

<b>Assistance Requesting:</b>		
<input type="checkbox"/> FMA (Flood Mitigation Assistance) <input type="checkbox"/> BRIC (Building Resilient and Infrastructure Communities) <input type="checkbox"/> HMGP (Hazard Mitigation Grant Program) If HMGP: FEMA-DR-#		
<b>Community Information:</b>	<b>Community NFIP Status:</b>	
<input type="checkbox"/> CRS Community ID #: _____  <input type="checkbox"/> Conforms to Local Mitigation Plan <input type="checkbox"/> State or Local Government <input checked="" type="checkbox"/> Private Non-Profit  <input type="checkbox"/> In Good Standing <input type="checkbox"/> Project Pre-Identified in Local Plan <input type="checkbox"/> Declared Area (HMGP only)	<input type="checkbox"/> Conforms to State Mitigation Plan <input type="checkbox"/> Participating <input type="checkbox"/> Non-Participating	
<b>Building Codes:</b>	<b>Primary Community Lifeline Utilized:</b>	
<input type="checkbox"/> Adopted the building codes consistent with the international codes? (fuel) Year of Building Code: Building Code Name:  <input type="checkbox"/> Building codes been assessed on the Building Code Effectiveness Grading Schedule?	<input type="checkbox"/> Safety and Security <input type="checkbox"/> Food, Water, Shelter  <input type="checkbox"/> Health and Medical <input type="checkbox"/> Energy (power grid),  <input type="checkbox"/> Communications (911, Dispatch) <input type="checkbox"/> Transportation (Highway/Roadway) <input type="checkbox"/> Hazardous Material (HAZMAT)	
<b>For state use only:</b>		
Date Pre-Application Received		
State Reviewer	Signed	Date

This worksheet is for all Hazard Mitigation Assistance programs for drainage improvement proposals. Please complete ALL sections and provide the requested documents. If you require technical assistance with this document, please contact the Hazard Mitigation Division at (404)-635-7522 or 1-800-TRY-GEMA to have a Hazard Mitigation Program Specialist assigned to you. A separate worksheet is required for each project.

1. **Name of Applicant:** Big Canoe Property Owners Association (POA)

2. **Applicant Type**

State Government     Local Government     Recognized Indian Tribe     Private Non-Profit

State Legislative District(s) Representatives 7 & 11; Senate 51

Federal Congressional District(s) 7&11

Federal Tax I.D. Number XXXXXXXXXX

DUNS Number 605573229

FIPS Code: 13277

3. **National Flood Insurance Program (NFIP) Community Identification Number** 130149; **Please see Attachment #1**

4. **NFIP Community Rating System Class Number** 10

5. **Document Prepared by/ Point of Contact:**

Ms. Mr. Mrs. First Name Wesley Last Name MacDonald

Title Principal Engineer Telephone 423-385-2312

Street Address 835 Georgia Avenue

City Chattanooga State TN Zip Code 37402

E-mail address wmacdonald@geosyntec.com

6. **Authorized Applicant Agent** (An individual authorized to sign financial and legal documents on behalf of the local government (e.g., the Chairperson, Board of County Commissioners, or the County Manager, etc.).

Ms. Mr. Mrs. First Name Scott Last Name Auer

Title General Manager Telephone 706-268-3346

Street Address 10586 Big Canoe

City Jasper State GA Zip Code 30143

E-mail address sauer@bigcanoepoa.org

7. **Project Title:** Lake Petit Dam Rehabilitation

8. **Project Summary.** Describe in detail what you are proposing to do.

The project will rehabilitate the dated Lake Petit Dam spillway and internal drains along portions of the lower half of the downstream slope of the dam. The current spillway has exceeded its design life (in service more than 52 years) and was constructed as multiple stepped chutes using a shotcrete surface with no internal drains. The internal drains are in place along the toe and the first and second benches of the Dam; were installed between 1974 and 1976 using corrugated metal pipe (CMP) and granular filter material to address post-construction seepage concerns; and are likely at the end of their design life. The existing spillway and internal drains were designed and constructed using guidelines and materials which are no longer the industry standard and require on-going maintenance to prevent failure, which could result in a breach of the Dam.

