

DRAFT ENVIRONMENTAL ASSESSMENT

Salt Creek Outlet Works Modification Project Dam Sites 4 (Bluestem) & 17 (Antelope Creek)

Lancaster County, Nebraska

U.S. Army Corps of Engineers Northwestern Division Omaha District

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1.0 INTRODUCTION

The U.S. Army Corps of Engineers (USACE), Northwestern Division, Omaha District has prepared this Environmental Assessment (EA) to evaluate the potential impacts to Salt Creek Dam Sites: Bluestem (Site 4) and Antelope Creek (Site 17) also known as Holmes Lake. This EA has been prepared in accordance with the National Environmental Policy Act of 1969 and the Council of Environmental Quality's Regulations (40 CFR 1500-1508), as reflected in the USACE Engineering Regulation, ER 200-2-2. This EA provides sufficient information about the potential adverse and beneficial environmental effects to allow the USACE, Omaha District Commander to make an informed decision on the appropriateness of an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI). This EA also serves as a Biological Assessment (BA) for purposes of Endangered Species Act (ESA) compliance.

1.1. Proposed Action

The USACE is planning an operation and maintenance project at two of the Salt Creek Dam Sites, Bluestem and Antelope Creek (Figure 1-1) to reduce the risk of concentrated leak erosion or internal erosion of embankment material along the conduit and uncontrolled seepage. The proposed rehabilitation measures include excavating earthen material around the conduit on the downstream slope of each dam and installing a filter of granular material along the conduit to allow for the filtered exit of any potential seepage. Risk reduction measures will be incorporated into the design to address seepage concerns during excavation.

These proposed modifications are structural only and would not change the operation of the dams for water control or flood risk management. Each reservoir behind the dam would be maintained at the conservation pool and would not require a drawdown for the conduit modification. The construction period would be restricted to September 4th through March 1st to reduce the likelihood of pools higher than the conservation pool coinciding with the construction period. Work is expected to last approximately 6 weeks per site.



Figure 1-1: Salt Creek Project Sites Vicinity Map.

Bluestem Dam is located in Lancaster County in southeastern Nebraska. This dam is on a tributary of the Olive Branch of the Salt Creek, approximately two miles west of Sprague, Nebraska. Antelope Creek Dam, also known as Holmes Lake, is located within the City of Lincoln near the southeast edge between South 56th Street and South 70th Street on Antelope Creek (Figure 1-1).

1.2. Purpose and Need

The purpose of the Salt Creek Outlet Work Modification Project is to allow for the filtered exit of any potential seepage along the conduits at Bluestem and Antelope Creek Dams. The project is needed as a risk reduction measure included in the Interim Risk Reduction Measure (IRRM) Plan for each dam site and is intended to reduce the risk of concentrated leak erosion or internal erosion of embankment material along the conduit and uncontrolled seepage. Based on risk assessments conducted for the Salt Creek Dam sites, there is a concern that a preferential seepage path may have developed because of one or a combination of the following adverse conditions: 1.) The original design of the conduits included the placement of seepage diaphragms/collars, which may increase the risk of seepage along the conduit due to difficulty in compacting around the diaphragms/collars increasing the potential for insufficient compaction and a preferential seepage path. 2.) The conduits were installed in narrow excavations with steep side slopes and backfilled completely with impervious material. This condition may have caused difficulty in compacting around the conduit and/or arching of material over the conduit, causing a preferential seepage path. 3.) Corrosion of the corrugated metal pipe conduits, prior to relining them, may have caused voids around the conduit. In addition, current design criteria requires inclusion of granular filter material along the downstream 1/3 of conduit to control seepage, which is not present around the conduits as constructed.

The conduits for the outlet works for the Salt Creek Dams were similarly designed and constructed with the exception of variances in conduit size and seepage diaphragm locations. They were constructed of corrugated metal pipes placed within an excavation trench, which was completely backfilled with impervious material. The entire length of conduits for each of these sites were lined with either reinforced concrete pipe or HDPE pipe and the annular spaced grouted following dam construction.

1.3. Authority

The Salt Creek Dams and Reservoirs are a part of ten flood control projects that were constructed under the authority of the Salt Creek and Tributaries Flood Control Project in Nebraska, authorized under Public Law 500, 85th Congress, commonly referred to as the "Flood Control Act of 1958." Authority was granted to construct flood control projects on Salt Creek and its tributaries, essentially in accordance with the report of the U. S. Army Corps of Engineers (Corps) Chief of Engineers contained in House Document 396, 84th Congress, 2d Session. In addition to flood damage reduction for the city of Lincoln, NE, other authorized purposes for the Salt Creek Dams and Reservoirs include water quality, recreation, and fish and wildlife enhancement.

1.4. Past Studies

Salt Creek Design Memorandum No. MSC-4 (USACE, 1961) Salt Creek Reservoir Regulation Manual (USACE, 1977) Bluestem Dam Operation and Maintenance Manual (USACE, 1981) Design Memorandum No. MSC-3 (USACE, 1961) Salt Creek Reservoir Regulation Manual (USACE, 1977)

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Antelope Creek Dam Operation and Maintenance Manual (USACE, 1981)

2.0 ALTERNATIVES

This chapter details the alternatives considered for the proposed modifications at Bluestem and Antelope Creek Dams. Two alternatives were considered for this project, Alternative 1: the No Action Alternative and Alternative 2: Proposed Action. These alternatives were evaluated against their ability to meet the Purpose and Need for the Project. This chapter includes a description of each alternative. Based on the overall purpose and need of the project, only the No Action Alternative and the Proposed Action were considered.

2.1. Alternative 1 - No Action

Under the No Action Alternative, current operation and maintenance activities would occur; however, no structural modifications or other proposed rehabilitation measures would occur to reduce the risk of concentrated leak erosion or internal erosion of dam embankment material along the conduit and uncontrolled seepage at Bluestem and Antelope Creek Dams.

Although the No Action Alternative does not meet the project purpose, it was carried forward for consideration to serve as a baseline of comparison for Alternative 2.

