



STAFF REPORT

DATE: February 11, 2020

DISCUSSION

AGENDA ITEM: Flooding

TO: Mayor and Council

SUBMITTED BY: Kristina Handt, City Administrator

BACKGROUND:

At a previous work session council asked to discuss flooding concerns ahead of the spring thaw.

ISSUE BEFORE COUNCIL:

What is the City's role in addressing flooding concerns?

PROPOSAL DETAILS/ANALYSIS:

City staff has had communications with the watershed staff and staff from Washington County regarding potential flooding issues in Lake Elmo. After the 2019 Spring floods, the watershed district provided maps of areas that had complained about flooding. Those maps are included in your packet. I met with John Hanson in July to review these parcel and discuss any possible actions the city could take in the future. In most cases due to the topography of private property, it would be up to the property owner to construct a berm on their property if they wanted to prevent flooding. There were some culverts that we knew had gotten plugged such as on 50th St and Jamaca last spring which public works will prioritize this year to minimize backups. Due to liability concerns, the city's position in the past has been that we won't go onto private property to do anything in response to flooding. The city will focus on its public infrastructure-roadways, culverts, etc. Similarly, Washington County focuses on their public infrastructure-county roads. The county has also communicated that they can provide sand and sand bags as needed to city, not private property owners. We have already ordered 2,000 sand bags and the sand will be delivered if/when needed.

We continue to get regular updates from Washington County regarding the flooding situation. Included in your packet is the most recent update from the National Weather Service.

Lastly, we have included information about the National Flood Insurance Program in the FRESH on a regular basis as well as in the Winter issue of the Source. Folks need to be aware that the insurance doesn't go into effect until 30 days after purchase so they should plan ahead.

FISCAL IMPACT:

For cities and townships requesting assistance from Washington County with sand/bags procurement, the following is the county rate for sand and sandbag requests:

On average, 70 sandbags (14 X 36) will use one ton of sand.

Item	Amount	Cost
One delivery of sand and bags	10 Tons of sand and 700 sand bags	\$225
One delivery of sand <i>only</i>	One deliver of sand only	\$120
One deliver of sand bags <i>only</i>	One deliver of bags only	\$105

The costs listed above do not cover county staff time for loading product or delivery, fuel, etc. Public Works is charging for their costs of the product only.









If other items are needed, for example a jet to clear culverts, staff would review options of contracting for that at the time it is needed. If we are unable to find one, Washington County may be able to help with the procurement.

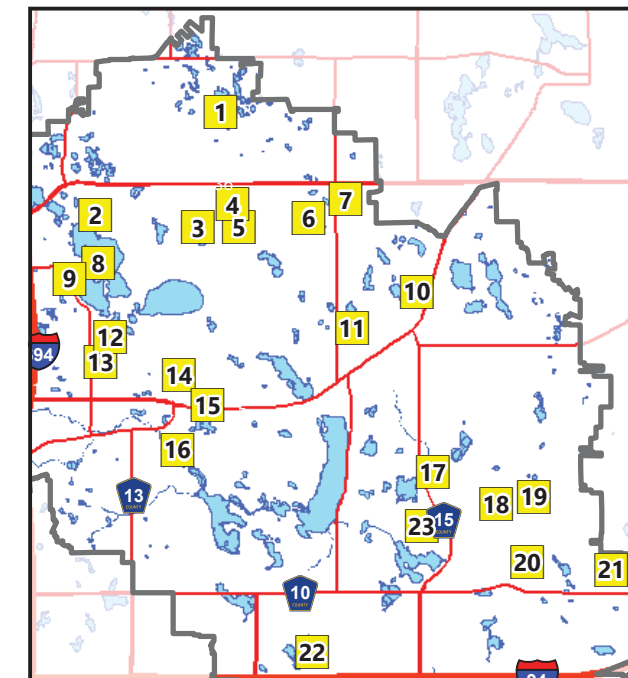
ATTACHMENT:

- 2019 Flood Areas
- National Weather Service Flood Outlook

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-  Selected Parcel Boundaries
-  Parcel Boundary
-  District Legal Boundary
-  Home/Structure of Concern
-  Assumed Basin of Concern
-  FEMA 1% Annual Chance Flood (100-yr, Zone AE, Eff. Feb. 2010)
- 2-Foot Contours (LiDAR, 2011)
 -  2-Foot Contour
 -  10-Foot Contour



