RAMSEY-WASHINGTON
METRO WATERSHED DISTRICT

Twin Lake Flood Management Presentation to the RWMWD Board of Managers

Erin Anderson Wenz, Barr Engineering Company

June 5, 2019

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Site visit June 5, 2019

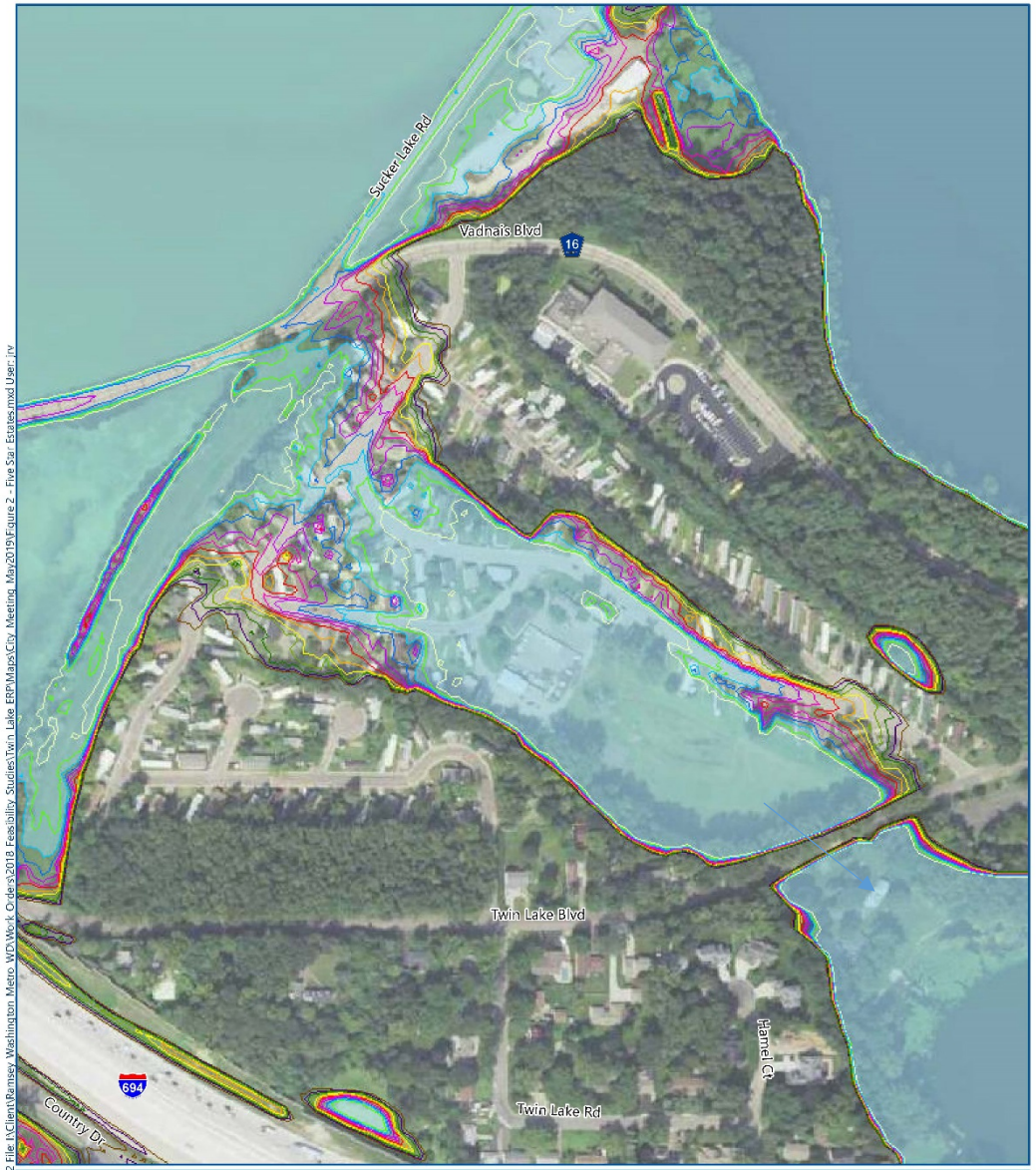
Technical memo sent in the Board packet May 31, 2019

Any questions about what you saw or read? Any questions about how these waterbodies are connected?

Five Star Estates (5/28/19)

MnDOT overflow berm (5/28/19)


berm
WSEL 5/17/2019 884.2
24-inch RCP
outlet from
West Vadnais
Google
Imagery ©2019 Google, Map data ©2019 Google United States Terms Send feedback



Inundation Elevation 885-Feet

Inundation Contours (Feet)

884
884_5
885
885.5
886
886.5
887
887.5
888
888.5
889
889.5
890

RAMSEY-WASHINGTON METRO WATERSHED DISTRICT

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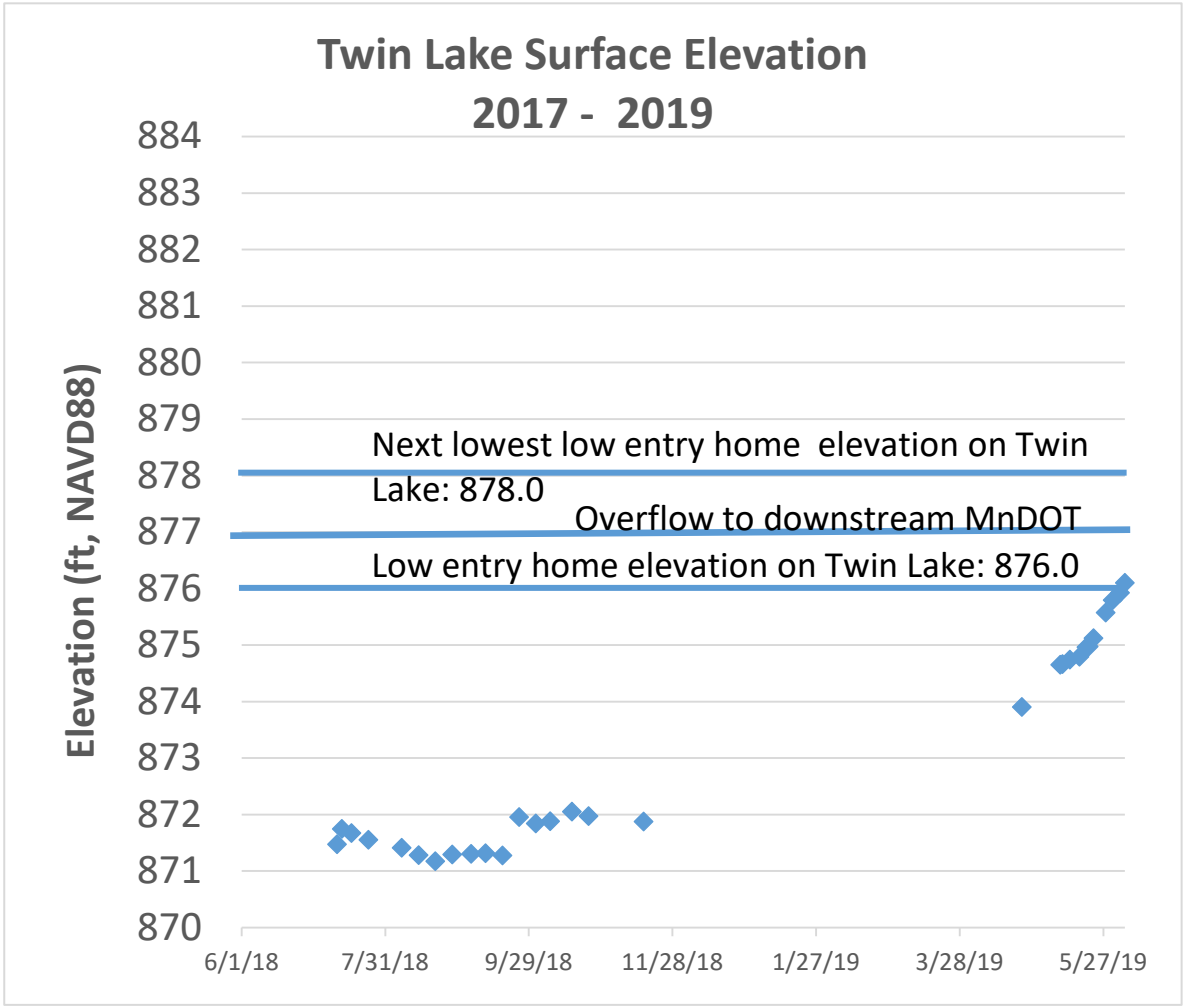
0 150 300
Feet