2.2. Alternative 2 – Proposed Action

Under Alternative 2, the reservoir outlet structures would be modified to install a filter along the conduit to allow for the filtered exit of any potential seepage along the conduits. The modification of the outlet works would be in a two stage approach. The first stage would consist of excavating an isolated area to a stable slope at the upstream most location of the filter. Then the diaphragm would be installed underneath the conduit up the haunches of the pipe. Prior to excavation, it would be required to maintain a minimum elevation around the excavation, by utilizing either the existing grade and/or constructing an additional earthen berm on top of existing grade. In the unlikely event that a significant flaw is exposed, this feature would function as a "ring levee" and allow impoundment of water within the excavation to counteract seepage pressures and reduce the gradient, thereby preventing the migration of embankment material out of the excavation. The excavation would be continuously monitored by a USACE geotechnical/dam safety engineer. Following the successful completion of the first stage of construction, the remainder of the pipe would be exposed in the required excavation and the rest of the filter would be constructed.

The construction period would be restricted to occur from September 4st through March 1st. This would reduce the likelihood of pools higher than the conservation pool coinciding with the construction period. All filter material will be required to be onsite prior to any excavation. This will allow the construction of a filter to mitigate an unanticipated adverse seepage condition. It is also anticipated that the construction time for each dam site would be less than 6 weeks, thereby reducing exposure. An Emergency Action Plan (EAP) would be prepared that details the methods of detection, notification, and mitigation in the unlikely event that uncontrolled seepage is detected.

2.2.1. Bluestem Dam

Salt Creek Outlet Works Modification Draft EA March 2019 Bluestem Dam is one of the ten Salt Creek projects built in the 1960s to provide flood protection for the City of Lincoln, NE. The project has a drainage area of 16.6 sq. miles and a permanent pool surface area of 325 acres. The project was completed in June 1963. The Nebraska Game and Parks Commission is the local sponsor of Bluestem Dam and is responsible for routine maintenance of the public parks and recreation facilities at the project, and for maintaining and operating the permanent pool for fish and wildlife conservation and recreational purposes.

The main components of the project are an earthen embankment section which serves as the main water barrier composed of compacted earth, outlet works that allow controlled water to flow out of the dam (Figure 2-1), and an earthen spillway used to provide additional release of water from the dam during major flood events. The earthen embankment is 2,760 feet long, 48 feet high, and the top is 15 feet wide. The elevation of the top of the embankment is 1,334 feet msl (mean sea level). The uncontrolled emergency spillway is located off the left abutment, is an earth-cut channel with a bottom width of 340 feet and elevation of 1,322.5 feet msl. The outlet works consist of a single reinforced concrete box drop inlet outlet with a maximum discharge of 345 cubic feet per second (Figure 2-2). The conduit is approximately 313 feet in length from the intake to the discharge end, which extends well past the downstream toe of the embankment, where it is supported by a pile trestle.



Figure 2-1: Bluestem Dam and Reservoir

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Figure 2-2: Bluestem Outlet Conduit

2.2.1.1. Outlet Works Modification

Construction access to Bluestem Dam would be from SW 42nd Street as shown in Figure 2-3 below. All work areas would be temporarily fenced to prevent access by the general public. Temporary haul roads would be re-established to preconstruction condition upon completion of work. All piezometer pipes, movement markers, other dam safety instrumentation, conduits, drain pipes, utilities and roadways in the area would be protected from construction damage. Construction materials and equipment such as excavators, dozers and scrapers would only be located in the approved staging areas and construction areas. Gravel to be used for the seepage filter would be from an approved site and stockpiled in the staging areas. Borrow areas A and B may be used for material to build the earthen berm to allow impoundment of water within the excavation to counteract seepage pressures and reduce the gradient, preventing the migration of embankment material out of the excavation. After the construction, the berm material would be used as fill over the conduit or returned to the borrow areas and graded back to their original contour and seeded with Corps approved native seed mix.



Figure 2-3: Bluestem Construction Area.

2.2.2. Antelope Creek

Antelope Creek Dam, also known as Holmes Lake, is located within the City of Lincoln near the southeast edge between South 56th Street and South 70th Street on Antelope Creek (Figure 1-1). The project has a drainage area of 5.35 sq. miles and a permanent pool surface area of 112 acres. The project was closed on September 17, 1962. The city of Lincoln, Nebraska is the local sponsor of Antelope Creek Dam and is responsible for routine maintenance of the embankment, spillway and the recreation facilities at the project.

Antelope Creek Dam consists of two embankments referred to as the north embankment and the south embankment (Figure 2-4). The north embankment extends across Antelope Creek and across a minor drainage way to the north. The south embankment dams a small tributary south of the main creek. The combined length of the embankments, including the width of the spillway between them, is approximately 7,700 feet. The embankments are homogeneous rolled earthfill structures, constructed primarily of low permeability lean clay materials. At the maximum, the

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embankment rises approximately 60 feet above the original main creek channel. Seepage through the embankment is controlled by a downstream internal sand drain with spaced finger drain outlets. A connecting channel that is 150 feet wide and approximately 1,750 feet long was excavated between the two arms of the reservoir to design elevation 1235.0 feet in order to maintain normal operating pools with the use of one outlet works system. A 1,600 feet long grass-lined spillway was constructed through the knoll between the north and south embankments with the channel width varying from 60 feet at the crest to 150 feet at the downstream end.

The outlet works system includes a reinforced concrete drop inlet intake structure containing two high-level uncontrolled inlets, two low-level uncontrolled inlets, a stop-logged inlet, and a retrofit low-level gated service inlet (Figure 2-5). The outlet works conduit is located through the north embankment in the lower abutment near the south bank of Antelope Creek. The conduit extends 320 feet downstream, from the intake structure to the concrete stilling basin which is 198 feet downstream of the embankment centerline. The original conduit for the outlet works was a 60 inch diameter corrugated metal pipe. In 1980, the conduit was lined with 42 inch diameter reinforced concrete pipe. The stilling basin is reinforced concrete structure. The outlet channel extends downstream from the stilling basin approximately 450 feet to the original creek channel. A connecting ditch was constructed along the upstream dike portion of the north embankment to conduct surface run-off north of Normal Boulevard to the main reservoir area.



