

GLWA Board of Directors Meeting

September 1, 2021

June 25, 2021 Post Event Analysis



Ed Hogan, PE



Dave Nitz, PE

Agenda

1. Investigation Progress
2. Weather Forecast and Actual Rainfall
3. GLWA Operations Staffing Timeline
4. Stormwater Pumping Stations – Electrical Considerations
5. System-Wide Operational Overview
6. Preliminary Mapping of Claimants

Investigation Progress

Investigation Progress to Date into the June 25, 2021 Wet Weather Event

1. Forensic Data Collection, Review and Analysis
2. Event Operational Review, Analysis and Timeline
3. Basement Flooding Complaints
4. Event Modeling Simulations and Analyses

Weather Forecast and Actual Rainfall

Weather Forecast for June 25 thru June 30, 2021 Event

Weather Sentry – GLWA Subscription

Thursday, June 24, 2021

Precipitation Forecast for Southeast Michigan

From the weather sentry report, expecting rain for **Downtown Detroit** from

- **06/25/2021-0.74 inches**
- **06/27/2021-0.31 inches**
- **06/29/2021-0.17 inches**
- **06/26/2021-0.33 inches**
- **06/28/2021-0.05 inches**
- **06/30/2021-0.15 inches**

From the weather sentry report, expecting rain for **DTW** from:

- **06/25/2021- 0.82 inches**
- **06/27/2021-0.34 inches**
- **06/29/2021-0.18 inches**
- **06/26/2021-0.37 inches**
- **06/28/2021-0.06 inches**
- **06/30/2021-0.16 inches**

DETROIT-DOWNTOWN

Date	Wed 6/23	Rest of Thu 6/24	Fri 6/25	Sat 6/26	Sun 6/27	Mon 6/28	Tue 6/29	Wed 6/30	Thu 7/1	Fri 7/2	Sat 7/3	Sun 7/4	Mon 7/5	Tue 7/6	Wed 7/7	Thu 7/8
Weather Condition																
Weather	Cloudy	Partly Cloudy	Rain	Rain	Rain	Rain	T-Storms	T-Storms	T-Storms	T-Storms	Rain	Partly Cloudy	Partly Cloudy	Partly Cloudy	Partly Cloudy	Partly Cloudy
Precipitation Chance (%)	-	0	80	80	80	76	76	68	80	80	77	0	0	0	0	0
Precipitation Amount (in.)	0.01	0.0	0.74	0.33	0.31	0.05	0.17	0.15	0.25	0.26	0.06	0.0	0.0	0.0	0.0	0.0
Precipitation Type	-	-	Rain	Rain	Rain	Rain	Rain	Rain	Rain	Rain	Rain	-	-	-	-	-