Feet

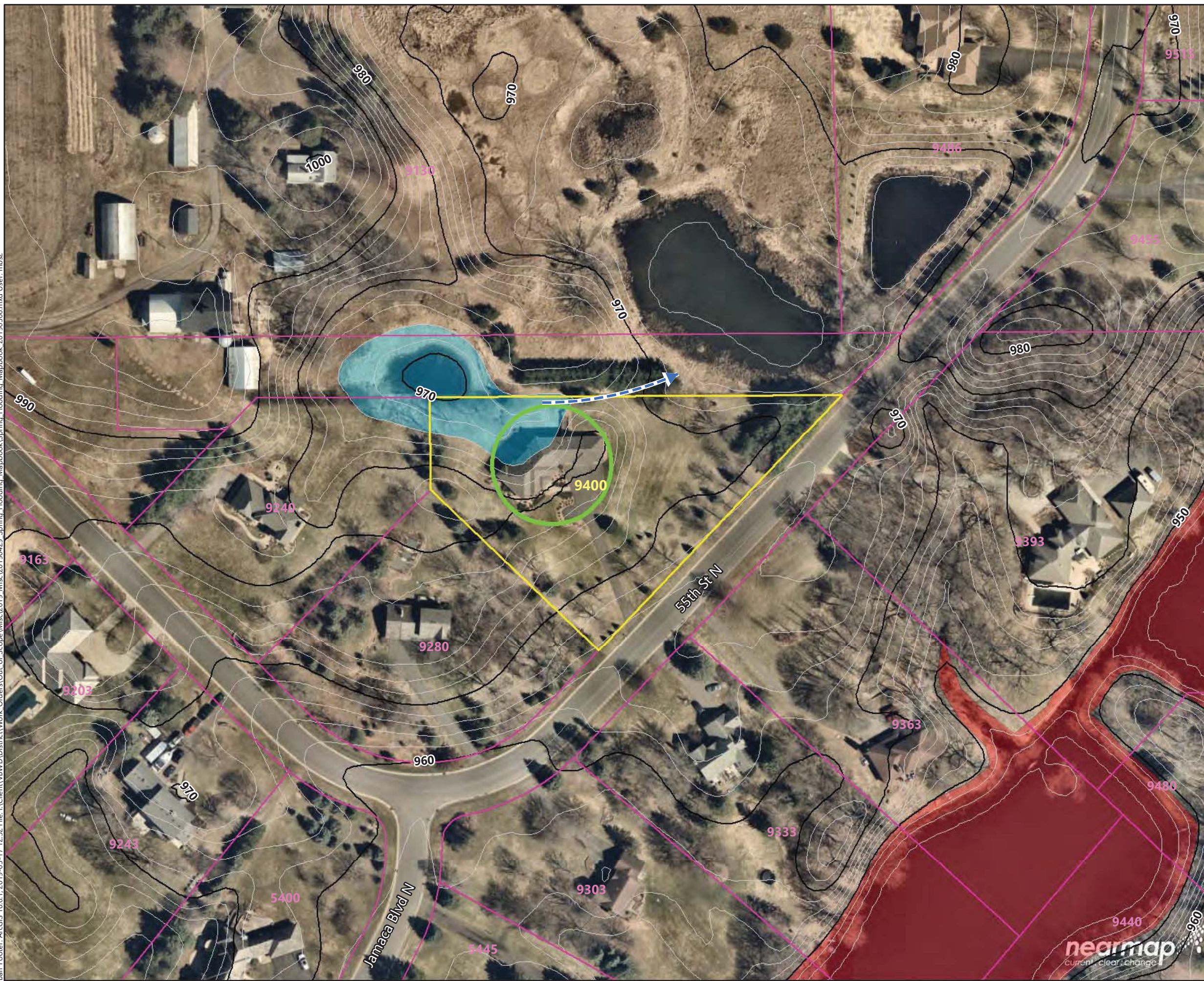











Map 2

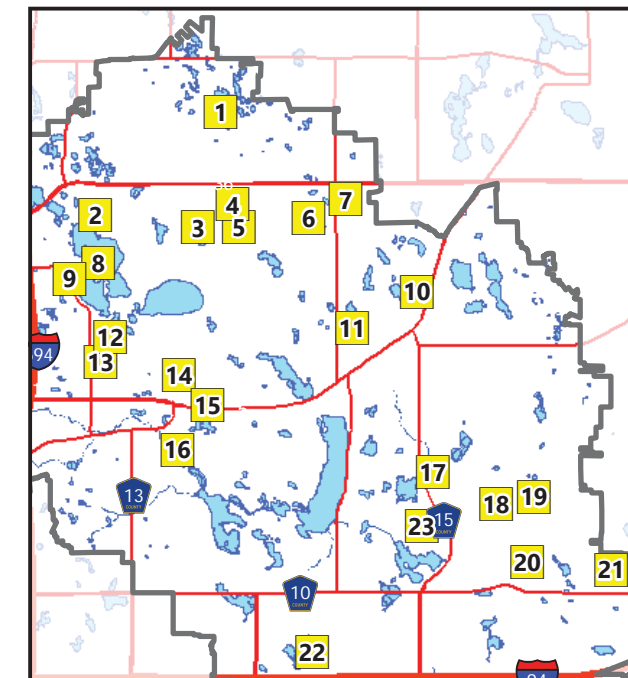
POTENTIAL FLOODING REVIEW
April 2019
Valley Branch Watershed District



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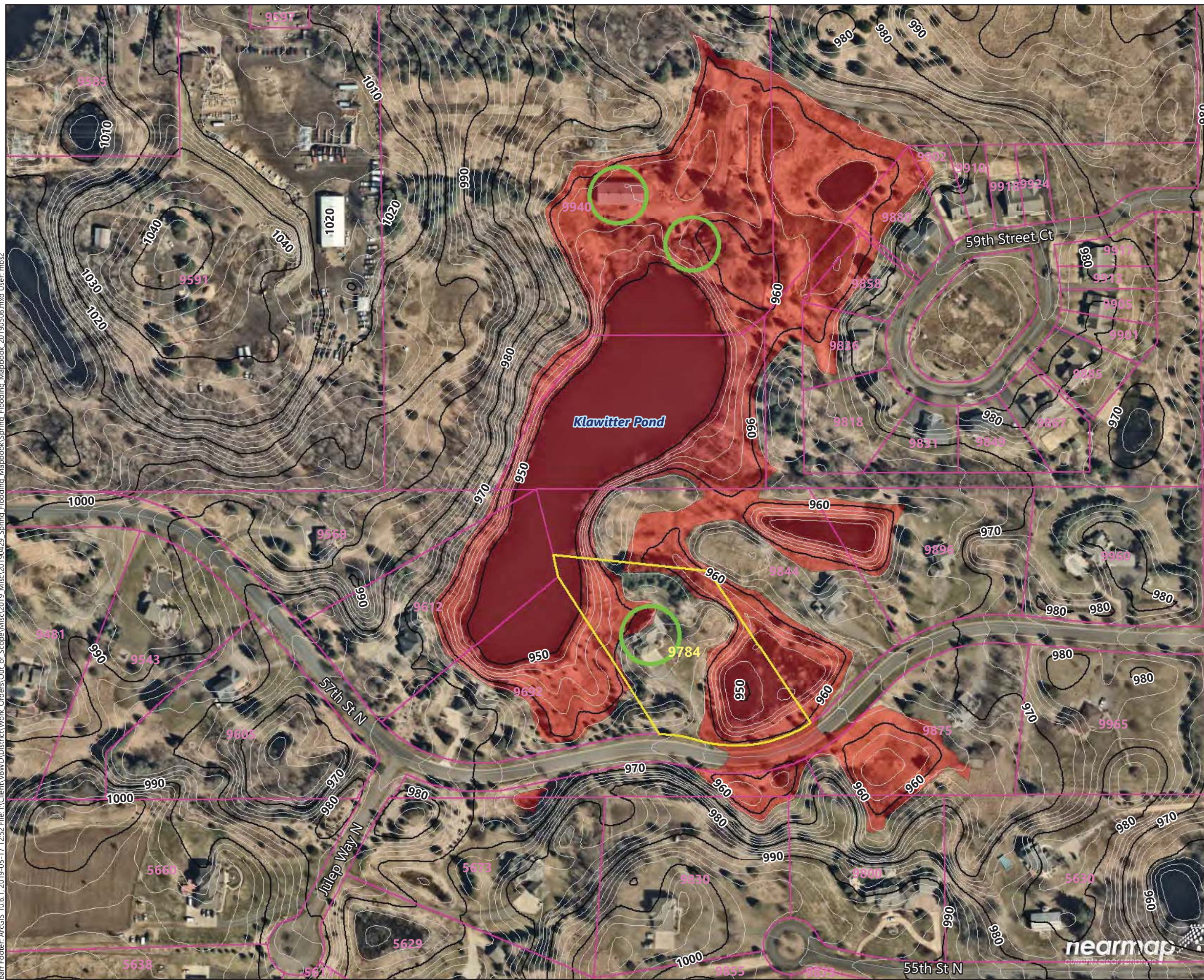
Feet