Figure 2-4: Antelope Creek Dam Aerial View

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Figure 2-5: Antelope Creek Dam Outlet Conduit

2.2.2.1. Outlet Works Modification

Construction access to the Antelope Creek Dam would be from Van Dorn Street as shown in Figure 2-6 below. All work areas would be temporarily fenced to prevent access by the general public. Temporary haul roads would be re-established to preconstruction condition upon completion of work. All piezometer pipes, movement markers, other dam safety instrumentation, conduits, drain pipes, utilities and roadways in the area would be protected from construction damage. Construction materials and equipment such as excavators, dozers and scrapers would only be located in the approved staging areas and construction areas. Gravel to be used for the seepage filter would be from an approved site and stockpiled in the staging areas. The borrow area may be used for material to build the earthen berm to allow impoundment of water within the excavation to counteract seepage pressures and reduce the gradient, preventing the migration of embankment material out of the excavation. After the construction, the berm material would be used as fill over the conduit or returned to the borrow areas and graded back to their original contour and seeded with Corps approved native seed mix.



Figure 2-6: Antelope Creek Construction Area.

3.0 AFFECTED ENVIRONMENT

3.1. Physical Geographic Resources

The Salt Creek basin drains a 1,645 square mile area of southeastern Nebraska, encompassing the city of Lincoln. The river originates near the town of Sprague, Nebraska, and travels northeast entering the Platte River, 25 miles southwest of Omaha, Nebraska. The Platte River drains the southern and western part of the basin. Salt Creek was channelized years ago in attempt to reduce flooding in and around the capitol city of Lincoln, Nebraska. Channeling a water system allows the system to carry more water and move it out of the city faster. Salt Creek becomes channelized as it enters Lincoln and stays channelized the rest of its existence.

The Salt Creek Basin is primarily urban, with 70% of the watershed land use consisting of urban land. Woodlands represent 15% of the land cover in the watershed, wetland four percent and the remaining four percent is accounted by miscellaneous land use (Salt Creek Watershed Network, 2011). The city of Lincoln, Nebraska is the only major industrial and urban development center in the Salt Creek Basin. The Lincoln metropolitan area has a population of approximately 200,000.

3.1.1. Topography

From the headwaters to Lincoln, the bottomlands adjacent to Salt Creek are fairly narrow, varying in width from one-quarter mile near Kramer to three-quarter of a mile as the stream approaches Lincoln. From Lincoln to the mouth, the valley is wider and varies from about 1 to 3 miles. The shallow groundwater table conforms generally to the topography of the basin. Groundwater contours indicate that most of the basin streams function to some extent as groundwater drains. At several Salt Creek dams, ground water was encountered primarily in sand strata in the glacial drift, and at creek bottom elevation in the valley alluvium. The occurrence of water at these sites is typical for this type of glacial deposit and it was assumed that similar conditions would be encountered at the remaining sites.

3.1.2. Soils

The Salt Creek drainage basin lies within the Dissected Till Plains Section of the Central Lowlands Physiographic Province. Pleistocene deposits of glacial, interglacial, and eolian origin overlie bedrock, which is at a maximum depth of over 200 feet, although in some localized areas bedrock occurs at relatively shallow depths. Bedrock under the greater portion of the basin is the Dakota Group sandstone and shales of Cretaceous age. In this general area, a typical section of the Pleistocene deposits in descending order are as follows: Peorian Loess Formation, Loveland (loess-clay) Formation, Kansan Glacial Drift, Aftonian (interglacial) Formation, and the Nebraskan Glacial Drift. In general, the Salt Creek basin is an eroded and dissected till plain which was covered by two eolian (wind deposited) deposits, Peorian Loess and Loveland (loess - clay) Formations. Post-Loveland erosion removed most of the Loveland and the remaining Loveland was subsequently covered by the younger Peorian Loess. In many places, especially in the western half of the basin, all the loess, both Loveland and Peorian, was removed by erosion exposing the underlying glacial drift.

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The near site geology consists primarily of Kansan age till and Pleistocene alluvial deposits. The abutments and valley foundation are comprised of Kansan till of widely varying composition. This till is described as brown to gray clay that is sandy, lean or fat. It is classified medium stiff to stiff and is of undetermined thickness at the site. The flood plain alluvial deposits overlie the Kansan till in the valley. These deposits are widely varying in composition and are derived from the Kansan till and local loess deposits. The alluvial deposits are described as brown and are also sandy, lean, or fat clays. These deposits are classified soft to stiff and are 40 feet thick.

3.1.3. Water Quality

Pursuant to the Federal Clean Water Act (CWA), the State of Nebraska has listed several of the Salt Creek reservoirs as "Category 5" waters in the Nebraska DEQ 2018 Water Quality Integrated Report (Table 3.1). A "Category 5" listing infers that at least one beneficial use is impaired and a TMDL is required. The beneficial uses impaired include aquatic life, aesthetics, and recreation. The identified pollutants/stressors include: high pH, dissolved oxygen, mercury (fish tissue), algae toxins, ammonia, nutrients, and sediment. A TMDL has been completed for Holmes Lake.

Bluestem Lake was listed as category 5 in the 2018 Water Quality Integrated Report. Aquatic Life use was impaired for Total Nitrogen, Total Phosphorus, Chlorophyll a, Hazard Index Compounds, and Mercury. The aesthetics use was impaired for Sediment. A Fish Consumption Assessment determined this waterbody's Aquatic Life use is supporting for Hazard Index Compounds and Mercury. New water quality data determined the Recreational use is impaired for E. coli bacteria.

Holmes Lake was listed as category 5 in the 2018 Water Quality Integrated Report. Aquatic Life use was impaired for Total Nitrogen, Total Phosphorus, Chlorophyll a, pH, Hazard Index Compounds, and Mercury. A Fish Consumption Assessment determined this waterbody's Aquatic Life use is supporting for Hazard Index Compounds.

