

# SEQUOYAH LAKE SPILLWAY AND DAM ASSESSMENT

## Prepared for:

Cherokee Village Suburban Improvement District No.1  
Cherokee Village, Arkansas



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Cherokee Village, Arkansas Sequoyah Lake Dam Assessment November 2025

## ACRONYMS AND ABBREVIATIONS

1D.....	One Dimensional
2D.....	Two Dimensional
ANRD .....	Arkansas Natural Resources Division
CFS .....	Cubic Feet per Second
CN .....	Curve Number
EAP .....	Emergency Action Plan
FEMA.....	Federal Emergency Management Agency
GIS .....	Geographic Information Systems
HEC.....	Hydrologic Engineering Center
LiDAR .....	Light Detection and Ranging
MCS.....	Mesoscale Convective Systems
NLCD.....	Land Cover Database
NGVD29 .....	National Geodetic Vertical Datum of 1929
NRCS .....	Natural Resources Conservation Service
NAVD88.....	North American Vertical Datum of 1988
PMF.....	Probable Maximum Flood
PMP.....	Probable Maximum Precipitation
RAS .....	River Analysis System
ROM .....	Rain-On-Mesh
SA.....	Storage Area
SCS .....	Soil Conservation Service
SD.....	Sunny Day
SDF .....	Spillway Design Flood
SSURGO .....	Soil Survey Geographic Database
USACE .....	United States Army Corps of Engineers
USGS .....	United States Geological Survey
WSE .....	Water Surface Elevation

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## **1.PROJECT BACKGROUND**

Cherokee Village Suburban Improvement District #1 (CVSID) contracted with Olsson to perform an assessment of the Sequoyah Lake Dam, which is owned and operated by CVSID and has

various recreational purposes to it. It is part of a connected network, consisting of three lakes. These lakes are Lake Sequoyah, Lake Thunderbird, and Lake Cherokee. Lake Sequoyah is connected to Lake Thunderbird through a small channel, while Lake Cherokee is located immediately downstream. Together these lakes provide a source of recreation.

On May 10, 2022, the Arkansas Department of Agriculture's, Natural Resources Division (ANRD), formerly the Arkansas Natural Resources Commission (ANRC) and the agency in charge of regulating dam safety in Arkansas, performed an inspection of the dam. As documented by an ANRD letter dated May 25, 2022 (Appendix A) and a recent visual assessment performed by Olsson (Appendix B) in November 2023, identified some signs of distress. This analysis is carried out to make detailed evaluations to determine existing condition of the dam and spillway capacity analysis.

In terms of their size and potential hazard, dams are classified based on Tables 2.1 and 2.2 of ANRD's Title 7 - Rules Governing Design and Operation of Dams (Title 7). Based on these tables, the dam is classified as a high hazard dam of intermediate size. Additionally, because of this classification, the spillway must be capable of safely passing the Probable Maximum Flood (PMF)

or a percentage of the PMF. A PMF is the flood that may be expected from the most severe combination of critical meteorological and hydrologic conditions that are possible for a particular location. As a result of this information, Olsson reviewed the available information available and modeled a Probable Maximum Precipitation (PMP) event. A PMP event assumes a theoretical maximum depth of precipitation for a given duration that is physically possible over a given size storm area at a particular geographic location.

## **2. SEQUOYAH LAKE DAM INFORMATION**

Sequoyah Lake Dam (Dam) consists of an approximately 1,050 feet long earthen embankment

structure with spillway that is approximately 57 ft tall. It was completed in 1958 and is located in Cherokee Village in Sharp County, Arkansas. It is located on and is fed by Little Otter Creek and its tributaries. Figure 1 provides a visual representation of the project area over aerial imagery. The earthen embankment was constructed with a crown width of 30 feet at a stated crest elevation of 486.7 ft (NGVD29) at its lowest point. The typical section side slopes for the upstream embankment consist of a riprap covered embankment at a slope of 2H:1V, while the downstream slope was designed with a vegetative cover and a 2H:1V slope. Information about the original dam design is limited; however, Appendix C contains information completed in 1980 by Cooper Consultants, Inc.

In addition to the main earthen embankment, the dam also includes a low-level drawdown structure, consisting of two (2) outlet valves leading to two (2) 24-inch corrugated metal pipes, and a primary spillway. The primary spillway consists of a rectangular shaped channel covered by a bridge. This bridge, along with its two (2) piers, creates a three (3) box outlet that is approximately 39 feet wide and 25 feet long. This spillway leads to a grouted rectangular channel with an approximately three (3) feet tall weir. While the concrete box / bridge outlet has an invert of 476.1 ft (NAVD88) the downstream weir increases the functional spillway elevation to 478.4 ft (NAVD88). This spillway then discharges into a natural channel that flows to the Spillway channel downstream.

As stated previously, information about the original dam design is limited. In 1980, the CVSID contracted with Cooper Consultants, Inc., to better define the dam and perform more detailed hydrologic and hydraulic analyses. This detailed analysis found that the spillway was capable of safely passing 50% PMF (0.5PMF) with discharge of approximately 4,026 cubic feet per second (cfs) through existing spillway. The same study identified the peak Water Surface Elevation (WSE) of 0.5PMF to be 485.8 ft (NGVD29) while the top of the dam elevation is 486.7 ft (NGVD29) at its low point. No information on vertical coordinate system was mentioned in the report; however, based on the date of the document, it is presumed to be Nation Geodetic Vertical Datum of 1929 (NGVD29).

Sequoyah Lake Dam is listed in the US Army Corps of Engineers National Inventory of Dams (NID) database as NID No. AR00249. NID lists the Sequoyah Lake Dam with a maximum storage of 3,000 acre-feet, drainage area of approximately 2.9 mi<sup>2</sup>, a lake surface area of 73 acres, and a maximum discharge of 22,280 cfs.

Because Sequoyah Lake Dam is greater than 25 feet in height and has a storage capacity greater than 50-acre feet, it is required to be permitted under the State of Arkansas's Dam Safety Program. Dams under 25 feet in height (as defined by Arkansas Natural Resources

Division (ANRD), irrespective of storage volume, are not automatically required to be permitted. Per Title 7, a dam's required spillway capacity is determined based on two criteria. These criteria are size and potential hazard. A dam's size classification is based on the more stringent of either the height of the dam or the maximum storage of the reservoir, while the hazard potential of a dam is determined based on the more stringent of either the potential for loss of human life or economic loss. Table 1 and Table 2 from Title 7 are reproduced below. Note that there is a typographical error (corrected herein) in the actual Table 1 as published by ANRD that indicates that small dams range in height from 24 to 40 feet. The text within the applicable subtitles of Title 7 clearly state that 25 feet is the regulatory height.

**Table 1. Size Clarification.**

Size	Maximum Storage	Height
	(acre-feet)	(feet)
Small	50 to 1000	25 to 40
Intermediate	≥ 1000 and < 50,000	≥ 40 and < 100
Large	≥ 50,000	≥ 100

**Table 2. Hazard Classification.**

Category	Loss of Human Life	Economic Loss
Low	No	Minimal (no significant structures; pastures, woodland, or largely undeveloped land); less than \$100,000.00
Significant	No	Appreciable (significant structures, industrial, or commercial development, or cropland); \$100,000.00 to \$500,000.00.
High	Yes	Excessive (extensive public, industrial, commercial, or agricultural development); over \$500,000.00

Loss of human life is based upon the presence of habitable structures.  
Hazard classification does not indicate the physical condition of the dam.

Based on Table 1 and Table 2, Sequoyah Lake Dam is classified as an intermediate sized dam based on maximum storage and height, and due to the presence of development that would be subject to potential economic loss resulting from a dam breach located downstream, the dam's hazard classification is classified as a high hazard dam. Based on these two criteria and Table 3, Lake Sequoyah Dam spillway must be capable of safely passing the Probable Maximum Flood (PMF). This agrees with the State of Arkansas's Dam Safety Division current rating for the dam, as well as ratings determined in previous analyses.

**Table 3. Spillway Design Flood for Dams.**

Classification Size Spillway Hazard		Design Flood (SDF)
Low	Small	0.25 PMF
	Intermediate	0.25 to 0.50 PMF
	*Large	0.50 to 0.75 PMF
Significant	Small	0.25 to 0.50 PMF
	Intermediate	0.50 to PMF
	Large	PMF
High	Small	0.50 PMF to PMF
	Intermediate	PMF
	Large	PMF

Note: Where ranges are given in this table, the spillway design flood shall be determined by straight line interpolation, based upon the effective height of dam or maximum storage, whichever computed SDF is greater. \*SDF shall be extrapolated at the same rate of change as an intermediate size dam to a maximum of .75 PMF.



### **3. TOPOGRAPHIC DATA**

To complete this assessment, Olsson used a combination of three topographic data sources. The first source was publicly available Light Detection and Ranging (LiDAR) data; the second was new hydrographic and topographic survey conducted for the existing dam, exit channel, and spillway structure performed by Olsson; and the third was historic dam information provided by CVSID. The LiDAR data was collected by the U.S. Geological Survey (USGS) as part of ongoing efforts to update topographic data across the country. It was collected as part of the 2017 Arkansas North Corridor FEMA R6 data collection project and has a 1-meter resolution. Additional topographic data in form of historic dam data and previous studies were provided by CVSID. The new hydrographic and topographic survey completed by Olsson was performed in April 2025. The survey extent was limited to an area of approximately 12 acres. Once the data was completed, it was used to develop a detailed terrain surface that could support 1-foot contour generation. This information is included in Appendix D. Ultimately, this information was used to better define dam characteristics and storage volume-elevation (EV) curves.

To develop a storage EV curve, an approximate lakebed terrain surface was developed using a

combination of the above-mentioned topographic sources. Since bathymetric data was collected for a small portion of the lake, engineering judgment was used to replicate pre-lake topographic details for construction of an EV curve for use in the dam assessment. Based on this information, the dam provides a maximum storage of approximately 2,031 acre-feet, at an elevation (EI) 484.0 ft (NAVD88). Additionally, top of dam embankment elevation is 483.6 ft (NAVD88) with a normal pool elevation of 478.4 ft (NAVD88). As Sequoyah Lake is connected with Lake Thunderbird, a lakebed terrain and storage EV curve was also developed for Lake Thunderbird using the same process mentioned above. Similarly, an EV curve was also developed for Lake Cherokee, as it lies immediate downstream of Sequoyah Lake Dam.

While there are three (3) lakes present upstream of Sequoyah Lake Dam, Olsson has not included those features in this analysis. This is because information was not available at the time of this analysis.

For this analysis, a horizontal projection of North American Datum of 1983 (NAD83), Arkansas State Plane North Zone projection with spatial units of US Survey Feet and a vertical coordinate system of North American Vertical Datum of 1988 (NAVD88) was selected. A summary of the dam and lake characteristics is shown in Table 4, Table 5, and Table 6.

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**Table 4. Data for Lake Sequoyah Dam.**

Data	
Top of Dam Elevation <sup>1</sup>	483.6 feet, NAVD88
Length of Dam (approximate)	1050 feet
Height of Dam <sup>2</sup>	57 feet
Elevation-Storage Curve for Lake Sequoyah <sup>+</sup>	
Elevation (feet) NAVD 88	Volume in Acre (feet)
430.0	0.0
434.0	5.6
436.0	21.4
438.0	44.7
440.0	72.9
442.0	105.2

444.0	141.6
446.0	181.9
448.0	226.3
450.0	275.0
452.0	328.2
454.0	385.9
456.0	448.5
458.0	516.1
460.0	588.9
462.0	667.2
464.0	751.1
466.0	840.9
468.0	937.0
470.0	1040.0
472.0	1151.0
474.0	1272.8
476.0	1407.1
478.0	1551.7
480.0	1702.6
482.0	1861.1
483.6	1996.5
484.0	2031.4

<sup>1</sup>Information based on As-built details provided by CVSID and engineering estimation by Olsson. <sup>2</sup> Height of dam is based on the information provided in the National Inventory of Dams.