Preliminary, subject to further investigation and analysis

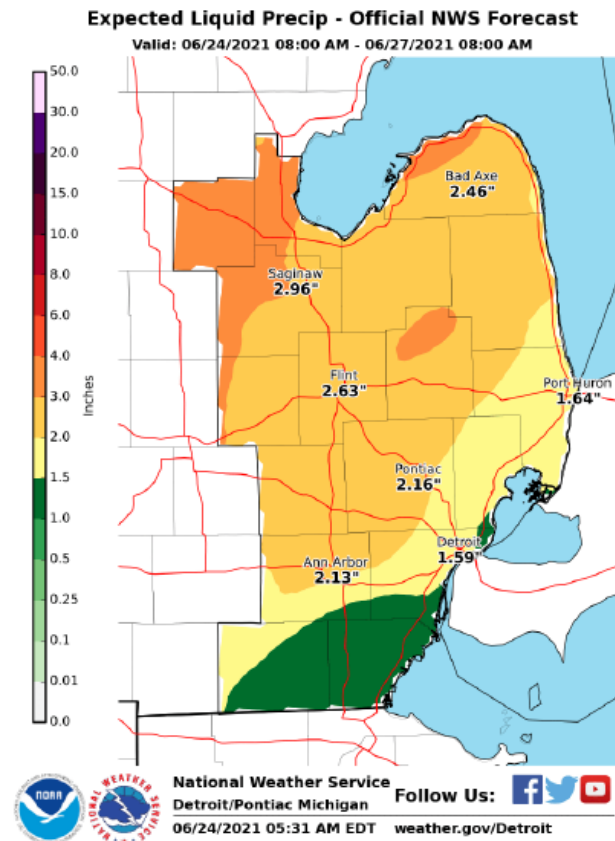
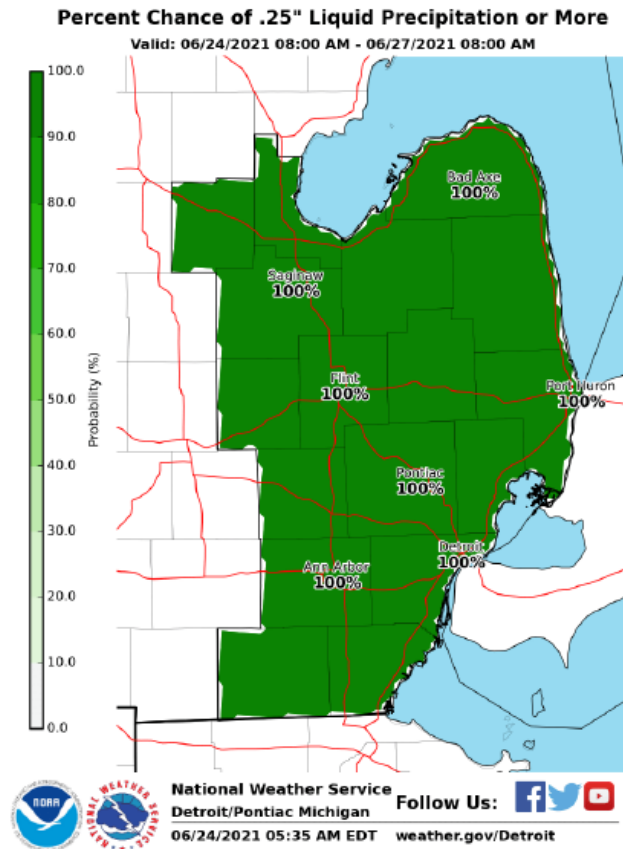
National Weather Service Probabilistic Forecast

Thursday, June 24, 2021

Probabilistic Quantitative Precipitation Forecast

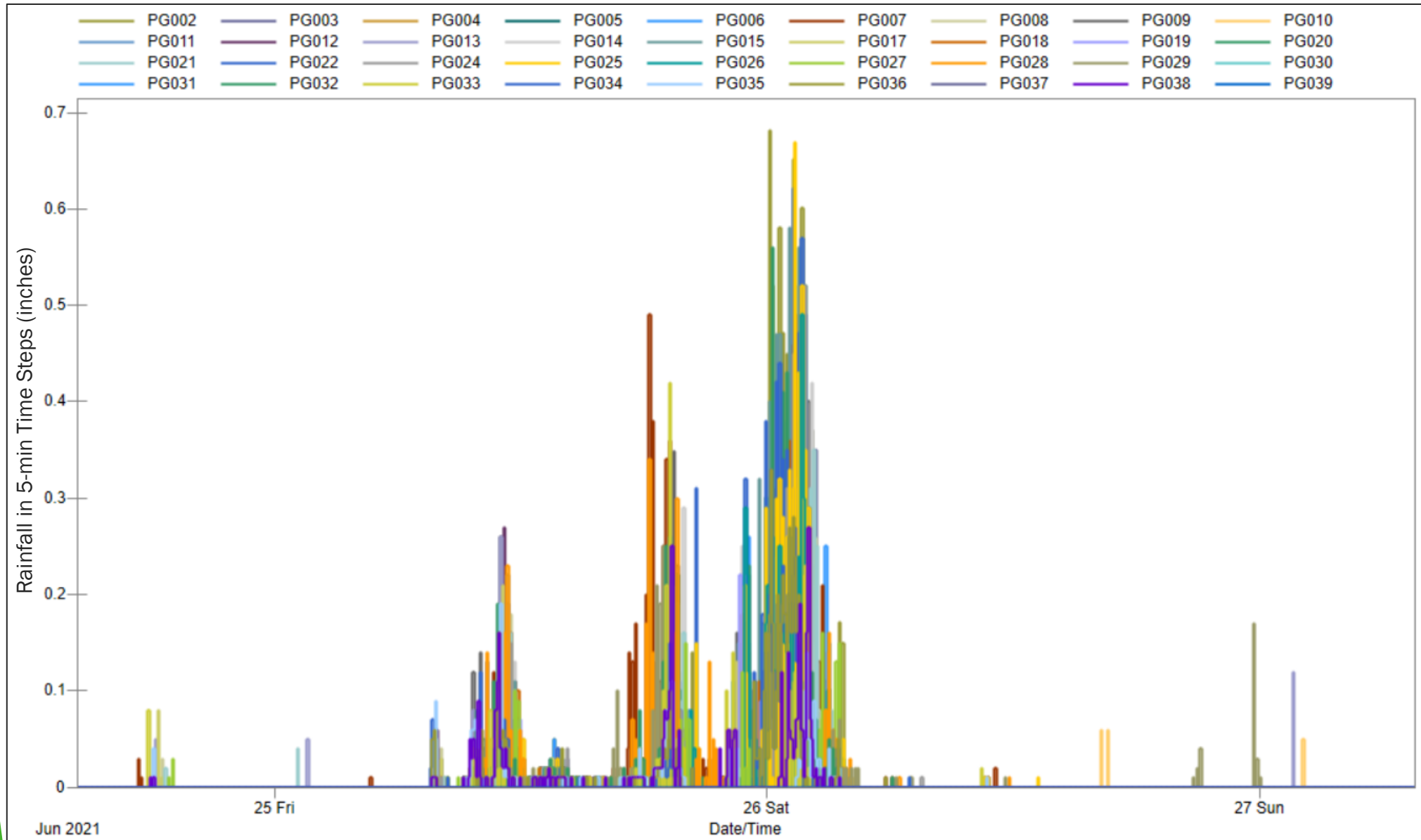
From the picture below the probability of receiving a precipitation of greater than **0.25 inches** on

