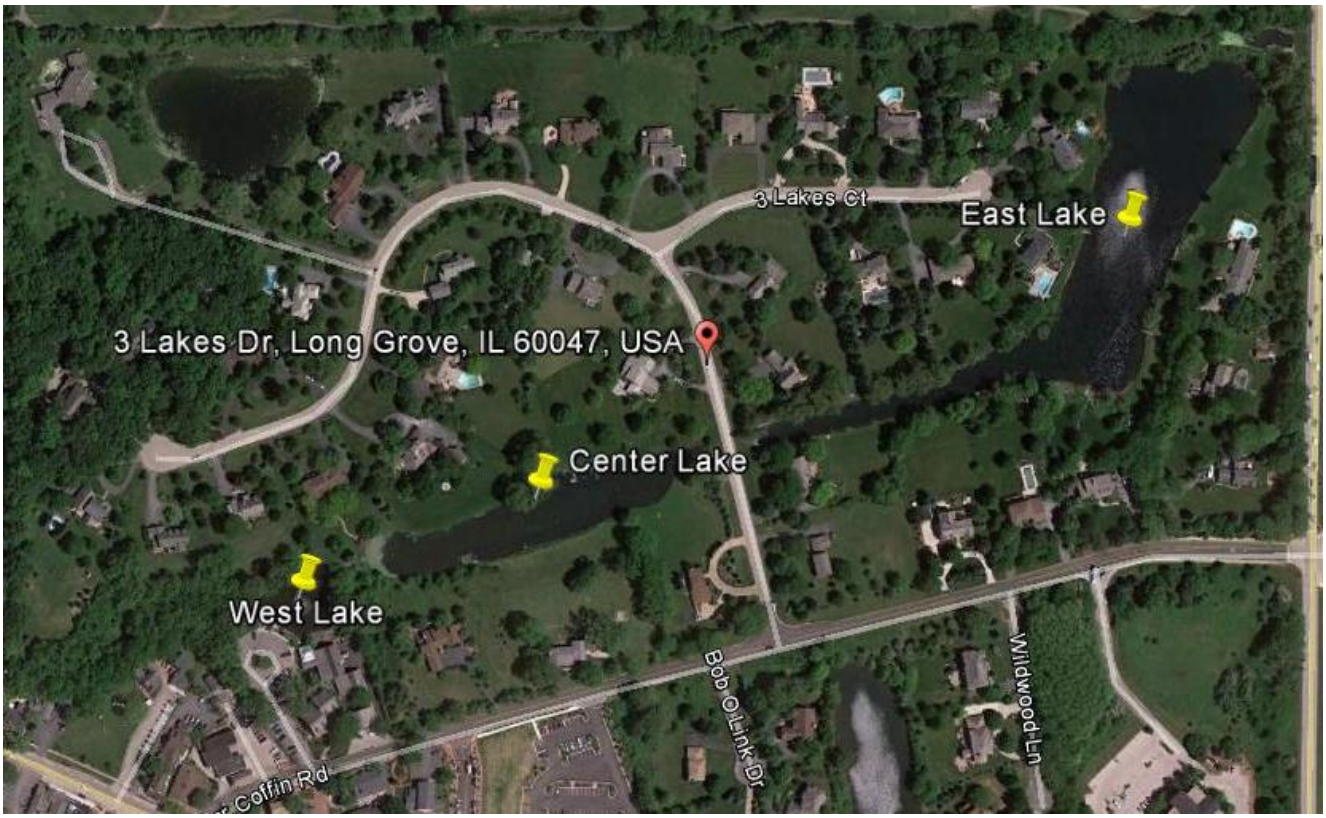
3 Lakes Drive
Long Grove, IL

SEDIMENT PROBING REPORT
May 2, 2013



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Integrated Lakes Management, Inc.
Lake and Pond Management
Restoration ▪ Consulting

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SEDIMENT PROBING REPORT
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INTRODUCTION

Ponds typically accumulate sediment and nutrients, and often support nuisance aquatic weed and algae growth, especially as they age. This report includes mapping of three small lakes for sediment thickness, water depth, and total depths, physical characterization of the type of sediment and a brief investigation as to the source of sediment.

The three areas investigated are shown on the cover page as East Lake, Center Lake and West Lake.

RESULTS

Table 1: Bathymetric and Sediment Probing Results:

	East Lake	Center Lake	West Lake
Size of Lake(acres)	4.7	1.7	0.5
Average water depth (ft.)*	4.9	3.4	6.2
Maximum water depth:	7.6	5.9	9.5
Average sediment thickness (ft.)**	0.9	2.4	2.2
Maximum sediment thickness (ft.)	3.7	5.0	5.2
Sediment volume (cubic yards)***	6,950	6,500	1,775
Recommended sediment removal volume****	4,500	6,200	1,675

*Based on average of points probed.
** Based on average depth multiplied by area.
***Wet sediment volume, which is ~ 50% water. Once this material is removed and dried it should a smaller volume.
****Recommended sediment removal volumes are based on areas with one foot of sediment accumulation or more.

The results from each probe are listed at the end of this report.