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+ Data determined as part of this analysis.

**Table 5. Data for Lake Thunderbird Dam.**

Data	
Top of Dam Elevation <sup>1</sup>	490.0 feet, NAVD88
Length of Dam (approximate)	1780 feet
Height of Dam (Streambed to Estimated Top of Dam) <sup>2</sup>	91 feet

Elevation-Storage Curve for Lake Thunderbird <sup>1</sup>	
Elevation (feet) NAVD 88	Volume in Acre (feet)
391.0	0.0
395.0	3.7
400.0	26.9
405.0	101.0
410.0	276.5
415.0	571.3
420.0	963.9
425.0	1431.8
430.0	1957.9
435.0	2536.7
440.0	3166.2
445.0	3836.7
450.0	4540.4
455.0	5275.5
460.0	6042.4
465.0	6841.3
470.0	7673.7
475.0	8545.9
480.0	9605.3
485.0	10892.2
490.0	12241.8

<sup>1</sup>Information based on As-built details provided by CVSID and engineering estimation by Olsson.

<sup>2</sup> Height of dam is based on the information provided in the National Inventory of Dams. + Data determined as part of this analysis.

**Table 6. Data for Lake Cherokee Dam.**

Data	
Top of Dam Elevation <sup>1</sup>	429.0 feet, NAVD88
Length of Dam (approximate) <sup>2</sup>	846 feet
Height of Dam (Streambed to Estimated Top of Dam) <sup>2</sup>	49 feet
Elevation-Storage Curve for Lake Cherokee <sup>+</sup>	
Elevation (feet) NAVD 88	Volume in Acre (feet)
395.0	0.0
400.0	4.5
405.0	12.7
410.0	23.7
415.0	37.6
420.0	64.6
425.0	172.3
429.0	324.9

<sup>1</sup>Information based on As-built details provided by CVSID and engineering estimation by Olsson.<sup>2</sup> Height of dam is based on the information provided in the National Inventory of Dams. + Data determined as part of this analysis

## 4. HYDROLOGIC ANALYSES

To assess the dam's ability to meet current hydrologic criteria based on its hazard classification, a new hydrologic analysis was performed to determine the runoff potential of the contributing watershed. To perform rainfall-runoff simulations for the PMP rainfall events, three PMP storm types were evaluated. The PMP storms were developed using the precipitation values obtained from the ANRD Dam Safety Division's PMP Geographic Information Systems (GIS) Tool, released as a part of 2019 Regional Probable Maximum Precipitation Study for Oklahoma, Arkansas, Louisiana, and Mississippi (herein referred to as the "2019 PMP Study"), which supersedes the methodology described in the 1982 National Weather Service Hydrometeorological Report No. 52. The PMP tool provides basin-specific, critically stacked temporal accumulation patterns for a specified series of storm durations (e.g., 6-hours and 72-hours). Within the 2019 PMP Study, there are three different storm types that can be evaluated. These storm types are: Local, General, and Tropical.

- **Local:** storm events that consist of local thunderstorms/Mesoscale Convective Systems (MCS) where the main rainfall occurs over short durations (up to 24 hours) and covers a small area (less than 100 mi<sup>2</sup>) and is most active from mid-spring through the early fall
- **General:** storm events associated with areas of low pressure moving across the region from the west and meeting moisture from the Gulf; occur in the fall and spring months; and are representative of where the main rainfall occurs over larger areas and cover longer durations of time

- **Tropical:** storm events, which occur less frequently, are influenced by a tropical system or remnants of tropical moisture; occur from June through October; and have accumulation characteristics similar to the general storm type

With multiple events available from the 2019 PMP study and based on guidance from ANRD, it is recommended that the most conservative scenario be used when looking at the performance of the Sequoyah Lake spillway. Therefore, for this PMP analysis, a sensitivity analysis was performed using the three storm events described above to determine which model scenario would produce the most runoff within the watershed. While Sequoyah Lake is in Northern Arkansas, the Tropical scenario has been included as there are opportunities for tropical moisture to impact the area (i.e., from remnants of a hurricane or tropical storm that moves inland). The sensitivity analysis looked at various combinations of distributed rainfall scenarios using the PMP Tool. The precipitation hyetographs were then used as an input to the two-dimensional (2D) HEC-RAS model. Table 7 is a tabular summary of the PMP scenarios used.

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**Table 7. Probable Maximum Precipitation Data.**

Source	Probable Maximum Precipitation (Depth in Inches)			
	6-hr	24-hr	48-hr	72-hr
State-Local Event	23.4	-	-	-
State-General Event	-	25.2	30.1	30.5
State-Tropical Event	-	32.9	34.9	35.0

The Rain-On-Mesh (ROM) hydraulic model was used to distribute runoff from rainfall events over a 2D computational mesh, using US Army Corps of Engineers (USACE) Hydrologic Engineering Center's (HEC)- River Analysis System (RAS) (Version 6.6). This approach was used to allow for using 2D unsteady flow routing through the 2.9 mi<sup>2</sup> drainage area into the lake. While one

dimensional (1D) modeling can be used for this analysis, it is based off of simplifying assumptions and cannot model the spread of flow (i.e., flow in both the longitudinal and lateral directions) because it uses a series of cross sections to represent the terrain surface and

roughness characteristics and assumes that velocities only vary in the longitudinal direction. Between these cross sections, the 1D model interpolates based on the available cross section data to perform its calculations for the area of interest. Dependent on the number of cross sections and the detail provided, the limitations of the 1D model could lead to incorrect computations, which could impact computed spillway discharges. However, with a 2D unsteady flow model, the system is modeled using a computational mesh rather than a series of cross sections along the longitudinal axis of the stream reach. The mesh consists of computational cells that have elevation ground profiles and roughness values along the cell faces that represent the topographic surface and frictional characteristics of the area and volumetric relationships for the cell area. The use of the 2D model allows for more detailed resolution in Water Surface Elevations (WSE), velocities, and flow patterns than is possible with a 1D model.

To hydraulically route the precipitation events, Olsson utilized the Soil Conservation Service (SCS) Curve Number (CN) methodology. This methodology uses spatially varying land cover and soils data to calculate rainfall runoff. Olsson obtained land use data from the 2023 United States Geological Survey (USGS) National Land Cover Database (NLCD) to create a land cover layer with Manning's "n" values based upon aerial imagery and engineering judgment. Soil data from the Soil Survey Geographic (SSURGO) database were downloaded from the Natural Resources Conservation Service (NRCS) to create a soil layer, which was then combined with the previously mentioned land use data to develop an infiltration layer for input to HEC-RAS. For this infiltration layer, Olsson utilized the NRCS CN methodology. The CN Method estimates excess precipitation as a function of cumulative precipitation, soil cover, land use, and antecedent soil moisture. For this study, Antecedent Moisture Condition Type II (average moisture condition) was assumed. As part of the soil characteristics, these soils have been grouped based on their Hydrologic Soil

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Group (HSG), which determines the ability of the soils to drain when saturated. The Lake Sequoyah Watershed consists of four classifications, which are B, C, C/D, D, and W. In the dual groups, the first letter is for drained areas while the second is for undrained areas. Additionally, for areas where dual groups were present, the more conservative group was used. Therefore, the predominant soil classifications in the watershed for this analysis are HSG D. The soil characteristics for the entire study area are displayed on Figure 2 Hydrologic Soil Group Map and landuse characteristics are displayed on Figure 3 Land Use Map.

To utilize the CN Method, the CN and abstraction ratio were defined in the newly created infiltration layer, which is simply an intersection of the land use and soils layers previously discussed. For this study, an abstraction ratio of 0.2 was considered based upon Soil Conservation Service (SCS) Technical Release 55 (TR-55) guidance. As the infiltration losses were calculated based on NRCS CN method which assumes zero infiltration after the soil is fully saturated after initial abstraction; no minimum infiltration was assigned to the current HEC-RAS model. Table 8 provides a summary of hydrologic and hydraulic characteristics used in ROM modeling.



Table 8. Hydrologic and Hydraulic Parameters.

NLCD Grid Code	NLCD Description	TR-55 Landuse	Additional Notes	Manning’s “n” Roughness Coefficient
11	Open Water	Water	--	0.01
21	Dev. Open Space	Open Space (Fair)	Parks with Minor Development	0.05
		Open Space (Good)	--	
22	Dev. Low Intensity	Residential (2 Acres)	Lots 2 Acres or Greater	0.06
23-L	Dev. Medium Intensity	Residential (1 Acre)	1-2 Acre Lots	0.08
23-M		Residential (1/4 Acre)	0.25-0.75 Acre Lots	
23-H		Residential (up to 1/8 Acre)	Townhouses/Apartments	

24	Dev. High Intensity	Commercial	--	0.1
31	Barren Land	Urban (Newly Graded)	--	0.05
41	Deciduous Forest	Woods (Good)	--	0.1
42	Evergreen Forest	Woods (Poor)	--	0.1
43	Mixed Forest	Woods (Fair)	--	0.1
52	Shrub/Scrub	Sagebrush with Grass Understory (Fair)	--	0.06
71	Grassland	Herb, Grass, Brush (Fair)	--	0.05
81	Pasture	Pasture (Good)	--	0.05
82	Cultivated Crops	Row Crop	--	0.06
90	Woody Wetlands	Woods (Good)	--	0.1
95	Emergent wetlands	Meadow	--	0.05
*	Channel	--	--	0.035

\*Added these classifications as a part of this study using engineering judgment.

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## 5. HYDRAULIC ANALYSES

Once precipitation hyetographs were computed for the PMP events discussed, a hydraulic analysis was performed to determine discharges passing through the spillway of the dam. The USACE's HEC-RAS software (Version 6.6) 2D hydraulic model was used for this analysis. This program simulates the flow from the dam and spillway using 2D unsteady flow principles to route the flood via a computational mesh representing the terrain. Since HEC-RAS uses a finite volume solution technique, the elevation-volume characteristics of each cell are based on the underlying terrain data for the entire cell, which yields more accurate WSE. A 2D model provides more ancillary benefits to the Client as there were additional discussions about assessing potential impacts to the spillway flow that may result from potential dam and spillway modifications. As a 2D model can capture such additional complexity (e.g., lateral variations in velocity, formation of eddies), it has been used for this analysis.

To develop the 2D hydraulic model, precipitation hyetographs based on PMP simulations were applied as rainfall directly to the hydraulic mesh. Previously created Sequoyah, Thunderbird, and Cherokee lakebed terrain surfaces were combined with the base topographic LiDAR data to create a final terrain surface for the Project. Figure 4 shows 10-ft topographic contours along with

final terrain surface used in hydraulic modeling. This final terrain and 2023 USGS NLCD data were then added into the hydraulic model to represent watershed characteristics both upstream and downstream of the Project area. Figure 2 also depicts the Lake Sequoyah and perimeter of the 2D mesh (i.e., the modeling domain) used in this analysis.

