



**Date:** 8/1/2023

**Subject:**

Results of Bathymetry and Sediment Quantity Study for the Borough of Mountain Lakes, New Jersey – Mountain, Birchwood, Crystal, Sunset, Wildwood, Grunden’s, Cove, and Shadow/Olive

**Prepared for:**

The Borough of Mountain Lakes  
Mr. Mitchell Stern, Borough Manager

**Prepared by:**

Steve Bartosh - President  
The Mapping Network  
402-241-8177

**Reviewed by:**

James J. Heiser, P.L.S.  
DPK Consulting  
732-764-0100

**HYDROGRAPHIC SURVEY EQUIPMENT AND PROCEDURES**

The Mapping Network conducted a bathymetry and sediment survey for the borough of Mountain Lakes. The survey was conducted to determine the depths and volume of sediment in eight of their reservoirs.

**Bathymetry Survey Collection Methods:**

The collection methods and equipment used are based on the USACE Single-Beam Methodology. Depth measurements were collected using an Odom CV100, a sonar signal processor designed to accurately record the full spectrum of the reservoir bottom in a raw format that was later processed in HYPACK software. A calibrated Digibar Pro sound velocity cast was taken prior to the survey to measure the speed of sound, which was then input into the Hypack software. The accuracy of the Odom CV100 data

is approximately 0.5% of the water depth, with a resolution of 0.1 feet. The system's accuracy was checked during the survey using manual measurements.



#### **Bathymetry Data Processing Methods:**

Bathymetry data was processed using HYPACK Software. Components of the bathymetric processing included verifying that the water depth was tracking the bottom and not outlying soundings created by water column interference (e.g., sharp drop-offs, vegetation, trees, debris). The data was then exported as XYZ (northing, easting, and depth) in a State Plane horizontal projection and vertical NAVD88 datum. The XYZ data was imported into ESRI ArcGIS, where a Triangular Irregular Network (TIN) was created using the 3D Analyst extension to represent surface morphology.

#### **Sediment Depth Collection Methods:**

Sediment thickness information was collected using a steel survey rod with 1/10 foot markings. The depth of sediment was determined by manually driving a steel probe into the sediment until refusal. The total penetration of sediment depth was then recorded in HYPACK software.

#### **Sediment Depth Data Processing:**

The sediment thickness data was imported as XYZ data into ESRI ArcGIS Pro where a Triangular Irregular Network (TIN) is created using the 3D Analyst extension to represent the sediment thickness in feet. A predetermined sampling area is used as the extent to which the data is clipped. Within the sampling area, maximum and mean sediment thickness is calculated along with estimated volume of soft sediment in cubic yards.

#### **Aquatic Vegetation Sonar and Navigation Interference:**

Aquatic vegetation in areas of the reservoirs interfered with the sonar readings. In these cases, manual measurements were taken to obtain more accurate lake depth readings. Manual measurements may not be as accurate in areas of extreme vegetation compared to areas with less aquatic vegetation.



**DPK  
CONSULTING**

Surveying • 3D Scanning • Drone Services

*Service Without Boundaries™*



DPK Consulting, LLC  
200 Metroplex Dr., Suite 285, Edison, NJ 08817  
P: 732-764-0100 F: 732-764-0990  
[www.dpkconsulting.net](http://www.dpkconsulting.net)



### **2010 to 2023 Comparison Maps:**

The comparison maps analyzed the amount of material change from 2010 to 2023. XYZ data from both 2010 and 2023 was imported into ESRI ArcGIS Pro, where TIN surfaces were created and depth and volume changes were analyzed with the 3D Analyst extension. Please note that differences in equipment, methods, and surveyors between 2010 and 2023 may introduce discrepancies when comparing the data from these two years.

### **Water Elevation:**

Benchmarks throughout the project site were provided by DPK Consulting. Utilizing these benchmarks, a Trimble R10 with RTX was used to measure the water level at time of survey. Due to multipath (tree-canopy) Sunset, Shadow and Olive, and Cove Lake were measured using LiDAR collected by DPK Consulting.

### **Data Projections and Datums:**

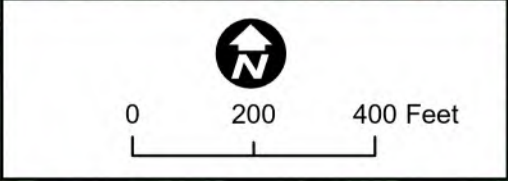
Horizontal Projection: NAD83 (2011) State Plane New Jersey FIPS 2900 (US Survey Feet)

Vertical Datum: North American Vertical Datum 1988 (US Survey Feet)

**MOUNTAIN LAKE RESULTS**

Area:	75.5 Acres
Water Level/Elevation:	499.2 Local Gauge on Dam / 498.9 NAVD88 RTK
Max Depth:	10.1 Feet
Mean Depth:	6.8 Feet
Volume (Holding Capacity):	168,487,340 gallons / 517.0 acre-feet
Estimated Sediment Volume:	256,832.6 cubic yards- wet unconsolidated sediment
Mean Sediment Thickness:	2.1 Feet
Lake Composition:	76% Water / 24% unconsolidated sediment
Estimated Sediment Change (2010-2013)	28,363 cubic yard gain
Mean Depth Change (2010-2013)	+0.23 Feet
Surveyor Notes:	<ul style="list-style-type: none"> <li>An abundance of various types of aquatic vegetation interfered with sonar measurements (specifically Chara), in the north-eastern and shallow parts of the south-western portion of the reservoir. We utilized our manual measurements in this area to best determine water depth.</li> </ul>





**Lake Information:**  
 Area: 75.5 acres  
 Max Depth: -10.1 ft  
 Mean Depth: -6.8 ft  
 Volume: 168,487,340 gallons / 517.0 acre-ft

**Mapping Information:**  
 Data Collection Performed: 06/13 - 06/14/2023  
 GPS: Mapping Grade (sub-foot accuracy)  
 Points Collected: 252,383  
 Water Level: Adjusted to Full Pool  
 Pool Elevation: 499.2' NAVD88 (Local Gauge)  
 Pool Elevation: 498.9' NAVD88 (RTK)



**DPK  
CONSULTING**


DPK CONSULTING, LLC  
 200 METROPLEX DRIVE - STE. 285, EDISON, NJ 08817  
 P: 732-764-0100 F: 732-764-0990  
 NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. 24GA28042200

date 09/15/2023

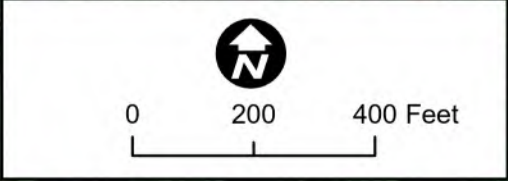
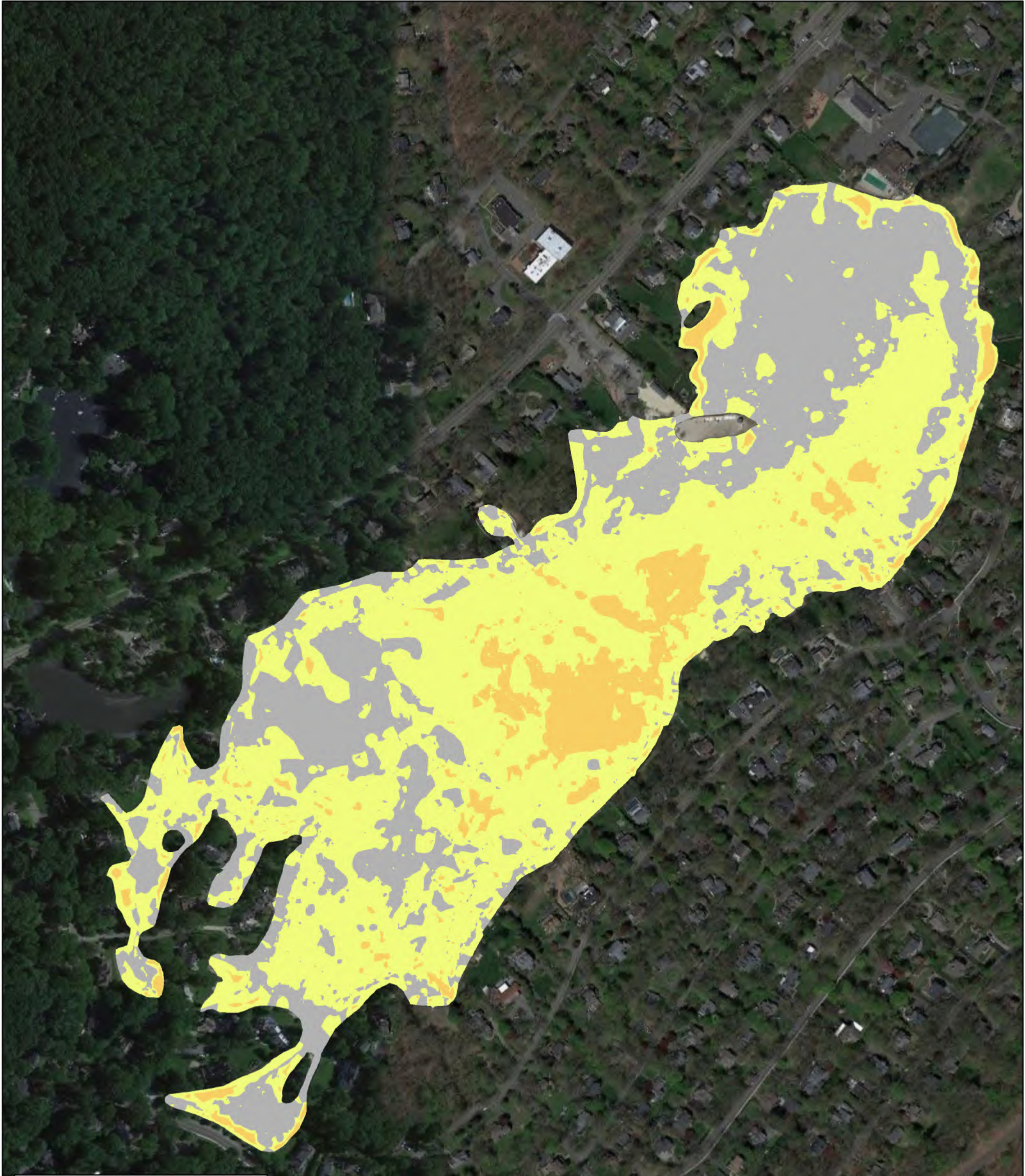
**James J. Heiser**  
 Professional Land Surveyor  
 JHEISER@DPKCONSULTING.NET

N.J. Lic: 24GS04331100  
 PA. Lic: SU075616  
 N.Y. Lic: 050932-1  
 CT. Lic: 70476  
 DE. Lic: S6-0010858

**Mountain Lakes - Mountain Lake  
3D - Elevation**



Copyright © 2023 The Mapping Network, LLC. All rights reserved. Reasonable efforts have been made to verify that this map accurately interprets the source data used in its preparation, however, a degree of error is inherent in all maps, and this map may contain omissions and errors in scale, resolution, rectification, positional accuracy, development methodology, interpretation of source data, and other circumstances. The Mapping Network, LLC MAKES NO WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. The Mapping Network, LLC SHALL NOT BE LIABLE TO ANY PERSON UNDER ANY LEGAL OR EQUITABLE THEORY FOR DAMAGES ARISING OUT OF THE USE OF THIS MAP, INCLUDING, WITHOUT LIMITATION, FOR DIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES. This map is date specific and is intended for use only at the published scale. Nothing in this map implies the right to use private property, which may lie within or be bounded by the waters shown on this map. Do not use this map for marine navigation, swimming, diving, or other related activities, as it does not depict all information necessary to perform these functions safely.



**Lake Information:**  
 Area: 75.5 acres  
 Max Depth: -10.1 ft  
 Mean Depth: -6.8 ft  
 Volume: 168,487,340 gallons / 517.0 acre-ft

**Mapping Information:**  
 Data Collection Performed: 06/13 - 06/14/2023  
 GPS: Mapping Grade (sub-foot accuracy)  
 Points Collected: 252,383  
 Water Level: Adjusted to Full Pool  
 Pool Elevation: 499.2' NAVD88 (Local Gauge)  
 Pool Elevation: 498.9' NAVD88 (RTK)



**DPK CONSULTING**  
 DPK CONSULTING, LLC  
 200 METROPLEX DRIVE - STE. 285, EDISON, NJ 08817  
 P: 732-764-0100 F: 732-764-0990  
 NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. 24GA28042200

date 09/15/2023

**James J. Heiser**  
 Professional Land Surveyor  
 JHEISER@DPKCONSULTING.NET


N.J. Lic: 24GS04331100  
 PA. Lic: SU075616  
 N.Y. Lic: 050932-1  
 CT. Lic: 70476  
 DE. Lic: S6-0010858

Net Material Gain: 28,362.8 yards<sup>3</sup>  
 Mean Depth Change: +0.23 ft

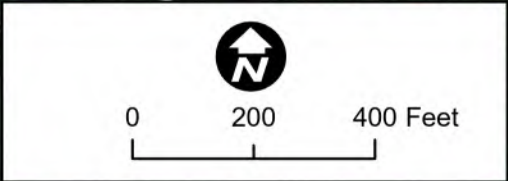
**Change in Depth (ft)  
 (2010 - 2023)**

- Minimal Change
- 0.0 to 1.0
- 1.0 to 2.0

**Mountain Lakes - Mountain Lake  
 2010 to 2023 Comparison**



Copyright © 2023 The Mapping Network, LLC. All rights reserved. Reasonable efforts have been made to verify that this map accurately interprets the source data used in its preparation, however, a degree of error is inherent in all maps, and this map may contain omissions and errors in scale, resolution, rectification, positional accuracy, development methodology, interpretation of source data, and other circumstances. The Mapping Network, LLC MAKES NO WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. The Mapping Network, LLC SHALL NOT BE LIABLE TO ANY PERSON UNDER ANY LEGAL OR EQUITABLE THEORY FOR DAMAGES ARISING OUT OF THE USE OF THIS MAP, INCLUDING, WITHOUT LIMITATION, FOR DIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES. This map is date specific and is intended for use only at the published scale. Nothing in this map implies the right to use private property, which may lie within or be bounded by the waters shown on this map. Do not use this map for marine navigation, swimming, diving, or other related activities, as it does not depict all information necessary to perform these functions safely.



**Lake Information:**  
 Area: 75.5 acres  
 Max Depth: -10.1 ft  
 Mean Depth: -6.8 ft  
 Volume: 168,487,340 gallons / 517.0 acre-ft

**Mapping Information:**  
 Data Collection Performed: 06/13 - 06/14/2023  
 GPS: Mapping Grade (sub-foot accuracy)  
 Points Collected: 252,383  
 Water Level: Adjusted to Full Pool  
 Pool Elevation: 499.2' NAVD88 (Local Gauge)  
 Pool Elevation: 498.9' NAVD88 (RTK)



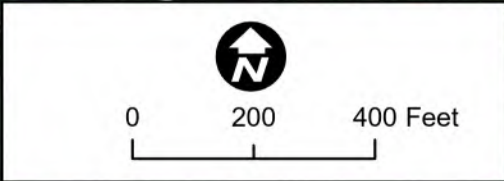
**DPK CONSULTING**  
 DPK CONSULTING, LLC  
 200 METROPLEX DRIVE - STE. 285, EDISON, NJ 08817  
 P: 732-764-0100 F: 732-764-0990  
 NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. 24GA28042200

date 09/15/2023

**James J. Heiser**  
 Professional Land Surveyor  
 JHEISER@DPKCONSULTING.NET

N.J. Lic: 24GS04331100  
 PA. Lic: SU075616  
 N.Y. Lic: 050932-1  
 CT. Lic: 70476  
 DE. Lic: S6-0010858

Copyright © 2023 The Mapping Network, LLC. All rights reserved. Reasonable efforts have been made to verify that this map accurately interprets the source data used in its preparation, however, a degree of error is inherent in all maps, and this map may contain omissions and errors in scale, resolution, rectification, positional accuracy, development methodology, interpretation of source data, and other circumstances. The Mapping Network, LLC MAKES NO WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. The Mapping Network, LLC SHALL NOT BE LIABLE TO ANY PERSON UNDER ANY LEGAL OR EQUITABLE THEORY FOR DAMAGES ARISING OUT OF THE USE OF THIS MAP, INCLUDING, WITHOUT LIMITATION, FOR DIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES. This map is date specific and is intended for use only at the published scale. Nothing in this map implies the right to use private property, which may lie within or be bounded by the waters shown on this map. Do not use this map for marine navigation, swimming, diving, or other related activities, as it does not depict all information necessary to perform these functions safely.



**Lake Information:**  
 Area: 75.5 acres  
 Max Depth: -10.1 ft  
 Mean Depth: -6.8 ft  
 Volume: 168,487,340 gallons / 517.0 acre-ft

**Mapping Information:**  
 Data Collection Performed: 06/13 - 06/14/2023  
 GPS: Mapping Grade (sub-foot accuracy)  
 Points Collected: 252,383  
 Water Level: Adjusted to Full Pool  
 Pool Elevation: 499.2' NAVD88 (Local Gauge)  
 Pool Elevation: 498.9' NAVD88 (RTK)



**DPK CONSULTING**  
 DPK CONSULTING, LLC  
 200 METROPLEX DRIVE - STE. 285, EDISON, NJ 08817  
 P: 732-764-0100 F: 732-764-0990  
 NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. 24GA28042200

date 09/15/2023

**James J. Heiser**  
 Professional Land Surveyor  
 JHEISER@DPKCONSULTING.NET

N.J. Lic: 24GS04331100  
 PA. Lic: SU075616  
 N.Y. Lic: 050932-1  
 CT. Lic: 70476  
 DE. Lic: S6-0010858

Mountain Lakes - Mountain Lake  
 Contours - Elevation



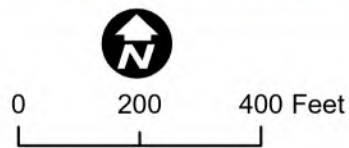
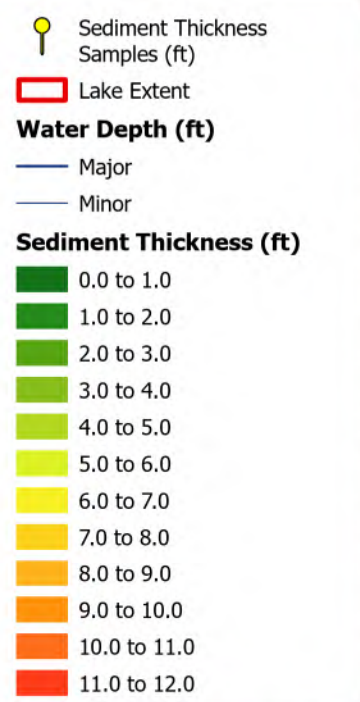
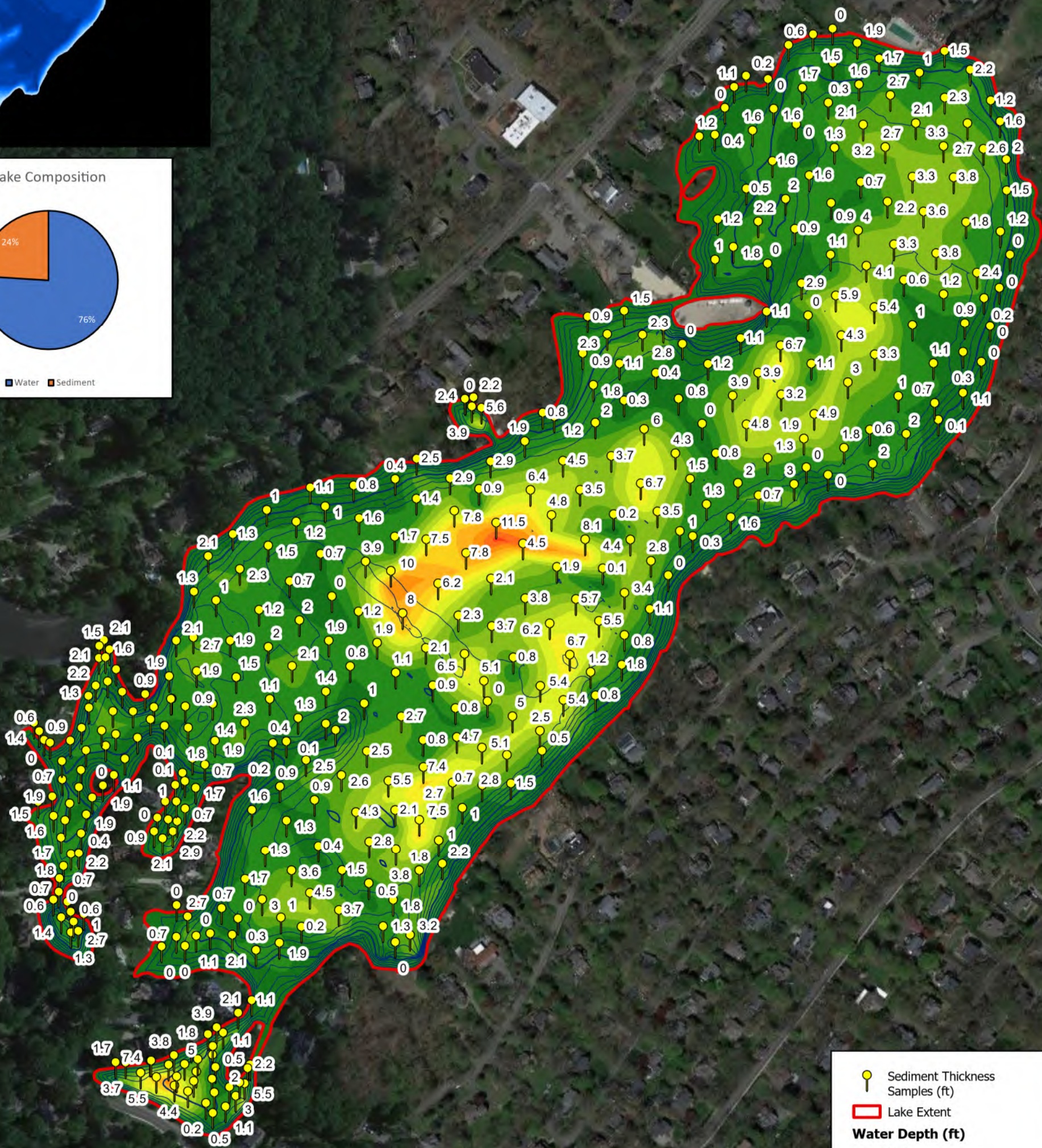
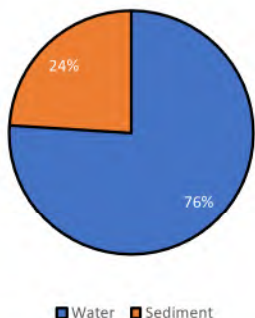
Copyright © 2023 The Mapping Network, LLC. All rights reserved. Reasonable efforts have been made to verify that this map accurately interprets the source data used in its preparation, however, a degree of error is inherent in all maps, and this map may contain omissions and errors in scale, resolution, rectification, positional accuracy, development methodology, interpretation of source data, and other circumstances. The Mapping Network, LLC MAKES NO WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. The Mapping Network, LLC SHALL NOT BE LIABLE TO ANY PERSON UNDER ANY LEGAL OR EQUITABLE THEORY FOR DAMAGES ARISING OUT OF THE USE OF THIS MAP, INCLUDING, WITHOUT LIMITATION, FOR DIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES. This map is date specific and is intended for use only at the published scale. Nothing in this map implies the right to use private property, which may lie within or be bounded by the waters shown on this map. Do not use this map for marine navigation, swimming, diving, or other related activities, as it does not depict all information necessary to perform these functions safely.



Estimated Sediment Volume: 256,832.6 yards<sup>3</sup>  
 Mean Sediment Thickness: 2.10 ft

Notes:  
 -The purpose of this study is to provide an estimated amount of soft sediment.  
 -Sediment volume calculations based on computer model generated from 392 measurements collected in the field.  
 -Areas of rock and impermeable surfaces may affect the estimated total volume of removable sediment.  
 -Shrinkage not included in calculations.  
 -The information collected for this project represents the current existing conditions on the date indicated and can only be considered as indicating conditions at the time.

Lake Composition



**Lake Information:**  
 Area: 75.5 acres  
 Max Depth: -10.1 ft  
 Mean Depth: -6.8 ft  
 Volume: 168,487,340 gallons / 517.0 acre-ft

**Mapping Information:**  
 Data Collection Performed: 06/13 - 06/14/2023  
 GPS: Mapping Grade (sub-foot accuracy)  
 Points Collected: 252,383  
 Water Level: Adjusted to Full Pool  
 Pool Elevation: 499.2' NAVD88 (Local Gauge)  
 Pool Elevation: 498.9' NAVD88 (RTK)



DPK CONSULTING, LLC  
 200 METROPLEX DRIVE - STE. 285, EDISON, NJ 08817  
 P: 732-764-0100 F: 732-764-0990  
 NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. 24GA28042200

James J. Heiser  
 Professional Land Surveyor  
 JHEISER@DPKCONSULTING.NET

date 09/15/2023  
 N.J. Lic: 24GS04331100  
 PA. Lic: SU075616  
 N.Y. Lic: 050932-1  
 CT. Lic: 70476  
 DE. Lic: S6-0010858

Mountain Lakes - Mountain Lake  
 Sediment Thickness

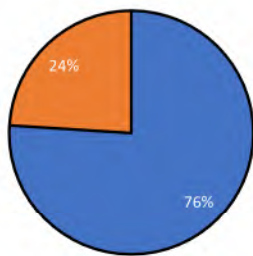




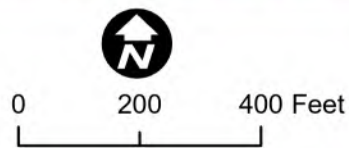
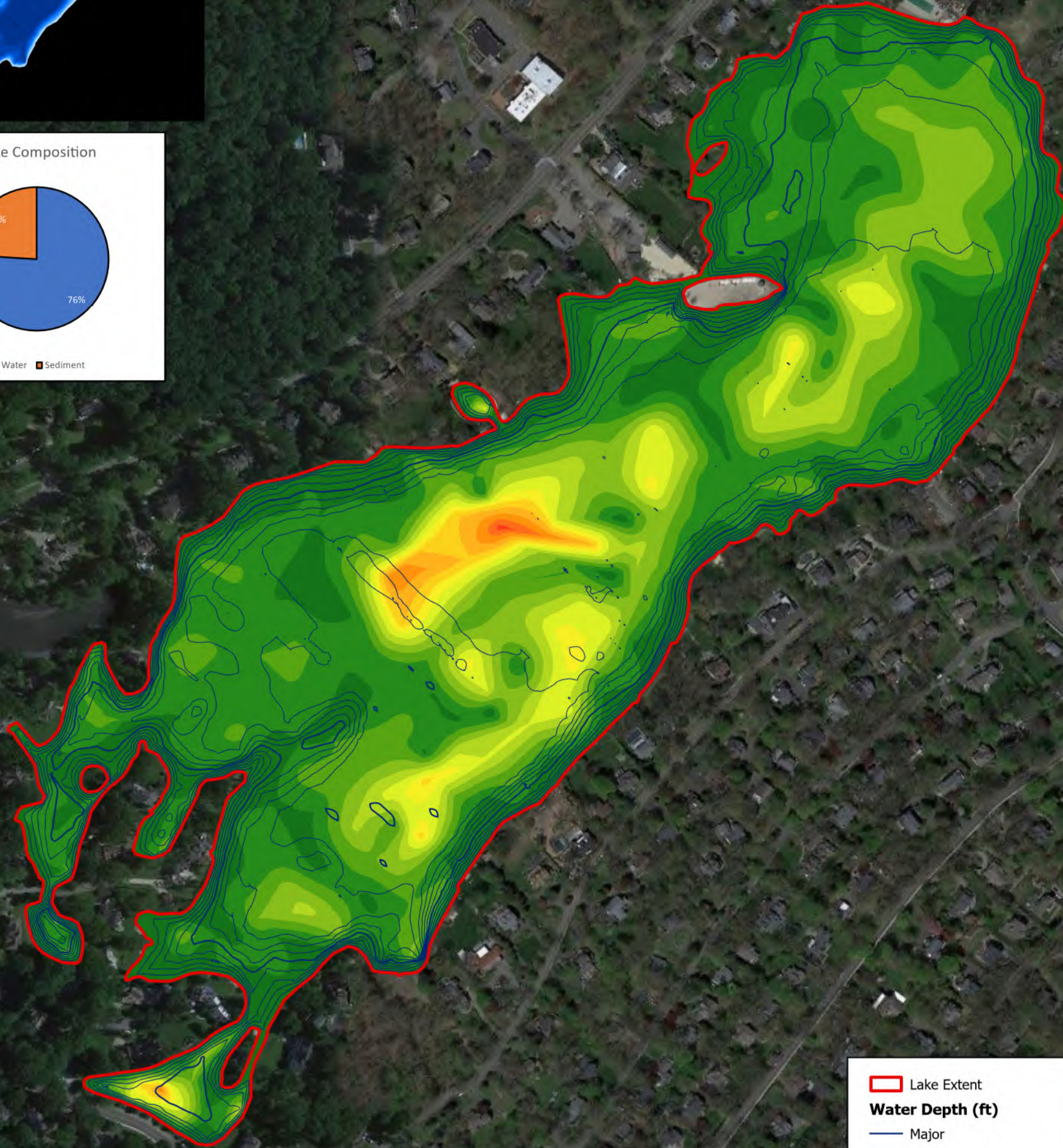
Estimated Sediment Volume: 256,832.6 yards<sup>3</sup>  
 Mean Sediment Thickness: 2.10 ft

Notes:  
 -The purpose of this study is to provide an estimated amount of soft sediment.  
 -Sediment volume calculations based on computer model generated from 392 measurements collected in the field.  
 -Areas of rock and impermeable surfaces may affect the estimated total volume of removable sediment.  
 -Shrinkage not included in calculations.  
 -The information collected for this project represents the current existing conditions on the date indicated and can only be considered as indicating conditions at the time.

Lake Composition



Water Sediment



Lake Information:

Area: 75.5 acres  
 Max Depth: -10.1 ft  
 Mean Depth: -6.8 ft  
 Volume: 168,487,340 gallons / 517.0 acre-ft

Mapping Information:

Data Collection Performed: 06/13 - 06/14/2023  
 GPS: Mapping Grade (sub-foot accuracy)  
 Points Collected: 252,383  
 Water Level: Adjusted to Full Pool  
 Pool Elevation: 499.2' NAVD88 (Local Gauge)  
 Pool Elevation: 498.9' NAVD88 (RTK)



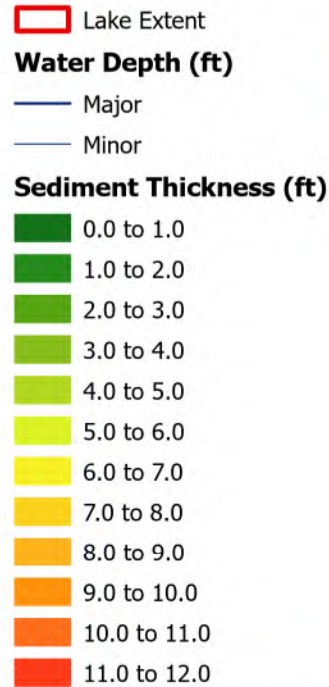
**DPK CONSULTING**

DPK CONSULTING, LLC  
 200 METROPLEX DRIVE - STE. 285, EDISON, NJ 08817  
 P: 732-764-0100 F: 732-764-0990  
 NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. 24GA28042200

James J. Heiser  
 Professional Land Surveyor  
 JHEISER@DPKCONSULTING.NET

date 09/15/2023

N.J. Lic: 24GS04331100  
 PA. Lic: SU075616  
 N.Y. Lic: 050932-1  
 CT. Lic: 70476  
 DE. Lic: S6-0010858



Mountain Lakes - Mountain Lake  
 Sediment Thickness

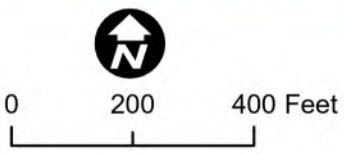
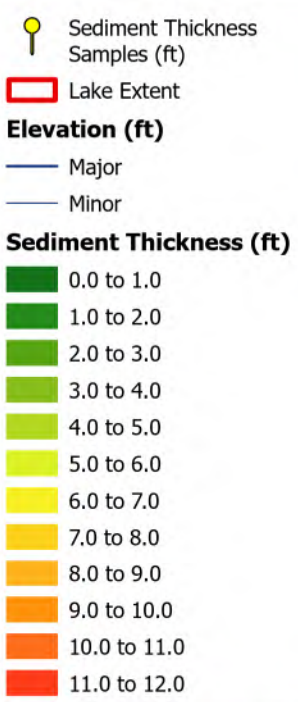
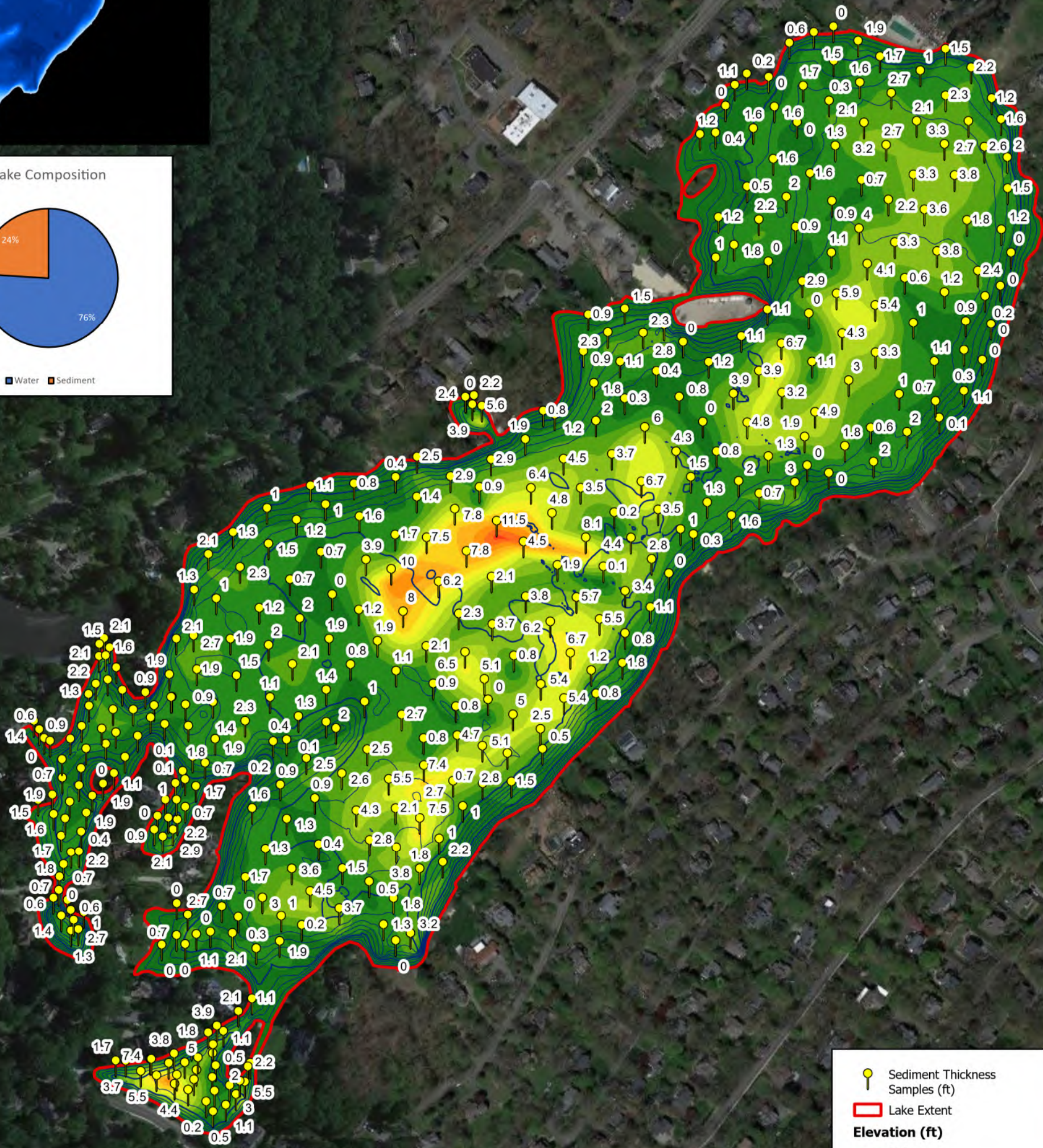
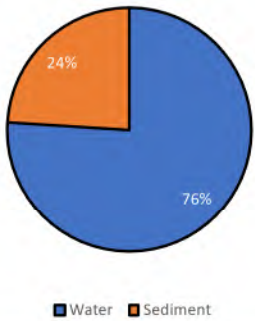




Estimated Sediment Volume: 256,832.6 yards<sup>3</sup>  
 Mean Sediment Thickness: 2.10 ft

Notes:  
 -The purpose of this study is to provide an estimated amount of soft sediment.  
 -Sediment volume calculations based on computer model generated from 392 measurements collected in the field.  
 -Areas of rock and impermeable surfaces may affect the estimated total volume of removable sediment.  
 -Shrinkage not included in calculations.  
 -The information collected for this project represents the current existing conditions on the date indicated and can only be considered as indicating conditions at the time.