FIVE STAR ESTATES

FIGURE 2

Barr Footer: ArcGIS 10.6.1, 2019-05-30 12:32 File: I:\Client\Ramsey Washington Metro WD\Work Orders\2018 Feasibility Studies\Twin Lake ERP\Maps\City Meeting, May2019\Figure 2 - Five Star Estates.mxd User: jrv

- According to the *2017-2016 Watershed Management Plan*, Twin Lake's 100-year flood elevation is 873.8.
- As of June 5, 2019, the elevation in Twin Lake is 876.1
- *We are clearly above the 100-year flood elevation.**
- *Most other emergency response plans in RWMWD are for homes <u>below</u> the 100-year flood elevation.*



*Above the 100-year flood elevation at existing structures, we don't always intervene to mitigate flooding, though we do work with our partners by providing guidance and support where homes are at risk of surficial flooding.

This spring, District staff have been working to discuss the changing situation at Twin Lake with municipal and agency stakeholders to build consensus around informed and coordinated decisions.

Little Canada's perspective

- District and City have been in close communication about Twin Lake levels
- City has requested District guidance on pumping
- City Council will be considering taking action at its emergency meeting planned for Thursday, June 6 at 8:30am

Vadnais Heights' perspective

- Currently making plans for what to do to protect Five Star Estates from a potential West Vadnais Lake overflow

MnDOT's perspective

- Need a drainage permit application to release water into their system. The stormwater system at the 694/35E interchange was not sized to accommodate stormwater flows from Twin Lake
- Concern over uncontrolled failure of 877.0 overflow into MnDOT system
- Mobilizing to reinforce the overflow June 6, 2019

MnDNR's perspective

- Need an appropriations permit to allow movement of water that would not otherwise go downstream
- Concern over uncontrolled failure of MnDOT overflow berm

St. Paul Regional Water Services' perspective

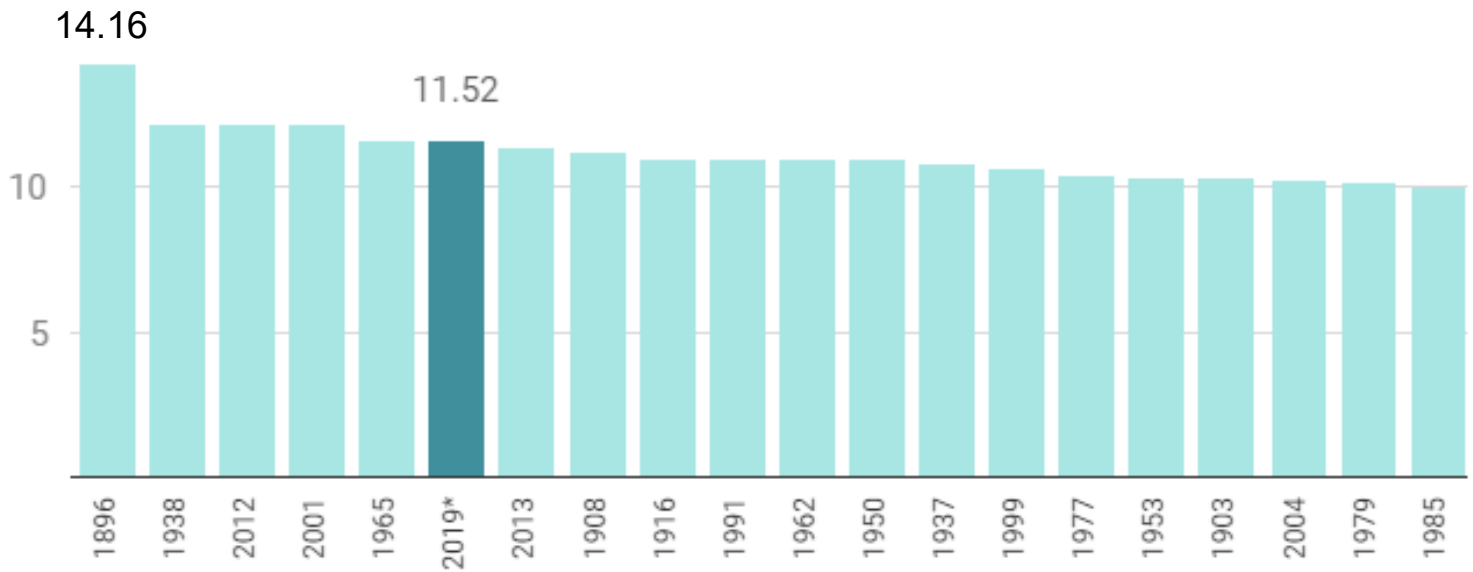
- Role is to protect the drinking water supply (East Vadnais Lake)
- At our request, they stopped pumping water from their parking lot into West Vadnais Lake
- Staff has reached out to them to discuss the overflow point between West Vadnais Lake and East Vadnais Lake

From a June 2, 2019 Star Tribune article

A very wet start of the year

Minnesota is in a historic state of sogginess after two of the coldest, wettest spring months ever. Normal precipitation average, based on the years 1981-2010, is 8.19 inches.

Statewide average precipitation (top 20, January-May)

