

Appendix J

Truckee River Flood Management Authority and National Weather Service
Memorandums and Presentation



Board of Directors

Donald Abbott, Chair	Alexis Hill, Vice Chair
Naomi Duerr	Mariluz Garcia
Ed Lawson	Miguel Martinez

Kara DiFrancesco, PhD
Bureau of Reclamation

Subject: Channel Capacity during sustained high streamflows along the Truckee River.

March 31, 2023

On March 3, 2023, I presented a talk on the subject of the Truckee River channel capacity and what kind of flows can be conveyed on a sustained basis without causing significant infrastructure damage. Under consideration is having sustained flows greater than 6,000 cubic feet per second (cfs) in order to better regulate and drain reservoirs. Overall, I carefully evaluated the Truckee River Channel Capacity Analysis by HDR and River Focus for flows from 6,000 cfs to 8,000 cfs. While I reviewed the report for the whole River from Reno to Pyramid Lake, the focus was a reach between Rock Blvd to McCarran Blvd along the South bank of the Truckee River. Up to around 8,000 cfs this is the only reach where breakouts significantly affect infrastructure. According to the analysis, there is a breakout along this stretch that begins at Truckee River flows as low as 6,000 cfs (p.55 of the Analysis). As the flow increases to 6,500 cfs to 7,000 cfs the size of this breakout increases and there is enough water breaking out into the Floodplain north of Mill Street to cause ponding against Mill Street at 6,500 cfs and then actual overtopping of Mill Street at 7,000 cfs with significant flooding along North Edison, North of Mill Street near the River as well as flooding south of Mill Street.

While acknowledging the potential breakout, I discussed the breakout flow and volume and balanced it against the capacity of a Sewer Main that was not part of the model that was used in the Analysis. According to City of Reno staff, this main has a diameter of 48 inches and actively flows water during high water events in the area. It continues to flow water until the water level in the River floods the outflow area creating backwatering that closes a flap that prevents water from going into or out of the main. The capacity of this main based on very basic conservative calculations is greater than 100 cfs when free flowing. Some initial cursory calculations of the breakout show it to be less than 100 cfs up to and perhaps beyond 7,000 cfs River flow. It appears the River at 7,000 cfs allows for at least partial outflow from the Sewer based on water elevation along the River. For higher flows, there may be backwatering that hinders sewer capacity.

During given flood events in the range of 10,000 – 12,000 cfs, TRFMA staff have seen ponding of water along North Edison and Mill during past floods, but the water does not breach Mill Street (I showed a picture of this during talk). At lower flows around 7,000 cfs, TRFMA staff have observed little or no water on North Edison nor ponding against Mill. In looking at the property, I believe the presence of this main along with drainage along Pioneer Ditch removes considerable water such that breaching or ponding against Mill or significant inundation along North Edison does not occur at flows up to and perhaps beyond 7,000 cfs. For this reason, I believe there is considerable evidence to allow for flow releases that cause the Truckee to go up to 7,000 cfs to manage reservoir storage.

E. George Robison, PhD, PE, DWRE
Executive Director Truckee River Flood Management Authority



Truckee River Breakouts and Drainage

George Robison

March 3, 2023



— BUREAU OF —
RECLAMATION

Truckee Basin Water Management Options Pilot Study—Channel Capacity Analysis

**Truckee Basin Water Management Options Pilot Study,
Nevada and California**

Prepared by

HDR, Inc.

Mitch Blum, P.E., Project Manager, Senior Water Resources Engineer
Keith Weaver, P.E., Senior Water Resources Engineer

River Focus, Inc. (Quality Control and Mapping)

Jake Gusman, P.E., D.WRE, Project Manager

Jon Viducich, P.E., Assistant Project Manager, Senior Hydraulic Engineer
Darren Bertrand, CFM, Senior Hydraulic Modeler

Reviewed by

Bureau of Reclamation – Lahontan Basin Area Office (LBAO)

November 9, 2022

Flow Values for Original analysis

Synthetic Flow Hydrograph Calculations				
Target Truckee River Peak Flow Rate (cfs)	Truckee River Recurrence Event Applied	Dry Creek Associated Peak Flow Rate (cfs)	NTD Associated Peak Flow Rate (cfs)	Steamboat Creek Associated Peak Flow Rate (cfs)
6,000	5 Year	132	108	488
6,500	5 Year	143	117	529
7,000	10 Year	168	136	619
7,500	10 Year	180	146	663

Areas of active Breakout 6000 cfs

1. Oxbow Park Minor and floodable floodplain
2. Between Rock and McCarran
3. Downstream undeveloped floodplains near River (29 breakouts total) “no insurable structures or roads”
4. Wadsworth Right Bank into Canal

* Pages 55 and 56 of November Report



Areas of active Breakout 6500 cfs

1. Only additional breakout near Lockwood minor flooding in undeveloped land.
2. In the Rock/McCarran Blvd Reach there is additional flooding
3. Ponds against but does not overtop roadway on Mill Street

* Pages 56 of November Report



Areas of active Breakout 7000 cfs

1. Only additional breakout downstream of Vista Undeveloped area. In the Truckee Meadows Reach around Reno.
2. In the Rock Blvd Reach there is additional flooding and model shows overtopping Mill Street into Energy Way.
3. Four additional breakout in downstream reach but undeveloped.

* Page 56 of November Report



Areas of active Breakout 7500 cfs

1. New Breakouts around Reno include overbank near McCarran Bridge on North Bank
2. Lower Reach has an additional breakout at 2 locations on near Lockwood and the other near Derby Dam. Small breakouts with no developed land threatened.

* Pages 56-57 of November Report



Areas of active Breakout 8000 cfs

1. New Breakouts around Reno another Breakout South Bank just downstream of Rock Blvd (Rock McCarran Reach). Another just downstream of McCarran Bridge. A very minor area downstream of TMWRF near mouth of Steamboat
2. Lower Reach has 7 additional breakouts Small breakouts with no developed land threatened.

* Pages 57 of November Report



Greater than 8000 cfs

1. The number and amount of water coming in from Rock to McCarran as well as River level indicates strong chance of Mill flooding and continual inundation of North Edison