OBSERVATIONS

- A major flood occurred two weeks prior to the site visit and one of the residents identified the debris line between the West and Center Lakes (Figure 11). Apparently the problem was that the outlet to the Center Lake was blocked. The water in all three lakes was slightly flowing at 0.1 – 0.3 feet of depth at the time of the site visit.
- Both the West and East Lakes do not have outlet culverts but have swales lined with plants and soil. These areas may be one source of sediment to the downstream areas.
- The West Lake shoreline was surrounded by rock. Two of the neighbors had major shoreline restoration projects completed using decorative rock a few weeks prior to the flood.
- Portions of the West Lake have natural shoreline. The remaining sections consist of mowed lawn and the restaurant parking lot. Shorelines for the Center and East Lake consist primarily of mowed lawn to the shoreline with no native plant buffer zone. Sections of these shorelines are eroded and contributing sediment to the lakes.
- No aquatic plants or algae were visible at the time of the site visit.
- The sediment in all three lakes consisted of organic rich muck.
- The Floodplain map (Figure 14) for these lakes does not show a major inflow, so most of the sediment within these ponds appears to be due to shoreline erosion and soil washing into the ponds from nearby properties.

Figure 1: View of East Lake from 3 Lakes Dr.

Figure 2: Shoreline erosion at East Lake.

Figure 3: View of main portion of East Lake.

Figure 4: Outlet channel for East Lake, near Rt. 83.

Figure 5: Inlet for East Lake on 3 Lakes Dr.

Figure 6: Center Lake facing west.

Figure 7: Shoreline erosion of Center Lake.

Figure 8: Shoreline erosion of Center Lake

Figure 9: Inlet for Center Lake.

Figure 10: Outlet for Center Lake. This outlet was plugged during the April flood event.

Figure 11: Debris line from recent flood between the West and Center Lakes.

Figure 12: West lake facing west.

Figure 13: West Lake facing south to the restaurant.

Figure 14: Floodplain map for the 3 Lakes area.

RECOMMENDATIONS

- The Center and West Lakes contain a significant amount of sediment that should be removed. Many of these areas have over two feet of sediment. The narrow channel of the East Lake also contains significant sediment deposits.
    - Estimated cost to remove sediment in the Center Lake is $124K ($20/cubic yards (CY)) - $279K ($45/CY) for 6,200 CY.
    - Estimated cost to remove sediment in the West Lake is $33.5K - $75K for 1,675 CY.
    - Estimated cost to remove sediment in the East Lake is $90K - $202K for 4,500 CY. This can be reduced if only the narrow portion is dredged.
    - These cost estimates include dredging and the sediment bags; they do not include moving the sediment to the final storage location. Permitting costs should be minimal if sediment disposal and muddy water can be kept onsite. This can be accomplished if the lake is lowered so that it is not flowing offsite at the time of dredging.

- The main source of sediment to the lakes appears to be shoreline erosion. Mowed lawn has very shallow root systems and provides little protection to the shoreline soils. It is recommended that a native plant buffer of at least 15 – 20 feet be installed around the shoreline of all of the lakes wherever possible.

- The outlets to the West Lake and the East Lake consist of swales that are cut channels. Typically pond outlets consist of culverts with grates that catch debris, or rock lined channels. The existing dirt channels may also be a source of sediment to downstream areas.

- This report is a good first step in determining which areas to dredge. The next step is for the community to determine their budget and priorities. Often a long-term fund is established for major projects such as dredging.
    - If dredging is to begin in the next two years then disposal areas should be determined and the permitting process should be started. Depending on the method utilized for dredging and the disposal location, permitting can be quite variable and early investigation into the requirements is recommended.