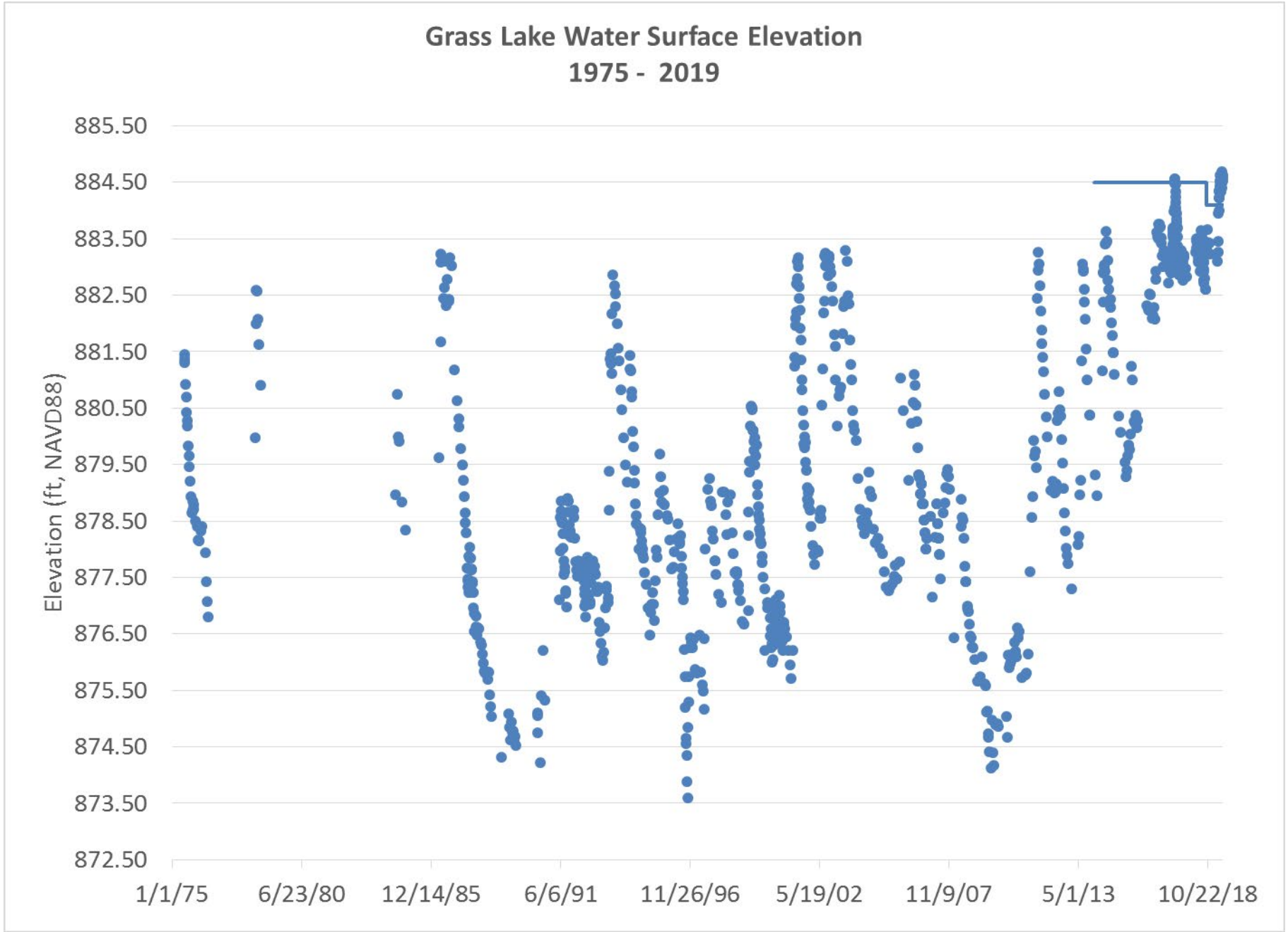


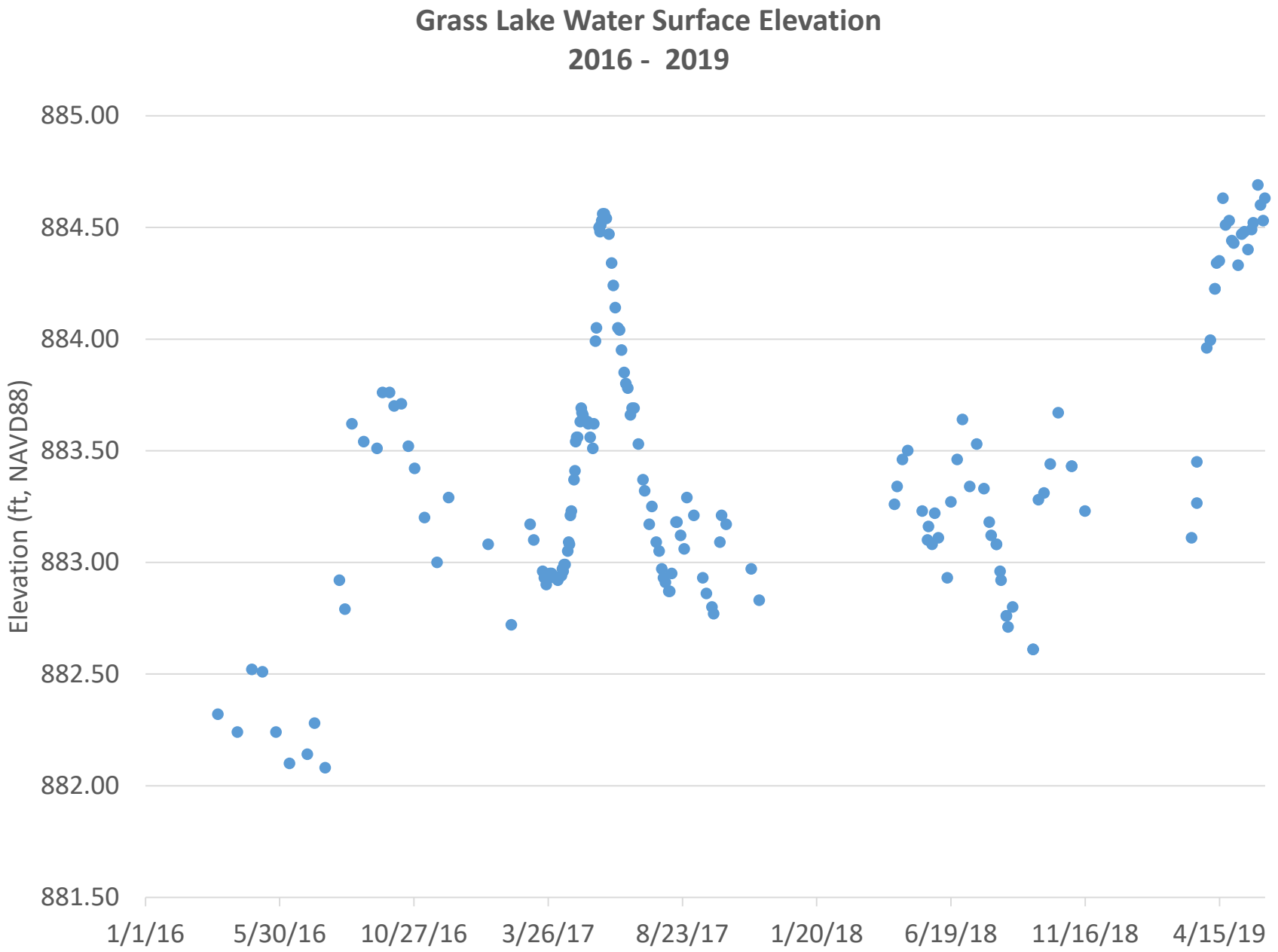
**Preliminary*

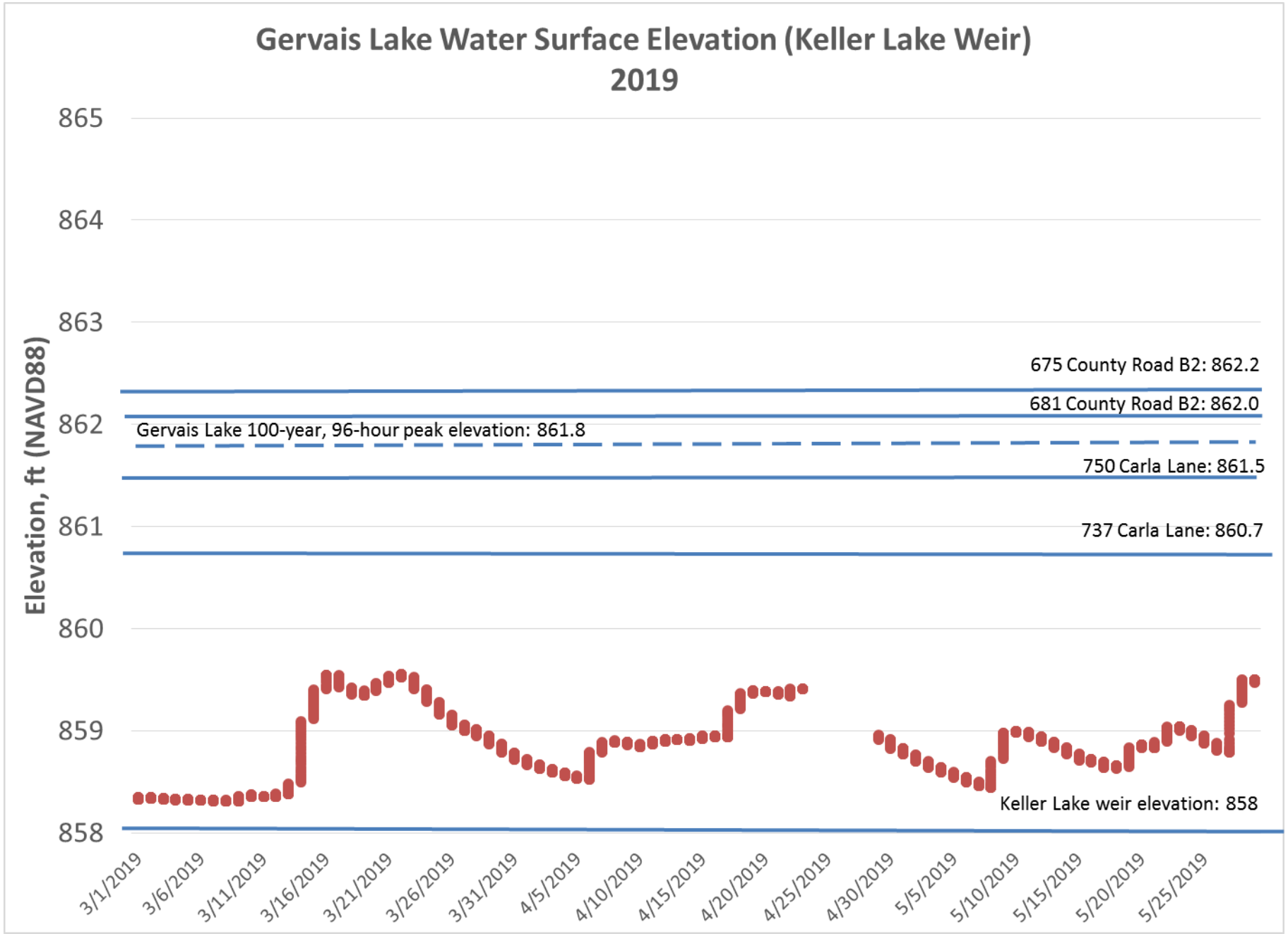
Chart: Eddie Thomas • Source: Midwestern Regional Climate Center • Get the data

