCA Database.

Brownfields List – A brownfield is a property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. There are no brownfield sites within one mile of the work area or adjacent areas. These results are based on a search for Brownfields sites using the EPA Envirofacts search engine.

Oil and Gas Wells – A search of the oil and gas wells in the area using the Arkansas Department of Energy and Environment Oil and Gas Commission website identifies multiple sites including oil wells, plugged oil wells, injection/disposal sites within the surrounding area. Although not classified as HTRW under USACE regulations, pipelines and oil wells play an important role in the HTRW existing conditions near the potential project area. This is because the well and/or pipeline contents could potentially leak or spill into the surrounding environment or affect the proposed project features. As a result of these findings, a thorough pipeline/well search should be initiated during design to ensure no interaction with the existing oil and gas infrastructure occurs. The Oil and Gas Commission website was used to map these findings. No oil wells or pipelines were found near the priority areas.

4.7 Interviews

Two interviews were conducted on 12 and 13 July 2021 in conjunction with the site inspection, and the following stakeholders were interviewed:

- Mr. Matthew Franklin; Natural Resource Specialist, Beaver Lake Office; Matthew.G.Franklin@usace.army.mil
- Mr. Matthew Voskamp; Natural Resource Specialist, Beaver Lake Office; Matthew.Voskamp@usace.army.mil

Information gleaned from the interviews is incorporated by way of reference throughout the report. The interview questions can be found in Figure 3.

5.0 Environmental Conditions

5.1 Environmental Permits and Licenses

5.1.1 RCRA Status

The subject property is not covered under a Resource Conservation and Recovery Act (RCRA) permit, and no hazardous waste is generated or stored on the property.

5.1.2 Solid Waste

The subject property has no active, inactive, or expired permits or licenses for solid waste disposal. No landfills exist on the property.

5.1.3 USTs/ASTs

No USTs or ASTs were found during the records search, site inspection and interviews indicated not UST/AST have been known to be located at the subject property.

5.1.4 National Pollutant Discharge Elimination System (NPDES)

Section 402 of the Clean Water Act (33 U.S.C. 1251 et. seq.) requires all facilities that discharge stormwater to acquire an NPDES that defines contaminant limits in effluent to be discharged. No permits were found using the EPA's Envirofacts database on or adjacent to the priority area.

5.1.5 Drinking Water Permits

No drinking water permits are in place at the subject property.

5.1.6 Air Permits

No air emission or air quality permits are in place at the subject property.

5.1.7 Nuclear Regulatory Commission (NRC)

The NRC is tasked with permitting the use and handling of radioactive materials and reactors. No NRC licenses are in place at the subject property.

5.1.8 Other Permits/ Licenses

No other permits were found during the records search.

5.2 Environmental Cleanup and Remediation

5.2.1 Installation Restoration Program

Beaver Lake is not an active military facility, and therefore would not be eligible for cleanup under the Installation Restoration Program.

5.2.2 Military Munitions Response Program

Beaver Lake is not an active military facility, and therefore would not be eligible for cleanup under the Military Munitions Restoration Program.

5.2.3 Other Environmental Investigations and Cleanups

No known environmental investigations or cleanups were found during the records search, site inspection and interviews indicated that no known investigations or cleanups are ongoing at Beaver Lake.

5.2.4 Storage, Release, and Disposal of Hazardous Substances

No releases to the environment or improper disposal of these substances were found during the records search, site inspection and interviews indicated no known improper disposal at the priority area.

5.3 Petroleum and Petroleum Products

No releases to the environment or improper disposal of petroleum products were found during the records search, site inspection and interviews indicated no known improper disposal at the priority area.

5.4 Polychlorinated Biphenyls (PCBs)

No evidence exists of the presence of PCBs on the subject property. No PCB-containing oils were found during the records search, site inspection and interviews indicated no known PCB-containing oils have been used or stored at the priority area.

5.5 Asbestos

No asbestos assessments were found during the ECP process, none were found during the records search, site inspection and interviews indicated no known asbestos containing material has been used or stored at the priority area.

5.6 Lead and Lead-Based Paint (LBP)

No lead-based paint (LBP) assessments were found during the ECP process. No LBP was found during the records search, site inspection and interviews indicated no known improper disposal at the priority area.

5.7 Radioactive Material

No radioactive material assessments were found during the ECP process. No potentially radioactive materials were identified during the VSI, and the presence of radioactive materials on the subject property is extremely unlikely.

5.8 Landfills/Dumps

No landfills or dumps were found during the records search, site inspection or interview investigation.

5.9 Munitions and Explosives of Concern (MEC) and/or Unexploded Ordnance (UXO)

No munitions, explosives, or unexploded ordinance (UXO) were found during the records search, site inspection or interview investigation.

5.10 Radon

Beaver Lake spans across Benton, Washington and Carroll Counties. Washington County is in the Environmental Protection Agency (EPA) Radon Zone 3. Counties in Radon Zone 3 are counties with predicted average indoor radon screening levels of less than 2 pCi/L (EPA, 2018). Benton and Carroll Counties are in the EPA Radon Zone 2 with a predicted average indoor radon level between 2 and 4 pCi/L (EPA, 2018). No radon assessments were found during the records search (EPA, 2019).

5.11 Pesticides

No records were found to indicate the storage, improper use, or disposal of pesticides on the subject property.

5.12 Other Identified Concerns

No significant other concerns were found during the records search, site inspection or interviews.

5.13 National Environmental Policy Act (NEPA)

As the federal agency in charge of this project USACE is in charge of coordinating National Environmental Policy Act (NEPA) compliance of 1969 (Public Law 91-190), the Council on Environmental Quality (CEQ) regulations (40 CFR 1500–1508), and the USACE implementing regulations, Policy and Procedures for Implementing NEPA, ER 200-2-2. As part of the records search and interview process recent NEPA documents were reviewed including the 2018 Draft Environmental Assessment for the Beaver Lake Master Plan Revision.

5.14 Adjacent Properties

As part of the ECP process, adjacent properties are assessed for environmental conditions, and those discovered conditions are evaluated based on the potential to affect the subject property. There is a residential structure approximately 100 yards south of the priority area and several boat docks on the opposite site of the cove from the priority area. The residences are first seen in the 1994 historical aerial photographs and the docks in 2001. The adjacent properties are unlikely to pose any HTRW concerns to the priority area.

6.0 Evaluation and Conclusions

6.1 Summary of ECP

Beaver Lake currently occupies more than 38,000 acres of Federal public lands and waters. This ECP report covers a 0.47-acre strip of land located near the northwestern part of Beaver Lake. The subject property is on the edge of the lake and currently owned by private landowner(s). The Lake is located in northwestern Arkansas, in Benton, Washington, Madison and Carroll Counties and it is approximately 6 miles west of Eureka Springs, Arkansas. The subject property, also known as Priority Area 15, is located at the Honey Creek area south of the Dam Site overlook.

This ECP report was prepared to characterize the existing environmental conditions at the subject property and is intended to be an aid in the leasing of real property. The ECP findings are based on the available sources of information concerning both past and present uses of the subject property. Information included readily available data associated with adjacent property records, aerial photography, personnel interviews, environmental programs and associated documentation, and current and historic investigations. In addition, record sources were reviewed to determine if there have been spills, leaks, discharges, leaching, underground injections, dumping, abandonments, or storage of hazardous substances or petroleum products at the installation. The VSI and interview process included inquiries and requests into the existence and availability of records that support the environmental condition of the property.

6.2 Conclusions

The subject property was classified into one of seven standard ECP area types (categories) as defined by ASTM D5746-98(2016) *Standard Classification of Environmental Condition of Property Area Types for Defense Base Closure and Realignment Facilities*. Below are the seven categories for reference.

Table 4: Definitions of ECP Categories

ECP Category	Definition
1	An area or parcel of real property where no release, or disposal of hazardous substances or petroleum products or their derivatives has occurred (including no migration of these substances from adjacent properties).
2	An area or parcel of real property where only the release or disposal of petroleum products or their derivatives has occurred.
3	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but at concentrations that do not require a removal or remedial action.
4	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, and all remedial actions necessary to protect human health and the environment have been taken.

5	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred and removal or remedial actions, or both, are under way, but all required actions have not yet been taken.
6	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but required response actions have not yet been initiated.
7	An area or parcel of real property that is unevaluated or requires additional evaluation.

Given these seven categories, the subject property is categorized below, along with the reasoning for each classification.

Table 5: Properties and ECP Categories

Acreage	ECP Category	Reasoning
0.47 ac.	1	No release or disposal of hazardous substances or petroleum products or their derivatives has occurred beyond de minimus amounts, including no migration of these substances from adjacent properties.

No release or disposal of hazardous substances or petroleum products or their derivatives has occurred beyond de minimus amounts on the subject property and no releases to the environment were observed or reported.

Asbestos assessments were not available for the subject property. It is unlikely that Asbestos Containing Material (ACM) is present but, in the future, if a building or structure will be disturbed, a licensed asbestos inspector is needed to confirm whether ACM is present or not.

7.0 Certification

I declare that, to the best of our professional knowledge and belief, we meet the definition of *Environmental professional* as defined in Part 312.10 of 40 CFR 312. We have the specific qualifications based on education, training, and experience to assess a property of the nature, history and setting of the subject property. We have developed and performed the appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312. All information/documentation provided accurately reflects the condition of the property. This report meets the DoD requirements for completion of an ECP Report.

Eugenia Barnes
Environmental Protection Specialist
U.S. Army Corps of Engineers
Fort Worth District

Date

Hollie Eljizi
Environmental Engineer
U.S. Army Corps of Engineers
Fort Worth District

Date

Jennifer Jefcoat
Chemist
U.S. Army Corps of Engineers
Fort Worth District

Date

8.0 References

American Society for Testing and Materials (ASTM), 2013. E1527-13, *Standard Practice for Environmental Site Assessments: Phase 1 Environmental Site Assessment Process*.

ASTM, 2016. D5746, *Standard Classification of Environmental Condition of Property Area Types for Defense Base Closure and Realignment Facilities*.

Department of the Army, 13 December 2007. Army Regulation 200-1. *Environmental Quality: Environmental Protection and Enhancement.*

Environmental Protection Agency (EPA), February 2019. *EPA Map of Radon Zones including State Radon Information and Contacts*. https://www.epa.gov/radon/find-information-about-local-radon-zones-and-state-contact-information#radonmap

Federal Emergency Management Agency (FEMA), 2019. FEMA Flood Map Service Center. https://msc.fema.gov/portal

USACE. 1993. White River Basin, Arkansas and Missouri, *Water Control Master Manual.*

USACE. 2013. Little Rock District Water Management website. Accessed at: www.swl-wc.usace.army.mil

United States Census Bureau. 2013. Easy Facts Website. Accessed at: http://www.census.gov/easystats/

USACE. 2018. Beaver Lake White River and Tributaries, *Arkansas Shoreline Management Plan.*

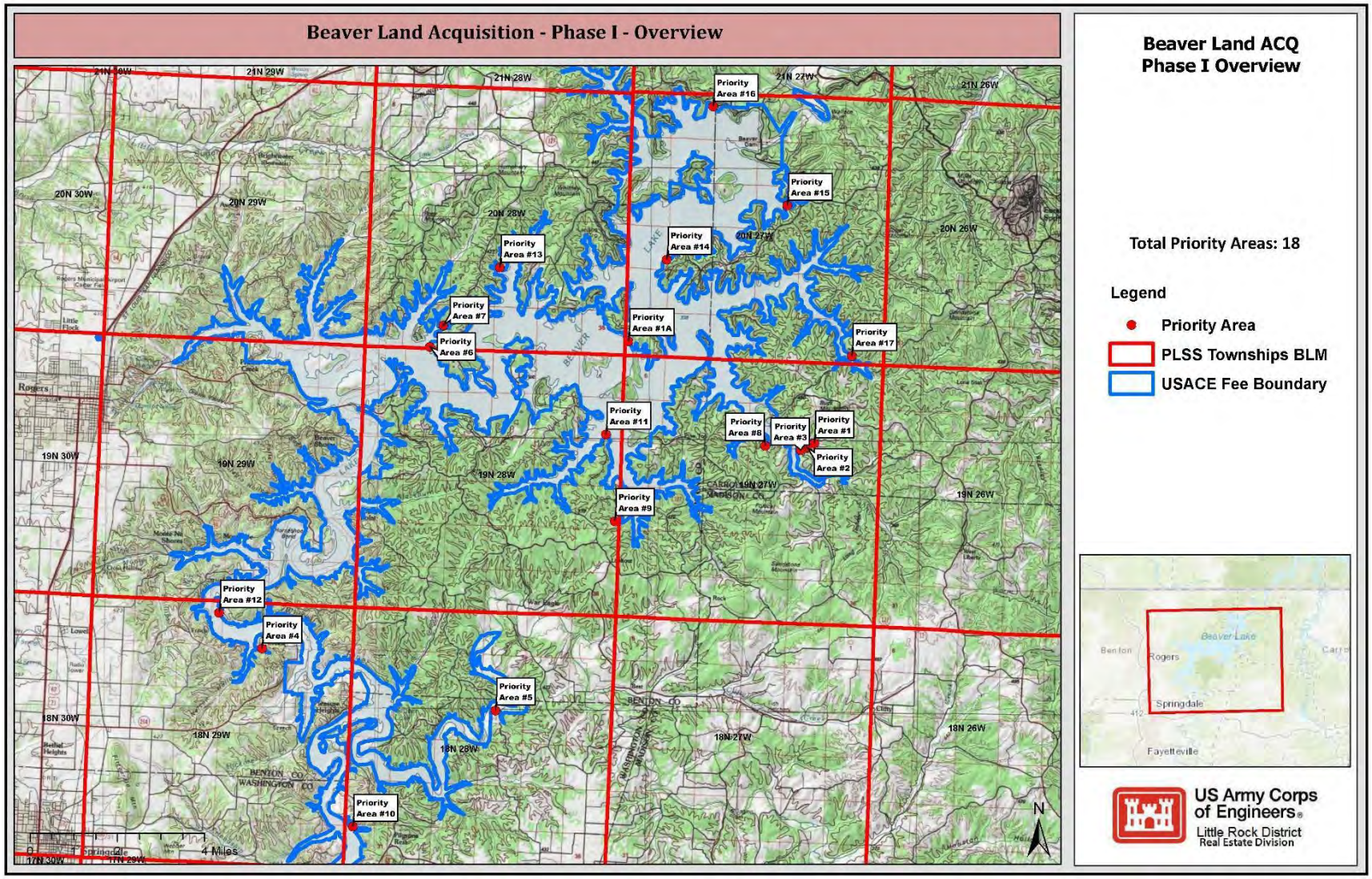
Arkansas Department of Energy and Environment Oil and Gas website Accessed August 2021 at: Commission, http://www.aogc.state.ar.us/maps/googleEarth.aspx

Beaver Watershed Alliance (BWA), 2012. *Beaver Lake Watershed Protection Strategy.*

Arkansas Department of Energy and Environment Environmental Quality website Accessed August 2021 at: https://www.adeq.state.ar.us/rst/programs/fees/facility_data.aspx

Figures

Figure 1: Beaver Lake Priority Areas



ACQ = Acquisition; PLSS = Public Land Survey System; BLM = Bureau of Land Management

Figure 2: Subject Property Detail

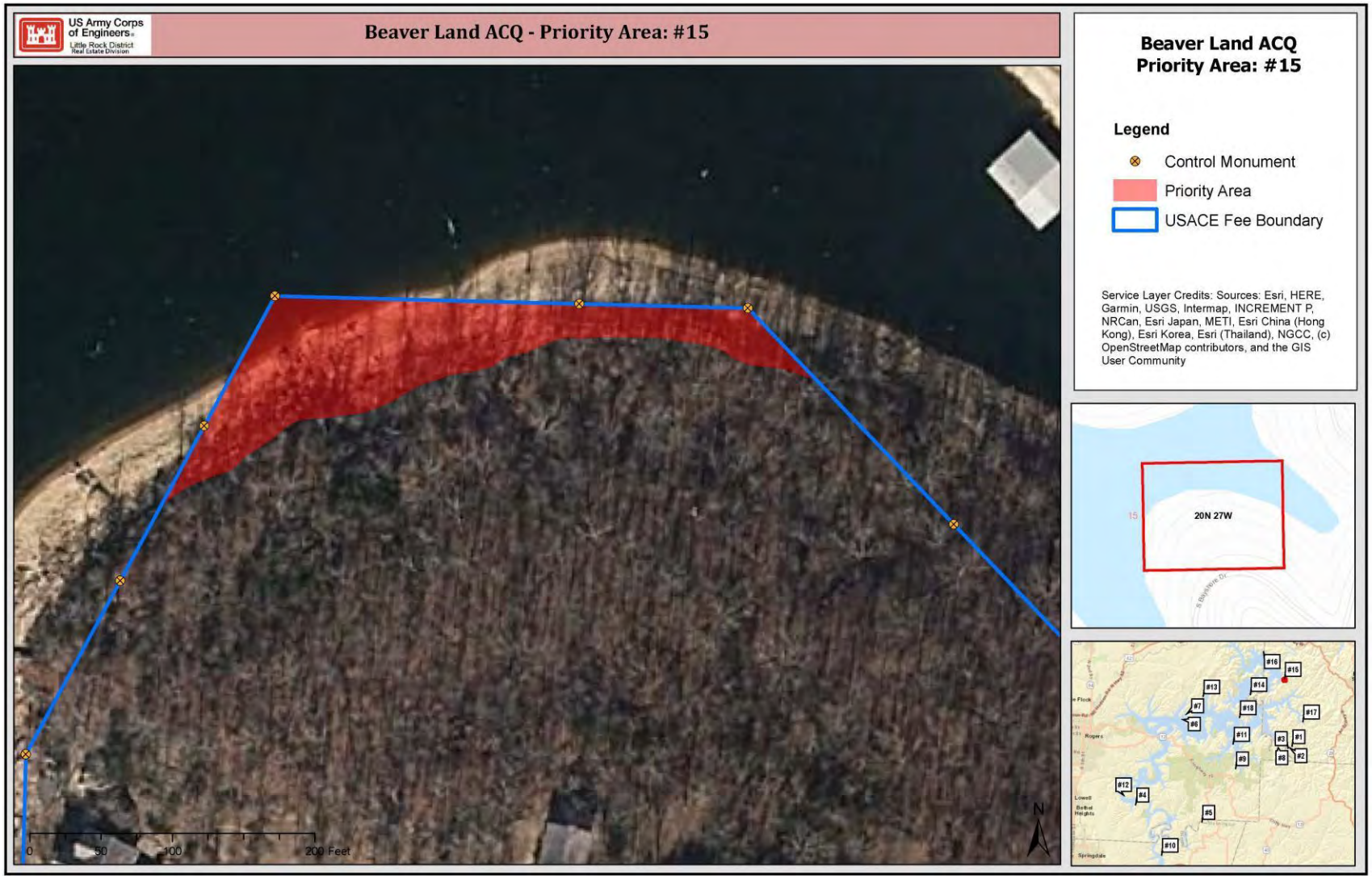


Figure 3: Interview Questions

Beaver Lake ECP
Interview Questions

1. Do you know of any environmental issues with this property?
2. Do you know of, or have access to, any reports concerning the environmental condition of this property? (i.e. site assessments, permits, storage tank registrations, safety plans, etc.) If so, would you be able to provide them? SWPPPs, SPCCs, air permits?
3. Do you know how this property has been historically used?
4. What is the property currently used for?
5. When were the site buildings constructed?
6. Are hazardous materials or petroleum products stored or used on this site? If so, what is the RCRA EPA ID? Does fueling occur on this property?
7. Do you know of any asbestos or LBP on the property or its buildings? Do you know the age of the buildings?
8. Has the site layout been manipulated in your recollection? (i.e. grading, excavation, etc.)?
9. Are there or have there been any cultural/historic items or buildings found on the property?
10. Is there anything else environmentally relevant that we should know?