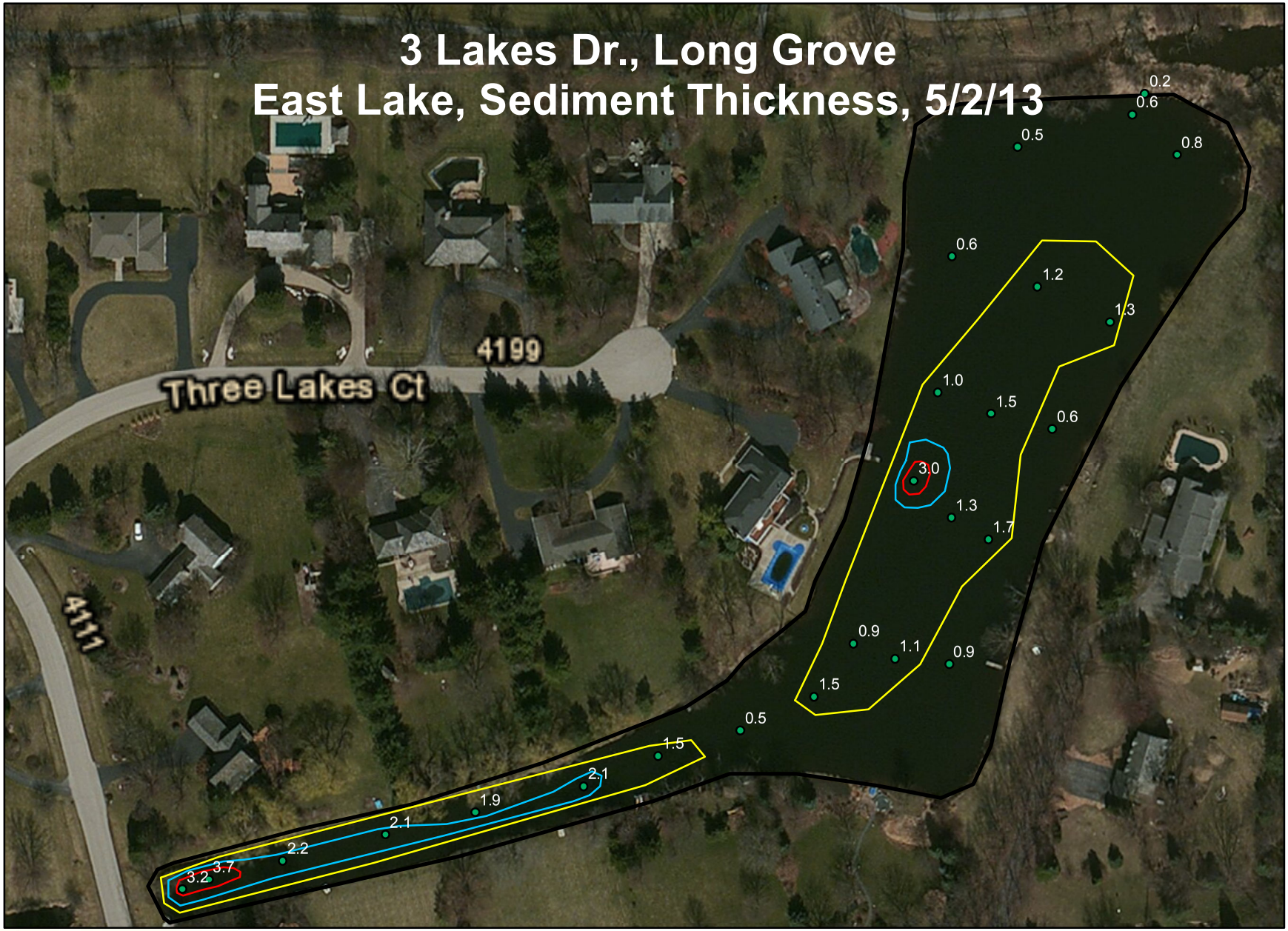
East Lake			
	Sediment	Water Depth	Total Depth
	feet	feet	feet
1	0.2	0.0	0.2
2	0.8	5.4	6.2
3	0.5	5.8	6.3
4	0.6	4.8	5.4
5	1.2	7.4	8.6
6	1.3	3.5	4.8
7	0.6	4.1	4.7
8	1.5	7.0	8.5
9	1.0	6.0	7.0
10	3.0	5.5	8.5
11	1.3	6.8	8.1
12	1.7	4.8	6.5
13	0.9	5.6	6.5
14	1.1	7.6	8.7
15	0.9	5.8	6.7
16	1.5	5.4	6.9
17	0.5	6.0	6.5
19	1.5	4.7	6.2
20	2.1	4.7	6.8
21	1.9	4.8	6.7
22	2.1	4.5	6.6
23	2.2	4.3	6.5
24	3.7	2.7	6.4
25	3.2	2.6	5.8
26	0.6	2.9	3.5
Average	1.4	4.9	6.3
Maximum	3.7	7.6	8.7

Center Lake

	Sediment	Water Depth	Total Depth
	feet	feet	feet
1	2.3	2.9	5.2
2	4.1	1.2	5.3
3	2.1	1.6	3.7
4	4.4	2.9	7.3
5	4.1	5.9	10.0
6	5.0	4.2	9.2
7	2.8	3.5	6.3
8	2.3	2.7	5.0
9	4.4	4.5	8.9
10	2.8	2.7	5.5
11	4.4	4.5	8.9
12	3.7	2.8	6.5
13	3.9	5.6	9.5
14	3.3	2.2	5.5
15	1.4	2.1	3.5
16	3.1	4.4	7.5
17	2.8	5.4	8.2
18	3.0	2.6	5.6
Average	3.3	3.4	6.8
Maximum	5.0	5.9	10.0

West Lake

	Sediment	Water Depth	Total Depth
	feet	feet	feet
1	2.8	5.5	8.3
2	3.3	4.8	8.1
3	5.2	4.8	10.0
4	4.4	5.2	9.6
5	2.9	7.9	10.8
6	1.5	9.5	11.0
7	2.6	6.2	8.8
8	2.8	5.7	8.5
9	3.8	6.2	10.0
Average	3.3	6.2	9.5
Maximum	5.2	9.5	11.0