Antelope Creek was also listed as category 5 in the 2018 Water Quality Integrated Report. Recreational use was impaired for E. coli bacteria. The Aquatic Life use was impaired for Selenium and Copper. Water quality data gathered in 2015 determined the Recreational use is supporting for E. coli. The Agricultural Water Supply Class B reporting was removed due to no criteria. The Selenium assessment methods were updated for the acute water quality standard to reflect EPA's priority toxic pollutants method of no more than one violation in the last 3 years. Chronic water quality standards were not able to be assessed against with the same dataset due to the states monitoring protocol which does not allow for the calculation of a 4 day average. Selenium is now supporting the Aquatic Life use.

	Impairments	Comments/Actions
Bluestem Lake	Recreation (E. coli)	Fish Consumption Assessment
	Aquatic Life - Chlorophyll α	completed
	(Total Nitrogen, Total	
	Phosphorus)	
	Aesthetics (Sediment)	
Holmes Lake	Aquatic Life - Fish	Phosphorous TMDL to address Total
	Consumption Advisory	Phosphorous & Dissolved Oxygen and
	(Mercury)	Sediment TMDLs approved 7/03,
	Aquatic Life - Chlorophyll α,	Lake renovated 2005, Fish
	pH (Total Nitrogen, Total	Consumption Assessment completed
	Phosphorus)	
Antelope Creek	Aquatic Life (Copper)	E. coli and Ammonia TMDLs approved 9/07

Table 3-1: Summary of Water Quality Issues

Source: Nebraska DEQ 2018 Water Quality Integrated Report.

3.2. Environmental Resources

3.2.1. Aquatic Resources

3.2.1.1. Wetlands

An evaluation of potential wetlands at the sites was conducted through review of the National Wetlands Inventory (NWI) online at www.fsw.gov/wetlands/Data/Mapper.html. The NWI depicts several different wetland types including Freshwater Emergent Wetland, Freshwater Forested/Shrub Wetland, Freshwater Pond and Riverine.

At Bluestem Dam, the NWI database indicates a 0.31 acre Freshwater Emergent Wetland and a 0.17 Riverine Wetland on the downstream side of the embankment (Figure 3-1). At Antelope Creek Dam, there are 2 mapped Riverine Wetlands totaling approximately 0.51 acres downstream of the embankment area that includes the outlet channel (Figure 3-2).



Figure 3-1: National Wetlands Inventory of Bluestem Dam



Figure 3-2: National Wetlands Inventory of Antelope Creek Dam

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3.2.1.2. Fisheries

The fishery at Bluestem Lake is comprised of largemouth bass, bluegill, black and white crappie, channel catfish, flathead catfish, and common carp. In 2012, it was estimated that 3,303 anglers spent 8,685 hours fishing at the lake. Holmes Lake fishery contains largemouth bass, carp, white perch, bluegill, catfish and rainbow trout. Rainbow trout are stocked every year in fall and winter.

3.2.2. Terrestrial Resources

3.2.2.1. Wildlife

Terrestrial cover types that occur in the Bluestem and Holmes Lake project areas include wooded and grass habitats; however, these are heavily invaded by invasive and weedy species. While these habitats are not optimal they do support some migrating shorebirds and waterfowl, and permanent and temporary residents including hawks, pheasants, quail, turkey, beavers, cottontail rabbit, fox squirrel and deer. In addition, wetland vegetation, where present along the shoreline fringe, provides food, water or shelter for beaver, frogs, deer and raccoon, and is essential habitat for many types of ducks, geese, herons, shorebirds, turtles, snakes and other animals that live around or frequent the reservoirs.

3.2.2.2. Vegetation

Prior to reservoir construction, the area had been transformed from a natural landscape to land used for dry land farming and some pastureland. Native plant communities were greatly reduced. The construction of the dams and inundation of the reservoir areas removed much of the existing riparian vegetation that was established along the creek and replaced the vegetation communities (within the reservoir boundary) with aquatic communities. The majority of the project lands were then replanted with various woody and herbaceous species for aesthetic, recreational, wildlife, and soil stabilization purposes. These species included, but were not limited to: oak, walnut, locust, maple, osage, bluegrass, fescue, and smooth brome.

3.2.3. Threatened and Endangered Species

In accordance with Section 7 of the Endangered Species Act, the U.S. Fish and Wildlife Service's Information for Planning and Consultation (IPAC) was used to determine which federally-listed threatened, endangered, or candidate species could potentially occur in the proposed project area. An endangered species is the classification provided to an animal or plant in danger of extinction within the foreseeable future throughout all or a significant portion of its range. A threatened species is the classification provided to an animal or plant likely to become endangered within the foreseeable future throughout all or a significant portion of its range. Table 3-2 lists the federally-listed and endangered and threatened species that may potentially exist in Lancaster County.

Scientific Name	Common Name	Status	Habitat
Sternula antillarum	Interior Least Tern	Endangered	Coastal beaches and river sandbars
Charadrius melodus	Piping Plover	Threatened	Coastal beaches and river sandbars
Scaphirhychus albus	Pallid Sturgeon	Endangered	Large, turbid, warm-water rivers
Cicindela nevadica lincolniana	Salt Creek Tiger Beetle	Endangered	Saline wetlands
Myotis septentrionalis	Northern Long-eared Bat	Threatened	Caves, mines, wooded areas
Platanthera praeclara	Western Prairie Fringed Orchid	Threatened	Wet prairies and sedge meadows
Grus americana	Whooping Crane	Endangered	Open expanses and wetlands

Table 3-2: Federally Listed Threatened and Endangered Species.

3.2.3.1. Interior Least Tern

Least terns are colonial birds that occupy coastal beaches and barren to sparsely vegetated sandbars along rivers, sand and gravel pits or lake and reservoir shorelines for nesting and chick rearing, which occurs from late April through August. Least tern uses several major river systems of the United States including the Missouri and Platte Rivers during the breeding season. Stabilization for navigation, flood control, hydropower generation, and irrigation has led to a loss of much of the sandbar habitat the species requires and led to the degradation of the remaining habitat.