Development of the hydraulic model geometry consisted of a variable sized 2D computational mesh that covered the Project area. As each cell represents a portion of the project area and flow in each cell can move to a neighboring cell in any direction, the 2D model allows for the simulation of water spreading out into the surrounding watershed, giving a more realistic picture of how the rainfall transitions to runoff and moves down to the lake. Additionally, the model mesh was improved by adding breaklines. Breaklines are a series of lines that modifies the geometry to represent key hydraulic features, such as dams and road embankments. Additionally, refinement regions were added to align the mesh cells with the anticipated flow direction, landuse patterns, or other key hydraulic features. These mesh refinements will ensure key hydraulic features are modeled correctly while allowing for model stability. By making the model more detailed in important areas, a clearer picture of the watershed and functionality of the dam spillway is established. Engineering judgment was used to identify locations of key hydraulic features.

There are three primary structures included in this analysis. They are Sequoyah Lake Dam, Lake Thunderbird Dam, and Lake Cherokee Dam. As these three dams operate together, they have been included in this model. However, only Sequoyah Lake Dam has had additional details added to it. These additional details include structures representing the dam embankment, existing spillway, and a small weir located approximately 60 feet downstream of the main spillway

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structure. In addition to these structures, Olsson also added the bridge at Iroquois Drive, which connects Lake Sequoyah and Lake Thunderbird.

To account for flows leaving the outer boundary of the model area (outside the Project area), normal depth boundary conditions were utilized. This boundary condition applies a slope, which is calculated from the average slope of the terrain located downstream of the boundary and is used to prevent runoff from building up at the edges of the model.

As part of the hydrologic and hydraulic assessment, multiple scenarios were analyzed to determine the Spillway Design Flood. For these analyses, the following seven scenarios were modeled. These scenarios were modeled to identify the worst-case condition for the Sequoyah Lake Spillway assessment.

- PMP for 72-hour Tropical storm event, (identified as “Tropical\_72hr”)
- PMP for 72-hour General storm event
- PMP for 48-hour Tropical storm event
- PMP for 48-hour General storm event
- PMP for 24-hour Tropical storm event

- PMP for 24-hour General storm event
- PMP for 6-hour Local storm event

## 5.1 Spillway Design Flood Analysis

Because Sequoyah Lake Dam is classified as an intermediate sized, high hazard dam, it is required to have a spillway that can pass the Probable Maximum Flood (PMF) event without overtopping the dam. With the ultimate goal for this analysis being to determine the discharges through the spillway and if any of the modeled events overtop the dam, numerous scenarios were developed. Based on the hydrologic and hydraulic analyses performed, the largest discharge that was produced for the dam is the Tropical 72-hour PMP scenario, with the Tropical 48-hour PMP scenario producing the next largest amount of discharge.

## 5.2 Assumptions for All Scenarios

The following assumptions were made for this analysis:

- Sequoyah Lake starts at a normal pool elevation of 478.4 feet, NAVD 88.
- Analysis does not account for flow bypasses that may occur, thus maximizing peak flows through spillway.
- Analysis uses a downstream boundary condition of normal depth.
- Worst-case condition for the dam and watershed has been routed through the dam.

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## 6. RESULTS

Based on the computed WSE, the dam is shown to be overtopped for all events modeled. The 72-hr Tropical scenario was identified as the largest and worst-case scenario for the Sequoyah Lake Dam. While the chances of the Sequoyah Lake watershed experiencing a tropical event are statistically rare, there is still a possibility. After guidance from the State's Dam Safety Division, it was confirmed that the most conservative storm produced by the 2019 PMP Study, which produces the most strenuous event for the reservoir, should be used, regardless of location. Therefore, for this analysis, it is recommended that the 72-hr Tropical storm scenario be chosen for the ultimate analysis.

Per the 2019 PMP Study, the Tropical Storm can be classified as rainfall resulting directly from a tropical system. While they are frequent in the warm coastal waters, the remaining energy and high amounts of moisture often continue inland for long distances and influence weather patterns for hundreds of miles. Additionally, when the tropical systems move inland, they often lose speed, which causes them to drop large amounts of rainfall over longer periods of time. Therefore, this is the reason why the Tropical 72-hr PMP scenario is recommended for consideration in evaluating Sequoyah Lake Dam and spillway during future design

improvements.

Currently, Sequoyah Lake Dam has a spillway crest at El 476.0 ft and has an effective top of dam at approximately El 483.6 ft (NAVD 88) at its lowest point, which was obtained from survey data. Using the Tropical 72-hr Existing Condition PMP scenario, the spillway passes a maximum discharge of approximately 3,983 cfs. However, approximately 17,324 cfs still overtops the dam with the lake's peak water surface elevation calculated to be El 487.4 ft (NAVD 88). This indicates the dam is overtopped by approximately 3.8 ft at its lowest point.

In order to meet the State's regulations, the dam or spillway will need to be improved. While it is outside the scope of work for this study to determine detailed options, several options that may be considered for the next phase to bring the dam into compliance are as follows:

- Increasing dam height to consistent elevation,
  - Increasing length of spillway crest,
  - Lowering lake level (permanently or temporarily) to increase storage capacity, and •
- Any combination of the suggestions above.

No scenarios were performed to determine the impacts of spillway improvement suggested above, as it was outside the scope of work for this Phase. Table 9 and Table 10 provide a tabular summary for all the scenarios modeled. The PMP inundation areas for the worst-case PMP event can be seen in Figure 5. Figures 6-8 detail the maximum WSE, depth, and velocities.

025-00244 15

**Table 9. Discharge from Dam and Spillway.**

	Existing Condition (6-hour) cubic feet per second (cfs)	Existing Condition (24-hour) (cfs)	Existing Condition (48-hour) (cfs)	Existing Condi on (72-ho ur) (cfs)	Exist Condi (24-h (cfs)
Spillway	3,517	3,105	3,115	3,116	3,983
Dam	13,629	10,240	10,335	10,341	16,600

**Table 10. Elevation at Dam and Spillway.**

--	--

	Existing Condition (6-hour) (feet, NAVD 88)	Existing Condition (24-hour) (feet, NAVD 88)	Existing Condition (48-hour) (feet, NAVD 88)	Existing Condition (72-hour) (feet, NAVD 88)	Existing Condition (96-hour) (feet, NAVD 88)
Spillway	486.8	486.3	486.3	486.3	486.3
Dam	486.8	486.3	486.3	486.3	486.3

025-00244 16

ATTACHMENT  
FIGURES

Feature Key:





Client Name:  
Cherokee Village  
Suburban Improvement  
District #1

**Notice of Intent:**  
Sequoyah Lake Spillway & Olsson  
Dam Assessment

Vicinity:

Fayetteville  
Project Location

Project Title:  
Dam Road, Cherokee  
Village, Arkansas 72529

Date Exported:  
11/14/2025 8:04 AM

This map was created by  
Description:  
Figure 1. Project

to visualize general location(s)  
Location  
of subject property. Unless

otherwise stated, features  
depicted herein do not  
represent legal or survey

boundaries.

Little Rock

Texarkana

Texarkana

Feature Key:

Dam Location

- Streamlines
- 2D Mesh Perimeter
- Hydrologic Soil Group B
- Hydrologic Soil Group C
- Hydrologic Soil Group C/D
- Hydrologic Soil Group D
- Hydrologic Soil Group W

175

Little Otter Cree<sub>k</sub>

Right Prong Otter Cree<sub>k</sub>

Big Otter Cree<sub>k</sub>

Cherokee  
Village North  
Course

South Fork  
Spring River

Iamonta Park  
Cedar Valley  
Park

Cherokee Park

Sharp County  
Regional Airport

62

62



Improvement District #1 Project Location

Project Title:  
Sequoyah Lake Spillway &  
Dam Assessment

**Notice of Intent:**

This map was created by Olsson  
to visualize general location(s)  
Vicinity:

Client Name:  
Cherokee Village Suburban Fayetteville

Project Location:  
Dam Road, Cherokee  
Village, Arkansas 72529  
Date Exported:  
11/14/2025 9:26 AM

Description:  
Figure 2.  
Hydrologic Soils  
Map  
of subject property. Unless  
otherwise stated, features  
depicted herein do not  
represent legal or survey  
boundaries.

Little Rock  
Texarkana

Texarkana

**Feature Key:**

- Dam Location
- Streamlines
- 2D Mesh Perimeter
- Open Water
- Developed, Open Space
- Developed, Low Intensity
- Developed, Medium Intensity
- Developed High Intensity
- Barren Land (Rock/Sand/Clay)
- Deciduous Forest
- Evergreen Forest
- Mixed Forest
- Shrub/Scrub
- Grassland/Herbaceous
- Hay/Pasture
- Cultivated Crops
- Emergent Herbaceous Wetlands

Otter Cree<sub>k</sub>

Lake  
Omaha

Sharp County  
Regional Airport

Right Prong

Cherokee Park

Cherokee  
Village South Course

Cherokee  
Village North  
Course

South Fork  
Spring  
River

Little Otter Cree<sub>k</sub>

Big Otter Cree<sub>k</sub>  
lamonta Park

0 2,500 5,000 10,000

NORTH

US Feet

Client Name:

Cherokee Village

Suburban Improvement

District #1

Project Location:

Dam Road, Cherokee

Village, Arkansas 72529

Date Exported:

11/14/2025 9:55 AM

Project Title:

Sequoyah Lake Spillway &

Dam Assessment

Project Location

This map was created by Olsson

to visualize general location(s)

Vicinity:

Fayetteville

Texarkana

Little Rock

Notice of Intent:

otherwise stated, features

depicted herein do not

represent legal or survey

boundaries.

Figure 3. Land Use

Map

of subject property. Unless

Feature Key:

Lake Sequoyah  
Existing 10 Ft. Contours  
Terrain with Lakebed  
Surface

Park

380

Elevation (ft. NAVD88) 784

346

South Fork Spring

River 370

360 175

390

400

450  
420

410

480

Dogwood Park

440

470

Big Otter Creek

Little Otter

Creek

Sequoia Park  
Pond

Channel Park  
490

460

430

540

560  
600

570

500

550

520

580

510



Allegheny Park

Lake  
Mirandy

0 1,250 2,500 5,000

NORTH  
US Feet

Client Name:

Notice of Intent:

Vicinity:

Cherokee Village  
Suburban Improvement  
District #1

Sequoyah Lake Spillway & Olsson  
Dam Assessment

Fayetteville  
Project Location

Project Title: This map was created by to visualize general location(s)

Project Location:  
Dam Road, Cherokee  
Village, Arkansas 72529

Description:  
Figure 5. PMP  
Inundation Map  
of subject property. Unless  
otherwise stated, features  
depicted herein do not  
represent legal or survey  
boundaries.

Texarkana

Date Exported:  
11/14/2025 10:27 AM

Texarkana  
Little Rock



Big Otter Creek<sup>k</sup>

Oneda Park

Dogwood Park

Little Otter Creek<sup>k</sup>

Iamonta Park

Seminole Park

Right Prong Otter  
Creek<sup>k</sup>

Sequoia  
Park Pond

Lake  
Mirandy

Allegheny Park

ark  
Feature Key:  
Dam Location  
175  
Streamlines  
Maximum Water  
Surface  
Elevation (ft. NAVD88)  
720

**Notice of Intent:**  
Cherokee Village  
Suburban Improvement  
District #1

Vicinity:  
Sequoyah Lake Spillway & Olsson  
Dam Assessment

Project Title: This map was created by to visualize general location(s) boundaries.