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N

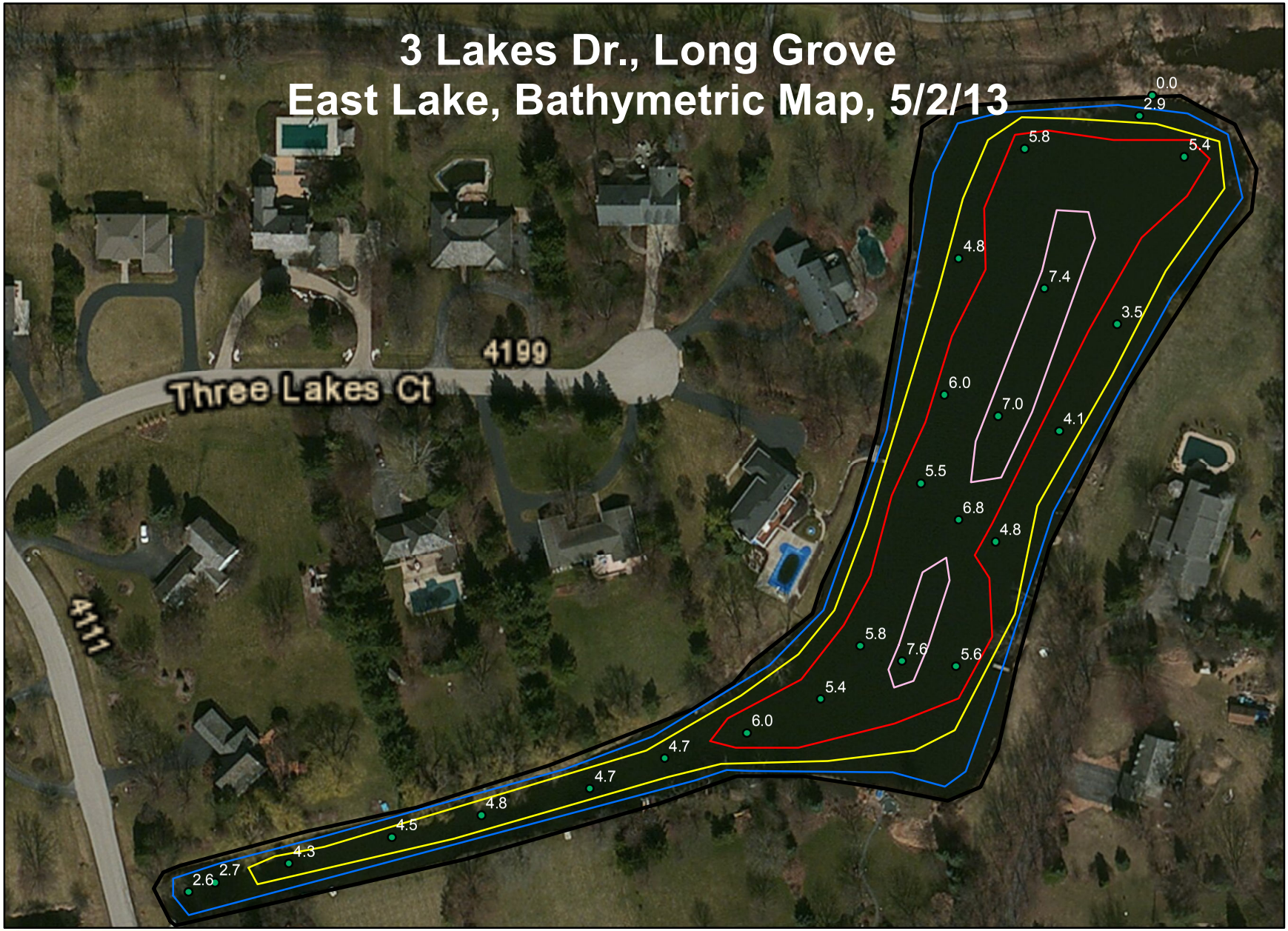
0 125 250 500 Feet

1 inch = 137 feet

Legend

- 1 ft sediment
- 2 ft sediment
- 3 ft sediment
- East lake shoreline
- EastLake

3 Lakes Dr., Long Grove
East Lake, Bathymetric Map, 5/2/13



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N

0 125 250 500 Feet

1 inch = 137 feet

Legend

- 1 ft
- 3 ft
- 5 ft
- 7 ft
- East lake shoreline
- EastLake

3 Lakes Dr., Long Grove