Lake Composition



**Lake Information:**  
 Area: 75.5 acres  
 Max Depth: -10.1 ft  
 Mean Depth: -6.8 ft  
 Volume: 168,487,340 gallons / 517.0 acre-ft

**Mapping Information:**  
 Data Collection Performed: 06/13 - 06/14/2023  
 GPS: Mapping Grade (sub-foot accuracy)  
 Points Collected: 252,383  
 Water Level: Adjusted to Full Pool  
 Pool Elevation: 499.2' NAVD88 (Local Gauge)  
 Pool Elevation: 498.9' NAVD88 (RTK)



DPK CONSULTING, LLC  
 200 METROPLEX DRIVE - STE. 285, EDISON, NJ 08817  
 P: 732-764-0100 F: 732-764-0990  
 NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. 24GA28042200

James J. Heiser  
 Professional Land Surveyor  
 JHEISER@DPKCONSULTING.NET

date 09/15/2023  
 N.J. Lic: 24GS04331100  
 PA. Lic: SU075616  
 N.Y. Lic: 050932-1  
 CT. Lic: 70476  
 DE. Lic: S6-0010858

Mountain Lakes - Mountain Lake  
 Sediment Thickness

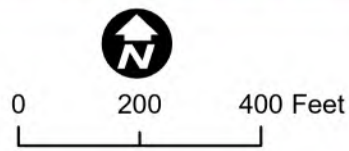
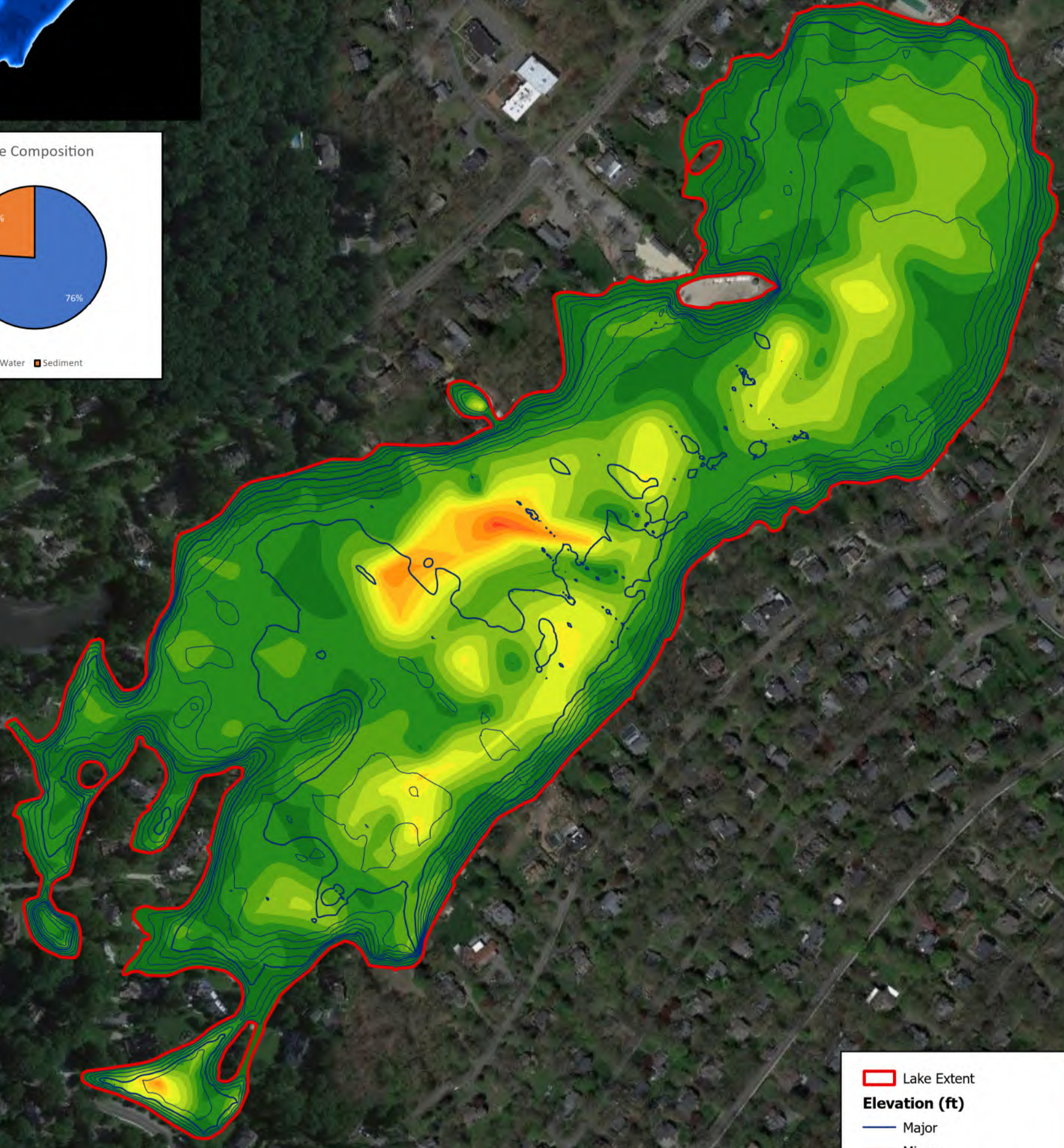
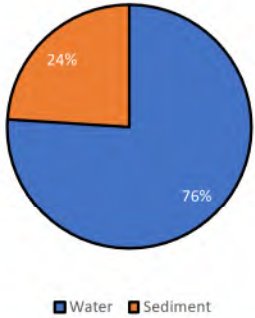




Estimated Sediment Volume: 256,832.6 yards<sup>3</sup>  
 Mean Sediment Thickness: 2.10 ft

Notes:  
 -The purpose of this study is to provide an estimated amount of soft sediment.  
 -Sediment volume calculations based on computer model generated from 392 measurements collected in the field.  
 -Areas of rock and impermeable surfaces may affect the estimated total volume of removable sediment.  
 -Shrinkage not included in calculations.  
 -The information collected for this project represents the current existing conditions on the date indicated and can only be considered as indicating conditions at the time.

Lake Composition



**Lake Information:**  
 Area: 75.5 acres  
 Max Depth: -10.1 ft  
 Mean Depth: -6.8 ft  
 Volume: 168,487,340 gallons / 517.0 acre-ft

**Mapping Information:**  
 Data Collection Performed: 06/13 - 06/14/2023  
 GPS: Mapping Grade (sub-foot accuracy)  
 Points Collected: 252,383  
 Water Level: Adjusted to Full Pool  
 Pool Elevation: 499.2' NAVD88 (Local Gauge)  
 Pool Elevation: 498.9' NAVD88 (RTK)

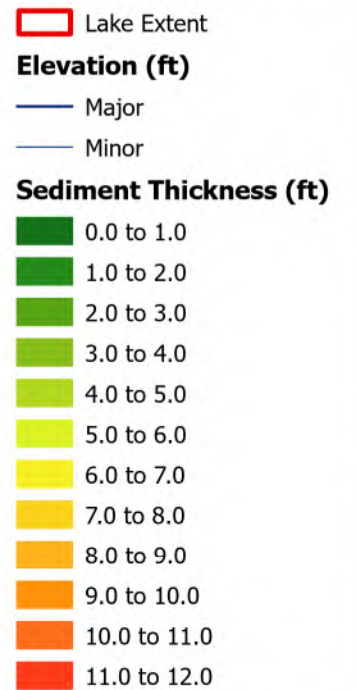


DPK CONSULTING, LLC  
 200 METROPLEX DRIVE - STE. 285, EDISON, NJ 08817  
 P: 732-764-0100 F: 732-764-0990  
 NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. 24GA28042200

**James J. Heiser**  
 Professional Land Surveyor  
 JHEISER@DPKCONSULTING.NET

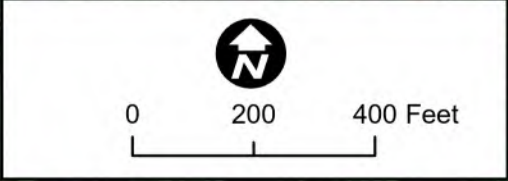
date 09/15/2023

N.J. Lic: 24GS04331100  
 PA. Lic: SU075616  
 N.Y. Lic: 050932-1  
 CT. Lic: 70476  
 DE. Lic: S6-0010858



Mountain Lakes - Mountain Lake  
 Sediment Thickness





**Lake Information:**  
 Area: 75.5 acres  
 Max Depth: -10.1 ft  
 Mean Depth: -6.8 ft  
 Volume: 168,487,340 gallons / 517.0 acre-ft

**Mapping Information:**  
 Data Collection Performed: 06/13 - 06/14/2023  
 GPS: Mapping Grade (sub-foot accuracy)  
 Points Collected: 252,383  
 Water Level: Adjusted to Full Pool  
 Pool Elevation: 499.2' NAVD88 (Local Gauge)  
 Pool Elevation: 498.9' NAVD88 (RTK)



**DPK CONSULTING**  
 DPK CONSULTING, LLC  
 200 METROPLEX DRIVE - STE. 285, EDISON, NJ 08817  
 P: 732-764-0100 F: 732-764-0990  
 NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. 24GA28042200


date 09/15/2023

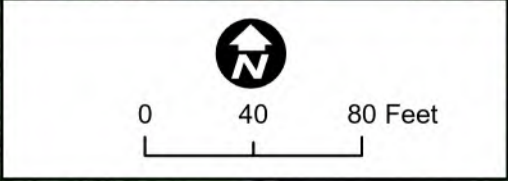
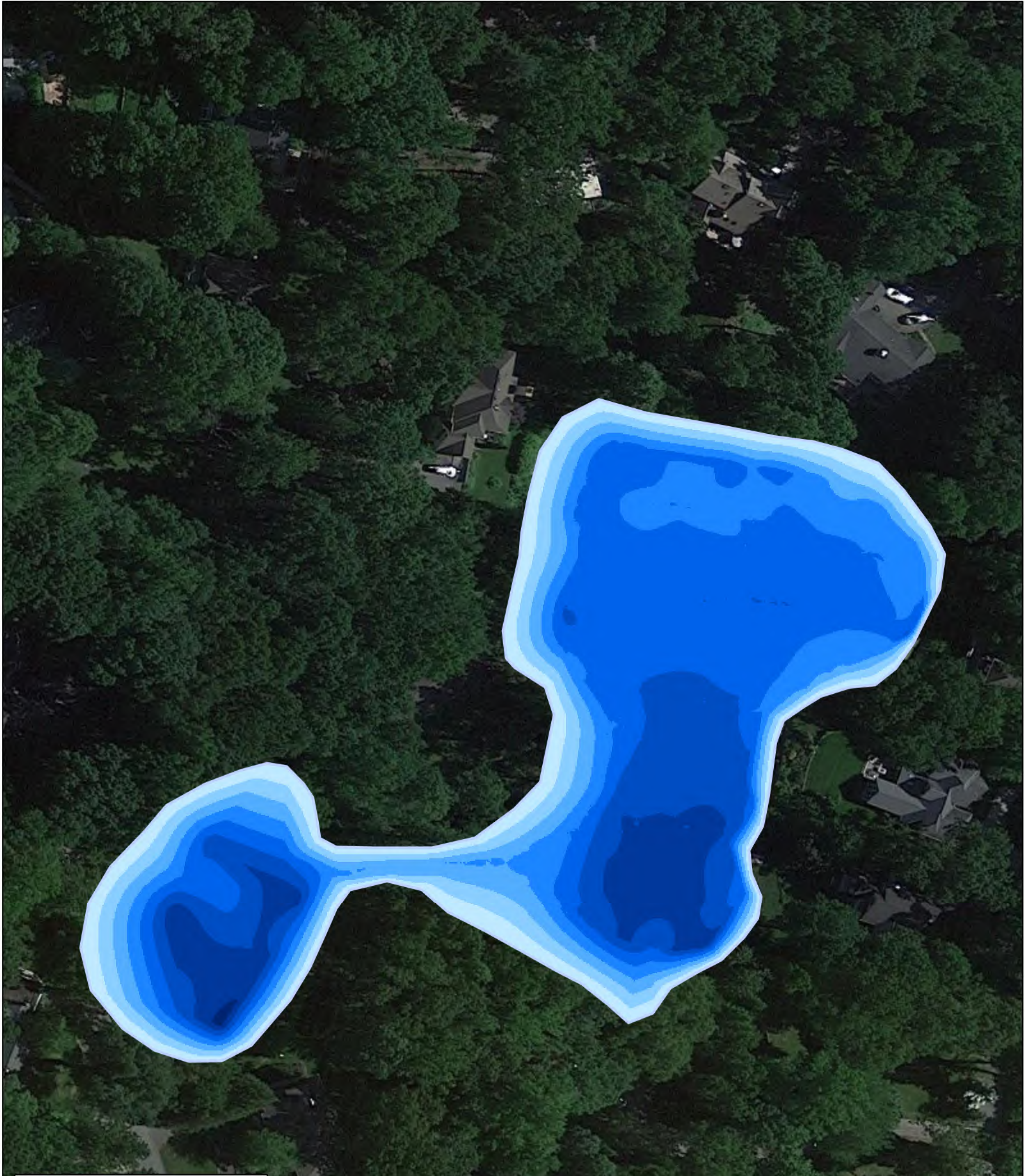
**James J. Heiser**  
 Professional Land Surveyor  
 JHEISER@DPKCONSULTING.NET

N.J. Lic: 24GS04331100  
 PA. Lic: SU075616  
 N.Y. Lic: 050932-1  
 CT. Lic: 70476  
 DE. Lic: S6-0010858

Copyright © 2023 The Mapping Network, LLC. All rights reserved. Reasonable efforts have been made to verify that this map accurately interprets the source data used in its preparation, however, a degree of error is inherent in all maps, and this map may contain omissions and errors in scale, resolution, rectification, positional accuracy, development methodology, interpretation of source data, and other circumstances. The Mapping Network, LLC MAKES NO WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. The Mapping Network, LLC SHALL NOT BE LIABLE TO ANY PERSON UNDER ANY LEGAL OR EQUITABLE THEORY FOR DAMAGES ARISING OUT OF THE USE OF THIS MAP, INCLUDING, WITHOUT LIMITATION, FOR DIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES. This map is date specific and is intended for use only at the published scale. Nothing in this map implies the right to use private property, which may lie within or be bounded by the waters shown on this map. Do not use this map for marine navigation, swimming, diving, or other related activities, as it does not depict all information necessary to perform these functions safely.

**SHADOW AND OLIVE LAKE RESULTS**

Area:	2.9 Acres
Water Level/Elevation:	Full Pool / 522.84 NAVD88
Max Depth:	7.5 Feet
Mean Depth:	3.7 Feet
Volume (Holding Capacity):	3,540,070 gallons / 10.9 acre-feet
Estimated Sediment Volume:	8,170 cubic yards- wet unconsolidated sediment
Mean Sediment Thickness:	1.7 Feet
Lake Composition:	68% Water / 32% unconsolidated sediment
Surveyor Notes:	<ul style="list-style-type: none"> <li>Navigation was limited along the shorelines due to tree obstruction. An abundance of various types of aquatic vegetation interfered with sonar measurements. In those areas we used manual measurement information.</li> </ul>
	



**Lake Information:**  
 Area: 2.9 acres  
 Max Depth: -7.5 ft  
 Mean Depth: -3.7 ft  
 Volume: 3,540,070 gallons / 10.9 acre-ft

**Mapping Information:**  
 Data Collection Performed: 06/15/2023  
 GPS: Mapping Grade (sub-foot accuracy)  
 Points Collected: 13,591  
 Water Level: Full Pool  
 Pool Elevation: 522.84' NAVD88




**DPK CONSULTING**  
 DPK CONSULTING, LLC  
 200 METROPLEX DRIVE - STE. 285, EDISON, NJ 08817  
 P-732-764-0100 F: 732-764-0990  
 NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. 24GA28042200

date 09/15/2023

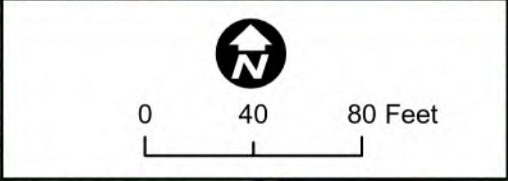
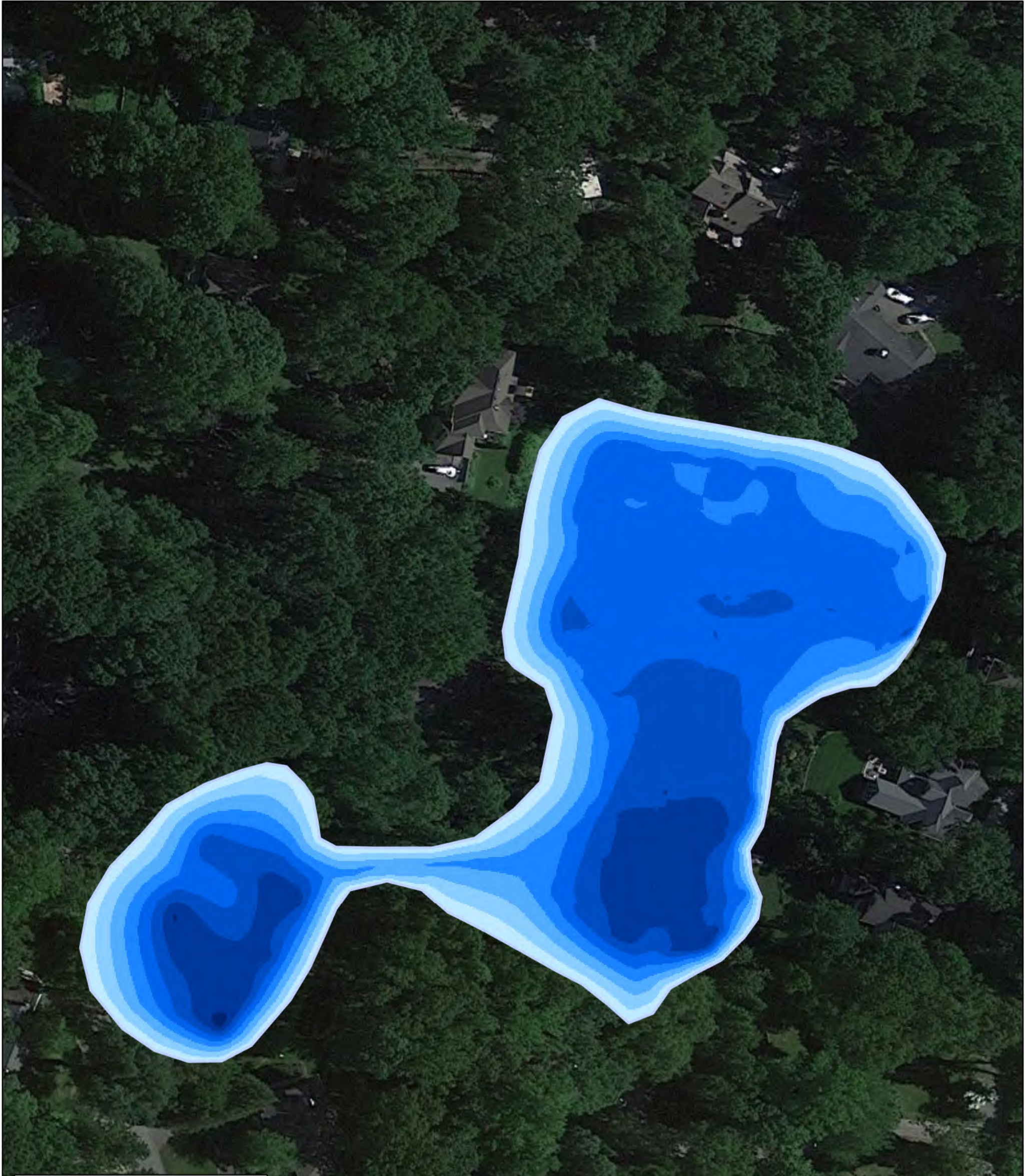
**James J. Heiser**  
 Professional Land Surveyor  
 JHEISER@DPKCONSULTING.NET

N.J. Lic: 24GS04331100  
 PA. Lic: SU075616  
 N.Y. Lic: 050932-1  
 CT. Lic: 70476  
 DE. Lic: S6-0010858

**Mountain Lakes - Shadow & Olive Lakes  
 3D - Depth**



Copyright © 2023 The Mapping Network, LLC. All rights reserved. Reasonable efforts have been made to verify that this map accurately interprets the source data used in its preparation, however, a degree of error is inherent in all maps, and this map may contain omissions and errors in scale, resolution, rectification, positional accuracy, development methodology, interpretation of source data, and other circumstances. The Mapping Network, LLC MAKES NO WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. The Mapping Network, LLC SHALL NOT BE LIABLE TO ANY PERSON UNDER ANY LEGAL OR EQUITABLE THEORY FOR DAMAGES ARISING OUT OF THE USE OF THIS MAP, INCLUDING, WITHOUT LIMITATION, FOR DIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES. This map is date specific and is intended for use only at the published scale. Nothing in this map implies the right to use private property, which may lie within or be bounded by the waters shown on this map. Do not use this map for marine navigation, swimming, diving, or other related activities, as it does not depict all information necessary to perform these functions safely.



**Lake Information:**  
 Area: 2.9 acres  
 Max Depth: -7.5 ft  
 Mean Depth: -3.7 ft  
 Volume: 3,540,070 gallons / 10.9 acre-ft

**Mapping Information:**  
 Data Collection Performed: 06/15/2023  
 GPS: Mapping Grade (sub-foot accuracy)  
 Points Collected: 13,591  
 Water Level: Full Pool  
 Pool Elevation: 522.84' NAVD88




**DPK CONSULTING**  
 DPK CONSULTING, LLC  
 200 METROPLEX DRIVE - STE. 285, EDISON, NJ 08817  
 P: 732-764-0100 F: 732-764-0990  
 NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. 24GA28042200

date 09/15/2023

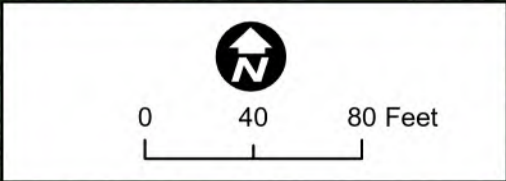
**James J. Heiser**  
 Professional Land Surveyor  
 JHEISER@DPKCONSULTING.NET

N.J. Lic: 24GS04331100  
 PA. Lic: SU075616  
 N.Y. Lic: 050932-1  
 CT. Lic: 70476  
 DE. Lic: S6-0010858

**Mountain Lakes - Shadow & Olive Lakes  
 3D - Elevation**



Copyright © 2023 The Mapping Network, LLC. All rights reserved. Reasonable efforts have been made to verify that this map accurately interprets the source data used in its preparation, however, a degree of error is inherent in all maps, and this map may contain omissions and errors in scale, resolution, rectification, positional accuracy, development methodology, interpretation of source data, and other circumstances. The Mapping Network, LLC MAKES NO WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. The Mapping Network, LLC SHALL NOT BE LIABLE TO ANY PERSON UNDER ANY LEGAL OR EQUITABLE THEORY FOR DAMAGES ARISING OUT OF THE USE OF THIS MAP, INCLUDING, WITHOUT LIMITATION, FOR DIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES. This map is date specific and is intended for use only at the published scale. Nothing in this map implies the right to use private property, which may lie within or be bounded by the waters shown on this map. Do not use this map for marine navigation, swimming, diving, or other related activities, as it does not depict all information necessary to perform these functions safely.



**Lake Information:**  
 Area: 2.9 acres  
 Max Depth: -7.5 ft  
 Mean Depth: -3.7 ft  
 Volume: 3,540,070 gallons / 10.9 acre-ft

**Mapping Information:**  
 Data Collection Performed: 06/15/2023  
 GPS: Mapping Grade (sub-foot accuracy)  
 Points Collected: 13,591  
 Water Level: Full Pool  
 Pool Elevation: 522.84' NAVD88



**DPK  
CONSULTING**


DPK CONSULTING, LLC  
 200 METROPLEX DRIVE - STE. 285, EDISON, NJ 08817  
 P: 732-764-0100 F: 732-764-0990  
 NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. 24GA28042200

date 09/15/2023

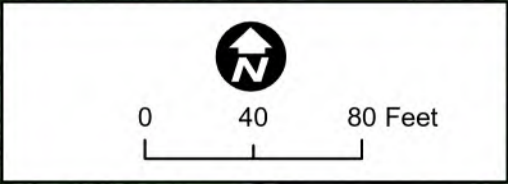
**James J. Heiser**  
 Professional Land Surveyor  
 JHEISER@DPKCONSULTING.NET

N.J. Lic: 24GS04331100  
 PA. Lic: SU075616  
 N.Y. Lic: 050932-1  
 CT. Lic: 70476  
 DE. Lic: S6-0010858

**Mountain Lakes - Shadow & Olive Lakes  
Contours - Depth**



Copyright © 2023 The Mapping Network, LLC. All rights reserved. Reasonable efforts have been made to verify that this map accurately interprets the source data used in its preparation, however, a degree of error is inherent in all maps, and this map may contain omissions and errors in scale, resolution, rectification, positional accuracy, development methodology, interpretation of source data, and other circumstances. The Mapping Network, LLC MAKES NO WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. The Mapping Network, LLC SHALL NOT BE LIABLE TO ANY PERSON UNDER ANY LEGAL OR EQUITABLE THEORY FOR DAMAGES ARISING OUT OF THE USE OF THIS MAP, INCLUDING, WITHOUT LIMITATION, FOR DIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES. This map is date specific and is intended for use only at the published scale. Nothing in this map implies the right to use private property, which may lie within or be bounded by the waters shown on this map. Do not use this map for marine navigation, swimming, diving, or other related activities, as it does not depict all information necessary to perform these functions safely.



**Lake Information:**  
 Area: 2.9 acres  
 Max Depth: -7.5 ft  
 Mean Depth: -3.7 ft  
 Volume: 3,540,070 gallons / 10.9 acre-ft

**Mapping Information:**  
 Data Collection Performed: 06/15/2023  
 GPS: Mapping Grade (sub-foot accuracy)  
 Points Collected: 13,591  
 Water Level: Full Pool  
 Pool Elevation: 522.84' NAVD88

**DPK CONSULTING**  
 DPK CONSULTING, LLC  
 200 METROPLEX DRIVE - STE. 285, EDISON, NJ 08817  
 P: 732-764-0100 F: 732-764-0990  
 NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. 24GA28042200

date 09/15/2023

**James J. Heiser**  
 Professional Land Surveyor  
 JHEISER@DPKCONSULTING.NET

N.J. Lic: 24GS04331100  
 PA. Lic: SU075616  
 N.Y. Lic: 050932-1  
 CT. Lic: 70476  
 DE. Lic: S6-0010858

**Mountain Lakes - Shadow & Olive Lakes  
 Contours - Elevation**

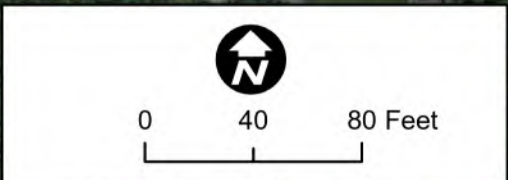
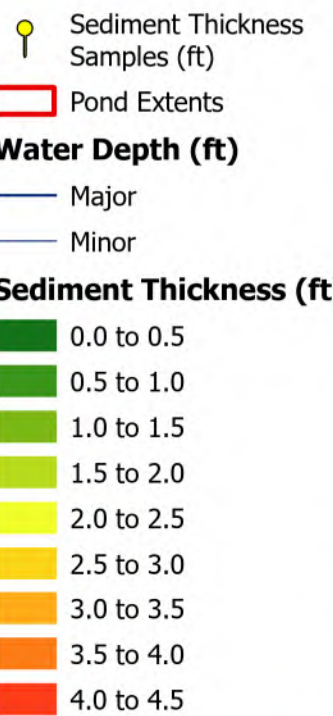
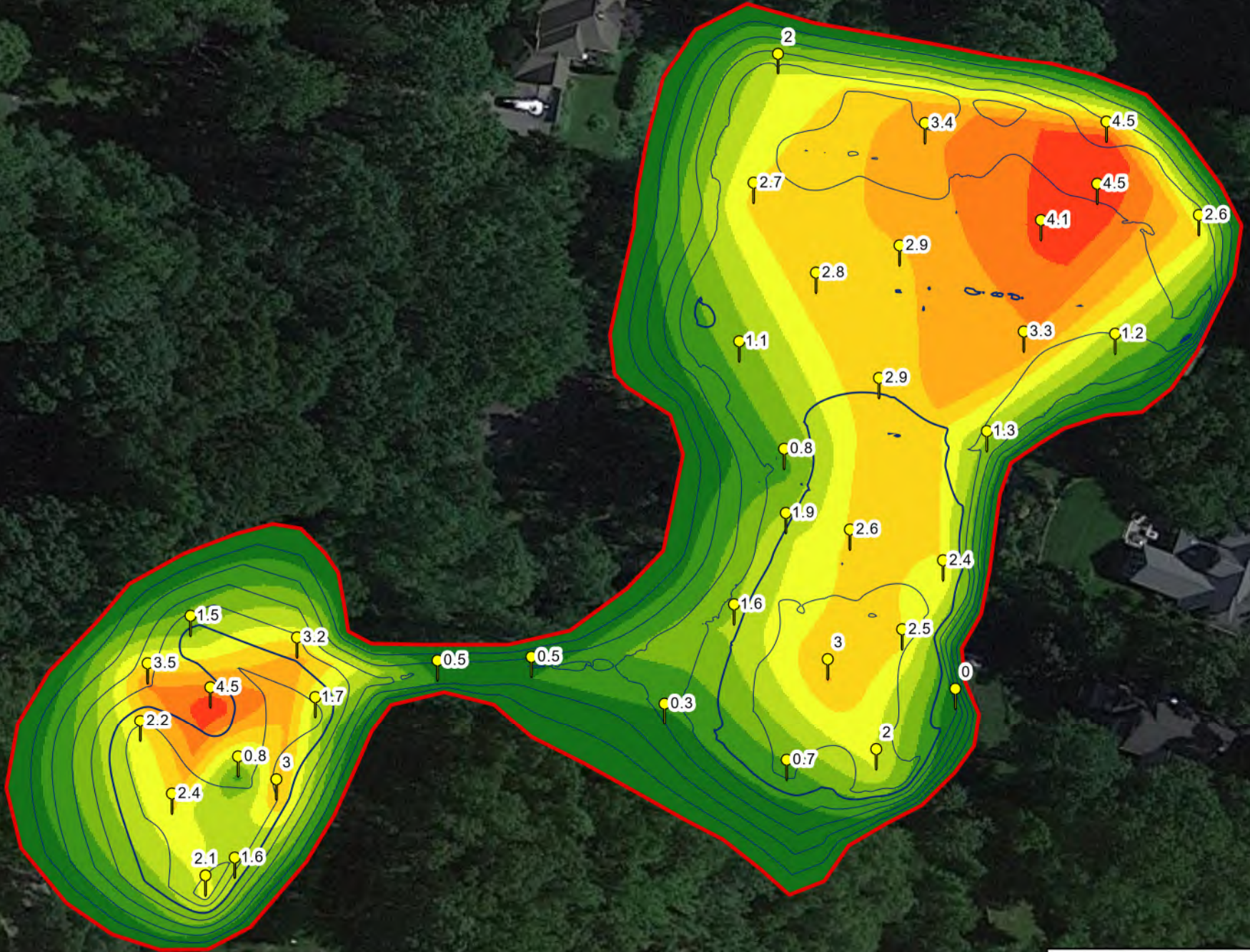
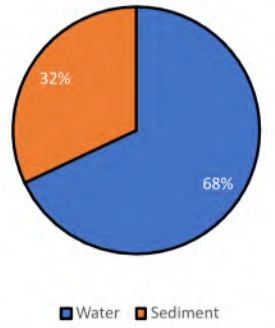
Copyright © 2023 The Mapping Network, LLC. All rights reserved. Reasonable efforts have been made to verify that this map accurately interprets the source data used in its preparation, however, a degree of error is inherent in all maps, and this map may contain omissions and errors in scale, resolution, rectification, positional accuracy, development methodology, interpretation of source data, and other circumstances. The Mapping Network, LLC MAKES NO WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. The Mapping Network, LLC SHALL NOT BE LIABLE TO ANY PERSON UNDER ANY LEGAL OR EQUITABLE THEORY FOR DAMAGES ARISING OUT OF THE USE OF THIS MAP, INCLUDING, WITHOUT LIMITATION, FOR DIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES. This map is date specific and is intended for use only at the published scale. Nothing in this map implies the right to use private property, which may lie within or be bounded by the waters shown on this map. Do not use this map for marine navigation, swimming, diving, or other related activities, as it does not depict all information necessary to perform these functions safely.



Estimated Sediment Volume: 8,169.7 yards<sup>3</sup>  
 Mean Sediment Thickness: 1.70 ft

Notes:  
 -The purpose of this study is to provide an estimated amount of soft sediment  
 -Sediment volume calculations based on computer model generated from 38 measurements collected in the field.  
 -Areas of rock and impermeable surfaces may affect the estimated total volume of removable sediment.  
 -Shrinkage not included in calculations  
 -The information collected for this project represents the current existing conditions on the date indicated and can only be considered as indicating conditions at the time.