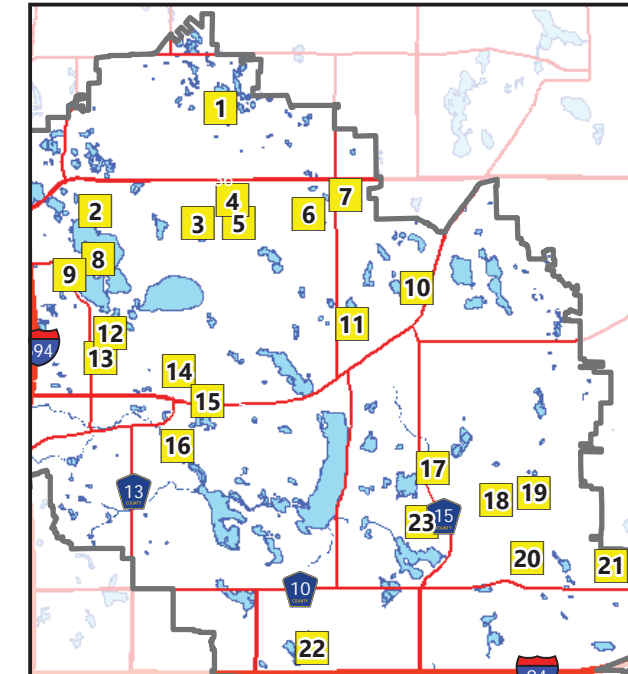
Map 3

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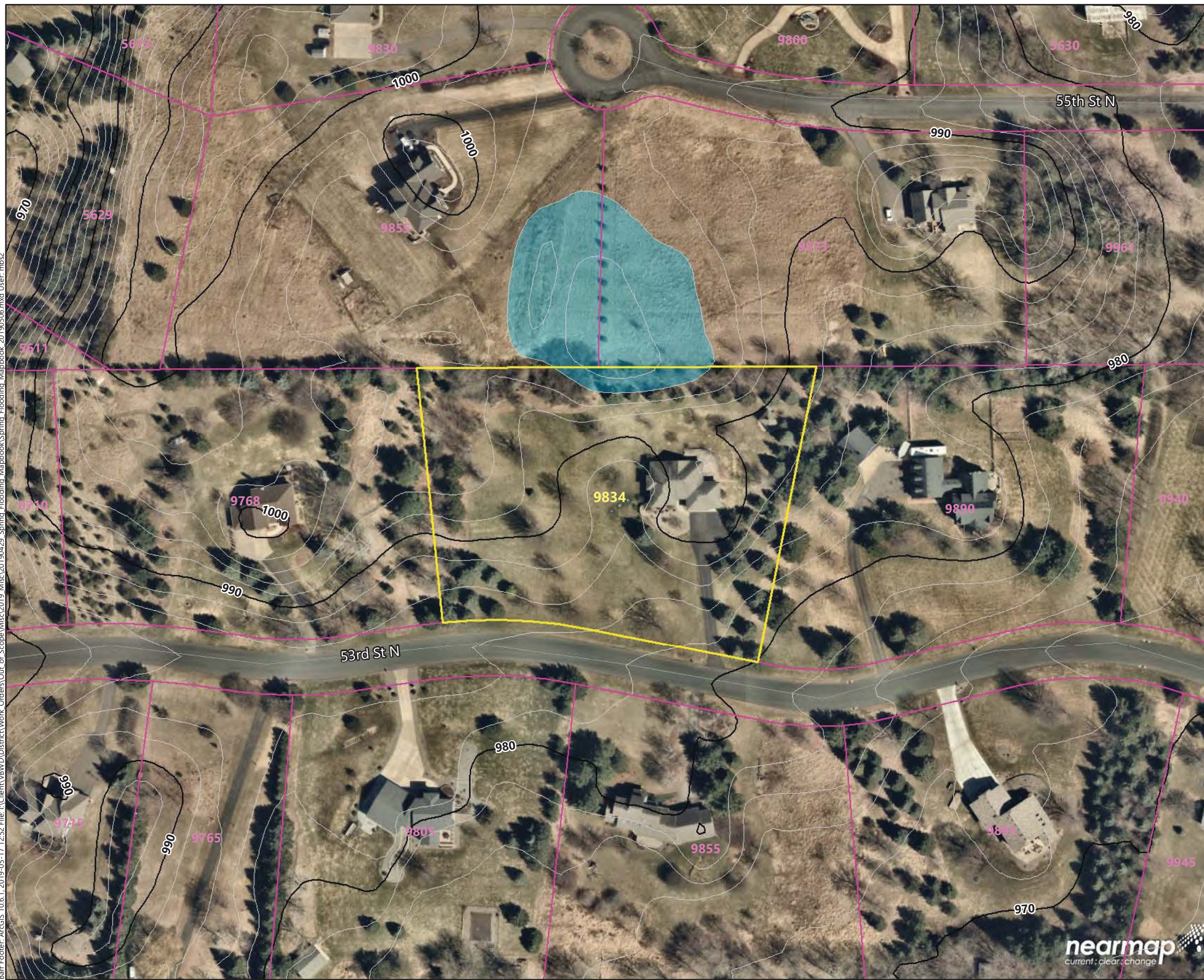








Map 4

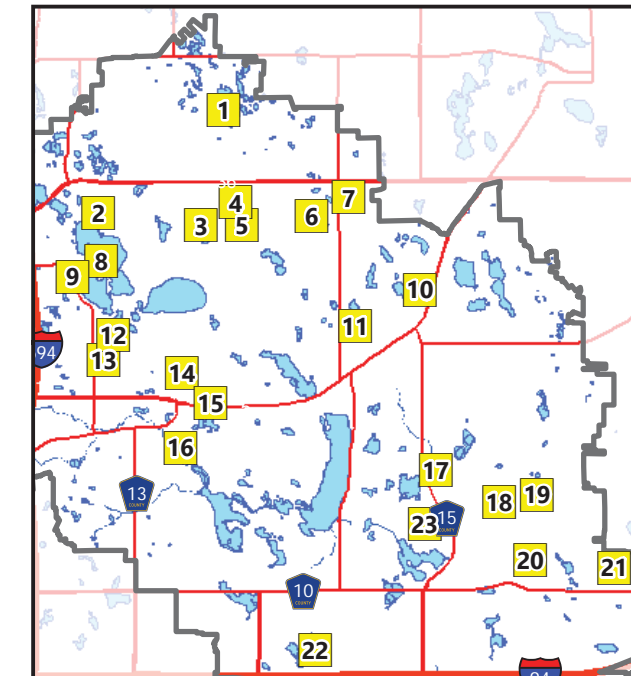
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Map 5

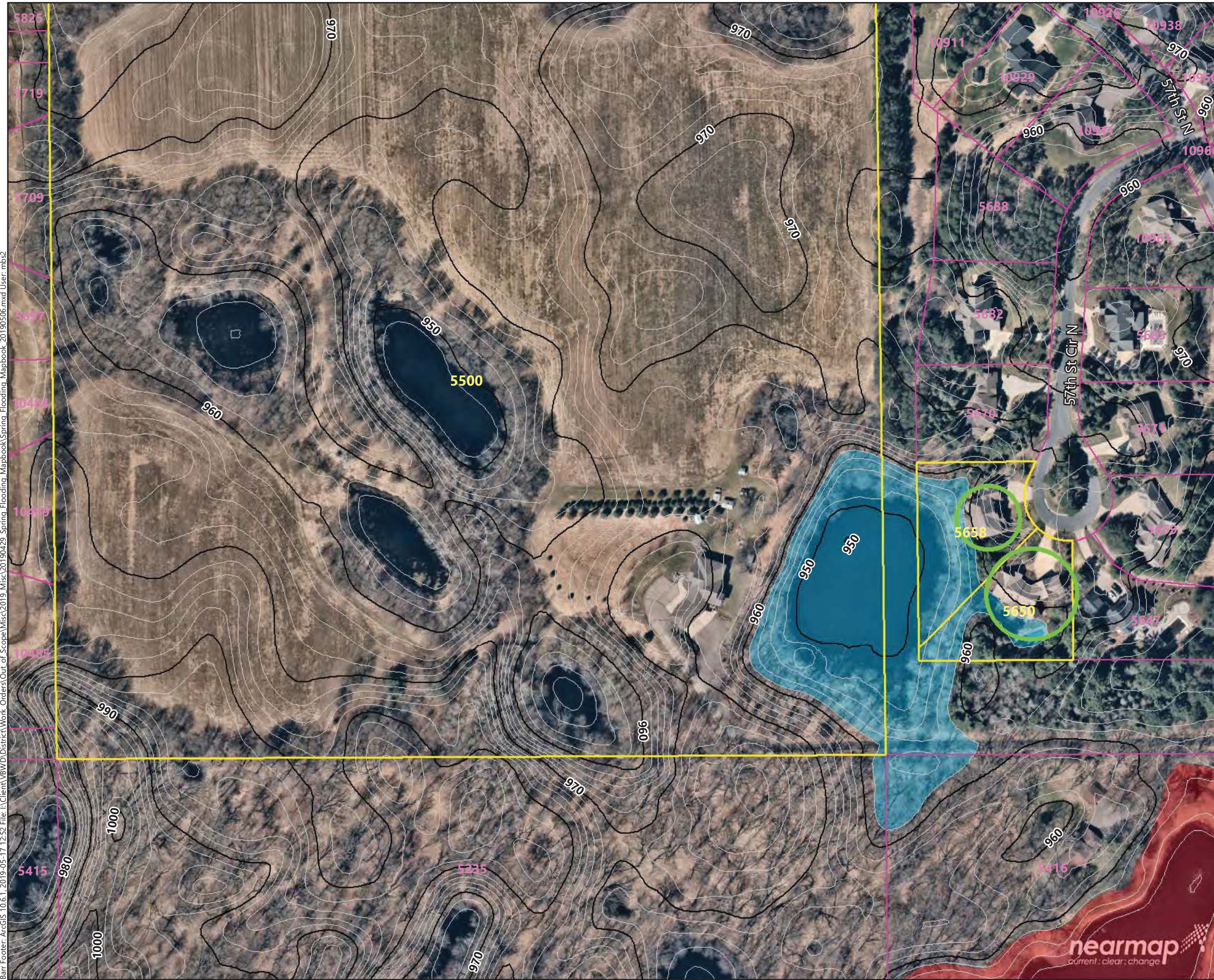
POTENTIAL FLOODING REVIEW









April 2019

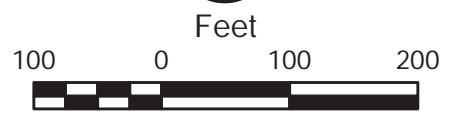
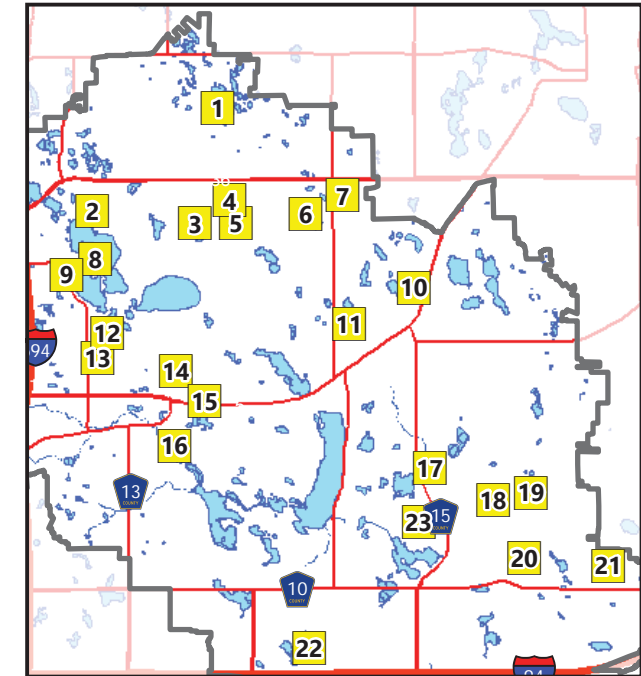
Valley Branch Watershed District