East Lake, Total Depth (Water + Sediment), 5/2/13

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N

0 125 250 500 Feet

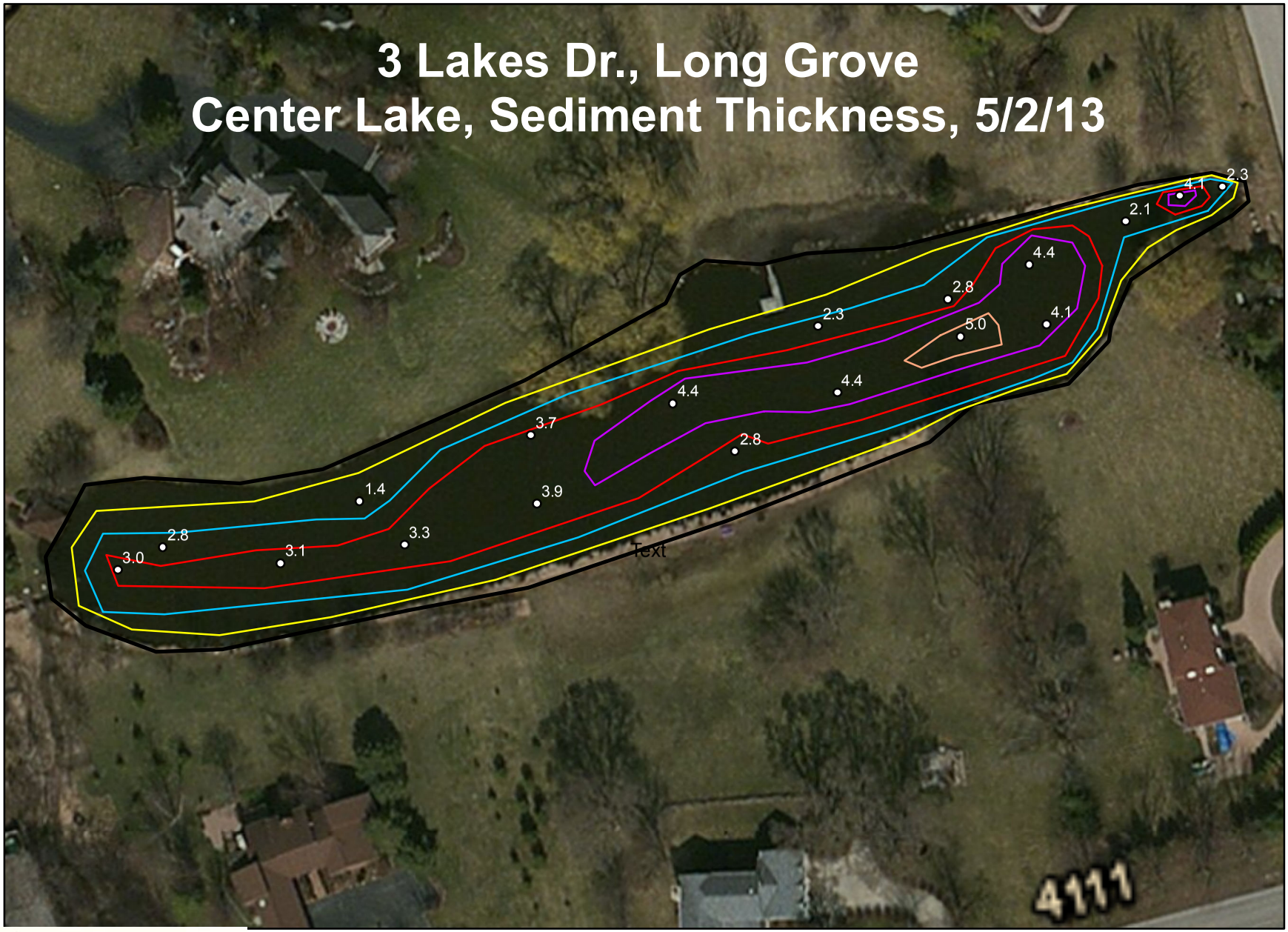
1 inch = 137 feet

Legend

East lake shoreline

EastLake

3 Lakes Dr., Long Grove
Center Lake, Sediment Thickness, 5/2/13



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N

0 75 150 300 Feet

1 inch = 83 feet

Legend

- 1 ft sediment
- 2 ft sediment
- 3 ft sediment
- 4 ft sediment
- 5 ft sediment
- Center lake shoreline
- CenterLake