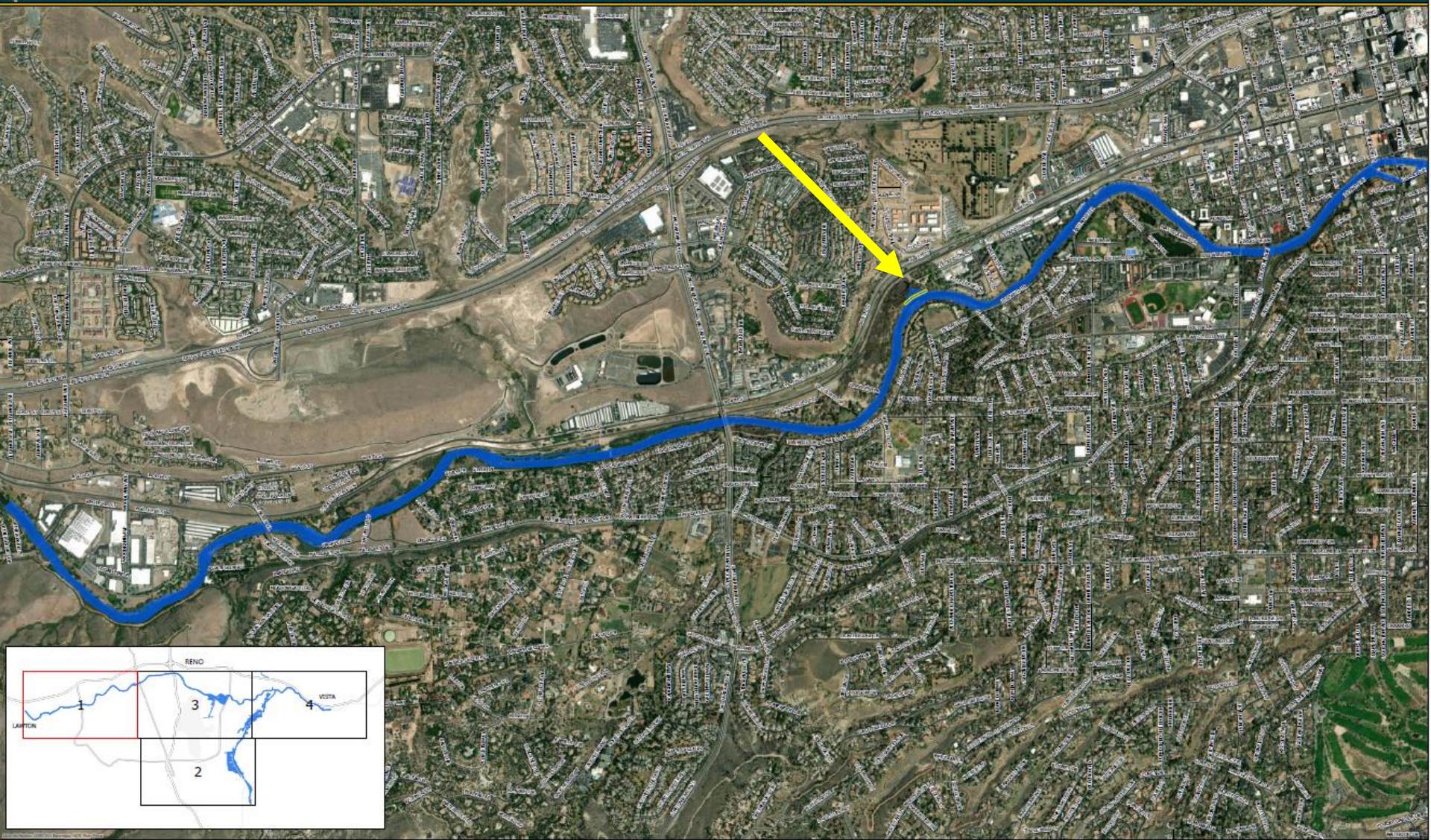


Tributary Flows for Sustained analysis

***Truckee Flows the same but sustained for 21 days**

Table 22. Tributary Baseflow Values

Tributary Stream	Winter 2015 Mean Discharge (cfs)	Winter 2017 Mean Discharge (cfs)	Final Baseflow (cfs)
North Truckee Drain	1	10	6
Steamboat Creek	5	97	61
Dry Creek	N/A	N/A	0



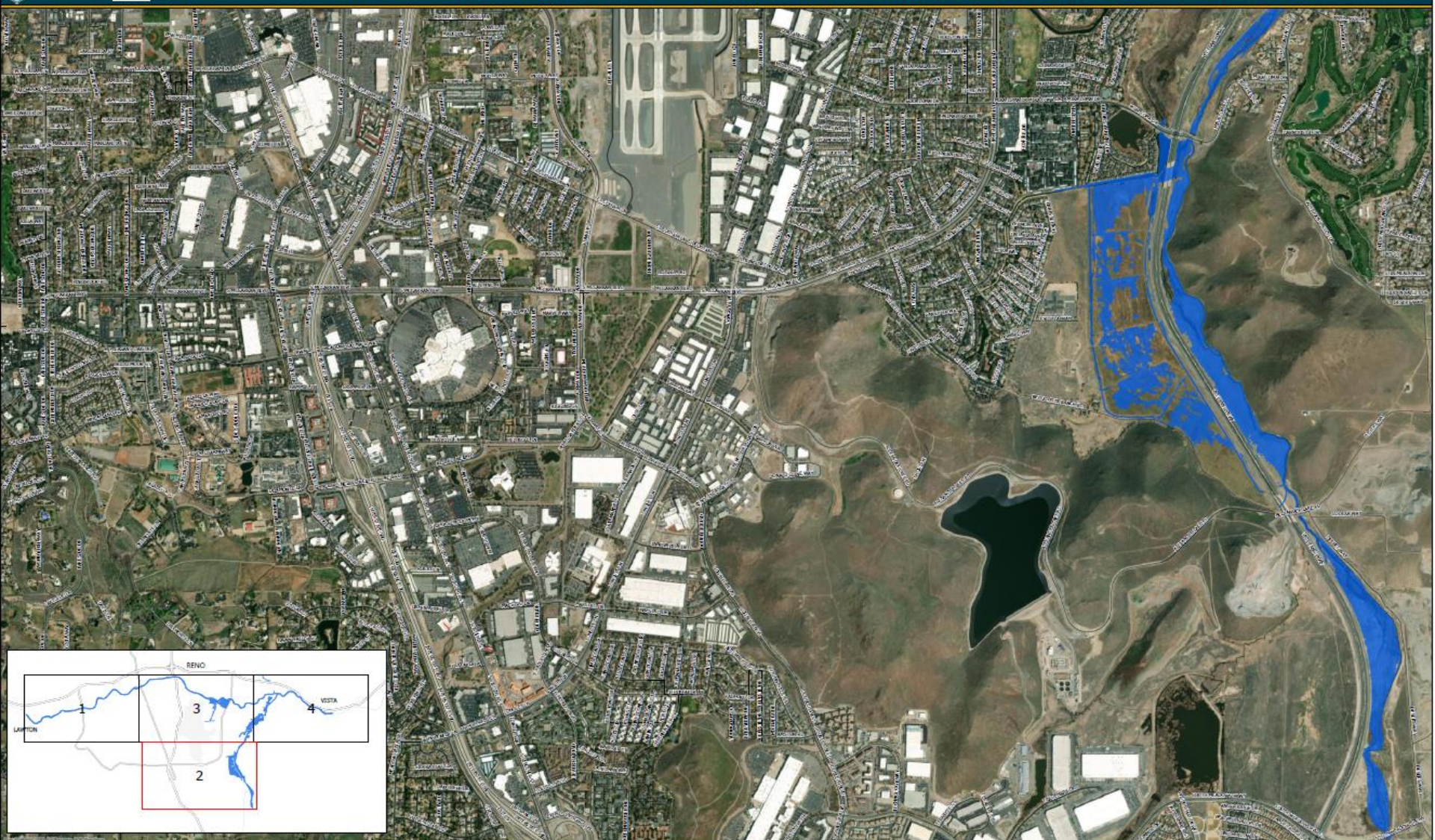
6,500 cfs Inundation Breakout Locations

21-day Sustained Flow: 6,500 cfs at Reno Gage

MAP SHEET 1 OF 4



*Mapping shows the maximum, stabilized inundation.



■ 6,500 cfs Inundation
 ■ Breakout Locations

*Mapping shows the maximum, stabilized inundation.