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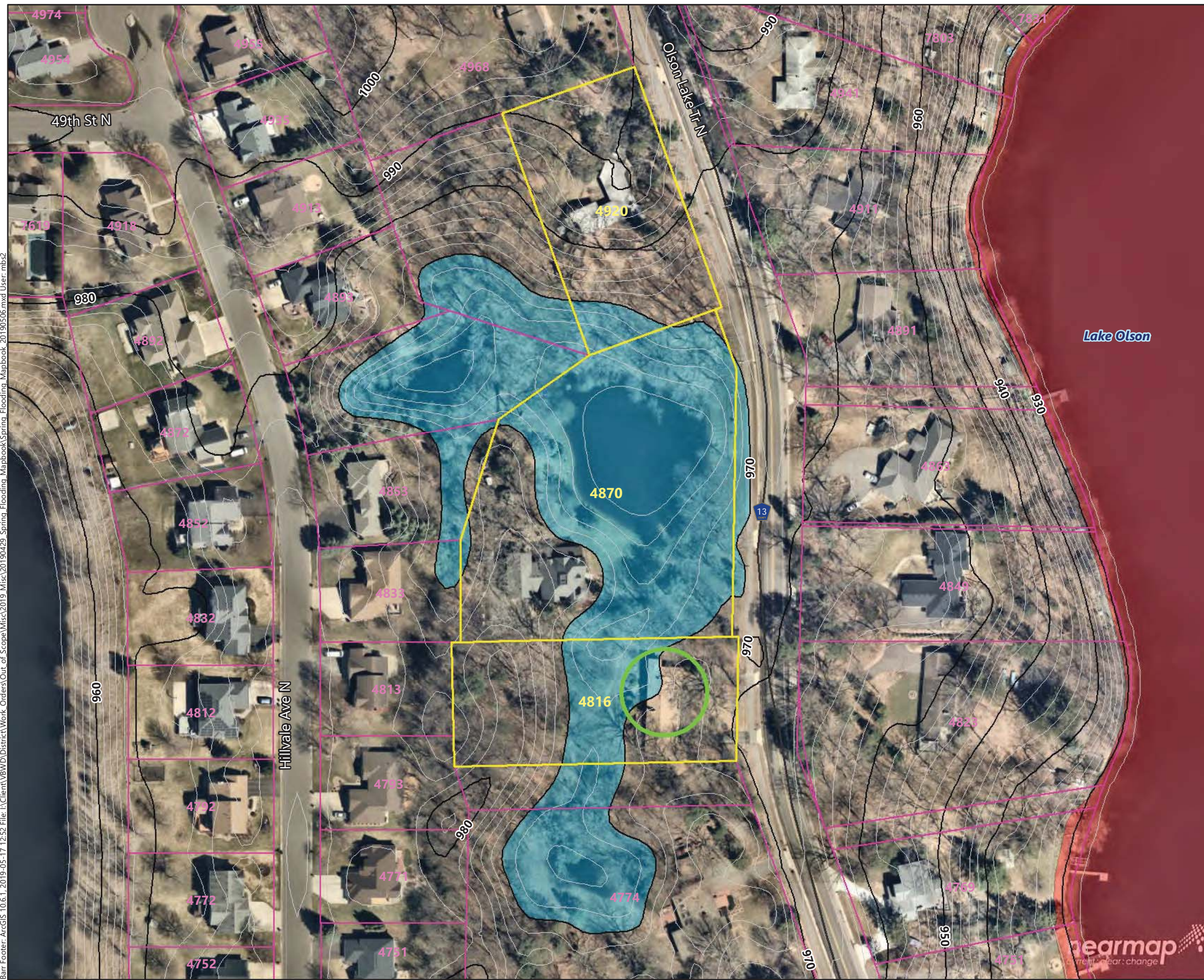










Map 6

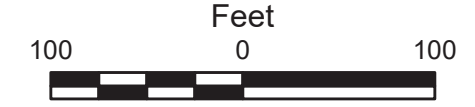
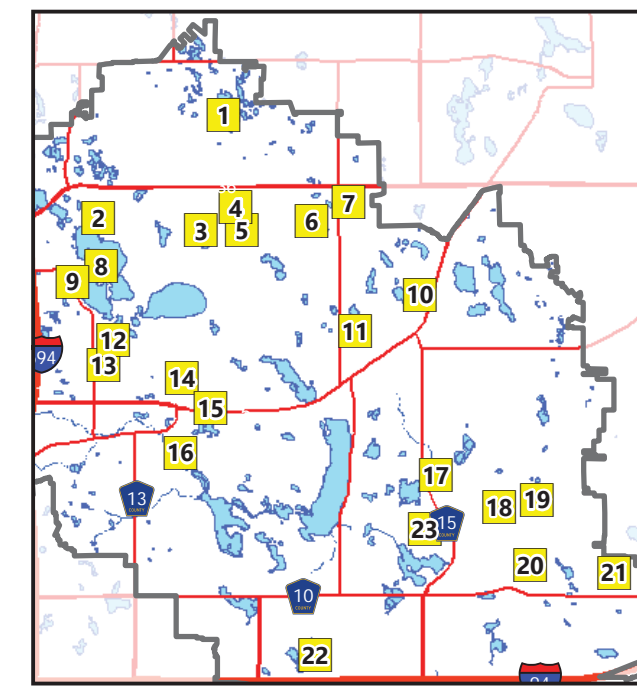
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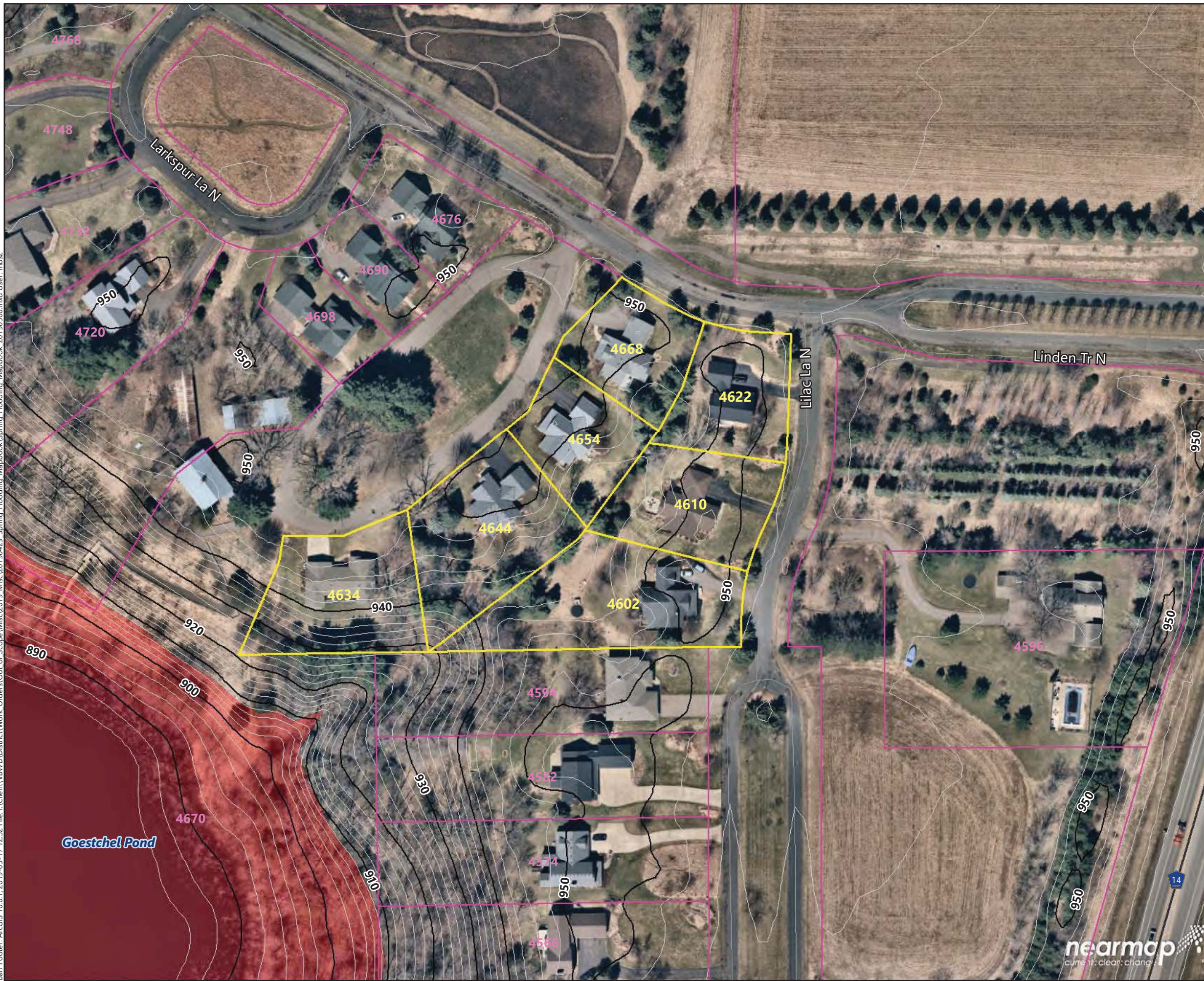