- **06/24/2021-06/27/2021 is 100%**
- Expected Liquid Precipitation for Detroit from **06/24/2021 08:00 am-06/27/2021 08:00 am is 1.59"**.
- Expected Precipitation from **06/25/2021 2:00 pm to 06/25/2021 7:59 pm is 0.50" to 0.75"**.



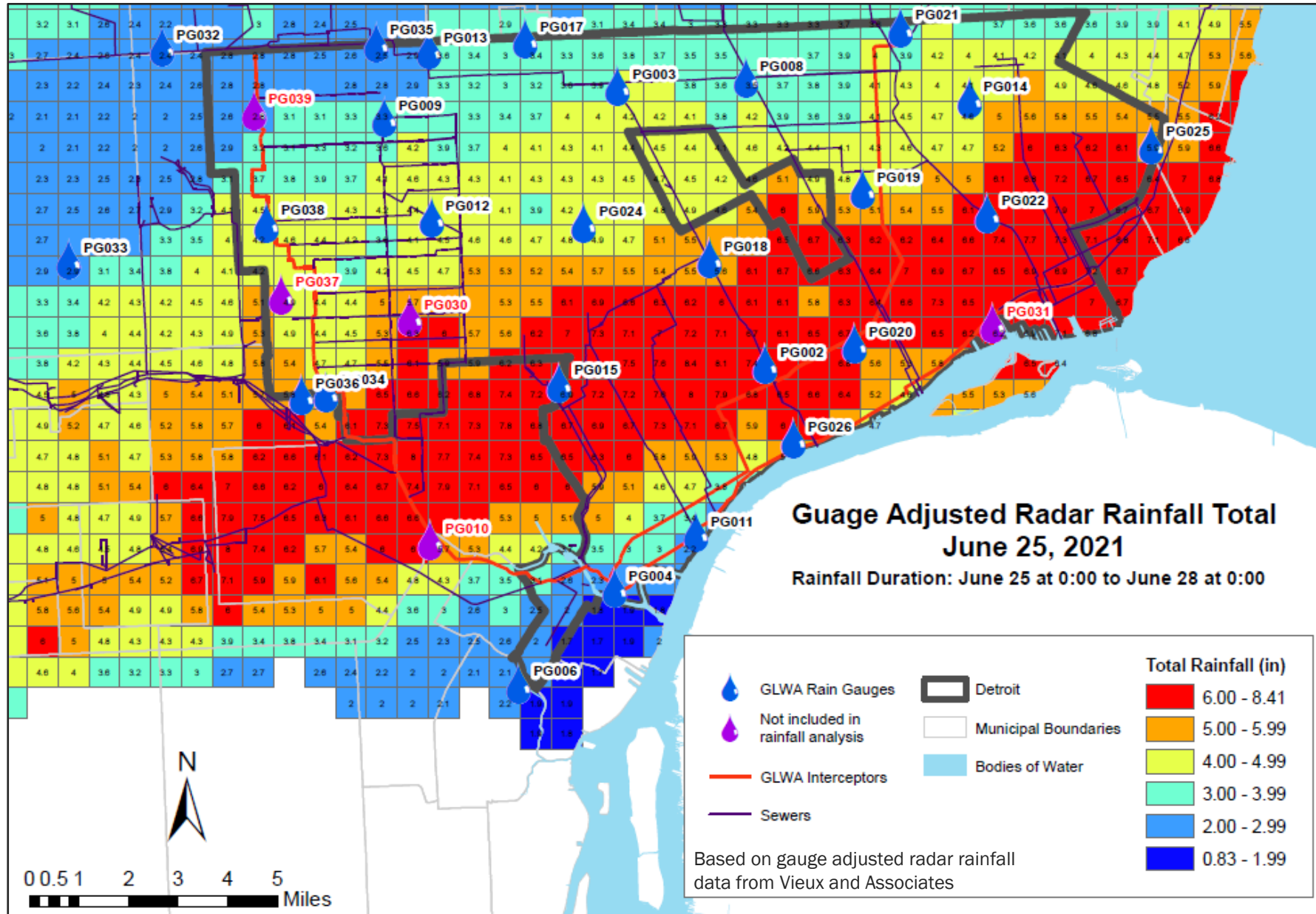
Preliminary, subject to further investigation and analysis