21-day Sustained Flow: 6,500 cfs at Reno Gage

MAP SHEET 2 OF 4

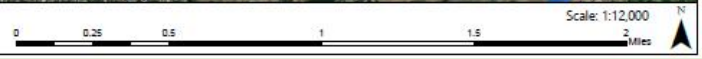


Scale: 1:12,000



■ 6,500 cfs Inundation ■ Breakout Locations

21-day Sustained Flow: 6,500 cfs at Reno Gage
 MAP SHEET 3 OF 4



*Mapping shows the maximum, stabilized inundation.



6500 cfs sustained



7000 sustained



7500 sustained



Drainage Main

Truckee River

Truckee River

Anchor Concrete

Truckee River
Tahoe-Pyramid Bikeway
Glendale Park

Truckee River
Tahoe-Pyramid Bikeway

SANCHEZ GRANITE INC

TMWA Fill Station

Diversified Metals

Ferrari Farms
Temporarily closed

US Air Force Cap Liaison

Daddy's Tacos
Mexican

Merry Maids

Mill St

N Edison Way

Kiwanis Activity Center
and Bike Program

Pioneer Ditch

HERO Environmental
Services

THE FACTORY-BMW
& EUROPEAN CARE...

Heritage Bank of
Nevada A division of...

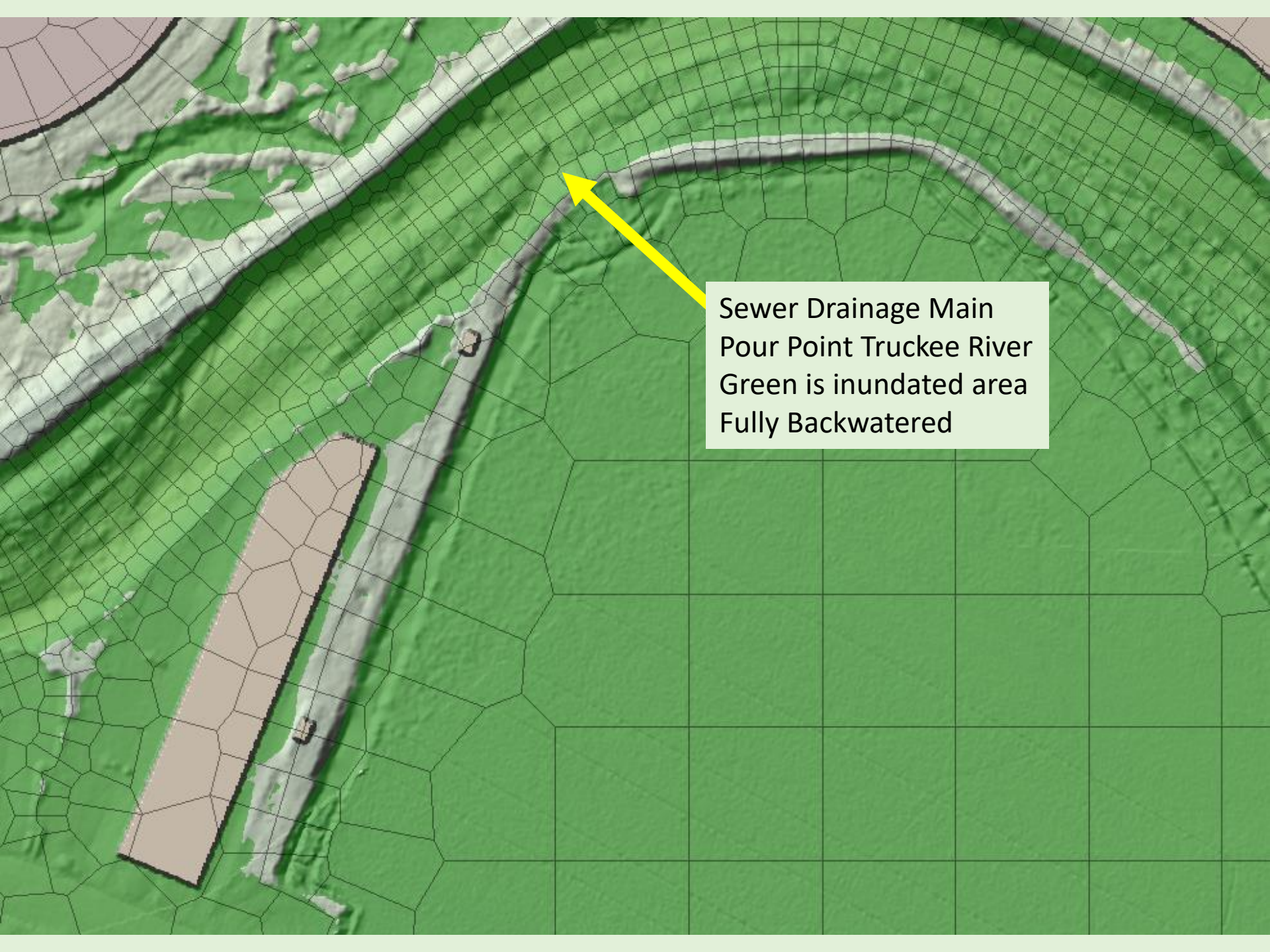
Havelock Wool
Insulation materials store