Lake Composition



**Lake Information:**  
 Area: 2.9 acres  
 Max Depth: -7.5 ft  
 Mean Depth: -3.7 ft  
 Volume: 3,540,070 gallons / 10.9 acre-ft

**Mapping Information:**  
 Data Collection Performed: 06/15/2023  
 GPS: Mapping Grade (sub-foot accuracy)  
 Points Collected: 13,591  
 Water Level: Full Pool  
 Pool Elevation: 522.84' NAVD88

**DPK CONSULTING**

DPK CONSULTING, LLC  
 200 METROPLEX DRIVE - STE. 285, EDISON, NJ 08817  
 P: 732-764-0100 F: 732-764-0990  
 NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. 24GA28042200

date 09/15/2023

**James J. Heiser**  
 Professional Land Surveyor  
 JHEISER@DPKCONSULTING.NET

N.J. Lic: 24GS04331100  
 PA. Lic: SU075616  
 N.Y. Lic: 050932-1  
 CT. Lic: 70476  
 DE. Lic: S6-0010858

Mountain Lakes - Shadow & Olive Lakes  
 Sediment Thickness



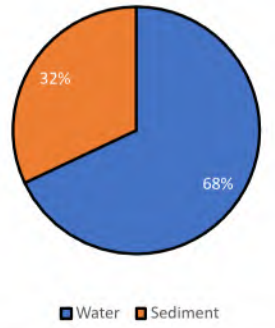
Copyright © 2023 The Mapping Network, LLC. All rights reserved. Reasonable efforts have been to verify that this map accurately interprets the source data used in its preparation, however, a degree of error is inherent in all maps, and this map may contain omissions and errors in scale, resolution, rectification, positional accuracy, development methodology, interpretation of source data, and other circumstances. The Mapping Network, LLC MAKES NO WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. The Mapping Network, LLC SHALL NOT BE LIABLE TO ANY PERSON UNDER ANY LEGAL OR EQUITABLE THEORY FOR DAMAGES ARISING OUT OF THE USE OF THIS MAP, INCLUDING, WITHOUT LIMITATION, FOR DIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES. This map is date specific and is intended for use only at the published scale. Nothing in this map implies the right to use private property, which may lie within or be bounded by the waters shown on this map. Do not use this map for marine navigation, swimming, diving, or other related activities, as it does not depict all information necessary to perform these functions safely.



Estimated Sediment Volume: 8,169.7 yards<sup>3</sup>  
 Mean Sediment Thickness: 1.70 ft

Notes:  
 -The purpose of this study is to provide an estimated amount of soft sediment  
 -Sediment volume calculations based on computer model generated from 38 measurements collected in the field.  
 -Areas of rock and impermeable surfaces may affect the estimated total volume of removable sediment.  
 -Shrinkage not included in calculations  
 -The information collected for this project represents the current existing conditions on the date indicated and can only be considered as indicating conditions at the time.

Lake Composition



Sediment Thickness Samples (ft)

Pond Extents

**Elevation (ft)**

Major

Minor

**Sediment Thickness (ft)**

0.0 to 0.5

0.5 to 1.0

1.0 to 1.5

1.5 to 2.0

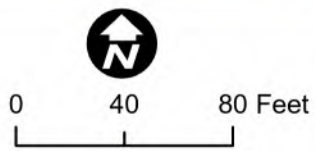
2.0 to 2.5

2.5 to 3.0

3.0 to 3.5

3.5 to 4.0

4.0 to 4.5



**Lake Information:**

Area: 2.9 acres  
 Max Depth: -7.5 ft  
 Mean Depth: -3.7 ft  
 Volume: 3,540,070 gallons / 10.9 acre-ft

**Mapping Information:**

Data Collection Performed: 06/15/2023  
 GPS: Mapping Grade (sub-foot accuracy)  
 Points Collected: 13,591  
 Water Level: Full Pool  
 Pool Elevation: 522.84' NAVD88



DPK CONSULTING, LLC  
 200 METROPLEX DRIVE - STE. 285, EDISON, NJ 08817  
 P: 732-764-0100 F: 732-764-0990  
 NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. 24GA28042200


James J. Heiser  
 Professional Land Surveyor  
 JHEISER@DPKCONSULTING.NET

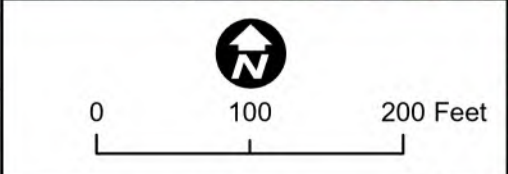
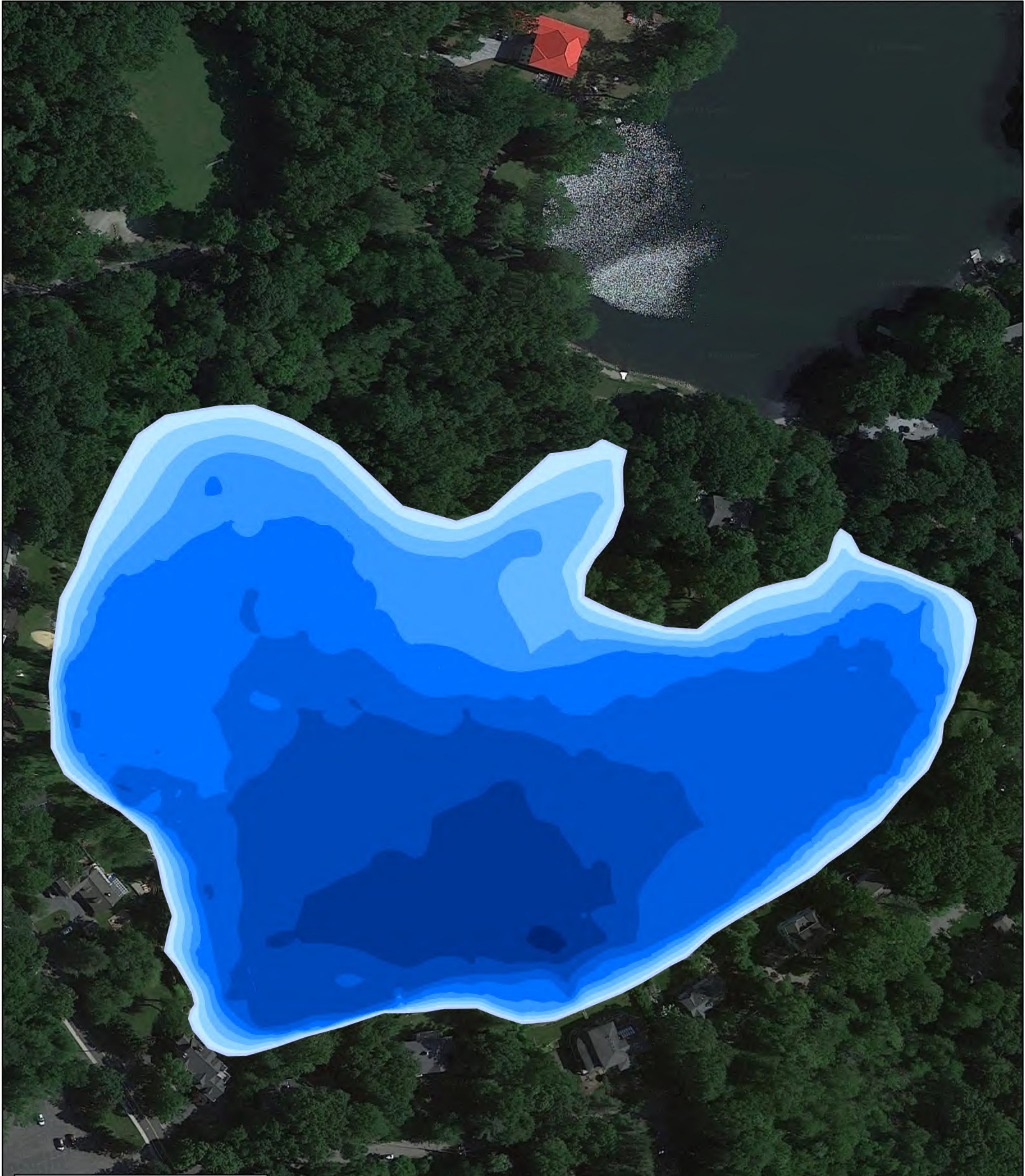
date 09/15/2023  
 N.J. Lic: 24GS04331100  
 PA. Lic: SU075616  
 N.Y. Lic: 050932-1  
 CT. Lic: 70476  
 DE. Lic: S6-0010858

Mountain Lakes - Shadow & Olive Lakes  
 Sediment Thickness



**SUNSET LAKE RESULTS**

Area:	15.0 Acres
Water Level/Elevation:	Full Pool / 526.7 NAVD88
Max Depth:	8.2 Feet
Mean Depth:	4.4 Feet
Volume (Holding Capacity):	21,726,462 gallons / 66.7 acre-feet
Estimated Sediment Volume:	88,642 cubic yards- wet unconsolidated sediment
Mean Sediment Thickness:	3.64 Feet
Lake Composition:	55% Water / 45% unconsolidated sediment
Estimated Sediment Change (2010-2013)	7,874.2 cubic yard gain
Mean Depth Change (2010-2013)	+0.32 Feet
Surveyor Notes:	<ul style="list-style-type: none"> <li>We observed dense clusters of filamentous algae and White Water-Lily scattered throughout the pond, which interfered with sonar. The inlet area directly downstream from Crystal Lake was very shallow and had large boulders scattered throughout. Manual probes were taken in this area.</li> </ul>
	



**Lake Information:**  
 Area: 15.0 acres  
 Max Depth: -8.2 ft  
 Mean Depth: -4.4 ft  
 Volume: 21,726,462 gallons / 66.7 acre-ft

**Mapping Information:**  
 Data Collection Performed: 06/13/2023  
 GPS: Mapping Grade (sub-foot accuracy)  
 Points Collected: 22,267  
 Water Level: Full Pool  
 Pool Elevation: 526.67' NAVD88



**DPK  
CONSULTING**

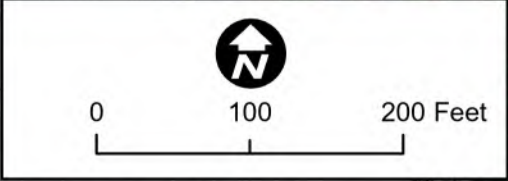
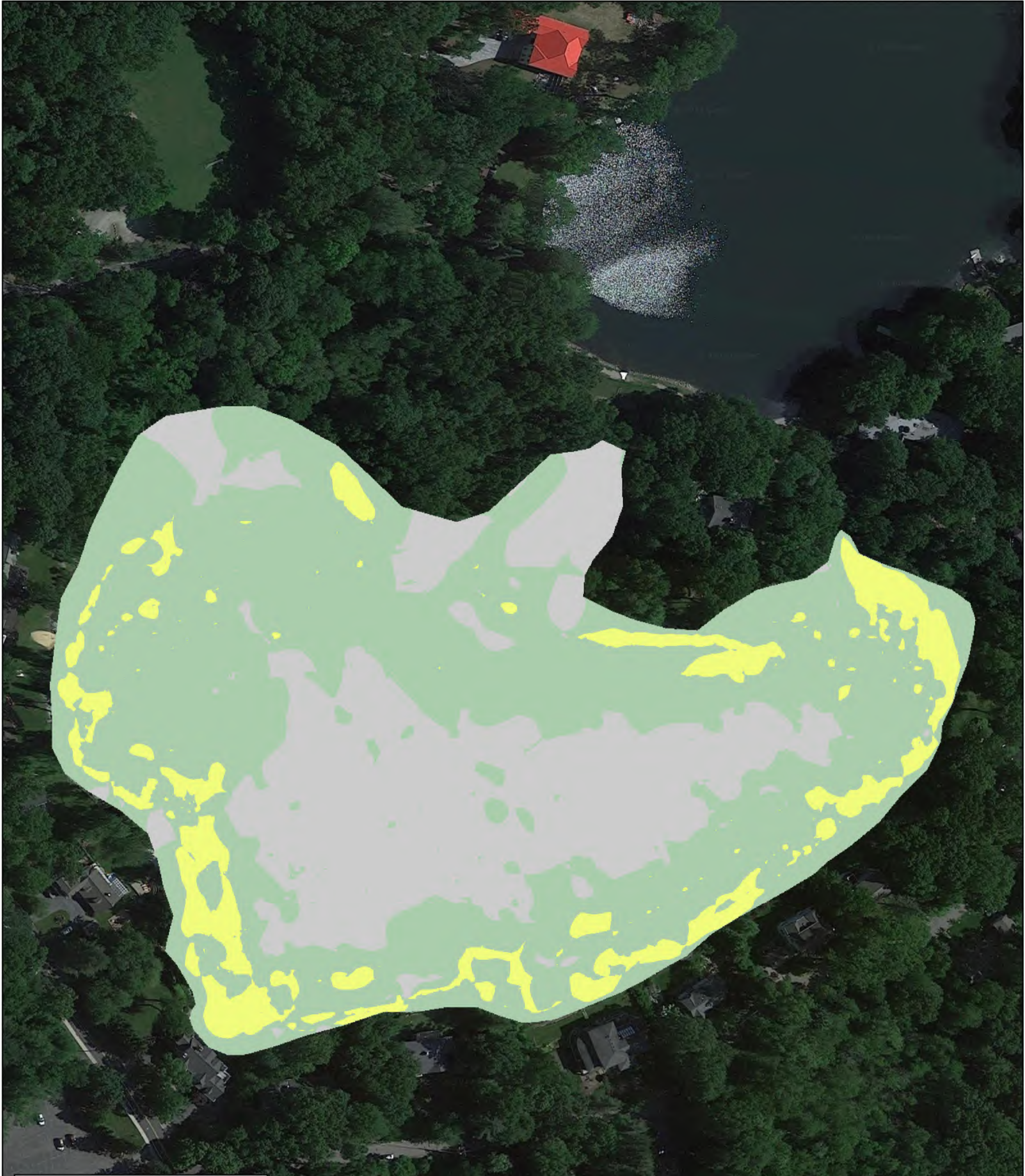
DPK CONSULTING, LLC  
 200 METROPLEX DRIVE - STE. 285, EDISON, NJ 08817  
 P: 732-764-0100 F: 732-764-0990  
 NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. 24GA28042200

date 09/15/2023

**James J. Heiser**  
 Professional Land Surveyor  
 JHEISER@DPKCONSULTING.NET

N.J. Lic: 24GS04331100  
 PA. Lic: SU075616  
 N.Y. Lic: 050932-1  
 CT. Lic: 70476  
 DE. Lic: S6-0010858

Copyright © 2023 The Mapping Network, LLC. All rights reserved. Reasonable efforts have been to verify that this map accurately interprets the source data used in its preparation, however, a degree of error is inherent in all maps, and this map may contain omissions and errors in scale, resolution, rectification, positional accuracy, development methodology, interpretation of source data, and other circumstances. The Mapping Network, LLC MAKES NO WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. The Mapping Network, LLC SHALL NOT BE LIABLE TO ANY PERSON UNDER ANY LEGAL OR EQUITABLE THEORY FOR DAMAGES ARISING OUT OF THE USE OF THIS MAP, INCLUDING, WITHOUT LIMITATION, FOR DIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES. This map is date specific and is intended for use only at the published scale. Nothing in this map implies the right to use private property, which may lie within or be bounded by the waters shown on this map. Do not use this map for marine navigation, swimming, diving, or other related activities, as it does not depict all information necessary to perform these functions safely.



**Lake Information:**  
 Area: 15.0 acres  
 Max Depth: -8.2 ft  
 Mean Depth: -4.4 ft  
 Volume: 21,726,462 gallons / 66.7 acre-ft

**Mapping Information:**  
 Data Collection Performed: 06/13/2023  
 GPS: Mapping Grade (sub-foot accuracy)  
 Points Collected: 22,267  
 Water Level: Full Pool  
 Pool Elevation: 526.67' NAVD88



**DPK CONSULTING**  
 DPK CONSULTING, LLC  
 200 METROPLEX DRIVE - STE. 285, EDISON, NJ 08817  
 P: 732-764-0100 F: 732-764-0990  
 NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. 24GA28042200

date 09/15/2023

**James J. Heiser**  
 Professional Land Surveyor  
 JHEISER@DPKCONSULTING.NET

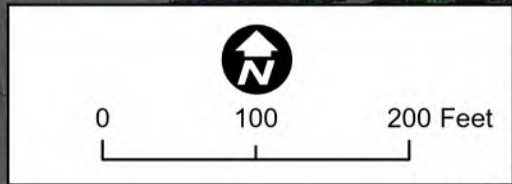
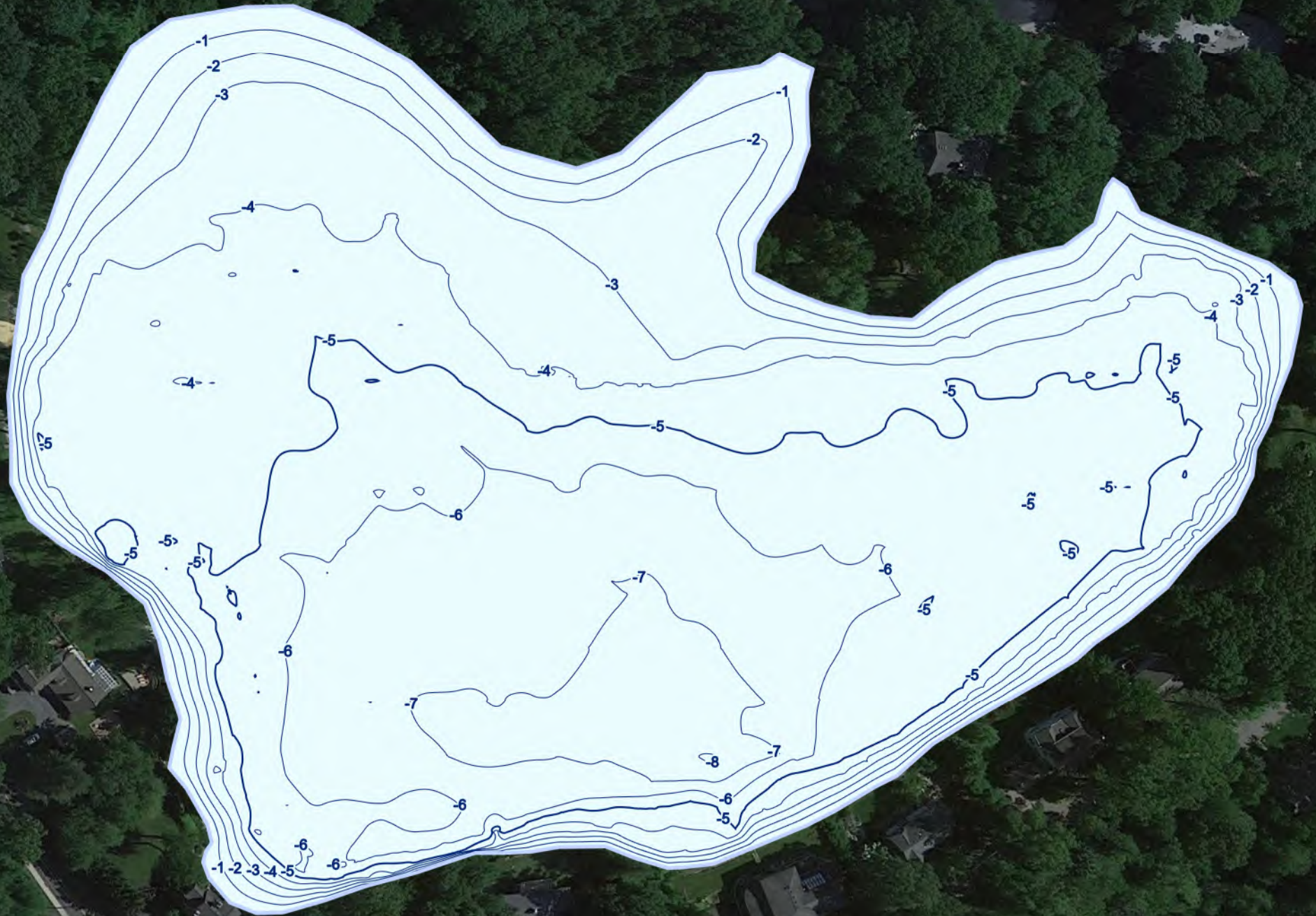
N.J. Lic: 24GS04331100  
 PA. Lic: SU075616  
 N.Y. Lic: 050932-1  
 CT. Lic: 70476  
 DE. Lic: S6-0010858

Net Material Gain: 7,874.2 yards<sup>3</sup>  
 Mean Depth Change: +0.32 ft

**Change in Depth (ft)  
 (2010 to 2023)**

- Minimal Change
- 0.0 to 1.0
- 1.0 to 2.0

Copyright © 2023 The Mapping Network, LLC. All rights reserved. Reasonable efforts have been made to verify the source data used in its preparation, however, a degree of error is inherent in all maps, and this map may contain omissions and errors in scale, resolution, rectification, positional accuracy, development methodology, interpretation of source data, and other circumstances. The Mapping Network, LLC MAKES NO WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. The Mapping Network, LLC SHALL NOT BE LIABLE TO ANY PERSON UNDER ANY LEGAL OR EQUITABLE THEORY FOR DAMAGES ARISING OUT OF THE USE OF THIS MAP, INCLUDING, WITHOUT LIMITATION, FOR DIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES. This map is date specific and is intended for use only at the published scale. Nothing in this map implies the right to use private property, which may lie within or be bounded by the waters shown on this map. Do not use this map for marine navigation, swimming, diving, or other related activities, as it does not depict all information necessary to perform these functions safely.



**Lake Information:**  
 Area: 15.0 acres  
 Max Depth: -8.2 ft  
 Mean Depth: -4.4 ft  
 Volume: 21,726,462 gallons / 66.7 acre-ft

**Mapping Information:**  
 Data Collection Performed: 06/13/2023  
 GPS: Mapping Grade (sub-foot accuracy)  
 Points Collected: 22,267  
 Water Level: Full Pool  
 Pool Elevation: 526.67' NAVD88



**DPK CONSULTING**  
 DPK CONSULTING, LLC  
 200 METROPLEX DRIVE - STE. 285, EDISON, NJ 08817  
 P: 732-764-0100 F: 732-764-0990  
 NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. 24GA28042200

date 09/15/2023

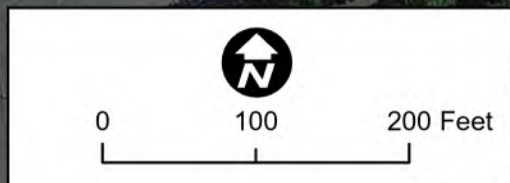
**James J. Heiser**  
 Professional Land Surveyor  
 JHEISER@DPKCONSULTING.NET

N.J. Lic: 24GS04331100  
 PA. Lic: SU075616  
 N.Y. Lic: 050932-1  
 CT. Lic: 70476  
 DE. Lic: S6-0010858

Mountain Lakes - Sunset Lake  
 Contours - Depth



Copyright © 2023 The Mapping Network, LLC. All rights reserved. Reasonable efforts have been to verify that this map accurately interprets the source data used in its preparation, however, a degree of error is inherent in all maps, and this map may contain omissions and errors in scale, resolution, rectification, positional accuracy, development methodology, interpretation of source data, and other circumstances. The Mapping Network, LLC MAKES NO WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. The Mapping Network, LLC SHALL NOT BE LIABLE TO ANY PERSON UNDER ANY LEGAL OR EQUITABLE THEORY FOR DAMAGES ARISING OUT OF THE USE OF THIS MAP, INCLUDING, WITHOUT LIMITATION, FOR DIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES. This map is date specific and is intended for use only at the published scale. Nothing in this map implies the right to use private property, which may lie within or be bounded by the waters shown on this map. Do not use this map for marine navigation, swimming, diving, or other related activities, as it does not depict all information necessary to perform these functions safely.



**Lake Information:**  
 Area: 15.0 acres  
 Max Depth: -8.2 ft  
 Mean Depth: -4.4 ft  
 Volume: 21,726,462 gallons / 66.7 acre-ft

**Mapping Information:**  
 Data Collection Performed: 06/13/2023  
 GPS: Mapping Grade (sub-foot accuracy)  
 Points Collected: 22,267  
 Water Level: Full Pool  
 Pool Elevation: 526.67' NAVD88



**DPK CONSULTING**  
 DPK CONSULTING, LLC  
 200 METROPLEX DRIVE - STE. 285, EDISON, NJ 08817  
 P: 732-764-0100 F: 732-764-0990  
 NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. 24GA28042200

date 09/15/2023

**James J. Heiser**  
 Professional Land Surveyor  
 JHEISER@DPKCONSULTING.NET

N.J. Lic: 24GS04331100  
 PA. Lic: SU075616  
 N.Y. Lic: 050932-1  
 CT. Lic: 70476  
 DE. Lic: S6-0010858

Mountain Lakes - Sunset Lake  
 Contours - Elevation



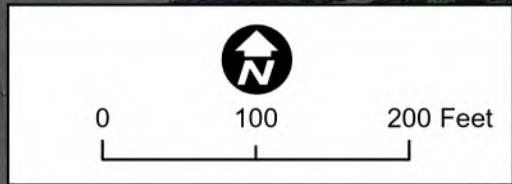
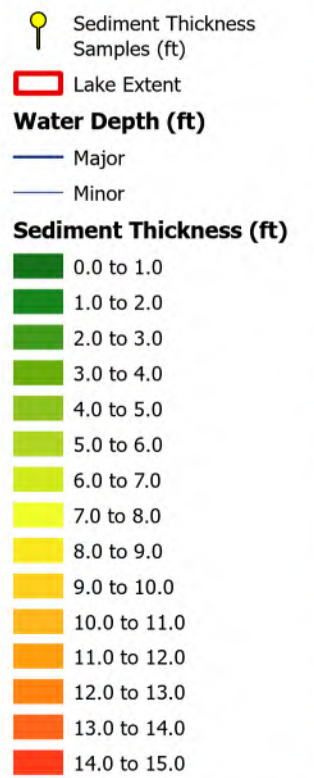
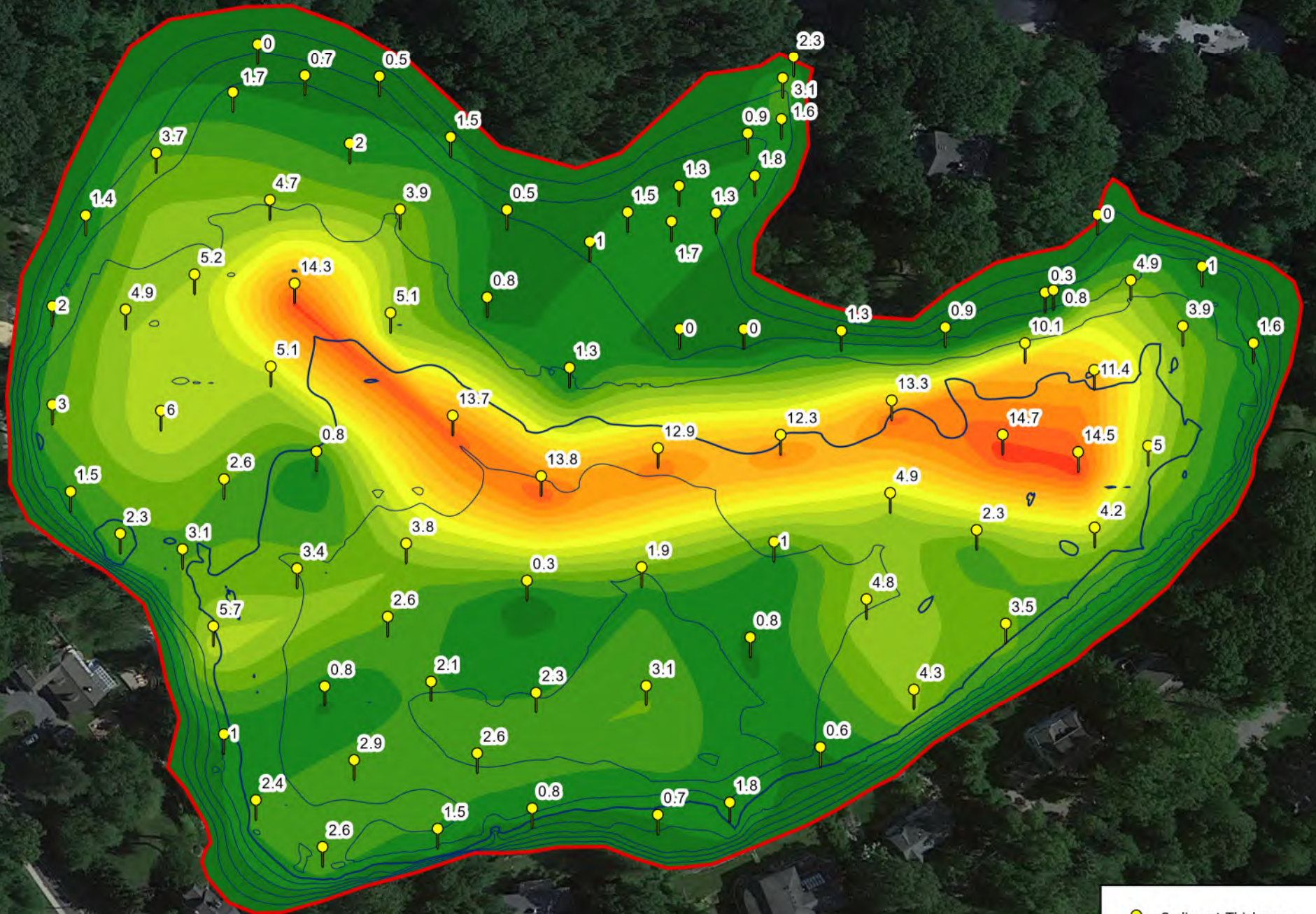
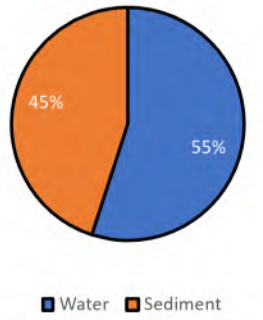
Copyright © 2023 The Mapping Network, LLC. All rights reserved. Reasonable efforts have been made to verify that this map accurately interprets the source data used in its preparation, however, a degree of error is inherent in all maps, and this map may contain omissions and errors in scale, resolution, rectification, positional accuracy, development methodology, interpretation of source data, and other circumstances. The Mapping Network, LLC MAKES NO WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. The Mapping Network, LLC SHALL NOT BE LIABLE TO ANY PERSON UNDER ANY LEGAL OR EQUITABLE THEORY FOR DAMAGES ARISING OUT OF THE USE OF THIS MAP, INCLUDING, WITHOUT LIMITATION, FOR DIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES. This map is date specific and is intended for use only at the published scale. Nothing in this map implies the right to use private property, which may lie within or be bounded by the waters shown on this map. Do not use this map for marine navigation, swimming, diving, or other related activities, as it does not depict all information necessary to perform these functions safely.



Estimated Sediment Volume: 88,641.6 yards<sup>3</sup>  
 Mean Sediment Thickness: 3.64 ft

Notes:  
 -The purpose of this study is to provide an estimated amount of soft sediment  
 -Sediment volume calculations based on computer model generated from 85 measurements collected in the field.  
 -Areas of rock and impermeable surfaces may affect the estimated total volume of removable sediment.  
 -Shrinkage not included in calculations  
 -The information collected for this project represents the current existing conditions on the date indicated and can only be considered as indicating conditions at the time.

Lake Composition



**Lake Information:**  
 Area: 15.0 acres  
 Max Depth: -8.2 ft  
 Mean Depth: -4.4 ft  
 Volume: 21,726,462 gallons / 66.7 acre-ft

**Mapping Information:**  
 Data Collection Performed: 06/13/2023  
 GPS: Mapping Grade (sub-foot accuracy)  
 Points Collected: 22,267  
 Water Level: Full Pool  
 Pool Elevation: 526.67' NAVD88

**DPK CONSULTING**  
 DPK CONSULTING, LLC  
 200 METROPLEX DRIVE - STE. 285, EDISON, NJ 08817  
 P: 732-764-0100 F: 732-764-0990  
 NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. 24GA28042200

date 09/15/2023

**James J. Heiser**  
 Professional Land Surveyor  
 JHEISER@DPKCONSULTING.NET

N.J. Lic: 24GS04331100  
 PA. Lic: SU075616  
 N.Y. Lic: 050932-1  
 CT. Lic: 70476  
 DE. Lic: S6-0010858

Mountain Lakes - Sunset Lake  
 Sediment Thickness

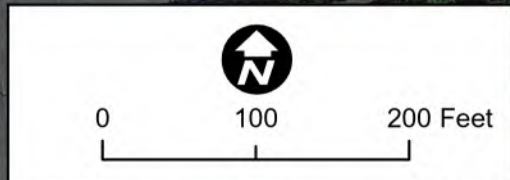
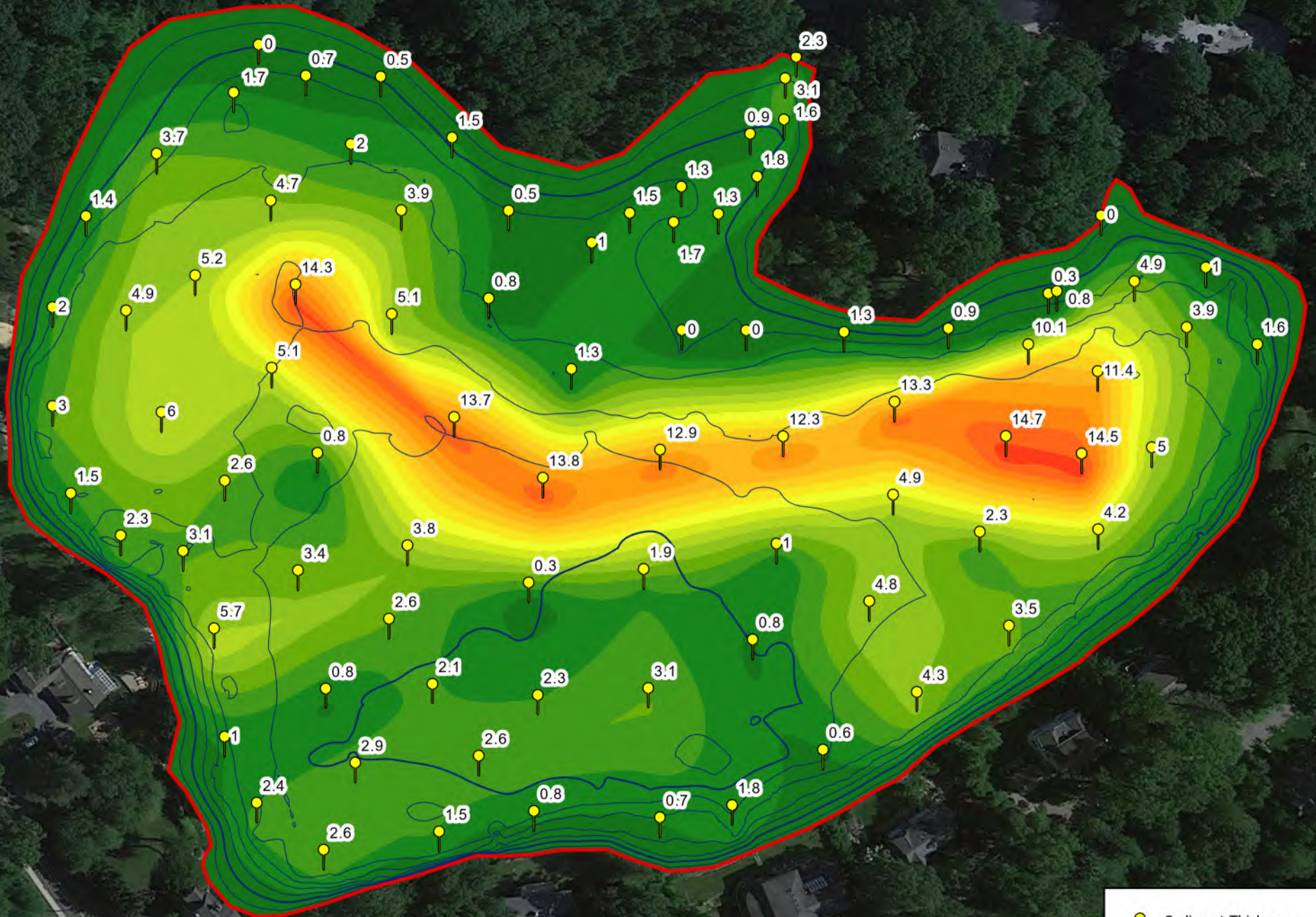
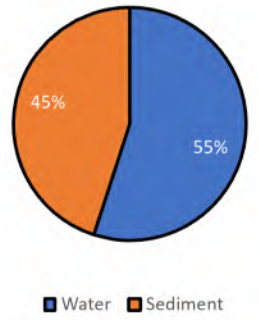




Estimated Sediment Volume: 88,641.6 yards<sup>3</sup>  
 Mean Sediment Thickness: 3.64 ft

Notes:  
 -The purpose of this study is to provide an estimated amount of soft sediment  
 -Sediment volume calculations based on computer model generated from 85 measurements collected in the field.  
 -Areas of rock and impermeable surfaces may affect the estimated total volume of removable sediment.  
 -Shrinkage not included in calculations  
 -The information collected for this project represents the current existing conditions on the date indicated and can only be considered as indicating conditions at the time.