Project Location: Description: Surface Elevation of subject property. Unless otherwise stated, features depicted herein do not represent legal or survey

Dam Road, Cherokee Village, Arkansas 72529

Date Exported: 11/14/2025 10:29 AM

Fayetteville  
Project Location

Little Rock

Texarkana

Texarkana

Big Otter Creek

Oneda Park

Dogwood Park

Little Otter Creek

ark

Feature Key:

Dam Location

175

Streamlines

Maximum Water

Depth (ft.) 92

0

lamonta Park

Seminole Park

Right Prong Otter Creek

Sequoya  
Park Pond

Lake  
Mirandy

Allegheny Park

0 1,250 2,500 5,000  
NORTH US Feet

Client Name:

**Notice of Intent:**

Vicinity:

Cherokee Village  
Suburban Improvement  
District #1

Sequoyah Lake Spillway & Olsson  
Dam Assessment

Fayetteville  
Project Location

Project Title: This map was created by to visualize general location(s)

Project Location: Dam Road, Cherokee Village, Arkansas 72529

Description: Figure 5. PMP Maximum Depth of subject property. Unless otherwise stated, features depicted herein do not represent legal or survey boundaries.

Texarkana

Date Exported: 11/10/2025 3:50 PM

Texarkana  
Little Rock

175

Dam Location

175  
Streamlines

Maximum Water  
Velocity (ft/s) 16

0

Creek

Big Otter Creek

Sequoia  
Park Pond

Oneda Park

Dogwood Park

Little Otter Cree  
k

ark

Iamonta Park

Seminole Park

Feature Key:

Right Prong Otter





**APPENDIX A**

**ANRD INSPECTION REPORT**

May 25, 2022

Mrs. Betsy Wall  
Post Office Box 840  
Cherokee Village, AR 72525  
cvsidgm@gmail.com

**RE: INSPECTION: PERMIT 40 – LAKE NAVAJO DAM - SHARP CO.**  
**PERMIT 259 – SEQUOYAH LAKE DAM - SHARP CO.**  
**PERMIT 258 – CHEROKEE LAKE DAM - SHARP CO.**  
**PERMIT 31 – LAKE THUNDERBIRD DAM - SHARP CO.**

Dear Mrs. Wall:

On May 10, 2022, the Natural Resources Division Dam Safety staff conducted an inspection of Lake Navajo Dam, Sequoyah Lake Dam, Cherokee Lake Dam, and Lake Thunderbird Dam. The results of the inspection and a review of owner responsibilities are noted below.

### **INSPECTION SUMMARY**

During the inspection visit, the dam appeared to be in a good operational condition overall.

#### **Lake Navajo Dam:**

The Lake Navajo Dam is in an good condition; however, some issues were noticed during the visit and requires monitoring and maintenance.

- a) The outlet valve requires testing to ensure it is operational (Figure 1).
- b) The downstream slope has excessive brushes and 1” to 2” diameter vegetation (Figure 2), it is recommended to clear the stream and extract the roots of the thick vegetation.
- c) Seepage was noticed at the left side of the dam toe; it is recommended to monitor the seepage. It was also noticed that there is leakage through the dam outlet (Figure 3).

#### **Sequoyah Lake Dam:**

The Sequoyah Lake Dam is in an good condition; however, some issues were noticed during the visit and requires monitoring and maintenance.

- a) Minor erosion on the upstream slope, causing misalignment (Figure 4). The slope should be regraded so that it is uniform, and riprap should be added to prevent future erosion.
- b) The outlet valve requires testing to ensure it is operational.
- c) Seepage was noticed at the left side of the dam toe; it is recommended to monitor the seepage. It was also noticed that there is leakage through the dam outlet (Figure 5).
- d) The

outlet concrete has some cracks, it is recommended to repair the concrete.

**Cherokee Lake Dam:**

The Cherokee Lake Dam appeared to be in good condition, however, it is recommended to remove the brushes on the downstream and test the spillway gate (Figure 6 and 7).

**Lake Thunderbird Dam:**

The Lake Thunderbird Dam is in an good condition; however, some issues were noticed during the visit and requires monitoring and maintenance.

- a) Shoreline has cracked and uneven, thin concrete layers that were poured previously, most of them have fallen in the lake, the slope should be regraded so that it is uniform, and riprap should be added to prevent future erosion.
- b) The spillway path has debris and brushes, it is recommended to clear the path and prevent any obstacles for water passage.

**OWNER RESPONSIBILITIES**

As you know, all four dams are classified as high hazard. As an owner of a high hazard dam, you are required to (1) maintain an updated Emergency Action Plan (EAP) for each dam, (2) execute an EAP tabletop exercise every year, and (3) conduct a test response drill every three years in conjunction with local emergency management officials. A copy of each EAP and the results of the test response drills must be provided to the Natural Resources Division. Additionally, our office must be notified at least one week in advance of any tabletop exercise or test response drill.

We request that you review your status with respect to these responsibilities and provide a timetable for compliance with these requirements.

Thank you for your continued cooperation and help in ensuring the safety of Arkansas' dams. If you have any questions, please contact our office at 501.682.5219. Thank you for your time and concern.

Sincerely,

Hanan Wehbi  
Dam Safety Engineer  
Arkansas Department of Agriculture  
Natural Resources Division  
10421 W Markham Street, Floor 3  
Little Rock, AR 72205  
Hanan.Wehbi@agriculture.arkansas.gov  
501-682-5219



**Figure 1: Lake Navajo Dam Outlet Valve**





**Figure 2: Lake Navajo Dam Downstream**

4 of 8





**Figure 3: Lake Navajo Dam Outlet**







**Figure 4: Sequoyah Lake Dam Upstream**

5 of 8



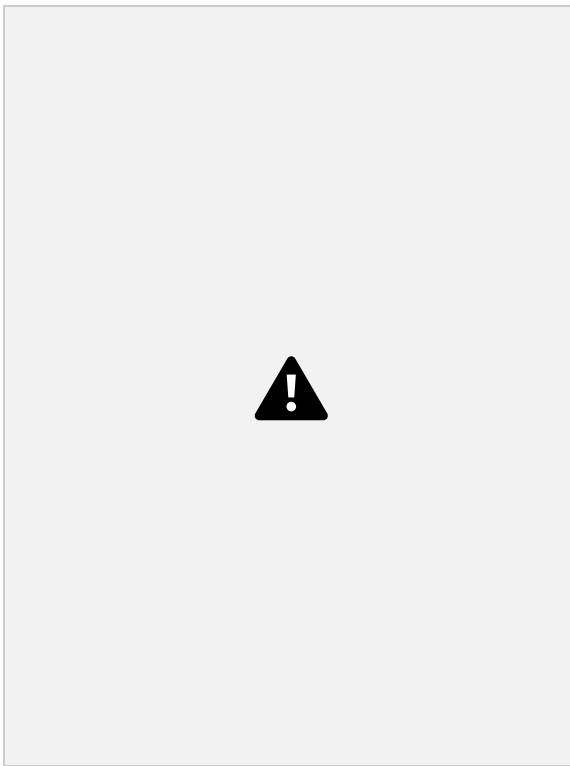




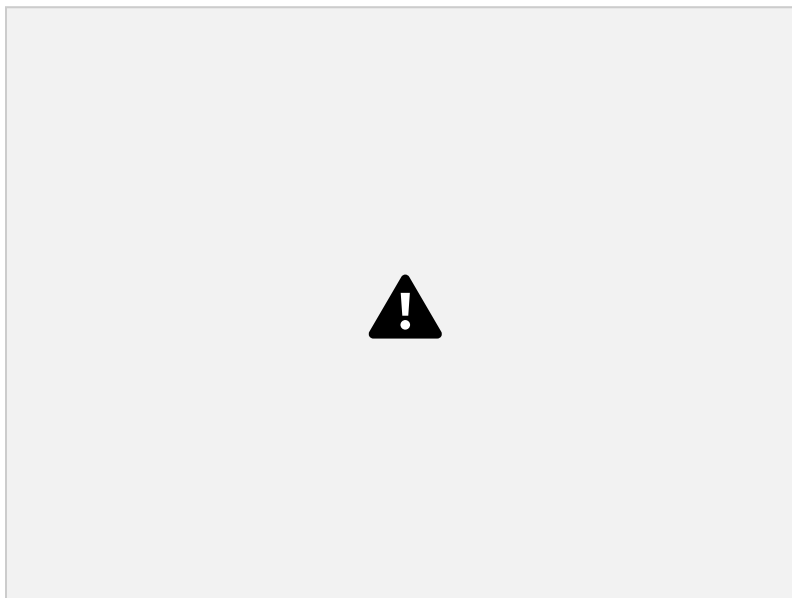
**Figure 5: Sequoyah Lake Dam Seepage**

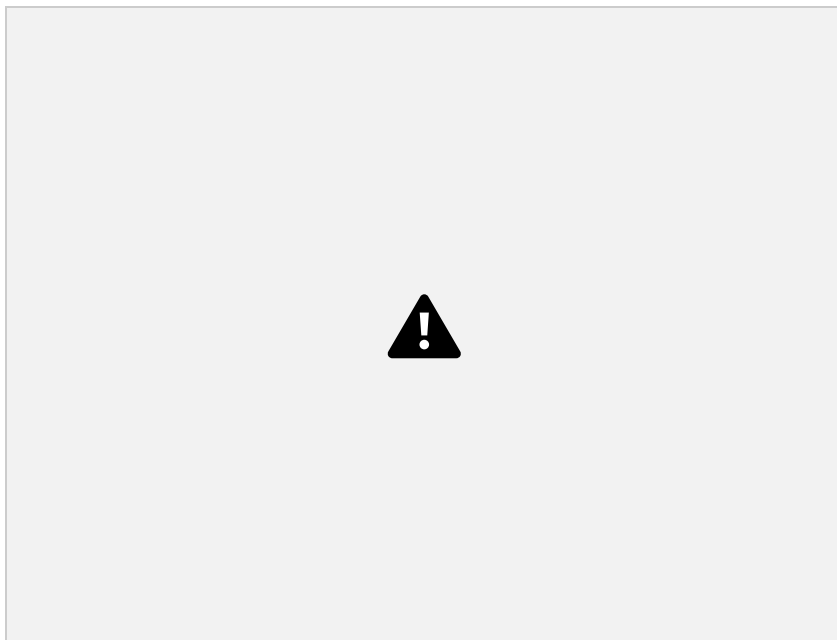


**Figure 6: Cherokee Dam Downstream**



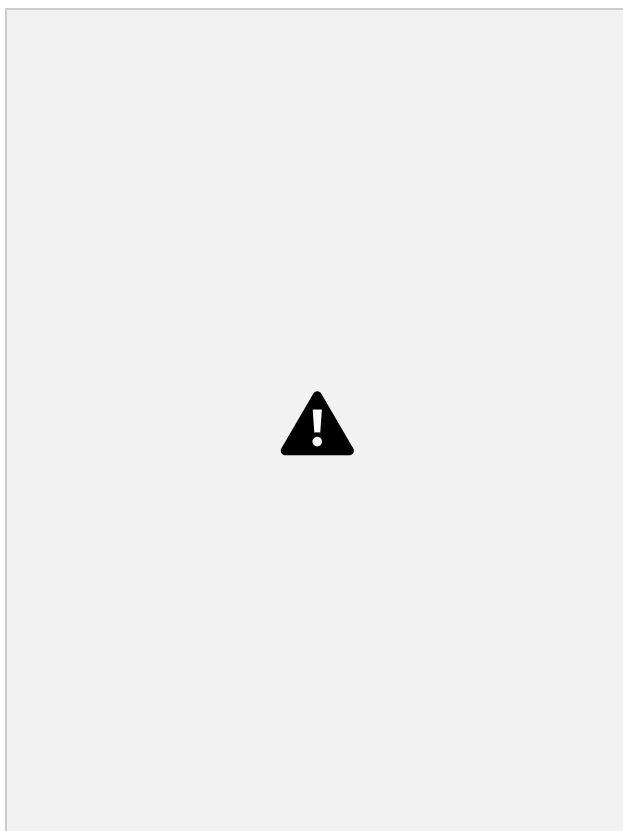
**Figure 7: Cherokee Dam Spillway Gate**