3.2.3.2. Piping Plover

The piping plover is a shorebird that favors coastal beaches, alkali wetlands, lakeshores, reservoir beaches and river sandbars for nesting and chick rearing, and utilizes the Missouri and Platte Rivers' sandbars and shorelines. Nesting and chick rearing occurs from April to August. In 1985, the USFWS listed the Northern Great Plains population as threatened. The USFWS designated critical habitat for the Northern Great Plains population of the piping plover, including the Missouri River, in September 2002. Designated areas of critical habitat include prairie alkali wetlands and surrounding shoreline; river channels and associated sandbars and islands; and reservoirs and inland lakes and their sparsely vegetated shorelines, peninsulas, and islands.

3.2.3.3. Pallid Sturgeon

The pallid sturgeon was officially listed as an endangered species on September 6, 1990. In Nebraska, the pallid sturgeon is found in the Missouri and Platte Rivers. Floodplains, backwaters, chutes, sloughs, islands, sandbars, and main channel waters formed the large-river ecosystem that provided macrohabitat requirements for the pallid sturgeon, a species that is associated with diverse aquatic habitats. These habitats historically were dynamic and in a

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constant state of change due to influences from the natural hydrograph, and sediment and runoff inputs from an enormous watershed spanning portions of ten states. Navigation, channelization and bank stabilization, and hydropower generation projects have caused the widespread loss of the diverse array of dynamic habitats once provided to pallid sturgeon on the Missouri River, resulting in a precipitous decline in populations of the species.

3.2.3.4. Salt Creek Tiger Beetle

The Salt Creek tiger beetle is confined to eastern Nebraska saline wetlands and associated streams and tributaries of Salt Creek in the northern third of Lancaster County. It is found along mud banks of streams and seeps, and in association with saline wetlands and exposed mud flats of saline wetlands. Four areas have been designated as critical habitat and include (1) Upper Little Salt Creek North in Lancaster County, (2) Little Salt Creek – Arbor Lake in Lancaster County, (3) Little Salt Creek – Roper in Lancaster County, and (4) Rock Creek – Jack Sinn Wildlife Management Area in Lancaster and Saunders Counties. Saline wetland and stream complexes found along Little Salt Creek and Rock Creek comprise the critical habitat designation. The primary reason for its decline includes its need for the previously mentioned specific habitat which now has become limiting.

3.2.3.5. Northern Long-eared Bat

The northern long-eared bat is found across much of the eastern and north central United States and all Canadian provinces from the Atlantic coast west to the southern Northwest Territories and eastern British Columbia. The species' range includes 37 states. White-nose syndrome, a fungal disease known to affect bats, is currently the predominant threat to this bat, especially throughout the Northeast where the species has declined by up to 99 percent from pre-white-nose syndrome levels at many hibernation sites. Northern long-eared bats spend winter hibernating in caves and mines, called hibernacula. They use areas in various sized caves or mines with constant temperatures, high humidity, and no air currents. Within hibernacula, surveyors find them hibernating most often in small crevices or cracks, often with only the nose and ears visible. During the summer, northern long-eared bats roost singly or in colonies underneath bark, in cavities or in crevices of both live trees and snags (dead trees).

3.2.3.6. Western Prairie Fringed Orchid

The western prairie fringed orchid inhabits tall-grass calcareous silt loam or sub-irrigated sand prairies. Declines in western prairie fringed orchid populations have been caused by the drainage and conversion of its habitats to agricultural production, channelization, siltation, road and bridge construction, grazing, haying, and the application of herbicides. Populations are known to occur in Boone, Cherry, Dodge, Garfield, Grant, Greeley, Hall, Holt, Lancaster, Loup, Madison, Otoe, Pierce, Rock, Saline, Sarpy, Seward, and Wheeler counties, and may occur at other sites in Nebraska.

3.2.3.7. Whooping Crane

The whooping crane is a bi-annual migrant, traveling between its summer habitat in central Canada, and its wintering grounds on the Texas coast, across the Great Plains of the U.S. in the spring and fall of each year. The migratory corridor runs in an approximately straight line from the Canadian Prairie Provinces of Alberta and Saskatchewan through the Great Plains states of eastern Montana, North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, and Texas. The whooping crane breeds, migrates, winters, and forages in a variety of wetland and other habitats, including coastal marshes and estuaries, inland marshes, lakes, ponds, wet meadows and rivers, and agricultural fields. Whooping cranes breed and nest in wetland habitat in Wood-Buffalo National Park, Canada. Bulrush is the dominant vegetation type in the potholes used for nesting, although cattail, sedge, musk-grass, and other aquatic plants are common. Nest sites are primarily located in shallow ponds that contain bulrush. During migration, whooping cranes use a variety of habitats; however wetland mosaics appear to be the most suitable. For feeding, whooping cranes primarily use shallow, seasonally and semi permanently flooded palustrine wetlands for roosting, and various cropland and emergent wetlands. In Nebraska, whooping cranes also often use riverine habitats.

3.3. Cultural Resources

A cultural resources literature search was conducted in consultation with the Nebraska State Historic Preservation Office (SHPO). An April 2017 database search confirmed that no historic properties are recorded in the project Area of Potential Effect (APE). Concurrently, the SHPO reviewed the USACE files related to this project and concluded that a survey for unrecorded cultural resources would not be required. SHPO determined that the proposed undertaking would have no effect for archaeological, architectural, or historic properties. Appendix A contains the Nebraska SHPO documentation.

3.4. Socioeconomics

Bluestem and Antelope Creek Dams are located in Lancaster County, Nebraska. The population of Lancaster County was 293,407 in 2012; however, 90 percent of that population is within the city of Lincoln the second largest city in Nebraska. In 2012, 83.9 percent of Lancaster County residents reported their race as Caucasian alone, while the remaining 16.1 percent consisted of other races or a mixture of races (U.S. Census Bureau).

In 2007-2011, Lancaster County had a per capita income of \$26,557 and had a median household income of \$51,059; this is compared to \$26,113 and \$50,695 respectively for the state of Nebraska (U.S. Census Bureau, 2010). For the state of Nebraska the percent of persons below poverty level was 11.8 (U.S. Census Bureau, 2010) while Lancaster County is 14.3 percent. The major sources of employment in Lancaster County in 2005-2009 were 38.6 percent management, business, science, and arts occupations; 16.5 percent service occupations; 25.8 percent sales and office occupations; 11.0 percent production, transportation, and material moving occupations; and 8.1 percent natural resources, construction, and maintenance occupations (U.S. Census Bureau, 2010). The unemployment rate for Lancaster County was 4.3 percent compared to the statewide unemployment rate of 3.8 percent (U.S. Census Bureau, 2012).