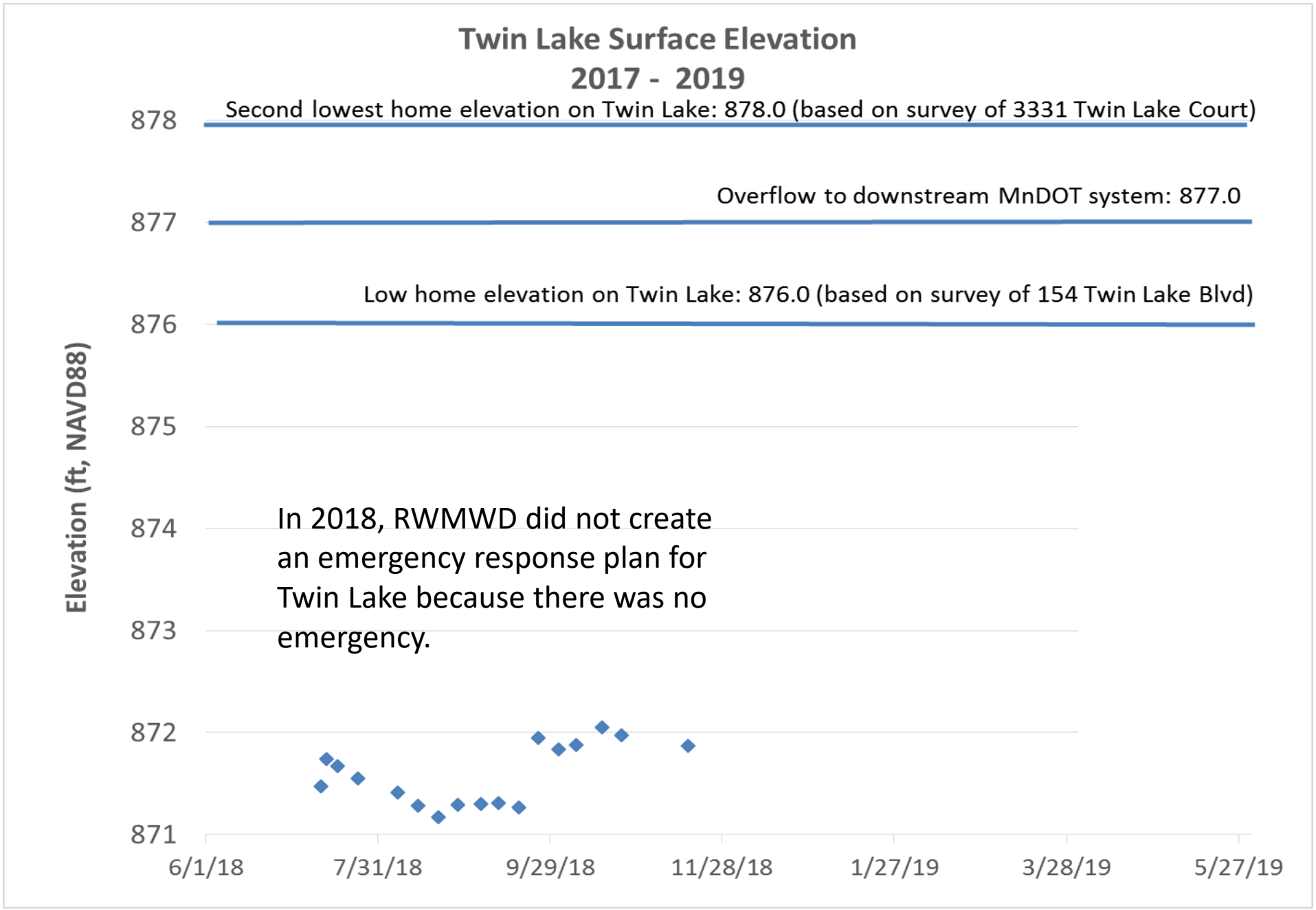
Statewide, 2019 is the sixth-wettest year to date since record-keeping began in 1871. For the Twin Cities area, it's the fourth-wettest year on record so far.

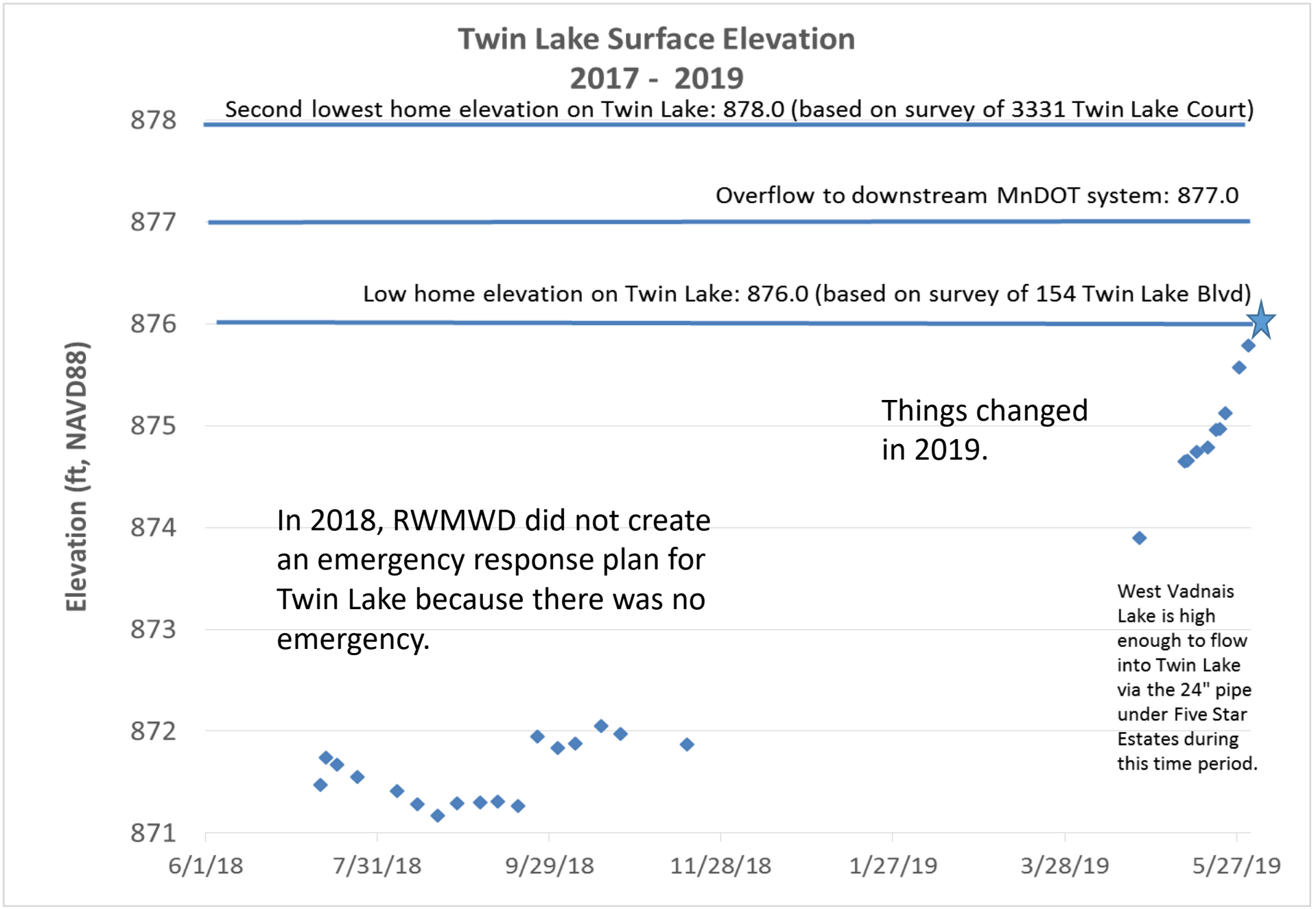
How has this affected lakes in the RWMWD?