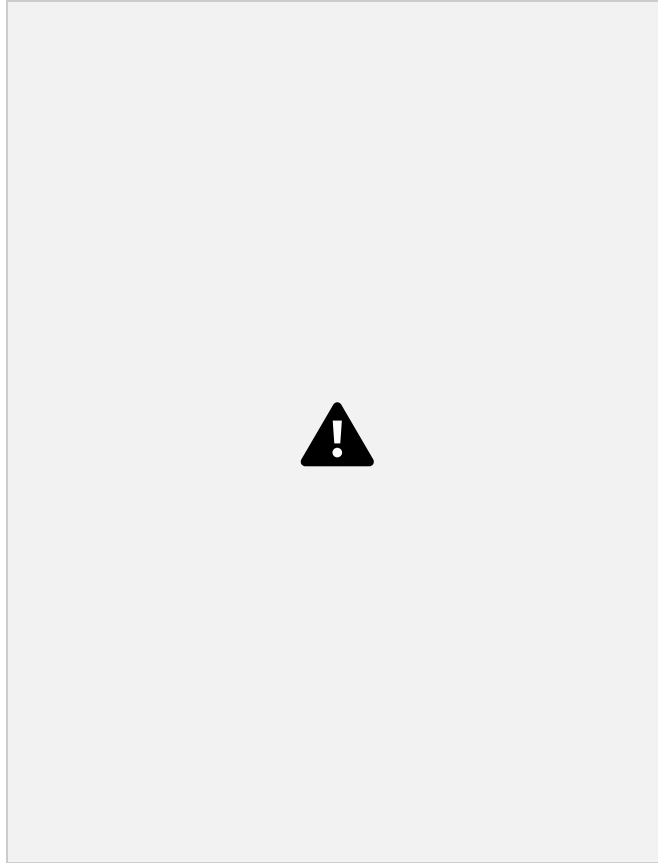




**Figure 8: Lake Thunderbird Upstream erosion**

7 of 8





**Figure 9: Lake Thunderbird Spillway**

# APPENDIX B

## OLSSON INSPECTION REPORT

Sequoyah Dam

Created 2023-11-29 08:27:03 CST by FTN TAB30 Updated 2023-12-04 13:23:52 CST by FTN

TAB30 Location 36.29953577, -91.5286733026

Name of Dam Sequoyah Dam

ARNUM 00249

Inspection Type Training

Date 2023-11-29

Time 08:27

Inspector of Record Betsy Waugh



Signature

Signed 2023-11-29 14:27:48 CST

Additional Parties On Site (Role) Jeremy Brooks trainer, George Robinson trainee. Betsy Waugh trainee Weather Clear / Sunny

Temperature (F) 32-40

Wind Speed Calm / still

### Crest

Describe the vegetation on the crest. (Check all that apply)

Recently mowed No

Trees of other inappropriate or excessive vegetation ?

Other cover (pavement, gravel, etc), Good vegetative cover,

Is there a driveway or road on crest? Yes - Paved Road (Public Access)

If yes, describe (type, size, location, materials, general condition))

HMA Pavement surface cracking typical of age.

Are there any cracks, depressions, ruts, or holes on crest?

No

Additional Observations HMA roadway has wearing cracks expected for age Page: 1 of 8



Crest Photos

Paved public access

Corrective Action Required - Crest No - Conditions Acceptable

## Upstream Slope

Reservoir Level Below Normal Pool

If Above or Below Normal Pool; Approx. feet above or below Normal Pool

-1.5

Describe the vegetation on the upstream slope. (Select all that apply)

Sparse vegetative cover, Other cover (pavement, gravel, etc) Yes

Trees or other inappropriate vegetation on the Upstream Slope ?

If yes, describe vegetation (veg type, size, location, etc)

Isolated woody vegetation near typically near waterline

Depressions, bulges, ruts or holes? Yes - Ruts

If yes, describe features (type, size, location, etc.) ~~Multiple areas of historic erosion~~

Eroded areas on the slope? Yes

If yes, describe erosion ( size, area, location, severity, etc.)

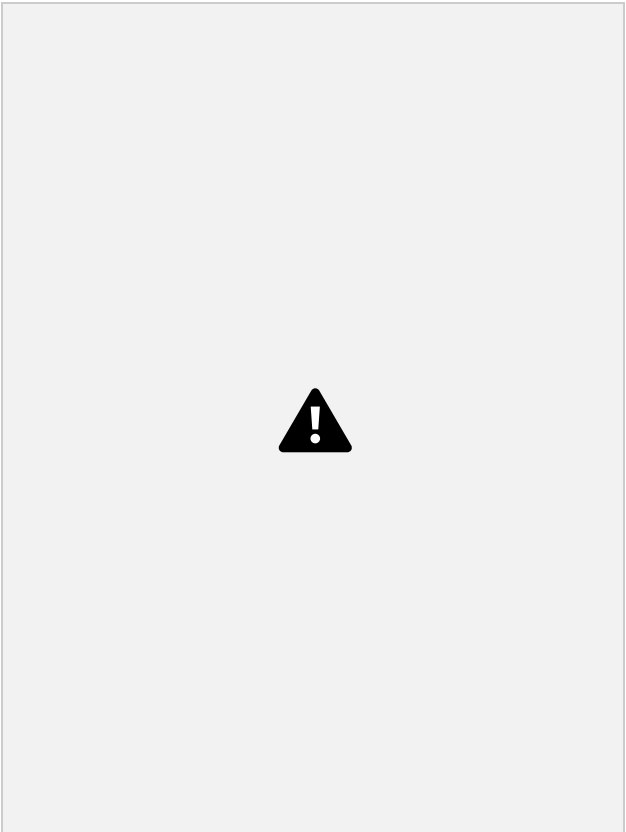
established vegetation

Multiple areas of historic erosion generally filled with rock or

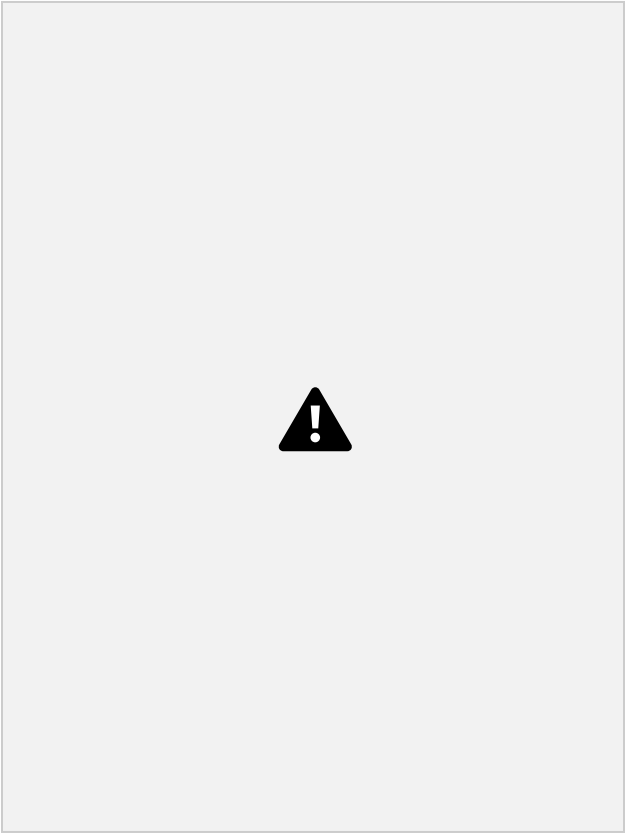
Cracks, sloughs or slides? No Slope protection? Yes

If yes, describe what type of protection and its condition (riprap-adequate) Rip rap

Additional Observations - Upstream Historic erosion on slopes, active wave action with erosion at the water line Upstream Slope Photos



Isolated woody vegetation at shoreline



historic erosion

Corrective Action Required - Upstream Slope ~~Yes~~ ~~Routine Maintenance Needed~~  
Upstream Slope Corrective Action Notes Riprap repairs

Downstream Slope

Describe the vegetation on the Downstream Slope. (Check all that apply)

Trees or other inappropriate vegetation on the Downstream Slope? Recently mowed, Good vegetative cover Yes

If yes, describe the (type, size, location, etc.) ~~Isolated woody vegetation on slopes~~

Depressions, bulges, ruts or holes on the Downstream Slope? Yes - Depression, Yes - Bulge, Yes - Hole

If yes, describe (type, size, area, location, etc.) ~~Multiple historic scarps and erosion reels, seeps~~

Eroded areas on the downstream slope? Yes

If yes, describe ( size, area, location, severity, etc.) ~~Stabilized erosion rills~~

Cracks, sloughs or slides on the downstream slope? Yes - Sloughs, Yes - Slides

If yes, describe ( length, width, height, location etc.) ~~Crest - 20', continuous across top~~

Wet areas or areas of hydrophilic vegetation? ~~Yes~~

If yes, describe ( size of area, location, etc.) At all seep locations Wet areas indicating seepage? Yes

If yes, describe (new area, size of area, location, etc.) appears at rock layer seams

Continuous across the top, East groin and west abutment and groin.

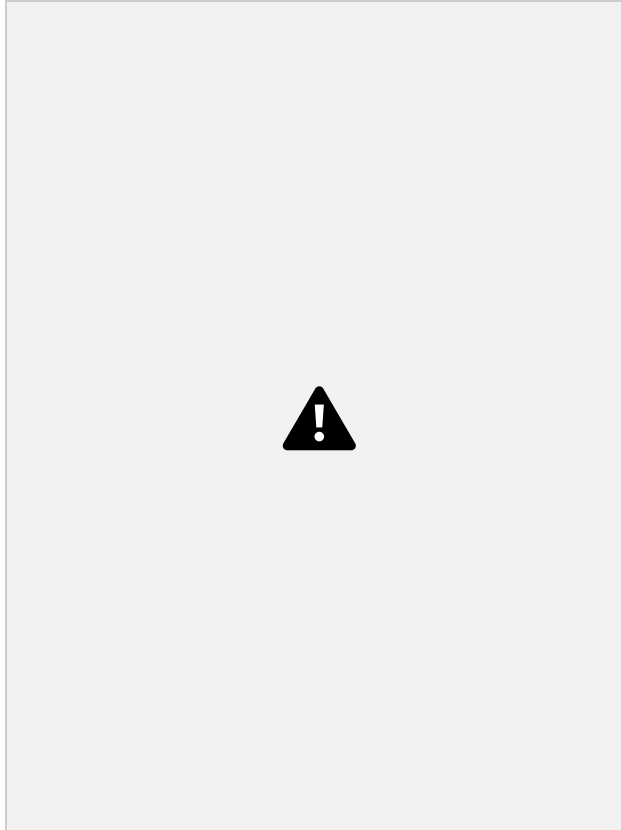
Leaks from the slope or toe of the dam? Yes

If yes, describe (location, rate of flow, turbidity of flow, etc.) generally clear