Actual Rainfall Recorded by GLWA Rain Gauge Network June 25, 2021 Wet Weather Event – Temporal Distribution



Preliminary, subject to further investigation and analysis

Actual Gauge Adjusted Radar Rainfall

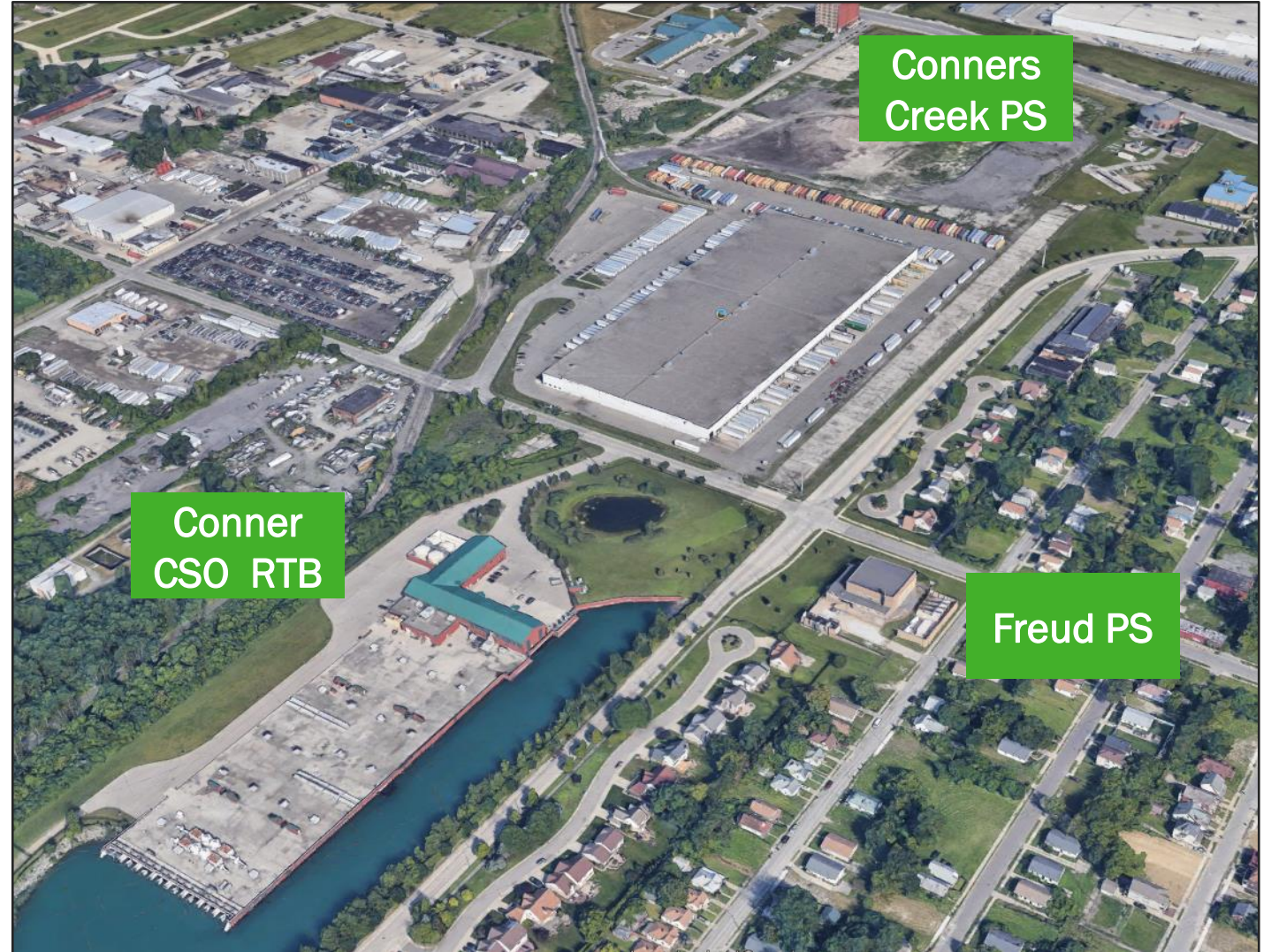


Preliminary, subject to further investigation and analysis

GLWA Operations Staffing Timeline

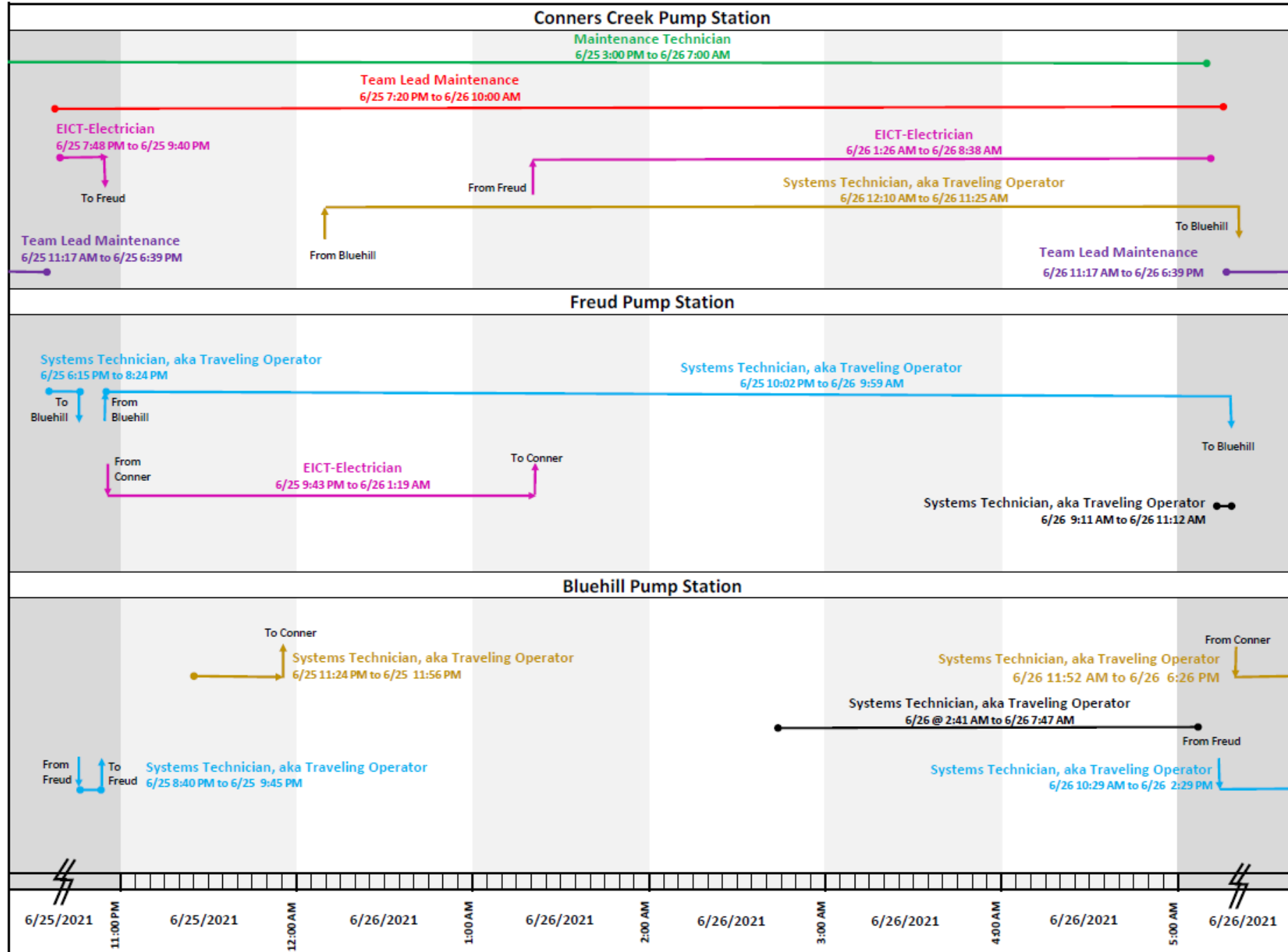
Conners Creek and Freud Pump Stations - Staffing Timeline