Grass Lake Water Surface Elevation
1975 - 2019
Elevation (ft, NAVD88)
885.50
884.50
883.50
882.50
881.50
880.50
879.50
878.50
877.50
876.50
875.50
874.50
873.50
872.50
1/1/75
6/23/80
12/14/85
6/6/91
11/26/96
5/19/02
11/9/07
5/1/13
10/22/18


Grass Lake Water Surface Elevation
2016 - 2019
Elevation (ft, NAVD88)
885.00
884.50
884.00
883.50
883.00
882.50
882.00
881.50
1/1/16
5/30/16
10/27/16
3/26/17
8/23/17
1/20/18
6/19/18
11/16/18
4/15/19


Gervais Lake Water Surface Elevation (Keller Lake Weir)
2019
Elevation, ft (NAVD88)
865
864
863
862
861
860
859
858
675 County Road B2: 862.2
681 County Road B2: 862.0
Gervais Lake 100-year, 96-hour peak elevation: 861.8
750 Carla Lane: 861.5
737 Carla Lane: 860.7
Keller Lake weir elevation: 858
3/1/2019
3/6/2019
3/11/2019
3/16/2019
3/21/2019
3/26/2019
3/31/2019
4/5/2019
4/10/2019
4/15/2019
4/20/2019
4/25/2019
4/30/2019
5/5/2019
5/10/2019
5/15/2019
5/20/2019
5/25/2019


Twin Lake Surface Elevation
2017 - 2019
Second lowest home elevation on Twin Lake: 878.0 (based on survey of 3331 Twin Lake Court)
Overflow to downstream MnDOT system: 877.0
Low home elevation on Twin Lake: 876.0 (based on survey of 154 Twin Lake Blvd)
In 2018, RWMWD did not create an emergency response plan for Twin Lake because there was no emergency.
Elevation (ft, NAVD88)
878
877
876
875
874
873
872
871
6/1/18
7/31/18
9/29/18
11/28/18
1/27/19
3/28/19
5/27/19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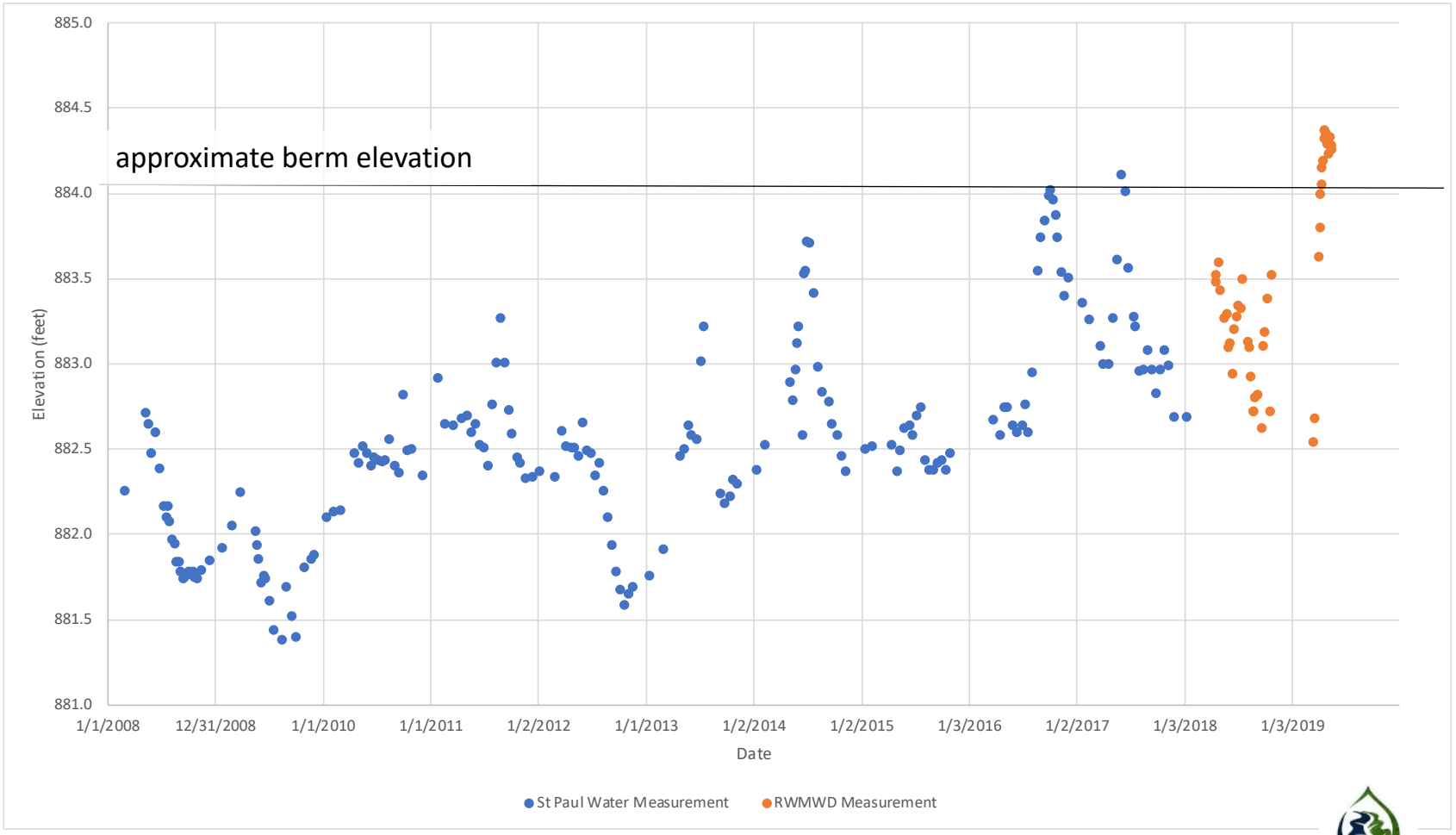
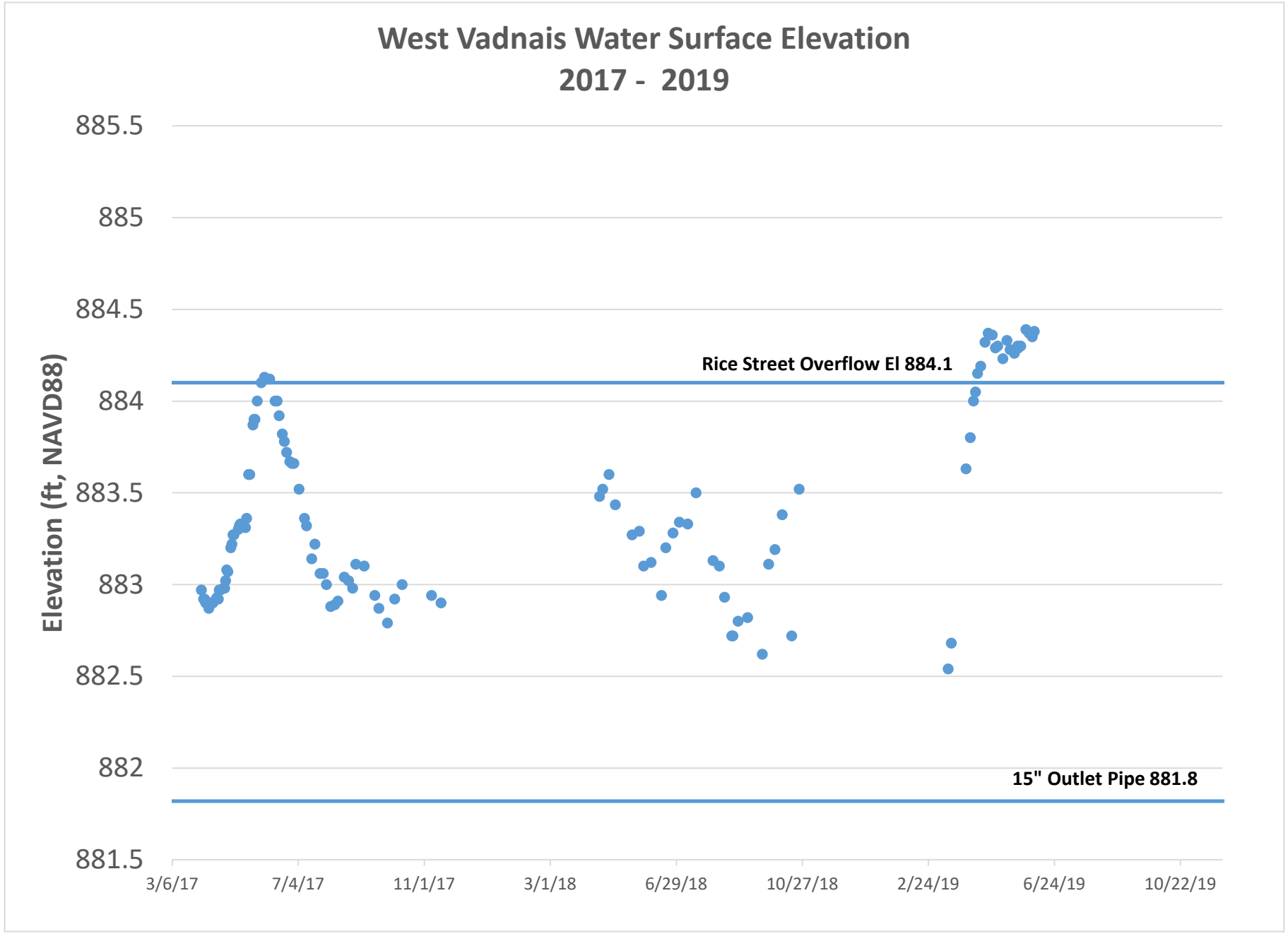
Overflow to downstream MnDOT system: 877.0
Low home elevation on Twin Lake: 876.0 (based on survey of 154 Twin Lake Blvd)
Things changed in 2019.
In 2018, RWMWD did not create an emergency response plan for Twin Lake because there was no emergency.
West Vadnais Lake is high enough to flow into Twin Lake via the 24" pipe under Five Star Estates during this time period.
Elevation (ft, NAVD88)
878
877
876
875
874
873
872
871
6/1/18
7/31/18
9/29/18
11/28/18
1/27/19
3/28/19
5/27/19