Paul's Heating and

Corate Blvd

Mill St

Titan Electrical

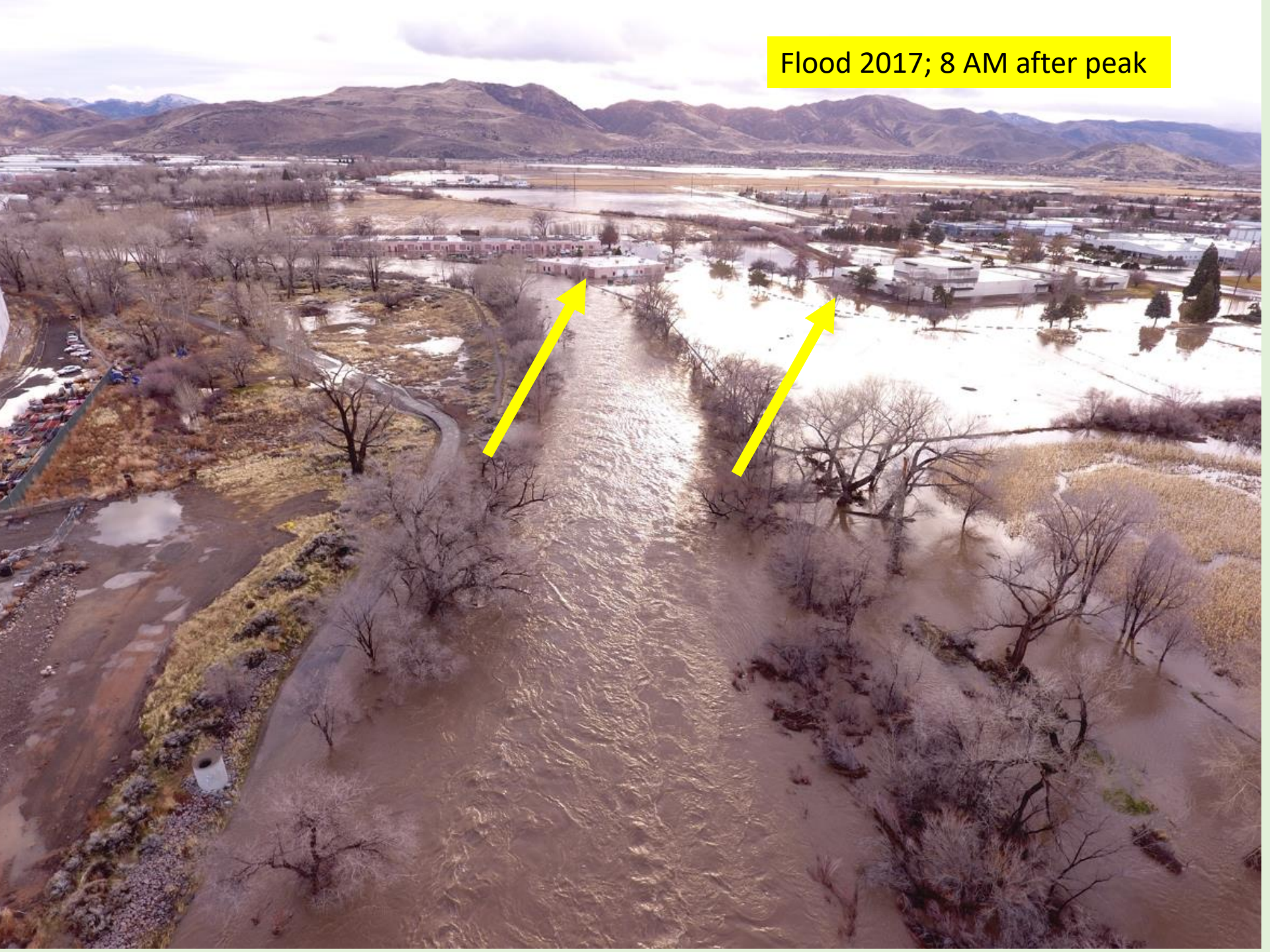


Sewer Drainage Main
Pour Point Truckee River
Green is inundated area
Fully Backwatered

