

An aerial photograph of Lake Barcroft, showing a dam on the left side. The water is dark and calm. In the foreground, there's a small building with a grey roof and a red railing. A line of black buoys stretches across the water. The background is filled with trees in various shades of autumn, including orange, red, and yellow. The sky is overcast and grey.

**LAKE BARCROFT'S**

**DREDGING**

**EXPERIENCE**

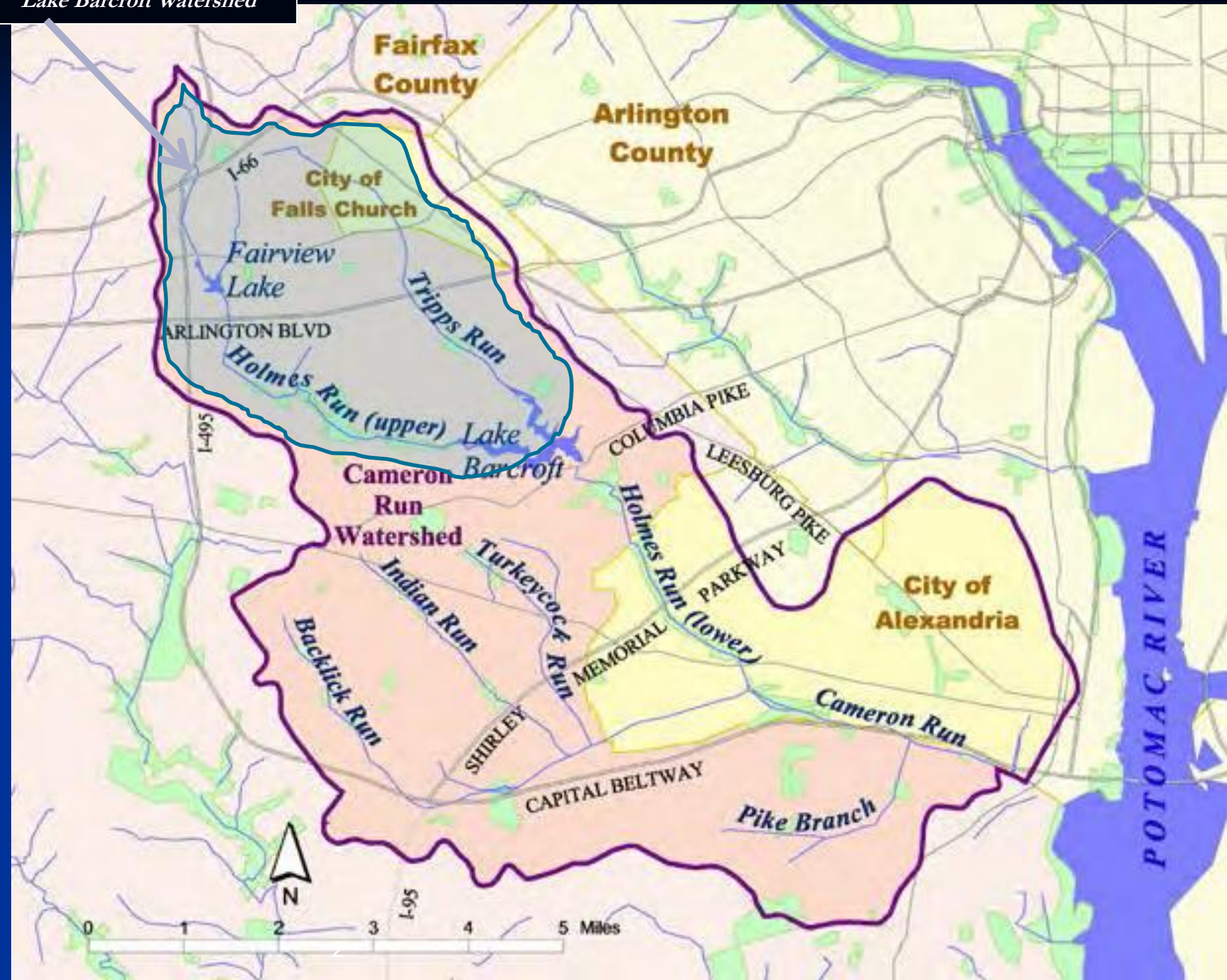
Presenter: Davis Grant

Lake Barcroft WID General Manager

# Where is Lake Barcroft?

- Cameron Run Watershed

Lake Barcroft Watershed







# Dredging Volumes Over The Years

- Approximately 600,000 cy of sediment has been dredged from Lake Barcroft since 1960.
- Until 2009, dredging took place every 4 to 5 years.
- In 2009 the LBWID developed an in-house dredging program and now dredges sections of the Lake each year.