3 Lakes Dr., Long Grove
Center Lake, Bathymetric Map, 5/2/13

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N

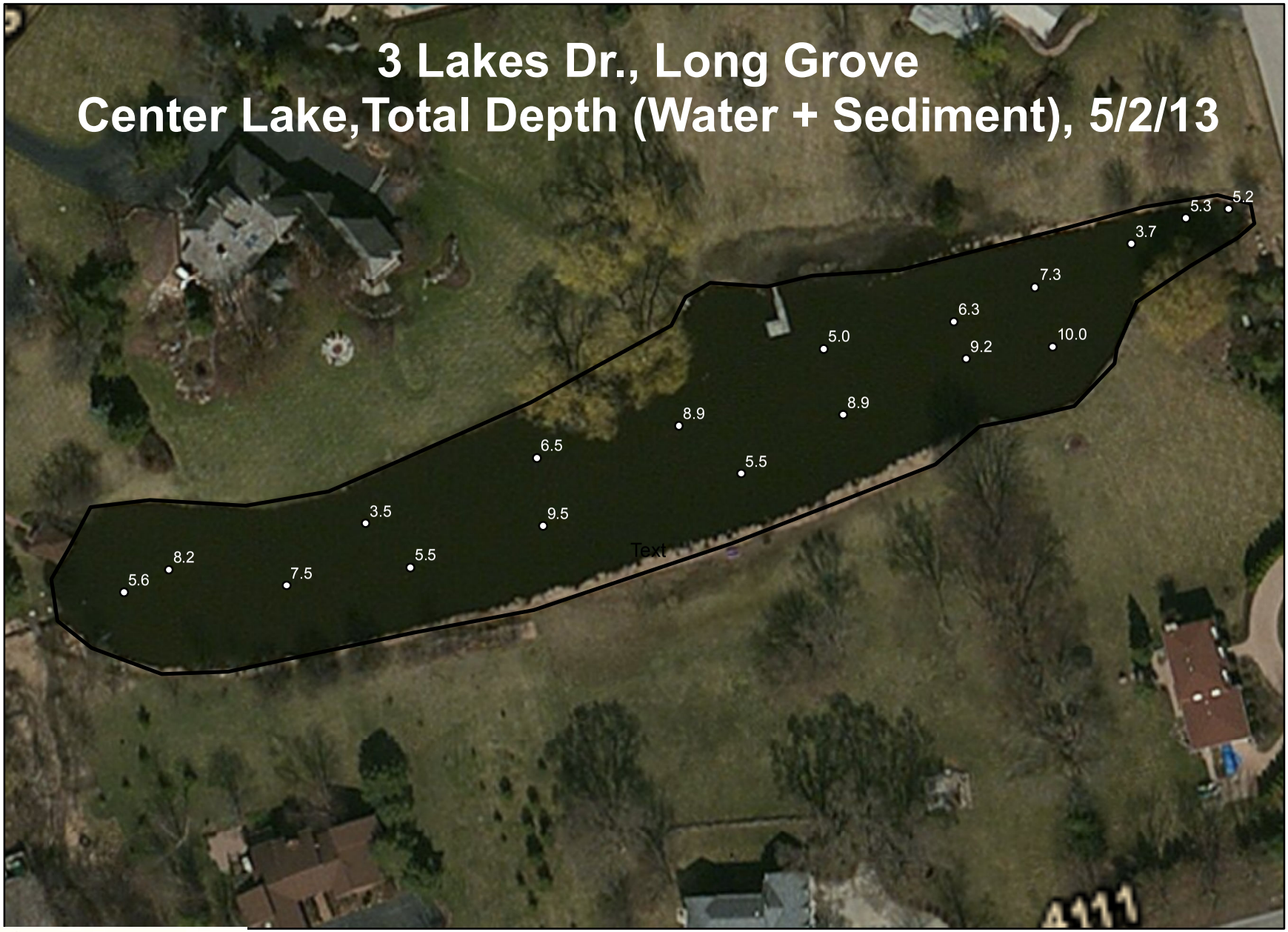
0 75 150 300 Feet

1 inch = 83 feet

Legend

- 1 ft
- 3 ft
- 5 ft
- Center lake shoreline
- CenterLake

3 Lakes Dr., Long Grove
Center Lake,Total Depth (Water + Sediment), 5/2/13



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N

0 75 150 300 Feet