Bank near De Francisco



Flood 2017; 8 AM after peak

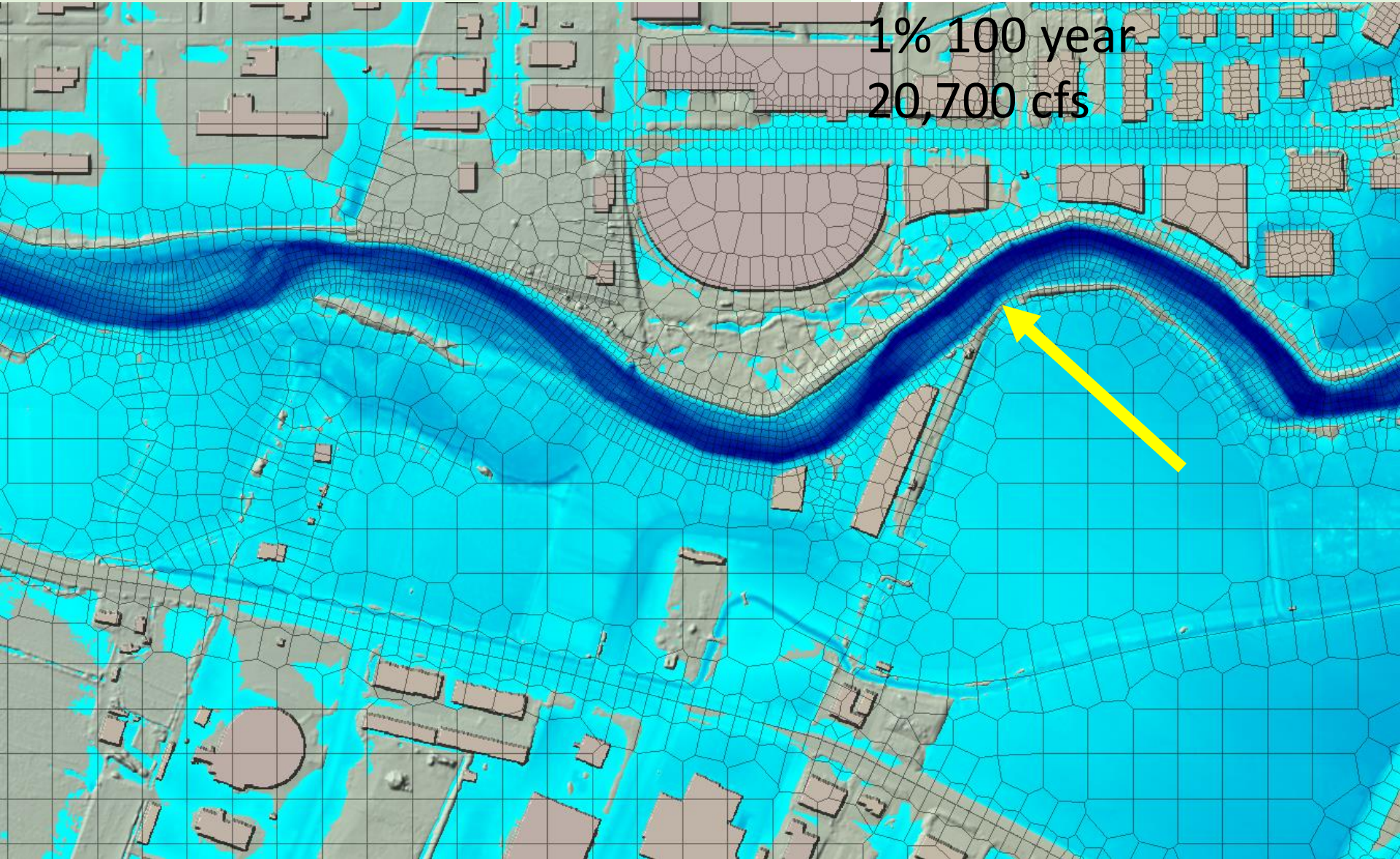


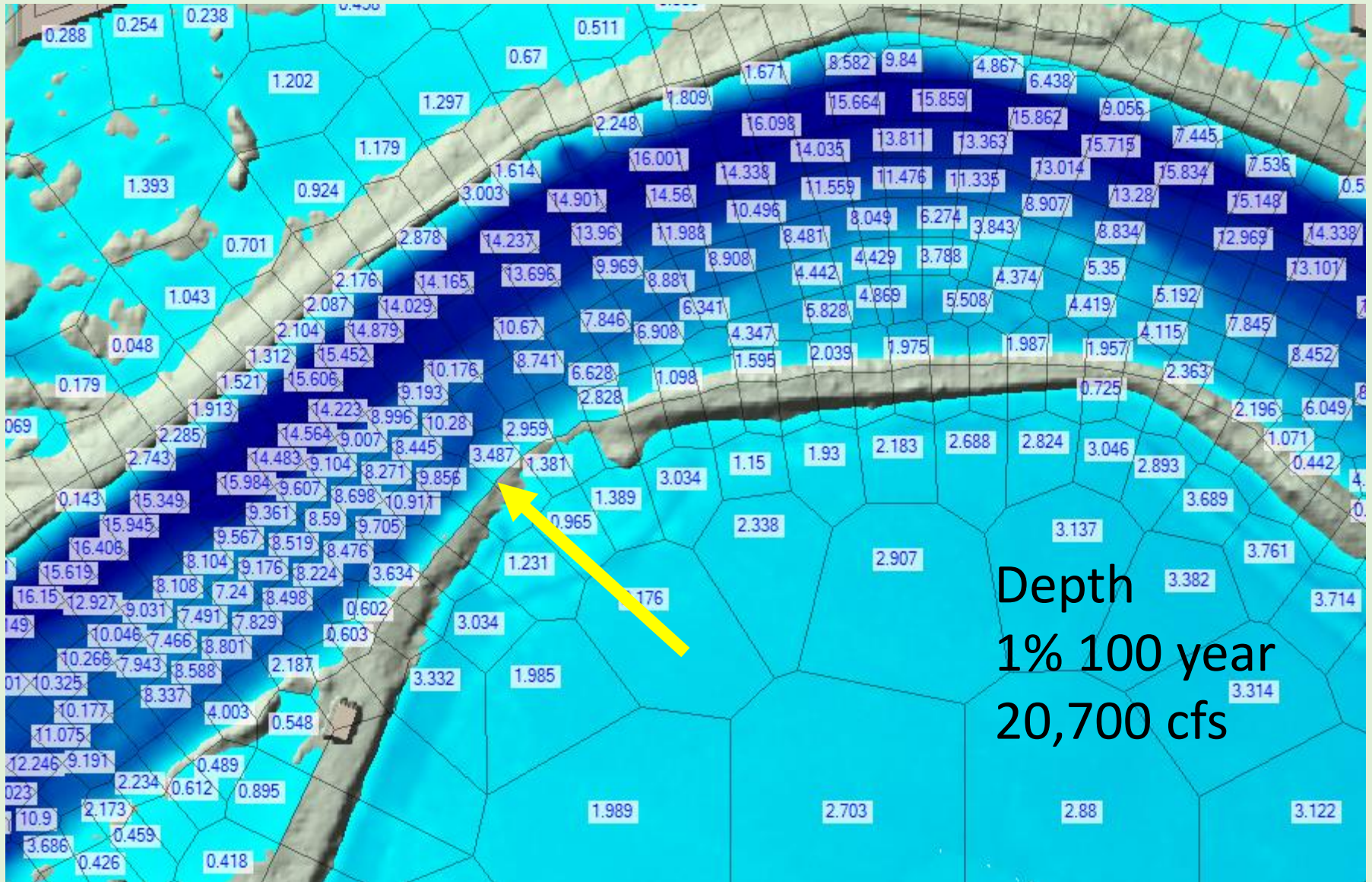


Drainage Main
48 inch RCP
100+ cfs capacity