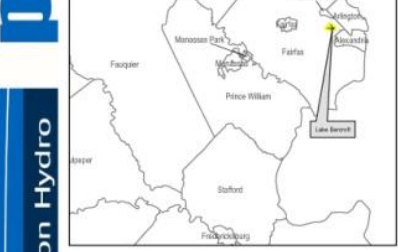
# Contributing Factors

- High percentage of impervious land within the watershed
- Lack of stormwater controls in the contributing watershed
- Stream Bank Erosion
- Road sand and debris
- Leaves and woody debris
- Climate change/storm intensity

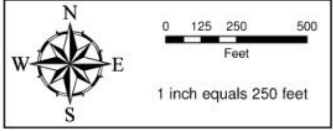
# Annual Bathymetry Survey



# Lake Barcroft Bathymetry



PRINCETON HYDRO, LLC.  
 1108 OLD YORK ROAD  
 P.O. BOX 720  
 RINGOES, NJ 08551



- SOURCES:**
1. Aerial image obtained in digital format from Fairfax County GIS Department.
  2. In-lake sediment contouring and grid analysis derived from collected bathymetric points using ESRI's ArcGIS 3-D Analyst module; contours in feet.
  3. Bathymetric data collected on lake by Princeton Hydro personnel on July 11, 12, & 13, 2005 using Knudsen 320BP Echosounder with Hyback Software and Trimble Pro-XRS GPS unit.
  4. Virginia counties data obtained from the US Census Bureau Geography Department website.

## WATER DEPTH OVERVIEW

**BATHYMETRIC SURVEY OF LAKE BARCROFT**  
 PREPARED FOR:  
 LAKE BARCROFT  
 WATERSHED IMPROVEMENT DISTRICT  
 FAIRFAX COUNTY  
 COMMONWEALTH OF VIRGINIA

**LEGEND**

Water Depth Contours (Feet)