The project will construct a modern spillway and rehabilitate the remaining CMP internal drains to update their performance, reliability, and design life and decrease ongoing maintenance by using modern construction materials, details, and standards. The rehabilitation will: (i) replace deteriorating

infrastructure; (ii) address operational items identified by Georgia Safe Dams Program (GSDP); and meet objectives identified in the Pickens County Hazard Mitigation Plan (HMP), which states that Lake Petit Dam is one of two dams in the county of the most concern due to the highest potential for downstream impacts.

The rehabilitation requires modifications to components of the Dam and includes:

- Replacement of the approximately 775-foot (ft)-long stepped chute spillway downstream of the existing weir and control structure. The existing weir and control structure will be protected during construction and continue to operate as originally constructed, not changing the downstream flows during storm events. Replacement is important to continue to maintain the dam and reservoir and prevent dam breach.
- Replacement of approximately 900 ft of existing CMP internal drains. The 550 ft internal drain along the first bench was replaced by the POA, with construction completion in April 2025.

**9. This project must be identified in your Local Mitigation Plan.** Provide excerpts from your approved Plan with the goals, objectives that supports your project. Also attach recommendation letter from your County EMA Director.

- **Please see Attachment #2** – Pickens County Emergency Management Agency – Recommendation Letter
- **Please see Attachment #3** – Pickens County Hazard Mitigation Plan 2024-2029
- Excerpts from Pickens County Approved Plan:

### **GOALS**

- GOAL 1 - Maximize the use of all resources by promoting intergovernmental coordination and partnerships in the public and private sectors
- GOAL 2 - Harden communities against the impacts of disasters through the development of new mitigation strategies and strict enforcement of current regulations that have proven effective
- GOAL 3 - Reduce and, where possible, eliminate repetitive damage, loss of life and property from disasters

### **OBJECTIVES**

- OBJECTIVE 1 - Reduce damage to property and loss of life through the utilization of preventative Activities
- OBJECTIVE 4 - Reduce damage to property and loss of life through the utilization of structural mitigation projects
- OBJECTIVE 7 - Minimize the impacts on local citizens, industry, and infrastructure of a dam breach
  - 7.c - Evaluate existing Category I and II dams for repairs, retrofits, and upgrades to ensure the safety of residents and businesses downstream
  - 7.e – Institute a county dam inspection and maintenance program
  - 7.f – Pursue grant opportunities for repairs, retrofits, and upgrade improvements on category I and II dams in Pickens County

- OBJECTIVE 8 - Implement additional protective measures and capabilities in response to manmade incidents

**10. Date of County Hazard Mitigation Plan Approval: 28 January 2025**

**I. History of Flood Related Hazards / Damages in the Area to be Protected**

Describe all flood related past damages from hazardous events (include name of storms if applicable) in the project area. Include presidentially declared disasters as well as events that did not result in a Presidential declaration.

<b>Date of Event</b>	<b>Description of Event</b>	<b>Description of Damages</b>	<b>Amount of Damages</b>	<b>Storm Year Event</b>	<b>Number of Days without service</b>	<b>Repair Type (Permanent or Temporary)</b>
2021	Severe Storms, Tornadoes (Federal Declaration)	Damage in base of spillway and cracking of sidewalls Required injection grouting and replacement of concrete slab section. Additional erosion behind sidewalls <sup>1</sup>	\$90,000 (2023) \$140,000 (2022)	2021	15 (2023) 30 (2022)	Temporary
2021	Tropical Storm Zeta (Federal Declaration)	Unknown <sup>2</sup>	Unknown <sup>2</sup>	2021	0	N/A
2017	Hurricane Irma (Two Federal Declarations)	Unknown <sup>2</sup>	Unknown <sup>2</sup>	2017	0	N/A
2016	Severe Storms and Flooding (Federal Declaration)	Unknown <sup>2</sup>	Unknown <sup>2</sup>	2016	0	N/A
2013	Flash Flood	Unknown <sup>2</sup>	Unknown <sup>2</sup>	2013	0	N/A
2011	2011, Severe Storms, Tornadoes (EF3), Straight-Line Winds, and Flooding (Federal Declaration)	Unknown <sup>2</sup>	Unknown <sup>2</sup>	2011	0	N/A
2004	Hurricane Ivan (Federal Declaration)	Damage in base of spillway and cracking of sidewalls Required injection grouting and replacement of concrete slab section. <sup>1</sup>	\$60,000 (2009)	2004	14 (2009)	Temporary
2004	Flash Flood	Unknown <sup>2</sup>	Unknown <sup>2</sup>	2004	0	N/A