Map 9

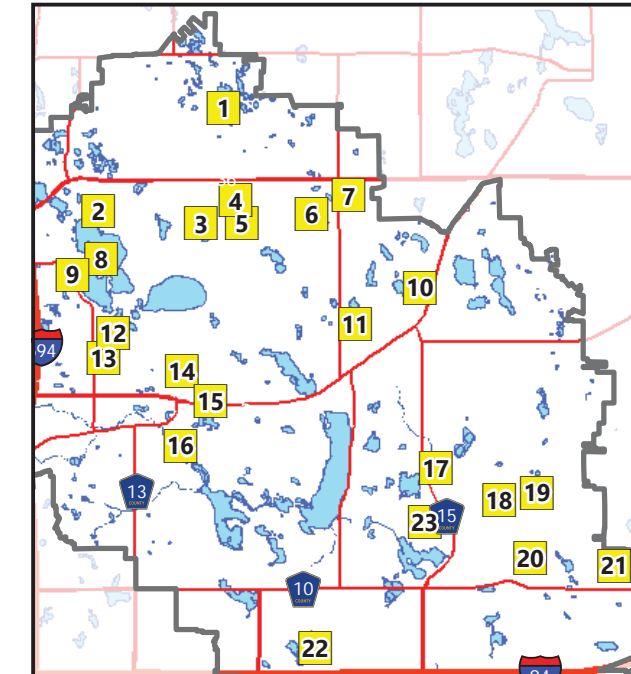
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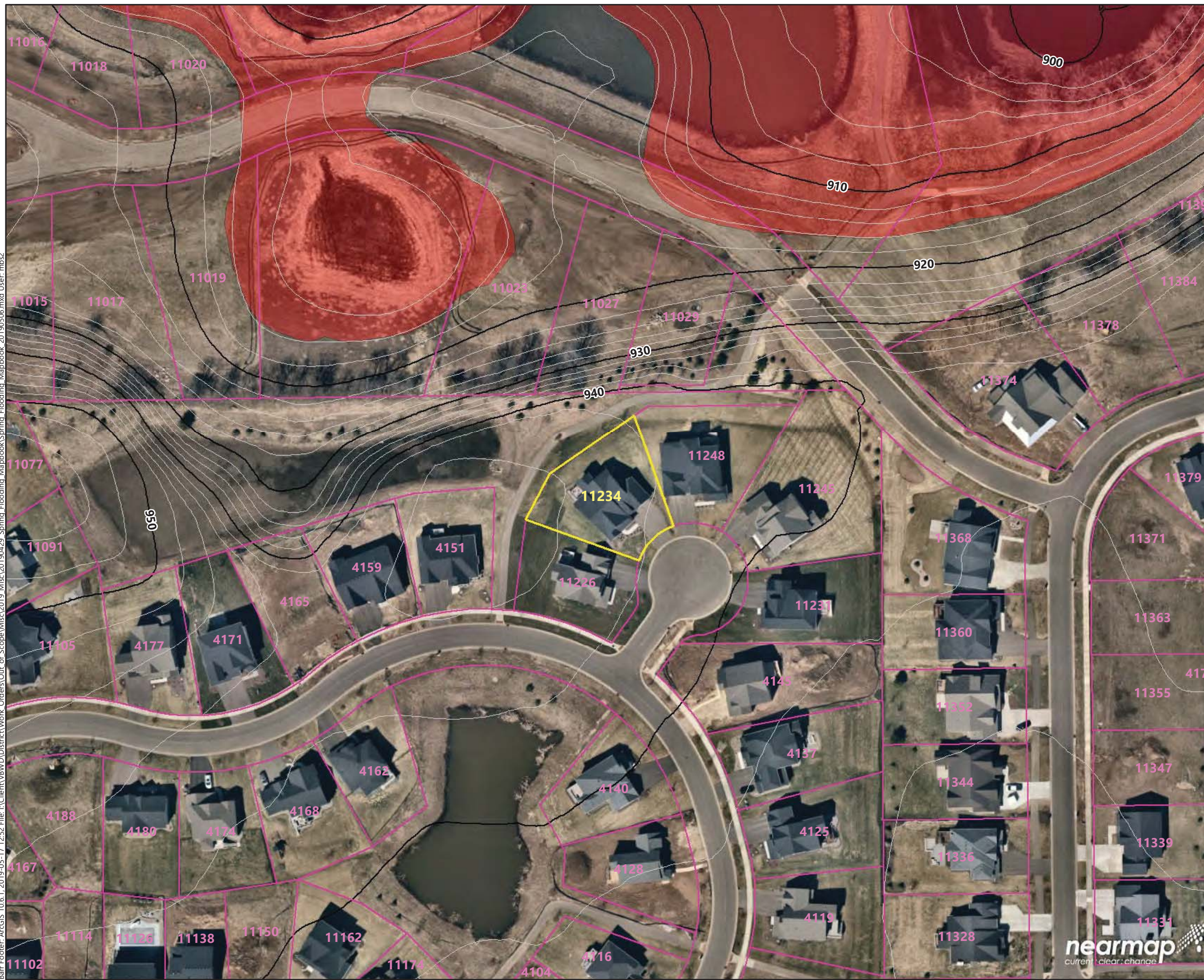