Lake Composition



**Lake Information:**  
 Area: 15.0 acres  
 Max Depth: -8.2 ft  
 Mean Depth: -4.4 ft  
 Volume: 21,726,462 gallons / 66.7 acre-ft

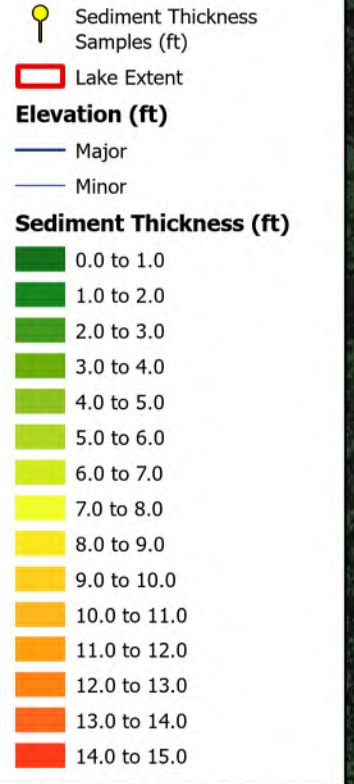
**Mapping Information:**  
 Data Collection Performed: 06/13/2023  
 GPS: Mapping Grade (sub-foot accuracy)  
 Points Collected: 22,267  
 Water Level: Full Pool  
 Pool Elevation: 526.67' NAVD88

**DPK CONSULTING**  
 DPK CONSULTING, LLC  
 200 METROPLEX DRIVE - STE. 285, EDISON, NJ 08817  
 P: 732-764-0100 F: 732-764-0990  
 NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. 24GA28042200

date 09/15/2023

**James J. Heiser**  
 Professional Land Surveyor  
 JHEISER@DPKCONSULTING.NET

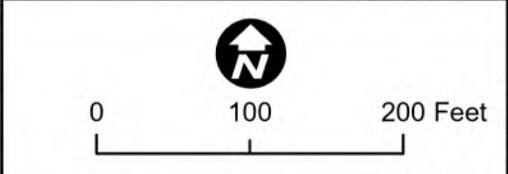
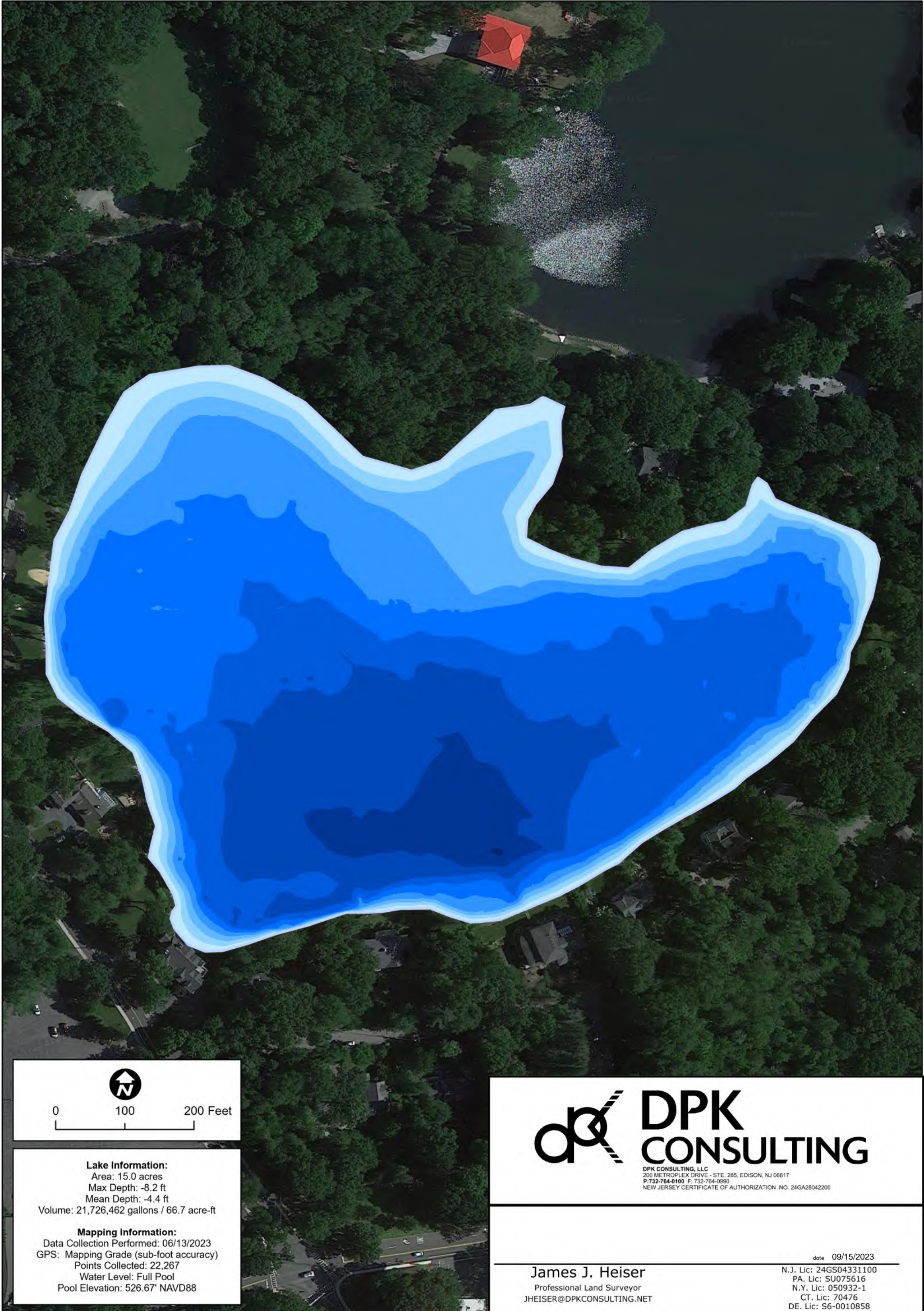
N.J. Lic: 24GS04331100  
 PA. Lic: SU075616  
 N.Y. Lic: 050932-1  
 CT. Lic: 70476  
 DE. Lic: S6-0010858



Mountain Lakes - Sunset Lake  
 Sediment Thickness



Copyright © 2023 The Mapping Network, LLC. All rights reserved. Reasonable efforts have been to verify that this map accurately interprets the source data used in its preparation, however, a degree of error is inherent in all maps, and this map may contain omissions and errors in scale, resolution, rectification, positional accuracy, development methodology, interpretation of source data, and other circumstances. The Mapping Network, LLC MAKES NO WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE MAPPING NETWORK, LLC SHALL NOT BE LIABLE TO ANY PERSON UNDER ANY LEGAL OR EQUITABLE THEORY FOR DAMAGES ARISING OUT OF THE USE OF THIS MAP, INCLUDING, WITHOUT LIMITATION, FOR DIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES. This map is date specific and is intended for use only at the published scale. Nothing in this map implies the right to use private property, which may lie within or be bounded by the waters shown on this map. Do not use this map for marine navigation, swimming, diving, or other related activities, as it does not depict all information necessary to perform these functions safely.



**Lake Information:**  
 Area: 15.0 acres  
 Max Depth: -8.2 ft  
 Mean Depth: -4.4 ft  
 Volume: 21,726,462 gallons / 66.7 acre-ft

**Mapping Information:**  
 Data Collection Performed: 06/13/2023  
 GPS: Mapping Grade (sub-foot accuracy)  
 Points Collected: 22,267  
 Water Level: Full Pool  
 Pool Elevation: 526.67' NAVD88



**DPK CONSULTING**  
 DPK CONSULTING, LLC  
 200 METROPLEX DRIVE - STE. 285, EDISON, NJ 08817  
 P: 732-764-0100 F: 732-764-0990  
 NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. 24GA28042200


date 09/15/2023

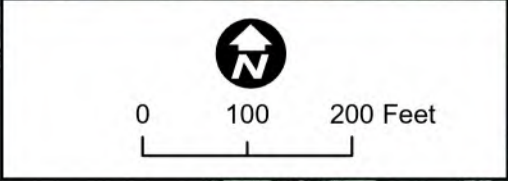
**James J. Heiser**  
 Professional Land Surveyor  
 JHEISER@DPKCONSULTING.NET

N.J. Lic: 24GS04331100  
 PA. Lic: SU075616  
 N.Y. Lic: 050932-1  
 CT. Lic: 70476  
 DE. Lic: S6-0010858

Copyright © 2023 The Mapping Network, LLC. All rights reserved. Reasonable efforts have been made to verify that this map accurately interprets the source data used in its preparation, however, a degree of error is inherent in all maps, and this map may contain omissions and errors in scale, resolution, rectification, positional accuracy, development methodology, interpretation of source data, and other circumstances. The Mapping Network, LLC MAKES NO WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. The Mapping Network, LLC SHALL NOT BE LIABLE TO ANY PERSON UNDER ANY LEGAL OR EQUITABLE THEORY FOR DAMAGES ARISING OUT OF THE USE OF THIS MAP, INCLUDING, WITHOUT LIMITATION, FOR DIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES. This map is date specific and is intended for use only at the published scale. Nothing in this map implies the right to use private property, which may lie within or be bounded by the waters shown on this map. Do not use this map for marine navigation, swimming, diving, or other related activities, as it does not depict all information necessary to perform these functions safely.

**CRYSTAL LAKE RESULTS**

Area:	19.2 Acres
Water Level/Elevation:	Full Pool / 540.953 NAVD88
Max Depth:	13.6 Feet
Mean Depth:	7.8 Feet
Volume (Holding Capacity):	49,138,783 gallons / 150.8 acre-feet
Estimated Sediment Volume:	195,428 cubic yards- wet unconsolidated sediment
Mean Sediment Thickness:	6.3 Feet
Lake Composition:	55% Water / 45% unconsolidated sediment
Estimated Sediment Change (2010-2013)	31,604 cubic yard gain
Mean Depth Change (2010-2013)	+1.00 Feet
Surveyor Notes:	<ul style="list-style-type: none"> <li>An abundance of various types of aquatic vegetation interfered with sonar measurements (specifically Chara) in the northern part of the reservoir. We utilized our manual measurements in this area to best determine water depth.</li> </ul> 



**Lake Information:**  
 Area: 19.2 acres  
 Max Depth: -13.6 ft  
 Mean Depth: -7.8 ft  
 Volume: 49,138,783 gallons / 150.8 acre-ft

**Mapping Information:**  
 Data Collection Performed: 06/15/2023  
 GPS: Mapping Grade (sub-foot accuracy)  
 Points Collected: 105,106  
 Water Level: Full Pool  
 Pool Elevation: 540.953' NAVD88



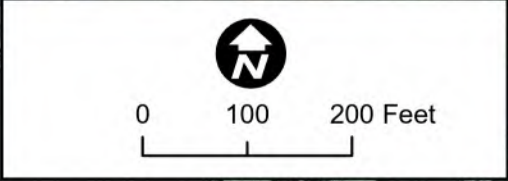
**DPK CONSULTING**  
 DPK CONSULTING, LLC  
 200 METROPLEX DRIVE - STE. 285, EDISON, NJ 08817  
 P: 732-764-0100 F: 732-764-0990  
 NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. 24GA28042200

date 09/15/2023

**James J. Heiser**  
 Professional Land Surveyor  
 JHEISER@DPKCONSULTING.NET

N.J. Lic: 24GS04331100  
 PA. Lic: SU075616  
 N.Y. Lic: 050932-1  
 CT. Lic: 70476  
 DE. Lic: S6-0010858

Copyright © 2023 The Mapping Network, LLC. All rights reserved. Reasonable efforts have been made to verify that this map accurately interprets the source data used in its preparation, however, a degree of error is inherent in all maps, and this map may contain omissions and errors in scale, resolution, rectification, positional accuracy, development methodology, interpretation of source data, and other circumstances. The Mapping Network, LLC MAKES NO WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. The Mapping Network, LLC SHALL NOT BE LIABLE TO ANY PERSON UNDER ANY LEGAL OR EQUITABLE THEORY FOR DAMAGES ARISING OUT OF THE USE OF THIS MAP, INCLUDING, WITHOUT LIMITATION, FOR DIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES. This map is date specific and is intended for use only at the published scale. Nothing in this map implies the right to use private property, which may lie within or be bounded by the waters shown on this map. Do not use this map for marine navigation, swimming, diving, or other related activities, as it does not depict all information necessary to perform these functions safely.



**Lake Information:**  
 Area: 19.2 acres  
 Max Depth: -13.6 ft  
 Mean Depth: -7.8 ft  
 Volume: 49,138,783 gallons / 150.8 acre-ft

**Mapping Information:**  
 Data Collection Performed: 06/15/2023  
 GPS: Mapping Grade (sub-foot accuracy)  
 Points Collected: 105,106  
 Water Level: Full Pool  
 Pool Elevation: 540.953' NAVD88




**DPK CONSULTING**  
 DPK CONSULTING, LLC  
 200 METROPLEX DRIVE - STE. 285, EDISON, NJ 08817  
 P: 732-764-0100 F: 732-764-0990  
 NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. 24GA28042200

date 09/15/2023

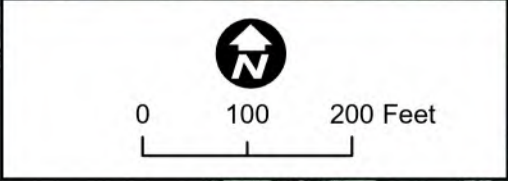
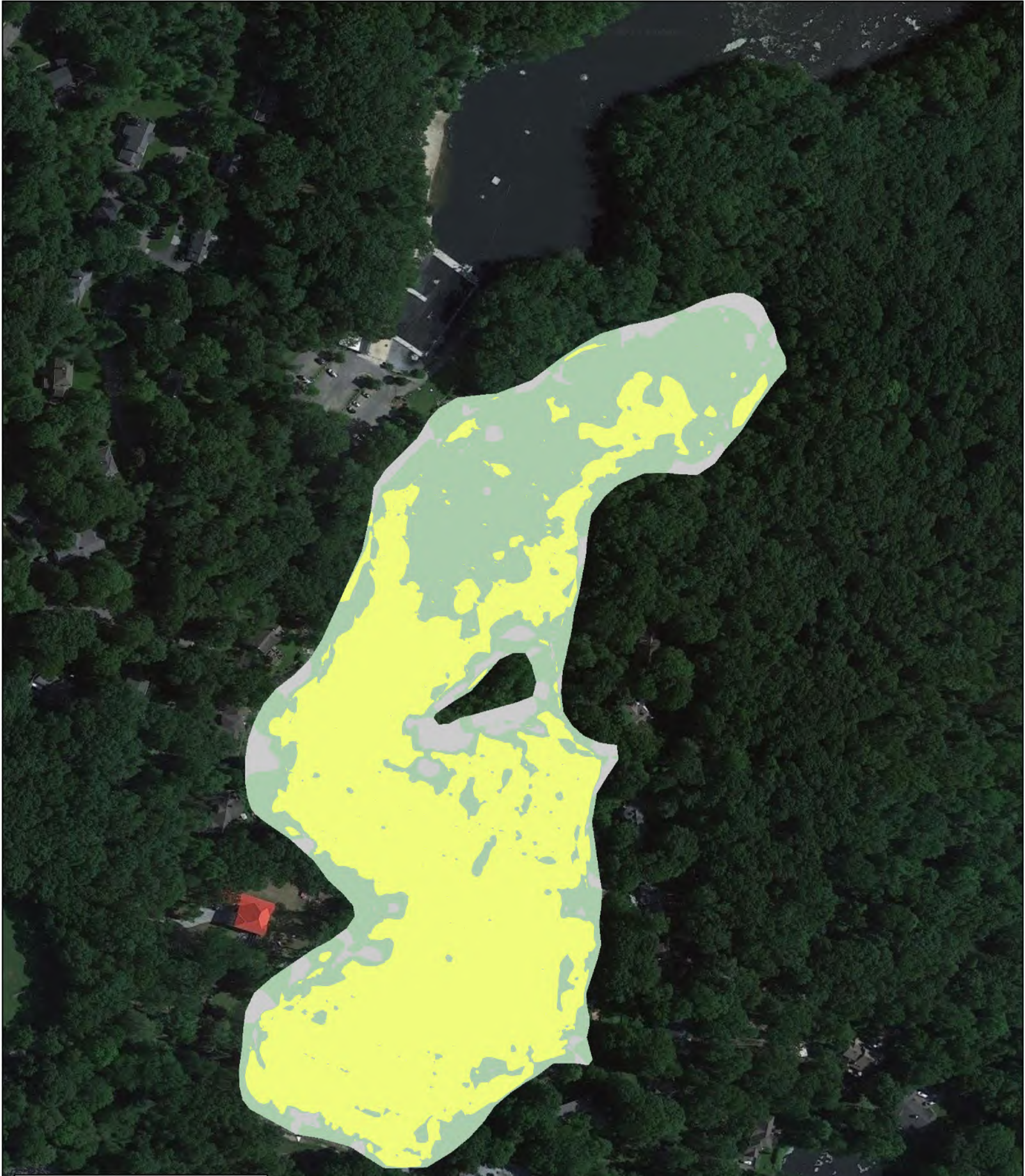
**James J. Heiser**  
 Professional Land Surveyor  
 JHEISER@DPKCONSULTING.NET

N.J. Lic: 24GS04331100  
 PA. Lic: SU075616  
 N.Y. Lic: 050932-1  
 CT. Lic: 70476  
 DE. Lic: S6-0010858

**Mountain Lakes - Crystal Lake  
 3D - Elevation**



Copyright © 2023 The Mapping Network, LLC. All rights reserved. Reasonable efforts have been to verify that this map accurately interprets the source data used in its preparation, however, a degree of error is inherent in all maps, and this map may contain omissions and errors in scale, resolution, rectification, positional accuracy, development methodology, interpretation of source data, and other circumstances. The Mapping Network, LLC MAKES NO WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. The Mapping Network, LLC SHALL NOT BE LIABLE TO ANY PERSON UNDER ANY LEGAL OR EQUITABLE THEORY FOR DAMAGES ARISING OUT OF THE USE OF THIS MAP, INCLUDING, WITHOUT LIMITATION, FOR DIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES. This map is date specific and is intended for use only at the published scale. Nothing in this map implies the right to use private property, which may lie within or be bounded by the waters shown on this map. Do not use this map for marine navigation, swimming, diving, or other related activities, as it does not depict all information necessary to perform these functions safely.



**Lake Information:**  
 Area: 19.2 acres  
 Max Depth: -13.6 ft  
 Mean Depth: -7.8 ft  
 Volume: 49,138,783 gallons / 150.8 acre-ft

**Mapping Information:**  
 Data Collection Performed: 06/15/2023  
 GPS: Mapping Grade (sub-foot accuracy)  
 Points Collected: 105,106  
 Water Level: Adjusted to Full Pool  
 Pool Elevation: 540.953' NAVD88



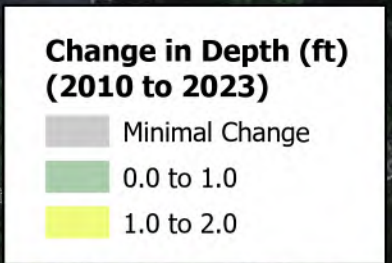
**DPK CONSULTING**  
 DPK CONSULTING, LLC  
 200 METROPLEX DRIVE - STE. 285, EDISON, NJ 08817  
 P: 732-764-0100 F: 732-764-0990  
 NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. 24GA28042200

date 09/15/2023


**James J. Heiser**  
 Professional Land Surveyor  
 JHEISER@DPKCONSULTING.NET

N.J. Lic: 24GS04331100  
 PA. Lic: SU075616  
 N.Y. Lic: 050932-1  
 CT. Lic: 70476  
 DE. Lic: S6-0010858

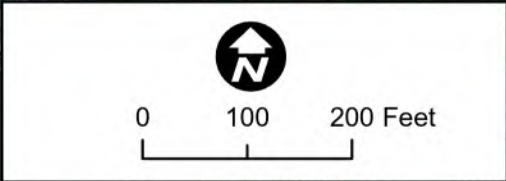
Net Material Gain: 31,603.8 yards<sup>3</sup>  
 Mean Depth Change: +1.01 ft



**Mountain Lakes - Crystal Lake  
 2010 to 2023 Comparison**



Copyright © 2023 The Mapping Network, LLC. All rights reserved. Reasonable efforts have been to verify that this map accurately interprets the source data used in its preparation, however, a degree of error is inherent in all maps, and this map may contain omissions and errors in scale, resolution, rectification, positional accuracy, development methodology, interpretation of source data, and other circumstances. The Mapping Network, LLC MAKES NO WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. The Mapping Network, LLC SHALL NOT BE LIABLE TO ANY PERSON UNDER ANY LEGAL OR EQUITABLE THEORY FOR DAMAGES ARISING OUT OF THE USE OF THIS MAP, INCLUDING, WITHOUT LIMITATION, FOR DIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES. This map is date specific and is intended for use only at the published scale. Nothing in this map implies the right to use private property, which may lie within or be bounded by the waters shown on this map. Do not use this map for marine navigation, swimming, diving, or other related activities, as it does not depict all information necessary to perform these functions safely.



**Lake Information:**  
 Area: 19.2 acres  
 Max Depth: -13.6 ft  
 Mean Depth: -7.8 ft  
 Volume: 49,138,783 gallons / 150.8 acre-ft


**Mapping Information:**  
 Data Collection Performed: 06/15/2023  
 GPS: Mapping Grade (sub-foot accuracy)  
 Points Collected: 105,106  
 Water Level: Full Pool  
 Pool Elevation: 540.953' NAVD88



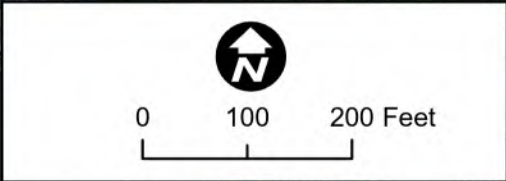
**DPK CONSULTING**  
 DPK CONSULTING, LLC  
 200 METROPLEX DRIVE - STE. 285, EDISON, NJ 08817  
 P: 732-764-0100 F: 732-764-0990  
 NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. 24GA28042200

date 09/15/2023  
**James J. Heiser**  
 Professional Land Surveyor  
 JHEISER@DPKCONSULTING.NET  
 N.J. Lic: 24GS04331100  
 PA. Lic: SU075616  
 N.Y. Lic: 050932-1  
 CT. Lic: 70476  
 DE. Lic: S6-0010858

**Mountain Lakes - Crystal Lake  
 Contours - Depth**



Copyright © 2023 The Mapping Network, LLC. All rights reserved. Reasonable efforts have been made to verify that this map accurately interprets the source data used in its preparation, however, a degree of error is inherent in all maps, and this map may contain omissions and errors in scale, resolution, rectification, positional accuracy, development methodology, interpretation of source data, and other circumstances. The Mapping Network, LLC MAKES NO WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. The Mapping Network, LLC SHALL NOT BE LIABLE TO ANY PERSON UNDER ANY LEGAL OR EQUITABLE THEORY FOR DAMAGES ARISING OUT OF THE USE OF THIS MAP, INCLUDING, WITHOUT LIMITATION, FOR DIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES. This map is date specific and is intended for use only at the published scale. Nothing in this map implies the right to use private property, which may lie within or be bounded by the waters shown on this map. Do not use this map for marine navigation, swimming, diving, or other related activities, as it does not depict all information necessary to perform these functions safely.



**Lake Information:**  
 Area: 19.2 acres  
 Max Depth: -13.6 ft  
 Mean Depth: -7.8 ft  
 Volume: 49,138,783 gallons / 150.8 acre-ft

**Mapping Information:**  
 Data Collection Performed: 06/15/2023  
 GPS: Mapping Grade (sub-foot accuracy)  
 Points Collected: 105,106  
 Water Level: Full Pool  
 Pool Elevation: 540.953' NAVD88



**DPK  
CONSULTING**

DPK CONSULTING, LLC  
 200 METROPLEX DRIVE - STE. 285, EDISON, NJ 08817  
 P: 732-764-0100 F: 732-764-0990  
 NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. 24GA28042200

date 09/15/2023

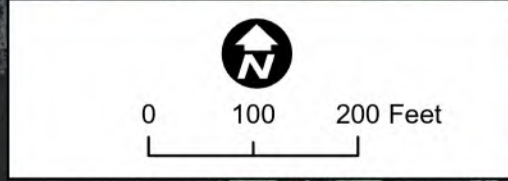
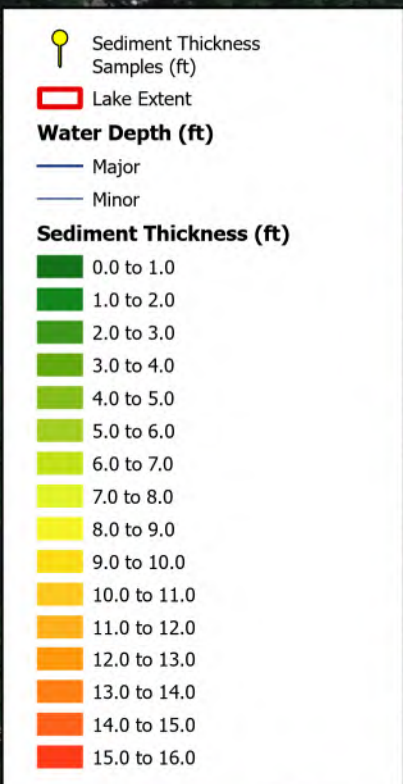
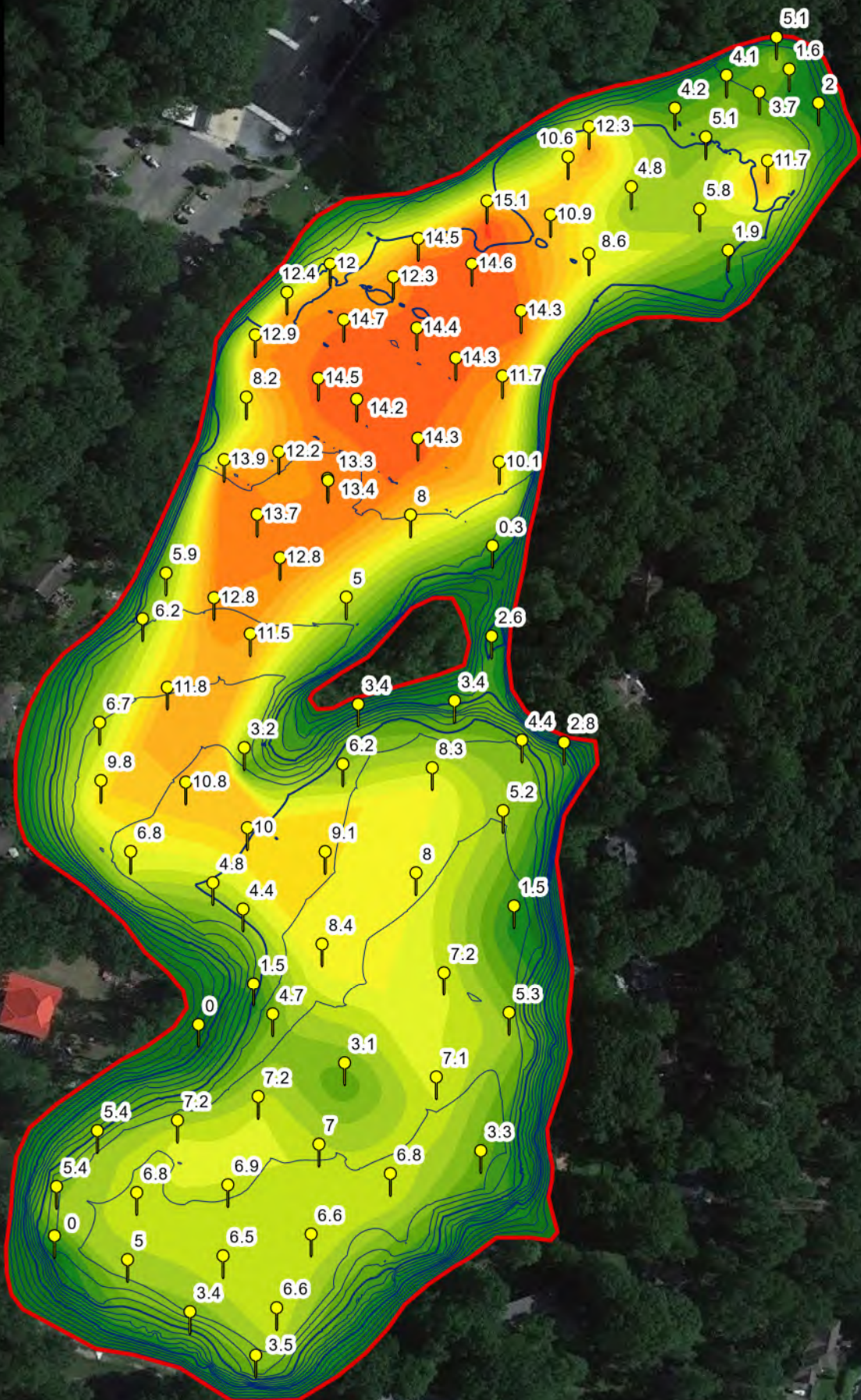
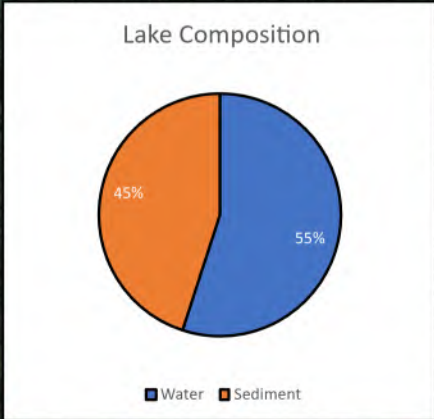
**James J. Heiser**  
 Professional Land Surveyor  
 JHEISER@DPKCONSULTING.NET

N.J. Lic: 24GS04331100  
 PA. Lic: SU075616  
 N.Y. Lic: 050932-1  
 CT. Lic: 70476  
 DE. Lic: S6-0010858



Estimated Sediment Volume: 195,428.3 yards<sup>3</sup>  
 Mean Sediment Thickness: 6.27 ft

Notes:  
 -The purpose of this study is to provide an estimated amount of soft sediment  
 -Sediment volume calculations based on computer model generated from 89 measurements collected in the field.  
 -Areas of rock and impermeable surfaces may affect the estimated total volume of removable sediment.  
 -Shrinkage not included in calculations  
 -The information collected for this project represents the current existing conditions on the date indicated and can only be considered as indicating conditions at the time.



**Lake Information:**  
 Area: 19.2 acres  
 Max Depth: -13.6 ft  
 Mean Depth: -7.8 ft  
 Volume: 49,138,783 gallons / 150.8 acre-ft

**Mapping Information:**  
 Data Collection Performed: 06/15/2023  
 GPS: Mapping Grade (sub-foot accuracy)  
 Points Collected: 105,106  
 Water Level: Full Pool  
 Pool Elevation: 540.953' NAVD88

**DPK CONSULTING**  
 DPK CONSULTING, LLC  
 200 METROPLEX DRIVE - STE. 285, EDISON, NJ 08817  
 P: 732-764-0100 F: 732-764-0990  
 NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. 24GA28042200

date 09/15/2023

**James J. Heiser**  
 Professional Land Surveyor  
 JHEISER@DPKCONSULTING.NET

N.J. Lic: 24GS04331100  
 PA. Lic: SU075616  
 N.Y. Lic: 050932-1  
 CT. Lic: 70476  
 DE. Lic: S6-0010858

Mountain Lakes - Crystal Lake  
 Sediment Thickness



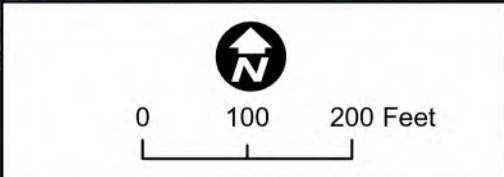
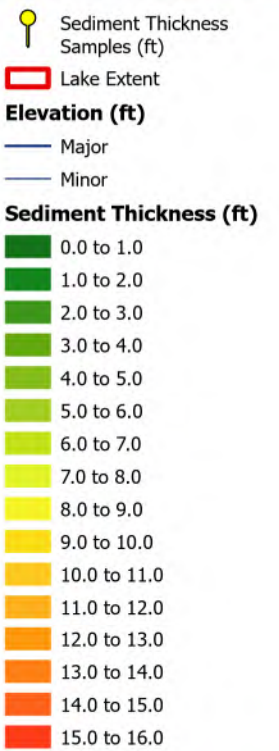
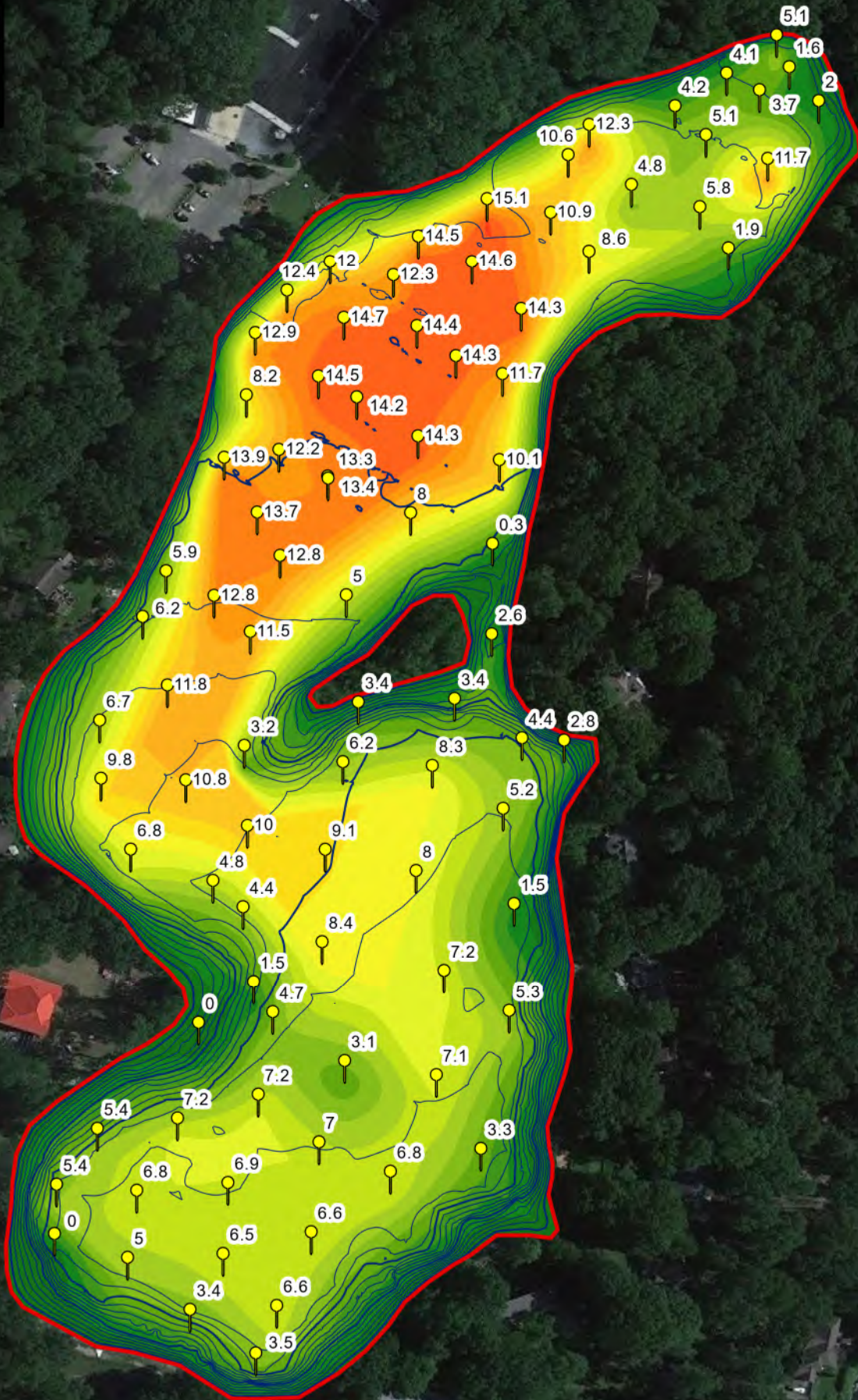
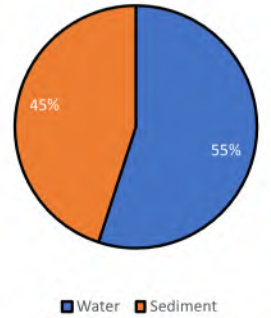
Copyright © 2023 The Mapping Network, LLC. All rights reserved. Reasonable efforts have been made to verify that this map accurately interprets the source data used in its preparation, however, a degree of error is inherent in all maps, and this map may contain omissions and errors in scale, resolution, rectification, positional accuracy, development methodology, interpretation of source data, and other circumstances. The Mapping Network, LLC MAKES NO WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. The Mapping Network, LLC SHALL NOT BE LIABLE TO ANY PERSON UNDER ANY LEGAL OR EQUITABLE THEORY FOR DAMAGES ARISING OUT OF THE USE OF THIS MAP, INCLUDING, WITHOUT LIMITATION, FOR DIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES. This map is date specific and is intended for use only at the published scale. Nothing in this map implies the right to use private property, which may lie within or be bounded by the waters shown on this map. Do not use this map for marine navigation, swimming, diving, or other related activities, as it does not depict all information necessary to perform these functions safely.