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3.4.1. Recreation

Bluestem Dam, NE is a State Recreation Area located just 2.5 miles west of Sprague, Nebraska and about 20 miles southwest of Lincoln, Nebraska. Bluestem Lake is 325 acres in size with 6 miles of shoreline. Bluestem provides boating, picnicking, and primitive camping with over 200 campsites to choose from. There is also an archery range, swim beach and a playground.

Holmes Lake Park encompasses 333.75 acres. Facilities on Corps property include roads, parking areas, boat ramp and dock, Americans with Disabilities Act (ADA) accessible fishing pier, two pedestrian bridges, ADA accessible playground, ADA accessible limestone walking trail, one permanent comfort station, 30-acre fenced dog run, picnic shelters, part of a golf course, and trails. The reservoir has a surface area of 123 acres, 20,925 feet of shoreline, a maximum depth of 22.0 feet, and a storage capacity of 905 acre-feet at conservation pool. Swimming is not allowed in the lake and boats must not be motorized.

Holmes Lake Park has baseball diamonds and a volleyball court. Winter sports include ice skating and sledding on the west side of the dam. The Holmes Golf Course is an 18-hole par 72 course featuring 6,805 yards of golf, a 40-tee driving range and was designed by golf course architect Floyd Farley

One of the most popular attractions here is Hyde Observatory, which is located on the south side of the lake and visitors can look at the night sky through three powerful telescopes and sit through two programs about astronomy or space exploration.

3.4.2. Prime Farmland

The United States Department of Agriculture (USDA) considers prime farmland to be land that has the best combination of physical and chemical characteristics that is readily available for producing crops. Prime farmland has the soil quality, growing season, and moisture supply needed to economically produce sustained high yields of crops when treated and managed according to acceptable farming methods. These lands are not excessively erodible or saturated with water for a long period, and they either do not flood frequently or are protected from flooding. Prime farmland soils are located in the project vicinity but are limited to locations of potential spoil areas. Non-prime farmland soils on the project site are classified as Burchard clay loam, Mayberry silty clay loam, Steinauer clay loam, Judson silt loam and Steinauer clay loam soils are moderately to well-drained soils. Prime farmland soils including Judson silt loam and Wymore silty clay loam are moderately to well-drained soils and are considered Farmland of Statewide Importance.

3.5. Air Quality

Sources of suspended particulate matter and air pollutants in the project area include agricultural, industrial, and recreational boating activities near the dredging site. Lancaster County complies

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with the National Ambient Air Quality Standards (NAAQS) and is not listed on the EPA's Currently Designated Nonattainment Areas for All Criteria Pollutants website (<u>http://epa.gov/oaqps001/greenbk/ancl3.html</u>).

3.6. Noise

Sources of noise in the Bluestem Dam project area result from recreational boating, hunting, and agricultural activities. In the spring and fall, farm tractor and truck use increases near the Bluestem Dam project site. At the Antelope Creek Dam include noise from city traffic and recreational use of the ball fields and park. Background noise levels are generally low.

4.0 ENVIRONMENTAL CONSEQUENCES

This section outlines the anticipated environmental effects from implementation of Alternative 2: Proposed Action as compared to the Alternative 1: No Action Alternative.

4.1. Physical Geographic Resources

4.1.1. Topography

Alternative 2 would require removal of material from borrow sites to be used for the berm construction. Following project implementation the material would be used as fill material over the outlet works or returned to the borrow sites and regraded to original contours. Therefore, there would be no change in topography with Alternative 2.

The No Action Alternative would not have any construction activities and would not result in changes in the existing topography of the reservoir or the surrounding park area.

4.1.2. Soils

Alternative 2 would require removal of material from borrow sites to be used for the berm construction. Following project implementation the material would be used as fill material over the outlet works or returned to the borrow sites and regraded to original contours and seeded with Corps approved native seed mix. Therefore, there would be no change in soils with Alternative 2.

The No Action Alternative would not have any construction activities and would not result in changes to soils of the reservoir or the surrounding park area.

4.1.3. Water Quality

Implementation of Alternative 2 may cause temporary increases in sediment to the drainage area downstream of the dam embankments. Construction and removal of the temporary berm may contribute small amounts of sediment during the construction to the creeks below the project area. These effects would be short term and minor and not expected to decrease water quality in the downstream channels. Long-term water quality would not be impacted as a result of this project.

The No Action Alternative would not have any construction activities and would not result in changes to water quality of the reservoir or the downstream area.

4.2. Environmental Resources

4.2.1. Aquatic Resources

4.2.1.1. Wetlands

The construction and staging areas at Bluestem and Antelope Creek Dams are located outside of the area identified as wetland and would not impact the wetland or its drainage pattern.

The outlet plunge pools below the conduits contain a small number of wetland associated plants that are anticipated to reestablish if damaged during construction.

The No Action Alternative would not have any construction activities and would not result in impacts to wetlands above the dam embankment or in the downstream area.

4.2.1.2. Platte River Depletion

Because the proposed conduit works modifications will be on a tributaries to Salt Creek, the USFWS is concerned about actions that could result in an in-stream flow depletion to the lower Platte River, which could impact federally listed species. There would be no draw down of Bluestem or Antelope Creek Reservoirs or changes to the amount of water released downstream. Therefore, there would be no in-stream flow depletion due to the proposed project.

4.2.1.3. Fisheries

Implementation of the outlet conduit modification project is not expected to impact fish populations as the work would occur below the dam embankments. Small amounts of sediment may result in the creek downstream from construction activities but would be short term and minor.

The No Action Alternative would not have any construction activities and would not result in any disturbance to fisheries in the reservoir or the downstream area.

4.2.2. Terrestrial Resources

4.2.2.1. Wildlife

Some animals may be temporarily disturbed or displaced during construction. This includes the potential to disturb or displace amphibians, reptiles, and other species that may occur in the outlet pool below the dam embankment. Due to the temporary nature of the construction activity and the availability of similar habitat surrounding the project area, long-term impacts are not expected.