Map 10

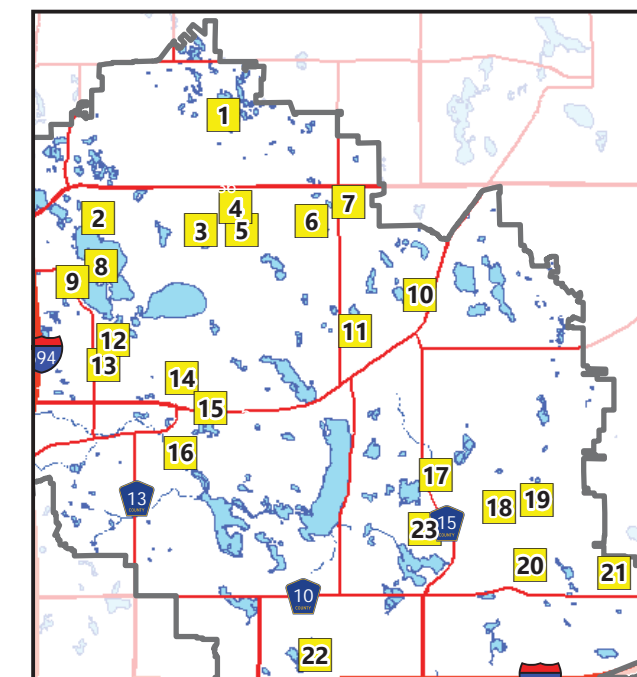
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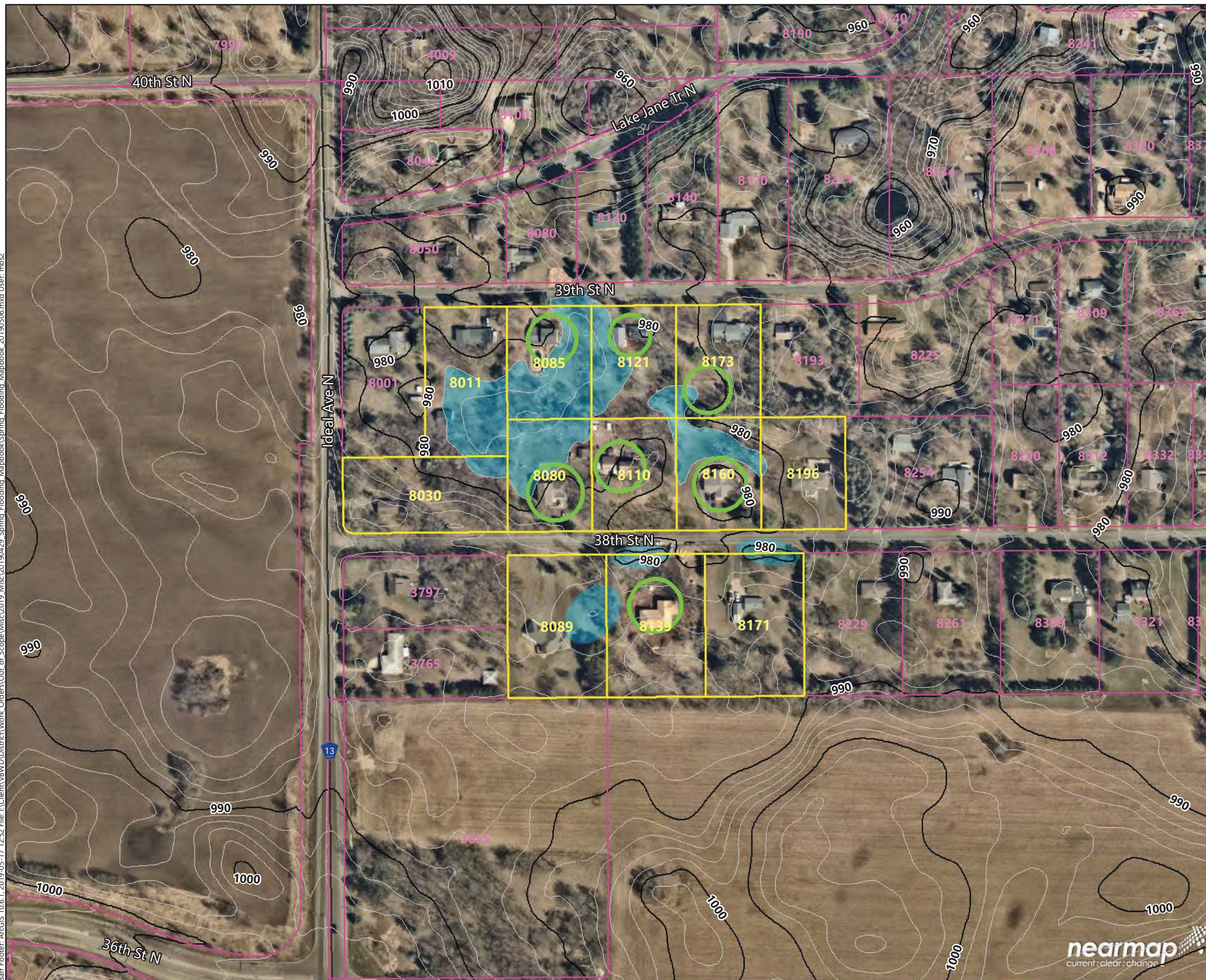









Map 11

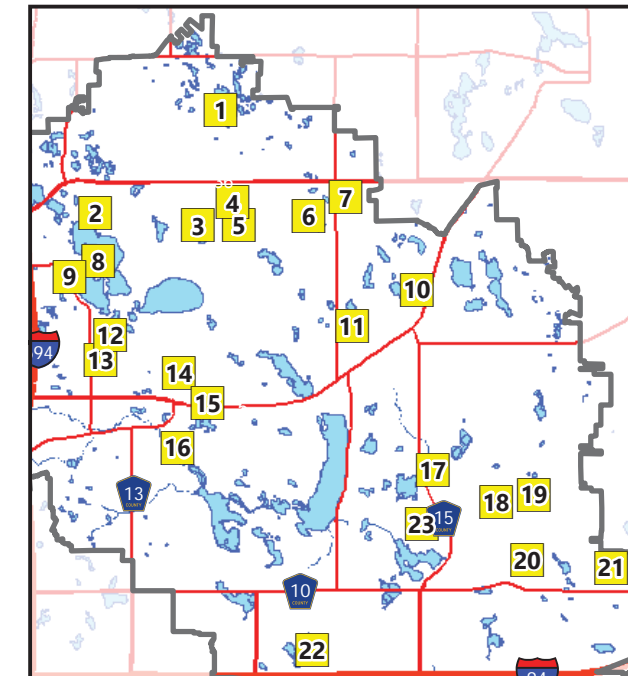
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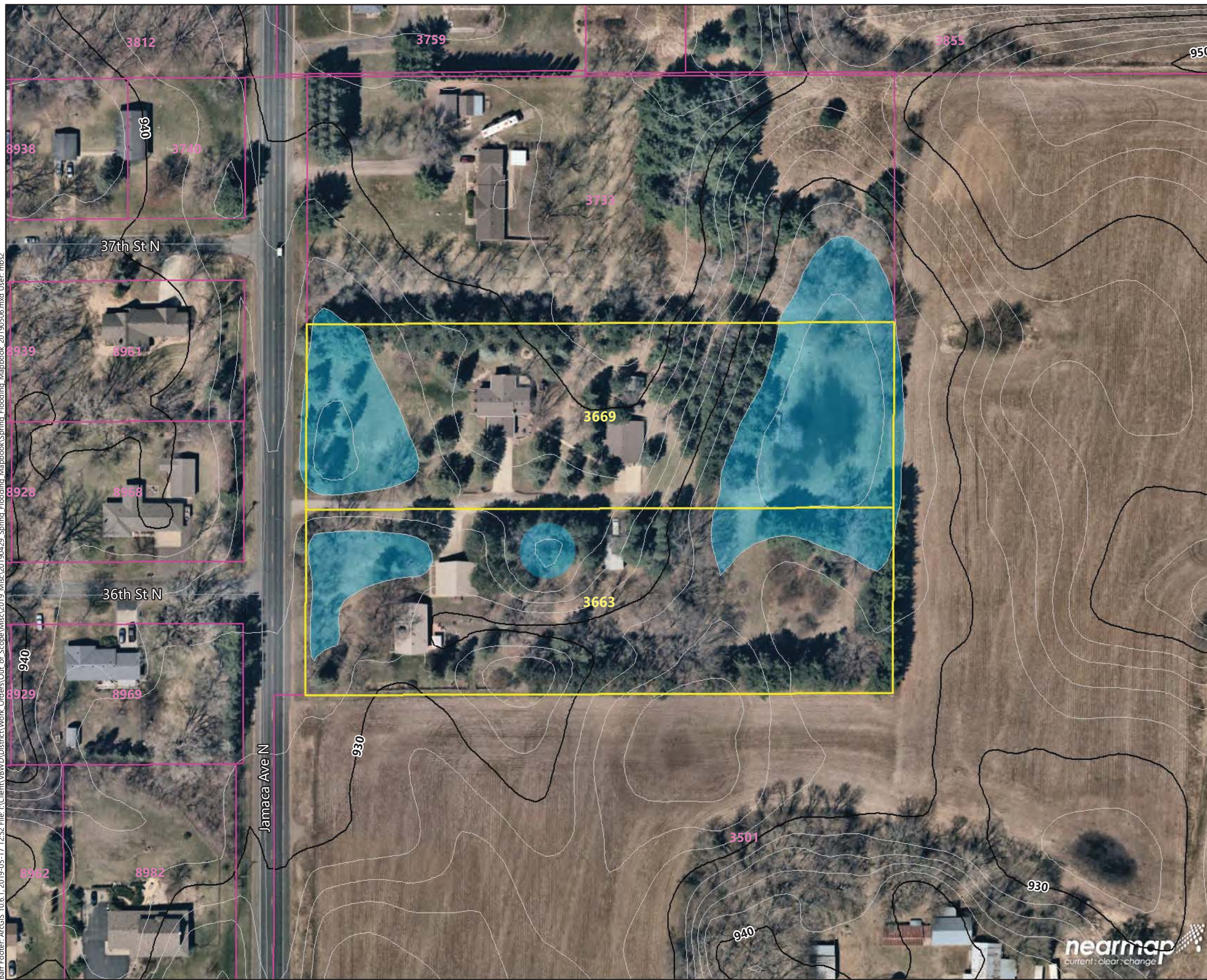