Estimated Sediment Volume: 195,428.3 yards<sup>3</sup>  
 Mean Sediment Thickness: 6.27 ft

Notes:  
 -The purpose of this study is to provide an estimated amount of soft sediment  
 -Sediment volume calculations based on computer model generated from 89 measurements collected in the field.  
 -Areas of rock and impermeable surfaces may affect the estimated total volume of removable sediment.  
 -Shrinkage not included in calculations  
 -The information collected for this project represents the current existing conditions on the date indicated and can only be considered as indicating conditions at the time.

Lake Composition



**Lake Information:**  
 Area: 19.2 acres  
 Max Depth: -13.6 ft  
 Mean Depth: -7.8 ft  
 Volume: 49,138,783 gallons / 150.8 acre-ft

**Mapping Information:**  
 Data Collection Performed: 06/15/2023  
 GPS: Mapping Grade (sub-foot accuracy)  
 Points Collected: 105,106  
 Water Level: Full Pool  
 Pool Elevation: 540.953' NAVD88

**DPK CONSULTING**  
 DPK CONSULTING, LLC  
 200 METROPLEX DRIVE - STE. 285, EDISON, NJ 08817  
 P: 732-764-0100 F: 732-764-0990  
 NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. 24GA28042200

date 09/15/2023

**James J. Heiser**  
 Professional Land Surveyor  
 JHEISER@DPKCONSULTING.NET


N.J. Lic: 24GS04331100  
 PA. Lic: SU075616  
 N.Y. Lic: 050932-1  
 CT. Lic: 70476  
 DE. Lic: S6-0010858

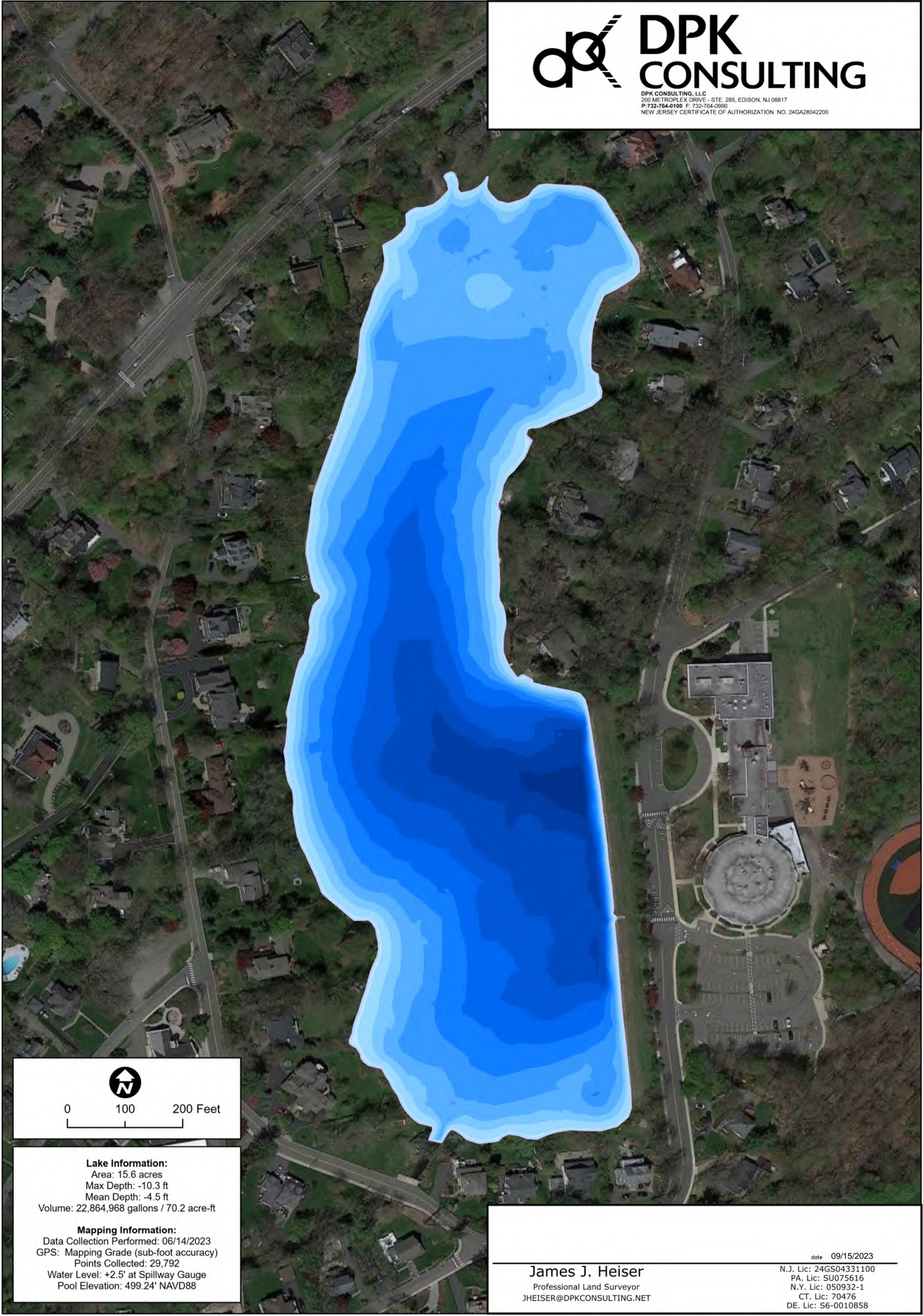
Mountain Lakes - Crystal Lake  
 Sediment Thickness



Copyright © 2023 The Mapping Network, LLC. All rights reserved. Reasonable efforts have been made to verify that this map accurately interprets the source data used in its preparation, however, a degree of error is inherent in all maps, and this map may contain omissions and errors in scale, resolution, rectification, positional accuracy, development methodology, interpretation of source data, and other circumstances. The Mapping Network, LLC MAKES NO WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. The Mapping Network, LLC SHALL NOT BE LIABLE TO ANY PERSON UNDER ANY LEGAL OR EQUITABLE THEORY FOR DAMAGES ARISING OUT OF THE USE OF THIS MAP, INCLUDING, WITHOUT LIMITATION, FOR DIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES. This map is date specific and is intended for use only at the published scale. Nothing in this map implies the right to use private property, which may lie within or be bounded by the waters shown on this map. Do not use this map for marine navigation, swimming, diving, or other related activities, as it does not depict all information necessary to perform these functions safely.

**WILDWOOD LAKE RESULTS**

Area:	15.6 Acres
Water Level/Elevation:	+2.5 Feet from top of gauge? / 499.2 NAVD88
Max Depth:	10.3 Feet
Mean Depth:	4.5 Feet
Volume (Holding Capacity):	22,864,968 gallons / 70.2 acre-feet
Estimated Sediment Volume:	29,662.4 cubic yards- wet unconsolidated sediment
Mean Sediment Thickness:	1.2 Feet
Lake Composition:	79% Water / 21% unconsolidated sediment
Estimated Sediment Change (2010-2013)	34,275.1 cubic yard gain
Mean Depth Change (2010-2013)	+1.4 Feet
Surveyor Notes:	<ul style="list-style-type: none"> <li>The spillway gauge was measured at an elevation of 499.2'. The water depth at this location was 2.5' above the concrete spillway bottom. There were dense clusters of filamentous algae along the western flank, northern half, and perimeter of the lake. The algae either completely blocked or attenuated the sonar signal, so manual probe measurements were taken in dense areas.</li> </ul> 



0 100 200 Feet

**Lake Information:**

Area: 15.6 acres  
Max Depth: -10.3 ft  
Mean Depth: -4.5 ft  
Volume: 22,864,968 gallons / 70.2 acre-ft

**Mapping Information:**

Data Collection Performed: 06/14/2023  
GPS: Mapping Grade (sub-foot accuracy)  
Points Collected: 29,792  
Water Level: +2.5' at Spillway Gauge  
Pool Elevation: 499.24' NAVD88

date 09/15/2023

**James J. Heiser**

Professional Land Surveyor  
JHEISER@DPKCONSULTING.NET

N.J. Lic: 24GS04331100  
PA. Lic: SU075616  
N.Y. Lic: 050932-1  
CT. Lic: 70476  
DE. Lic: S6-0010858

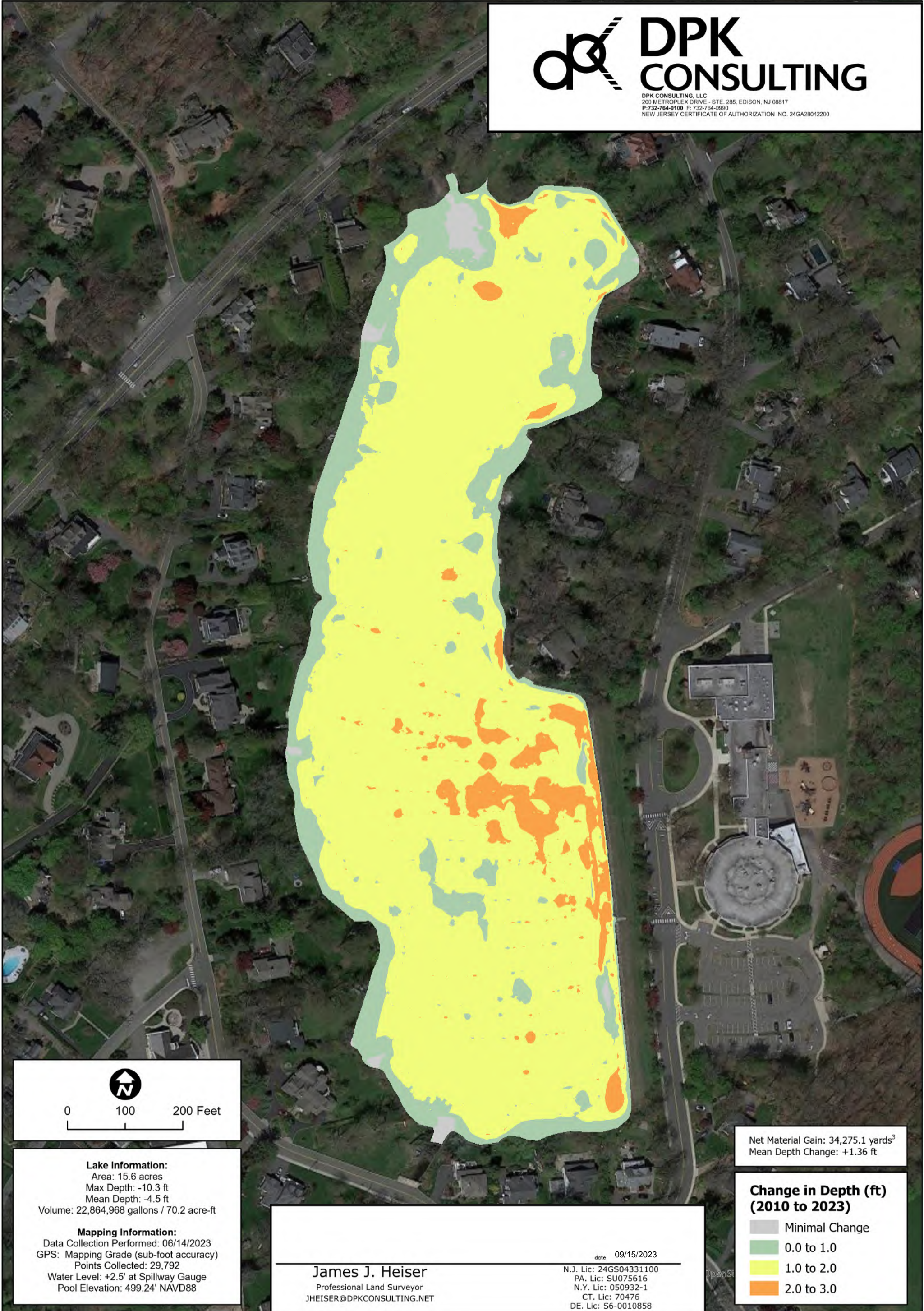
## Mountain Lakes - Wildwood Lake 3D - Elevation





# DPK CONSULTING

DPK CONSULTING, LLC  
 200 METROPLEX DRIVE - STE. 285, EDISON, NJ 08817  
 P: 732-764-0100 F: 732-764-0990  
 NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. 24GA28042200



0 100 200 Feet

**Lake Information:**

Area: 15.6 acres  
 Max Depth: -10.3 ft  
 Mean Depth: -4.5 ft  
 Volume: 22,864,968 gallons / 70.2 acre-ft

**Mapping Information:**

Data Collection Performed: 06/14/2023  
 GPS: Mapping Grade (sub-foot accuracy)  
 Points Collected: 29,792  
 Water Level: +2.5' at Spillway Gauge  
 Pool Elevation: 499.24' NAVD88

date 09/15/2023

**James J. Heiser**

Professional Land Surveyor  
 JHEISER@DPKCONSULTING.NET

N.J. Lic: 24GS04331100  
 PA. Lic: SU075616  
 N.Y. Lic: 050932-1  
 CT. Lic: 70476  
 DE. Lic: S6-0010858

Net Material Gain: 34,275.1 yards<sup>3</sup>  
 Mean Depth Change: +1.36 ft

**Change in Depth (ft)  
 (2010 to 2023)**

- Minimal Change
- 0.0 to 1.0
- 1.0 to 2.0
- 2.0 to 3.0

**Mountain Lakes - Wildwood Lake  
 2010 to 2023 Comparison**





# DPK CONSULTING

DPK CONSULTING, LLC  
200 METROPLEX DRIVE - STE. 285, EDISON, NJ 08817  
P: 732-764-0100 F: 732-764-0990  
NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. 24GA28042200



0 100 200 Feet

**Lake Information:**

Area: 15.6 acres  
Max Depth: -10.3 ft  
Mean Depth: -4.5 ft  
Volume: 22,864,968 gallons / 70.2 acre-ft

**Mapping Information:**

Data Collection Performed: 06/14/2023  
GPS: Mapping Grade (sub-foot accuracy)  
Points Collected: 29,792  
Water Level: +2.5' at Spillway Gauge  
Pool Elevation: 499.24' NAVD88

date 09/15/2023

**James J. Heiser**

Professional Land Surveyor  
JHEISER@DPKCONSULTING.NET

N.J. Lic: 24GS04331100  
PA. Lic: SU075616  
N.Y. Lic: 050932-1  
CT. Lic: 70476  
DE. Lic: S6-0010858

## Mountain Lakes - Wildwood Lake Contours - Depth





0 100 200 Feet

**Lake Information:**

Area: 15.6 acres  
Max Depth: -10.3 ft  
Mean Depth: -4.5 ft  
Volume: 22,864,968 gallons / 70.2 acre-ft

**Mapping Information:**

Data Collection Performed: 06/14/2023  
GPS: Mapping Grade (sub-foot accuracy)  
Points Collected: 29,792  
Water Level: +2.5' at Spillway Gauge  
Pool Elevation: 499.24' NAVD88

**James J. Heiser**

Professional Land Surveyor  
JHEISER@DPKCONSULTING.NET

date 09/15/2023

N.J. Lic: 24GS04331100  
PA. Lic: SU075616  
N.Y. Lic: 050932-1  
CT. Lic: 70476  
DE. Lic: S6-0010858

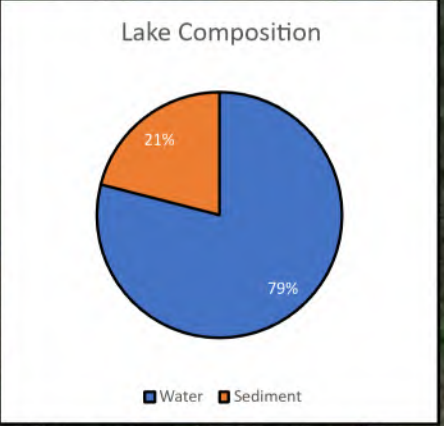
## Mountain Lakes - Wildwood Lake Contours - Elevation



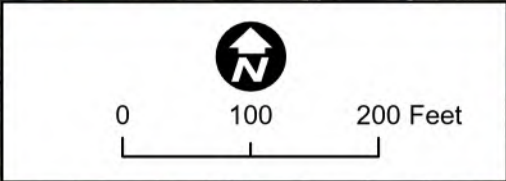


Estimated Sediment Volume: 29,662.4 yards<sup>3</sup>  
 Mean Sediment Thickness: 1.17 ft

Notes:  
 -The purpose of this study is to provide an estimated amount of soft sediment  
 -Sediment volume calculations based on computer model generated from 140 measurements collected in the field.  
 -Areas of rock and impermeable surfaces may affect the estimated total volume of removable sediment.  
 -Shrinkage not included in calculations  
 -The information collected for this project represents the current existing conditions on the date indicated and can only be considered as indicating conditions at the time.



**DPK CONSULTING, LLC**  
 200 METROPLEX DRIVE - STE. 285, EDISON, NJ 08817  
 P: 732-764-0100 F: 732-764-0990  
 NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. 24GA28042200



**Lake Information:**  
 Area: 15.6 acres  
 Max Depth: -10.3 ft  
 Mean Depth: -4.5 ft  
 Volume: 22,864,968 gallons / 70.2 acre-ft

**Mapping Information:**  
 Data Collection Performed: 06/14/2023  
 GPS: Mapping Grade (sub-foot accuracy)  
 Points Collected: 29,792  
 Water Level: +2.5' at Spillway Gauge  
 Pool Elevation: 499.24' NAVD88

date 09/15/2023  
 N.J. Lic: 24GS04331100  
 PA. Lic: SU075616  
 N.Y. Lic: 050932-1  
 CT. Lic: 70476  
 DE. Lic: S6-0010858

**James J. Heiser**  
 Professional Land Surveyor  
 JHEISER@DPKCONSULTING.NET

- Sediment Thickness Samples (ft)
- Lake Extent
- Water Depth (ft)**
  - Major
  - Minor
- Sediment Thickness (ft)**
  - 0.0 to 0.5
  - 0.5 to 1.0
  - 1.0 to 1.5
  - 1.5 to 2.0
  - 2.0 to 2.5
  - 2.5 to 3.0
  - 3.0 to 3.5
  - 3.5 to 4.0
  - 4.0 to 4.5
  - 4.5 to 5.0
  - 5.0 to 5.5

Mountain Lakes - Wildwood Lake  
 Sediment Thickness

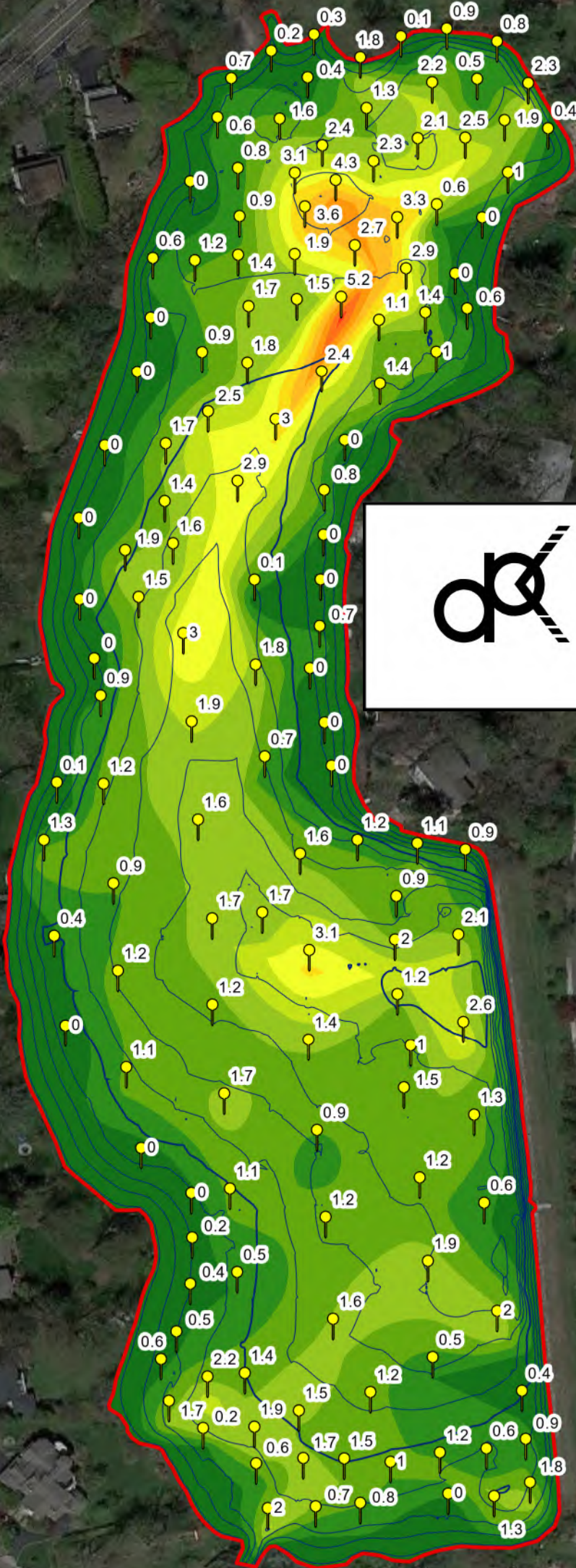
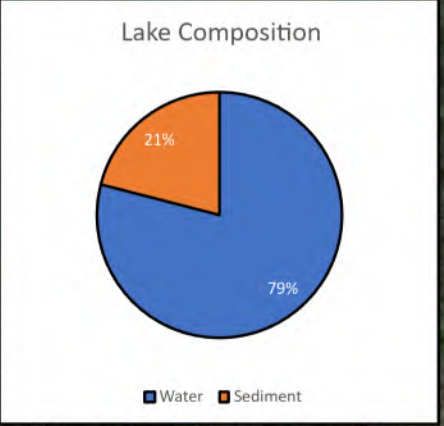


Copyright © 2023 The Mapping Network, LLC. All rights reserved. Reasonable efforts have been made to verify that this map accurately interprets the source data used in its preparation, however, a degree of error is inherent in all maps, and this map may contain omissions and errors in scale, resolution, rectification, positional accuracy, development methodology, interpretation of source data, and other circumstances. The Mapping Network, LLC MAKES NO WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE MAPPING NETWORK, LLC SHALL NOT BE LIABLE TO ANY PERSON UNDER ANY LEGAL OR EQUITABLE THEORY FOR DAMAGES ARISING OUT OF THE USE OF THIS MAP, INCLUDING, WITHOUT LIMITATION, FOR DIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES. This map is date specific and is intended for use only at the published scale. Nothing in this map implies the right to use private property, which may lie within or be bounded by the waters shown on this map. Do not use this map for marine navigation, swimming, diving, or other related activities, as it does not depict all information necessary to perform these functions safely.

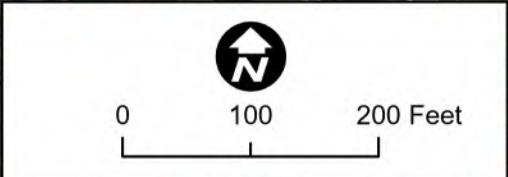


Estimated Sediment Volume: 29,662.4 yards<sup>3</sup>  
 Mean Sediment Thickness: 1.17 ft

Notes:  
 -The purpose of this study is to provide an estimated amount of soft sediment  
 -Sediment volume calculations based on computer model generated from 140 measurements collected in the field.  
 -Areas of rock and impermeable surfaces may affect the estimated total volume of removable sediment.  
 -Shrinkage not included in calculations  
 -The information collected for this project represents the current existing conditions on the date indicated and can only be considered as indicating conditions at the time.



**DPK CONSULTING**  
 DPK CONSULTING, LLC  
 200 METROPLEX DRIVE - STE. 285, EDISON, NJ 08817  
 P: 732-764-0100 F: 732-764-0980  
 NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. 24GA28042200



**Lake Information:**  
 Area: 15.6 acres  
 Max Depth: -10.3 ft  
 Mean Depth: -4.5 ft  
 Volume: 22,864,968 gallons / 70.2 acre-ft

**Mapping Information:**  
 Data Collection Performed: 06/14/2023  
 GPS: Mapping Grade (sub-foot accuracy)  
 Points Collected: 29,792  
 Water Level: +2.5' at Spillway Gauge  
 Pool Elevation: 499.24' NAVD88

date 09/15/2023  
 James J. Heiser  
 Professional Land Surveyor  
 JHEISER@DPKCONSULTING.NET  
 N.J. Lic: 24GS04331100  
 PA. Lic: SU075616  
 N.Y. Lic: 050932-1  
 CT. Lic: 70476  
 DE. Lic: S6-0010858

- Sediment Thickness Samples (ft)
- Lake Extent
- Elevation (ft)**
  - Major
  - Minor
- Sediment Thickness (ft)**
  - 0.0 to 0.5
  - 0.5 to 1.0
  - 1.0 to 1.5
  - 1.5 to 2.0
  - 2.0 to 2.5
  - 2.5 to 3.0
  - 3.0 to 3.5
  - 3.5 to 4.0
  - 4.0 to 4.5
  - 4.5 to 5.0
  - 5.0 to 5.5

Mountain Lakes - Wildwood Lake  
 Sediment Thickness

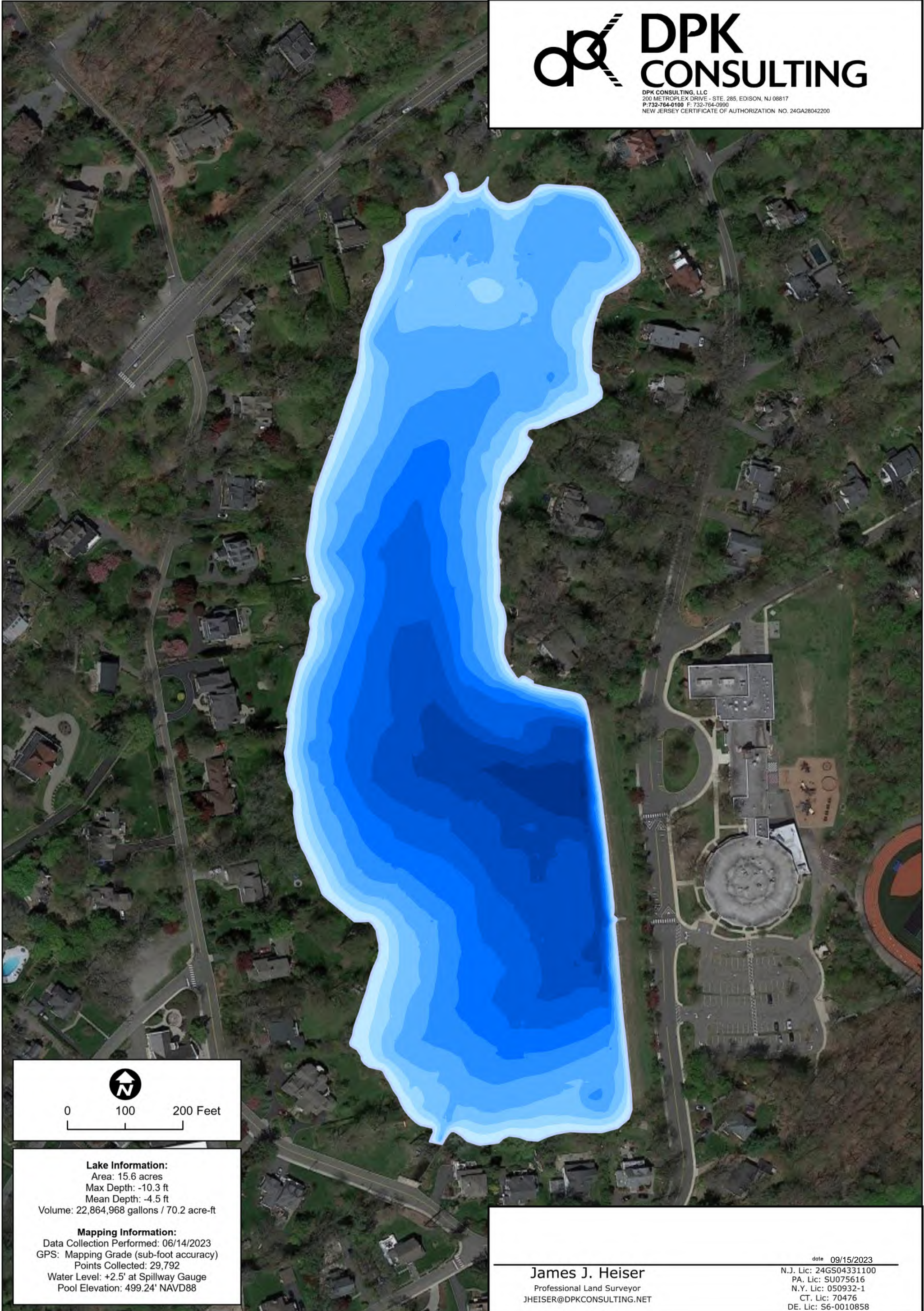


Copyright © 2023 The Mapping Network, LLC. All rights reserved. Reasonable efforts have been made to verify that this map accurately interprets the source data used in its preparation, however, a degree of error is inherent in all maps, and this map may contain omissions and errors in scale, resolution, rectification, positional accuracy, development methodology, interpretation of source data, and other circumstances. The Mapping Network, LLC MAKES NO WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. The Mapping Network, LLC SHALL NOT BE LIABLE TO ANY PERSON UNDER ANY LEGAL OR EQUITABLE THEORY FOR DAMAGES ARISING OUT OF THE USE OF THIS MAP, INCLUDING, WITHOUT LIMITATION, FOR DIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES. This map is date specific and is intended for use only at the published scale. Nothing in this map implies the right to use private property, which may lie within or be bounded by the waters shown on this map. Do not use this map for marine navigation, swimming, diving, or other related activities, as it does not depict all information necessary to perform these functions safely.