West Vadnais Lake levels



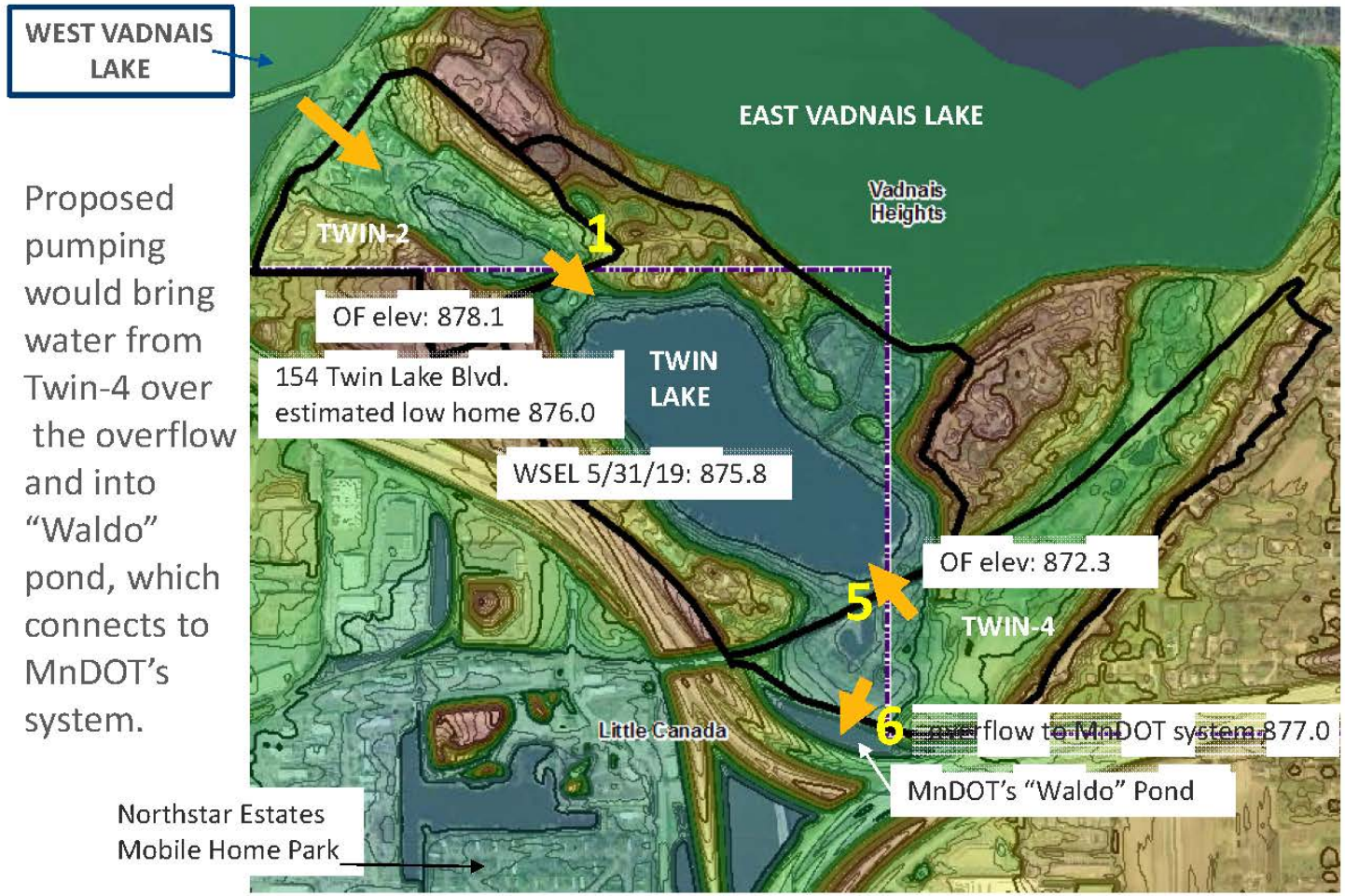

West Vadnais Water Surface Elevation
2017 - 2019
Elevation (ft, NAVD88)
885.5
885
884.5
884
883.5
883
882.5
882
881.5
Rice Street Overflow El 884.1
15" Outlet Pipe 881.8
3/6/17
7/4/17
11/1/17
3/1/18
6/29/18
10/27/18
2/24/19
6/24/19
10/22/19

The City of Little Canada will be discussing several options at their meeting tomorrow morning, including:

- Do nothing more
- Enhanced protection at the low home
- Pumping Twin Lake
- Combination of enhanced protection at the low home and pumping

Twin Lake
subwatershed & drainage patterns

Proposed pumping would bring water from Twin-4 over the overflow and into "Waldo" pond, which connects to MnDOT's system.