Map 13

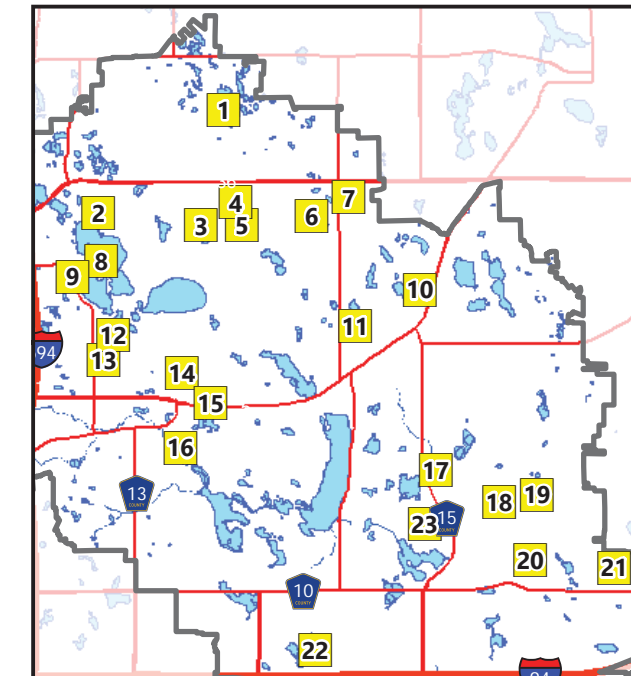
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Map 14

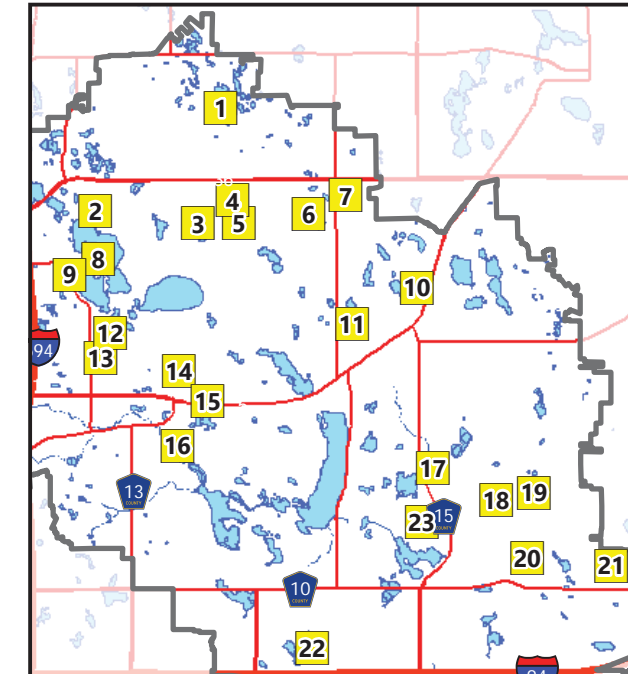
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Map 15

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Early Spring Flood Outlook – Elevated Threat

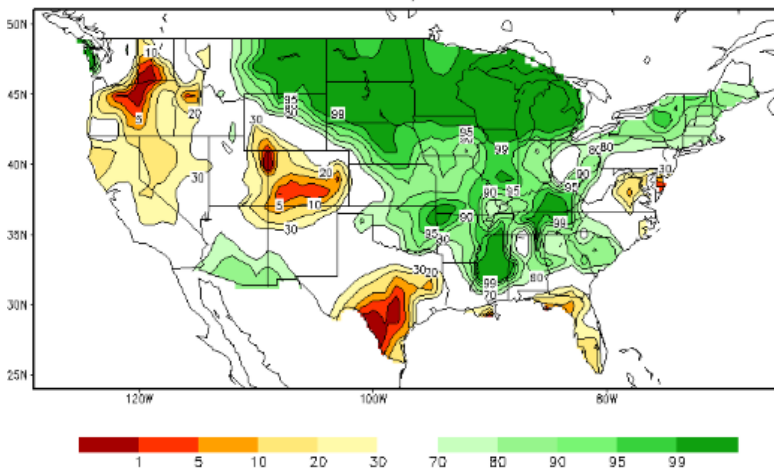
- Current conditions suggest spring flooding will be more likely than in a typical year, throughout the upper midwest. However, significant flooding is not certain.
- Major contributing factors to flood potential will be determined over the winter months.

What Do We Know So Far?

Soils are Wet

All of the upper Midwest received well above normal rain again this fall, mostly 150 to 200 percent of normal. This continued to supply soils with excess moisture as we froze the upper portion of the soil.

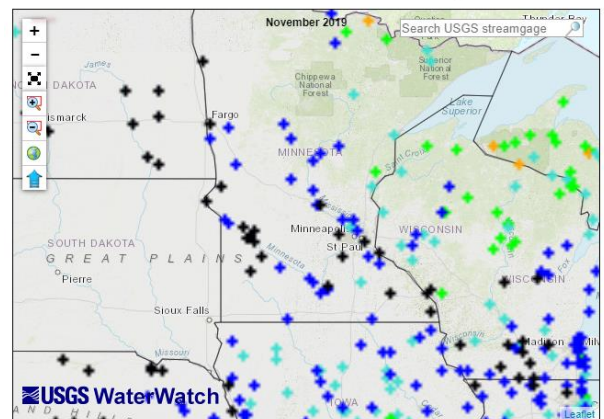
Calculated Soil Moisture Ranking Percentile
JAN 20, 2020



Streamflow is High

Going into seasonal freeze-up, river levels throughout the upper Midwest remained very high, with many showing record levels for early winter.

Map of monthly average streamflow compared to historical streamflow for the month of the year



Explanation - Percentile classes					
●	●	●	●	●	●
Low	<10	10-24	25-75	76-90	>90
	Much below normal	Below normal	Normal	Above normal	Much above normal

What does this mean?

Before we even look at snowpack, the soil and rivers are primed for high runoff. A low snowpack would help reduce the flood threat, but a normal or high snowpack would increase the risk of major spring flooding. Much like last year, the type of melt we get will be a major factor. Recall that

we had a nearly ideal melt in spring 2019

(mild days with cold nights for recovery, and a three-week period of no rain/snow in March). Even a “normal” melt season would result in significant spring flooding this time around.

Spring Flood Threat Checklist (as of mid January)

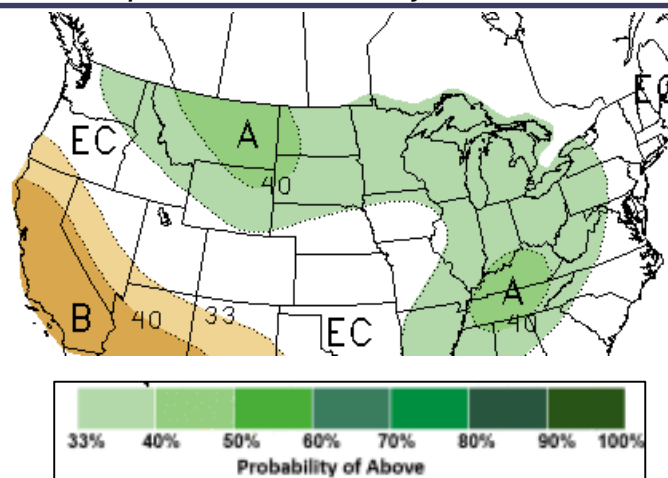
Threat	Impact to Potential Spring Flooding	Link to Image
High river levels	Increased Threat	USGS WaterWatch
High soil moisture	Increased Threat	CPC Soil Moisture
Winter Precipitation	To Be Determined	Winter Outlook
Snowpack/Liquid Equivalent	To Be Determined	Snow Analysis
Rate of Snowmelt	To Be Determined	24, 48, & 72 hr Snowmelt
Frost Depth*	So far, decreased threat	Frost Depth Map
Spring Precipitation	To Be Determined	Precip Forecast (in season)

* Frost depth is fairly shallow so far this winter due to mild temperatures and early snow "blanket".