# DPK CONSULTING

DPK CONSULTING, LLC  
200 METROPLEX DRIVE - STE. 285, EDISON, NJ 08817  
P: 732-764-0100 F: 732-764-0990  
NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. 24GA28042200



0 100 200 Feet

**Lake Information:**

Area: 15.6 acres  
Max Depth: -10.3 ft  
Mean Depth: -4.5 ft  
Volume: 22,864,968 gallons / 70.2 acre-ft

**Mapping Information:**

Data Collection Performed: 06/14/2023  
GPS: Mapping Grade (sub-foot accuracy)  
Points Collected: 29,792  
Water Level: +2.5' at Spillway Gauge  
Pool Elevation: 499.24' NAVD88

**James J. Heiser**

Professional Land Surveyor  
JHEISER@DPKCONSULTING.NET

date 09/15/2023

N.J. Lic: 24GS04331100  
PA. Lic: SU075616  
N.Y. Lic: 050932-1  
CT. Lic: 70476  
DE. Lic: S6-0010858

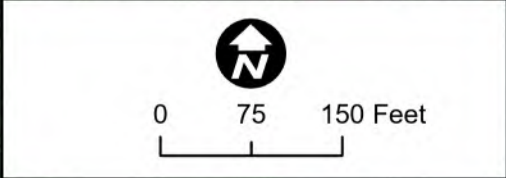
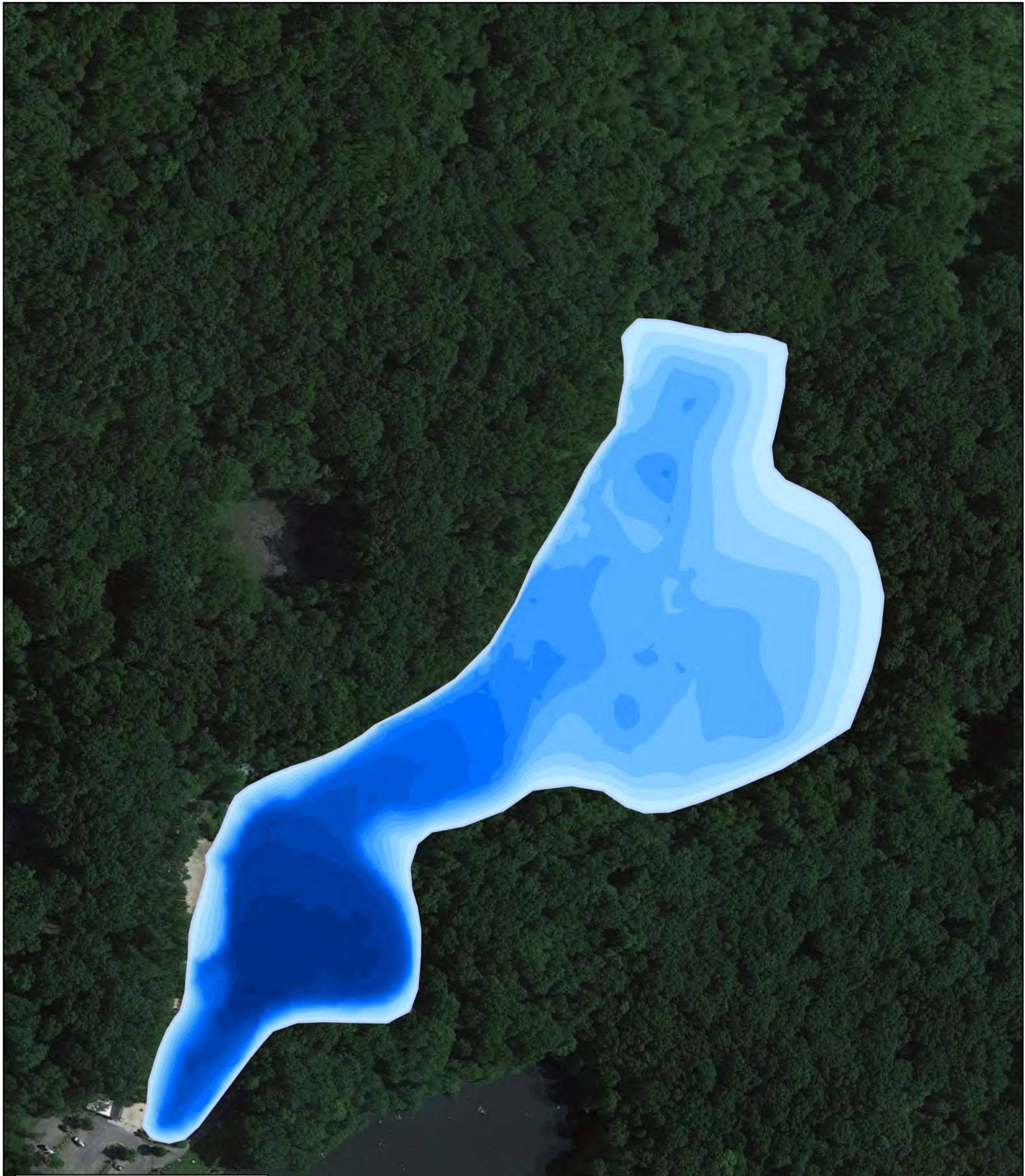
## Mountain Lakes - Wildwood Lake 3D - Depth



**BIRCHWOOD LAKE RESULTS**

Area:	12.9 Acres
Water Level/Elevation:	Full Pool / 558.5 NAVD88
Max Depth:	14.3 Feet
Mean Depth:	5.4 Feet
Volume (Holding Capacity):	22,661,839 gallons / 69.5 acre-feet
Estimated Sediment Volume:	11,217.4 cubic yards- wet unconsolidated sediment
Mean Sediment Thickness:	5.3 Feet
Lake Composition:	50% Water / 50% unconsolidated sediment
Estimated Sediment Change (2010-2013)	17,893.0 cubic yard gain
Mean Depth Change (2010-2013)	+0.85 Feet
Surveyor Notes:	<ul style="list-style-type: none"> <li>An abundance of various types of aquatic vegetation interfered with sonar measurements (specifically Chara and European Milfoil), in the northern part of the reservoir. Navigation was difficult in the northern area due to shallow depths and various species of Lily and Spadderdock. Navigation in the southern portion of the lake was limited by swimming areas. We utilized our manual measurements in this area to best determine water depth.</li> </ul>





**Lake Information:**  
 Area: 12.9 acres  
 Max Depth: -14.3 ft  
 Mean Depth: -5.4 ft  
 Volume: 22,661,839 gallons / 69.5 acre-ft

**Mapping Information:**  
 Data Collection Performed: 06/15/2023  
 GPS: Mapping Grade (sub-foot accuracy)  
 Points Collected: 31,824  
 Water Level: Full Pool  
 Pool Elevation: 558.54' NAVD88



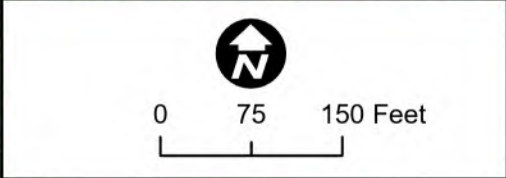
**DPK CONSULTING**  
 DPK CONSULTING, LLC  
 200 METROPLEX DRIVE - STE. 285, EDISON, NJ 08817  
 P: 732-764-0100 F: 732-764-0990  
 NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. 24GA28042200

date 09/15/2023

**James J. Heiser**  
 Professional Land Surveyor  
 JHEISER@DPKCONSULTING.NET

N.J. Lic: 24GS04331100  
 PA. Lic: SU075616  
 N.Y. Lic: 050932-1  
 CT. Lic: 70476  
 DE. Lic: S6-0010858

Copyright © 2023 The Mapping Network, LLC. All rights reserved. Reasonable efforts have been made to verify that this map accurately interprets the source data used in its preparation, however, a degree of error is inherent in all maps, and this map may contain omissions and errors in scale, resolution, rectification, positional accuracy, development methodology, interpretation of source data, and other circumstances. The Mapping Network, LLC MAKES NO WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. The Mapping Network, LLC SHALL NOT BE LIABLE TO ANY PERSON UNDER ANY LEGAL OR EQUITABLE THEORY FOR DAMAGES ARISING OUT OF THE USE OF THIS MAP, INCLUDING, WITHOUT LIMITATION, FOR DIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES. This map is date specific and is intended for use only at the published scale. Nothing in this map implies the right to use private property, which may lie within or be bounded by the waters shown on this map. Do not use this map for marine navigation, swimming, diving, or other related activities, as it does not depict all information necessary to perform these functions safely.



**Lake Information:**  
 Area: 12.9 acres  
 Max Depth: -14.3 ft  
 Mean Depth: -5.4 ft  
 Volume: 22,661,839 gallons / 69.5 acre-ft

**Mapping Information:**  
 Data Collection Performed: 06/15/2023  
 GPS: Mapping Grade (sub-foot accuracy)  
 Points Collected: 31,824  
 Water Level: Full Pool  
 Pool Elevation: 558.54' NAVD88




**DPK CONSULTING**  
 DPK CONSULTING, LLC  
 200 METROPLEX DRIVE - STE. 285, EDISON, NJ 08817  
 P: 732-764-0100 F: 732-764-0990  
 NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. 24GA28042200

date 09/15/2023

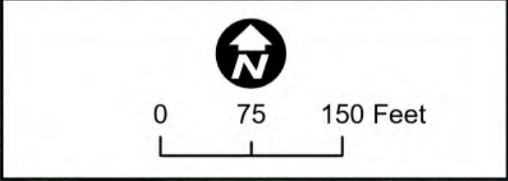
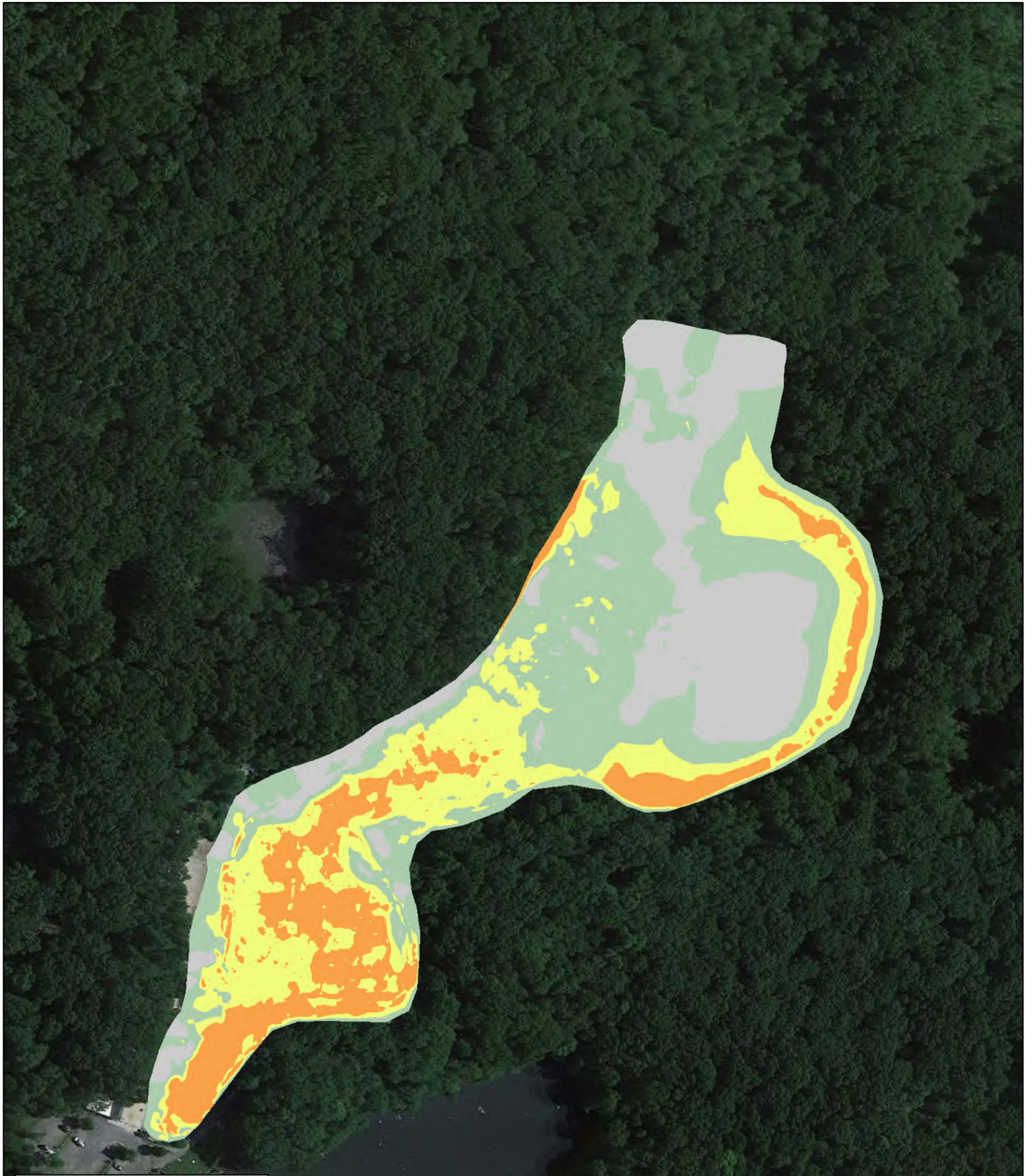
**James J. Heiser**  
 Professional Land Surveyor  
 JHEISER@DPKCONSULTING.NET

N.J. Lic: 24GS04331100  
 PA. Lic: SU075616  
 N.Y. Lic: 050932-1  
 CT. Lic: 70476  
 DE. Lic: S6-0010858

**Mountain Lakes - Birchwood Lake  
 3D - Elevation**



Copyright © 2023 The Mapping Network, LLC. All rights reserved. Reasonable efforts have been made to verify that this map accurately interprets the source data used in its preparation, however, a degree of error is inherent in all maps, and this map may contain omissions and errors in scale, resolution, rectification, positional accuracy, development methodology, interpretation of source data, and other circumstances. The Mapping Network, LLC MAKES NO WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. The Mapping Network, LLC SHALL NOT BE LIABLE TO ANY PERSON UNDER ANY LEGAL OR EQUITABLE THEORY FOR DAMAGES ARISING OUT OF THE USE OF THIS MAP, INCLUDING, WITHOUT LIMITATION, FOR DIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES. This map is date specific and is intended for use only at the published scale. Nothing in this map implies the right to use private property, which may lie within or be bounded by the waters shown on this map. Do not use this map for marine navigation, swimming, diving, or other related activities, as it does not depict all information necessary to perform these functions safely.



**Lake Information:**  
 Area: 12.9 acres  
 Max Depth: -14.3 ft  
 Mean Depth: -5.4 ft  
 Volume: 22,661,839 gallons / 69.5 acre-ft

**Mapping Information:**  
 Data Collection Performed: 06/15/2023  
 GPS: Mapping Grade (sub-foot accuracy)  
 Points Collected: 31,824  
 Water Level: Full Pool  
 Pool Elevation: 558.54' NAVD88



**DPK CONSULTING**

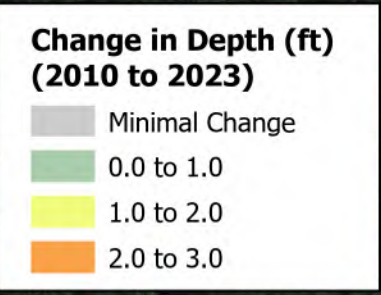
DPK CONSULTING, LLC  
 200 METROPLEX DRIVE - STE. 285, EDISON, NJ 08817  
 P: 732-764-0100 F: 732-764-0990  
 NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. 24GA28042200

date 09/15/2023


**James J. Heiser**  
 Professional Land Surveyor  
 JHEISER@DPKCONSULTING.NET

N.J. Lic: 24GS04331100  
 PA. Lic: SU075616  
 N.Y. Lic: 050932-1  
 CT. Lic: 70476  
 DE. Lic: S6-0010858

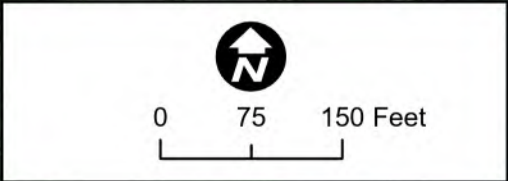
Net Material Gain: 17,893.0 yards<sup>3</sup>  
 Mean Depth Change: +0.85 ft



**Mountain Lakes - Birchwood Lake  
 2010 to 2023 Comparison**



Copyright © 2023 The Mapping Network, LLC. All rights reserved. Reasonable efforts have been made to verify that this map accurately interprets the source data used in its preparation, however, a degree of error is inherent in all maps, and this map may contain omissions and errors in scale, resolution, rectification, positional accuracy, development methodology, interpretation of source data, and other circumstances. The Mapping Network, LLC MAKES NO WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. The Mapping Network, LLC SHALL NOT BE LIABLE TO ANY PERSON UNDER ANY LEGAL OR EQUITABLE THEORY FOR DAMAGES ARISING OUT OF THE USE OF THIS MAP, INCLUDING, WITHOUT LIMITATION, FOR DIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES. This map is date specific and is intended for use only at the published scale. Nothing in this map implies the right to use private property, which may lie within or be bounded by the waters shown on this map. Do not use this map for marine navigation, swimming, diving, or other related activities, as it does not depict all information necessary to perform these functions safely.



**Lake Information:**  
 Area: 12.9 acres  
 Max Depth: -14.3 ft  
 Mean Depth: -5.4 ft  
 Volume: 22,661,839 gallons / 69.5 acre-ft

**Mapping Information:**  
 Data Collection Performed: 06/15/2023  
 GPS: Mapping Grade (sub-foot accuracy)  
 Points Collected: 31,824  
 Water Level: Full Pool  
 Pool Elevation: 558.54' NAVD88



**DPK CONSULTING**  
 DPK CONSULTING, LLC  
 200 METROPLEX DRIVE - STE. 285, EDISON, NJ 08817  
 P: 732-764-0100 F: 732-764-0990  
 NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. 24GA28042200

date 09/15/2023

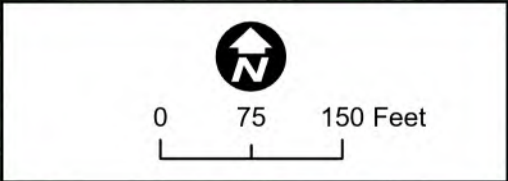
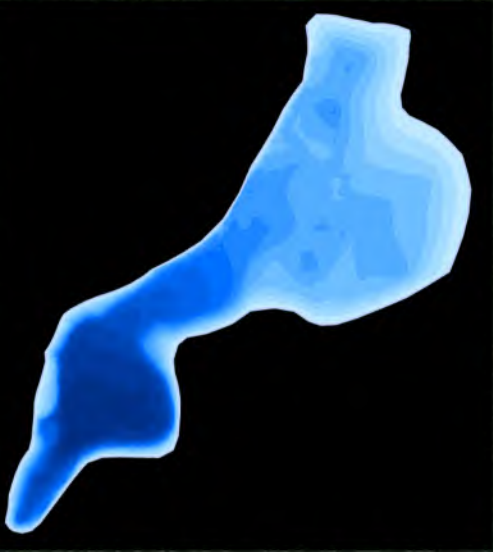
**James J. Heiser**  
 Professional Land Surveyor  
 JHEISER@DPKCONSULTING.NET

N.J. Lic: 24GS04331100  
 PA. Lic: SU075616  
 N.Y. Lic: 050932-1  
 CT. Lic: 70476  
 DE. Lic: S6-0010858

Mountain Lakes - Birchwood Lake  
 Contours - Depth



Copyright © 2023 The Mapping Network, LLC. All rights reserved. Reasonable efforts have been made to verify that this map accurately interprets the source data used in its preparation, however, a degree of error is inherent in all maps, and this map may contain omissions and errors in scale, resolution, rectification, positional accuracy, development methodology, interpretation of source data, and other circumstances. The Mapping Network, LLC MAKES NO WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE MAPPING NETWORK, LLC SHALL NOT BE LIABLE TO ANY PERSON UNDER ANY LEGAL OR EQUITABLE THEORY FOR DAMAGES ARISING OUT OF THE USE OF THIS MAP, INCLUDING, WITHOUT LIMITATION, FOR DIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES. This map is date specific and is intended for use only at the published scale. Nothing in this map implies the right to use private property, which may lie within or be bounded by the waters shown on this map. Do not use this map for marine navigation, swimming, diving, or other related activities, as it does not depict all information necessary to perform these functions safely.



**Lake Information:**  
 Area: 12.9 acres  
 Max Depth: -14.3 ft  
 Mean Depth: -5.4 ft  
 Volume: 22,661,839 gallons / 69.5 acre-ft

**Mapping Information:**  
 Data Collection Performed: 06/15/2023  
 GPS: Mapping Grade (sub-foot accuracy)  
 Points Collected: 31,824  
 Water Level: Full Pool  
 Pool Elevation: 558.54' NAVD88



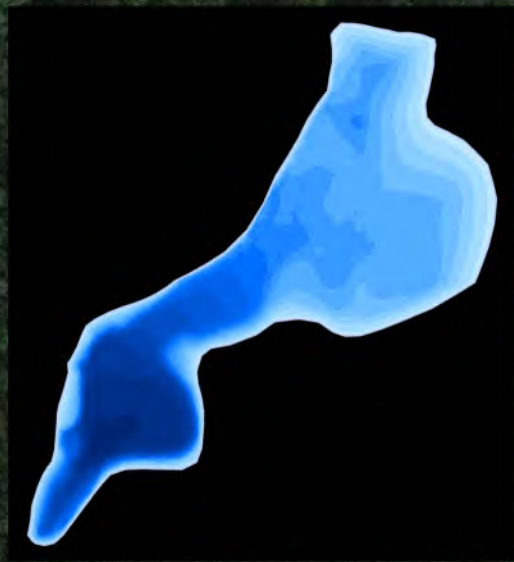
**DPK CONSULTING**  
 DPK CONSULTING, LLC  
 200 METROPLEX DRIVE - STE. 285, EDISON, NJ 08817  
 P: 732-764-0100 F: 732-764-0990  
 NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. 24GA28042200

date 09/15/2023

**James J. Heiser**  
 Professional Land Surveyor  
 JHEISER@DPKCONSULTING.NET

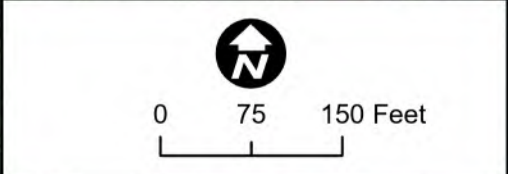
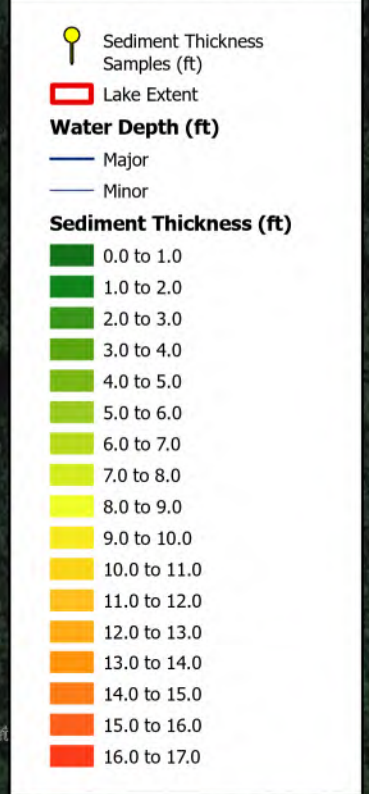
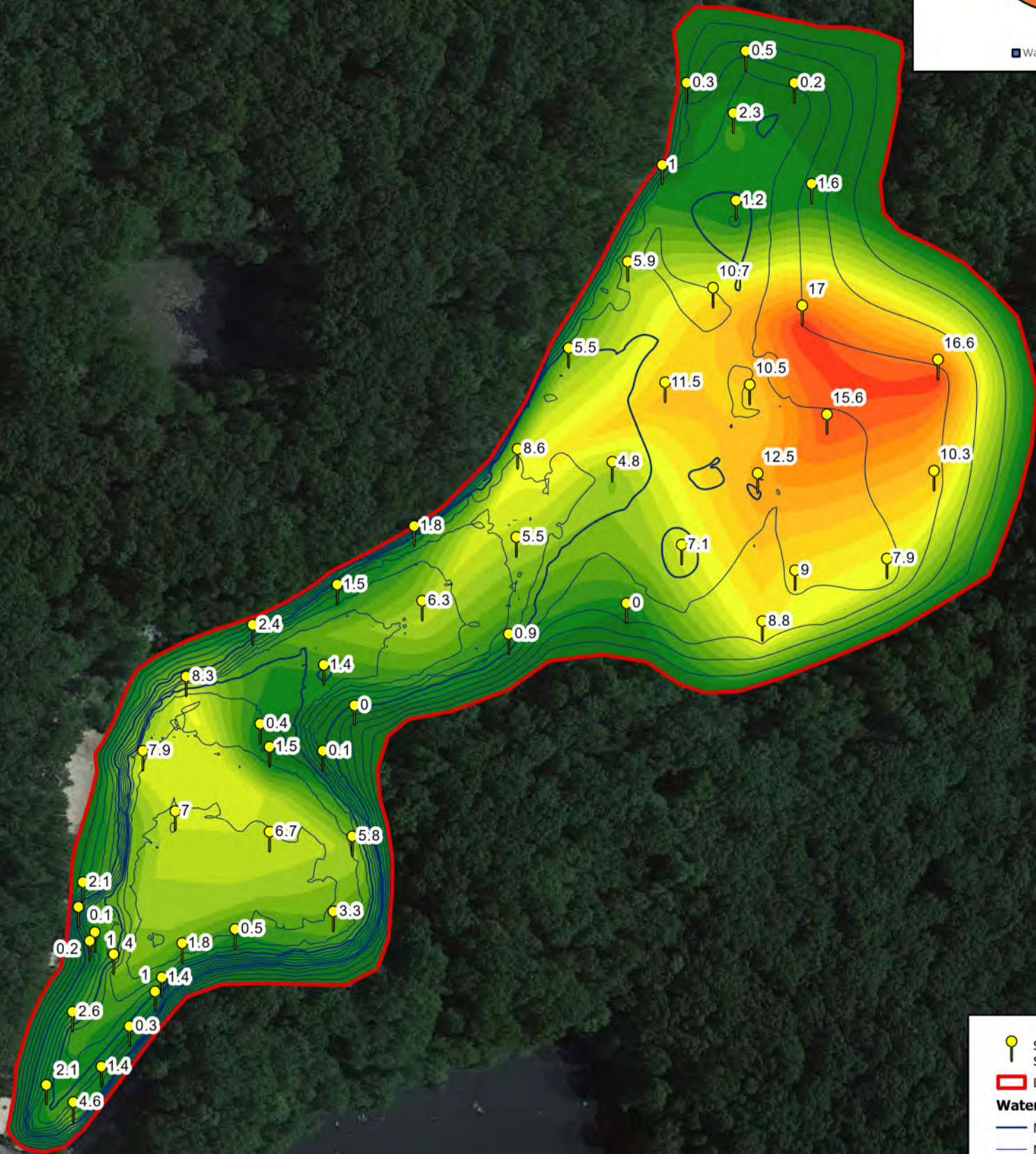
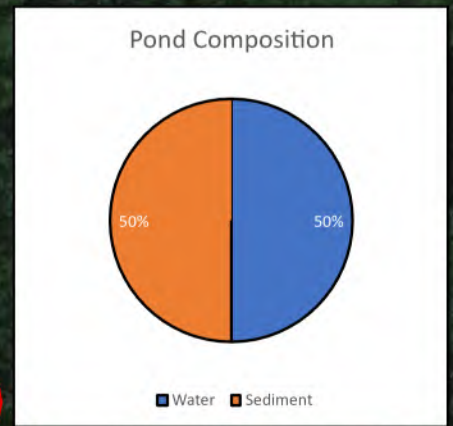
N.J. Lic: 24GS04331100  
 PA. Lic: SU075616  
 N.Y. Lic: 050932-1  
 CT. Lic: 70476  
 DE. Lic: S6-0010858

Copyright © 2023 The Mapping Network, LLC. All rights reserved. Reasonable efforts have been used to verify that this map accurately interprets the source data used in its preparation, however, a degree of error is inherent in all maps, and this map may contain omissions and errors in scale, resolution, rectification, positional accuracy, development methodology, interpretation of source data, and other circumstances. The Mapping Network, LLC MAKES NO WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. The Mapping Network, LLC SHALL NOT BE LIABLE TO ANY PERSON UNDER ANY LEGAL OR EQUITABLE THEORY FOR DAMAGES ARISING OUT OF THE USE OF THIS MAP, INCLUDING, WITHOUT LIMITATION, FOR DIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES. This map is date specific and is intended for use only at the published scale. Nothing in this map implies the right to use private property, which may lie within or be bounded by the waters shown on this map. Do not use this map for marine navigation, swimming, diving, or other related activities, as it does not depict all information necessary to perform these functions safely.



Estimated Sediment Volume: 110,217.4 yards<sup>3</sup>  
 Mean Sediment Thickness: 5.26 ft

Notes:  
 -The purpose of this study is to provide an estimated amount of soft sediment  
 -Sediment volume calculations based on computer model generated from 55 measurements collected in the field.  
 -Areas of rock and impermeable surfaces may affect the estimated total volume of removable sediment.  
 -Shrinkage not included in calculations  
 -The information collected for this project represents the current existing conditions on the date indicated and can only be considered as indicating conditions at the time.



**Lake Information:**  
 Area: 12.9 acres  
 Max Depth: -14.3 ft  
 Mean Depth: -5.4 ft  
 Volume: 22,661,839 gallons / 69.5 acre-ft

**Mapping Information:**  
 Data Collection Performed: 06/15/2023  
 GPS: Mapping Grade (sub-foot accuracy)  
 Points Collected: 31,824  
 Water Level: Full Pool  
 Pool Elevation: 558.54' NAVD88

DPK CONSULTING, LLC  
 200 METROPLEX DRIVE - STE. 285, EDISON, NJ 08817  
 P: 732-764-0100 F: 732-764-0990  
 NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. 24GA28042200

date 09/15/2023

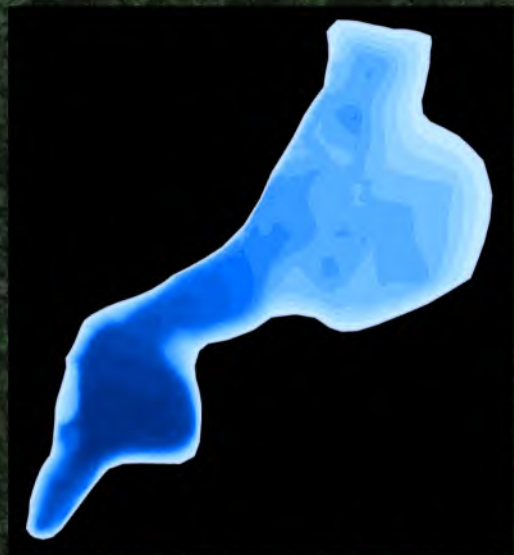
**James J. Heiser**  
 Professional Land Surveyor  
 JHEISER@DPKCONSULTING.NET

N.J. Lic: 24GS04331100  
 PA. Lic: SU075616  
 N.Y. Lic: 050932-1  
 CT. Lic: 70476  
 DE. Lic: S6-0010858

Mountain Lakes - Birchwood Lake  
 Sediment Thickness



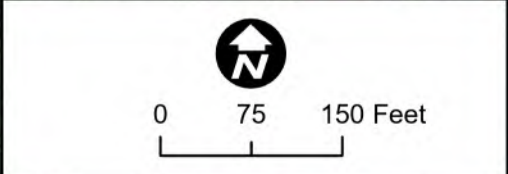
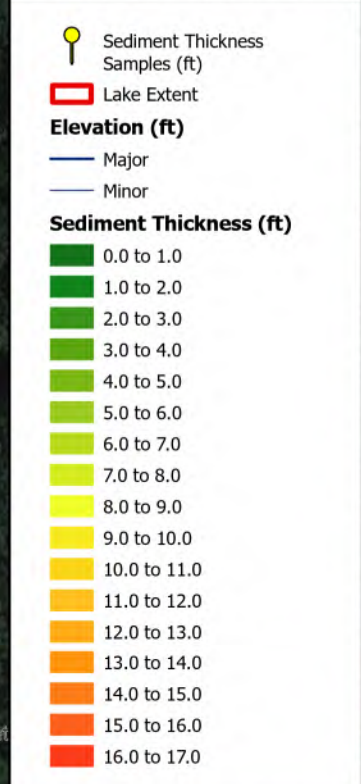
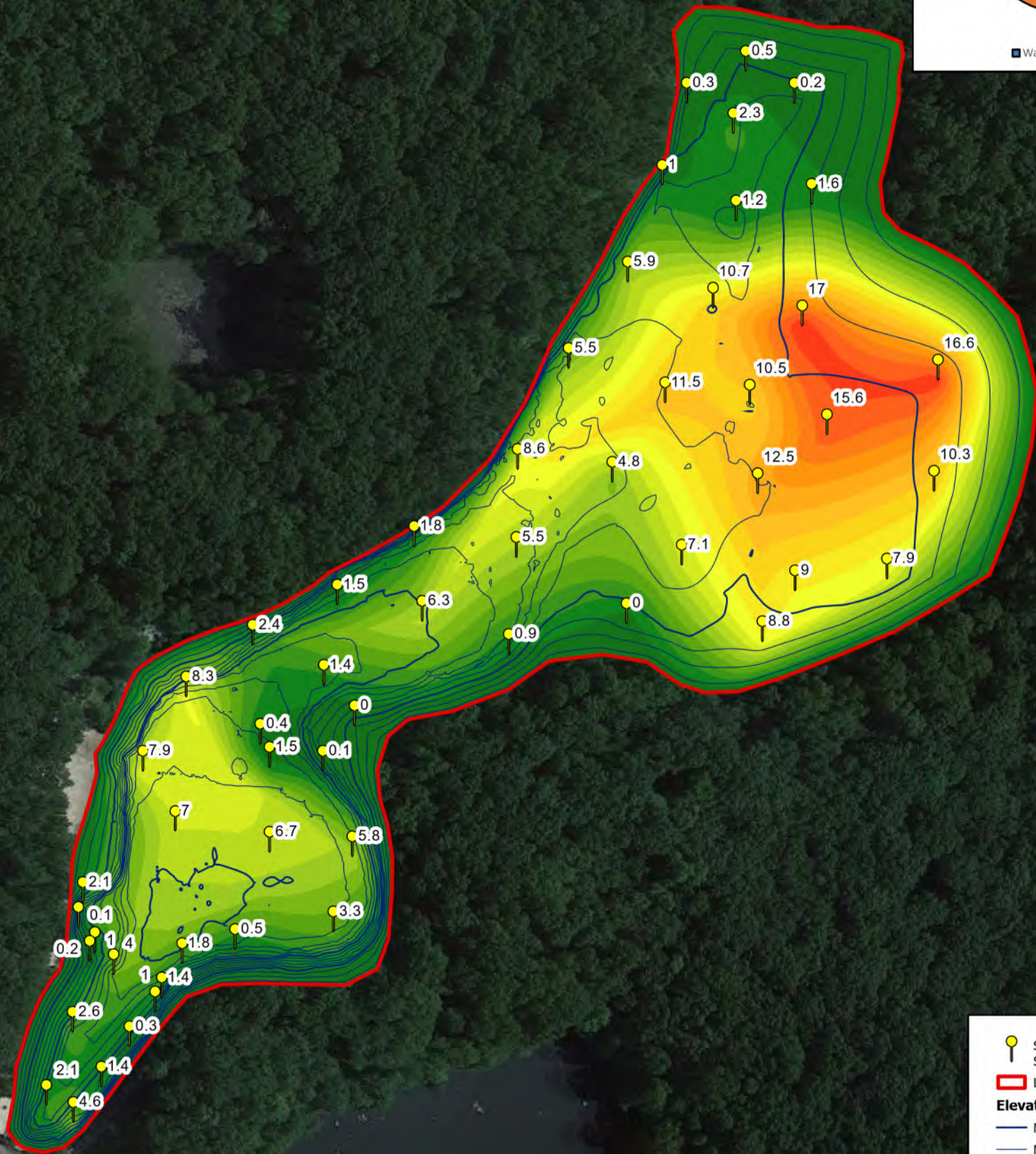
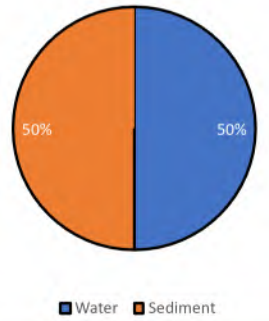
Copyright © 2023 The Mapping Network, LLC. All rights reserved. Reasonable efforts have been made to verify that this map accurately interprets the source data used in its preparation, however, a degree of error is inherent in all maps, and this map may contain omissions and errors in scale, resolution, rectification, positional accuracy, development methodology, interpretation of source data, and other circumstances. The Mapping Network, LLC MAKES NO WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. The Mapping Network, LLC SHALL NOT BE LIABLE TO ANY PERSON UNDER ANY LEGAL OR EQUITABLE THEORY FOR DAMAGES ARISING OUT OF THE USE OF THIS MAP, INCLUDING, WITHOUT LIMITATION, FOR DIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES. This map is date specific and is intended for use only at the published scale. Nothing in this map implies the right to use private property, which may lie within or be bounded by the waters shown on this map. Do not use this map for marine navigation, swimming, diving, or other related activities, as it does not depict all information necessary to perform these functions safely.



Estimated Sediment Volume: 110,217.4 yards<sup>3</sup>  
 Mean Sediment Thickness: 5.26 ft

Notes:  
 -The purpose of this study is to provide an estimated amount of soft sediment  
 -Sediment volume calculations based on computer model generated from 55 measurements collected in the field.  
 -Areas of rock and impermeable surfaces may affect the estimated total volume of removable sediment.  
 -Shrinkage not included in calculations  
 -The information collected for this project represents the current existing conditions on the date indicated and can only be considered as indicating conditions at the time.