Appendix A Visual Site Inspection Photographs

13 July 2021

Priority Area 15 – Priority area seen from watercraft

Priority Area 15 – Boat dock at priority area

Priority Area 15 – Boat dock at priority area

Priority Area 15 – Boat dock at priority area

Priority Area 15 – Priority area seen from watercraft

Priority Area 15 – Priority area seen from watercraft

Priority Area 15 – Priority area seen from watercraft

Final

U.S. Army Environmental Condition of Property Report
Priority Area 16

Beaver Lake
Beaver Lake, Arkansas

August 30, 2021

Prepared For:
Beaver Lake Land Acquisition

Prepared By:
U.S. Army Corps of Engineers
Regional Planning and Environmental Center
Fort Worth District
Fort Worth, Texas

[This page is intentionally left blank.]

Table of Contents

List of Appendices:

List of Acronyms

ACM	Asbestos-containing material
AR	Army Regulation
AST	Aboveground storage tank
ASTM	American Society for Testing and Materials
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CFR	Code of Federal Regulations
DoD	Department of Defense
ECP	Environmental Condition of Property
EDR	Environmental Data Resources, Inc.
EPA	Environmental Protection Agency
ERNS	Emergency Response Notification System
FAA	Federal Aviation Administration
HTRW	Hazardous, Toxic and Radioactive Waste
IRP	Installation Restoration Program
LBP	Lead-based Paint
LUST	Leaking underground storage tank
MEC	Munitions and Explosives of Concern
NEPA	National Environmental Policy Act
NFRAP	No Further Remedial Action Planned
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NRC	Nuclear Regulatory Commission
ODEQ	Oklahoma Department of Environmental Quality
OWS	Oil-water separator
PCB	Polychlorinated Biphenyl
POL	Petroleum, Oils, and Lubricants
RCRA	Resource Conservation and Recovery Act
SEMS	Superfund Enterprise Management System
SF	Square feet
SHWS	State Hazardous Waste Sites
SWPPP	Stormwater Pollution Prevention Plan
TSD	Transport, Storage, Disposal
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
UST	Underground storage tank
UXO	Unexploded Ordnance
VCP	Voluntary Cleanup Program
VSI	Visual site inspection

1.0 Executive Summary

This environmental condition of property (ECP) report has been prepared to document the environmental conditions and provide information for the acquisition of land that would be necessary for the operation, maintenance, and control of the Beaver Lake reservoir in Arkansas. This fee acquisition pertains to the frequently inundated land immediately surrounding the lake, below an elevation of 1128 ft above mean sea level (msl). The Army prepares an ECP in order to provide the public with information relative to the environmental condition of the property, assist Federal agencies during the property screening process, provide information about completed remedial and corrective actions at the property, and to assist in determining appropriate responsibilities, asset valuation, and liabilities with other parties to a transaction.

Beaver Lake currently occupies more than 38,000 acres of Federal public lands and waters. This ECP report covers a 1.30 acre narrow strip of land located at the northern end of Beaver Lake. The subject property is on the edge of the lake and currently owned by private landowner(s). The Lake is located in northwestern Arkansas, in Benton, Washington, Madison and Carroll Counties and it is approximately 6 miles west of Eureka Springs, Arkansas. The subject property, also known as Priority Area 16, is located at the intersection of the White River, Dry Gulch, and Indian Creek.

This ECP report presents a summary of readily available information on the environmental conditions of, and concerns relative to, the land, facilities, and real property assets of Beaver Lake. The findings included in the report are based on a record search of historical environmental investigation reports and site historical documents, a review of aerial photography, stakeholder interviews, and a site inspection conducted 12 – 13 July 2021.

Based on the environmental conditions found and the ECP analysis, the property can be categorized as an ECP Category 1, indicating a site where no release, or disposal of hazardous substances or petroleum products or their derivatives has occurred (including no migration of these substances from adjacent properties).

2.0 Purpose

2.1 General

This environmental condition of property (ECP) report has been prepared to document the environmental conditions and provide information for the acquisition of land surrounding Beaver Lake in Benton, Washington, Madison and Carrol Counties, Arkansas. This report meets the requirements of Title 40, Code of Federal Regulations (CFR), Part 373, and United States Army Regulation (AR) 200-1 (2007), *Environmental Quality, Environmental Protection and Enhancement*. The ECP report also follows the American Society for Testing and Materials (ASTM) E1527-13 *Standard Practice for Environmental Site Assessments: Phase 1 Environmental Site Assessment Process*. The subject property in this report is subsequently categorized according to ASTM D5746 (2016) *Standard Classification of Environmental Condition of Property Area Types for Defense Base Closure and Realignment Facilities*.

The Army prepares an ECP for the following purposes:

- Provide the public with information relative to the environmental condition of the property.
- Assist Federal agencies during the property screening process.
- Provide information to prospective buyers.
- Provide information about completed remedial and corrective actions at the property.
- Assist in determining appropriate responsibilities, asset valuation, and liabilities with other parties to a transaction.

The ECP contains the information required to comply with the provisions of 40 CFR, Part 373 that require a notice to accompany contracts for the sale of, and deeds entered into the transfer of, federal property on which hazardous substances may have been stored, released or disposed. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) §120(h) stipulates that a notice is required if certain quantities of designated hazardous substances have been stored on the property.

The ECP Report is not prepared to satisfy a real property purchaser's duty to conduct an "all-appropriate inquiry" to establish an "innocent purchaser defense" to CERCLA 107 liability. Any such use of the ECP Report by any party is outside the control of the Army and beyond the scope of the ECP Report. The Army, its officers, employees, or contractors makes no warranties or representations that any ECP Report satisfies any such requirements for any party.

2.2 Scope

Priority Area 16 occupies 1.30 acres of land. This ECP report covers 1.30 acres of land located near the intersection of the White River Dry Gulch, and Indian Creek on Beaver Lake. Priority Area 16 is comprised of a narrow wooded strip of land just west of the North Bluff Dam Site on the northern end of Beaver Lake. There is access via watercraft and although it wasn't explored potential terrestrial access via private property from Dam Site Rd. Areas within the lake that are not within the Priority Area will be considered adjacent property. A general site location map is provided in Figure 1, and map showing the subject property are shown in Figure 2.

2.3 Limitations

This ECP report presents a summary of readily available information on the environmental conditions of, and concerns relative to, the land, facilities, and real property assets of the subject property. The findings included in the report are based on a record search of available historical environmental investigation reports and site historical documents, a review of aerial photography, stakeholder interviews, and a site reconnaissance conducted 12 – 13 July 2021. Historical environmental investigation reports and site historical documents were reviewed in support of this ECP, and the information obtained from other studies is reflected within this report by reference. The ECP process recognizes that the condition of

property and classification can change as historical contamination is cleaned up (if required) or if a new source of contamination is identified. Records reviewed during the assessment were accepted as accurate and a reasonable effort was made to resolve discrepancies identified during the document review.

During the ECP assessment, all available sources of information concerning both past and present environmentally significant uses of the property were reviewed. This included readily available data associated with adjacent property records; 1985, 1994, 2001, 2004, 2006, 2009, 2010, 2012, 2014, 2016, 2017, 2018, and 2020 aerial photography; personnel interviews; current and historic investigations; and topographical maps. In addition, record sources were reviewed to determine if there have been spills, leaks, discharges, leaching, underground injection, dumping, abandonment, or storage of hazardous substances or petroleum products at the subject property. The site reconnaissance and interview process included inquiries and requests into the existence and availability of records that support the environmental condition of the property. The site reconnaissance included a Visual Site Inspection (VSI) of the subject property. No sampling or analysis was conducted during this survey.

2.4 Report Organization

The remainder of this ECP report is organized as follows:

Section 3 – Property Description: This section provides location and description of the subject property; an overview of historical and current land uses; and a description of the environmental setting of the lake area, including climate, topography, geology, and demography.

Section 4 – Survey Methodology: This section describes the methods used to obtain the information for this ECP Report such as the development of study sections, the VSI, aerial photography analysis, records review, interviews, and data management.

Section 5 – Environmental Conditions: This section provides the existing environmental information. The findings are organized by relevant environmental "issues," including permits and licenses, cleanup activities, hazardous substances, petroleum and related products, asbestos, lead-based paint (LBP), radioactive materials, landfills, explosive contaminated structures, radon, pesticides, and polychlorinated biphenyls (PCBs). This section also includes adjacent property descriptions.

Section 6 – Evaluation and Conclusions: This section provides a summary of the subject property and evaluates the property for categorization as per ASTM D5746 (2016).

Section 7 – Certification: This section documents the approval of the ECP report.

Section 8 – References: This section provides an inventory of the reference material used in the preparation of this ECP Report.

Appendices: A list of appendices is provided in the Table of Contents.

3.0 Property Description

3.1 Parcel Locations and Description

Beaver Lake is located in the scenic Ozark Mountain region of northwestern Arkansas in Benton, Washington, Carroll and Madison counties. The total area currently contained in the Beaver project, including both land and water surface, consists of 38,138 acres owned in fee. Of this total, 1,432 acres are in flowage easement. The proposed Land Acquisition would include adding any land below the 1128 msl water level. The White River drainage area above Beaver Lake is approximately 1,186 square miles. When the lake is at the top of the conservation pool (elevation 1120.43 ft msl), the water area is 28,299 surface acres with 490 miles of shoreline within the lands owned in fee. The shoreline is irregular with topography primarily consisting of steep bluffs and gentle slopes.

Priority Area 16 is a long narrow 1.30 acre strip of land located at the northern end of the lake near the North Bluffs Dam Site. The subject property is on the edge of the lake and currently owned by private landowner(s). Two residences are immediately adjacent to the priority area. The residence at the northern end of the priority area has a covered boat dock and the residence near the southern portion has a smaller uncovered dock. Both docks are at least partially within the priority area foot print.

3.2 Historic Land Use

Beaver Lake is a multiple purpose water resource development project initially authorized for flood control, hydropower generation and other beneficial uses by the Flood Control Act dated 3 September 1954. The inclusion of storage in the lake for municipal and industrial water supply was authorized by the Water Supply Act of 1958. Beaver Lake is a major component of a comprehensive plan for water resource development in the White River Basin of Arkansas and Missouri. Construction of Beaver Dam was initiated in March 1960. The dam was completed in June 1966, and the powerhouse and switchyard were completed in 1965. Beaver Lake was declared operational for public use in 1965.

For Priority Area 16, the historical aerial photography show that this area has been used for private residences as far back as 1994.

3.3 Current Land Use

Beaver Lake is located in the Ozark Highlands of Carroll, Washington, Benton, and Madison Counties. Having 490 miles of shoreline (at conservation pool) and over 28,000 water surface acres, Beaver Lake is the largest reservoir in northwest Arkansas and the first federal impoundment on the White River.

There are 12 public use areas around Beaver Lake. There are 11 parks on the lake presently operated by the Corps of Engineers. The State of Arkansas owns and operates Hobbs State Park Conservation Area, which covers 12,056 acres, and Devil's Eyebrow Natural Area, which covers 2,503 acres. Both properties are adjacent to USACE lands. There are two parks, Ventris, and Blue Springs that have been reduced to lake access only. One Park (Big Clifty) is operated by Carroll County, Arkansas.

Despite being located adjacent to the fast-growing communities of Fayetteville, Springdale, Bentonville, and Rogers, Arkansas and a regional population of over 500,000, the lake provides open spaces and a quality outdoor recreation opportunity. Many arms and coves of the lake offer secluded areas for traditional activities such as fishing, skiing, sailing and scuba diving, but also allow for passive recreation opportunities like photography and nature observation.

Priority Area 16 is currently a residential property.

3.4 Utilities

Priority Area 16 has no known utilities.

3.5 Environmental Setting

3.5.1 Climate

The climate in the Beaver Lake area is classified as humid subtropical according to the Köppen climate model. A humid subtropical climate is characterized by hot, usually humid summers and mild to cool winters. The Köppen definition of this climate is for the coldest month's mean temperature to be between 26.6 °F (−3 °C) and 64.4 °F (18 °C), and the warmest month to be above 71.6 °F (22 °C). Some climatologists prefer to use 32 °F (0 °C) as the lower bound for the coldest month's mean temperature. Under the modern Trewartha climate classification, climates are termed Humid Subtropical when they have mean temperatures of 50 °F (10 °C) for eight or more months a year. In most locations classed within this system, the mean temperature of the coldest month is between 35 °F (3 °C) and 65 °F (18 °C). Some climatologists consider the Trewartha grouping of subtropical climates to be more real-world and fitting on a global scale.

While technically classified as humid subtropical, the climate in the Beaver Lake area is considered moderate. The area experiences all four seasons and does receive cold air masses from the north; however, some of the Arctic masses are blocked by the higher elevations of the Ozarks.

Average temperatures range from a high of 88 °F (31.1 °C) and low of 27 °F (-2.7 °C) in nearby Rogers, Arkansas. Extreme temperatures rarely exceed 96 °F (35.6 °C) and 13°F (-10.6 °C). Late summer is the time of maximum heat and least rainfall. During the winter months, midday temperatures in the basin are relatively warm, around 55 to 60 °F. Some short periods of cold weather occur with temperature ranging from 0°to 10°F. On winter nights, temperatures from 37 o F to below freezing are common. Highest recorded temperature in Rogers, Arkansas was 114 °F (45.6 °C) (recorded in July 1954). The lowest temperature recorded was −16 °F (−26.7 °C), in February 1996.

The relative humidity typically ranges from 41% (comfortable) to 91% (very humid) over the course of the year, rarely dropping below 24% (dry) and reaching as high as 100% (very humid). The air is driest around April 9, at which time the relative humidity drops below 49% (comfortable) three days out of four; it is most humid around June 3, exceeding 87% (very humid) three days out of four.

Dew point is often a better measure of how comfortable a person will find the weather than relative humidity because it more directly relates to whether perspiration will evaporate from the skin, thereby cooling the body. Lower dew points feel drier and higher dew points feel more humid. Over the course of a year, the dew point typically varies from 19°F (dry) to 71°F (muggy) and is rarely below 4°F (dry) or above 74°F (very muggy). There are two periods in the year that are most comfortable: The first is between April 18 and June 6 and the second is between September 3 and October 23. The air feels neither too dry nor too muggy during these periods (https://weatherspark.com/averages/31495/Rogers-Arkansas-United-States).

Average annual rainfall for the Beaver Lake area is 45 inches per year. Precipitation is weakly seasonal, with a bimodal pattern: wet seasons in the spring and fall, and relatively drier summers and winters, but some rain in all months. The spring wet season is more pronounced than fall, with the highest rainfall typically occurring in May. The average annual snowfall for the Beaver area is about 12 inches. Snowpacks are usually short lived and are not commonly a concern for flooding.

Climate change is an area of concern due to the potential for effects on many aspects of the environment, especially those related to water resources. The U.S. Global Change Research Program (USGCRP) summarized information regarding climate change and its potential effects in regional assessments (http://www.globalchange.gov/publications/reports/scientific-assessments/us-impacts). In the Midwest, which extends from Minnesota to Missouri, extreme events such as heat waves, droughts and heavy rainfall events are projected to occur more frequently. Should these events become significant enough to impact the operation of Beaver Lake, the Master Plan and associated documents (i.e. Operations Management Plan and Shoreline Management Plan) would be reviewed and revised, if necessary.

3.5.2 Topography, Geology, and Soils

The depositional environment of the rocks found in the Arkansas Ozarks is one of a relatively shallow continental shelf, sloping toward deeper water generally toward the south. This shelf emerged many times during the Paleozoic resulting in numerous unconformities throughout the sequence. The Ozark Plateaus region of Arkansas is made up of generally flat-lying Paleozoic age strata divided into three plateau surfaces. The lowest and northern-most plateau is the Salem Plateau. The Springfield Plateau stands above the Salem a few hundred feet and is generally capped by lower Mississippian age limestones and cherts. The southernmost and highest plateau of the Ozarks is the Boston Mountains. All of these plateaus are deeply dissected by numerous streams throughout the area. The faulting in the Ozarks is generally normal; most faults displaying a displacement down on the southern side. However, some observations reveal that a few strike-slip faults may be present. Gentle folds are noted but are generally of very low amplitude. The depositional environment of the rocks found in the Arkansas Ozarks is one of a relatively shallow continental shelf, sloping toward deeper water generally toward the south.

Beaver Lake is part of the Springfield Plateau that occupies primarily the western and southwestern flanks of the Ozark Plateau province. The Springfield Plateau in this region rises to an elevation of approximately 1400 feet and in many areas, forms extensive plains. Hilly areas occur where rivers and their tributaries cut into the plateau surface, most notably in the vicinity of the White River and Beaver Lake. As streams like the Buffalo National River cut through the plateau down to the level of the White River, they sometimes carve spectacular bluffs.