The No Action Alternative would not have any construction activities and would not result in any disturbance to wildlife species in the reservoir or the downstream area.

4.2.2.2. Vegetation

Due to the temporary nature of the construction activity and the availability of similar habitat surrounding the project area, long-term impacts are not expected. There may be some cedar trees removed from the borrow areas, however, if it is required this would occur outside of the

migratory bird nesting season. All construction, access road, staging and borrow areas would be brought back to pre-project conditions and replanted with Corps approved native species.

The No Action Alternative would not have any construction activities and would not result in any disturbance to vegetation in the reservoir or the downstream area.

4.2.3. Threatened and Endangered Species

The following sub-sections provide effect determinations and associated reasoning for each of the listed species of concern.

4.2.3.1. Interior Least Tern and Piping Plover

Determination: *No effect*. The project area is a previously disturbed area and managed for wildlife and recreation. There have been no known sightings at the proposed project sites and there is no known habitat on site. There would be no hydrologic effect to the Platte River as there would not be a drawdown of Bluestem or Antelope Creek Reservoirs or changes to the amount of water released downstream result of the project

4.2.3.2. Pallid Sturgeon

Determination: *No effect.* The pallid sturgeon is a large river obligate, and as such, is not found in the project sites and would not be affected by the proposed construction. There would be no water depletions associated with the project and therefore no impacts to the Platte River system.

4.2.3.3. Salt Creek Tiger Beetle

Determination: *No effect*. The Salt Creek tiger beetle is confined to eastern Nebraska saline wetlands and associated streams and tributaries of Salt Creek in the northern third of Lancaster County. The insect is believed to have disappeared from the southern margin of Saunders County. There have been no known sightings at the proposed project sites. There is no known habitat on site, and there is no known potential habitat in the vicinity of the downstream areas that could be affected from project activities.

4.2.3.4. Northern Long-eared Bat

Determination: *No effect*. There would not be any trees removed or any effects to habitat used by the bat. Construction would occur during the winter months outside the nesting/roosting season so bats would likely not be present.

4.2.3.5. Western Prairie Fringed Orchid

Determination: *No effect*. There are no known records of western prairie fringed orchid at the project sites. Prior to any construction activities, surveys would occur within the area of the potential construction footprint to ensure no plants would be impacted by construction. If plants

are found onsite, measures will be taken to avoid these areas and buffer the area from any potential indirect effects of construction with construction BMPs.

4.2.3.6. Whooping Crane

Determination: *No effect*. There are no known records of whooping cranes at the project sites. Construction would occur during the winter months outside the migration season so cranes would not likely be present.

4.3. Cultural Resources

The Omaha District Archeologist was consulted to determine if any architectural or archeological cultural resources exist on the project area. It will be recommended that construction workers involved in the project be aware that buried artifacts may be encountered. In the event that cultural resources are encountered during construction activities, construction would be stopped and the Corps' Missouri River Project Office would be contacted. Construction would not be resumed until approval has been received from the Nebraska SHPO.

4.4. Socioeconomics

Overall, the aesthetics of Bluestem and Antelope Creek Dams and Reservoirs would not be affected by the Outlet Works Modification project implementation. There would be approximately 6 weeks per site that construction occurs below the dam embankments but would not impact use or access to the reservoirs. Work would occur from September 4 through March 1 to minimize recreation impacts.

4.4.1. Recreation

The Outlet Works Modification project would likely have very minor short-term impacts to recreation due to construction activities. The construction would take place below the dam embankments from September 4 to March 1. Project activities would occur for approximately 6 weeks. Access to the lakes would not be affected by the project activities.

The No Action Alternative would have no impact on recreation.

4.4.2. Prime Farmland

The project sites are State Recreational Areas used for water storage and flood control, modifications are structural only, and no cropland would be taken out of production, thus, NRCS has determined that the project was found to be cleared of Farmland Protection Policy Act (FPPA) significant concerns. No conversion of prime farmland would occur.

4.5. Environmental Justice

There would be no disproportionate impacts to minority or low-income populations as a result of the No Action or Alternative 2.

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4.6. Air Quality

Minor increases in dust and equipment exhaust are expected during construction associated with the proposed projects. These increases would be temporary and localized and would not be expected to result in Lancaster County becoming a non-attainment area for any NAAQS parameters. Therefore, the proposed project would have no impacts on air quality.

The No Action Alternative would not have any construction activities and would not have any effect on air quality.

4.7. Noise

Short-term noise levels would be increased temporarily due to construction activities on the site. Noise impacts would be reduced by restricting project activities to daylight hours. No long-term noise impacts are expected.

The No Action Alternative would not have any construction activities and would have no impact on noise.

4.8. Summary

The Salt Creek Outlet Works Modification Project may have some short term minor effects to wildlife, water quality, recreation and noise that are directly related to time of construction. Long term impacts to these resources is not expected. Modification of the outlet works would reduce the risk of concentrated leak erosion or internal erosion of the dam embankment material along the conduit and uncontrolled seepage.

4.9. Cumulative Impacts

In compliance with the NEPA and CEQ regulations, potential cumulative effects on the environment are required to be assessed. A cumulative effect is an effect on the environment that results from the incremental impact of the resulting action when added to other past, present, and reasonably foreseeable future actions. While actions may be insignificant independently and locally, cumulative impacts accumulate over time and can result in larger scope of impacts. Outlet works modifications at other Salt Creek Dam sites have recently occurred or planned for construction in 2019. These include Olive Creek (Site 2), Wagon Train (Site 8), Stage Coach (Site 9), and Pawnee (Site 14).

The project at Stage Coach Dam included boat ramp, installation of a breakwater, and a fishery renovation. Implementation of the project required a 10.1 foot drawdown of the reservoir. Analysis concluded the drawdown would not reduce or influence the flows downstream in the Platte River.