Pond Composition



**Lake Information:**  
 Area: 12.9 acres  
 Max Depth: -14.3 ft  
 Mean Depth: -5.4 ft  
 Volume: 22,661,839 gallons / 69.5 acre-ft

**Mapping Information:**  
 Data Collection Performed: 06/15/2023  
 GPS: Mapping Grade (sub-foot accuracy)  
 Points Collected: 31,824  
 Water Level: Full Pool  
 Pool Elevation: 558.54' NAVD88

**DPK CONSULTING**  
 DPK CONSULTING, LLC  
 200 METROPLEX DRIVE - STE. 285, EDISON, NJ 08817  
 P: 732-764-0100 F: 732-764-0990  
 NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. 24GA28042200

date 09/15/2023

**James J. Heiser**  
 Professional Land Surveyor  
 JHEISER@DPKCONSULTING.NET


N.J. Lic: 24GS04331100  
 PA. Lic: SU075616  
 N.Y. Lic: 050932-1  
 CT. Lic: 70476  
 DE. Lic: S6-0010858

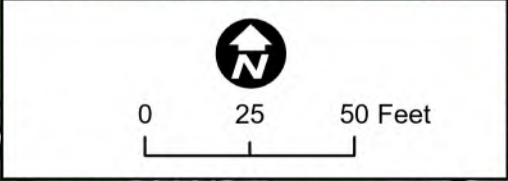
Mountain Lakes - Birchwood Lake  
 Sediment Thickness



Copyright © 2023 The Mapping Network, LLC. All rights reserved. Reasonable efforts have been made to verify that this map accurately interprets the source data used in its preparation, however, a degree of error is inherent in all maps, and this map may contain omissions and errors in scale, resolution, rectification, positional accuracy, development methodology, interpretation of source data, and other circumstances. The Mapping Network, LLC MAKES NO WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE MAPPING NETWORK, LLC SHALL NOT BE LIABLE TO ANY PERSON UNDER ANY LEGAL OR EQUITABLE THEORY FOR DAMAGES ARISING OUT OF THE USE OF THIS MAP, INCLUDING, WITHOUT LIMITATION, FOR DIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES. This map is date specific and is intended for use only at the published scale. Nothing in this map implies the right to use private property, which may lie within or be bounded by the waters shown on this map. Do not use this map for marine navigation, swimming, diving, or other related activities, as it does not depict all information necessary to perform these functions safely.

**COVE LAKE RESULTS**

Area:	0.93 Acres
Water Level/Elevation:	Full Pool / 510.8 NAVD88
Max Depth:	8.5 Feet
Mean Depth:	3.7 Feet
Volume (Holding Capacity):	1,056,563 gallons / 3.2 acre-feet
Estimated Sediment Volume:	2,130 cubic yards- wet unconsolidated sediment
Mean Sediment Thickness:	1.4 Feet
Lake Composition:	71% Water / 29% unconsolidated sediment
Surveyor Notes:	<ul style="list-style-type: none"> <li>Navigation was limited along the shoreline due to tree obstruction. An abundance of various types of aquatic vegetation interfered with sonar measurements. In those areas we used manual measurement information.</li> </ul> 



**Lake Information:**  
 Area: 0.93 acres  
 Max Depth: -8.5 ft  
 Mean Depth: -3.7 ft  
 Volume: 1,056,563 gallons / 3.2 acre-ft

**Mapping Information:**  
 Data Collection Performed: 06/15/2023  
 GPS: Mapping Grade (sub-foot accuracy)  
 Points Collected: 11,071  
 Water Level: Full Pool  
 Pool Elevation: 510.795' NAVD88



**DPK  
CONSULTING**

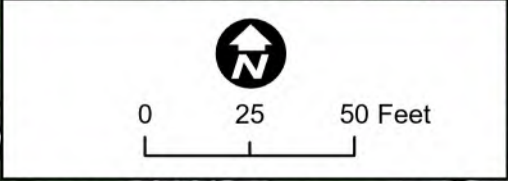
DPK CONSULTING, LLC  
 200 METROPLEX DRIVE - STE. 285, EDISON, NJ 08817  
 P: 732-764-0100 F: 732-764-0990  
 NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. 24GA28042200

date 09/15/2023

**James J. Heiser**  
 Professional Land Surveyor  
 JHEISER@DPKCONSULTING.NET

N.J. Lic: 24GS04331100  
 PA. Lic: SU075616  
 N.Y. Lic: 050932-1  
 CT. Lic: 70476  
 DE. Lic: S6-0010858

Copyright © 2023 The Mapping Network, LLC. All rights reserved. Reasonable efforts have been made to verify that this map accurately interprets the source data used in its preparation, however, a degree of error is inherent in all maps, and this map may contain omissions and errors in scale, resolution, rectification, positional accuracy, development methodology, interpretation of source data, and other circumstances. The Mapping Network, LLC MAKES NO WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. The Mapping Network, LLC SHALL NOT BE LIABLE TO ANY PERSON UNDER ANY LEGAL OR EQUITABLE THEORY FOR DAMAGES ARISING OUT OF THE USE OF THIS MAP, INCLUDING, WITHOUT LIMITATION, FOR DIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES. This map is date specific and is intended for use only at the published scale. Nothing in this map implies the right to use private property, which may lie within or be bounded by the waters shown on this map. Do not use this map for marine navigation, swimming, diving, or other related activities, as it does not depict all information necessary to perform these functions safely.



**Lake Information:**  
 Area: 0.93 acres  
 Max Depth: -8.5 ft  
 Mean Depth: -3.7 ft  
 Volume: 1,056,563 gallons / 3.2 acre-ft

**Mapping Information:**  
 Data Collection Performed: 06/15/2023  
 GPS: Mapping Grade (sub-foot accuracy)  
 Points Collected: 11,071  
 Water Level: Full Pool  
 Pool Elevation: 510.795' NAVD88



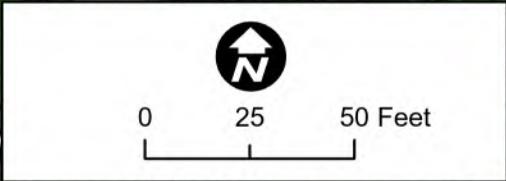
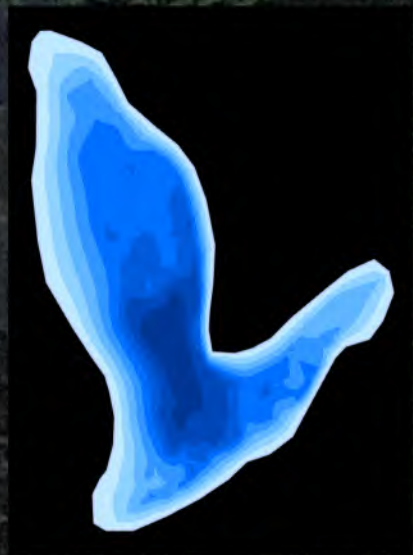
**DPK CONSULTING**  
 DPK CONSULTING, LLC  
 200 METROPLEX DRIVE - STE. 285, EDISON, NJ 08817  
 P: 732-764-0100 F: 732-764-0990  
 NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. 24GA28042200

date 09/15/2023

**James J. Heiser**  
 Professional Land Surveyor  
 JHEISER@DPKCONSULTING.NET

N.J. Lic: 24GS04331100  
 PA. Lic: SU075616  
 N.Y. Lic: 050932-1  
 CT. Lic: 70476  
 DE. Lic: S6-0010858

Copyright © 2023 The Mapping Network, LLC. All rights reserved. Reasonable efforts have been made to verify that this map accurately interprets the source data used in its preparation, however, a degree of error is inherent in all maps, and this map may contain omissions and errors in scale, resolution, rectification, positional accuracy, development methodology, interpretation of source data, and other circumstances. The Mapping Network, LLC MAKES NO WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. The Mapping Network, LLC SHALL NOT BE LIABLE TO ANY PERSON UNDER ANY LEGAL OR EQUITABLE THEORY FOR DAMAGES ARISING OUT OF THE USE OF THIS MAP, INCLUDING, WITHOUT LIMITATION, FOR DIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES. This map is date specific and is intended for use only at the published scale. Nothing in this map implies the right to use private property, which may lie within or be bounded by the waters shown on this map. Do not use this map for marine navigation, swimming, diving, or other related activities, as it does not depict all information necessary to perform these functions safely.



**Lake Information:**  
 Area: 0.93 acres  
 Max Depth: -8.5 ft  
 Mean Depth: -3.7 ft  
 Volume: 1,056,563 gallons / 3.2 acre-ft

**Mapping Information:**  
 Data Collection Performed: 06/15/2023  
 GPS: Mapping Grade (sub-foot accuracy)  
 Points Collected: 11,071  
 Water Level: Full Pool  
 Pool Elevation: 510.795' NAVD88



**DPK CONSULTING**  
 DPK CONSULTING, LLC  
 200 METROPLEX DRIVE - STE. 285, EDISON, NJ 08817  
 P: 732-764-0100 F: 732-764-0990  
 NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. 24GA28042200

date 09/15/2023

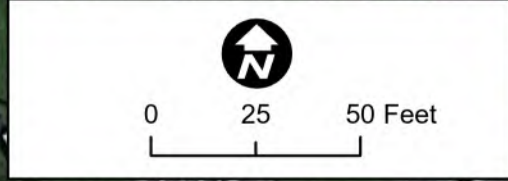
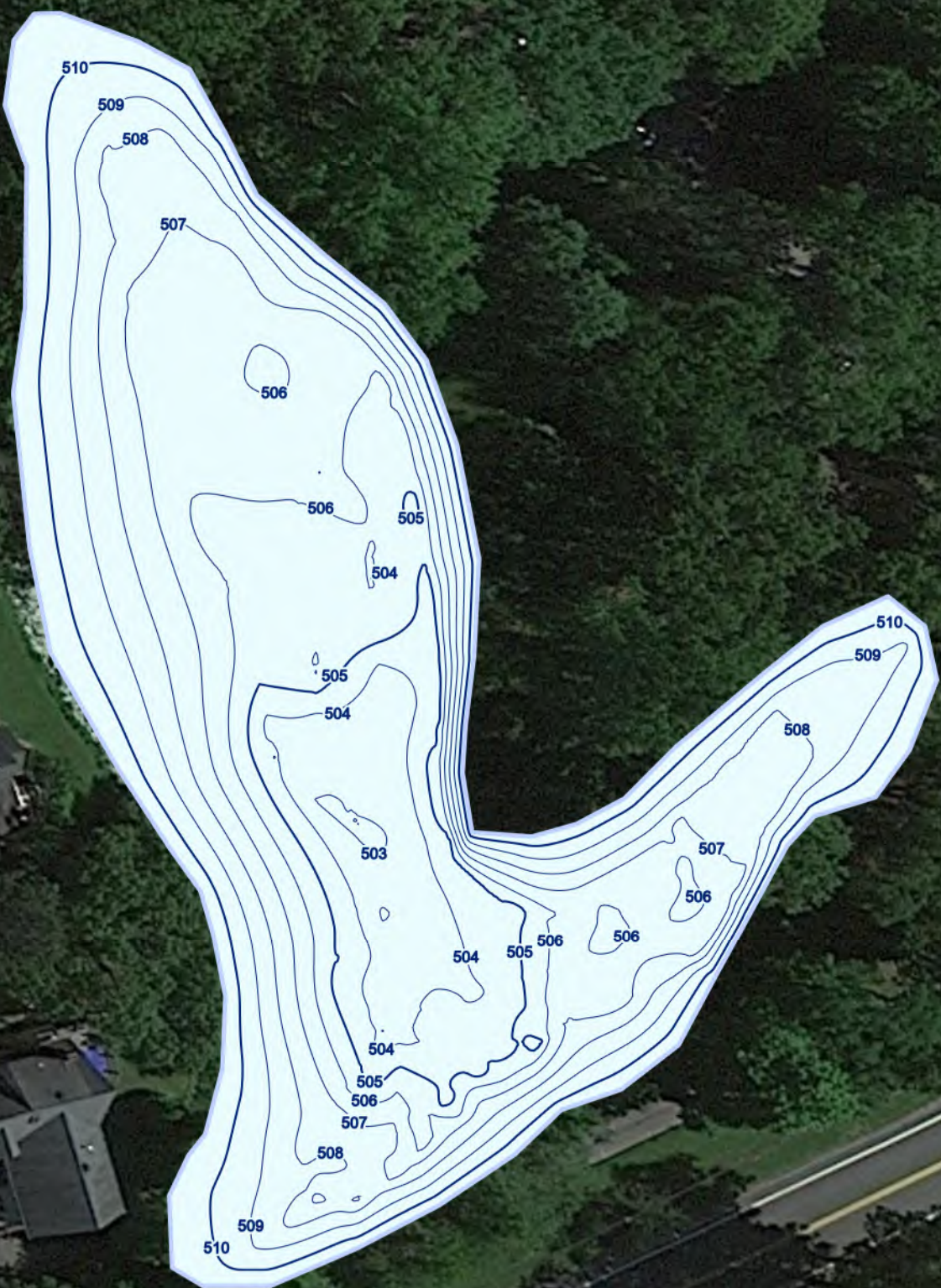
**James J. Heiser**  
 Professional Land Surveyor  
 JHEISER@DPKCONSULTING.NET

N.J. Lic: 24GS04331100  
 PA. Lic: SU075616  
 N.Y. Lic: 050932-1  
 CT. Lic: 70476  
 DE. Lic: S6-0010858

Mountain Lakes - Cove Lake  
 Contours - Depth



Copyright © 2023 The Mapping Network, LLC. All rights reserved. Reasonable efforts have been made to verify that this map accurately interprets the source data used in its preparation, however, a degree of error is inherent in all maps, and this map may contain omissions and errors in scale, resolution, rectification, positional accuracy, development methodology, interpretation of source data, and other circumstances. The Mapping Network, LLC MAKES NO WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. The Mapping Network, LLC SHALL NOT BE LIABLE TO ANY PERSON UNDER ANY LEGAL OR EQUITABLE THEORY FOR DAMAGES ARISING OUT OF THE USE OF THIS MAP, INCLUDING, WITHOUT LIMITATION, FOR DIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES. This map is date specific and is intended for use only at the published scale. Nothing in this map implies the right to use private property, which may lie within or be bounded by the waters shown on this map. Do not use this map for marine navigation, swimming, diving, or other related activities, as it does not depict all information necessary to perform these functions safely.



**Lake Information:**  
 Area: 0.93 acres  
 Max Depth: -8.5 ft  
 Mean Depth: -3.7 ft  
 Volume: 1,056,563 gallons / 3.2 acre-ft

**Mapping Information:**  
 Data Collection Performed: 06/15/2023  
 GPS: Mapping Grade (sub-foot accuracy)  
 Points Collected: 11,071  
 Water Level: Full Pool  
 Pool Elevation: 510.795' NAVD88



**DPK CONSULTING**  
 DPK CONSULTING, LLC  
 200 METROPLEX DRIVE - STE. 285, EDISON, NJ 08817  
 P: 732-764-0100 F: 732-764-0990  
 NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. 24GA28042200

date 09/15/2023

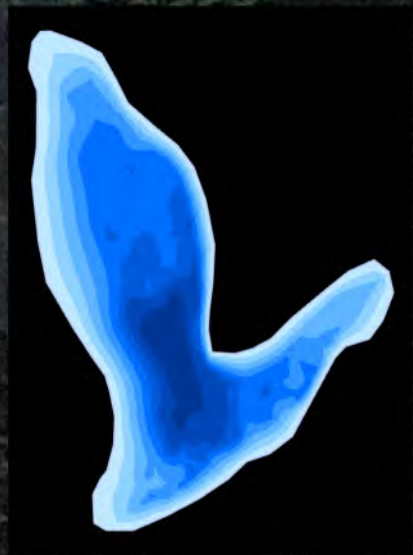
**James J. Heiser**  
 Professional Land Surveyor  
 JHEISER@DPKCONSULTING.NET

N.J. Lic: 24GS04331100  
 PA. Lic: SU075616  
 N.Y. Lic: 050932-1  
 CT. Lic: 70476  
 DE. Lic: S6-0010858

**Mountain Lakes - Cove Lake  
 Contours - Elevation**

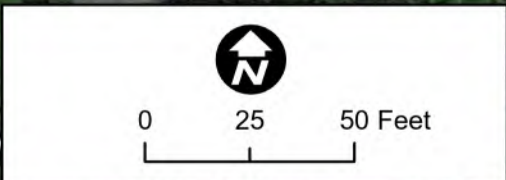
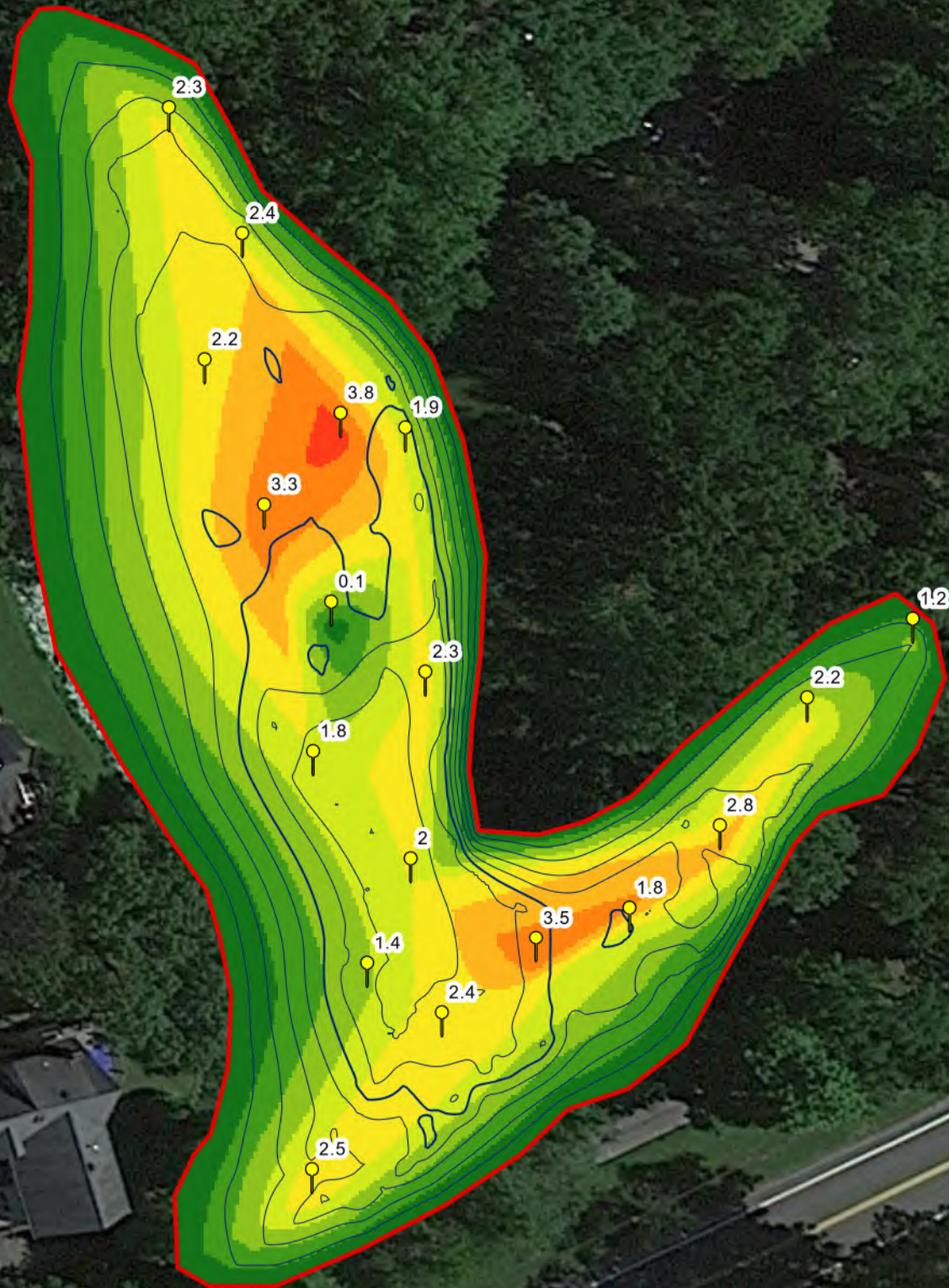
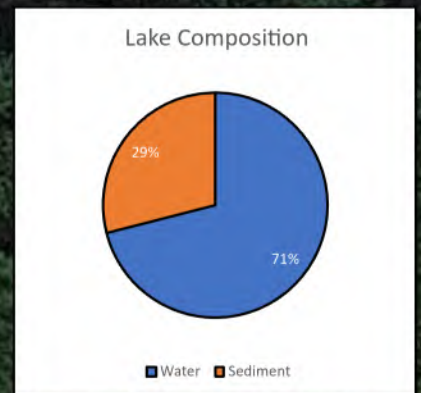


Copyright © 2023 The Mapping Network, LLC. All rights reserved. Reasonable efforts have been made to verify that this map accurately interprets the source data used in its preparation, however, a degree of error is inherent in all maps, and this map may contain omissions and errors in scale, resolution, rectification, positional accuracy, development methodology, interpretation of source data, and other circumstances. The Mapping Network, LLC MAKES NO WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. The Mapping Network, LLC SHALL NOT BE LIABLE TO ANY PERSON UNDER ANY LEGAL OR EQUITABLE THEORY FOR DAMAGES ARISING OUT OF THE USE OF THIS MAP, INCLUDING, WITHOUT LIMITATION, FOR DIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES. This map is date specific and is intended for use only at the published scale. Nothing in this map implies the right to use private property, which may lie within or be bounded by the waters shown on this map. Do not use this map for marine navigation, swimming, diving, or other related activities, as it does not depict all information necessary to perform these functions safely.



Estimated Sediment Volume: 2,129.9 yards<sup>3</sup>  
 Mean Sediment Thickness: 1.40 ft

Notes:  
 -The purpose of this study is to provide an estimated amount of soft sediment  
 -Sediment volume calculations based on computer model generated from 18 measurements collected in the field.  
 -Areas of rock and impermeable surfaces may affect the estimated total volume of removable sediment.  
 -Shrinkage not included in calculations  
 -The information collected for this project represents the current existing conditions on the date indicated and can only be considered as indicating conditions at the time.



**Lake Information:**  
 Area: 0.93 acres  
 Max Depth: -8.5 ft  
 Mean Depth: -3.7 ft  
 Volume: 1,056,563 gallons / 3.2 acre-ft

**Mapping Information:**  
 Data Collection Performed: 06/15/2023  
 GPS: Mapping Grade (sub-foot accuracy)  
 Points Collected: 11,071  
 Water Level: Full Pool  
 Pool Elevation: 510.795' NAVD88

**DPK CONSULTING**  
 DPK CONSULTING, LLC  
 200 METROPLEX DRIVE - STE. 285, EDISON, NJ 08817  
 P: 732-764-0100 F: 732-764-0990  
 NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. 24GA28042200

date 09/15/2023

**James J. Heiser**  
 Professional Land Surveyor  
 JHEISER@DPKCONSULTING.NET

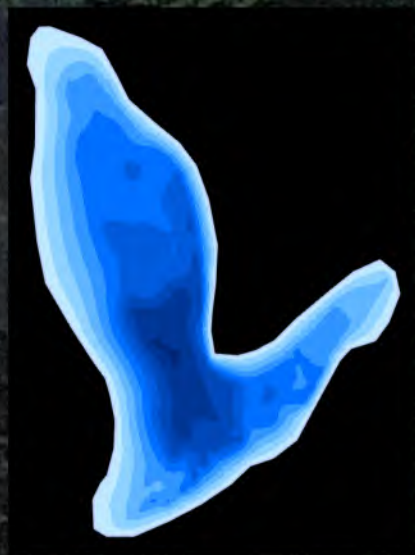
N.J. Lic: 24GS04331100  
 PA. Lic: SU075616  
 N.Y. Lic: 050932-1  
 CT. Lic: 70476  
 DE. Lic: S6-0010858

- Sediment Thickness Samples (ft)
- Lake Extent
- Water Depth (ft)**
  - Major
  - Minor
- Sediment Thickness (ft)**
  - 0.0 to 0.5
  - 0.5 to 1.0
  - 1.0 to 1.5
  - 1.5 to 2.0
  - 2.0 to 2.5
  - 2.5 to 3.0
  - 3.0 to 3.5
  - 3.5 to 4.0

Mountain Lakes - Cove Lake  
 Sediment Thickness

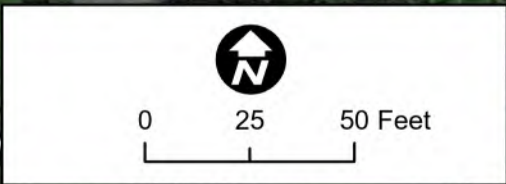
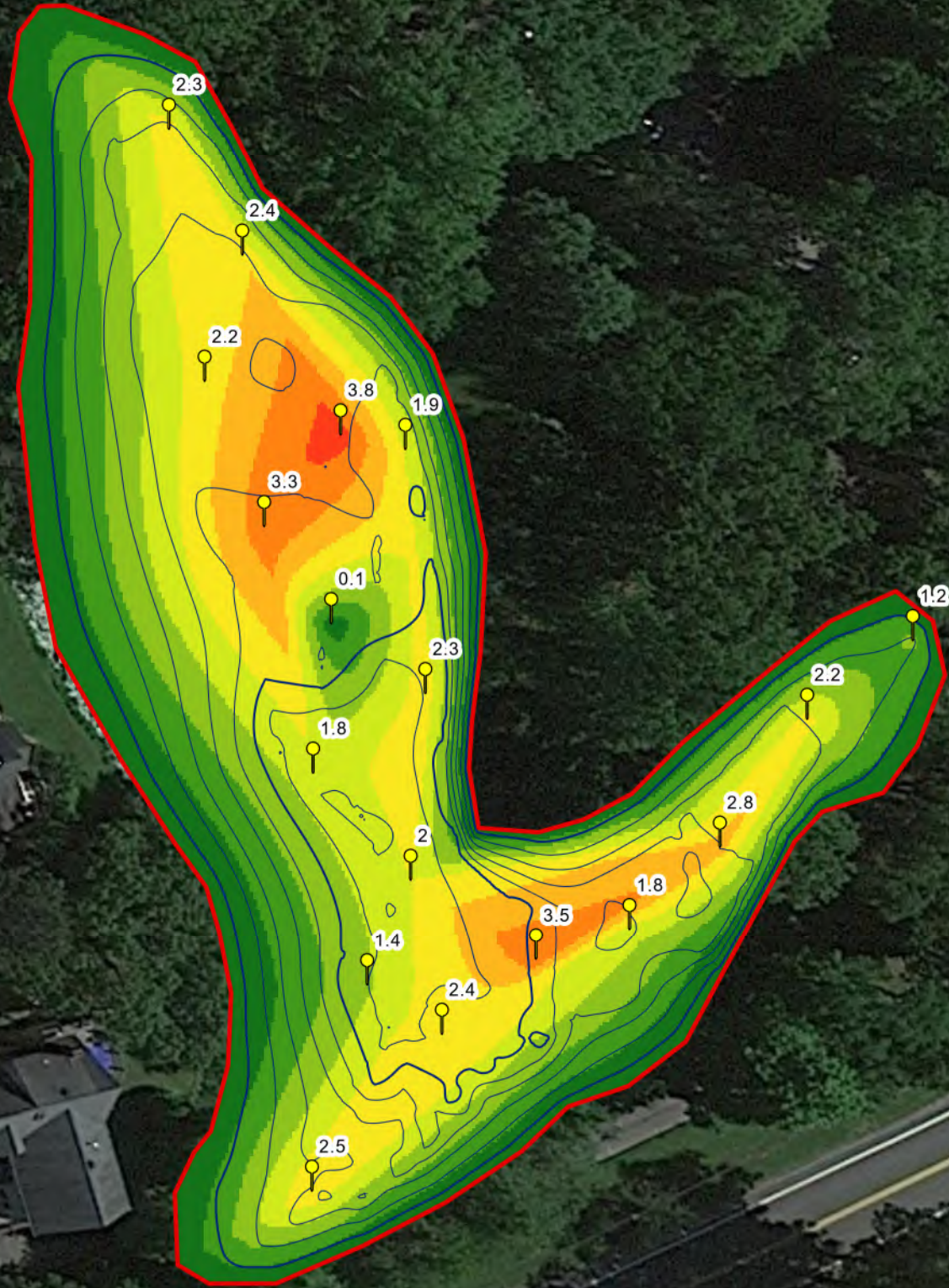
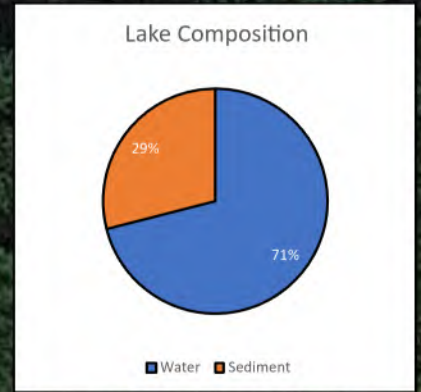


Copyright © 2023 The Mapping Network, LLC. All rights reserved. Reasonable efforts have been made to verify that this map accurately interprets the source data used in its preparation, however, a degree of error is inherent in all maps, and this map may contain omissions and errors in scale, resolution, rectification, positional accuracy, development methodology, interpretation of source data, and other circumstances. The Mapping Network, LLC MAKES NO WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. The Mapping Network, LLC SHALL NOT BE LIABLE TO ANY PERSON UNDER ANY LEGAL OR EQUITABLE THEORY FOR DAMAGES ARISING OUT OF THE USE OF THIS MAP, INCLUDING, WITHOUT LIMITATION, FOR DIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES. This map is date specific and is intended for use only at the published scale. Nothing in this map implies the right to use private property, which may lie within or be bounded by the waters shown on this map. Do not use this map for marine navigation, swimming, diving, or other related activities, as it does not depict all information necessary to perform these functions safely.



Estimated Sediment Volume: 2,129.9 yards<sup>3</sup>  
 Mean Sediment Thickness: 1.40 ft

Notes:  
 -The purpose of this study is to provide an estimated amount of soft sediment  
 -Sediment volume calculations based on computer model generated from 18 measurements collected in the field.  
 -Areas of rock and impermeable surfaces may affect the estimated total volume of removable sediment.  
 -Shrinkage not included in calculations  
 -The information collected for this project represents the current existing conditions on the date indicated and can only be considered as indicating conditions at the time.



**Lake Information:**  
 Area: 0.93 acres  
 Max Depth: -8.5 ft  
 Mean Depth: -3.7 ft  
 Volume: 1,056,563 gallons / 3.2 acre-ft

**Mapping Information:**  
 Data Collection Performed: 06/15/2023  
 GPS: Mapping Grade (sub-foot accuracy)  
 Points Collected: 11,071  
 Water Level: Full Pool  
 Pool Elevation: 510.795' NAVD88

**DPK CONSULTING**  
 DPK CONSULTING, LLC  
 200 METROPLEX DRIVE - STE. 285, EDISON, NJ 08817  
 P: 732-764-0100 F: 732-764-0990  
 NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. 24GA28042200

James J. Heiser  
 Professional Land Surveyor  
 JHEISER@DPKCONSULTING.NET

date 09/15/2023  
 N.J. Lic: 24GS04331100  
 PA. Lic: SU075616  
 N.Y. Lic: 050932-1  
 CT. Lic: 70476  
 DE. Lic: S6-0010858


- Sediment Thickness Samples (ft)
- Lake Extent
- Elevation (ft)**
  - Major
  - Minor
- Sediment Thickness (ft)**
  - 0.0 to 0.5
  - 0.5 to 1.0
  - 1.0 to 1.5
  - 1.5 to 2.0
  - 2.0 to 2.5
  - 2.5 to 3.0
  - 3.0 to 3.5
  - 3.5 to 4.0

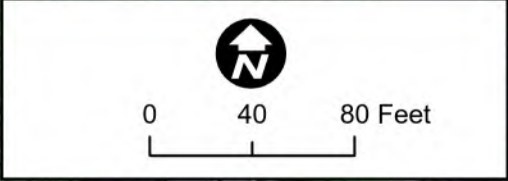
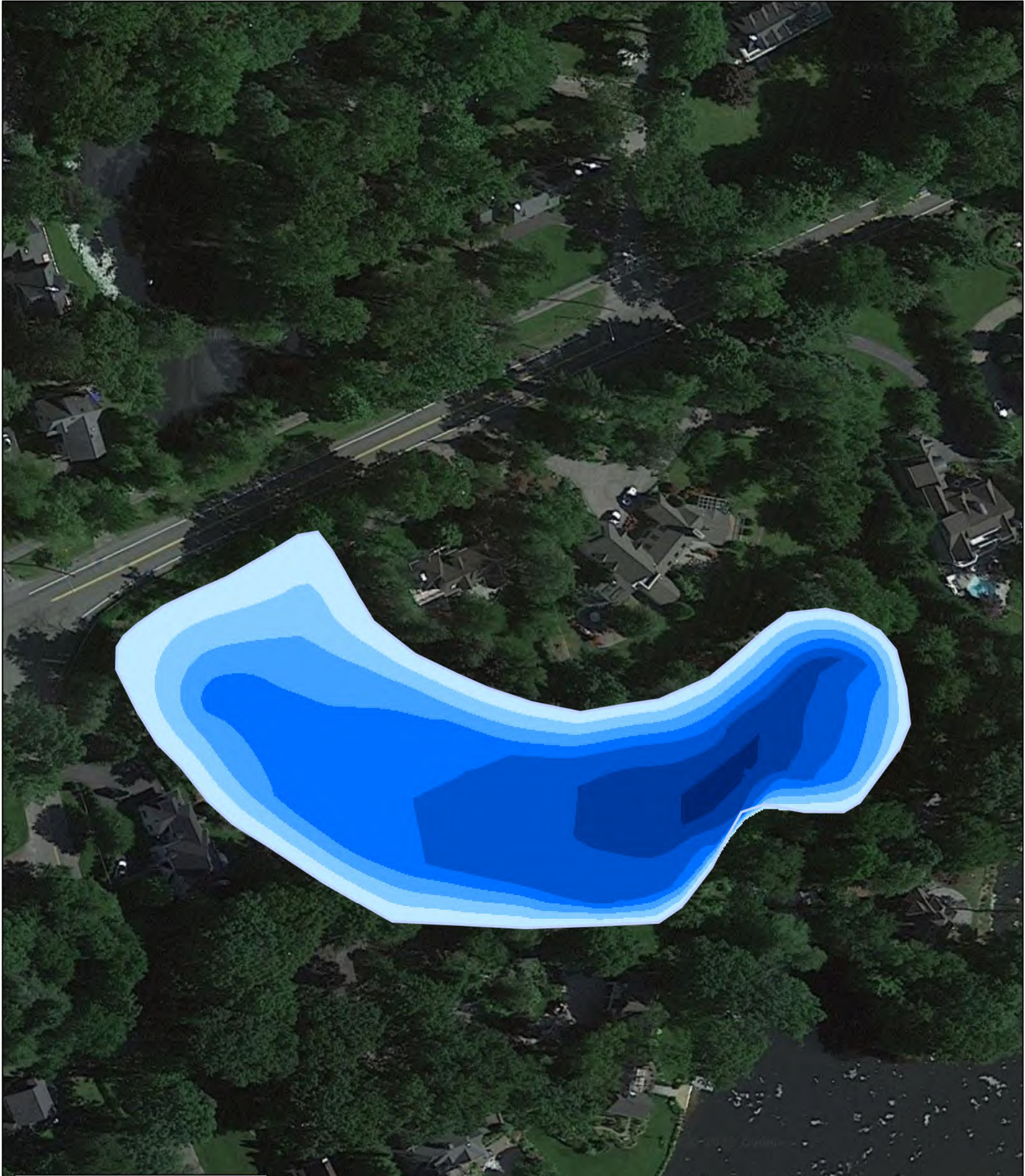
Mountain Lakes - Cove Lake  
 Sediment Thickness



Copyright © 2023 The Mapping Network, LLC. All rights reserved. Reasonable efforts have been made to verify that this map accurately interprets the source data used in its preparation, however, a degree of error is inherent in all maps, and this map may contain omissions and errors in scale, resolution, rectification, positional accuracy, development methodology, interpretation of source data, and other circumstances. The Mapping Network, LLC MAKES NO WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. The Mapping Network, LLC SHALL NOT BE LIABLE TO ANY PERSON UNDER ANY LEGAL OR EQUITABLE THEORY FOR DAMAGES ARISING OUT OF THE USE OF THIS MAP, INCLUDING, WITHOUT LIMITATION, FOR DIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES. This map is date specific and is intended for use only at the published scale. Nothing in this map implies the right to use private property, which may lie within or be bounded by the waters shown on this map. Do not use this map for marine navigation, swimming, diving, or other related activities, as it does not depict all information necessary to perform these functions safely.