Lower Ordovician, Middle to Upper Devonian and Lower and Upper Mississippian age strata are present around Beaver Lake. Upper Ordovician and Devonian strata crop out around Beaver Lake and its tributaries. The Lower Mississippian Boone Formation comprises the surface rock over the majority of the area and forms the surface of the heavily dissected Springfield Plateau. In addition to the Boone Formation, Cotter and Jefferson City formations (Jefferson City formation has not been successfully differentiated from the Cotter Formation in Arkansas), and the Powel formation, all of Ordovician age are present in the area. Formations in the Devonian strata include the Chattanooga, Clifty and Penters.

The Boone Formation consists of gray, fine- to coarse-grained fossiliferous limestone interbedded with chert. This formation caps the higher hills in the area. Since limestone is easily dissolved by water, cave and solution (karst) features are prominent. The Boone Formation is well known for dissolutional features, such as sinkholes, caves, and enlarged fissures. Surface water may drain directly into channels in limestone, where it can move rapidly and without filtration to the surface as a spring, at a location that is unpredictable without extensive testing. Therefore, water pollution problems are of particular concern in this region. The thickness of the Boone Formation is 300 to 350 feet in most of northern Arkansas, but as much as 390 feet has been reported.

The Cotter Dolomite is composed of dolostone of predominantly two types: a fine-grained, argillaceous, earthy textured, relatively soft, white to buff or gray dolostone called "cotton rock", and a more massive, medium-grained, gray dolostone that weathers to a somewhat hackly surface texture and becomes dark on exposure. The formation contains chert, some minor beds of greenish shale, and occasional thin interbedded sandstone. The thickness is about 340 feet in the vicinity of Cotter, but the interval may range up to 500 feet thick in places.

The Powell Dolomite is generally a fine-grained, light-gray to greenish-gray, limy, argillaceous dolostone with thin beds of shale, sandstone, sandy dolostone, and occasionally chert. The formation’s thickness may be as much as 215 feet but is often much thinner.

The Chattanooga Shale Formation is typically black, fissile clay shale that weathers into thin flakes. The beds are usually cut by prominent joints creating polygonal blocks upon weathering. The upper part of the formation may be slightly sandy and usually contains abundant pyrite. Thickness ranges from 0 to about 85 feet; normally averaging about 30 feet (AGS).

The strata throughout the region are nearly horizontal. One predominant geological feature of the lake area is a low, persistent, limestone bluff, which occurs just above the Ordovician- Mississippian contact.

The faulting in the Ozarks is generally normal; most faults displaying a displacement down on the southern side. Lineaments and faults characteristic of northwest Arkansas are present around Beaver Lake. The Fayetteville Fault lies beneath Beaver Lake. This fault is the west side of a graben that has down-dropped the Boone Formation to lake level. The Starkey Fault bounds the east side of the graben. Both faults trend approximately N 450E. One section of the Starkey fault trends N 60-700E. The Clantonville Lineament – Monocline is a northeast to southwest trending structural feature that extends from north of Clantonville to Ventris Hollow. The location of this feature was determined from the 1:24,000 three dimensional quadrangle and from structural disparities in the Lower Mississippian rock units. This structural feature could be responsible for the presence of lead-zinc mineralization in an old prospect near Clantonville (north of Beaver Lake). The trend of this lineament to monocline is N 30-400E. Paleokarst features within the top of the Powell Dolomite are present around Beaver Lake and coincident with a lineament in Limekiln Hollow near Garfield, northwest of Beaver Lake.

In general, the soils of the Ozark Plateaus are residual and are formed on a broad, domed, upwarp consisting mostly of limestone and dolomite. The main difference in the soils is due to different rocks from which the soils were formed. The main geologic materials are cherty limestone; cherty, very siliceous dolomite; cherty, siliceous dolomite; and alluvium, which are weathered and water transported products of the first three materials. Glade-rock soil occurs where the cherty, very siliceous dolomite is exposed to the soil formation. Dolomite is more resistant to weathering than limestone and siliceous dolomite is even more resistant, so very shallow soil results. In areas where the dolomite is less siliceous, more weathering has taken place; however, the soils produced are not as deep as soils formed by limestone.

The following eight soils associations are found in and around the Beaver project area: Captina-Nixa, Captina-Nixa-Pickwick, Clarksville-Nixa-Baxter, Corydon-Sogn, Enders-Allegheny-Mountainburg, Razort-Captina-Etowah, Linker-Apison-Hector, and Captina-Pembroke.

3.5.3 Hydrology and Groundwater

In the Interior Highlands of western and northern Arkansas ground-water supplies are more limited than in the Coastal Plain. Much of the Ozark Plateaus region is underlain by carbonate rocks, which are quite soluble in the presence of water. Solution by ground water has caused many large openings through which water passes so quickly that contaminants from the surface cannot be filtered out. Signs of these openings are caves, sink holes, springs and lost stream segments. As a consequence, the water in shallow wells may not be suitable for human consumption without treatment.
Three aquifers, which are part of the Ozark Plateaus Aquifer System, are located within northern Arkansas. The Springfield Plateau aquifer is generally under unconfined conditions, with groundwater movement occurring through fractures and solution cavities formed by dissolution of carbonate rock. Local discharge is through springs and streams. The Ozark aquifer is generally under confined conditions, especially where overlain by the units of the Ozark Confining Unit (Chattanooga Shale). Most wells in the Springfield Plateau and upper units in the Ozark aquifer yield 5-10 gpm on the average, with yields greater than 25 gpm in rare cases.

The third aquifer, the Roubidoux Formation and the Gunter Sandstone Member of the Gasconade Formation in northern Arkansas occur at greater depth and constitute the only significant aquifer system in the Ozarks. Both are permeable sandstone and carbonate units of Ordovician age. These aquifers serve as the principal source of high-quality water for many communities in northern Arkansas where surface water sources are unavailable. Together these units may yield up to 500 gpm to wells. These formations do not outcrop anywhere in Arkansas but instead outcrop in southern Missouri.

3.5.4 Water Quality

The waters of the Arkansas portion of the White River watershed have all been designated by the Arkansas Department of Environmental Quality (ADEQ) for fisheries, primary and secondary contact recreation, and domestic, agricultural, and industrial water supplies (ADEQ, 2012). Beaver Lake is classified by ADEQ as a Type A water body, which includes most larger lakes of several thousand acres in size, in upland forest dominated watersheds, having an average depth of 30 to 60 feet, and having low primary production (i.e., having a low trophic status if in natural [unpolluted] condition). Beaver Lake, like all other lakes of its size in the Ozark region, stratifies chemically and thermally in the late spring with stratification extending into late fall and early winter. During the warmer months, lake waters of the upper layer (the epilimnion) are warmer and contain more dissolved oxygen, while the denser, lower layer waters (the hypolimnion) are colder and contain very little or no dissolved oxygen, thus undesirable for fish habitat.

This undesirable water, when discharged downstream from hydropower generation, may cause some problems in the tailwaters. To combat this problem, the dissolved oxygen content is monitored and various management measures are implemented to improve the dissolved oxygen concentration in the hydropower releases. A highly productive trout fishery has been established in the Beaver tailwaters by the Arkansas Game and Fish Commission because of the available discharge of cold water from the dam, which is reaerated by turbulence as it flows downstream.

As the stratified epilimnion cools in the late fall and winter, the layers begin to mix (de-stratify) and dissolved oxygen (DO) is more evenly distributed. This condition is more favorable to the fishery of the lake and overall water quality.

The upper 1500 acres of Beaver Lake has been listed by the Arkansas Department of Environmental Quality (ADEQ) on Arkansas' 303(d) list of impaired waters, approved by the Environmental Protection Agency (EPA), due to turbidity (ADEQ, 2008). According to the Arkansas 303(d) list, these excessive levels impact the local fisheries as well as primary contact, both designated uses of Beaver Lake. The elevated turbidity levels are due to excessive silt from surface erosion from agriculture activities, unpaved road surfaces, in-stream erosion – mainly from unstable stream banks, and any other land surface disturbing activity. The Draft 2010 Integrated Water Quality and Monitoring Report (ADEQ, 2010) added pathogen indicator bacteria as a contaminant for the same area of Beaver Lake. Surface erosion activities are listed as the probable source for this contaminant as well.

Clean Water Act requires states to list waters that do not meet Federal water quality standards or have a significant potential not to meet standards as a result of point source dischargers or non- point source run-off. Subsequent to listing on the 303(d) list, the statute requires that the states develop and set the Total Maximum Daily Load (TMDL) for water bodies on the list within 13 years. A TMDL establishes the maximum amount of a pollutant that can enter a specific water body without violating the water quality standards. Values are normally calculated amounts based on dilution and the assimilative capacity of the water body. TMDLs have not been established by ADEQ for the upper Beaver Lake area.

3.6 Biological and Cultural Resources

3.6.1 Terrestrial Ecosystems

The area surrounding Beaver Lake is mostly forested. Trees and shrubs around the lakeshore include upland oak and hickory species, persimmon, honey locust, hawthorn, dogwood, redbud, coralberry, smooth and winged sumac, and buttonbush. Frequent periods of inundation keep a thin strip of government owned lands around the lake in early stages of succession. Red cedar and short-leafed pine,

the principal evergreens, are dispersed throughout the region and are found in many large, scattered groups. Ground covers consist of greenbrier, sedges, and native grasses. White-tailed deer and eastern wild turkey are common game animals found and hunted in the Beaver Lake area. Black bears have also become common in the area and are hunted on the lands around the lake. The principal small game species found in the open upland areas include bobwhite quail, cottontail rabbit, and mourning dove. Gray and fox squirrels are common in upland wooded areas. Furbearing animals found in the Beaver Lake area include coyote, red fox, gray fox, otter, mink, muskrat, beaver, bobcat, and raccoon. Habitat management that includes wildlife food plot plantings, mowing, soil disturbance, removal of exotic species and application of prescribed fire provide benefit to these populations.

The common goldeneye, hooded merganser, bufflehead, and ring-necked duck are the predominant migratory waterfowl species visiting Beaver Lake. Mallards, gadwall, and other duck species are also present; however, they are only transient visitors as their characteristic feeding habits of obtaining food from shallow waters is limited. Resident Canada geese are so numerous in many coves and recreation areas that their presence has become a nuisance.

Ring-billed gulls are seen frequently around the Beaver Lake area. Greater and lesser yellow legs, pelicans, and large flocks of horned grebes are also seen during their peak migration in the spring and fall. Beaver Lake is also one of the few places where visitors can see both the turkey vulture and the black vulture at the same time in the winter. Beaver Lake has also become a popular place that visitors come to observe bald eagles, commonly wintering 150 or more birds and hosting 5-6 breeding pairs during the nesting period of March to June. The surrounding woodlands and grasslands serve as prime nesting areas for resident and neotropical migratory songbirds.

3.6.2 Aquatic Ecosystems and Wetlands

Walleye, smallmouth bass, striped bass, hybrid white-striped bass, and paddlefish have been introduced into Beaver Lake to add diversity to the fishery. Natural reproduction of striped bass and hybrid white-striped bass does not occur in Beaver Lake. Since 2004, AGFC stocks approximately 100,000 walleye, 30,000 channel catfish, 30,000 blue catfish, and 200,000 striped bass each year. While natural reproduction occurs in white crappie, black crappie, largemouth bass, and smallmouth bass, AGFC supplements this reproduction by occasional stockings of these species. Historically, there have also been introductions of northern pike, blue catfish, lake trout, and threadfin shad.

Located within the Springfield Plateau of the Ozark Mountains region of northern Arkansas, the area surrounding Beaver Lake is characterized by limestone, dolomite, or chert geology. The many rivers and streams flowing through the region have created a landscape of level highlands dissected by rugged valleys rich in karst features such as caves and sinkholes. Associated with these streams and landscape features are a variety of wetland habitats representative of the five wetland classes occurring within the region. These wetland classes include depressions, flats, fringe, riverine, and slope. It is possible, and perhaps even likely, that all of these classes of wetlands occur in the general area of Beaver Lake. However, those most likely to occur in the area immediately surrounding the lake are fringe (most likely reservoir), riverine (most likely spring runs) and slope wetlands (most likely calcareous slope).

3.6.3 Threatened and Endangered Species

The following species listed in Table 1 are from the U.S. Fish and Wildlife Service's federally classified status list of species and the Arkansas Natural Heritage data sets which have been reported and identified on project lands. Although the bald eagle was delisted by USFWS in 2007 due to recovery of the species, both the bald and golden eagles are still protected in accordance with the Bald and Golden Eagle Protection Act. The federal Migratory Bird Treaty Act of 1918 also provides protection to certain species of migratory birds. A total of 31 bird species are currently protected under this federal statute.

Table 1: Threatened and Endangered Species

	Federal Status	State Status/Global Rank
Gray Bat	LE	SE / S2S3/G4
Indiana Bat	LE	SE / /S1/G2
Northern long-eared Bat	LT	SE / S1S2/ G1G2
Ozark Big-eared Bat	LT	Not listed
Little Brown Bat	-	SE / S1
Bald Eagle	*Protected under Bald and Golden Eagle Protection Act	S3B,S4N/G5
Eastern Black Rail	LT	Not listed
Piping Plover	LT	Not listed
Rufa Red Knot	LT	Not listed
Whooping Crane	Experimental Population, Non-Essential	Not listed
Ozark Cavefish	LT	SE / S1/G3
Neosho Mucket	LE	Not Listed
Rabbitsfoot mussel	LT	SE/S3/G3G4
Snuffbox Mussel	LE	Not listed
Monarch Butterfly	C	Not listed
Missouri Bladderpod	LT	S2/G3
Opaque Prairie Sedge	-	SE / S2S3G4
Yellow Coneflower	-	ST / S2G3T3
Ovate-leaf Catchfly	-	ST / S2G3
Royal Catchfly	-	ST / S2G3

FEDERAL STATUS CODES

LE = Listed Endangered; the U.S. Fish and Wildlife Service has listed this species as endangered under the Endangered Species Act.
LT = Listed Threatened; the U.S. Fish and Wildlife Service has listed this species as threatened under the Endangered Species Act.
C = Candidate Species;

STATE STATUS CODES

INV = Inventory Element; The Arkansas Natural Heritage Commission is currently conducting active inventory work on these elements. Available data suggests these elements are of conservation concern. These elements may include outstanding examples of Natural Communities, colonial bird nesting sites, outstanding scenic and geologic features as well as plants and animals, which, according to current information, may be rare, peripheral, or of an undetermined status in the state. The ANHC is gathering detailed location information on these elements.

GLOBAL RANKS

G3 = Vulnerable globally. At moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors.
G4 = Apparently secure globally. Uncommon but not rare; some cause for long-term concern due to declines or other factors.
G5 = Secure globally. Common, widespread and abundant.
T-RANKS= T subranks are given to global ranks when a subspecies, variety, or race is considered at the state level. The subrank is made up of a "T" plus a number or letter (1, 2, 3, 4, 5, H, U, X) with the same ranking rules as a full species.

STATE RANKS

S1 = Critically imperiled in the state due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors making it vulnerable to extirpation.
S2 = Imperiled in the state due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it vulnerable to extirpation.
S3 = Vulnerable in the state due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.

GENERAL RANKING NOTES

Q = A "Q" in the global rank indicates the element's taxonomic classification as a species is a matter of conjecture among scientists.

Source: Arkansas Natural Heritage Commission

3.6.4 Cultural Resources

The records search, interviews, and site inspection identified no cultural resource assessments or findings for the subject property.

During the past seventy years scientific investigation of archaeological sites in the Beaver Lake area has been carried out in several phases. In 1922 and 1923, Mark R. Harrington of Phillip Academy was the first archeologist to excavate sites on the area that is now Beaver Lake. He excavated 13 bluff shelters. Between 1928 and 1935, the work of Harrington was continued by S.C. Dellinger of the University of Arkansas Museum. Dellinger supervised the excavation of 21 rock shelters. In the early 1960's, a series of surveys were conducted by several archeologists from the University of Arkansas Museum. Today, there are 280 known archeological sites along or immediately adjacent to Beaver Lake. Of these, 271 are identified as prehistoric, seven are historic and two sites have no known cultural affiliation.

Table 2: Historical and Cultural Resources at Beaver Lake

Type of Site	Number of sites
Historic	7
Prehistoric	271
No known cultural affiliation	2
Total	280
National Register Eligibility Status	
Not Evaluated	132

Not Eligible	5
Eligible	1

4.0 Survey Methodology

4.1 Development of Study Sections

The information gathered during the development of the ECP was used to group the subject property into standardized categories using Department of Defense (DoD) guidance, and in accordance with ASTM D5746 (2016). The ECP category definitions are summarized below in Table 3.

Table 3: Definitions of ECP Categories

ECP Category	Definition
1	An area or parcel of real property where no release, or disposal of hazardous substances or petroleum products or their derivatives has occurred (including no migration of these substances from adjacent properties).
2	An area or parcel of real property where only the release or disposal of petroleum products or their derivatives has occurred.
3	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but at concentrations that do not require a removal or remedial action.
4	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, and all remedial actions necessary to protect human health and the environment have been taken.
5	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred and removal or remedial actions, or both, are under way, but all required actions have not yet been taken.
6	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but required response actions have not yet been initiated.
7	An area or parcel of real property that is unevaluated or requires additional evaluation.

The final ECP category designations for the subject property are shown in Section 6.2, Table 5.

4.2 Visual Site Inspection

A VSI was conducted on 13 July 2021 at the subject property to check for recognized environmental conditions. The VSI was conducted by Mrs. Hollie Eljizi, Ms. Jennifer Jeffcoat and Mr. Robert Singleton from the U.S. Army Corps of Engineers (USACE). USACE representatives were accompanied by Mr. Mathew Voskamp of the USACE Beaver Lake office.

The VSI was performed from a USACE Beaver Lake Office watercraft near the bank of the subject property. Right of Entry (ROE) was and the shoreline was accessible from the watercraft and explored. At the time of inspection, the lake level was at 1127 ft msl, conservation pool lake level is 1121 ft msl. This made part of the priority area under water during the VSI, however water clarity was good, and no debris or other concerns were seen in the water. The shoreline was treed and rocky with a slight slope into the lake. Wood debris from fallen trees and a piece of encapsulated foam were seen along the shoreline. Two permitted private boat docks are located within the priority area, a larger covered dock and smaller uncovered dock. No apparent signs of Hazardous, Toxic and Radioactive Waste (HTRW) were visible during the VSI.