Depth

1% 100 year
20,700 cfs

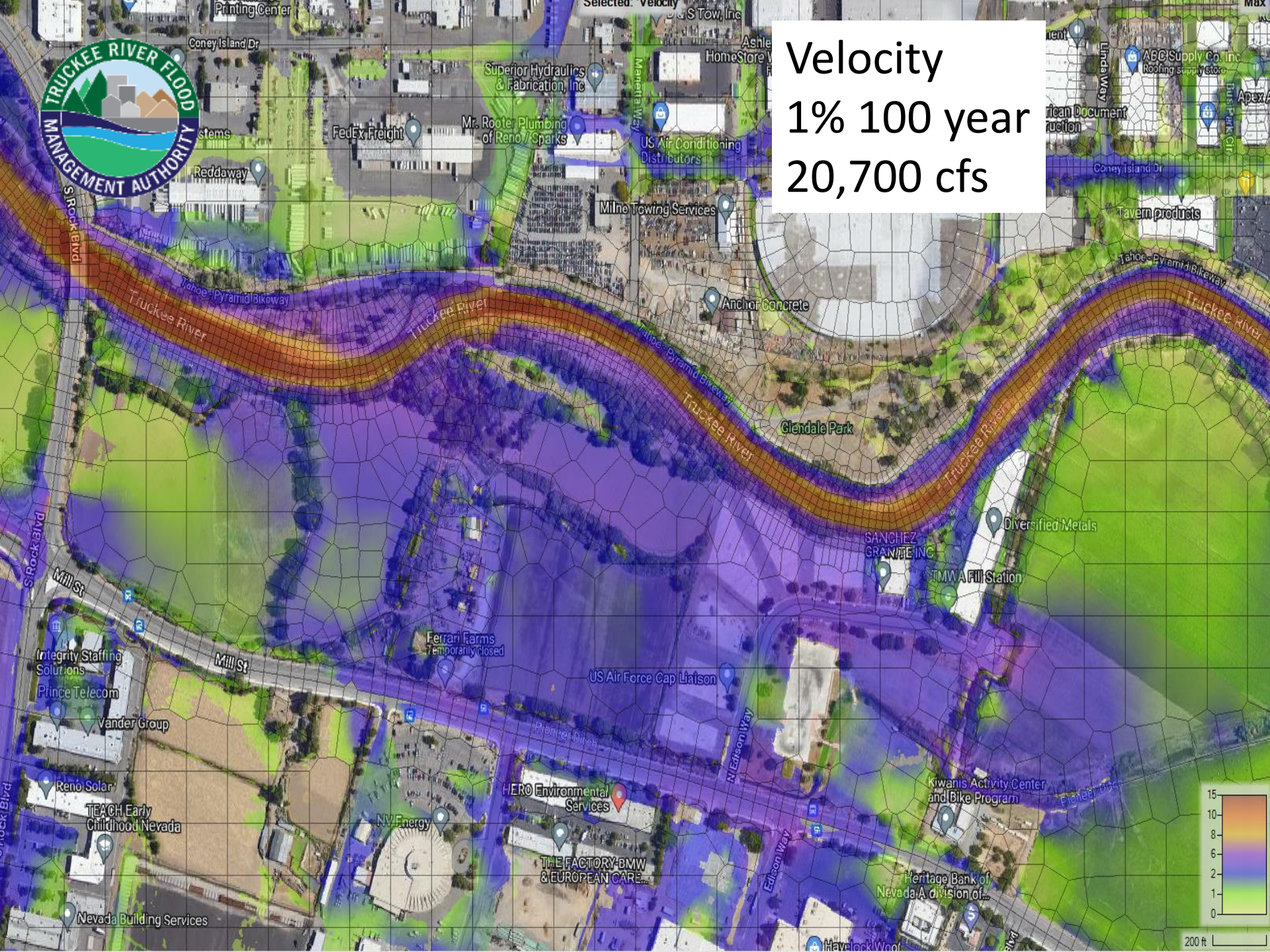


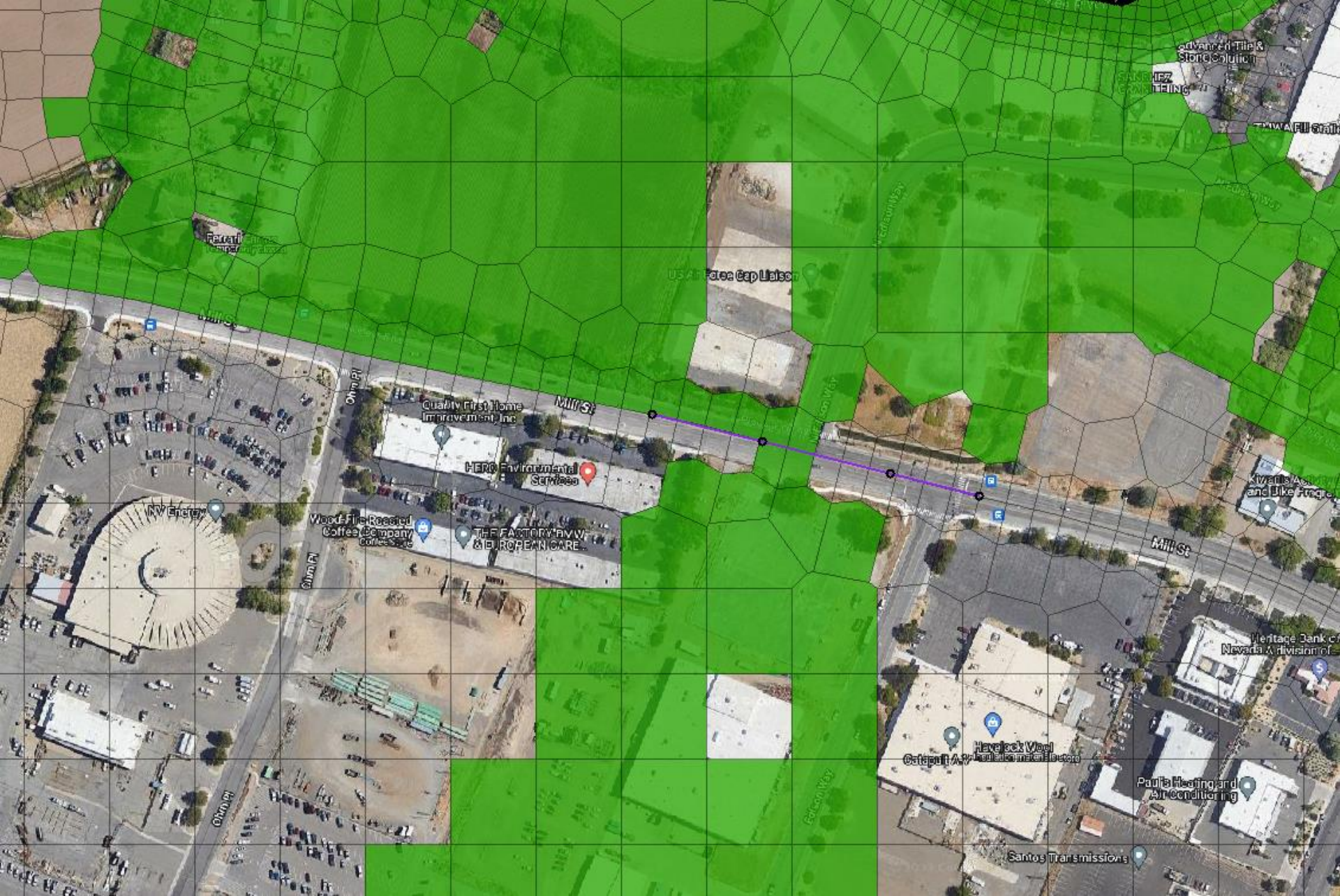


Depth
1% 100 year
20,700 cfs

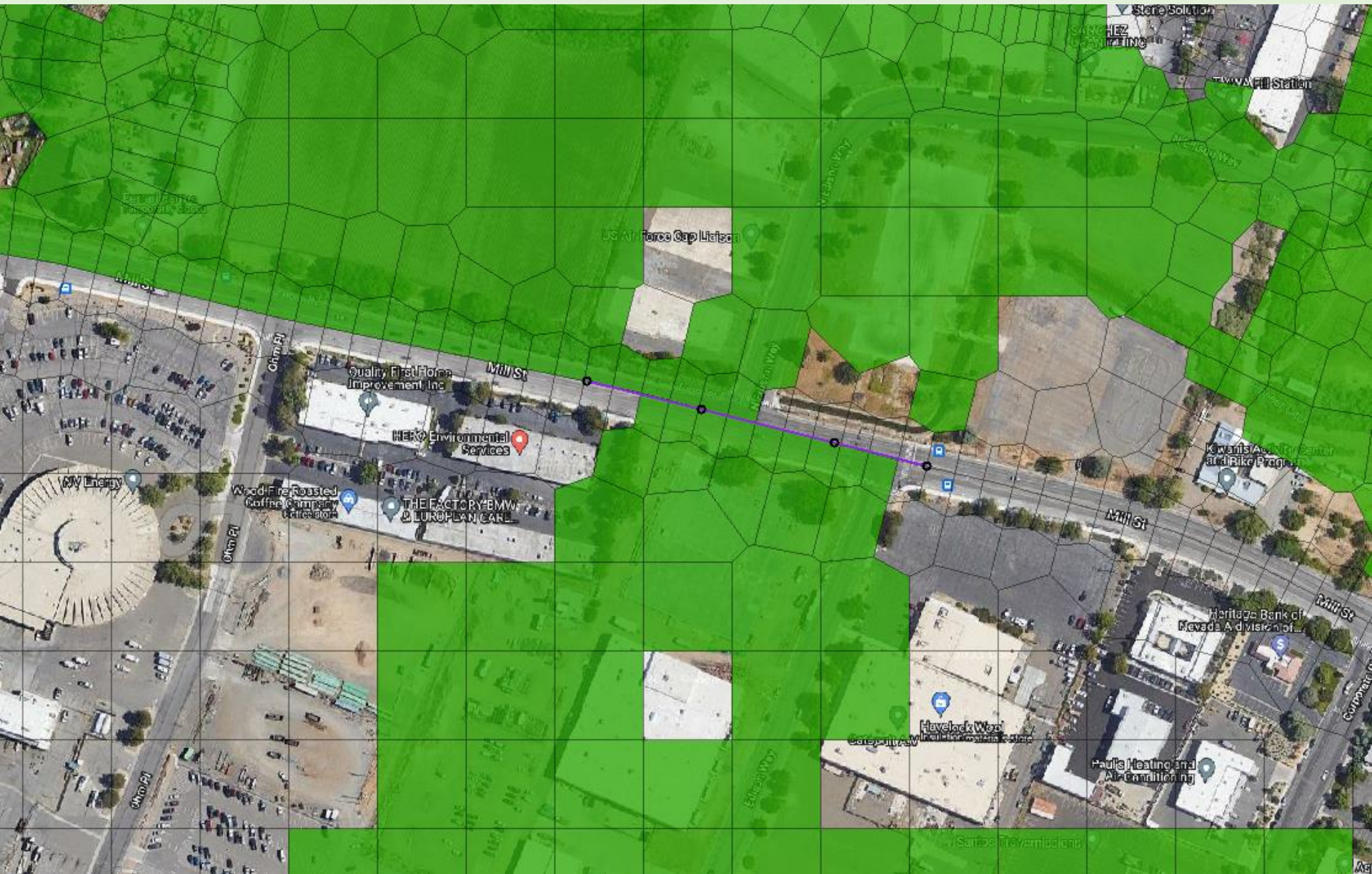