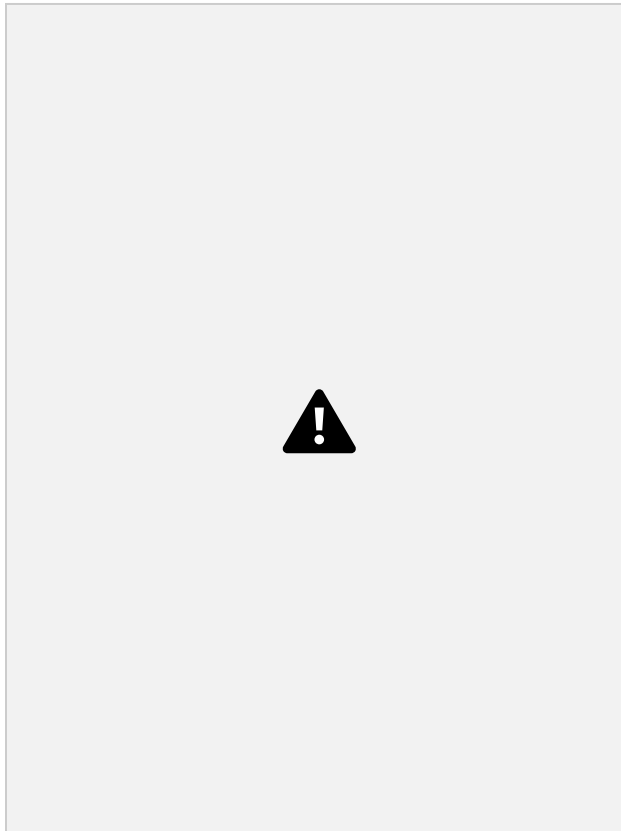
East side gallons per hour, west side gallons per minute. Turbidity

Additional Observations - Downstream Seepage in west groin appears focused in rock strata Downstream Slope Photos





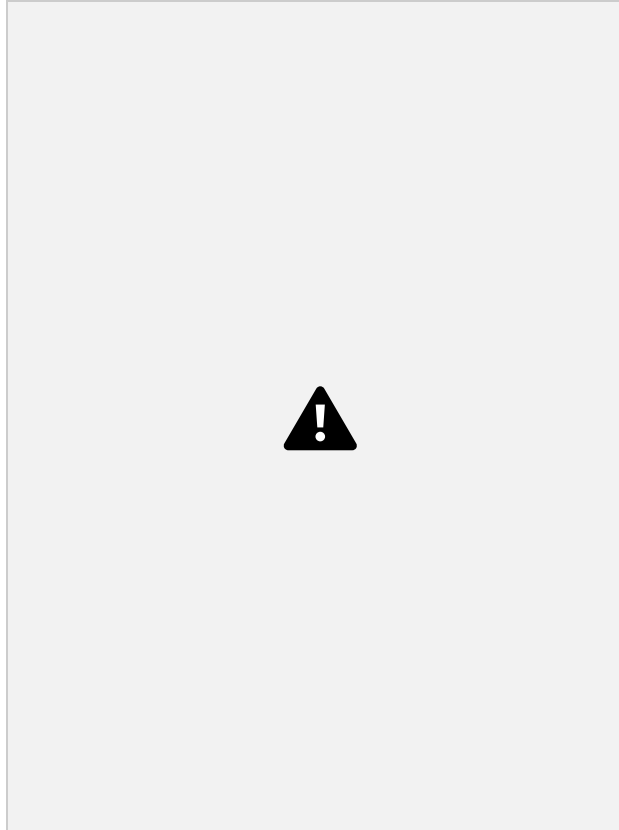
Belly in downslope at midway of dam



Notice toe of dam with heavy vegetation



Sloughs and sliding, erosion rolls historic but not stabilized



Corrective Action Required - Downstream Slope ~~Yes~~ ~~Routine Maintenance Needed~~  
Downstream Slope Corrective Action Notes ~~Fill holes as routine maintenance coordinate with engineer regarding additional improvements or modifications~~

## Principal and Emergency Spillways

Types of Spillways (outlets) present (Select all that apply) Low Level Drawdown Structure, Primary Spillway

Primary Spillway Type Corrugated Metal Pipe, Concrete Channel, Earthen Channel For pipes, is inlet obstructed?

Unable to assess, inlet submerged For pipes, condition of trash racks Unable to assess, inlet submerged Are

Valves or Control Structures Present Yes

For pipes, condition of valves N/A

If Operable date of last operation, if inoperable describe condition missing valve operator handle

Two valves present only one functional operated 11/29/2023 other

For pipes, any visible cracks, separations or holes? ~~No~~

For pipes, are any leaks present? No

For pipes, overall condition? Normal, unable to assess

For channels, is the entrance obstructed No

For channels, describe vegetation in the spillway ~~None Concrete~~

For channels, any inappropriate vegetation in the channel?

If yes, describe type of vegetation size, location, etc. woody vegetation in lower channel some grass in cracks of concrete sections  
Yes

For channels, eroded areas? Yes

If yes, describe (size of area, location, severity, etc.) ~~Erosion in pockets of fractured concrete and top of bank~~ Page: 7 of 8

For concrete channels, any leaks? Yes

If yes, describe (location, severity, rate of flow, etc.) ~~Water disappearing at concrete crack~~

For channels, overall condition? Deteriorated

Additional Observations - Spillways break away wooden weir appears incorrectly fabricated Spillway Photos



Corrective Action Required - Spillways Yes - Routine

Maintenance Needed

Spillway Corrective Action Notes Maintenance where erosion at East end of wire

#### Instrumentation

Does the dam have any other monitoring devices? ~~No~~



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**APPENDIX D**  
**TOPOGRAPHIC SURVEY**

OWNERSHIP TABLE: P1. LOT 8, BLOCK 3

OWNERSHIP TABLE: P18. LOT 7, BLOCK 2

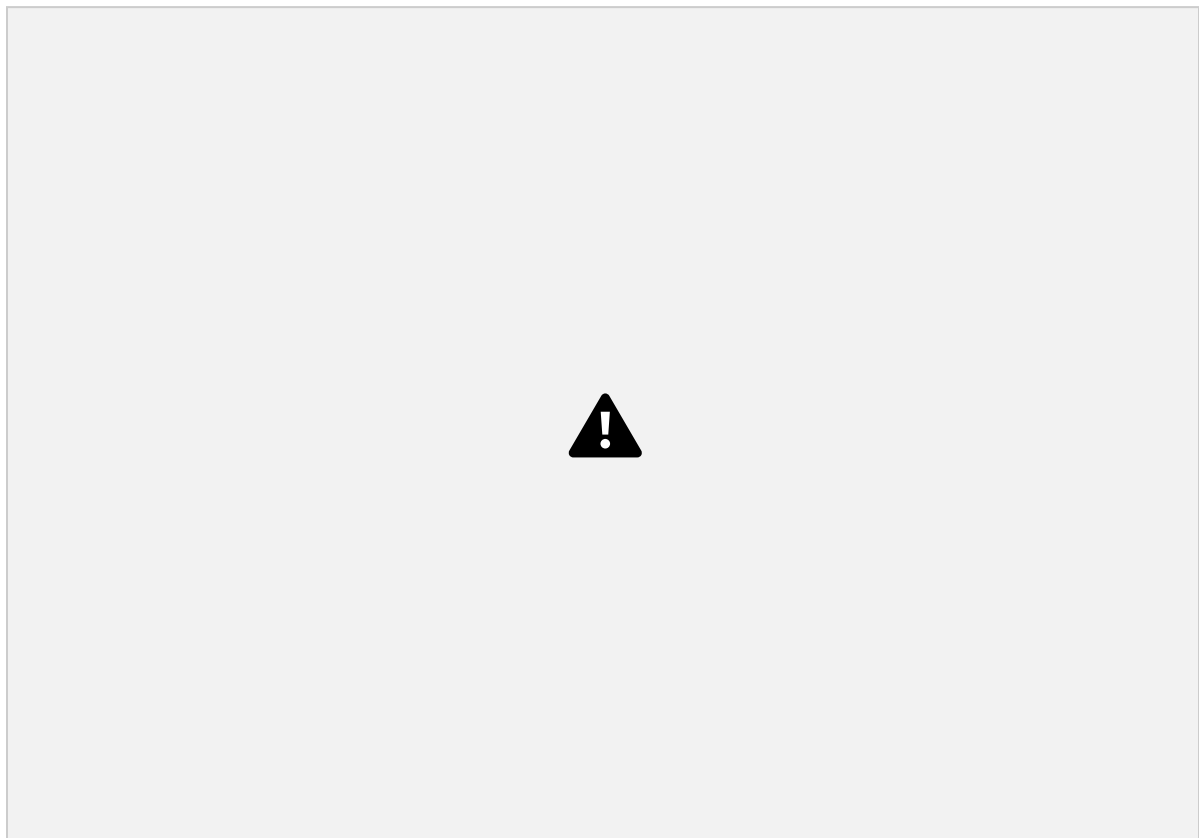
OWNERSHIP TABLE:

P34. LOT H, BLOCK 16

Topographic Survey Lake Sequoyah,  
Dam Assessment

POINT # NORTHING EASTING ELEVATION FULL DESCRIPTION Cherokee  
Village, Arkansas

VICINITY MAP (NOT TO SCALE)



WEST LAKE ESTATES FIRST ADDITION  
EAST LAKE ADDITION

RIBEIRO HORLANDINO NETO  
OJIBWAY FOURTH ADDITION PETTUS-WATERS LIVING TRUST  
BRENDA YAGER, CHRISTINE MCNULTY  
1 716044.12 1451154.97 483.710 2" ALUMINUM MONUMENT ON 5/8" REBAR - STATION 0+78.45,  
41.44' RT  
NO AVAILABLE STREET ADDRESS CHEROKEE VILLAGE, ARKANSAS 72529 PARCEL ID:  
324-00023-000  
& BRIGITTE WILSON 108 E LAKESHORE DRIVE  
127 IROQUOIS DRIVE  
CHEROKEE VILLAGE, ARKANSAS 72529 PARCEL ID: 278-00343-000  
104 715383.41 1450284.34 494.625 MAG NAIL  
P2. LOT 9, BLOCK 3  
CHEROKEE VILLAGE, ARKANSAS 72529  
PARCEL ID: 252-00062-000  
P35. LOT 34, BLOCK 7  
1451052.71 483.35 2" ALUMINUM MONUMENT ON 5/8" REBAR - STATION -0+50

T

WEST LAKE ESTATES FIRST ADDITION  
P19. LOT 8, BLOCK 2  
OJIBWAY SECOND ADDITION  
RIBEIRO HORLANDINO NETO NO AVAILABLE STREET ADDRESS CHEROKEE VILLAGE,  
ARKANSAS 72529  
EAST LAKE ADDITION LORI ADKINS  
106 E LAKESHORE DRIVE  
PAUL LAURA SCARBROUGH 125 IROQUOIS DRIVE  
CHEROKEE VILLAGE, ARKANSAS 72529

## CONTROL POINT TABLE

OFF-SITE

AREA SITE

19

PARCEL ID: 324-00023-000 P3. LOT 10, BLOCK 3

CHEROKEE VILLAGE, ARKANSAS 72529  
PARCEL ID: 278-00234-000  
PARCEL ID: 252-00063-000  
P36. LOT 33, BLOCK 7

P20. LOT 9, BLOCK 2  
H & H PROPERTIES INVESTMENT CORPORATION  
EAST LAKE ADDITION  
OJIBWAY SECOND ADDITION DESTINEY GREENE