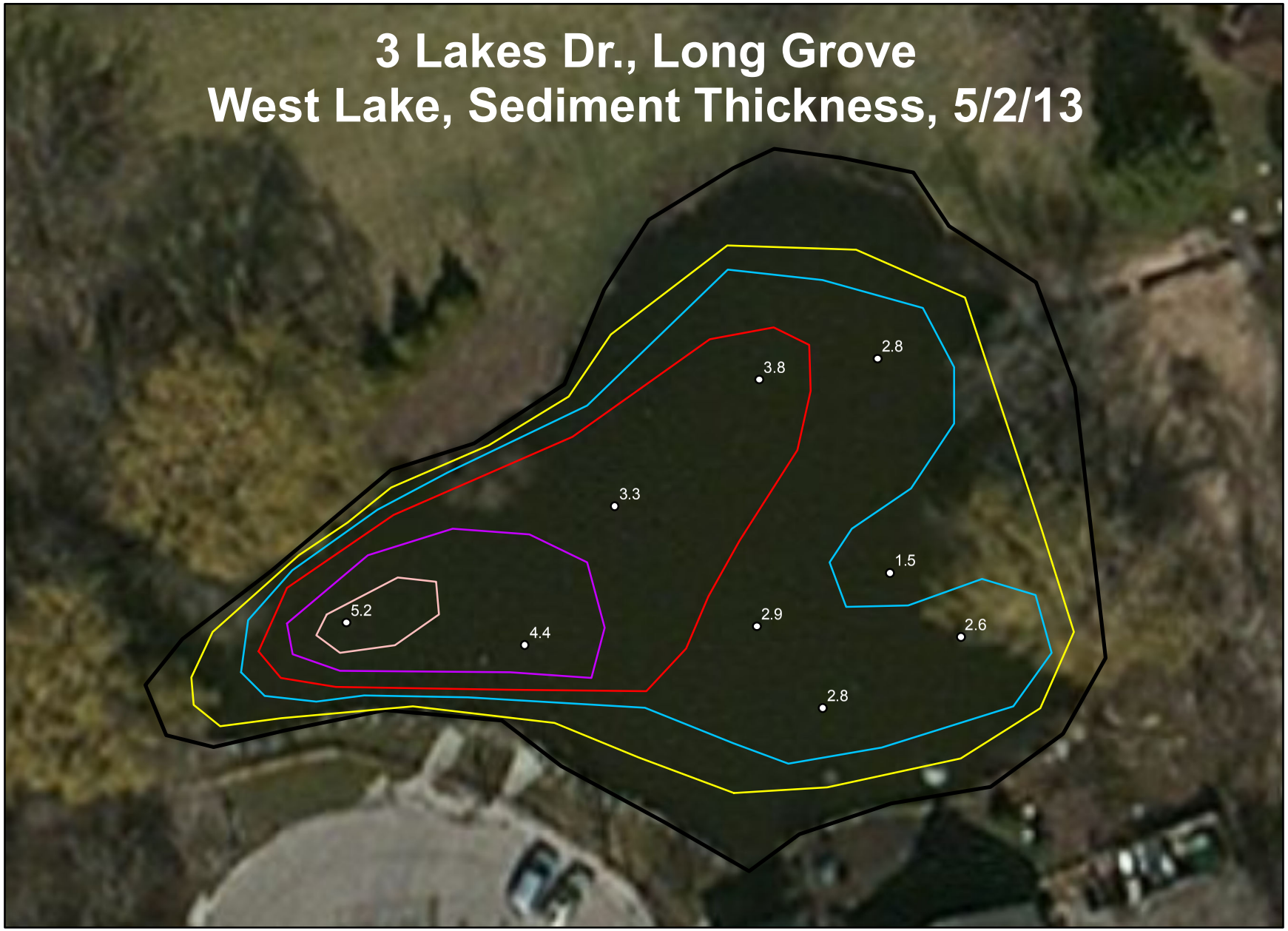
1 inch = 83 feet

Legend

Center lake shoreline

CenterLake

3 Lakes Dr., Long Grove
West Lake, Sediment Thickness, 5/2/13



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N

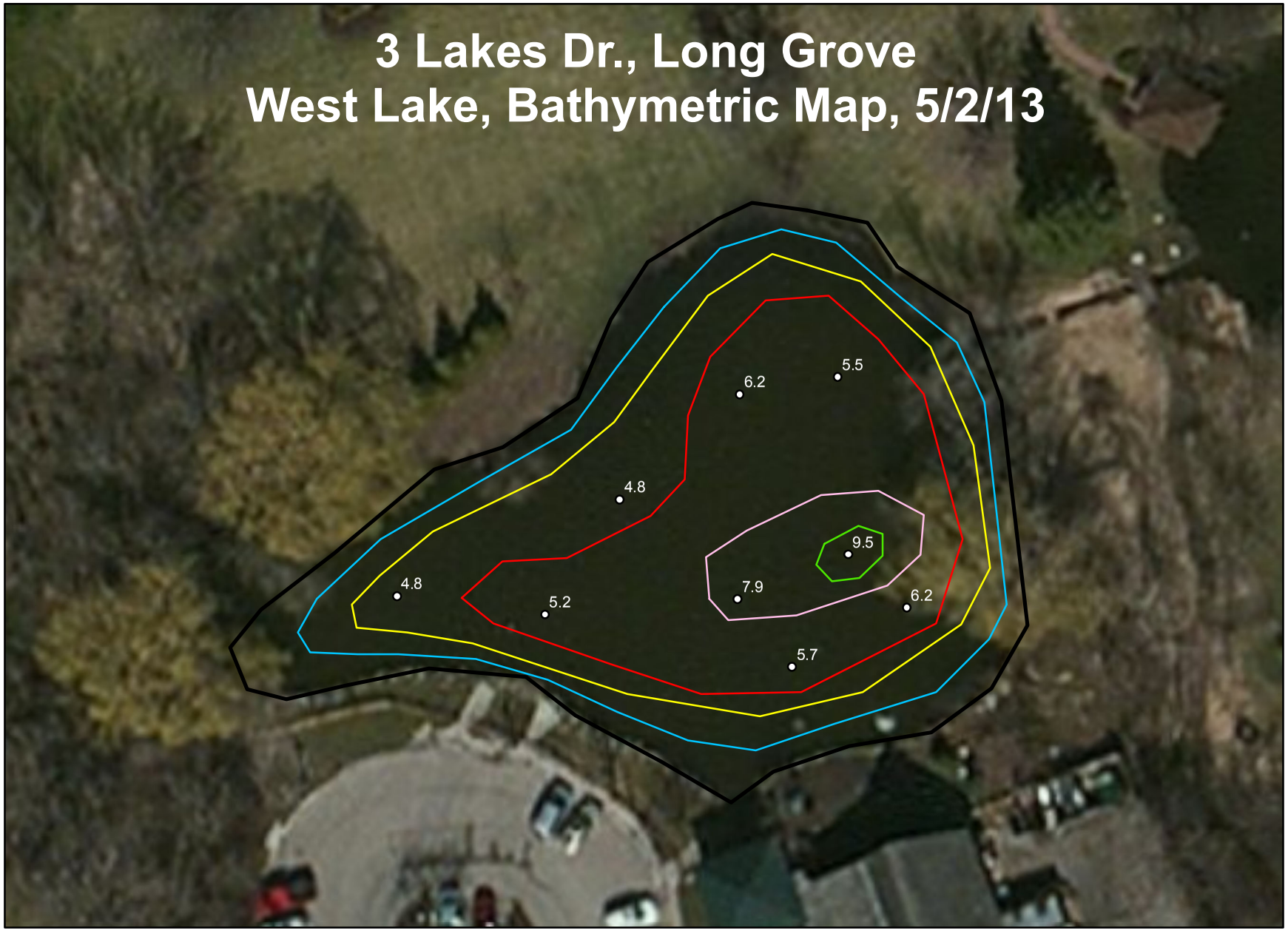
0 30 60 120 Feet

1 inch = 33 feet

Legend

- 1 ft sediment
- 2 ft sediment
- 3 ft sediment
- 4 ft sediment
- 5 ft sediment
- Shoreline
- WestLake

