

Memorandum

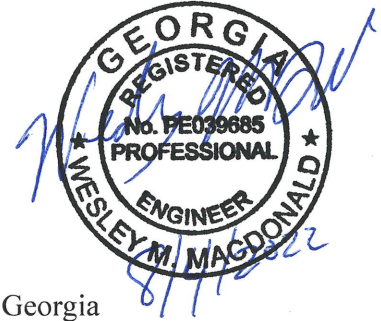
Date: Thursday, 04 August 2022

To: Mr. David M. Griffin, P.E., Program Manager and
Mrs. Kate Betsill, Environmental Engineer
Safe Dams Program, Environmental Protection Division, Georgia

Copies to: Mr. Scott Auer, General Manager and
Mr. Anu Saxena, P.E., Director of Capital Projects
Big Canoe Property Owners Associates

From: Wesley MacDonald, P.E.
Geosyntec Consultants

Subject: Lake Petit Volume Update – Permit #112-009-00462



Dear Mr. Griffin,

On behalf of the Big Canoe Property Owners Association (POA), Geosyntec Consultants, Inc. (Geosyntec) is pleased to present the Safe Dams Program (SDP) of the Environmental Protection Division (EPD) of Georgia with this Technical Memorandum (Memo) documenting the surveyed volume of Lake Petit. Table 1 presents the current volume of the lake as it is listed in the SDP inventory of dams dated 22 November 2019 (accessed 25 July 2022) and the U.S. Army Corps of Engineers National Inventory of Dams (USACE NID) online database (accessed 25 July 2022). We understand there are no formal records documenting how or when the volumes reported from these two agencies were determined. A bathymetric survey was performed by Geosyntec on behalf of the POA to clearly define the current storage volume of the lake at normal pool and maximum water storage elevation levels. This Memo was requested by the SDP to make formal change to the documented lake volume.

In March 2022, a multibeam hydrographic survey was conducted of the reservoir bottom of Lake Petit by Seaside Engineering and Surveying, LLC (Seaside), a licensed surveyor in the state of Georgia, using their vessel "Renus" and a dual head R2Sonic 2020 Multibeam swath sonar system. This provided near-continuous coverage of the lakebed. Ground surface elevations above the reservoir were obtained from Light Detection and Ranging (LiDAR) contours provided by the

Georgia Department of Natural Resources for Pickens County (2012) and the Dawson County GIS department (2011), which were the best available data for coverage of the area.

The surveyed lake volume listed in Table 1 was based on these three data sources and was determined by combining the two county LiDAR data sets into one existing topographic ground surface and then combining the topographic file with the bathymetric survey. In areas between the topographic and bathymetric surveys, AUTOCAD Civil 3D (Civil 3D) was used to tie the two surfaces together to create one continuous, composite surface. Civil 3D was used to determine the volume between the respective storage levels and the composite surface. The normal pool elevation and maximum water storage elevation were determined in an April 2021 survey by Jordan Engineering, a licensed surveyor in the state of Georgia, to be at Elevation (EL) 1635.5 feet (ft) and EL 1647 ft respectively. The maximum water storage elevation was used to determine maximum storage volume. Elevations provided are in relation to the North American Vertical Datum of 1988 (NAVD88), and horizontal mapping was done using the Georgia West Plane Coordinate System based on the North American Datum of 1983 (NAD83). Contours of the mapped ground surface are presented in Figure 1 along with a stage storage table based on these same surveys. The resulting surveyed volumes are presented in Table 1 and show a decrease in the previously listed volumes by the SDP and USACE.

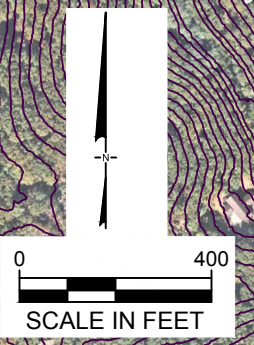
Table 1 – Summary of Lake Petit Reported and Surveyed Volumes

	SDP Inventory of Dams (2019)	USACE NID	Surveyed (2022)
Maximum Water Storage (acre-foot[ft])	7,500	7,500	5,635
Normal Pool (acre-ft)	4,600	4,600	4,235
Surface Area at Normal Pool (acres)	--	105	107