**N** Fayetteville, AR 72703

olsson.com

NO AVAILABLE STREET ADDRESS CHEROKEE VILLAGE, ARKANSAS 72529 PARCEL ID:  
324-00024-000  
XRP LAND GROUP LLC & STATE OF ARKANSAS 2023  
123 IROQUOIS DRIVE  
CHEROKEE VILLAGE, ARKANSAS 72529 PARCEL ID: 278-00233-000  
TEL 479.443.3404 FAX 479.443.4340

P4. LOT 11, BLOCK 3  
CHEROKEE VILLAGE, ARKANSAS 72529  
PARCEL ID: 252-00064-000  
P37. LOT 11, BLOCK 11  
150007150008

MAG NAIL - STATION 14+50  
Olsson - Survey Arkansas COA #1010  
WEST LAKE ESTATES FIRST ADDITION  
P21. LOT 10, BLOCK 2  
OJIBWAY SECOND ADDITION  
G H FAMILY TRUST  
EAST LAKE ADDITION  
PATTI M & GARRY W SCALF  
150009  
2" ALUMINUM MONUMENT ON 5/8" REBAR - STATION 12+00

**F C O T O I**  
**C E R T I F I C A T E**  
**F A U H R A T O I N**

27 IROQUOIS CIRCLE  
CHEROKEE VILLAGE, ARKANSAS 72529 PARCEL ID: 324-00025-000

P5. LOT 7, BLOCK 3  
SALLY MAE SEAVER & LALONDE REX BELL  
NO AVAILABLE STREET ADDRESS  
NO AVAILABLE STREET ADDRESS  
CHEROKEE VILLAGE, ARKANSAS 72529  
CHEROKEE VILLAGE, ARKANSAS 72529  
PARCEL ID: 278-00297-001  
PARCEL ID: 252-00065-000  
150011  
716035.05 MAG NAIL - STATION 2+00

**R - 05 - W**

WEST LAKE ESTATES FIRST ADDITION  
P22. LOT 11, BLOCK 2

**N S I**  
**A R K A S E N G N E E R**

LAND OF LAND INC.  
NO AVAILABLE STREET ADDRESS CHEROKEE VILLAGE, ARKANSAS 72529 PARCEL ID:  
324-00022-000

P6. LOT 6, BLOCK 3  
EAST LAKE ESTATES ADDITION FREDERICK TRAN  
NO AVAILABLE STREET ADDRESS CHEROKEE VILLAGE, ARKANSAS 72529 PARCEL ID:  
252-00066-000

P23. LOT 1, BLOCK 1

B<sup>Y</sup>  
WEST LAKE ESTATES FIRST ADDITION  
EAST LAKE ADDITION  
DAVID L GRUGER & DEBORAH A GRUGER

76 W LAKESHORE DRIVE CHEROKEE VILLAGE, ARKANSAS 72529 PARCEL ID: 324-00021-000

P7. LOT 5, BLOCK 3  
CHEROKEE SUB IMP DIST #1 NO AVAILABLE STREET ADDRESS CHEROKEE VILLAGE,  
ARKANSAS 72529 PARCEL ID: 252-00001-000

P24. LOT 2, BLOCK 1  
1. Horizontal coordinates are based on NAD83 (2011)(Epoch: 2010.0000), State Plane Coordinate  
System,  
WEST LAKE ESTATES FIRST ADDITION  
CRAIG LYONS  
NO AVAILABLE STREET ADDRESS CHEROKEE VILLAGE, ARKANSAS 72529 PARCEL ID:  
324-00020-000

P8. LOT 4, BLOCK 3  
EAST LAKE ADDITION CHEROKEE SUB IMP DIST #1 NO AVAILABLE STREET ADDRESS

CHEROKEE VILLAGE, ARKANSAS 72529 PARCEL ID: 252-00002-000

P25. PT OF LOT 3, BLOCK 1

2. ~~Elevations are based on~~ NAVD 88 (Geoid18) as determined through GNSS observation and OPUS 3.

~~Top of Water Elevation of Lake Sequoyah~~ was measured at 1:55pm, April 23, 2025. Top of Water  
Elevation in the

## DESCRIPTION REVISIONS

WEST LAKE ESTATES FIRST ADDITION

**\*\*SEE SHEET 2 OF 2 FOR TOPOGRAPHIC SURVEY DRAWING\*\***

2025

LAND OF LAND INC.

NO AVAILABLE STREET ADDRESS CHEROKEE VILLAGE, ARKANSAS 72529 PARCEL ID:  
324-00019-000

P9. LOT 3, BLOCK 3

EAST LAKE ADDITION CHEROKEE SUB IMP DIST #1 NO AVAILABLE STREET ADDRESS  
CHEROKEE VILLAGE, ARKANSAS 72529 PARCEL ID: 252-00003-000

P26. PT OF LOT 3 & LOT 4, BLOCK 1

4. Fully submerged areas of Lake Sequoyah were surveyed using a Sonarmite Single Beam Echo  
Sounder and

### GENERAL NOTES:

5. Fully submerged areas of Lake Cherokee are based on conventional survey methods but must be  
verified by Arkansas North Zone, U.S. survey feet as determined through GNSS observations and OPUS

Post-Processed

WEST LAKE ESTATES FIRST ADDITION

Solution.

GEORGE B & KAREN SCHULTZ NO AVAILABLE STREET ADDRESS CHEROKEE VILLAGE,  
ARKANSAS 72529 PARCEL ID: 324-00018-000

P10. LOT 2, BLOCK 3

EAST LAKE ADDITION

PATRICK E & PATSY A ROBINSON TRUST 114 E LAKESHORE DRIVE CHEROKEE VILLAGE,  
ARKANSAS 72529 PARCEL ID: 252-00004-000

P27. LOT 5, BLOCK 1

6. The boundary and lot lines shown for this Topographic Survey are approximate in location and being  
based on

Post-Processed Solution.

7. Field data was gathered by conventional surveying methods and from LiDAR data collected by high  
precision Spillway was measured at 2:15pm, April 23, 2025.

DATE

WEST LAKE ESTATES FIRST ADDITION

JERRY DAWSON

NO AVAILABLE STREET ADDRESS CHEROKEE VILLAGE, ARKANSAS 72529 PARCEL ID:

324-00017-000

P11. LOT 1, BLOCK 3

EAST LAKE ADDITION BRUCE A & SUZANNE U FEENEY TRUST 116 E LAKESHORE DRIVE  
CHEROKEE VILLAGE, ARKANSAS 72529 PARCEL ID: 252-00005-000

P28. LOT 6, BLOCK 1

underwater contours are based on survey soundings and are not based on conventional survey methods.

5. Olsson and the surveyor of record do not guarantee that all underground utilities, whether active or  
abandoned,

conventional resurvey methods under dry conditions to be accurately relied upon for future material  
placement and earth quantity calculations.

REV NO

WEST LAKE ESTATES FIRST ADDITION  
EAST LAKE ADDITION  
BRADLEY A & VICKIE L ARMSTRONG

F:\2025\00001-00500\025-00244\40-Design\Survey\SRVY\Sheets\V\_SURVEY\_02500244.dwg<sup>9</sup> DATE:

Nov 07, 2025 2:55pm USER: sroper<sup>2</sup>  
& JOSHUA HOPPER

NO AVAILABLE STREET ADDRESS CHEROKEE VILLAGE, ARKANSAS 72529 PARCEL ID:  
324-00016-000

P12. LOT 1, BLOCK 2

EAST LAKE ADDITION SCOTT FRANKHOUSER NO AVAILABLE STREET ADDRESS CHEROKEE  
VILLAGE, ARKANSAS 72529 PARCEL ID: 252-00056-000

P13. LOT 2, BLOCK 2

EAST LAKE ADDITION SCOTT FRANKHOUSER NO AVAILABLE STREET ADDRESS CHEROKEE  
VILLAGE, ARKANSAS 72529 PARCEL ID: 252-00057-000

P14. LOT 3, BLOCK 2

EAST LAKE ADDITION PAUL F GOTTSCHALK 3 DOGWOOD CIRCLE  
CHEROKEE VILLAGE, ARKANSAS 72529 PARCEL ID: 252-00058-000

P15. LOT 4, BLOCK 2  
EAST LAKE ESTATES ADDITION SCOTT FRANKHOUSER  
BRUCE A & SUSANNE U FEENEY TRUST NO AVAILABLE STREET ADDRESS CHEROKEE  
VILLAGE, ARKANSAS 72529 PARCEL ID: 252-00006-000

P29. LOT 7, BLOCK 1  
EAST LAKE ADDITION DOROTHY KEIFER  
120 E LAKESHORE DRIVE CHEROKEE VILLAGE, ARKANSAS 72529 PARCEL ID: 252-00007-000

P30. LOT 8, BLOCK 1  
EAST LAKE ADDITION ROY R SMITH  
122 E LAKESHORE DRIVE CHEROKEE VILLAGE, ARKANSAS 72529 PARCEL ID: 252-00008-000

P31. LOT 9, BLOCK 1  
EAST LAKE ADDITION DEBRA B BREWI  
124 E LAKESHORE DRIVE CHEROKEE VILLAGE, ARKANSAS 72529 PARCEL ID: 252-00009-000

P32. LOT 10, BLOCK 1  
EAST LAKE ADDITION CRISTINE & RYAN D WRIGHT

46<sup>7</sup>

## INSET "A" - KARST AREA TOPOGRAPHY

0' 20'10"  
SCALE IN FEET

Karst  
(typical)

45<sup>0</sup>

45<sup>3</sup>

45<sub>4</sub>

limited corner search and monumentation, and are not suitable to be utilized for property line determinations, easement descriptions, or partial property acquisitions.

6. The purpose of this Topographic Survey is to locate visible surface improvements and bare earth

contours as CHEROKEE VILLAGE, SHARP COUNTY, ARKANSAS<sup>S</sup>



LiDAR sensors mounted to an Olsson UAV platform. The horizontal and vertical positional accuracies for this Topographic Survey was made in accordance with current model standards for Topographic Surveys as

Part of Section 16 & Part of Section 17, T19N, R5<sup>W</sup>  
published by the National Society of Professional Surveyors (NSPS).

## LAKE SEQUOYAH, DAM ASSESSMENT<sup>T</sup>

are shown on this Topographic Survey. Furthermore, Olsson and the surveyor of record does not warrant that

the underground utilities depicted are precisely located. No physical verification of underground utilities has been performed. If exact underground utility locations are required, they must be verified and confirmed by field

potholing the utilities. Olsson and the surveyor of record assume no liability for the accuracy of

## underground utility TOPOGRAPHIC SURVEY<sup>Y</sup>

locations being depicted or for any omission of unobserved utilities and/or structures. Utilities were requested to be located and marked per the Arkansas 811 One-call System, Ticket number 250319-0262.

those currently exist. Bearings and distances have not annotated along any boundary or lot lines and this Topographic Survey does not constitute a boundary survey.