2002	Tornado	Unknown <sup>2</sup>	Unknown <sup>2</sup>	2002	0	N/A
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Notes:

<sup>1</sup> Includes cumulative damage from events since the previous temporary repairs, as applicable.

<sup>2</sup> Responses of “Unknown” indicate that the description of and amount of damages were unknown at the time. Suspected or potential damage from these events are included in repairs associated with subsequent events.

<sup>3</sup> Damages presented in this table are only costs of repairs for the spillway structure itself.

For each event, include a discussion on the effectiveness the proposed project will have on the amount of damages. For each event, indicate the number of days without service for the damaged structures (functional downtime and loss of service).

**II. Hazards to be Mitigated/Level of Protection**

**1. Select the type of hazards the proposed project will mitigate:**

Flood    Wind    Seismic    Tornado    Hurricane    Other (list) Potential for dam breach due to: (i) spillway failure and/or (ii) seepage or internal erosion due to faulty internal drains.

**2. Identify the type of proposed project:**

Provide for each type of structure the number of structures in the project area that will receive a benefit from the proposed project. Include all structures in project area.

- 115   Residential property
- 15   Businesses / commercial property
- 0   Public buildings
- 2   Schools / hospitals / houses of worship
- 3   Park
- 5   Utilities
- 1   Cell Towers
- 5   Roadways

**3. Project Useful Life:** The project will provide protection against the hazard(s) above for more than 50 years.

**4. Protection Provided**

Describe, in detail, the existing problem and explain how the proposed project will solve the problem.

- Describe the existing problem
- How long has the existing problem persisted

**Existing Problem:**

The spillway and internal drains at Lake Petit Dam were constructed in the 1970s and are likely at the end of their initial design life (approximately 50 years). In its current condition the probability of failure of the dam is higher than it would be following the proposed rehabilitation measures.

*Spillway:* The existing spillway is the main pathway where water passes from Lake Petit to the receiving stream, downstream to other dams, and to other portions of Pickens County. The spillway passes the stormwater that flows into the reservoir and generally has continuous flow except in times of drought. The existing spillway was designed and constructed without many current design principles that are typically incorporated in such a feature (e.g., a hardened surface that is scour resistant, a drainage feature along the sides of the spillway to prevent erosion, underdrains to relieve uplift pressure, etc.). During extreme storm events, such as flash floods, thunderstorms, tropical storms, or hurricanes, flow through the spillway greatly increases which can lead to additional damage to the shotcrete surface of the spillway from increased scour and erosion and/or large debris such as downed trees passing through the spillway. Stormwater runoff along the outside of the spillway increases, causing erosion along the exterior of the spillway, preventing stormwater from entering the spillway. Should the spillway fail, the underlying soils could backwards erode to the spillway control structure, resulting in uncontrolled release of the reservoir.

*Internal Drains:* The existing internal drains were installed to control seepage through the earthen embankment by preventing uncontrolled soil piping and internal erosion by providing a filtered zone for the seepage to exit the Dam. The existing internal drains were designed and constructed using CMP, which has a finite design life that has likely been met or exceeded, and the drains do not appear to be performing as intended which is shown by seepage occurring at various locations along the downstream slope of the Dam.

Failure of the spillway or internal drains could result in an uncontrolled release of the reservoir inundating the downstream items identified in item II.2. The project will provide long-term structural capacity for the spillway to provide controlled discharge of flows from Lake Petit and controlled seepage through the earthen embankment by preventing soil piping and internal erosion.