Velocity
1% 100 year
20,700 cfs

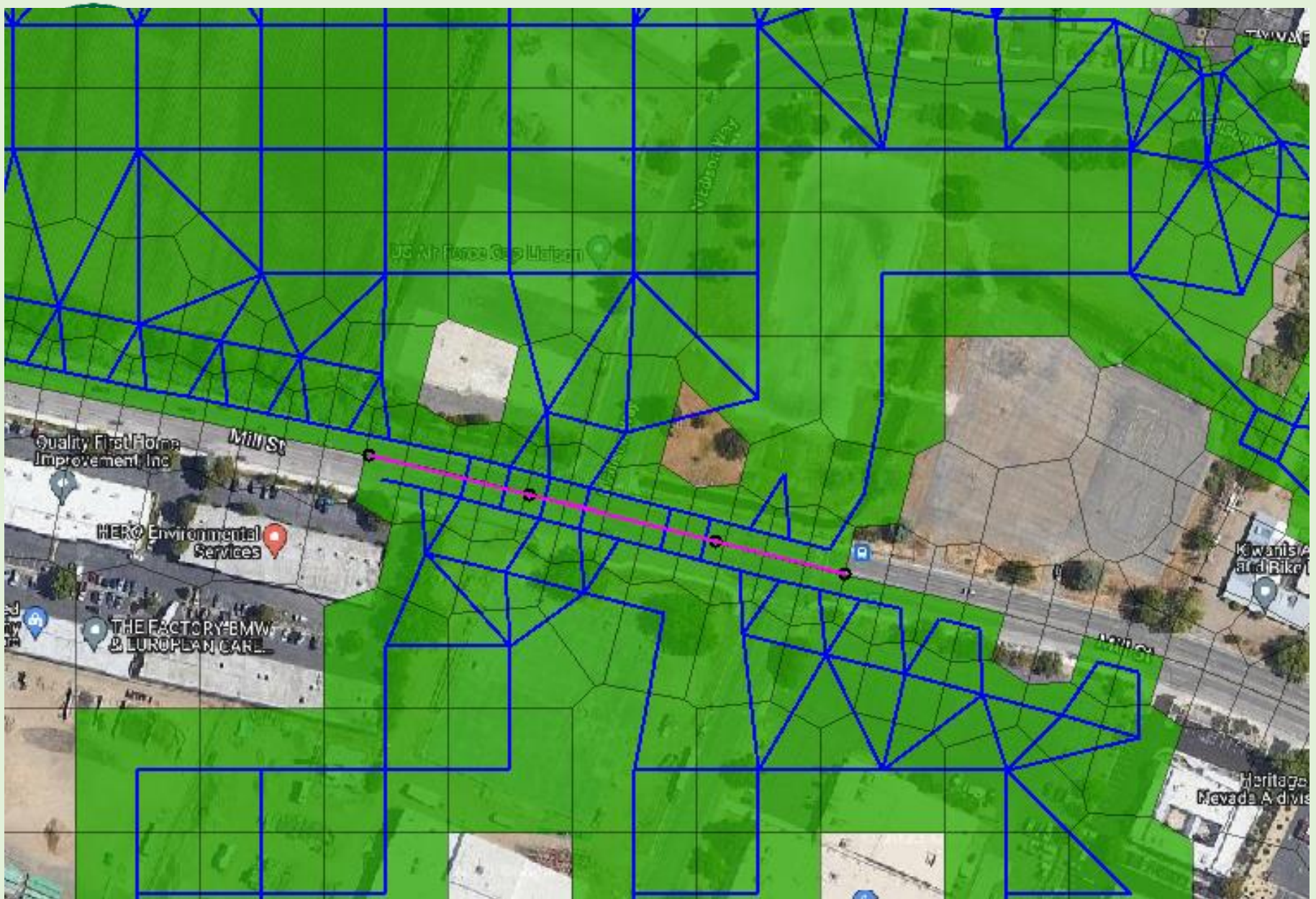




6500 cfs



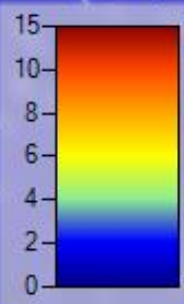
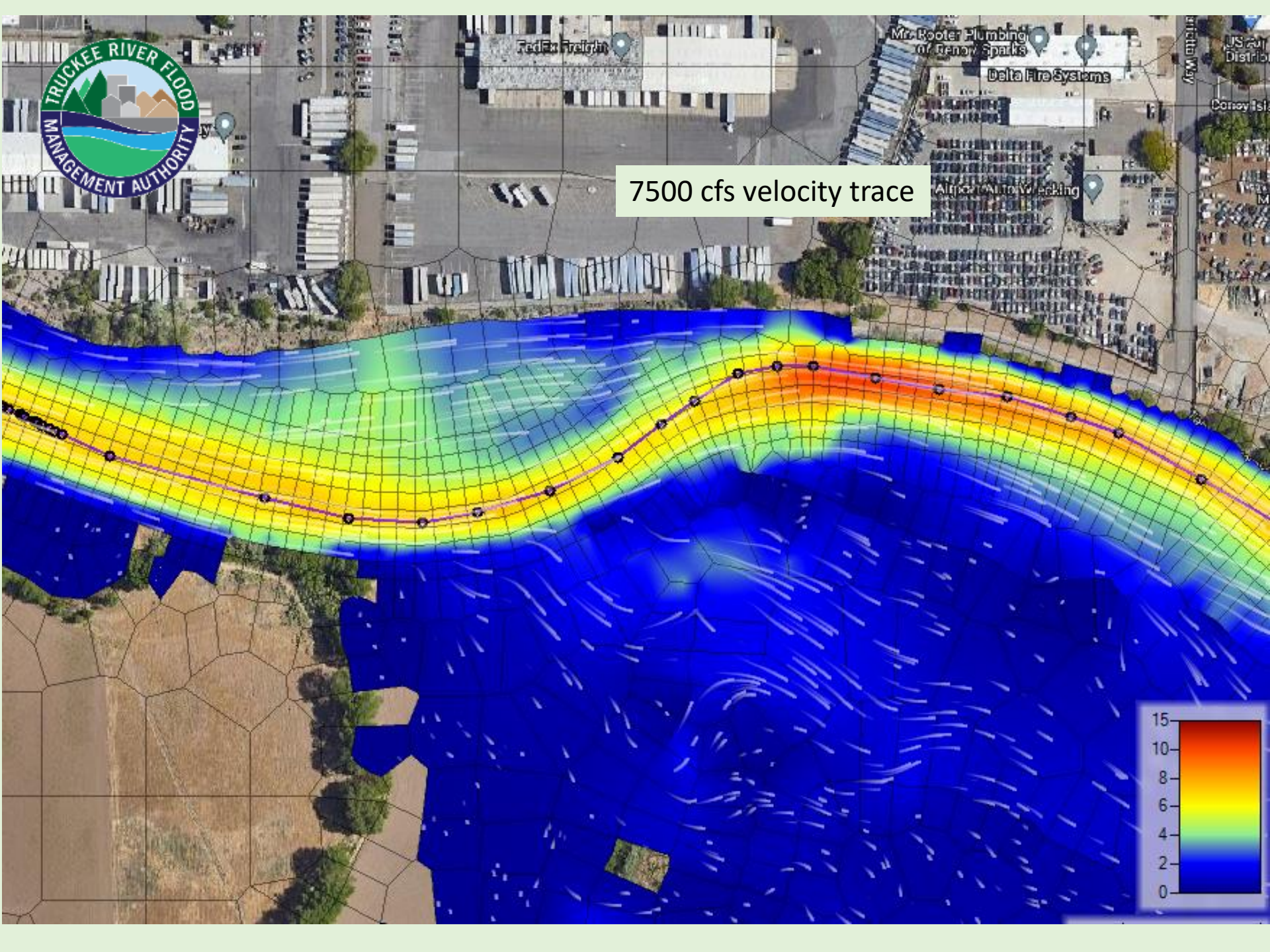
7000 cfs