Photos from the VSI can be found in Appendix A.

4.3 Aerial Photography Analysis

Aerial photographs were available from Google Earth maps for 1985, 1994, 2001, 2004, 2006, 2009, 2010, 2012, 2014, 2016, 2017, 2018, and 2020.

The initial aerial photograph from 1985 is of poor quality and the area isn't discernable. The next photo form 1994 is also of poor quality but a boat dock can be seen at the northern most end of the priority area with an associated residence at the crest of the hill above it and a residence at the crest of the hill adjacent to the southern end of the property and a small dock on the opposite site of the cove. The next photo from 2001 shows two additional docks in the center of the priority area and another dock on the opposite side of the cove, there is no discernable change in the 2004 and 2005 photos. The next photo from 2006 shows another residence or structure nearer to the southern end of the parcel. There is no change in the 2009 photo, the next photo from 2010 shows no changes with the exception of the larger dock near the middle of the priority area is no longer seen. There are no changes in the photos from 2012 to 2020.

All aerial photographs are included in Appendix B.

4.4 Sanborn Map Review

Sanborn maps were not available for the subject property, or for the adjacent areas.

4.5 Topographic Map Review

Historical topographic maps were available from the US Geological Survey Website for the Beaver Lake area for 1900, 1901, 1945, 1949, 1954, 1957, 1958, 1964, 1985, 2011, 2014, 2017, and 2020. Several observations can be gleaned from these maps. First, the area before the lake was formed consisted of valleys with steep bluffs and hill sides around the White River and it's tributaries. The historical maps show this valley and river basin from the 1900 to 1964 topographic maps. In 1985 the river and Beaver Dam at the northern end of the lake can been seen in the valley of the historical White River.

All topographic maps are included in Appendix C.

4.6 Records Review

4.6.1 Standard Environmental Record Sources

In this evaluation records, maps and other documents that provide environmental information about the project area are obtained and reviewed. A desktop records review was conducted using various sources to determine the presence of HTRW sites on or near the subject property. This search was focused on active cleanup sites and sites with a reasonable risk of HTRW release. Several databases were searched manually to narrow down the search area. These databases included the Environmental Protection Agency (EPA) Cleanups in my Community database, the EPA Envirofacts databases, the Arkansas Department of Environmental Quality's (ADEQ) web search tool of Underground Storage Tanks (UST) and Above Ground Storage Tanks (AST), and the Arkansas Department of Energy and Environment Oil and Gas Commission oil and gas well maps. The information collected from this desktop records review was analyzed for recognized environmental conditions (RECs) that would affect the proposed project or need further investigation, given the proposed project measures. The following resources were searched.

Federal National Priorities List (NPL) – The records search did not reveal any NPL sites in the project footprint or adjacent areas. There are nine NPL sites in the state of Arkansas, none of which are located near Beaver Lake or the priority areas. This is based on a search of the EPA Superfund: National Priorities List (NPL) list.

Federal Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) List – The CERCLIS, now called the Superfund Enterprise Management System (SEMS)

database, tracks hazardous waste sites where remedial action has occurred under EPA's CERCLA program. This list also includes sites that are in the screening and assessment phase for possible inclusion on the NPL. The records search of EPA's listed SEMS sites did not reveal any sites in the project footprints or adjacent areas. This is based on a search of the EPA SEMS database.

Federal No Further Remedial Action Planned (NFRAP) – The Federal NFRAP list (now known as the SEMS archive list) tracks sites where no further remedial action is planned, based on available assessments and information. The list also represents sites that were not chosen for the NPL. Further EPA assessment could possibly be ongoing, and hazardous environmental conditions may still exist; however, in the absence of remedial action and assessment data, no determination about environmental hazards can be made. The records search did not reveal any NFRAP sites in the project footprint or adjacent areas. This is based on a search of the EPA SEMS database.

Federal Resource Conservation and Recovery Act (RCRA) Corrective Action List – The records search of EPAs Cleanups in My Community showed two RCRA Corrective Actions within one mile of the project search area. No RCRA corrective actions were found to be located within one mile of the project footprint. This is based on a search of the EPA Cleanups in My Community.

State Superfund Sites - This search is to check for any state CERCLA sites in the project vicinity. The records search of state CERCLA cleanup sites did not show any sites of concern in the project or adjacent areas. This search is based on a search of the Arkansas Department of Energy and Environment data base.

State and Tribal Solid Waste Facilities/Landfill Sites – This search is designed to check any state or tribal databases for solid waste handling facilities or landfills in the project vicinity. The records search did not find any solid waste facilities or landfill sites in area of this project or adjacent areas. This is based on a search of the EPA Landfill Methane Outreach Program (LMOP) and ADEQ Permitted Solid Waste Disposal database.

State and Tribal Registered Storage Tanks – This list is a combination of the State of Arkansas registered UST and AST databases, representing sites with storage tanks registered with the State of Arkansas. The search revealed one AST within one mile of the work area or adjacent areas. This AST is not expected to impact the project due to its distance from the proposed project. These results are based on a search of the Arkansas Department of Energy and Environment Oil and Gas Commission website.

State and Tribal Voluntary Cleanup Sites – The ADEQ Elective Site Cleanup Agreement (ESCA) database identifies sites where the responsible party chooses to clean up the site themselves with ADEQ oversight. Five sites were identified from this database. None of the sites are within one mile of the work area and are therefore not expected to impact the proposed project. These results are based on a search of the ADEQ ESCA Database.

Brownfields List – A brownfield is a property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. There are no brownfield sites within one mile of the work area or adjacent areas. These results are based on a search for Brownfields sites using the EPA Envirofacts search engine.

Oil and Gas Wells – A search of the oil and gas wells in the area using the Arkansas Department of Energy and Environment Oil and Gas Commission website identifies multiple sites including oil wells, plugged oil wells, injection/disposal sites within the surrounding area. Although not classified as HTRW under USACE regulations, pipelines and oil wells play an important role in the HTRW existing

conditions near the potential project area. This is because the well and/or pipeline contents could potentially leak or spill into the surrounding environment or affect the proposed project features. As a result of these findings, a thorough pipeline/well search should be initiated during design to ensure no interaction with the existing oil and gas infrastructure occurs. The Oil and Gas Commission website was used to map these findings. No oil wells or pipelines were found near the priority areas.

4.7 Interviews

Two interviews were conducted on 12 and 13 July 2021 in conjunction with the site inspection, and the following stakeholders were interviewed:

- Mr. Matthew Franklin; Natural Resource Specialist, Beaver Lake Office; Matthew.G.Franklin@usace.army.mil
- Mr. Matthew Voskamp; Natural Resource Specialist, Beaver Lake Office; Matthew.Voskamp@usace.army.mil

Information gleaned from the interviews is incorporated by way of reference throughout the report. The interview questions can be found in Figure 3.

5.0 Environmental Conditions

5.1 Environmental Permits and Licenses

5.1.1 RCRA Status

The subject property is not covered under a Resource Conservation and Recovery Act (RCRA) permit, and no hazardous waste is generated or stored on the property.

5.1.2 Solid Waste

The subject property has no active, inactive, or expired permits or licenses for solid waste disposal. No landfills exist on the property.

5.1.3 USTs/ASTs

No USTs or ASTs were found during the records search, site inspection and interviews indicated not UST/AST have been known to be located at the subject property.

5.1.4 National Pollutant Discharge Elimination System (NPDES)

Section 402 of the Clean Water Act (33 U.S.C. 1251 et. seq.) requires all facilities that discharge stormwater to acquire an NPDES that defines contaminant limits in effluent to be discharged. No permits were found using the EPA's Envirofacts database on or adjacent to the priority area.

5.1.5 Drinking Water Permits

No drinking water permits are in place at the subject property.

5.1.6 Air Permits

No air emission or air quality permits are in place at the subject property.

5.1.7 Nuclear Regulatory Commission (NRC)

The NRC is tasked with permitting the use and handling of radioactive materials and reactors. No NRC licenses are in place at the subject property.

5.1.8 Other Permits/ Licenses

No other permits were found during the records search.

5.2 Environmental Cleanup and Remediation

5.2.1 Installation Restoration Program

Beaver Lake is not an active military facility, and therefore would not be eligible for cleanup under the Installation Restoration Program.

5.2.2 Military Munitions Response Program

Beaver Lake is not an active military facility, and therefore would not be eligible for cleanup under the Military Munitions Restoration Program.

5.2.3 Other Environmental Investigations and Cleanups

No known environmental investigations or cleanups were found during the records search, site inspection and interviews indicated that no known investigations or cleanups are ongoing at Beaver Lake.

5.2.4 Storage, Release, and Disposal of Hazardous Substances

No releases to the environment or improper disposal of these substances were found during the records search, site inspection and interviews indicated no known improper disposal at the priority area.

5.3 Petroleum and Petroleum Products

No releases to the environment or improper disposal of petroleum products were found during the records search, site inspection and interviews indicated no known improper disposal at the priority area.

5.4 Polychlorinated Biphenyls (PCBs)

No evidence exists of the presence of PCBs on the subject property. No PCB-containing oils were found during the records search, site inspection and interviews indicated no known PCB-containing oils have been used or stored at the priority area.

5.5 Asbestos

No asbestos assessments were found during the ECP process, none were found during the records search, site inspection and interviews indicated no known asbestos containing material has been used or stored at the priority area.

5.6 Lead and Lead-Based Paint (LBP)

No lead-based paint (LBP) assessments were found during the ECP process. No LBP was found during the records search, site inspection and interviews indicated no known improper disposal at the priority area.

5.7 Radioactive Material

No radioactive material assessments were found during the ECP process. No potentially radioactive materials were identified during the VSI, and the presence of radioactive materials on the subject property is extremely unlikely.

5.8 Landfills/Dumps

No landfills or dumps were found during the records search, site inspection or interview investigation.

5.9 Munitions and Explosives of Concern (MEC) and/or Unexploded Ordnance (UXO)

No munitions, explosives, or unexploded ordinance (UXO) were found during the records search, site inspection or interview investigation.

5.10 Radon

Beaver Lake spans across Benton, Washington and Carroll Counties. Washington County is in the Environmental Protection Agency (EPA) Radon Zone 3. Counties in Radon Zone 3 are counties with predicted average indoor radon screening levels of less than 2 pCi/L (EPA, 2018). Benton and Carroll Counties are in the EPA Radon Zone 2 with a predicted average indoor radon level between 2 and 4 pCi/L (EPA, 2018). No radon assessments were found during the records search (EPA, 2019).

5.11 Pesticides

No records were found to indicate the storage, improper use, or disposal of pesticides on the subject property.

5.12 Other Identified Concerns

No significant other concerns were found during the records search, site inspection or interviews.

5.13 National Environmental Policy Act (NEPA)

As the federal agency in charge of this project USACE is in charge of coordinating National Environmental Policy Act (NEPA) compliance of 1969 (Public Law 91-190), the Council on Environmental Quality (CEQ) regulations (40 CFR 1500–1508), and the USACE implementing regulations, Policy and Procedures for Implementing NEPA, ER 200-2-2. As part of the records search and interview process recent NEPA documents were reviewed including the 2018 Draft Environmental Assessment for the Beaver Lake Master Plan Revision.

5.14 Adjacent Properties

As part of the ECP process, adjacent properties are assessed for environmental conditions, and those discovered conditions are evaluated based on the potential to affect the subject property. There are no structures immediately adjacent to the priority area. The nearest structure is approximately 0.15 miles southwest on the opposite side of the cove from the subject property. The residence is first seen in the 1994 historical aerial photographs. The adjacent properties are unlikely to pose any HTRW concerns to the priority area.

6.0 Evaluation and Conclusions

6.1 Summary of ECP

Beaver Lake currently occupies more than 38,000 acres of Federal public lands and waters. This ECP report covers a 1.30 acre narrow strip of land located at the northern end of Beaver Lake. The subject property is on the edge of the lake and currently owned by private landowner(s). The Lake is located in northwestern Arkansas, in Benton, Washington, Madison and Carroll Counties and it is approximately 6 miles west of Eureka Springs, Arkansas. The subject property, also known as Priority Area 16, is located at the intersection of the White River, Dry Gulch, and Indian Creek.

This ECP report was prepared to characterize the existing environmental conditions at the subject property and is intended to be an aid in the leasing of real property. The ECP findings are based on the available sources of information concerning both past and present uses of the subject property.

Information included readily available data associated with adjacent property records, aerial photography, personnel interviews, environmental programs and associated documentation, and current and historic investigations. In addition, record sources were reviewed to determine if there have been spills, leaks, discharges, leaching, underground injections, dumping, abandonments, or storage of hazardous substances or petroleum products at the installation. The VSI and interview process included inquiries and requests into the existence and availability of records that support the environmental condition of the property.

6.2 Conclusions

The subject property was classified into one of seven standard ECP area types (categories) as defined by ASTM D5746-98(2016) *Standard Classification of Environmental Condition of Property Area Types for Defense Base Closure and Realignment Facilities*. Below are the seven categories for reference.

Table 4: Definitions of ECP Categories

ECP Category	Definition
1	An area or parcel of real property where no release, or disposal of hazardous substances or petroleum products or their derivatives has occurred (including no migration of these substances from adjacent properties).
2	An area or parcel of real property where only the release or disposal of petroleum products or their derivatives has occurred.
3	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but at concentrations that do not require a removal or remedial action.
4	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, and all remedial actions necessary to protect human health and the environment have been taken.
5	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred and removal or remedial actions, or both, are under way, but all required actions have not yet been taken.
6	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but required response actions have not yet been initiated.
7	An area or parcel of real property that is unevaluated or requires additional evaluation.

Given these seven categories, the subject property is categorized below, along with the reasoning for each classification.

Table 5: Properties and ECP Categories

Acreage	ECP Category	Reasoning
1.30 ac.	1	No release or disposal of hazardous substances or petroleum products or their derivatives has occurred beyond de minimus amounts, including no migration of these substances from adjacent properties.

No release or disposal of hazardous substances or petroleum products or their derivatives has occurred beyond de minimus amounts on the subject property and no releases to the environment were observed or reported.

Asbestos assessments were not available for the subject property. It is unlikely that Asbestos Containing Material (ACM) is present but, in the future, if a building or structure will be disturbed, a licensed asbestos inspector is needed to confirm whether ACM is present or not.

7.0 Certification

I declare that, to the best of our professional knowledge and belief, we meet the definition of *Environmental professional* as defined in Part 312.10 of 40 CFR 312. We have the specific qualifications based on education, training, and experience to assess a property of the nature, history and setting of the subject property. We have developed and performed the appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312. All information/documentation provided accurately reflects the condition of the property. This report meets the DoD requirements for completion of an ECP Report.

_____ _____

Eugenia Barnes
Environmental Protection Specialist
U.S. Army Corps of Engineers
Fort Worth District

Date

_____ _____

Hollie Eljizi
Environmental Engineer
U.S. Army Corps of Engineers
Fort Worth District

Date

_____ _____

Jennifer Jefcoat
Chemist
U.S. Army Corps of Engineers
Fort Worth District

Date

8.0 References

American Society for Testing and Materials (ASTM), 2013. E1527-13, *Standard Practice for Environmental Site Assessments: Phase 1 Environmental Site Assessment Process*.

ASTM, 2016. D5746, *Standard Classification of Environmental Condition of Property Area Types for Defense Base Closure and Realignment Facilities*.

Department of the Army, 13 December 2007. Army Regulation 200-1. *Environmental Quality: Environmental Protection and Enhancement.*

Environmental Protection Agency (EPA), February 2019. *EPA Map of Radon Zones including State Radon Information and Contacts*. https://www.epa.gov/radon/find-information-about-local-radon-zones-and-state-contact-information#radonmap

Federal Emergency Management Agency (FEMA), 2019. FEMA Flood Map Service Center. https://msc.fema.gov/portal

USACE. 1993. White River Basin, Arkansas and Missouri, *Water Control Master Manual.*

USACE. 2013. Little Rock District Water Management website. Accessed at: www.swl-wc.usace.army.mil

United States Census Bureau. 2013. Easy Facts Website. Accessed at: http://www.census.gov/easystats/

USACE. 2018. Beaver Lake White River and Tributaries, *Arkansas Shoreline Management Plan.*