3 Lakes Dr., Long Grove
West Lake, Bathymetric Map, 5/2/13



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N

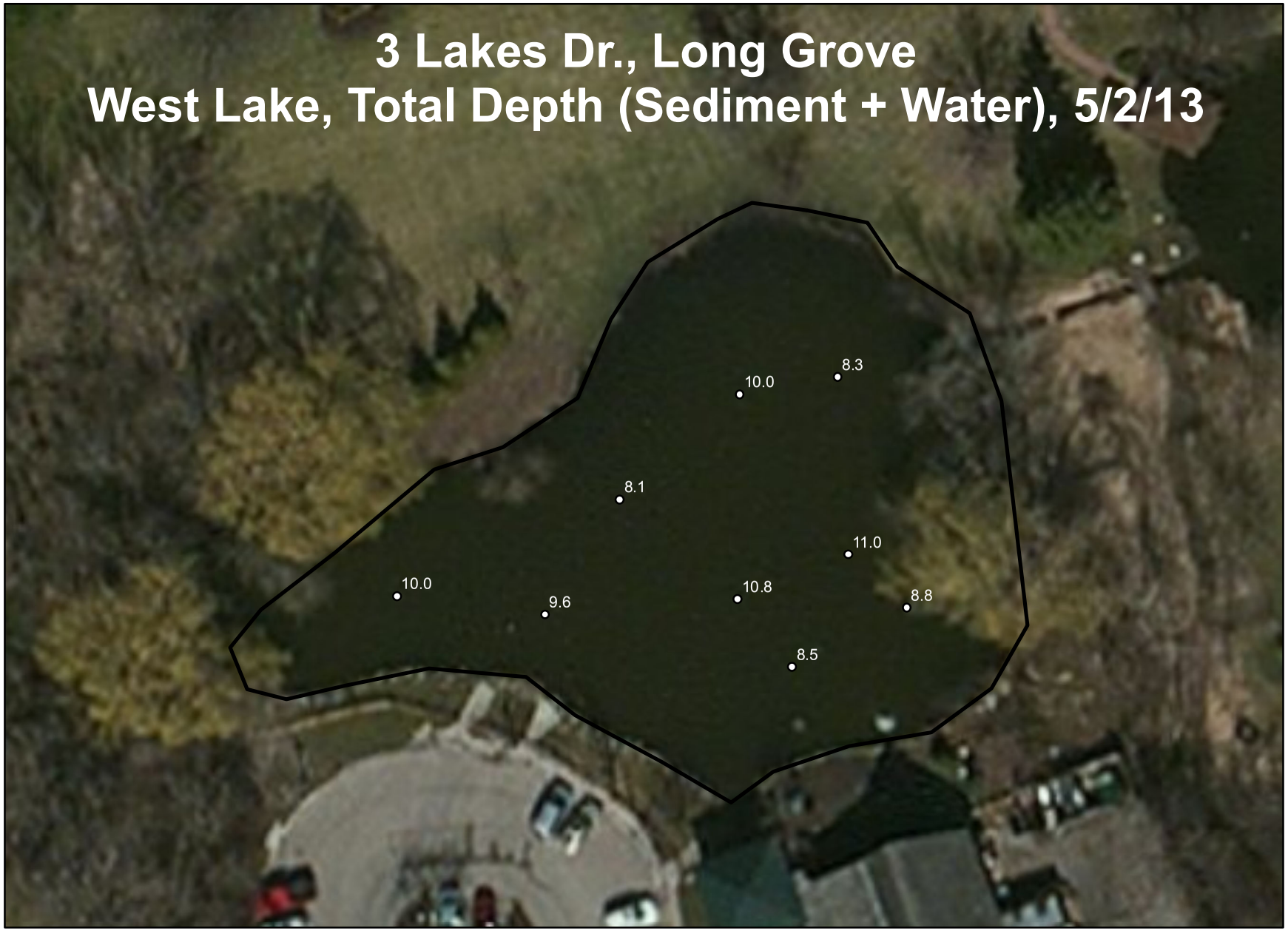
0 35 70 140 Feet

1 inch = 40 feet

Legend

- 1 ft
- 3 ft
- 5 ft
- 7 ft
- 9 ft
- Shoreline
- WestLake

3 Lakes Dr., Long Grove
West Lake, Total Depth (Sediment + Water), 5/2/13



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N

0 35 70 140 Feet

1 inch = 40 feet

Legend

Shoreline

WestLake