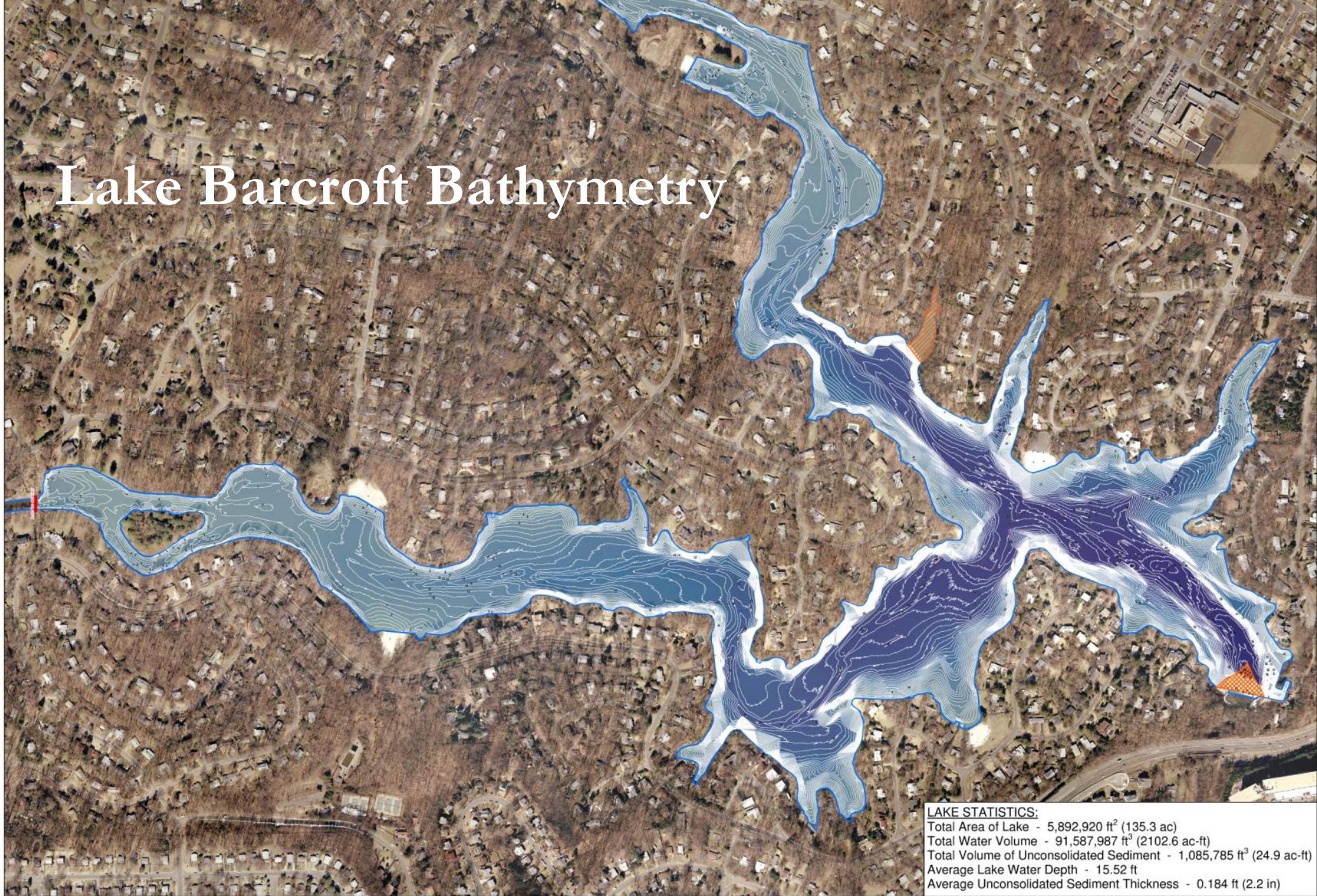
- Inaccessible Area at Time of Survey
- GPS Data Unavailable at Time of Survey
- Lake Boundary