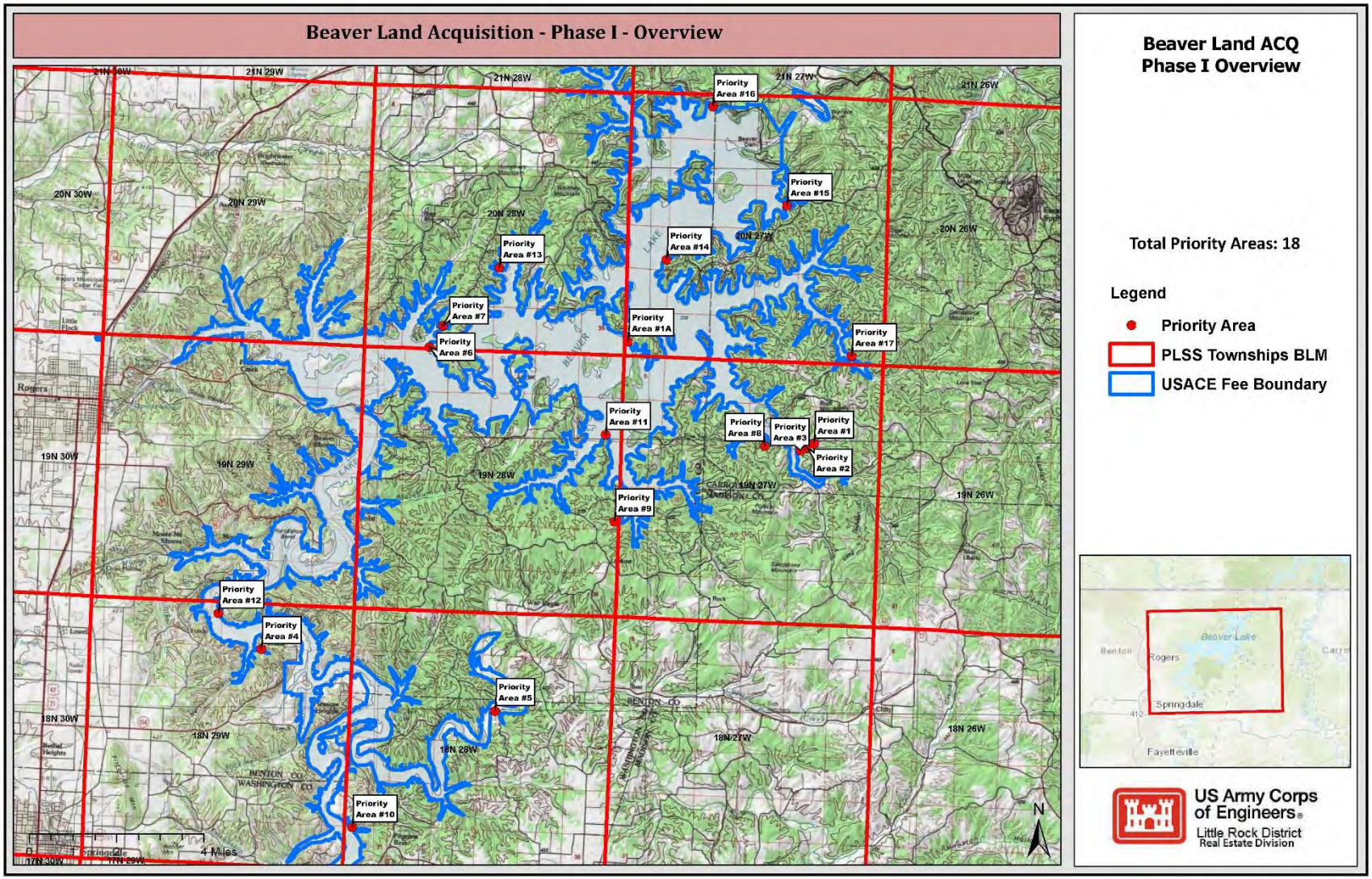
Arkansas Department of Energy and Environment Oil and Gas website Accessed August 2021 at: Commission, http://www.aogc.state.ar.us/maps/googleEarth.aspx

Beaver Watershed Alliance (BWA), 2012. *Beaver Lake Watershed Protection Strategy.*

Arkansas Department of Energy and Environment Environmental Quality website Accessed August 2021 at: https://www.adeq.state.ar.us/rst/programs/fees/facility_data.aspx

Figures

Figure 1: Beaver Lake Priority Areas



ACQ = Acquisition; PLSS = Public Land Survey System; BLM = Bureau of Land Management

Figure 2: Subject Property Detail

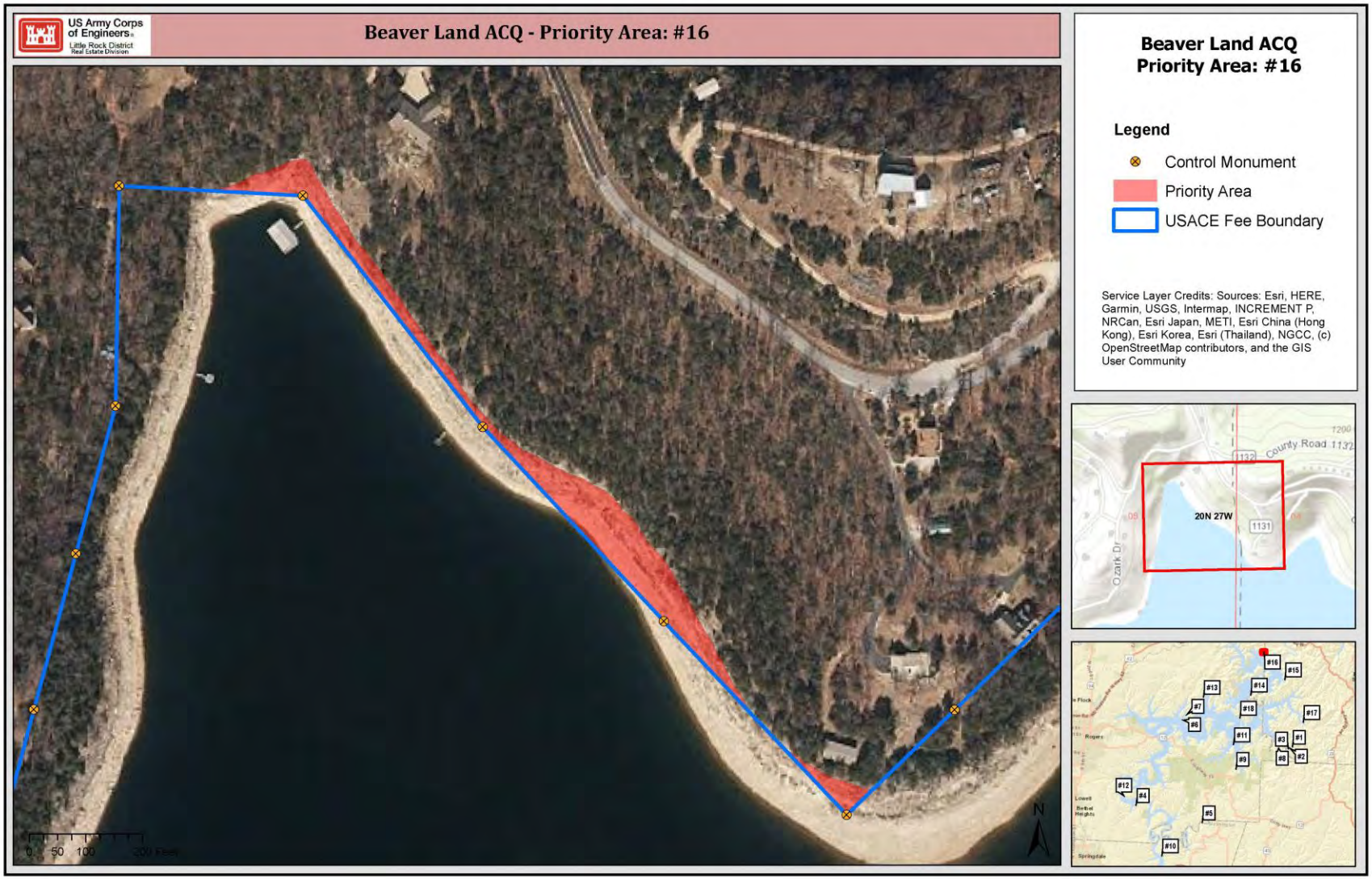


Figure 3: Interview Questions

Beaver Lake ECP
Interview Questions

1. Do you know of any environmental issues with this property?
2. Do you know of, or have access to, any reports concerning the environmental condition of this property? (i.e. site assessments, permits, storage tank registrations, safety plans, etc.) If so, would you be able to provide them? SWPPPs, SPCCs, air permits?
3. Do you know how this property has been historically used?
4. What is the property currently used for?
5. When were the site buildings constructed?
6. Are hazardous materials or petroleum products stored or used on this site? If so, what is the RCRA EPA ID? Does fueling occur on this property?
7. Do you know of any asbestos or LBP on the property or its buildings? Do you know the age of the buildings?
8. Has the site layout been manipulated in your recollection? (i.e. grading, excavation, etc.)?
9. Are there or have there been any cultural/historic items or buildings found on the property?
10. Is there anything else environmentally relevant that we should know?

Appendix A Visual Site Inspection Photographs

13 July 2021

Priority Area 16 – View of the priority area from the watercraft

Priority Area 16 – View of the priority area from the watercraft

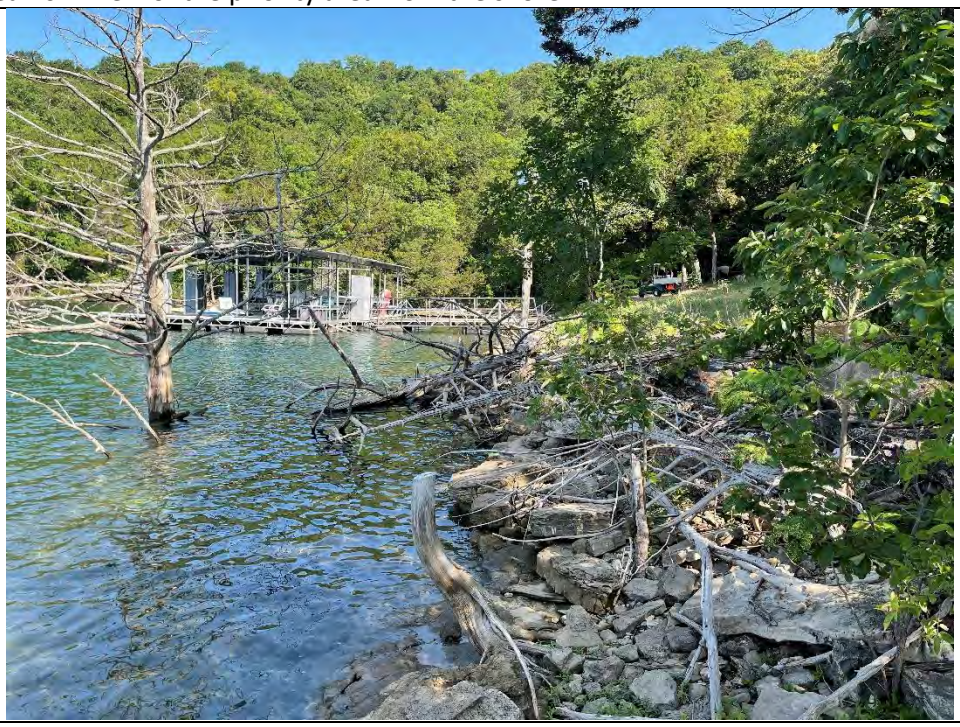
Priority Area 16 – View of the priority area from the watercraft, encapsulated foam can be seen

Priority Area 16 – Larger boat dock located on at the priority area

Priority Area 16 – Larger boat dock located on at the priority area

Priority Area 16 – View of the priority area from the watercraft

Priority Area 16 – View of the priority area from the shore

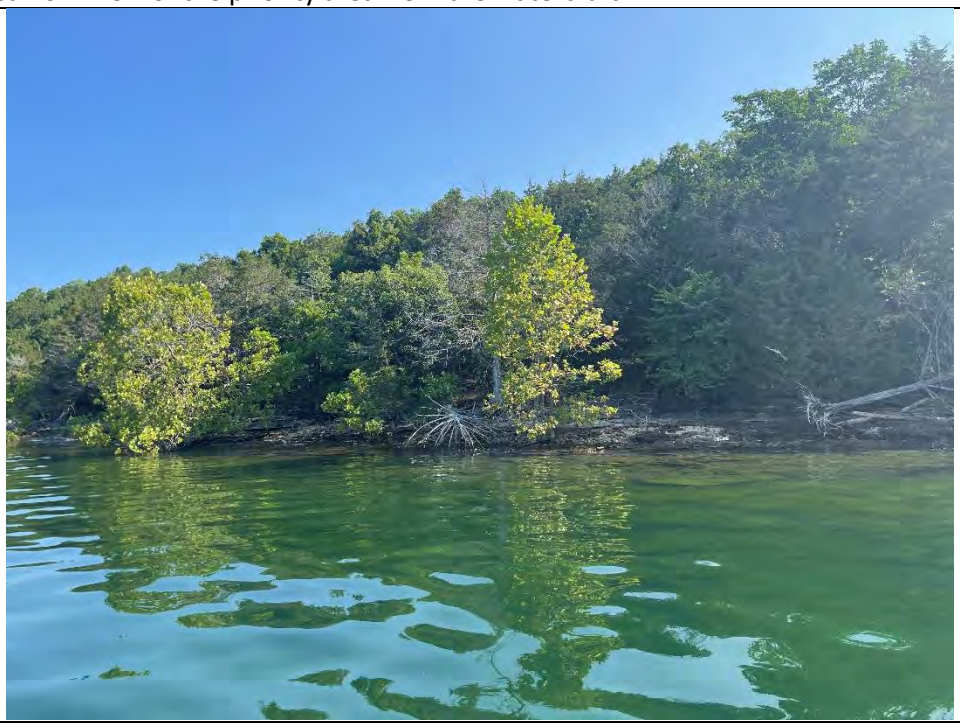


Priority Area 16 – Larger boat dock located on at the priority area

Priority Area 16 – View of the priority area from the watercraft

Priority Area 16 – View of the priority area from the watercraft

Priority Area 16 – View of the priority area from the watercraft



Priority Area 16 – View of the priority area from the watercraft

Priority Area 16 – View of the priority area from the watercraft

Priority Area 16 – View of the priority area from the watercraft

Priority Area 16 – Smaller boat dock located on at the priority area

Priority Area 16 – Smaller boat dock located on at the priority area

Final

U.S. Army Environmental Condition of Property Report
Priority Area 17

Beaver Lake
Beaver Lake, Arkansas

August 30, 2021

Prepared For:
Beaver Lake Land Acquisition

Prepared By:
U.S. Army Corps of Engineers
Regional Planning and Environmental Center
Fort Worth District
Fort Worth, Texas

[This page is intentionally left blank.]

Table of Contents

List of Appendices:

List of Acronyms

ACM	Asbestos-containing material
AR	Army Regulation
AST	Aboveground storage tank
ASTM	American Society for Testing and Materials
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CFR	Code of Federal Regulations
DoD	Department of Defense
ECP	Environmental Condition of Property
EDR	Environmental Data Resources
EPA	Environmental Protection Agency
ERNS	Emergency Response Notification System
HTRW	Hazardous, Toxic and Radioactive Waste
IRP	Installation Restoration Program
LBP	Lead-based Paint
LUST	Leaking underground storage tank
MEC	Munitions and Explosives of Concern
NEPA	National Environmental Policy Act
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NRC	Nuclear Regulatory Commission
ODEQ	Oklahoma Department of Environmental Quality
OWS	Oil-water separator
PCB	Polychlorinated Biphenyl
POL	Petroleum, Oils, and Lubricants
RCRA	Resource Conservation and Recovery Act
SEMS	Superfund Enterprise Management System
SF	Square feet
SHWS	State Hazardous Waste Sites
SWPPP	Stormwater Pollution Prevention Plan
TSD	Transport, Storage, Disposal
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
UST	Underground storage tank
UXO	Unexploded Ordnance
VCP	Voluntary Cleanup Program
VSI	Visual site inspection

1.0 Executive Summary

This environmental condition of property (ECP) report has been prepared to document the environmental conditions and provide information for the acquisition of land that would be necessary for the operation, maintenance, and control of the Beaver Lake reservoir in Arkansas. This fee acquisition pertains to the frequently inundated land immediately surrounding the lake, below an elevation of 1128 ft above mean sea level (msl). The Army prepares an ECP in order to provide the public with information relative to the environmental condition of the property, assist Federal agencies during the property screening process, provide information about completed remedial and corrective actions at the property, and to assist in determining appropriate responsibilities, asset valuation, and liabilities with other parties to a transaction.

Beaver Lake currently occupies more than 38,000 acres of Federal public lands and waters. This ECP report covers a narrow strip of land approximately 1.44 acres located on the eastern edge of Beaver Lake. The subject property is on the edge of the lake and currently owned by private landowner(s). The Lake is located in northwestern Arkansas, in Benton, Washington, Madison and Carroll Counties and it is approximately 6 miles west of Eureka Springs, Arkansas. The subject property, also known as Priority Area 17, is in the eastern region of the lake near the end of North Clifty Creek.

This ECP report presents a summary of readily available information on the environmental conditions of, and concerns relative to, the land, facilities, and real property assets of Beaver Lake. The findings included in the report are based on a record search of historical environmental investigation reports and site historical documents, a review of aerial photography, stakeholder interviews, and a site inspection conducted 12 – 13 July 2021.

Based on the environmental conditions found and the ECP analysis, the property can be categorized as an ECP Category 1, indicating a site where no release, or disposal of hazardous substances or petroleum products or their derivatives has occurred (including no migration of these substances from adjacent properties).

2.0 Purpose

2.1 General

This environmental condition of property (ECP) report has been prepared to document the environmental conditions and provide information for the acquisition of land surrounding Beaver Lake in Benton, Washington, Madison and Carrol Counties, Arkansas. This report meets the requirements of Title 40, Code of Federal Regulations (CFR), Part 373, and United States Army Regulation (AR) 200-1 (2007), *Environmental Quality, Environmental Protection and Enhancement*. The ECP report also follows the American Society for Testing and Materials (ASTM) E1527-13 *Standard Practice for Environmental Site Assessments: Phase 1 Environmental Site Assessment Process*. The subject property in this report is subsequently categorized according to ASTM D5746 (2016) *Standard Classification of Environmental Condition of Property Area Types for Defense Base Closure and Realignment Facilities*.

The Army prepares an ECP for the following purposes:

- Provide the public with information relative to the environmental condition of the property.
- Assist Federal agencies during the property screening process.
- Provide information to prospective buyers.
- Provide information about completed remedial and corrective actions at the property.
- Assist in determining appropriate responsibilities, asset valuation, and liabilities with other parties to a transaction.

The ECP contains the information required to comply with the provisions of 40 CFR, Part 373 that require a notice to accompany contracts for the sale of, and deeds entered into for the transfer of, federal property on which hazardous substances may have been stored, released or disposed. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) §120(h) stipulates that a notice is required if certain quantities of designated hazardous substances have been stored on the property.

The ECP Report is not prepared to satisfy a real property purchaser's duty to conduct an "all-appropriate inquiry" to establish an "innocent purchaser defense" to CERCLA 107 liability. Any such use of the ECP Report by any party is outside the control of the Army and beyond the scope of the ECP Report. The Army, its officers, employees or contractors makes no warranties or representations that any ECP Report satisfies any such requirements for any party.

2.2 Scope

Priority Area 17 occupies almost 1.5 acres of land. This ECP report covers 1.44 acres of land located within the eastern region of the lake. Priority Area 17 is comprised of pristine and clear water, with two docks on the property, one appearing older than the other. Also, although docks are present, there is no oil sheen or POL in the surrounding water areas, making the priority area rather clean, with light erosion throughout the property near the bluffs. There is access via watercraft and no ROE was granted. Areas within the lake that are not within the Priority Area will be considered adjacent property. A general site location map is provided in Figure 1, and maps showing the subject property are shown in Figure 2.