- Conners Creek and Freud Pump Stations were staffed throughout the storm event
- The facilities are within minutes of each other
- Freud Pump Station design provides for remote operation



GLWA Staff Response Timeline to June 25, 2021 Event

Conners Creek, Freud and Bluehill Pump Stations Staff During June 25-26, 2021 Rainfall Event



Focused Timeline – House Power Service Interruption at Conners Creek PS

Events leading up to, during, and following the power interruption:

- Electrician was dispatched to Freud PS due to power feed issues (9:40 PM)
- Systems Technician started 2nd pump at Conners Creek PS when breaker tripped (12:49 AM)
- Electrician was notified to return to Conners Creek PS to address power outage (12:53 AM)
- Electrician investigated power supply, diagnosed and reset the breaker (1:38 AM)
- Duration of power interruption due to breaker trip was 49 minutes
- Two (2) pumps operated throughout this period of the breaker trip
- Three (3) additional pumps were started within about 12 minutes

Stormwater Pumping Stations – Electrical Considerations

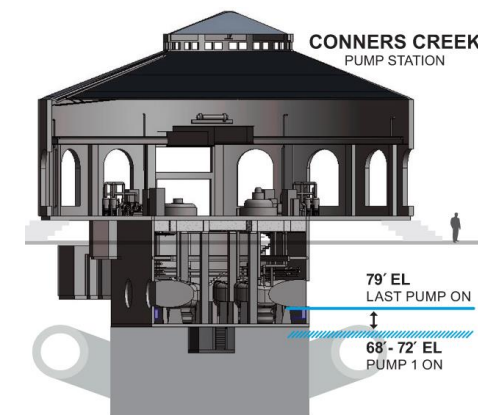
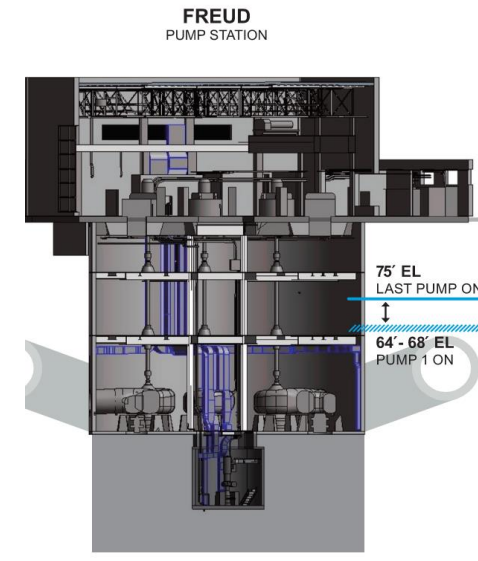