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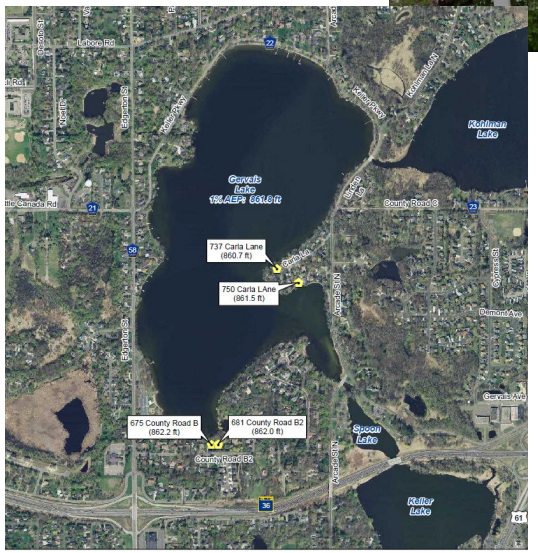
There are habitable structures at risk of flooding below the 100-year flood elevation under existing conditions downstream of Twin Lake.

flood-prone areas

Little Canada

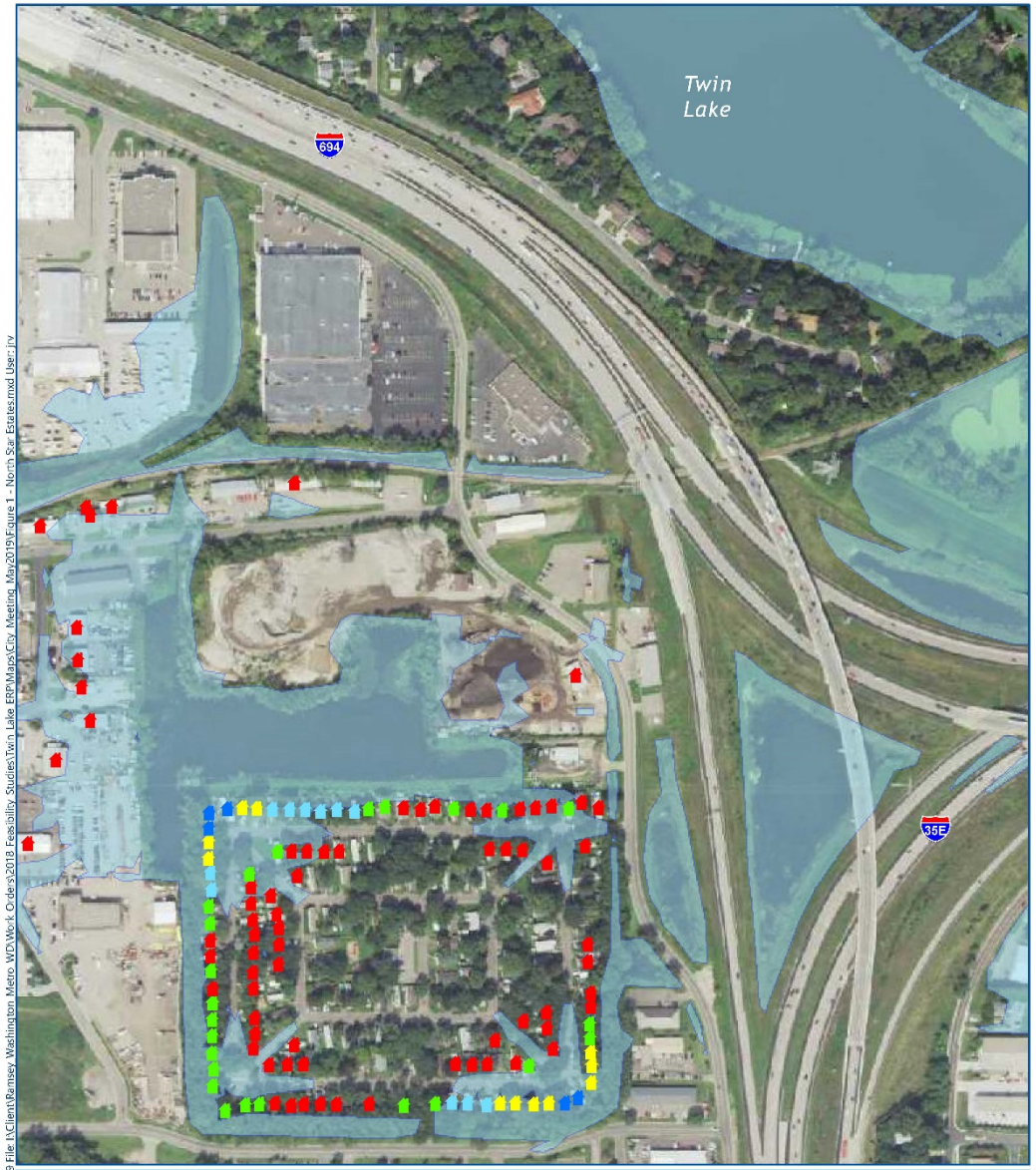
Owasso Basin and

North Star Estates



Little Canada

Low homes on Gervais Lake



Impacted Structures

- 100-Year 8.32 Inch
- 50-Year 7.17 Inch
- 25-Year 6.16 Inch
- 10-Year 5.03 Inch
- 4 Inch

Existing 100-Year 96-Hour Inundation Extent

RAMSEY-WASHINGTON METRO WATERSHED DISTRICT

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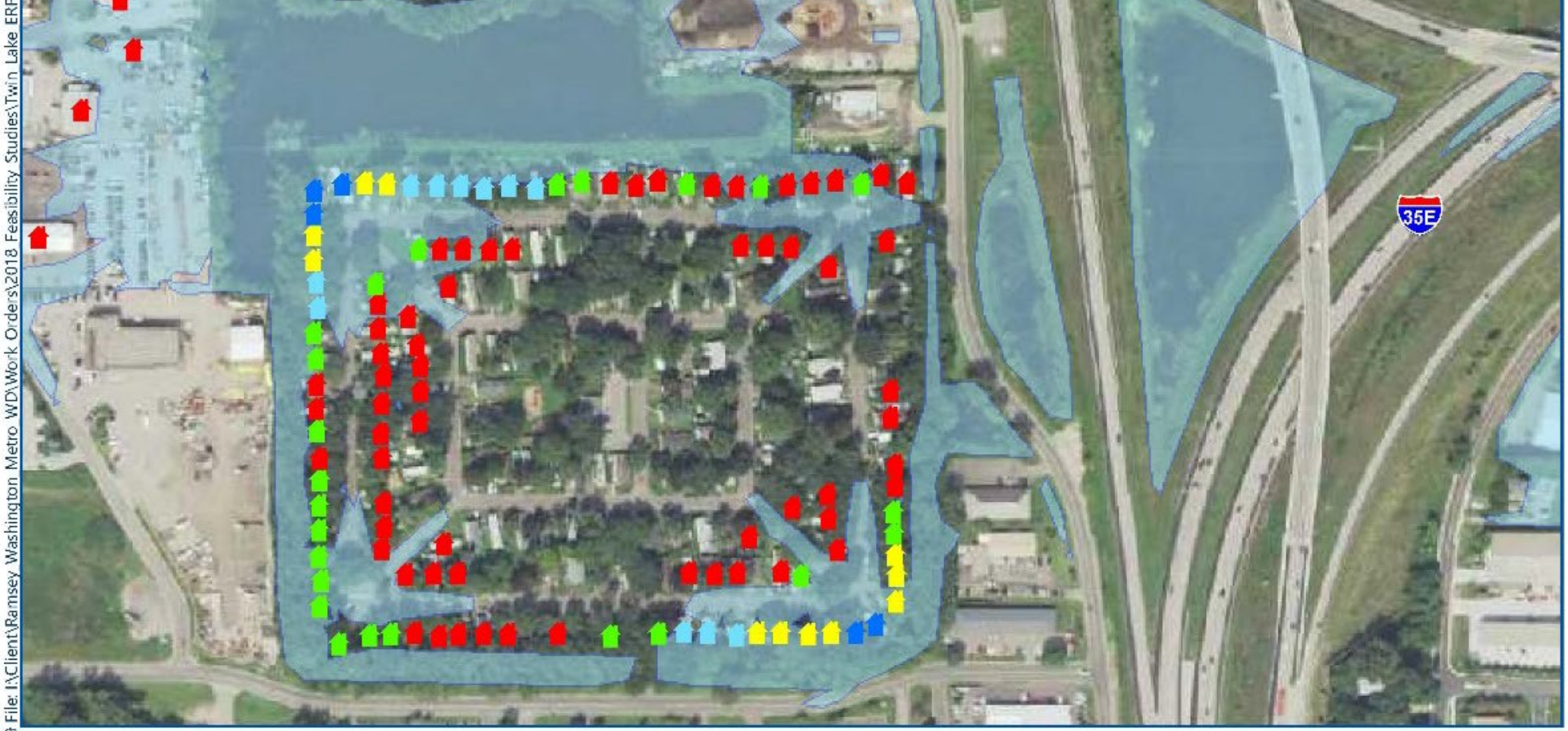
0 200 400
Feet