2.3 Limitations

This ECP report presents a summary of readily available information on the environmental conditions of, and concerns relative to, the land, facilities, and real property assets of the subject property. The findings included in the report are based on a record search of available historical environmental investigation reports and site historical documents, a review of aerial photography, stakeholder interviews, and a site reconnaissance conducted 12 – 13 July 2021. Historical environmental investigation reports and site historical documents were reviewed in support of this ECP, and the information obtained from other studies is reflected within this report by reference. The ECP process recognizes that the condition of

property and classification can change as historical contamination is cleaned up (if required) or if a new source of contamination is identified. Records reviewed during the assessment were accepted as accurate and a reasonable effort was made to resolve discrepancies identified during the document review.

During the ECP assessment, all available sources of information concerning both past and present environmentally significant uses of the property were reviewed. This included readily available data associated with adjacent property records; 1985, 1994, 2001, 2004, 2006, 2009, 2010, 2012, 2014, 2016, 2017, 2018, and 2020 aerial photography; personnel interviews; current and historic investigations; and topographical maps. In addition, record sources were reviewed to determine if there have been spills, leaks, discharges, leaching, underground injection, dumping, abandonment, or storage of hazardous substances or petroleum products at the subject property. The site reconnaissance and interview process included inquiries and requests into the existence and availability of records that support the environmental condition of the property. The site reconnaissance included a Visual Site Inspection (VSI) of the subject property. No sampling or analysis was conducted during this survey.

2.4 Report Organization

The remainder of this ECP report is organized as follows:

Section 3 – Property Description: This section provides location and description of the subject property; an overview of historical and current land uses; and a description of the environmental setting of the airport, including climate, topography, geology, and demography.

Section 4 – Survey Methodology: This section describes the methods used to obtain the information for this ECP Report such as the development of study sections, the VSI, aerial photography analysis, records review, interviews, and data management.

Section 5 – Environmental Conditions: This section provides the existing environmental information. The findings are organized by relevant environmental "issues," including permits and licenses, cleanup activities, hazardous substances, petroleum and related products, asbestos, lead-based paint (LBP), radioactive materials, landfills, explosive contaminated structures, radon, pesticides, and polychlorinated biphenyls (PCBs). This section also includes adjacent property descriptions.

Section 6 – Evaluation and Conclusions: This section provides a summary of the subject property and evaluates the property for categorization as per ASTM D5746 (2016).

Section 7 – Certification: This section documents the approval of the ECP report.

Section 8 – References: This section provides an inventory of the reference material used in the preparation of this ECP Report.

Appendices: A list of appendices is provided in the Table of Contents.

3.0 Property Description

3.1 Parcel Locations and Description

Beaver Lake is located in the scenic Ozark Mountain region of northwestern Arkansas in Benton, Washington, Carroll and Madison counties. The total area currently contained in the Beaver project, including both land and water surface, consists of 38,138 acres owned in fee. Of this total, 1,432 acres are in flowage easement. The proposed Land Acquisition would include adding any land below the 1128 msl water level. The White River drainage area above Beaver Lake is approximately 1,186 square miles. When the lake is at the top of the conservation pool (elevation 1120.43 ft msl), the water area is 28,299 surface acres with 490 miles of shoreline within the lands owned in fee. The shoreline is irregular with topography primarily consisting of steep bluffs and gentle slopes.

Priority Area 17 is a 1.44 acre narrow strip of wooded land located in a cove of Big Clifty Creek. The priority area has a boat dock within the footprint and a second boat dock immediately adjacent. The shoreline is partially rocky and partially eroded soil.

3.2 Historic Land Use

Beaver Lake is a multiple purpose water resource development project initially authorized for flood control, hydropower generation and other beneficial uses by the Flood Control Act dated 3 September 1954. The inclusion of storage in the lake for municipal and industrial water supply was authorized by the Water Supply Act of 1958. Beaver Lake is a major component of a comprehensive plan for water resource development in the White River Basin of Arkansas and Missouri. Construction of Beaver Dam was initiated in March 1960. The dam was completed in June 1966, and the powerhouse and switchyard were completed in 1965. Beaver Lake was declared operational for public use in 1965.

The historical aerial photographs show that Priority Area 17 has had a boat dock on it as far back as 2009 and a residence adjacent to it as far back as 2010.

3.3 Current Land Use

Beaver Lake is located in the Ozark Highlands of Carroll, Washington, Benton, and Madison Counties. Having 490 miles of shoreline (at conservation pool) and over 28,000 water surface acres, Beaver Lake is the largest reservoir in northwest Arkansas and the first federal impoundment on the White River.

There are 12 public use areas around Beaver Lake. There are 11 parks on the lake presently operated by the Corps of Engineers. The State of Arkansas owns and operates Hobbs State Park Conservation Area, which covers 12,056 acres, and Devil's Eyebrow Natural Area, which covers 2,503 acres. Both properties are adjacent to U.S. Army Corps of Engineers (USACE) lands. There are two parks, Ventris, and Blue Springs that have been reduced to lake access only. One Park (Big Clifty) is operated by Carroll County, Arkansas.

Despite being located adjacent to the fast-growing communities of Fayetteville, Springdale, Bentonville, and Rogers, Arkansas and a regional population of over 500,000, the lake provides open spaces and a quality outdoor recreation opportunity. Many arms and coves of the lake offer secluded areas for traditional activities such as fishing, skiing, sailing and scuba diving, but also allow for passive recreation opportunities like photography and nature observation.

Priority Area 17 remains largely undeveloped forested area with a boat dock and residential structure approximately 65 yards from the shoreline.

3.4 Utilities

Priority Area 17 has no known utilities.

3.5 Environmental Setting

3.5.1 Climate

The climate in the Beaver Lake area is classified as humid subtropical according to the Köppen climate model. A humid subtropical climate is characterized by hot, usually humid summers and mild to cool winters. The Köppen definition of this climate is for the coldest month's mean temperature to be between 26.6 °F (−3 °C) and 64.4 °F (18 °C), and the warmest month to be above 71.6 °F (22 °C). Some climatologists prefer to use 32 °F (0 °C) as the lower bound for the coldest month's mean temperature. Under the modern Trewartha climate classification, climates are termed Humid Subtropical when they have mean temperatures of 50 °F (10 °C) for eight or more months a year. In most locations classed within this system, the mean temperature of the coldest month is between 35 °F (3 °C) and 65 °F (18 °C). Some climatologists consider the Trewartha grouping of subtropical climates to be more real-world and fitting on a global scale.

While technically classified as humid subtropical, the climate in the Beaver Lake area is considered moderate. The area experiences all four seasons and does receive cold air masses from the north; however, some of the Arctic masses are blocked by the higher elevations of the Ozarks.

Average temperatures range from a high of 88 °F (31.1 °C) and low of 27 °F (-2.7 °C) in nearby Rogers, Arkansas. Extreme temperatures rarely exceed 96 °F (35.6 °C) and 13°F (-10.6 °C). Late summer is the time of maximum heat and least rainfall. During the winter months, midday temperatures in the basin are relatively warm, around 55 o to 60 o F. Some short periods of cold weather occur with temperature ranging from 0 o to 10 o F. On winter nights, temperatures from 37 o F to below freezing are common. Highest recorded temperature in Rogers, Arkansas was 114 °F (45.6 °C) (recorded in July 1954). The lowest temperature recorded was −16 °F (−26.7 °C), in February 1996.

The relative humidity typically ranges from 41% (comfortable) to 91% (very humid) over the course of the year, rarely dropping below 24% (dry) and reaching as high as 100% (very humid). The air is driest around April 9, at which time the relative humidity drops below 49% (comfortable) three days out of four; it is most humid around June 3, exceeding 87% (very humid) three days out of four.

Dew point is often a better measure of how comfortable a person will find the weather than relative humidity because it more directly relates to whether perspiration will evaporate from the skin, thereby cooling the body. Lower dew points feel drier and higher dew points feel more humid. Over the course of a year, the dew point typically varies from 19°F (dry) to 71°F (muggy) and is rarely below 4°F (dry) or above 74°F (very muggy). There are two periods in the year that are most comfortable: The first is between April 18 and June 6 and the second is between September 3 and October 23. The air feels neither too dry nor too muggy during these periods (https://weatherspark.com/averages/31495/Rogers-Arkansas-United-States).

Average annual rainfall for the Beaver Lake area is 45 inches per year. Precipitation is weakly seasonal, with a bimodal pattern: wet seasons in the spring and fall, and relatively drier summers and winters, but some rain in all months. The spring wet season is more pronounced than fall, with the highest rainfall typically occurring in May. The average annual snowfall for the Beaver area is about 12 inches. Snowpacks are usually short lived and are not commonly a concern for flooding.

Climate change is an area of concern due to the potential for effects on many aspects of the environment, especially those related to water resources. The U.S. Global Change Research Program (USGCRP) summarized information regarding climate change and its potential effects in regional assessments (http://www.globalchange.gov/publications/reports/scientific-assessments/us-impacts). In the Midwest, which extends from Minnesota to Missouri, extreme events such as heat waves, droughts and heavy rainfall events are projected to occur more frequently. Should these events become significant enough to impact the operation of Beaver Lake, the Master Plan and associated documents (i.e., Operations Management Plan and Shoreline Management Plan) would be reviewed and revised, if necessary.

3.5.2 Topography, Geology, and Soils

The depositional environment of the rocks found in the Arkansas Ozarks is one of a relatively shallow continental shelf, sloping toward deeper water generally toward the south. This shelf emerged many times during the Paleozoic resulting in numerous unconformities throughout the sequence. The Ozark Plateaus region of Arkansas is made up of generally flat-lying Paleozoic age strata divided into three plateau surfaces. The lowest and northern-most plateau is the Salem Plateau. The Springfield Plateau stands above the Salem a few hundred feet and is generally capped by lower Mississippian age limestones and cherts. The southernmost and highest plateau of the Ozarks is the Boston Mountains. All of these plateaus are deeply dissected by numerous streams throughout the area. The faulting in the Ozarks is generally normal; most faults displaying a displacement down on the southern side. However, some observations reveal that a few strike-slip faults may be present. Gentle folds are noted but are generally of very low amplitude. The depositional environment of the rocks found in the Arkansas Ozarks is one of a relatively shallow continental shelf, sloping toward deeper water generally toward the south.

Beaver Lake is part of the Springfield Plateau that occupies primarily the western and southwestern flanks of the Ozark Plateau province. The Springfield Plateau in this region rises to an elevation of approximately 1400 feet and in many areas, forms extensive plains. Hilly areas occur where rivers and their tributaries cut into the plateau surface, most notably in the vicinity of the White River and Beaver Lake. As streams like the Buffalo National River cut through the plateau down to the level of the White River, they sometimes carve spectacular bluffs.

Lower Ordovician, Middle to Upper Devonian and Lower and Upper Mississippian age strata are present around Beaver Lake. Upper Ordovician and Devonian strata crop out around Beaver Lake and its tributaries. The Lower Mississippian Boone Formation comprises the surface rock over the majority of the area and forms the surface of the heavily dissected Springfield Plateau. In addition to the Boone Formation, Cotter and Jefferson City formations (Jefferson City formation has not been successfully differentiated from the Cotter Formation in Arkansas), and the Powel formation, all of Ordovician age are present in the area. Formations in the Devonian strata include the Chattanooga, Clifty and Penters.

The Boone Formation consists of gray, fine- to coarse-grained fossiliferous limestone interbedded with chert. This formation caps the higher hills in the area. Since limestone is easily dissolved by water, cave and solution (karst) features are prominent. The Boone Formation is well known for dissolutional features, such as sinkholes, caves, and enlarged fissures. Surface water may drain directly into channels in limestone, where it can move rapidly and without filtration to the surface as a spring, at a location that is unpredictable without extensive testing. Therefore, water pollution problems are of particular concern in this region. The thickness of the Boone Formation is 300 to 350 feet in most of northern Arkansas, but as much as 390 feet has been reported.

The Cotter Dolomite is composed of dolostone of predominantly two types: a fine-grained, argillaceous, earthy textured, relatively soft, white to buff or gray dolostone called "cotton rock", and a more massive, medium-grained, gray dolostone that weathers to a somewhat hackly surface texture and becomes dark on exposure. The formation contains chert, some minor beds of greenish shale, and occasional thin interbedded sandstone. The thickness is about 340 feet in the vicinity of Cotter, but the interval may range up to 500 feet thick in places.

The Powell Dolomite is generally a fine-grained, light-gray to greenish-gray, limy, argillaceous dolostone with thin beds of shale, sandstone, sandy dolostone, and occasionally chert. The formation’s thickness may be as much as 215 feet but is often much thinner.

The Chattanooga Shale Formation is typically black, fissile clay shale that weathers into thin flakes. The beds are usually cut by prominent joints creating polygonal blocks upon weathering. The upper part of the formation may be slightly sandy and usually contains abundant pyrite. Thickness ranges from to about 85 feet; normally averaging about 30 feet (AGS).

The strata throughout the region are nearly horizontal. One predominant geological feature of the lake area is a low, persistent, limestone bluff, which occurs just above the Ordovician-2 Mississippian contact.

The faulting in the Ozarks is generally normal; most faults displaying a displacement down on the southern side. Lineaments and faults characteristic of northwest Arkansas are present around Beaver Lake. The Fayetteville Fault lies beneath Beaver Lake. This fault is the west side of a graben that has down-dropped the Boone Formation to lake level. The Starkey Fault bounds the east side of the graben. Both faults trend approximately N 450E. One section of the Starkey fault trends N 60-700E. The Clantonville Lineament – Monocline is a northeast to southwest trending structural feature that extends from north of Clantonville to Ventris Hollow. The location of this feature was determined from the 1:24,000 three dimensional quadrangle and from structural disparities in the Lower Mississippian rock units. This structural feature could be responsible for the presence of lead-zinc mineralization in an old prospect near Clantonville (north of Beaver Lake). The trend of this lineament to monocline is N 30-400E. Paleokarst features within the top of the Powell Dolomite are present around Beaver Lake and coincident with a lineament in Limekiln Hollow near Garfield, northwest of Beaver Lake.

In general, the soils of the Ozark Plateaus are residual and are formed on a broad, domed, upwarp consisting mostly of limestone and dolomite. The main difference in the soils is due to different rocks from which the soils were formed. The main geologic materials are cherty limestone; cherty, very siliceous dolomite; cherty, siliceous dolomite; and alluvium, which are weathered and water transported products of the first three materials. Glade-rock soil occurs where the cherty, very siliceous dolomite is exposed to the soil formation. Dolomite is more resistant to weathering than limestone and siliceous dolomite is even more resistant, so very shallow soil results. In areas where the dolomite is less siliceous, more weathering has taken place; however, the soils produced are not as deep as soils formed by limestone.

The following eight soils associations are found in and around the Beaver project area: Captina-Nixa, Captina-Nixa-Pickwick, Clarksville-Nixa-Baxter, Corydon-Sogn, Enders-Allegheny-Mountainburg, Razort-Captina-Etowah, Linker-Apison-Hector, and Captina-Pembroke.

3.5.3 Hydrology and Groundwater

In the Interior Highlands of western and northern Arkansas ground-water supplies are more limited than in the Coastal Plain. Much of the Ozark Plateaus region is underlain by carbonate rocks, which are quite soluble in the presence of water. Solution by ground water has caused many large openings through which water passes so quickly that contaminants from the surface cannot be filtered out. Signs of these openings are caves, sink holes, springs and lost stream segments. As a consequence, the water in shallow wells may not be suitable for human consumption without treatment.

Three aquifers, which are part of the Ozark Plateaus Aquifer System, are located within northern Arkansas. The Springfield Plateau aquifer is generally under unconfined conditions, with groundwater movement occurring through fractures and solution cavities formed by dissolution of carbonate rock. Local discharge is through springs and streams. The Ozark aquifer is generally under confined conditions, especially where overlain by the units of the Ozark Confining Unit (Chattanooga Shale). Most wells in the Springfield Plateau and upper units in the Ozark aquifer yield 5-10 gpm on the average, with yields greater than 25 gpm in rare cases.

The third aquifer, the Roubidoux Formation and the Gunter Sandstone Member of the Gasconade Formation in northern Arkansas occur at greater depth and constitute the only significant aquifer system in the Ozarks. Both are permeable sandstone and carbonate units of Ordovician age. These aquifers serve as the principal source of high-quality water for many communities in northern Arkansas where surface water sources are unavailable. Together these units may yield up to 500 gpm to wells. These formations do not outcrop anywhere in Arkansas but instead outcrop insouthern Missouri.

3.5.4 Water Quality

The waters of the Arkansas portion of the White River watershed have all been designated by the Arkansas Department of Environmental Quality (ADEQ) for fisheries, primary and secondary contact recreation, and domestic, agricultural, and industrial water supplies (ADEQ, 2012). Beaver Lake is classified by ADEQ as a Type A water body, which includes most larger lakes of several thousand acres in size, in upland forest dominated watersheds, having an average depth of 30 to 60 feet, and having low primary production (i.e., having a low trophic status if in natural [unpolluted] condition). Beaver Lake, like all other lakes of its size in the Ozark region, stratifies chemically and thermally in the late spring with stratification extending into late fall and early winter. During the warmer months, lake waters of the upper layer (the epilimnion) are warmer and contain more dissolved oxygen, while the denser, lower layer waters (the hypolimnion) are colder and contain very little or no dissolved oxygen, thus undesirable for fish habitat.

This undesirable water, when discharged downstream from hydropower generation, may cause some problems in the tailwaters. To combat this problem, the dissolved oxygen content is monitored and various management measures are implemented to improve the dissolved oxygen concentration in the hydropower releases. A highly productive trout fishery has been established in the Beaver tailwaters by the Arkansas Game and Fish Commission because of the available discharge of cold water from the dam, which is reaerated by turbulence as it flows downstream.

As the stratified epilimnion cools in the late fall and winter, the layers begin to mix (de-stratify) and dissolved oxygen (DO) is more evenly distributed. This condition is more favorable to the fishery of the lake and overall water quality.

The upper 1500 acres of Beaver Lake has been listed by the Arkansas Department of Environmental Quality (ADEQ) on Arkansas' 303(d) list of impaired waters, approved by the Environmental Protection Agency (EPA), due to turbidity (ADEQ, 2008). According to the Arkansas 303(d) list, these excessive levels impact the local fisheries as well as primary contact, both designated uses of Beaver Lake. The elevated turbidity levels are due to excessive silt from surface erosion from agriculture activities, unpaved road surfaces, in-stream erosion – mainly from unstable stream banks, and any other land surface disturbing activity. The Draft 2010 Integrated Water Quality and Monitoring Report (ADEQ, 2010) added pathogen indicator bacteria as a contaminant for the same area of Beaver Lake. Surface erosion activities are listed as the probable source for this contaminant as well.