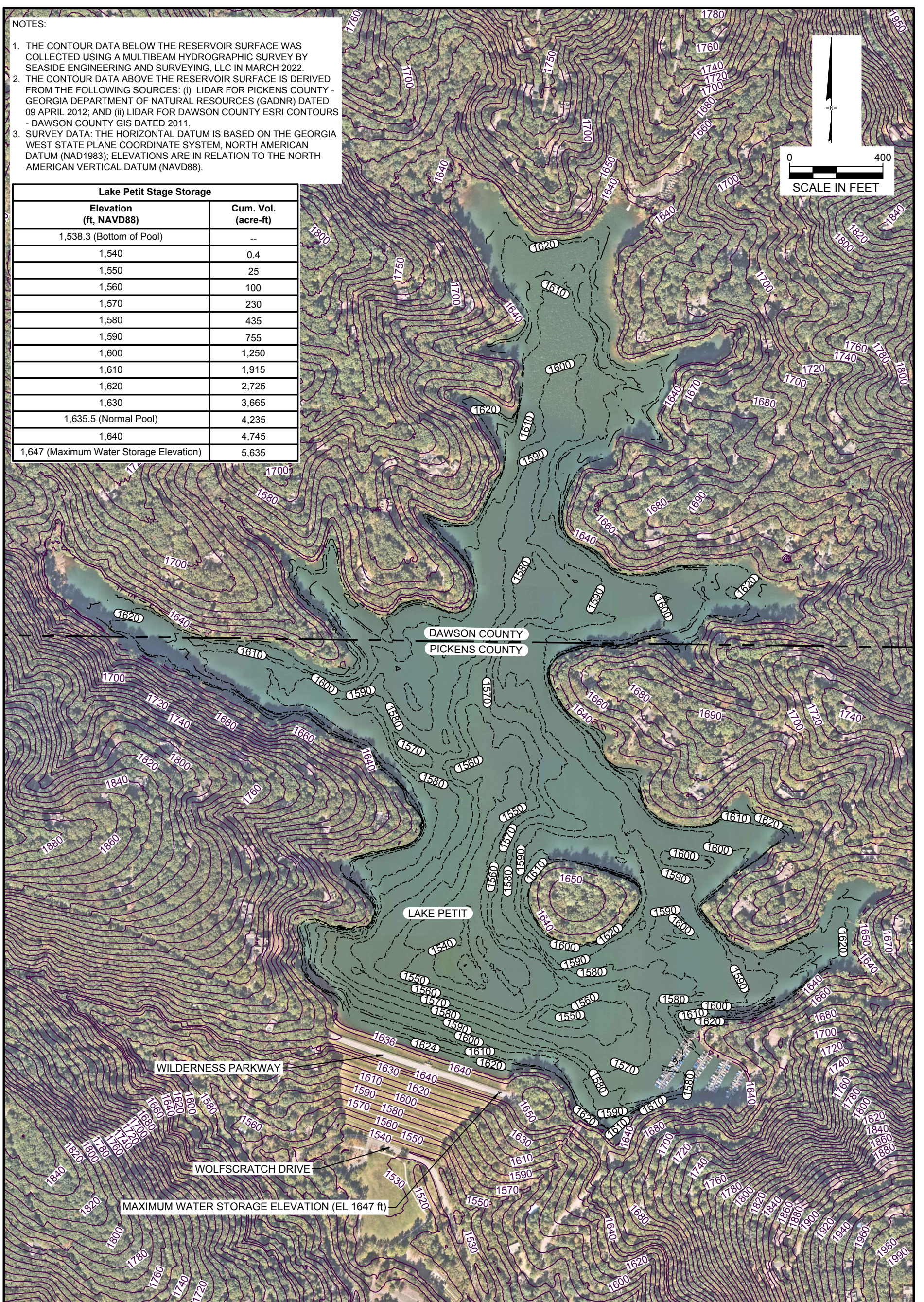
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NOTES:

1. THE CONTOUR DATA BELOW THE RESERVOIR SURFACE WAS COLLECTED USING A MULTIBEAM HYDROGRAPHIC SURVEY BY SEASIDE ENGINEERING AND SURVEYING, LLC IN MARCH 2022.
2. THE CONTOUR DATA ABOVE THE RESERVOIR SURFACE IS DERIVED FROM THE FOLLOWING SOURCES: (i) LIDAR FOR PICKENS COUNTY - GEORGIA DEPARTMENT OF NATURAL RESOURCES (GADNR) DATED 09 APRIL 2012; AND (ii) LIDAR FOR DAWSON COUNTY ESRI CONTOURS - DAWSON COUNTY GIS DATED 2011.
3. SURVEY DATA: THE HORIZONTAL DATUM IS BASED ON THE GEORGIA WEST STATE PLANE COORDINATE SYSTEM, NORTH AMERICAN DATUM (NAD1983); ELEVATIONS ARE IN RELATION TO THE NORTH AMERICAN VERTICAL DATUM (NAVD88).



Lake Petit Stage Storage	
Elevation (ft, NAVD88)	Cum. Vol. (acre-ft)
1,538.3 (Bottom of Pool)	--
1,540	0.4
1,550	25
1,560	100
1,570	230
1,580	435
1,590	755
1,600	1,250
1,610	1,915
1,620	2,725
1,630	3,665
1,635.5 (Normal Pool)	4,235
1,640	4,745
1,647 (Maximum Water Storage Elevation)	5,635



LEGEND

- 1645 GROUND ELEVATION CONTOUR (FEET)
- 1560 BATHYMETRIC ELEVATION CONTOUR (FEET)
- ELEVATION POINT

LAKE PETIT VOLUME
UPDATE - RESERVOIR CONTOURS
BIG CANOE POA
JASPER, GEORGIA



FIGURE
1

PROJECT NO: TN8667.05 AUGUST 2022