Winter 2019: **Precipitation Outlook**

Outlooks continue to favor near to above normal precipitation for the winter months. The indicators are fairly weak in the global pattern this winter (no strong El Niño or La Niña), so confidence is not particularly high this year. Temperatures will be fairly mild into early February, then potentially below normal the rest of the month.

Keep in mind...even a normal amount of precipitation this winter season would bring an elevated risk for flooding this upcoming spring.



The updated Winter Outlook for Jan-Mar 2020 indicates slightly higher than normal chances for above normal precipitation.

Next Update Planned for mid February

2020 Probabilistic Spring Flood Outlook Dates:
February 13, 2020
February 27, 2020
March 12, 2020

Potential Flooding Impacts For Winter/Spring

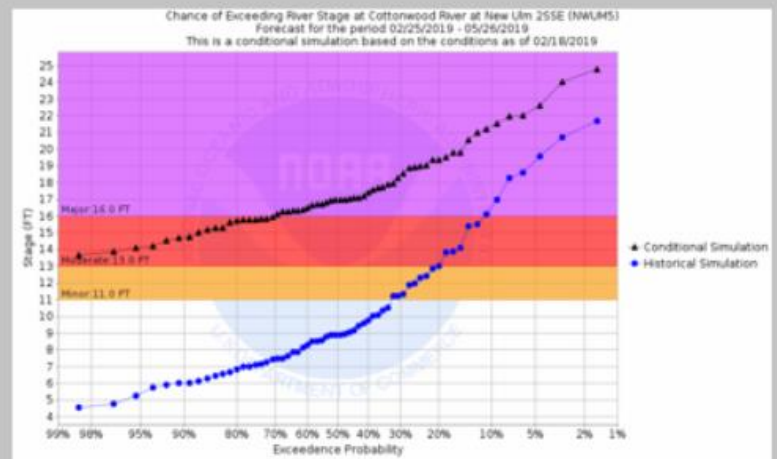
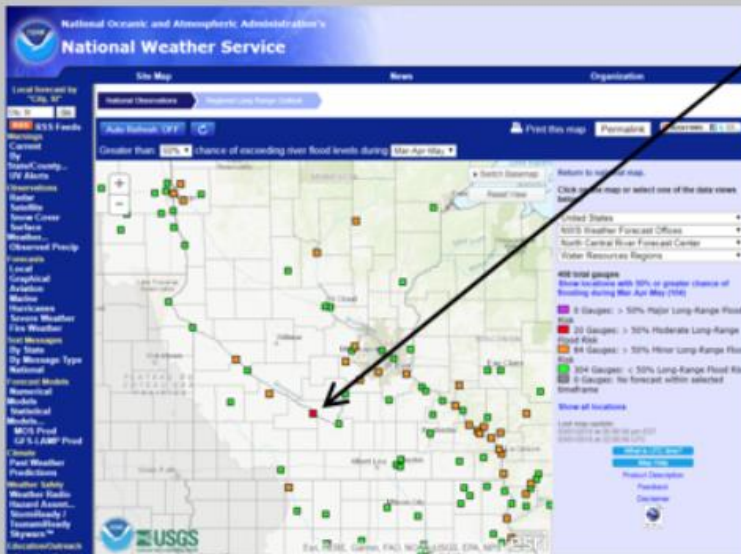
- Widespread flooding affecting infrastructure in Spring 2020
 - Including lakes, lowlands, agriculture, overland flooding.
- Elevated risk for ice jams

*The National Weather Service urges those who would be affected by flooding to **Prepare Now** and stay tuned to updates as we move through the winter into early spring.*

How to Read the Long Range Flood Risk Graphics – at https://water.weather.gov/ahps2/long_range.php?wfo=mpx

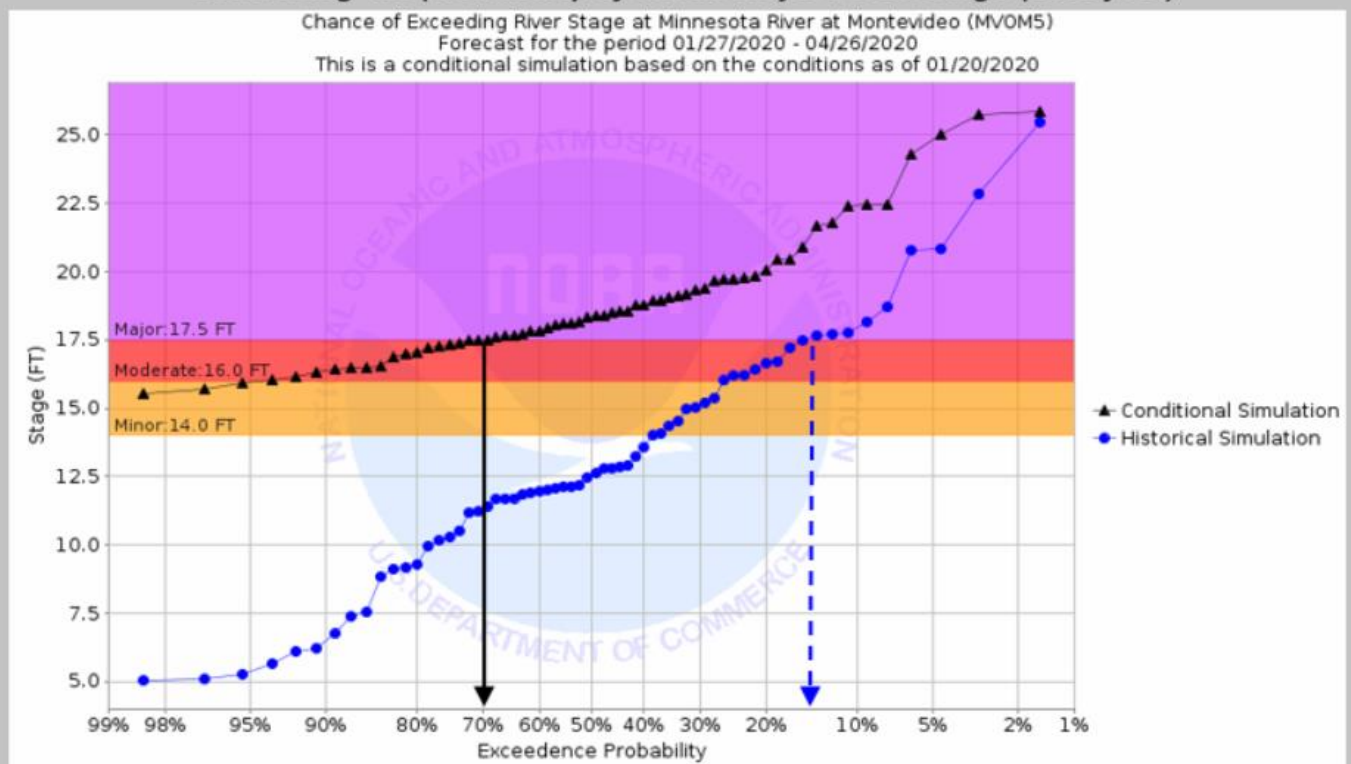
River forecasters run long range river models, including current soil moisture profiles, snow pack info, and 45-day model precipitation forecasts. The result is a graph of probability of reaching various stages .

Click a point in here -- hover over the "Probability Information" tab – and select the "...during Entire Period" graph. It will look something like this:



For Example, Look at the Minnesota River at Montevideo

Evaluating the probability of reach Major Flood Stage (17.5 feet)



Black Line represents the newest forecast – **Blue Line** represents historical average.

Chance of reaching major flood stage (purple) this spring is about 70 percent, well above the 15% historical average.