Clean Water Act requires states to list waters that do not meet Federal water quality standards or have a significant potential not to meet standards as a result of point source dischargers or non- point source run-off. Subsequent to listing on the 303(d) list, the statute requires that the states develop and set the Total Maximum Daily Load (TMDL) for water bodies on the list within 13 years. A TMDL establishes the maximum amount of a pollutant that can enter a specific water body without violating the water quality standards. Values are normally calculated amounts based 39 on dilution and the assimilative capacity of the water body. TMDLs have not been established by ADEQ for the upper Beaver Lake area.

3.6 Biological and Cultural Resources

3.6.1 Terrestrial Ecosystems

The area surrounding Beaver Lake is mostly forested. Trees and shrubs around the lakeshore include upland oak and hickory species, persimmon, honey locust, hawthorn, dogwood, redbud, coralberry, smooth and winged sumac, and buttonbush. Frequent periods of inundation keep a thin strip of

government owned lands around the lake in early stages of succession. Red cedar and short-leafed pine, the principal evergreens, are dispersed throughout the region and are found in many large, scattered groups. Ground covers consist of greenbrier, sedges, and native grasses. White-tailed deer and eastern wild turkey are common game animals found and hunted in the Beaver Lake area. Black bears have also become common in the area and are hunted on the lands around the lake. The principal small game species found in the open upland areas include bobwhite quail, cottontail rabbit, and mourning dove. Gray and fox squirrels are common in upland wooded areas. Furbearing animals found in the Beaver Lake area include coyote, red fox, gray fox, otter, mink, muskrat, beaver, bobcat, and raccoon. Habitat management that includes wildlife food plot plantings, mowing, soil disturbance, removal of exotic species and application of prescribed fire provide benefit to these populations.

The common goldeneye, hooded merganser, bufflehead, and ring-necked duck are the predominant migratory waterfowl species visiting Beaver Lake. Mallards, gadwall, and other duck species are also present; however, they are only transient visitors as their characteristic feeding habits of obtaining food from shallow waters is limited. Resident Canada geese are so numerous in many coves and recreation areas that their presence has become a nuisance.

Ring-billed gulls are seen frequently around the Beaver Lake area. Greater and lesser yellow legs, pelicans, and large flocks of horned grebes are also seen during their peak migration in the spring and fall. Beaver Lake is also one of the few places where visitors can see both the turkey vulture and the black vulture at the same time in the winter. Beaver Lake has also become a popular place that visitors come to observe bald eagles, commonly wintering 150 or more birds and hosting 5-6 breeding pairs during the nesting period of March to June. The surrounding woodlands and grasslands serve as prime nesting areas for resident and neotropical migratory songbirds.

3.6.2 Aquatic Ecosystems and Wetlands

Walleye, smallmouth bass, striped bass, hybrid white-striped bass, and paddlefish have been introduced into Beaver Lake to add diversity to the fishery. Natural reproduction of striped 27 bass and hybrid white-striped bass does not occur in Beaver Lake. Since 2004, AGFC stocks 28 approximately 100,000 walleye, 30,000 channel catfish, 30,000 blue catfish, and 200,000 striped 29 bass each year. While natural reproduction occurs in white crappie, black crappie, largemouth 30 bass, and smallmouth bass, AGFC supplements this reproduction by occasional stockings of these 31 species. Historically, there have also been introductions of northern pike, blue catfish, lake trout, and threadfin shad.

Located within the Springfield Plateau of the Ozark Mountains region of northern Arkansas, the area surrounding Beaver Lake is characterized by limestone, dolomite, or chert geology. The many rivers and streams flowing through the region have created a landscape of level highlands dissected by rugged valleys rich in karst features such as caves and sinkholes. Associated with these streams and landscape features are a variety of wetland habitats representative of the five wetland classes occurring within the region. These wetland classes include depressions, flats, fringe, riverine, and slope. It is possible, and perhaps even likely, that all of these classes of wetlands occur in the general area of Beaver Lake. However, those most likely to occur in the area immediately surrounding the lake are fringe (most likely reservoir), riverine (most likely spring runs) and slope wetlands (most likely calcareous slope).

3.6.3 Threatened and Endangered Species

The following species listed in Table 1 are from the U.S. Fish and Wildlife Service's federally classified status list of species and the Arkansas Natural Heritage data sets which have been reported and identified on project lands. Although the bald eagle was delisted by USFWS in 2007 due to recovery of the species, both the bald and golden eagles are still protected in accordance with the Bald and Golden Eagle Protection Act. The federal Migratory Bird Treaty Act of 1918 also provides protection to certain species of migratory birds. A total of 31 bird species are currently protected under this federal statute.

Table 1: Threatened and Endangered Species

	Federal Status	State Status/Global Rank
Gray Bat	LE	SE / S2S3/G4
Indiana Bat	LE	SE / /S1/G2
Northern long-eared Bat	LT	SE / S1S2/ G1G2
Ozark Big-eared Bat	LT	Not listed
Little Brown Bat	-	SE / S1
Bald Eagle	*Protected under Bald and Golden Eagle Protection Act	S3B,S4N/G5
Eastern Black Rail	LT	Not listed
Piping Plover	LT	Not listed
Rufa Red Knot	LT	Not listed
Whooping Crane	Experimental Population, Non-Essential	Not listed
Ozark Cavefish	LT	SE / S1/G3
Neosho Mucket	LE	Not Listed
Rabbitsfoot mussel	LT	SE/S3/G3G4
Snuffbox Mussel	LE	Not listed
Monarch Butterfly	C	Not listed
Missouri Bladderpod	LT	S2/G3
Opaque Prairie Sedge	-	SE / S2S3G4
Yellow Coneflower	-	ST / S2G3T3
Ovate-leaf Catchfly	-	ST / S2G3
Royal Catchfly	-	ST / S2G3

FEDERAL STATUS CODES

LE = Listed Endangered; the U.S. Fish and Wildlife Service has listed this species as endangered under the Endangered Species Act.

LT = Listed Threatened; the U.S. Fish and Wildlife Service has listed this species as threatened under the Endangered Species Act.

C = Candidate Species;

STATE STATUS CODES

INV = Inventory Element; The Arkansas Natural Heritage Commission is currently conducting active inventory work on these elements. Available data suggests these elements are of conservation concern. These elements may include outstanding examples of Natural Communities, colonial bird nesting sites, outstanding scenic and geologic features as well as plants and animals, which, according to current information, may be rare, peripheral, or of an undetermined status in the state. The ANHC is gathering detailed location information on these elements.

GLOBAL RANKS

G3 = Vulnerable globally. At moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors.

G4 = Apparently secure globally. Uncommon but not rare; some cause for long-term concern due to declines or other factors.

G5 = Secure globally. Common, widespread and abundant.

T-RANKS= T subranks are given to global ranks when a subspecies, variety, or race is considered at the state level. The subrank is made up of a "T" plus a number or letter (1, 2, 3, 4, 5, H, U, X) with the same ranking rules as a full species.

STATE RANKS

S1 = Critically imperiled in the state due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors making it vulnerable to extirpation.

S2 = Imperiled in the state due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it vulnerable to extirpation.

S3 = Vulnerable in the state due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.

GENERAL RANKING NOTES

Q = A "Q" in the global rank indicates the element's taxonomic classification as a species is a matter of conjecture among scientists.

Source: Arkansas Natural Heritage Commission

3.6.4 Cultural Resources

The records search, interviews, and site inspection identified no cultural resource assessments or findings for the subject property.

During the past seventy years scientific investigation of archaeological sites in the Beaver Lake area has been carried out in several phases. In 1922 and 1923, Mark R. Harrington of Phillip Academy was the first archeologist to excavate sites on the area that is now Beaver Lake. He excavated 13 bluff shelters. Between 1928 and 1935, the work of Harrington was continued by S.C. Dellinger of the University of Arkansas Museum. Dellinger supervised the excavation of 21 rock shelters. In the early 1960's, a series of surveys were conducted by several archeologists from the University of Arkansas Museum. Today, there

are 280 known archeological sites along or immediately adjacent to Beaver Lake. Of these, 271 are identified as prehistoric, seven are historic and two sites have no known cultural affiliation.

Table 2: Historical and Cultural Resources at Beaver Lake

Type of Site	Number of sites
Historic	7
Prehistoric	271
No known cultural affiliation	2
Total	280
National Register Eligibility Status	
Not Evaluated	132
Not Eligible	5
Eligible	1

4.0 Survey Methodology

4.1 Development of Study Sections

The information gathered during the development of the ECP was used to group the subject property into standardized categories using Department of Defense (DoD) guidance, and in accordance with ASTM D5746 (2016). The ECP category definitions are summarized below in Table 2.

Table 3: Definitions of ECP Categories

ECP Category	Definition
1	An area or parcel of real property where no release, or disposal of hazardous substances or petroleum products or their derivatives has occurred (including no migration of these substances from adjacent properties).
2	An area or parcel of real property where only the release or disposal of petroleum products or their derivatives has occurred.
3	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but at concentrations that do not require a removal or remedial action.
4	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, and all remedial actions necessary to protect human health and the environment have been taken.
5	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred and removal or remedial actions, or both, are under way, but all required actions have not yet been taken.
6	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but required response actions have not yet been initiated.
7	An area or parcel of real property that is unevaluated or requires additional evaluation.

The final ECP category designations for the subject property are shown in Section 6.2, Table 6.

4.2 Visual Site Inspection

A VSI was conducted on 13 July 2021 at the subject property to check for recognized environmental conditions. The VSI was conducted by Mrs. Hollie Eljizi, Ms. Jennifer Jefcoat and Mr. Robert Singleton from the U.S. Army Corps of Engineers (USACE). USACE representatives were accompanied by Mr.

Mathew Voskamp of the USACE Beaver Lake office.

The VSI was performed from a USACE Beaver Lake Office watercraft near the bank of the subject property as a Right of Entry (ROE) was not available at the time of the inspection. At the time of inspection, there is no visible debris or branches seen, probably due to the depth of the water being almost 40 feet. The water clarity was pristine, being able to see to the bottom, as well as having trees growing up out of the water. Parts of the had light bank soil erosion and other parts were rocky with 1 foot steep bluffs. There seemed to be a dock on the property, being less than 5 years old. The adjacent property has an older dock on it. No apparent signs of Hazardous, Toxic and Radioactive Waste (HTRW) were visible during the VSI.

Photos from the VSI can be found in Appendix A.

4.3 Aerial Photography Analysis

Aerial photographs were available from Google Earth maps for 1985, 1994, 2001, 2004, 2006, 2009, 2010, 2012, 2014, 2016, 2017, 2018, and 2020.

The initial aerial photograph from 1985 is of poor quality and the area isn't discernable. The next photo from 1994 shows a treed area with no structures or docks on the priority area or adjacent area. There is no change in the next photos from 2001 to 2006, in the 2009 photos two docks can be seen on the priority area, the 2010 photo shows a residence adjacent the northern end of the priority area and clearing of the vegetation near the southern end. There is no change in the 2012 and 2014 photos, in the 2016 photo shows

All aerial photographs are included in Appendix B.

4.4 Sanborn Map Review

Sanborn maps were not available for the subject property, or for the adjacent areas.

4.5 Topographic Map Review

Historical topographic maps were available from the US Geological Survey Website for the Beaver Lake area for 1900, 1901, 1945, 1949, 1954, 1957, 1958, 1964, 1985, 2011, 2014, 2017, and 2020. Several observations can be gleaned from these maps. First, the area before the lake was formed consisted of valleys with steep bluffs and hill sides around the White River and it's tributaries. The historical maps show this valley and river basin from the 1900 to 1964 topographic maps. In 1985 the river and Beaver Dam at the northern end of the lake can been seen in the valley of the historical White River.

All topographic maps are included in Appendix C.

4.6 Records Review

4.6.1 Standard Environmental Record Sources

In this evaluation records, maps and other documents that provide environmental information about the project area are obtained and reviewed. A desktop records review was conducted using various sources to determine the presence of HTRW sites on or near the subject property. This search was focused on active cleanup sites and sites with a reasonable risk of HTRW release. Several databases were searched manually to narrow down the search area. These databases included the Environmental Protection Agency (EPA) Cleanups in my Community database, the EPA Envirofacts databases, the Arkansas Department of Environmental Quality's (ADEQ) web search tool of Underground Storage Tanks (UST) and Above Ground Storage Tanks (AST), and the Arkansas Department of Energy and Environment Oil and Gas Commission oil and gas well maps. The information collected from this desktop records review was analyzed for recognized environmental conditions (RECs) that would affect the proposed project or need further investigation, given the proposed project measures. The following resources were searched.

Federal National Priorities List (NPL) – The records search did not reveal any NPL sites in the project footprint or adjacent areas. There are nine NPL sites in the state of Arkansas, none of which are located near Beaver Lake or the priority areas. This is based on a search of the EPA Superfund: National Priorities List (NPL) list.

Federal Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) List – The CERCLIS, now called the Superfund Enterprise Management System (SEMS) database, tracks hazardous waste sites where remedial action has occurred under EPA's CERCLA program. This list also includes sites that are in the screening and assessment phase for possible inclusion on the NPL. The records search of EPA's listed SEMS sites did not reveal any sites in the project footprints or adjacent areas. This is based on a search of the EPA SEMS database.

Federal No Further Remedial Action Planned (NFRAP) – The Federal NFRAP list (now known as the SEMS archive list) tracks sites where no further remedial action is planned, based on available assessments and information. The list also represents sites that were not chosen for the NPL. Further EPA assessment could possibly be ongoing, and hazardous environmental conditions may still exist; however, in the absence of remedial action and assessment data, no determination about environmental hazards can be made. The records search did not reveal any NFRAP sites in the project footprint or adjacent areas. This is based on a search of the EPA SEMS database.

Federal Resource Conservation and Recovery Act (RCRA) Corrective Action List – The records search of EPAs Cleanups in My Community showed two RCRA Corrective Actions within one mile of the project search area. No RCRA corrective actions were found to be located within one mile of the project footprint. This is based on a search of the EPA Cleanups in My Community.

State Superfund Sites - This search is to check for any state CERCLA sites in the project vicinity. The records search of state CERCLA cleanup sites did not show any sites of concern in the project or adjacent areas. This search is based on a search of the Arkansas Department of Energy and Environment data base.

State and Tribal Solid Waste Facilities/Landfill Sites – This search is designed to check any state or tribal databases for solid waste handling facilities or landfills in the project vicinity. The records search did not find any solid waste facilities or landfill sites in area of this project or adjacent areas. This is based on a search of the EPA Landfill Methane Outreach Program (LMOP) and ADEQ Permitted Solid Waste Disposal database.

State and Tribal Registered Storage Tanks – This list is a combination of the State of Arkansas registered UST and AST databases, representing sites with storage tanks registered with the State of Arkansas. The search revealed one AST within one mile of the work area or adjacent areas. This AST is not expected to impact the project due to its distance from the proposed project. These results are based on a search of the Arkansas Department of Energy and Environment Oil and Gas Commission website.

State and Tribal Voluntary Cleanup Sites – The ADEQ Elective Site Cleanup Agreement (ESCA) database identifies sites where the responsible party chooses to clean up the site themselves with ADEQ oversight. Five sites were identified from this database. None of the sites are within one mile of the work area and are therefore not expected to impact the proposed project. These results are based on a search of the ADEQ ESCA Database.

Brownfields List – A brownfield is a property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant.

There are no brownfield sites within one mile of the work area or adjacent areas. These results are based on a search for Brownfields sites using the EPA Envirofacts search engine.

Oil and Gas Wells – A search of the oil and gas wells in the area using the Arkansas Department of Energy and Environment Oil and Gas Commission website identifies multiple sites including oil wells, plugged oil wells, injection/disposal sites within the surrounding area. Although not classified as HTRW under USACE regulations, pipelines and oil wells play an important role in the HTRW existing conditions near the potential project area. This is because the well and/or pipeline contents could potentially leak or spill into the surrounding environment or affect the proposed project features. As a result of these findings, a thorough pipeline/well search should be initiated during design to ensure no interaction with the existing oil and gas infrastructure occurs. The Oil and Gas Commission website was used to map these findings. No oil wells or pipelines were found near the priority areas.

4.7 Interviews

Two interviews were conducted on 12 and 13 July 2021 in conjunction with the site inspection, and the following stakeholders were interviewed:

- Mr. Matthew Franklin; Natural Resource Specialist, Beaver Lake Office; Matthew.G.Franklin@usace.army.mil
- Mr. Matthew Voskamp; Natural Resource Specialist, Beaver Lake Office; Matthew.Voskamp@usace.army.mil

Information gleaned from the interviews is incorporated by way of reference throughout the report. The interview questions can be found in Figure 3.

4.8 Data Management

Data obtained during the ECP assessment were provided in electronic and/or hard copy format. A complete list of documents is provided in Section 8.0.

5.0 Environmental Conditions

5.1 Environmental Permits and Licenses

5.1.1 RCRA Status

The subject property is not covered under a Resource Conservation and Recovery Act (RCRA) permit, and no hazardous waste is generated or stored on the property.

5.1.2 Solid Waste

The subject property has no active, inactive, or expired permits or licenses for solid waste disposal. No landfills exist on the property.

5.1.3 USTs/ASTs

No USTs or ASTs were found during the records search, site inspection and interviews indicated not UST/AST have been known to be located at the subject property.

5.1.4 National Pollutant Discharge Elimination System (NPDES)

Section 402 of the Clean Water Act (33 U.S.C. 1251 et. seq.) requires all facilities that discharge stormwater to acquire an NPDES that defines contaminant limits in effluent to be discharged. No permits were found using the EPA's Envirofacts database on or adjacent to the priority area.

5.1.5 Drinking Water Permits

No drinking water permits are in place at the subject property.

5.1.6 Air Permits

No air emission or air quality permits are in place at the subject property.

5.1.7 Nuclear Regulatory Commission (NRC)

The NRC is tasked with permitting the use and handling of radioactive materials and reactors. No NRC licenses are in place at the subject property.