**Duration of Existing Problem:**

Maintenance repairs have been performed on the spillway and internal drains since as early as 2009 (spillway) and 2021 (temporary seepage filter placement), and the need for these repairs has been increasing more recently.

Maintenance repairs to address spalling, cracking, undermining, and erosion were performed to the spillway in 2009, 2021, and 2023. Maintenance repairs to address unfiltered seepage were performed to the downstream face of the Dam in 2021. The internal drain along the first bench was replaced with construction completion in April 2025.

Downstream flooding as a consequence of dam breach has been modelled and included in the dams Emergency Inundation

**III. Project Location**

1. Name and physical address (including city, state, county, and zip code)

Big Canoe Property Owners Association

Lake Petit DamWilderness ParkwayJasper, Georgia 30143Digital Latitude: 34.46098 Digital Longitude: -84.28923

\*Digital Latitude and Digital Longitude coordinates need to be in Decimal Degrees. \*

Year Structure Built: 1972

## 2. Description of the project location

Lake Petit Dam is located in the Big Canoe Community on the southeastern edge of Lake Petit. The Dam's spillway is located approximately 330-feet from the eastern edge of the Dam and cascades approximately 775-feet into Petit Creek. The spillway generally spans between Wilderness Parkway near the upstream end and Wolfscratch Drive at the downstream end. The Dam's internal drains are located along the toe and the first and second benches of the downstream face of the Dam.

3. **Flood Insurance Rate Map (FIRM) showing Project Site**

Attach a copy of the panel(s) from the FIRM. **(Please see Attachment #1)**

Using the FIRM, determine the flood zone(s) of the project site (Check all zones in the project area).

- VE or V 1-30
- AE or A 1-30
- AO or AH
- A (no base flood elevation given)
- B or X (shaded)
- C or X (unshaded)
- Floodway
- Coastal Barrier Resource Act (CBRA) Zone

4. **Letter of Map Revision (LOMR)**

*A Letter of Map Revision may be needed on this project. Any changes to the Flood Insurance Rate Maps (FIRM) need to be reflected on the flood maps, which is accomplished through the LOMR process. The construction of this project may lower the 100-year flood elevation and thus, possibly lower the flood insurance rates for structures in the project area.*

A LOMR is not needed for this project, as it will not change downstream flows.

**5. City and County Map with Project Site and Photographs**

- Include an 8” by 11” map with the project site clearly marked.
  - o **Please see Attachment #4**
- USGS 1:24,000 topo map with project site marked on the map.
  - o **Please see Attachment #5**
- Include color photographs showing a front view, a side view, a back view, and a street view of the structure
  - o **Please see Attachment #6**

**6. Protection and magnitude of event: Fill in the level of protection and the magnitude of event the proposed project will mitigate**

<b>Type of Structure</b> (Residential, Business, Public Building, School, Hospital, House of Worship, Roadways, Utilities)	<b>Number of Structures Protected</b>	<b>Flood Event in Years</b> (10,25,50,100,500)	<b>Wind Speed</b> (Miles Per Hour)	<b>Earthquake</b> (Mercalli Scale)
Residential property; Businesses / commercial property; Schools / hospitals / houses of worship; Parks; Utilities; Cell Towers; Roadways	Approx. 146	Dam Breach	N/A	N/A

**7. Engineering Projects ONLY**

Include **ALL** engineering calculations (with signed engineering seal) used to determine the above level of protection.

- o **Please see Attachment #7 for the stamped spillway design sealed by the engineer and supporting calculations. Additionally, the original sealed design for replacement of the drains along Bench 1 on the Dam is included in Attachment #7 as well.**

**IV. Site Plan**

Site plan, with alignment drawings, that includes the location, plan view and cross-section of cuts, fills and structures are required. Include the type, and measurements of all pipes, culverts, ditches, swales and detention/retention basins and ponds. Send the following engineering documentation as appropriate. **Be sure that submitted documents are signed and sealed by preparing engineer.**