NORTH STAR ESTATES

FIGURE 1

Barr Footer: ArcGIS 10.6.1, 2019-05-30 13:09 File: I:\Client\Ramsey_Washington_Metro_WD\Work Orders\2018 Feasibility Studies\Twin Lake ERP\Maps\City Meeting_May2019\Figure 1 - North Star Estates.mxd User: jnv



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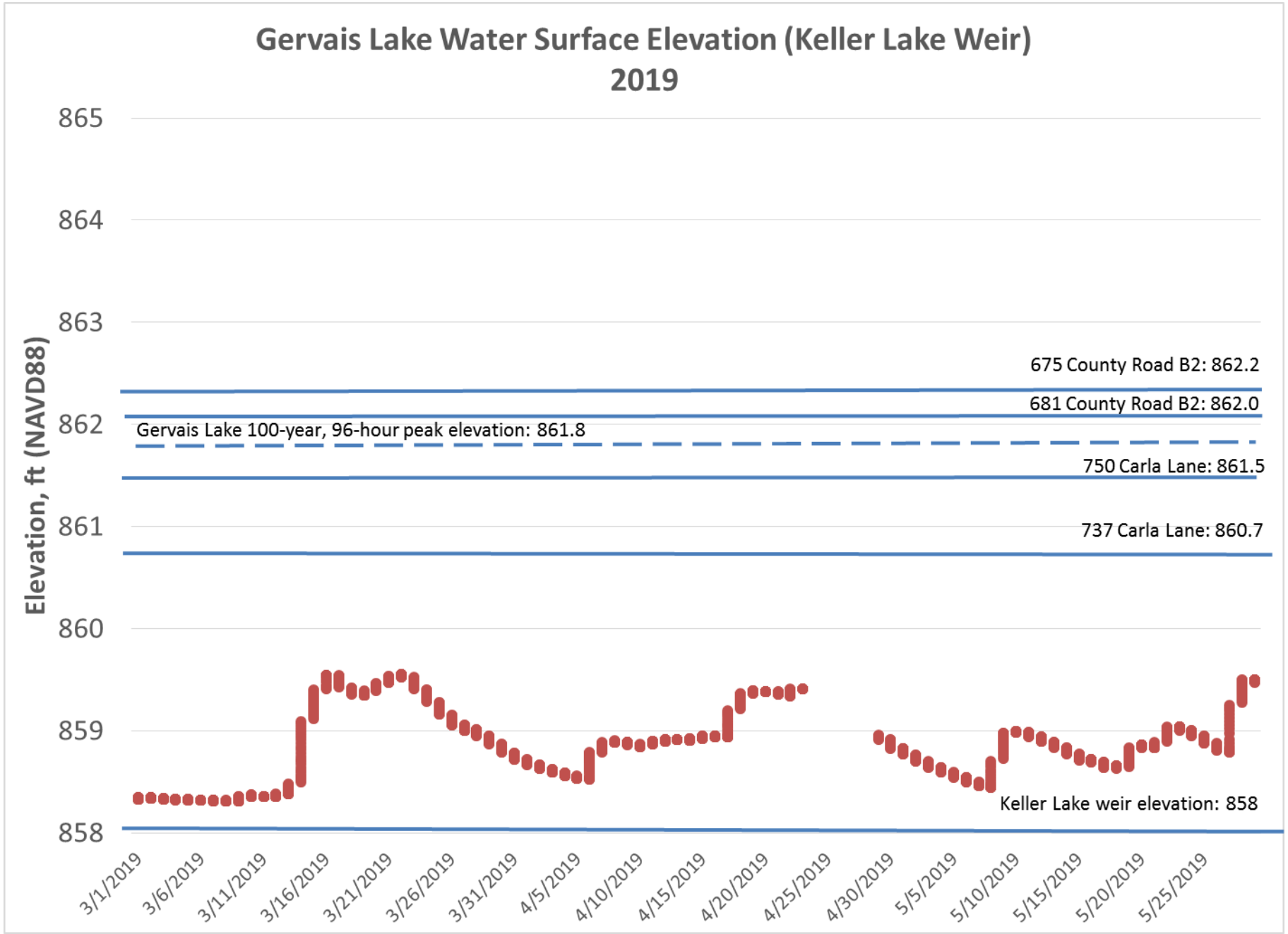
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3/31/2019
4/5/2019
4/10/2019
4/15/2019
4/20/2019
4/25/2019
4/30/2019
5/5/2019
5/10/2019
5/15/2019
5/20/2019
5/25/2019

10-year 4-day rainfall event

Location	Existing	1 cfs	5 cfs	10 cfs	15 cfs	20 cfs
Gervais Lake	860.47	860.47 0.00	860.47 0.00	860.47 0.00	860.48 +0.01	860.48 +0.01
West Vadnais Lake	884.68	884.68 0.00	884.68 0.00	884.68 0.00	884.68 0.00	884.68 0.00

100-year 4-day rainfall event

Location	Existing	1 cfs	5 cfs	10 cfs	15 cfs	20 cfs
Gervais Lake	862.52	862.52 0.00	862.52 0.00	862.52 0.00	862.53 +0.01	862.53 +0.01
West Vadnais Lake	885.08	885.08 0.00	885.08 0.00	885.08 0.00	885.08 0.00	885.08 0.00

What do the managers need to decide tonight?

At their meeting tomorrow, the City of Little Canada may decide to pursue pumping at Twin Lake.

If they do, do you…

- ***Continue to provide information to Little Canada but do not support the pumping option.***

  Consequences:

  The lake will likely overflow and sit at 877.0 for an extended period, bouncing during storm events

  During that time, Twin Lake's level would be sitting at least 1 foot above the low entry of 154 Twin Lake Blvd

  MnDOT's overflow berm may have some increased risk of uncontrolled failure

- ***Continue to provide information to the city and support the City's plan to pump Twin Lake with restrictions.***

  Consequences:

  City will have to stop pumping at 12 to 24 hours before a significant storm event and wait until the storm passes through MnDOT's system and Owasso Basin before restarting pumping.

  There may be times when Twin Lake will overflow regardless of pumping.

  District staff will need to provide a higher level of support during pumping activities.

  Pumping action could take a long time to get Twin Lake to lower elevations.

  District would assist the City in determining appropriate drawdown limits.

  Legal perspective…

- RWMWD and City of Little Canada are looking for ways to increase flood storage to help protect low homes on Twin Lake and the Five Star Estates mobile home park.
- No guarantee of specific lake levels, or prevention of lake overflows.
- Pumping is not necessarily seen as a long term solution.

Photo taken June 5, 2019 by David Vlasin