## CERTIFICATE OF SURVEY AND ACCURACY

5 DOGWOOD CIRCLE

CHEROKEE VILLAGE, ARKANSAS 72529 PARCEL ID: 252-00059-000

126 E LAKESHORE DRIVE CHEROKEE VILLAGE, ARKANSAS 72529 PARCEL ID: 252-000010-000

455

45<sub>6</sub>

45<sub>7</sub>

450

43<sup>5</sup>

That I, Keith A. Sikes, do hereby certify that this Topographic Survey project was completed under my direct supervision from an

P16. LOT 5, BLOCK 2

P33. LOT 11, BLOCK 1

45<sup>2 46</sup><sub>0</sub>

44<sup>5</sup>

43<sub>8</sub>

actual ground survey of the land made under my supervision; that the ground and airborne survey were completed at the 95 percent confidence level to meet Federal Geographic Data Committee Standards;

that this survey was preformed to meet Arkanas Standards  
EAST LAKE ESTATES ADDITION TOMMY J & BILLIE GAIL DUNLAP 7 DOGWOOD CIRCLE  
CHEROKEE VILLAGE, ARKANSAS 72529  
EAST LAKE ADDITION  
ASHLEY PROPERTIES, LLC & ABIDE WELL, LLC 128 E LAKESHORE DRIVE  
CHEROKEE VILLAGE, ARKANSAS 72529

46<sub>0</sub>

46<sup>5</sup>

46<sup>1</sup>

44<sup>6</sup> 44<sup>4</sup>

43<sup>2</sup>

of Practice of for Property Boundary Survey and Plat where applicable. The airborne LiDAR data was collected on March 4, 2025. Conventional survey data was collected on March 11, 12, 24-27, and April 22, 23, 2025.

1-2

PARCEL ID: 252-00060-000

P17. LOT 6, BLOCK 2

EAST LAKE ESTATES ADDITION BERNADETTE M EBERLE 9 DOGWOOD CIRCLE

CHEROKEE VILLAGE, ARKANSAS 72529 PARCEL ID: 252-00061-000

PARCEL ID: 252-000011-000

45<sub>9</sub>

44<sup>0</sup>

11.07.2025

drawn by: designed by: project no.: date:

SBR

KAS

025-0024411.07.2025

Keith A. Sikes, AR PS 1507 Date

**SHEET**

Olsson Associates, AR COA 1010 ksikes@olsson.com

STATE PLAT CODE: 500-19N-05W-0-16-304-67-1507 of

STATE PLAT CODE: 500-19N-05W-0-17-102-67-1507

**Topographic Survey-LEGEND OF**

**SYMBOLS & ABBREVIATIONS** West Lake Addition

FO  
Found 3/8" Rebar  
Lot 34,  
Block 2

# Lake Sequoyah, Dam Assessment Cherokee Village, Arkansas

CONTROL POINT FOUND MONUMENT (AS NOTED)  
SD UNDERGROUND STORM-SEWER LINE

P-O<sub>-</sub>H

P-O<sup>H</sup>

W LAKESHORE DRIVE<sup>E</sup> Lot 35,

P-O<sup>H</sup>  
Block 2  
Lot 32,  
Block 1  
ELECTRIC METER<sup>EM</sup>

POWER POLE

GUY WIRE

BENCH

BENCH

W<sup>W</sup> UNDERGROUND WATER LINE<sub>2</sub> P-O<sup>H</sup> OVERHEAD POWER LINE MAJOR CONTOUR LINE

460

COMM<sub>A</sub> NCH<sub>E</sub> C<sub>I</sub> RC<sub>I</sub> LE

TP

IROQUOIS CIRCLE<sup>E</sup>  
COMMACHE DRIVE<sub>I</sub><sup>E</sup>

P-O<sub>-</sub>H

P1

Lake Cherokee

PICNIC TABLE

MAILBOX

FIBER OPTIC PEDESTAL<sup>FO</sup>

MINOR CONTOUR LINE

R/W  
RIGHT-OF-WAY LINE

Lot 33,  
TELEPHONE PEDESTAL<sup>-TP</sup>

LOT LINE

Buried Cable Sign

P5

450

Block 1

FO  
FO

420

WATER MANHOLE

WATER METER WATER VALVE

TIMBERLINE

FL FLOW LINE CP CONTROL POINT

3537 North Steele Boulevard

P2

Found 1/2" Open Top Pipe

420

FIRE DEPT. CONNECTION

CMP CORRUGATED METAL PIPE Suite 310

P<sub>2</sub>O<sub>2</sub>H<sub>2</sub>

P11

Found 1/2" pipe

SIGN (AS NOTED)

POINT #

Fayetteville, AR 72703

455

450

BOLLARD

NORTHING

ASPHALT SURFACE

olsson.com

TEL 479.443.3404

716044.1200

1

FAX 479.443.4340

460

P3

P6

TP

Buried Cable Sign

P<sub>2</sub>O<sub>2</sub>H<sub>2</sub>

CONCRETE SURFACE

100

715941.5670

Olsson - Survey

101

Arkansas COA #1010

Found 1/2" Rebar

46<sub>5</sub>

Found 1" Pinched  
Top Pipe  
P7

Found 1/2" Rebar  
P10

45<sup>0</sup> 44<sup>5</sup> 45<sup>5</sup> 46<sup>0</sup> 42<sup>5</sup> 43<sup>5</sup>

P<sub>H</sub>

715864.3940  
FULLY SUBMERGED AREA 102  
715906.8110

103  
715619.3570

TP  
470

Gravel Trail

44<sup>0</sup>

104

P4

Found 1" Pinched  
Top Pipe  
P8  
P9

43<sup>0</sup>

Marsh Area  
715383.4090 105

716498.6320

Found 1" Open Top Pipe

47<sub>5</sub>

Grouted

Discharge

Found 1/2" Spillway Pinched Top Pipe

Found 1" Pinched  
Top Pipe

Karst Area

P-O<sub>H</sub>

DOGWOOD CIRCLE

106

715623.5060 107

716417.7290 108

715796.7970

P-O<sub>H</sub>

Stacked Wood 1"x12"s

(See Inset "A")

Vertical Datum 109

B<sup>Y</sup>

-0+5<sub>0</sub>

Breakaway Weir

<sub>FO</sub>

Vertical Datum is NAVD 88 (Geoid18).

716038.2670

Top Elev: 478.40

<sub>TP</sub>

110

Median Sign

Top Water Elev: 478.5

0+0<sub>0</sub>

43<sub>0</sub>

9' Flat Bottom

46<sup>5</sup>46<sup>0</sup>

Concrete Drainage

60" Steel Tank (Possible Water Well Intake)

Elevations being Benched from Control Monument 1

716193.2820716135.9900

(April 23, 2025) w

B<sub>er</sub>m

Channel

44<sup>0</sup>  
N: 716044.120 E: 1451154.967  
111 715982.4970

112  
Conc. Steps  
W  
24" CMP  
30'0' 60' 120'  
Elevation: 483.71  
Buried Cable Sign

1+0<sub>0</sub>

WM<sup>W</sup>FO  
FO

FL=468.9

5<sup>5</sup>  
45 44<sup>5</sup>

Bridge, Bottom

42<sub>5</sub>

43<sub>0</sub>

SCALE IN FEET

P.OH  
Do Not Enter Sign  
Elev: 476.1

2+0<sub>0</sub>

24" CMP

43<sub>5</sub>

44<sub>0</sub> 43<sub>5</sub>

6" Steel Pipe Post (Typ)

P22

P12

DESCRIPTION REVISIONS

Yield Sign

23LF x 12.3' W x 8'H  
FL=468.6

3+0<sub>0</sub>

D  
Ditch

45<sub>0</sub>

44<sub>5</sub>

43<sup>5</sup>

P-O<sub>H</sub>

-2025

W

Triple Box Culvert  
Control Monument 1  
Bridge (39'L x 23'W)  
Bottom Elev: 476.6

48<sup>0</sup>

P-O<sup>H</sup>

W

WM

S

460

483.9

45<sup>5</sup>

47<sup>0</sup>

46<sup>5</sup>

48<sup>0</sup>

47<sup>5</sup>

48<sup>0</sup>

47<sup>5</sup>

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48<sup>0</sup>

47<sup>5</sup>

E LAKESHORE DRIVE



~~Boulder, Barrier (Typ)~~

Boulder, Barrier (Typ)

(14' ASPHALT)

Wooden Private-Lake Sign

Boat Deck

~~460~~ - ~~455~~
$$\frac{6+\theta}{\theta}$$

6" Steel Pipe Post (Typ)

P19

Found 1/2" Rebar

~~465~~ ~~483.5~~ SLOPE

## Wooden Sequoyah Lake Sign

11.07.2025

Wooden Lake Requirements sign

3.4

$$\frac{8+\theta}{\theta}$$

46<sup>5</sup>  
Found 1/2"  
P15

43<sup>5</sup>  
9+0  
0

Pinched Top Pipe  
P16  
P17

43<sup>5</sup>

## OFF-SITE AREA

Top Water Elev: 478.5 (April 23, 2025)

45<sup>0</sup>  
483.8 10+0  
0

P.O.  
Found 1/2" Rebar  
(Sitz 1497)  
WM  
P18

CHEROKEE VILLAGE, SHARP COUNTY, ARKANSAS

Part of Section 16 & Part of Section 17, T19N, R5<sup>W</sup>

Speed Limit Sign  
P34  
Buried Cable Sign

LAKE SEQUOYAH, DAM ASSESSMENT

P.O.  
FO  
Yield Sign

P.W.  
Found 1/2" Rebar

AR Hwy 175 - Iroquois Driv<sup>e</sup> 23' Asphalt P34

43<sup>5</sup>

44<sup>0</sup>  
Wooden Boat Dock

Gravel

11+0  
0

W  
WM  
Street Sign

0' 50'25"  
SCALE IN FEET  
Found 1/2" Rebar

Found 1/2" Rebar (Cap stamped PLS 1487)

R<sup>W</sup>  
44<sup>5</sup>

45<sup>5</sup>  
W  
12+0  
0

P-OH  
Buried Cable Sign Street Sign 13+0  
0  
P-O<sub>-</sub>H

SEQUOYAH RIDGE ROAD<sup>D</sup> FO

## TOPOGRAPHIC SURVEY<sup>Y</sup>

F:\2025\00001-00500\025-00244\40-Design\Survey\SRVY\Sheets\V\_SURVEY\_02500244.dwg<sup>g</sup> DATE:

Nov 07, 2025 2:56pm USER: sroper<sup>2</sup>  
CP 104

Found 1/2" rebar  
FO  
(busted through blue cap)  
Lake Sequoyah

46  
0

EM  
BENCH  
BENCH  
P23  
FO

14+0  
0

14+5  
0


Lake Thunderbolt  
id


Hazard Sign

22 LF x 18' W x 14' H  
Box Culvert

Bottom Elev: 474.0  
EM

~~Hazard Sign~~  
BENCH  
P24  
P25

  
P-OH  
Hazard Sign  
~~18" RCP~~  
~~FL=485.2~~  
  
P35  
P26

~~Channel~~  
Found 1/2" Rebar (Blue cap  
no markings)  
~~2-2~~  
18" RCP  
WM  
 Hazard Sign  
Found 1/2" Rebar  
FL=488.4

Water Meter

P36

AR Hwy 175 - Iroquois Drive<sup>e</sup> 23' Asphalt

P-OH  
P-OH  
Found 1/2" Rebar  
(faded cap)

Found 3/8" Rebar  
P27

P28

WM FoEM WM

(illegible cap)

R/W

P29 P30 P31

drawn by: designed by:

SBRKAS

R/W

Found 3/8" Rebar

P32

project no.: date:

025-0024411.07.2025

Found 1/2" Rebar

P37

P33

**SHEET**

of



## **SEQUOYAH LAKE SPILLWAY AND DAM ASSESSMENT**

Cherokee Village Suburban Improvement District No.1, Cherokee Village,  
Arkansas November 2025

Olsson Project No. 025-00244