**Please see Attachment #7.**

- ❑ Calculations used to determine the sizes of any culverts in the project area (drainage area, amount of flow, slope of culvert, invert elevations).
  - **Please see Attachment #7 for calculations for the spillway. Bookmark added in PDF**
- ❑ Calculations used to determine the sizes of any ditches and swales in the project area (drainage area, amount of flow, slope, and depth of the ditch).
  - **Please see Attachment #7 for calculations for the spillway. Bookmark added in PDF**
- ❑ Calculations used to determine the size of any detention/retention basins and ponds (drainage area, amount of flow, stage-storage, and stage-discharge curves).
  - **Not applicable.**
- ❑ Statement indicating no upstream or downstream impacts.
  - **Please see Attachment #7. Bookmark added in PDF**
- ❑ Statement indicating the design level of the drainage improvement. i.e. 100-year protection.
  - **The spillway will help mitigate the potential breach of the Dam which is not tied to a return period, but the design life for the proposed spillway and internal drain improvements is over 50 years. Bookmark added in PDF**

**V. Additional Benefit-Cost Information**

Additional annual maintenance cost attributed to the project: \$200,000 per year for maintenance of the Dam in its current state. Approximately \$50,000 per year following proposed mitigation.

The flood frequency at which the drainage structure is likely to fail:

As-is (before mitigation) condition. GSDP noted in 2009 email correspondence to the POA that spillway needs to be replaced. If it is not replaced the probability of failure is greater, and is likely to happen at some point, as it has passed its design life. The failure is not directly tied to a flood event.

Upgraded (after-mitigation) condition. The failure is not directly tied to a flood frequency, but a design life (which is over 50 years).

**Loss of Function for Roads/Bridges**

Estimated Number of One-Way Trips Per Day: 2,885 (SR 53 5,770 AADT, GDOT, 2023)

Estimated Delay (Detour) Time per One Way Trip (hours): 2/3 hours

Storm Year Flood Event during Loss of Function for Roads/Bridges: Loss of function would be recognized during a breach of the Dam, which is not necessarily tied to a particular flood event.

**Loss of Function for Utilities**

Unit of Service – Examples are gallons of water, kilowatt hours of electricity: loss of water company pumping location; loss of sewage station; loss of electricity

Unit of Time – Enter applicable unit corresponding to unit of service: up to 1 year

Volume of Service Provided: TBD

Normal Value per Unit of Service: TBD

Storm Year Flood Event during Loss of Function for Utilities: Loss of function would be recognized during a breach of the Dam, which is not necessarily tied to a particular flood event.

### **Loss of Function for Buildings**

Annual budget of Public/Non-profit agencies: \$21M

## **VI. Project Cost**

Do not include contingency costs in the budget. List all anticipated costs in detailed. Consider the potential future date of construction when compiling the cost estimate. **Please provide documentation for each budget item with detailed vendor(s) estimates.**

**Please see project costs presented in Attachment #8**

We have included a cost benefit estimate utilizing the FEMA Cost Benefit Analysis spreadsheet (V6.0). Please see Attachment #9. The following are information/assumptions used in this analysis.

- This analysis was done utilizing cost estimates for replacement of only structures in the dam breach inundation area using the U.S. Army Corps of Engineers National Structure Index (NSI). This identified 65 structures Costs for this were in 2021 dollars. From the NSI [Technical Documentation](#):

### **Structure Valuation**

Depreciated replacement values were estimated based on an assumed replacement category and a dollar per square footage estimate for that category; these assignments are informed by an analysis of survey data, parcel use types, and other source inputs. All values are in 2021 prices levels. Dollars per square foot estimates are then multiplied by the square footage estimate for each structure to obtain the structure value.

These replacement values for structures are then depreciated in order to obtain depreciated replacement value; each structure is depreciated by 1% per year for the first 20 years, after which it is assumed that routine maintenance would keep structure values at 80% of their replacement values.

Content values are obtained by multiplying structure values against an occupancy type specific structure to content value ratio; these ratios are shown below in the Occupancy Type table.

- There have been no previous damages downstream from failure of the spillway or breach of the dam. Implementation of the proposed rehabilitation would lower the probability of failure of the dam and spillway. Estimates are included for the probability of these failures as “return periods”.