**Lake Depth**

**Feet**

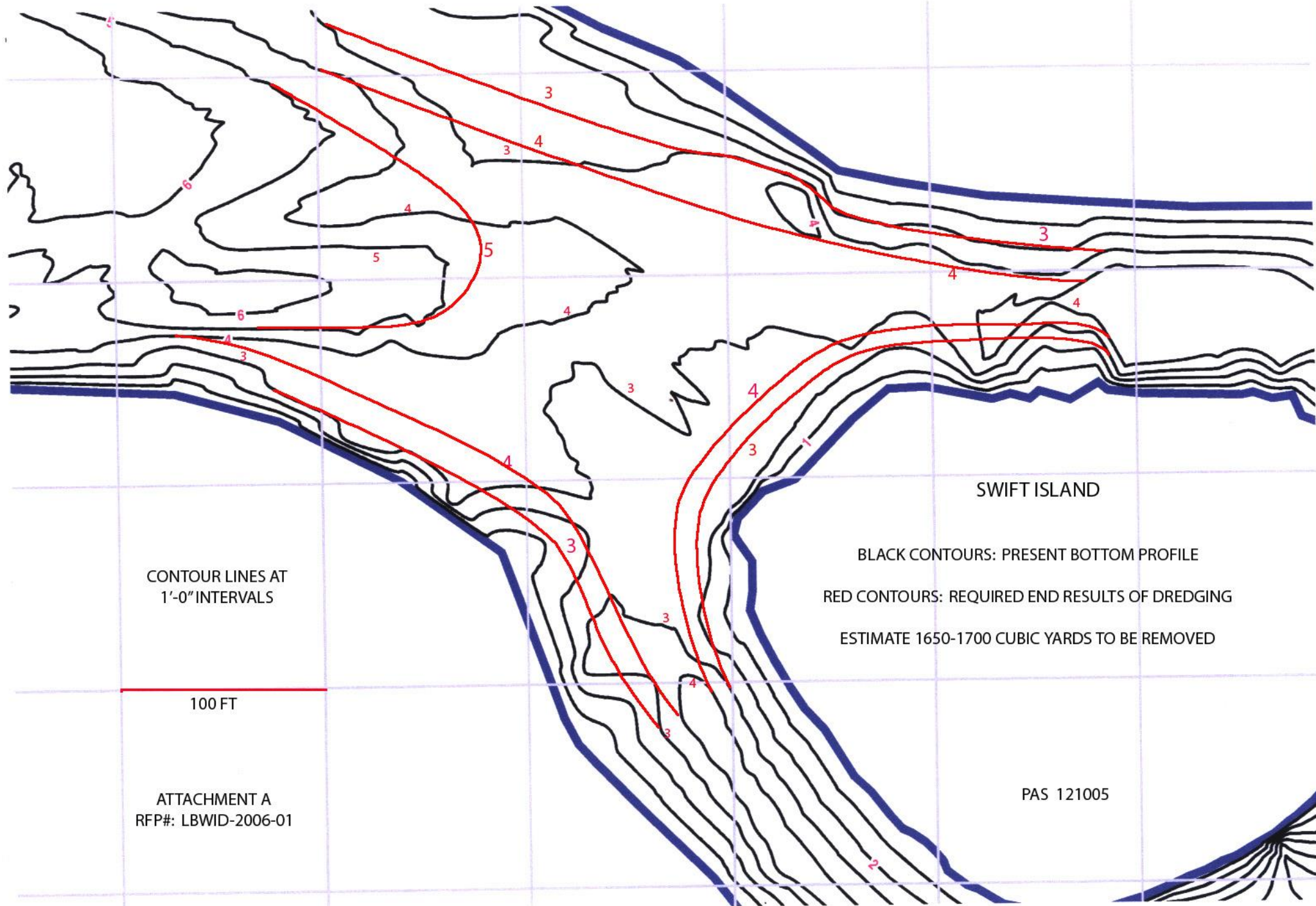
- 0.0
- 22.5
- 45.0

**LAKE STATISTICS:**  
 Total Area of Lake - 5,892,920 ft<sup>2</sup> (135.3 ac)  
 Total Water Volume - 91,587,987 ft<sup>3</sup> (2102.6 ac-ft)  
 Total Volume of Unconsolidated Sediment - 1,085,785 ft<sup>3</sup> (24.9 ac-ft)  
 Average Lake Water Depth - 15.52 ft  
 Average Unconsolidated Sediment Thickness - 0.184 ft (2.2 in)









SWIFT ISLAND

CONTOUR LINES AT  
1'-0" INTERVALS

100 FT

ATTACHMENT A  
RFP#: LBWID-2006-01

BLACK CONTOURS: PRESENT BOTTOM PROFILE  
RED CONTOURS: REQUIRED END RESULTS OF DREDGING  
ESTIMATE 1650-1700 CUBIC YARDS TO BE REMOVED

PAS 121005

# Contact Dredging

(Utilized until 2009)

- Planned dredging every 4 to 5 years
  - 10,000 to 12,000 cy of sediment dredged each event
- Expensive equipment mobilization cost and uncertainty of contractor availability
- Difficulty in disposing of larger quantities of dredge spoils
- Increased intensity of storms could leave parts of the Lake filled in for several years, in between dredging events.

# Contract Dredging Equipment





# Contract Dredging Equipment

# In-House Dredging Program

(Started in 2009)

- Dredging is now done each spring and fall
  - 4 weeks of dredging done each season
  - A combined total of 3,500 to 4,000 cy of sediment is dredged each year.
- Available to respond to infill from large storm events
- Annually disposing of smaller amounts of dredge spoils
- Eliminated equipment mobilization cost
- Equipment can be used for other lake enhancement projects

# Floating Excavator and Transport Barge



# Transporting Sediment to Shore







# Off-Loading Transport Barges

# Dredge Spoil Disposal

- Two on-site decanting basins
  - Combined volume of 12,000 cy
  - Dredge spoils stay in the basin for approximately 8 to 10 months to dry out
- Dried dredge spoils are then trucked away for permanent disposal
  - Each passing year presents an increased challenge for locating a disposal location
  - In recent years we are trucking the material as far as 50 miles for disposal
  - Increased fuel cost and traffic has significantly increased the cost of trucking
  - The lack of disposal sites has significantly increased tipping/disposal fees

# Dredge Spoils Drying



# Temporary Disposal / Drying Facility (Decanting Basin)





Dried sediment being loaded  
for permanent disposal

# Questions