The Conestoga Dam (Site 12) Aquatic Habitat Restoration Project included modification of the inlet structure to allow for flexibility in controlling reservoir levels, removal of approximately 500,000 cubic yards of lakebed sediment to improve water quality and provide habitat depth diversity. Recreation improvements included a new boat ramp, mooring facility, fishing piers and angler access trails. Implementation of this project required draining of the reservoir. It was determined the depletion would represent from 0.019 percent to 0.024 percent of the flow in the river. Based on this reasoning it is anticipated that removing 310 acre-feet of sediment from Conestoga would have a negligible impact on Platte River flows.

Implementation of the Outlet Works Conduit Modification Project at Bluestem and Antelope Creek Dams would not require a reservoir drawdown and therefore would not cumulatively effect flows in the Platte River. Effects of the projects were determined to be minor to wildlife, water quality, recreation and noise that are directly related to time of construction. Long term impacts or cumulative effects are not expected to occur in the Salt Creek Watershed.

5.0 COMPLIANCE WITH ENVIRONMENTAL LAWS AND REGULATIONS

This section describes pertinent environmental laws and regulations and serves to ensure the proposed project is in compliance.

Bald and Golden Eagle Protection Act, 16 U.S.C. Sec. 668, 668 note, 669a-668d. *In compliance*. This Act prohibits the taking or possession of and commerce in bald and golden eagles, with limited exceptions for the scientific or exhibition purposes, for religious purposes of Indian Tribes, or for the protection of wildlife, agriculture or preservation of the species. The proposed action would not affect bald or golden eagles or their habitat.

Clean Air Act, as amended, 42 U.S.C. 185711-7. et seq. *In compliance*. Air quality is not expected to be impacted to any measurable degree by the proposed action.

Clean Water Act, as amended. (Federal Water Pollution Control Act) 33 U.S.C. 1251. et seq. *In compliance*. The objective of this Act is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters (33 USC 1251). The USACE regulates discharges of dredge or fill material into waters of the United States pursuant to Section 404 of the Clean Water Act. This permitting authority applies to all waters of the United States including navigable waters and wetlands. The USACE conduit and associated plunge pool activities would be authorized under the NWP-3-Maintenance.

Comprehensive Environmental Response Compensation and Liability Act (CERCLA). In compliance. Typically CERCLA is triggered by (1) the release or substantial threat of a release of a hazardous substance into the environment; or (2) the release or substantial threat of a release of any pollutant or contaminant into the environment which presents an imminent threat to the public health and welfare. No CERCLA issues were identified and no substantial release of hazardous materials has been recorded to date.

Endangered Species Act, as amended. 16 U.S.C. 1531, et seq. *In compliance*. The analysis in this EA has determined there would be no effect to the piping plover, interior least tern, pallid sturgeon, northern long-eared bat, Salt Creek tiger beetle, Western prairie fringed orchid, or whooping crane.

Environmental Justice (E.O. 12898). In compliance. Federal agencies shall make achieving environmental justice part of their mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations in the United States. The project does not disproportionately impact minority or low-income populations.

Farmland Protection Policy Act (Subtitle I of Title XV of the Agriculture and Food Act of 1981), effective August 6, 1984. *In compliance*. The purpose of the Farmland Protection Policy Act is to minimize the extent to which Federal programs contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses, and to assure that Federal programs are administered in a manner that will be compatible with state, local government, and private

programs and policies protecting farmland. There will be no conversion of farmland associated with the proposed pool level modification.

Federal Water Project Recreation Act, as amended, 16 U.S.C. 460-1(12), et seq. *In compliance*. Federal legislation which requires that recreation and fish and wildlife enhancement be given full consideration in federal water development projects.

Fish and Wildlife Coordination Act. 16 U.S.C. 661 et seq. *In compliance*. The USFWS IPaC system has been consulted for listed threatened and endangered species present in the area and has been provided a copy of this EA.

Floodplain Management (E.O. 11988). In compliance. The Floodplain Management Executive Order requires federal agencies to avoid to the extent possible the long and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. The proposed project would potentially alter levels within the lake and would not alter any floodplains.

Migratory Bird Treaty Act of 1918 as amended, 16 U.S. C. 703-711, et seq. *In compliance*. The Migratory Bird Treaty Act (MBTA) is the domestic law that affirms, or implements, the United States commitment to four international conventions with Canada, Japan, Mexico and Russia for the protection of shared migratory bird resources. The MBTA governs the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests. The take of all migratory birds is governed by the MBTAs regulation of taking migratory birds for educational, scientific, and recreational purposes and requiring harvest to be limited to levels that prevent over utilization. Executive Order 13186 (2001) directs executive agencies to take certain actions to implement the act. Any improvements planned in the management area would occur outside of the nesting season to limit effects to migratory birds. No impacts to vegetation containing bird nests would occur from the proposed action. The area would continue to provide benefits to migratory birds for feeding, breeding, and sheltering opportunities.

National Environmental Policy Act (NEPA), as amended, 42 U.S.C. 4321, et seq. *In compliance*. This environmental assessment has been prepared for the proposed action and to satisfy the NEPA requirement. An Environmental Impact Statement is not required.

National Historic Preservation Act, as amended. 16 U.S.C. 470a, et seq. *In compliance*. The area has been previously surveyed for cultural resources. Should an unanticipated cultural site become exposed during a drawdown, the District archeologist and the State Historic Preservation Office (SHPO) would be notified, and the discovery would be assessed

Noise Control Act of 1972, 42 U.S.C. 4901 et seq. *In compliance*. The proposed action may have short term increases in noise that would be localized to the project site during times of construction. There would not be any long term impacts to noise levels in the area.

Protection of Wetlands (E.O.11990). In compliance. This executive order provides that each agency must minimize the destruction, loss or degradation of wetlands and to preserve and

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enhance the natural and beneficial values of wetlands. The construction and staging areas at Bluestem and Antelope Creek Dams are located outside of this area identified as wetlands and would not impact the wetland or its drainage pattern. The outlet plunge pools below the conduits contain a small number of wetland associated plants. Additional fill may be added to stabilize the embankment and plunge pool. Plants would quickly reestablish if damaged during construction.

Rivers and Harbors Act, 33 U.S.C. 401, et seq. *In compliance*. The proposed action is a pool level modification only. No excavation or construction activities resulting in fill discharged into navigable waters would take place.

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