**GRUNDEN'S POND RESULTS**

Area:	2.4 Acres
Water Level/Elevation:	Full Pool / 504.8 NAVD88
Max Depth:	6.4 Feet
Mean Depth:	2.9 Feet
Volume (Holding Capacity):	2,346,726 gallons / 7.2 acre-feet
Estimated Sediment Volume:	6,596 cubic yards- wet unconsolidated sediment
Mean Sediment Thickness:	1.7 Feet
Lake Composition:	64% Water / 36% unconsolidated sediment
Surveyor Notes:	<ul style="list-style-type: none"> <li>An abundance of various types of aquatic vegetation interfered with sonar. Manual measurements were utilized in this area to best determine water depth.</li> </ul> 



**Pond Information:**  
 Area: 2.4 acres  
 Max Depth: -6.4 ft  
 Mean Depth: -2.9 ft  
 Volume: 2,346,726 gallons / 7.2 acre-ft

**Mapping Information:**  
 Data Collection Performed: 06/15/2023  
 GPS: Mapping Grade (sub-foot accuracy)  
 Points Collected: 11,355  
 Water Level: Full Pool  
 Pool Elevation: 504.77' NAVD88



**DPK  
CONSULTING**

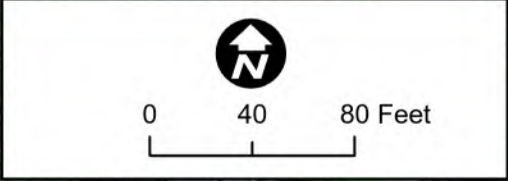
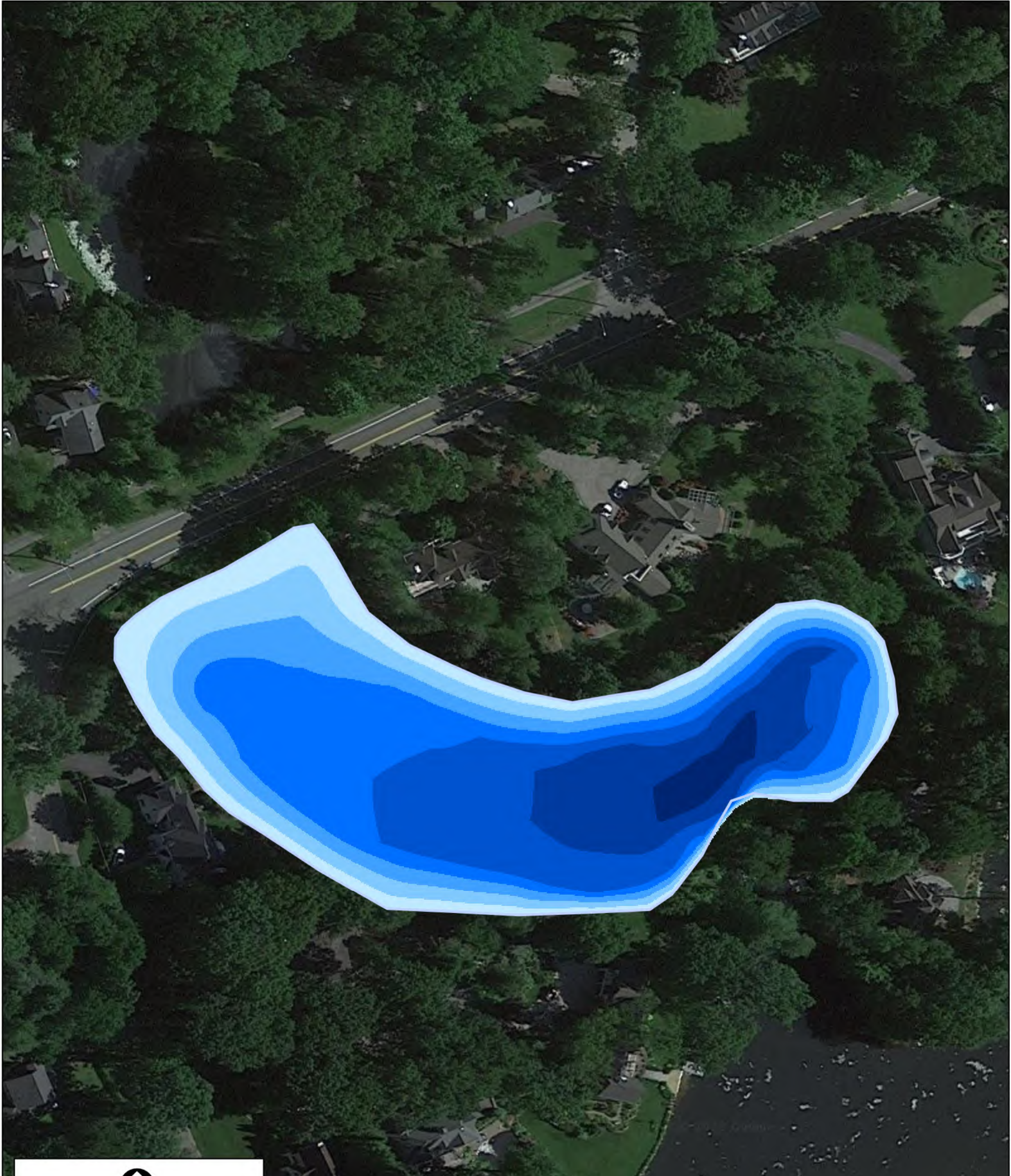
DPK CONSULTING, LLC  
 200 METROPLEX DRIVE - STE. 285, EDISON, NJ 08817  
 P: 732-764-0100 F: 732-764-0990  
 NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. 24GA28042200

date 09/15/2023

**James J. Heiser**  
 Professional Land Surveyor  
 JHEISER@DPKCONSULTING.NET

N.J. Lic: 24GS04331100  
 PA. Lic: SU075616  
 N.Y. Lic: 050932-1  
 CT. Lic: 70476  
 DE. Lic: S6-0010858

Copyright © 2023 The Mapping Network, LLC. All rights reserved. Reasonable efforts have been made to verify that this map accurately interprets the source data used in its preparation, however, a degree of error is inherent in all maps, and this map may contain omissions and errors in scale, resolution, rectification, positional accuracy, development methodology, interpretation of source data, and other circumstances. The Mapping Network, LLC MAKES NO WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. The Mapping Network, LLC SHALL NOT BE LIABLE TO ANY PERSON UNDER ANY LEGAL OR EQUITABLE THEORY FOR DAMAGES ARISING OUT OF THE USE OF THIS MAP, INCLUDING, WITHOUT LIMITATION, FOR DIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES. This map is date specific and is intended for use only at the published scale. Nothing in this map implies the right to use private property, which may lie within or be bounded by the waters shown on this map. Do not use this map for marine navigation, swimming, diving, or other related activities, as it does not depict all information necessary to perform these functions safely.



**Pond Information:**  
 Area: 2.4 acres  
 Max Depth: -6.4 ft  
 Mean Depth: -2.9 ft  
 Volume: 2,346,726 gallons / 7.2 acre-ft

**Mapping Information:**  
 Data Collection Performed: 06/15/2023  
 GPS: Mapping Grade (sub-foot accuracy)  
 Points Collected: 11,355  
 Water Level: Full Pool  
 Pool Elevation: 504.77' NAVD88



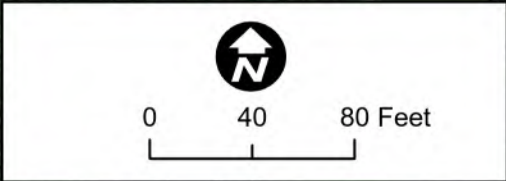
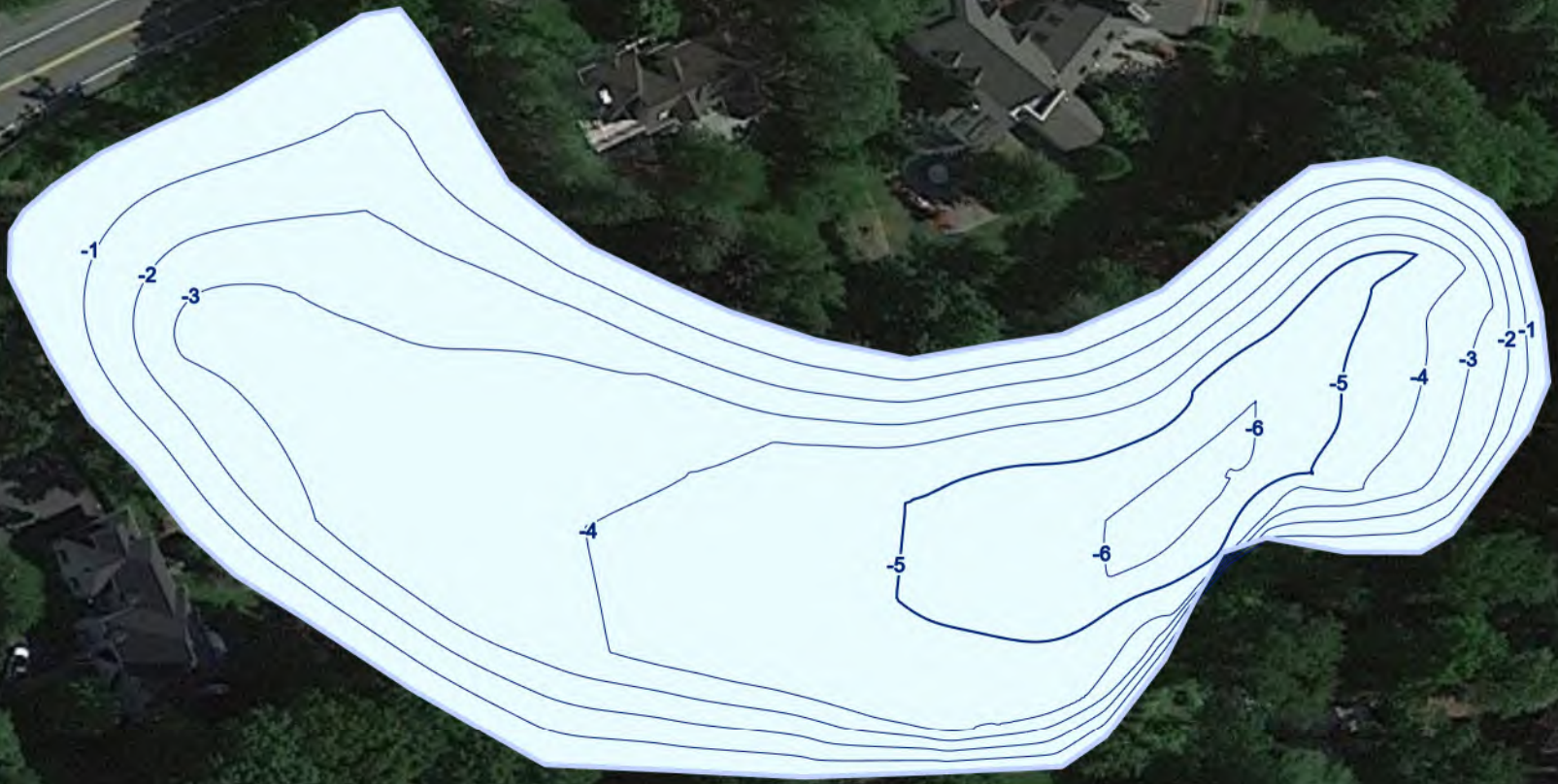
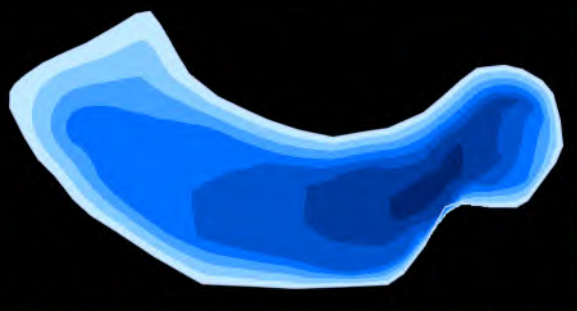
**DPK CONSULTING**  
 DPK CONSULTING, LLC  
 200 METROPLEX DRIVE - STE. 285, EDISON, NJ 08817  
 P: 732-764-0100 F: 732-764-0990  
 NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. 24GA28042200

date 09/15/2023

**James J. Heiser**  
 Professional Land Surveyor  
 JHEISER@DPKCONSULTING.NET

N.J. Lic: 24GS04331100  
 PA. Lic: SU075616  
 N.Y. Lic: 050932-1  
 CT. Lic: 70476  
 DE. Lic: S6-0010858

Copyright © 2023 The Mapping Network, LLC. All rights reserved. Reasonable efforts have been made to verify that this map accurately interprets the source data used in its preparation, however, a degree of error is inherent in all maps, and this map may contain omissions and errors in scale, resolution, rectification, positional accuracy, development methodology, interpretation of source data, and other circumstances. The Mapping Network, LLC MAKES NO WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. The Mapping Network, LLC SHALL NOT BE LIABLE TO ANY PERSON UNDER ANY LEGAL OR EQUITABLE THEORY FOR DAMAGES ARISING OUT OF THE USE OF THIS MAP, INCLUDING, WITHOUT LIMITATION, FOR DIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES. This map is date specific and is intended for use only at the published scale. Nothing in this map implies the right to use private property, which may lie within or be bounded by the waters shown on this map. Do not use this map for marine navigation, swimming, diving, or other related activities, as it does not depict all information necessary to perform these functions safely.



**Pond Information:**  
 Area: 2.4 acres  
 Max Depth: -6.4 ft  
 Mean Depth: -2.9 ft  
 Volume: 2,346,726 gallons / 7.2 acre-ft

**Mapping Information:**  
 Data Collection Performed: 06/15/2023  
 GPS: Mapping Grade (sub-foot accuracy)  
 Points Collected: 11,355  
 Water Level: Full Pool  
 Pool Elevation: 504.77' NAVD88




**DPK CONSULTING**  
 DPK CONSULTING, LLC  
 200 METROPLEX DRIVE - STE. 285, EDISON, NJ 08817  
 P: 732-764-0100 F: 732-764-0990  
 NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. 24GA28042200

date 09/15/2023

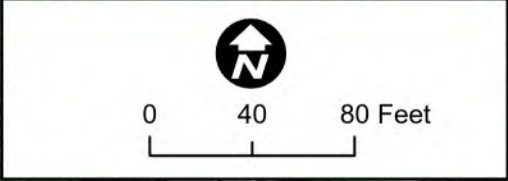
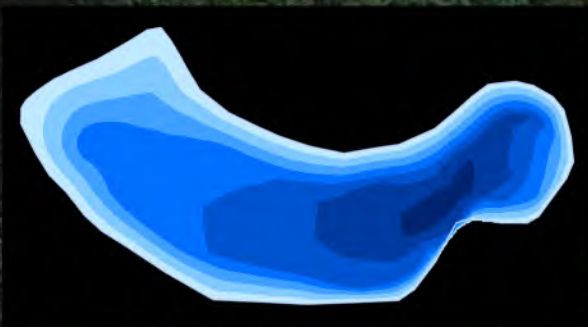
**James J. Heiser**  
 Professional Land Surveyor  
 JHEISER@DPKCONSULTING.NET

N.J. Lic: 24GS04331100  
 PA. Lic: SU075616  
 N.Y. Lic: 050932-1  
 CT. Lic: 70476  
 DE. Lic: S6-0010858

**Mountain Lakes - Grunden's Pond  
 Contours - Depth**



Copyright © 2023 The Mapping Network, LLC. All rights reserved. Reasonable efforts have been made to verify that this map accurately interprets the source data used in its preparation, however, a degree of error is inherent in all maps, and this map may contain omissions and errors in scale, resolution, rectification, positional accuracy, development methodology, interpretation of source data, and other circumstances. The Mapping Network, LLC MAKES NO WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. The Mapping Network, LLC SHALL NOT BE LIABLE TO ANY PERSON UNDER ANY LEGAL OR EQUITABLE THEORY FOR DAMAGES ARISING OUT OF THE USE OF THIS MAP, INCLUDING, WITHOUT LIMITATION, FOR DIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES. This map is date specific and is intended for use only at the published scale. Nothing in this map implies the right to use private property, which may lie within or be bounded by the waters shown on this map. Do not use this map for marine navigation, swimming, diving, or other related activities, as it does not depict all information necessary to perform these functions safely.



**Pond Information:**  
 Area: 2.4 acres  
 Max Depth: -6.4 ft  
 Mean Depth: -2.9 ft  
 Volume: 2,346,726 gallons / 7.2 acre-ft

**Mapping Information:**  
 Data Collection Performed: 06/15/2023  
 GPS: Mapping Grade (sub-foot accuracy)  
 Points Collected: 11,355  
 Water Level: Full Pool  
 Pool Elevation: 504.77' NAVD88



**DPK  
CONSULTING**


DPK CONSULTING, LLC  
 200 METROPLEX DRIVE - STE. 285, EDISON, NJ 08817  
 P: 732-764-0100 F: 732-764-0990  
 NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. 24GA28042200

date 09/15/2023

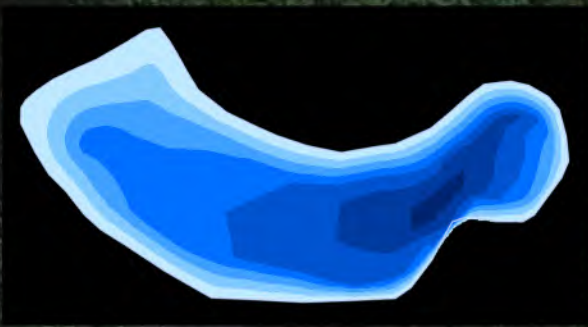
**James J. Heiser**  
 Professional Land Surveyor  
 JHEISER@DPKCONSULTING.NET

N.J. Lic: 24GS04331100  
 PA. Lic: SU075616  
 N.Y. Lic: 050932-1  
 CT. Lic: 70476  
 DE. Lic: S6-0010858

**Mountain Lakes - Grunden's Pond  
Contours - Elevation**



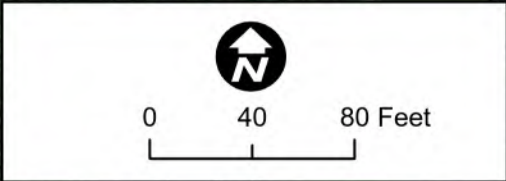
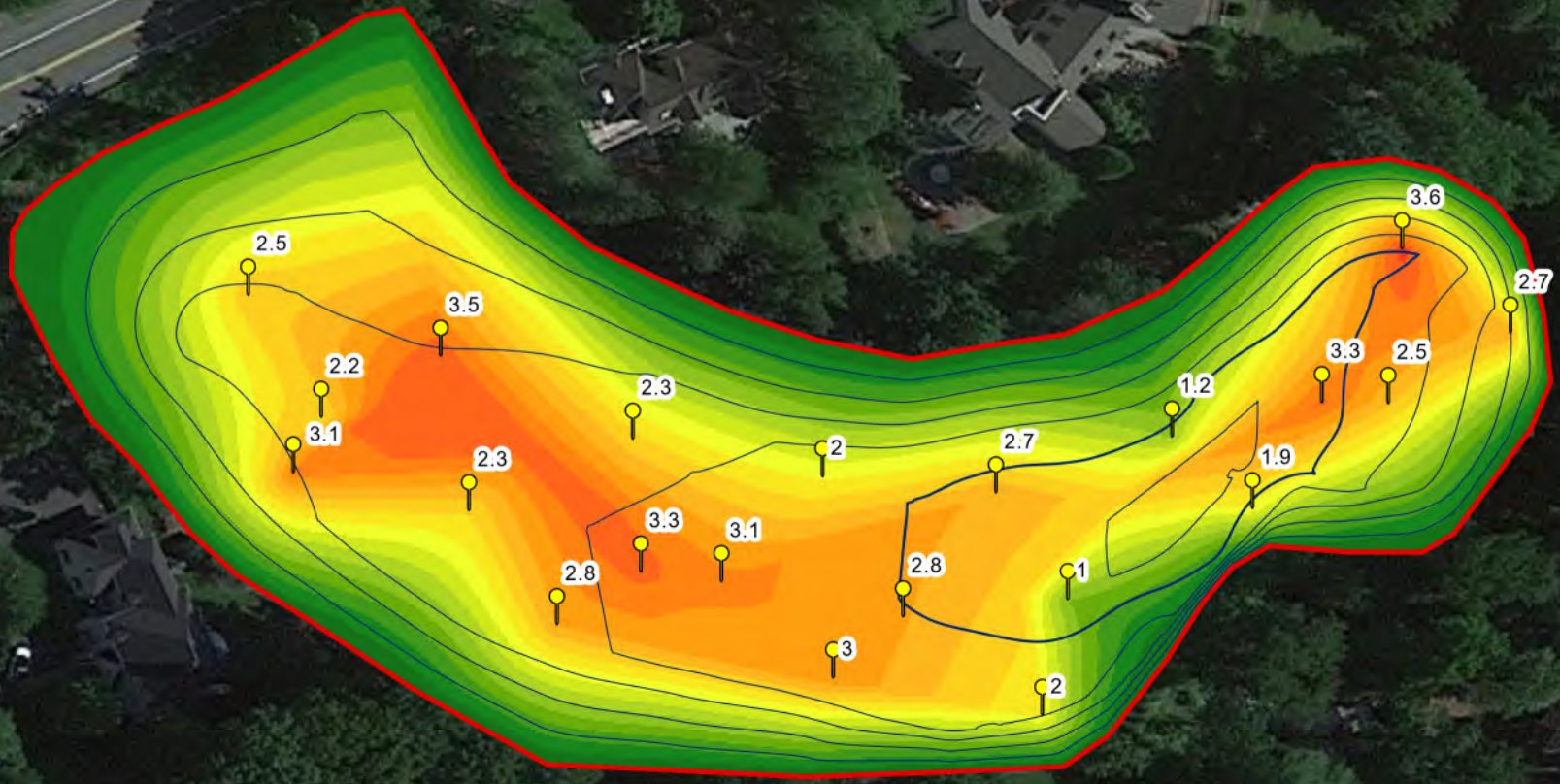
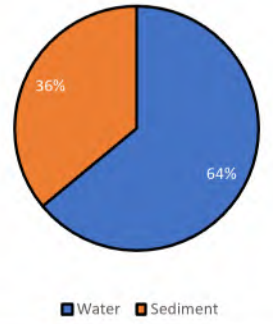
Copyright © 2023 The Mapping Network, LLC. All rights reserved. Reasonable efforts have been made to verify that this map accurately interprets the source data used in its preparation, however, a degree of error is inherent in all maps, and this map may contain omissions and errors in scale, resolution, rectification, positional accuracy, development methodology, interpretation of source data, and other circumstances. The Mapping Network, LLC MAKES NO WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. The Mapping Network, LLC SHALL NOT BE LIABLE TO ANY PERSON UNDER ANY LEGAL OR EQUITABLE THEORY FOR DAMAGES ARISING OUT OF THE USE OF THIS MAP, INCLUDING, WITHOUT LIMITATION, FOR DIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES. This map is date specific and is intended for use only at the published scale. Nothing in this map implies the right to use private property, which may lie within or be bounded by the waters shown on this map. Do not use this map for marine navigation, swimming, diving, or other related activities, as it does not depict all information necessary to perform these functions safely.



Estimated Sediment Volume: 6,595.8 yards<sup>3</sup>  
 Mean Sediment Thickness: 1.67 ft

Notes:  
 -The purpose of this study is to provide an estimated amount of soft sediment  
 -Sediment volume calculations based on computer model generated from 21 measurements collected in the field.  
 -Areas of rock and impermeable surfaces may affect the estimated total volume of removable sediment.  
 -Shrinkage not included in calculations  
 -The information collected for this project represents the current existing conditions on the date indicated and can only be considered as indicating conditions at the time.

Pond Composition



**Pond Information:**  
 Area: 2.4 acres  
 Max Depth: -6.4 ft  
 Mean Depth: -2.9 ft  
 Volume: 2,346,726 gallons / 7.2 acre-ft

**Mapping Information:**  
 Data Collection Performed: 06/15/2023  
 GPS: Mapping Grade (sub-foot accuracy)  
 Points Collected: 11,355  
 Water Level: Full Pool  
 Pool Elevation: 504.77' NAVD88

**DPK CONSULTING**  
 DPK CONSULTING, LLC  
 200 METROPLEX DRIVE - STE. 285, EDISON, NJ 08817  
 P: 732-764-0100 F: 732-764-0990  
 NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. 24GA28042200

date 09/15/2023

**James J. Heiser**  
 Professional Land Surveyor  
 JHEISER@DPKCONSULTING.NET

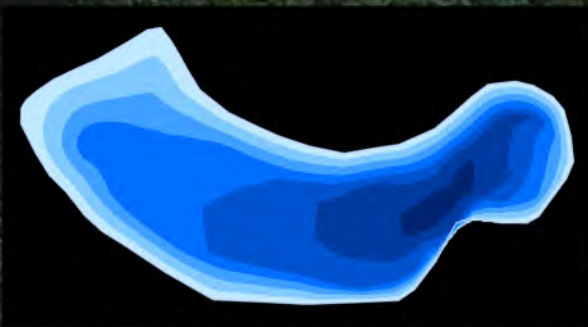
N.J. Lic: 24GS04331100  
 PA. Lic: SU075616  
 N.Y. Lic: 050932-1  
 CT. Lic: 70476  
 DE. Lic: S6-0010858

- Sediment Thickness Samples (ft)
- Pond Extent
- Water Depth (ft)**
  - Major
  - Minor
- Sediment Thickness (ft)**
  - 0.00 to 0.25
  - 0.25 to 0.50
  - 0.50 to 0.75
  - 0.75 to 1.00
  - 1.00 to 1.25
  - 1.25 to 1.50
  - 1.50 to 1.75
  - 1.75 to 2.00
  - 2.00 to 2.25
  - 2.25 to 2.50
  - 2.50 to 2.75
  - 2.75 to 3.00
  - 3.00 to 3.25
  - 3.25 to 3.50
  - 3.50 to 3.75

Mountain Lakes - Grunden's Pond  
 Sediment Thickness

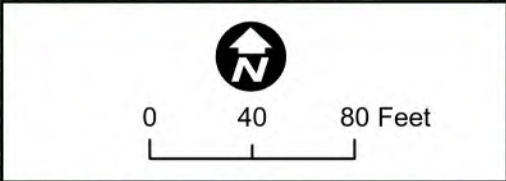
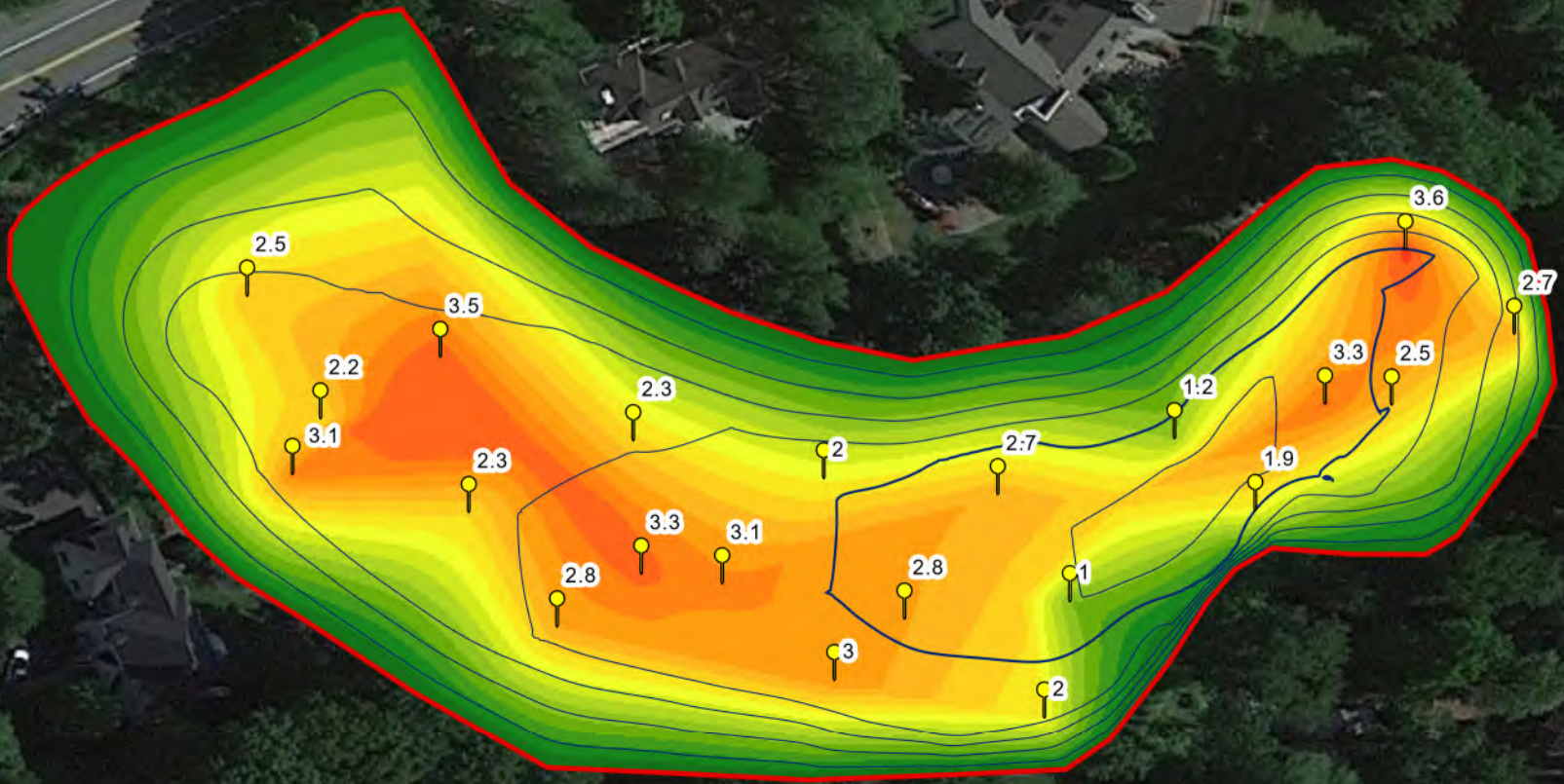
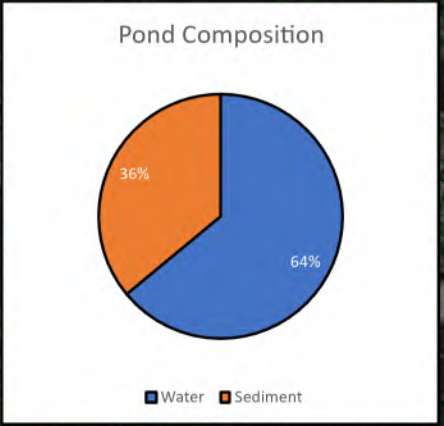


Copyright © 2023 The Mapping Network, LLC. All rights reserved. Reasonable efforts have been made to verify that this map accurately interprets the source data used in its preparation, however, a degree of error is inherent in all maps, and this map may contain omissions and errors in scale, resolution, rectification, positional accuracy, development methodology, interpretation of source data, and other circumstances. The Mapping Network, LLC MAKES NO WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. The Mapping Network, LLC SHALL NOT BE LIABLE TO ANY PERSON UNDER ANY LEGAL OR EQUITABLE THEORY FOR DAMAGES ARISING OUT OF THE USE OF THIS MAP, INCLUDING, WITHOUT LIMITATION, FOR DIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES. This map is date specific and is intended for use only at the published scale. Nothing in this map implies the right to use private property, which may lie within or be bounded by the waters shown on this map. Do not use this map for marine navigation, swimming, diving, or other related activities, as it does not depict all information necessary to perform these functions safely.



Estimated Sediment Volume: 6,595.8 yards<sup>3</sup>  
 Mean Sediment Thickness: 1.67 ft

Notes:  
 -The purpose of this study is to provide an estimated amount of soft sediment  
 -Sediment volume calculations based on computer model generated from 21 measurements collected in the field.  
 -Areas of rock and impermeable surfaces may affect the estimated total volume of removable sediment.  
 -Shrinkage not included in calculations  
 -The information collected for this project represents the current existing conditions on the date indicated and can only be considered as indicating conditions at the time.



**Pond Information:**  
 Area: 2.4 acres  
 Max Depth: -6.4 ft  
 Mean Depth: -2.9 ft  
 Volume: 2,346,726 gallons / 7.2 acre-ft

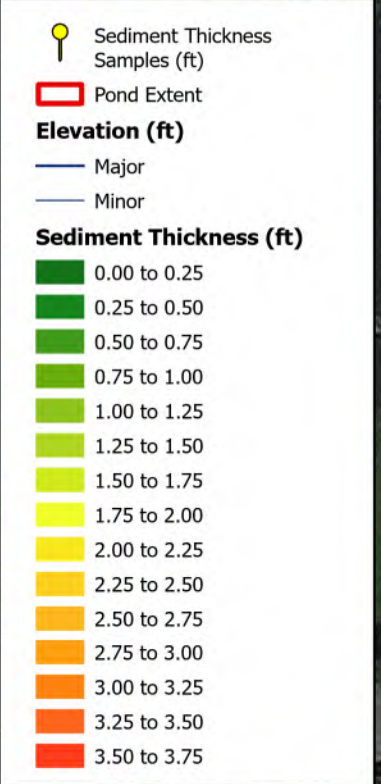
**Mapping Information:**  
 Data Collection Performed: 06/15/2023  
 GPS: Mapping Grade (sub-foot accuracy)  
 Points Collected: 11,355  
 Water Level: Full Pool  
 Pool Elevation: 504.77' NAVD88

**DPK CONSULTING**  
 DPK CONSULTING, LLC  
 200 METROPLEX DRIVE - STE. 285, EDISON, NJ 08817  
 P: 732-764-0100 F: 732-764-0990  
 NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. 24GA28042200

date 09/15/2023

**James J. Heiser**  
 Professional Land Surveyor  
 JHEISER@DPKCONSULTING.NET

N.J. Lic: 24GS04331100  
 PA. Lic: SU075616  
 N.Y. Lic: 050932-1  
 CT. Lic: 70476  
 DE. Lic: S6-0010858



Mountain Lakes - Grunden's Pond  
 Sediment Thickness



Copyright © 2023 The Mapping Network, LLC. All rights reserved. Reasonable efforts have been made to verify that this map accurately interprets the source data used in its preparation, however, a degree of error is inherent in all maps, and this map may contain omissions and errors in scale, resolution, rectification, positional accuracy, development methodology, interpretation of source data, and other circumstances. The Mapping Network, LLC MAKES NO WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. The Mapping Network, LLC SHALL NOT BE LIABLE TO ANY PERSON UNDER ANY LEGAL OR EQUITABLE THEORY FOR DAMAGES ARISING OUT OF THE USE OF THIS MAP, INCLUDING, WITHOUT LIMITATION, FOR DIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES. This map is date specific and is intended for use only at the published scale. Nothing in this map implies the right to use private property, which may lie within or be bounded by the waters shown on this map. Do not use this map for marine navigation, swimming, diving, or other related activities, as it does not depict all information necessary to perform these functions safely.