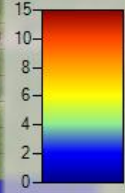
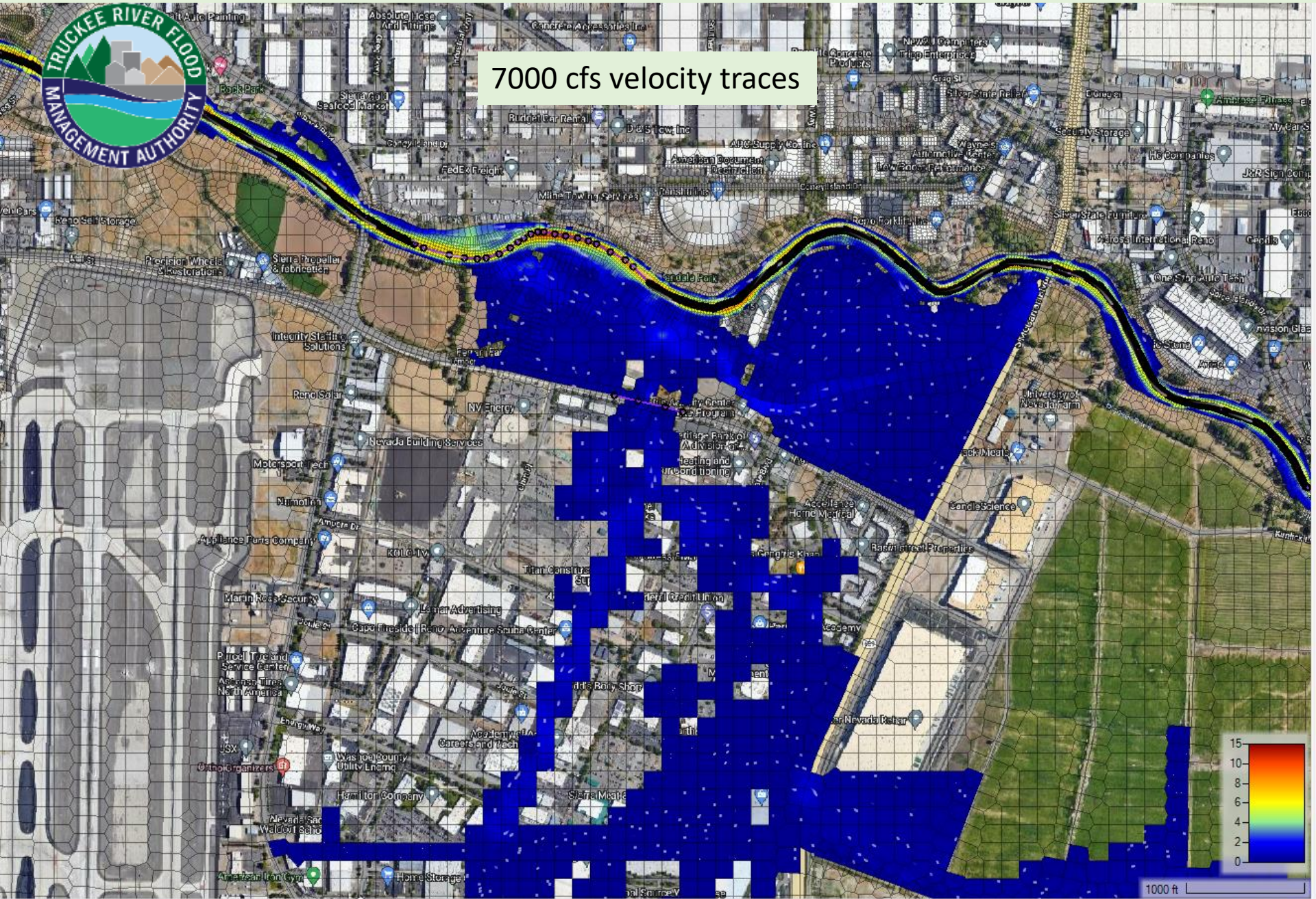
7500 cfs



7500 cfs velocity trace



7000 cfs velocity traces



1000 ft



New Meadows Project and changes



- Fill with Levee GSR vs. Wall
- Levee vs. Wall TMWA North Bank
- Fill with terracing Airport vs. terracing and Levee
- Realigned channel with habitat enhancement Mill McCarran with Levee vs. Levee and Wall and no instream enhancement only floodplain.
- Mostly Levee vs. Wall north Bank to Vista vs. Wall with some levee
- ~Up to an extra 2400 cfs

**All changes will have same or better Hydraulic properties when completed for minimization of downstream impacts.*

Summary

1. The capacity of the drainage main is likely greater than the breakout flow.
2. This is the reason that in photos with larger floods we do not see it breaching Mill Street
3. Because Edison gets flooded fairly significantly at 7500 cfs, I think 7000 is justifiable but probably not 7500 cfs.
4. Need to get the actual breakout rates to absolutely verify all this but they are likely less than water main.





U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Weather Service
2350 Raggio Parkway
Reno, Nevada 89512

July 13, 2023

Truckee Basin Water Management Options Pilot Technical Team
c/o Kara DiFrancesco, Project Manager
Bureau of Reclamation
Lahontan Basin Area Office
705 North Plaza Street
Carson City NV 89701-4015

Subject: High flow targets for the Truckee River through Reno and Sparks

In 2018 the National Weather Service (NWS) Reno office proposed updates to the flood stages for the Truckee River through the Reno and Sparks metropolitan area to better reflect current river conditions and flood control improvements. Impacts and lack of impacts from recent high flow and flood events along with feedback from partners indicated that the previous flood stages were too low and resulted in over-warning. Careful evaluation of flood impacts and feedback and observations from a wide variety of public safety partners was incorporated into the changes in flood stages at the Reno, Vista and Wadsworth gage locations. Unanimous approval of the new flood stages was confirmed from partners, including but not limited to, the Federal Water Master, Truckee River Flood Management Authority, City of Reno Utility Services, City of Sparks Community Services, Washoe County Emergency Management, Storey County Emergency Management, and the Pyramid Lake Paiute Tribe Emergency Management.

I am aware of the proposed increase of the high flow target for the Truckee Water Control Manual from 6,000 cfs at the Reno gage to 7,000 cfs at the Reno gage. The proposed flows are well below the updated flood stages. While the Channel Capacity Analysis by HDR and River Focus indicate significant out of bank flows at and above 6,000 cfs near Edison Way, we received no reports of flooding in this area at 4/7/2018 at 6,690 cfs, and inundation was less severe than indicated by much lower flow simulations for the 2/10/17 event.

I have high confidence that this change will increase the flood resilience for the communities along the Truckee River by allowing for more rapid evacuation of flood control space before and after flood events and potential flood events, while only causing temporary inconvenience flooding issues in a few parks, along the bike path, and in undeveloped sections of the floodplain. I support the proposed increase in the high flow target to 7,000 cfs at the Reno gage.

Sincerely,

Tim Bardsley

Tim Bardsley
Senior Service Hydrologist, NWS Reno