Otis Lake Water Level

Summary

Otis Lake was once part of an extensive system of wetlands and ponds. All but a small remnant of that wetland system has been eliminated, leaving Otis Lake susceptible to rising water levels. Over two decades ago, the Municipality installed a lake level control system to prevent the lake from rising to the point where it threatens nearby properties. However, this system has been suffering from a lack of maintenance and no longer functions – as reflected in excessive lake levels during the past several years of high precipitation. Appropriate maintenance work would restore the system to functionality and allow it to continue to fulfill its intended purpose of maintaining Otis Lake in a safe condition.

Slide 1

Location of Otis Lake: Princeton Way is on the west of Otis Lake, Stanford Drive on the north, Carlson Park on the northeast, Duke Drive on the southeast, and municipal wetlands on the south, extending southwest.

Of note: a. Otis Lake has no obvious discrete natural inlet or outlet.

b. The adjoining wetlands used to be part of a far more extensive wetlands system that continued to the west as far as where the Sears Mall is now located.

Slide 2

Close-up view of lake. Otis Lake is about 10 acres in area.

Of note: the elevation of the water surface when the lake was surveyed for this drawing, on June 3, 1997, was about 119.5 feet above sea level. By comparison, on June 4, 2014, the lake was approximately 10 inches higher.

Slide 3

This slide shows the sources and routes of surface water that feeds the lake and wetlands.

Of note: a. The northeast part of College Village is served by a storm sewer system that drains into Otis Lake at the edge of Carlson Park.

b. The southeast part of College Village has no storm sewer system. Precipitation runs down the streets to Duke Drive and off the end of Duke Drive into the wetlands. The situation is similar for Princeton Way.

Slide 4

Terminus of the storm sewer next to Carlson Park.

Slide 5

In the late 1990's, to improve the water quality of Otis Lake, the Municipality installed a "constructed wetlands" (settling pond) next to Carlson Park to treat the storm sewer discharge before it enters the lake. This slide shows the wooden weir that holds back the settling pond. Settling pond water is to the upper right; lake water is to the lower left.

Slide 6

Close-up view of settling pond weir.

Slide 7

Water running down Duke Drive and into the wetlands during a light rainfall.

Slide 8

As the table of lake elevations indicates, during the 1980's the lake level tended to rise significantly higher than it had in the past. At times the lake level was high enough to cause problems to nearby properties.

It is likely that Otis Lake used to drain through the extensive wetlands complex referred to under Slide 1, and that elimination of most of these wetlands has contributed to rising lake levels.

Slide 9

During the late 1980's, the Municipality studied possible ways to keep Otis Lake from rising excessively. The Municipality first tested a 100 foot length of perforated pipe buried in the corner of the wetlands, connected to an underground collection tank and weir ("control structure") that discharges into the municipal storm sewer system next to 36th Avenue. (The buried pipe is labeled Alternate No. 2 in the drawing.) The hope was that this would be able to collect enough water to control the lake level.

Slide 10

Drawing of the control structure.

Slide 11

Photo of the manhole covers providing access to the control structure.

Slide 12

Unfortunately, the buried perforated pipe did not collect a significant amount of water. "Alternate No. 3" shown in Slide 9, which would have involved a buried pipe extending all the way to and under Otis Lake, was not pursued due to technical and cost concerns. Instead, the Municipality constructed a shallow ditch in 1990 to connect Otis Lake to the control structure. The red line on the drawing shows the approximate location of the ditch, except that the ditch actually extends further to the west than shown, since the control structure is located across from MacInnes St.

Slide 13

Recent view of ditch looking north toward Otis Lake.

Slide 14

The elevation of the weir in the underground control structure can be varied by adding or removing timbers. Historically the elevation was set high enough that the system rarely withdrew water from Otis Lake after the initial installation. This photo shows a recent test by the Municipality during which timbers were temporarily removed to allow water to flow over the weir.

Slide 15

Over the years, the ditch has partially filled in. As shown in this slide, the approximately 100 foot section of the ditch closest to the lake has virtually disappeared, so the lake is no longer connected to the ditch. Maintenance of the lake level control system is needed to restore it to functionality.

Slide 16

In the absence of a functioning lake level control system, the past several years of above-average precipitation have caused Otis Lake to rise excessively – higher than at an time since before the ditch was installed in 1990. For example, the lake often floods the

settling pond that is supposed to treat storm sewer effluent from the northeast area of College Village (compare with Slides 5 and 6).

Slide 17

Another view of the lake flooding the settling pond.

Slide 18

The lake about 3-1/2 inches above the settling pond weir.

Slide 19

Another view.

Slide 20

High water in Otis Lake.

Slides 21 through 24

Carlson Park has been experiencing extensive seasonal ponding.

Slide 25 and 26

The area around the "frog pond" or "duck pond" in the wetlands southwest of the lake has also been experiencing high water levels. Water has been creeping up the adjoining property's lawn.

Slides 27 and 28

The fishermen's trail along the southeast shore of Otis Lake is often flooded.

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