5.1.8 Other Permits/ Licenses

No additional environmental permits or licenses were identified during records research, interviews, or the VSI.

5.2 Environmental Cleanup and Remediation

5.2.1 Installation Restoration Program

Beaver Lake is not an active military facility, and therefore would not be eligible for cleanup under the Installation Restoration Program.

5.2.2 Military Munitions Response Program

Beaver Lake is not an active military facility, and therefore would not be eligible for cleanup under the Military Munitions Restoration Program.

5.2.3 Other Environmental Investigations and Cleanups

No known environmental investigations or cleanups were found during the records search, site inspection and interviews indicated that no known investigations or cleanups are ongoing at Beaver Lake.

5.2.4 Storage, Release, and Disposal of Hazardous Substances

No releases to the environment or improper disposal of these substances were found during the records search, site inspection and interviews indicated no known improper disposal at the priority area.

5.3 Petroleum and Petroleum Products

No releases to the environment or improper disposal of petroleum products were found during the records search, site inspection and interviews indicated no known improper disposal at the priority area.

5.4 Polychlorinated Biphenyls (PCBs)

No evidence exists of the presence of PCBs on the subject property. No PCB-containing oils were found during the records search, site inspection and interviews indicated no known PCB-containing oils have been used or stored at the priority area.

5.5 Asbestos

No asbestos assessments were found during the ECP process, none were found during the records search, site inspection and interviews indicated no known asbestos containing material has been used or stored at the priority area.

5.6 Lead and Lead-Based Paint (LBP)

No lead-based paint (LBP) assessments were found during the ECP process. No LBP was found during the records search, site inspection and interviews indicated no known improper disposal at the priority area.

5.7 Radioactive Material

No radioactive material assessments were found during the ECP process. No potentially radioactive materials were identified during the VSI, and the presence of radioactive materials on the subject property is extremely unlikely.

5.8 Landfills/Dumps

No landfills or dumps were found during the records search, site inspection or interview investigation.

5.9 Munitions and Explosives of Concern (MEC) and/or Unexploded Ordnance (UXO)

No munitions, explosives, or unexploded ordinance (UXO) were found during the records search, site inspection or interview investigation.

5.10 Radon

Beaver Lake spans across Benton, Washington and Carroll Counties. Washington County is in the Environmental Protection Agency (EPA) Radon Zone 3. Counties in Radon Zone 3 are counties with predicted average indoor radon screening levels of less than 2 pCi/L (EPA, 2018). Benton and Carroll Counties are in the EPA Radon Zone 2 with a predicted average indoor radon level between 2 and 4 pCi/L (EPA, 2018). No radon assessments were found during the records search (EPA, 2019).

5.11 Pesticides

No records were found to indicate the storage, improper use, or disposal of pesticides on the subject property.

5.12 Other Identified Concerns

No significant other concerns were found during the records search, site inspection or interviews.

5.13 National Environmental Policy Act (NEPA)

As the federal agency in charge of this project USACE is in charge of coordinating National Environmental Policy Act (NEPA) compliance of 1969 (Public Law 91-190), the Council on Environmental Quality (CEQ) regulations (40 CFR 1500–1508), and the USACE implementing regulations, Policy and Procedures for Implementing NEPA, ER 200-2-2. As part of the records search and interview process recent NEPA documents were reviewed including the 2018 Draft Environmental Assessment for the Beaver Lake Master Plan Revision.

5.14 Adjacent Properties

As part of the ECP process, adjacent properties are assessed for environmental conditions, and those discovered conditions are evaluated based on the potential to affect the subject property. The nearest structure to the priority area is a residence approximately 65 yards inland from the shore. The residence sits just above subject property and is connected by a pathway to the boat dock located in the priority

area. The residence is first seen in the 2016 historical aerial photographs. The adjacent properties are unlikely to pose any HTRW concerns to the priority area.

6.0 Evaluation and Conclusions

6.1 Summary of ECP

Beaver Lake currently occupies more than 38,000 acres of Federal public lands and waters. This ECP report covers a narrow strip of land approximately 1.44 acres located on the eastern edge of Beaver Lake. The subject property is on the edge of the lake and currently owned by private landowner(s). The Lake is located in northwestern Arkansas, in Benton, Washington, Madison and Carroll Counties and it is approximately 6 miles west of Eureka Springs, Arkansas. The subject property, also known as Priority Area 17, is in the eastern region of the lake near the end of North Clifty Creek.

This ECP report was prepared to characterize the existing environmental conditions at the subject property and is intended to be an aid in the leasing of real property. The ECP findings are based on the available sources of information concerning both past and present uses of the subject property. Information included readily available data associated with adjacent property records, aerial photography, personnel interviews, environmental programs and associated documentation, and current and historic investigations. In addition, record sources were reviewed to determine if there have been spills, leaks, discharges, leaching, underground injections, dumping, abandonments, or storage of hazardous substances or petroleum products at the installation. The VSI and interview process included inquiries and requests into the existence and availability of records that support the environmental condition of the property.

6.2 Conclusions

The subject property was classified into one of seven standard ECP area types (categories) as defined by ASTM D5746-98(2016) *Standard Classification of Environmental Condition of Property Area Types for Defense Base Closure and Realignment Facilities*. Below are the seven categories for reference.

Table 4: Definitions of ECP Categories

ECP Category	Definition
1	An area or parcel of real property where no release, or disposal of hazardous substances or petroleum products or their derivatives has occurred (including no migration of these substances from adjacent properties).
2	An area or parcel of real property where only the release or disposal of petroleum products or their derivatives has occurred.
3	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but at concentrations that do not require a removal or remedial action.
4	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, and all remedial actions necessary to protect human health and the environment have been taken.
5	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred and removal or remedial actions, or both, are under way, but all required actions have not yet been taken.
6	An area or parcel of real property where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but required response actions have not yet been initiated.
7	An area or parcel of real property that is unevaluated or requires additional evaluation.

Given these seven categories, the subject property is categorized below, along with the reasoning for each classification.

Table 5: Properties and ECP Categories

Acreage	**ECP Category**	**Reasoning**
1.44 ac.	1	No release or disposal of hazardous substances or petroleum products or their derivatives has occurred beyond de minimus amounts, including no migration of these substances from adjacent properties.

No release or disposal of hazardous substances or petroleum products or their derivatives has occurred beyond de minimus amounts on the subject property and no releases to the environment were observed or reported.

Asbestos assessments were not available for the subject property. It is unlikely that Asbestos Containing Material (ACM) is present but, in the future, if a building or structure will be disturbed, a licensed asbestos inspector is needed to confirm whether ACM is present or not.

7.0 Certification

I declare that, to the best of our professional knowledge and belief, we meet the definition of *Environmental professional* as defined in Part 312.10 of 40 CFR 312. We have the specific qualifications based on education, training, and experience to assess a property of the nature, history and setting of the subject property. We have developed and performed the appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312. All information/documentation provided accurately reflects the condition of the property. This report meets the DoD requirements for completion of an ECP Report.

_____ _____

Eugenia Barnes
Environmental Protection Specialist
U.S. Army Corps of Engineers
Fort Worth District

Date

_____ _____

Hollie Eljizi
Environmental Engineer
U.S. Army Corps of Engineers
Fort Worth District

Date

_____ _____

Jennifer Jefcoat
Chemist
U.S. Army Corps of Engineers
Fort Worth District

Date

8.0 References

American Society for Testing and Materials (ASTM), 2013. E1527-13, *Standard Practice for Environmental Site Assessments: Phase 1 Environmental Site Assessment Process*.

ASTM, 2016. D5746, *Standard Classification of Environmental Condition of Property Area Types for Defense Base Closure and Realignment Facilities*.

Department of the Army, 13 December 2007. Army Regulation 200-1. *Environmental Quality: Environmental Protection and Enhancement.*

Environmental Protection Agency (EPA), February 2019. *EPA Map of Radon Zones including State Radon Information and Contacts*. https://www.epa.gov/radon/find-information-about-local-radon-zones-and-state-contact-information#radonmap

Federal Emergency Management Agency (FEMA), 2019. FEMA Flood Map Service Center. https://msc.fema.gov/portal

USACE. 1993. White River Basin, Arkansas and Missouri, *Water Control Master Manual.*

USACE. 2013. Little Rock District Water Management website. Accessed at: www.swl-wc.usace.army.mil

United States Census Bureau. 2013. Easy Facts Website. Accessed at: http://www.census.gov/easystats/

USACE. 2018. Beaver Lake White River and Tributaries, *Arkansas Shoreline Management Plan.*

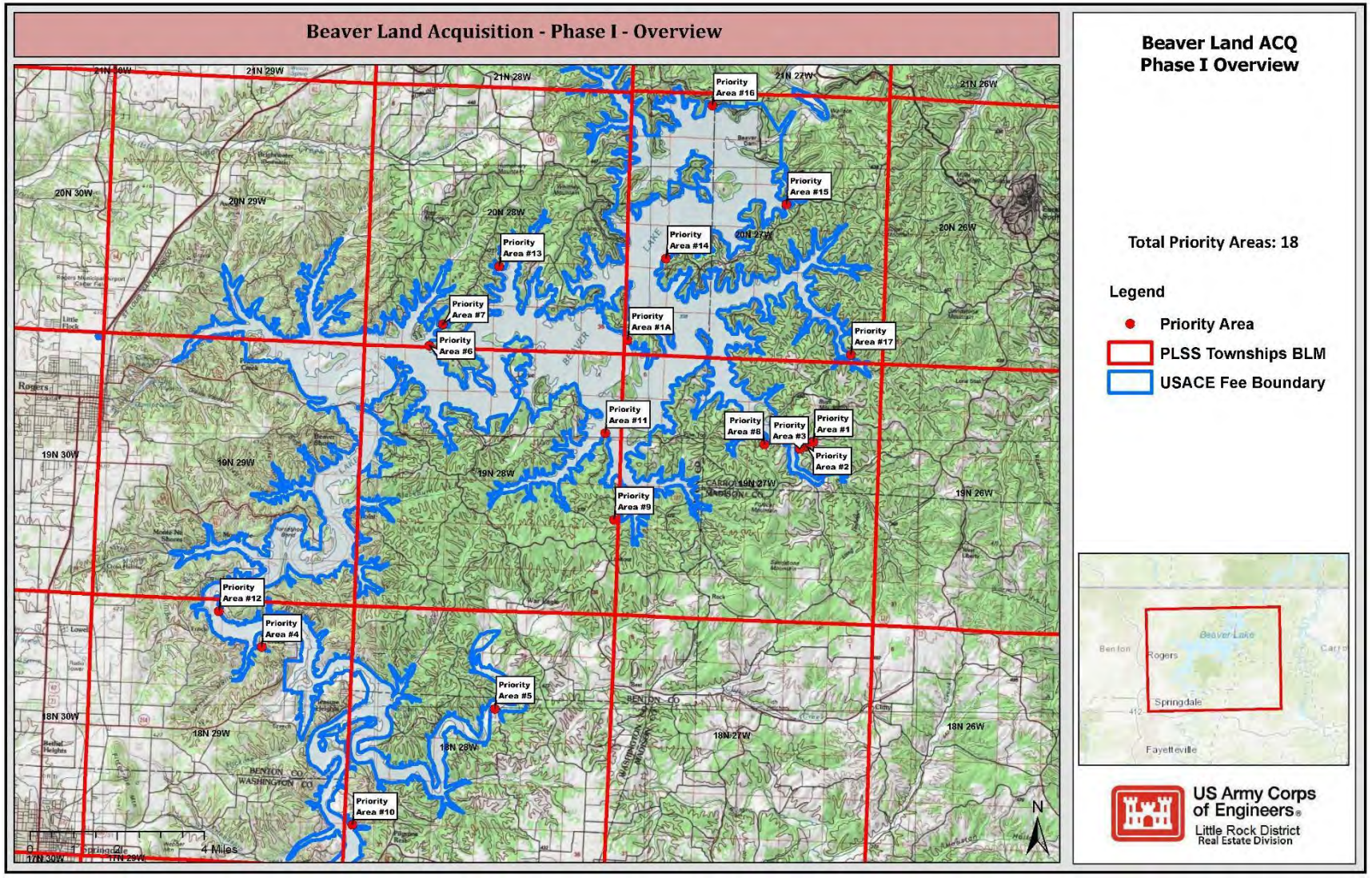
Arkansas Department of Energy and Environment Oil and Gas Commission website, accessed August 2021 at: Commission, http://www.aogc.state.ar.us/maps/googleEarth.aspx

Beaver Watershed Alliance (BWA), 2012. *Beaver Lake Watershed Protection Strategy.*

Arkansas Department of Energy and Environment, Division of Environmental Quality website, accessed August 2021 at: https://www.adeq.state.ar.us/rst/programs/fees/facility_data.aspx

Figures

Figure 1: Beaver Lake Priority Area



ACQ = Acquisition; PLSS = Public Land Survey System; BLM = Bureau of Land Management

Figure 2: Subject Property Detail

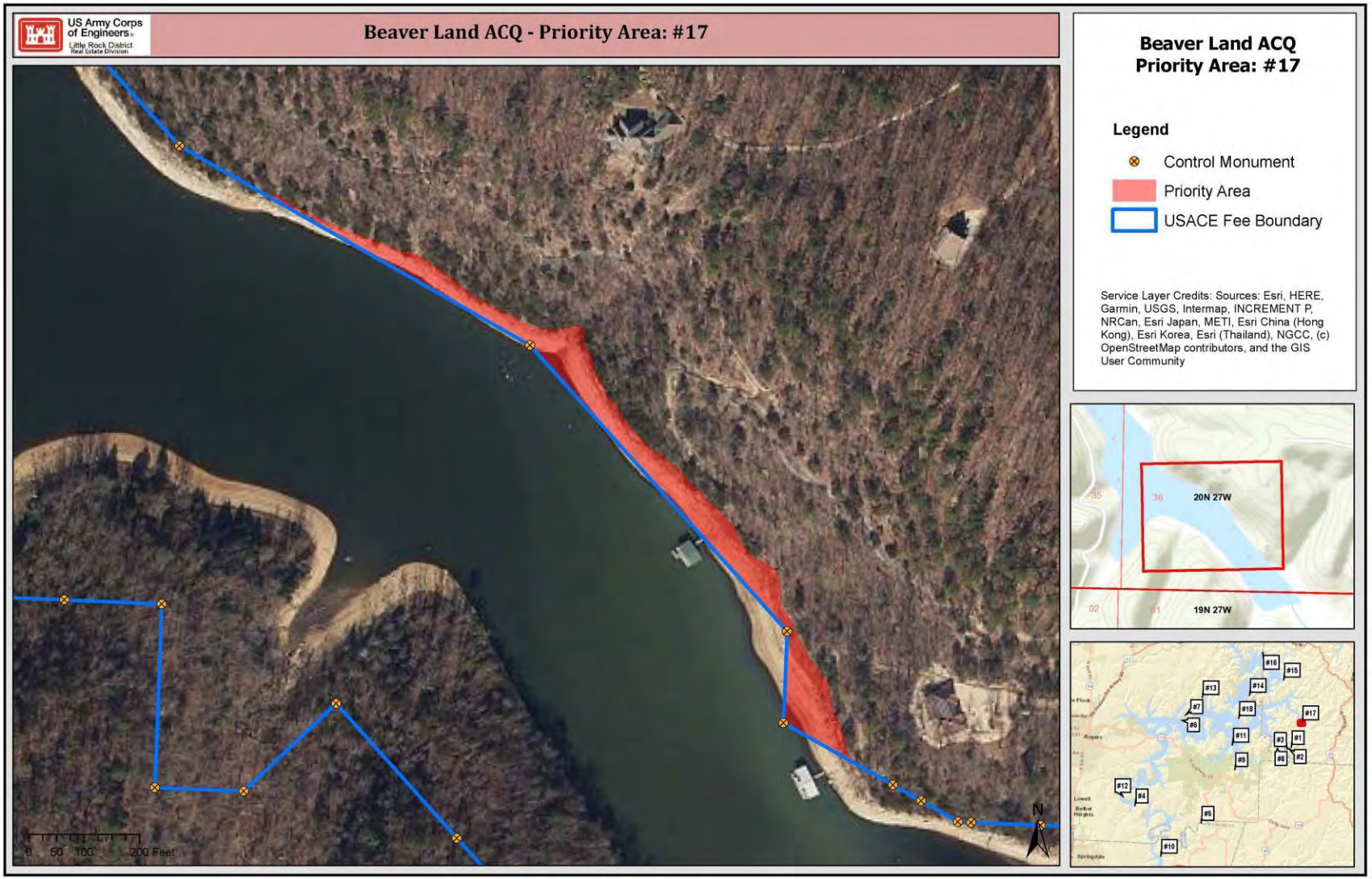


Figure 3: Interview Questions

Beaver Lake ECP
Interview Questions

1. Do you know of any environmental issues with this property?
2. Do you know of, or have access to, any reports concerning the environmental condition of this property? (i.e. site assessments, permits, storage tank registrations, safety plans, etc.) If so, would you be able to provide them? SWPPPs, SPCCs, air permits?
3. Do you know how this property has been historically used?
4. What is the property currently used for?
5. When were the site buildings constructed?
6. Are hazardous materials or petroleum products stored or used on this site? If so, what is the RCRA EPA ID? Does fueling occur on this property?
7. Do you know of any asbestos or LBP on the property or its buildings? Do you know the age of the buildings?
8. Has the site layout been manipulated in your recollection? (i.e. grading, excavation, etc.)?
9. Are there or have there been any cultural/historic items or buildings found on the property?
10. Is there anything else environmentally relevant that we should know?

Appendix A Visual Site Inspection Photographs

13 July 2021

Site 17 – View of priority area from watercraft

Priority Area 17 – View of priority area from watercraft

Priority Area 17 – Views of priority area bluffs as seen from watercraft

Priority Area 17 – Trees growing from ground/shoreline of Priority Area

Priority Area 17 - View of both docks on Priority Area property and adjacent property

Priority Area 17 - View of both docks on Priority Area property and adjacent property

Priority Area 17 – Closer view of dock at priority area

Priority Area 17 – Closer view of dock at priority area

Priority Area 17 – View of shoreline and dock at priority area

Priority Area 17 – View of shoreline at priority area

Priority Area 17 – Tree branch debris at priority area

Priority Area 17 – View of priority area from watercraft