Preliminary, subject to further investigation and analysis

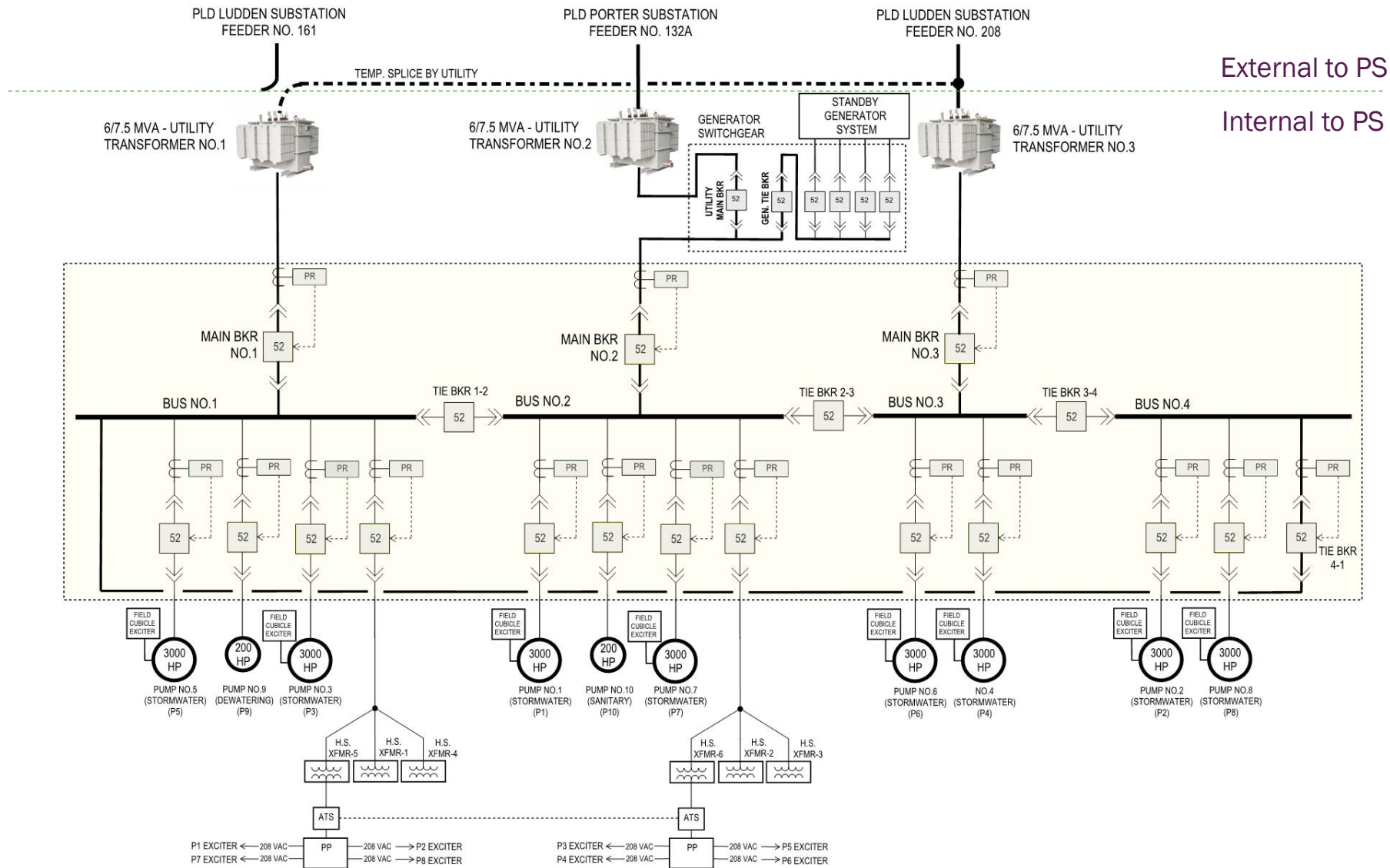
Storm Pump Station Electrical Considerations

June 25 Rain Event

- Freud Pump Station (PS)
 - Power Supply
 - Stand-By Generator
 - Power Quality
- Conners Creek PS
 - House Power Service Interruption
- Bluehill PS



Freud PS – Electrical System



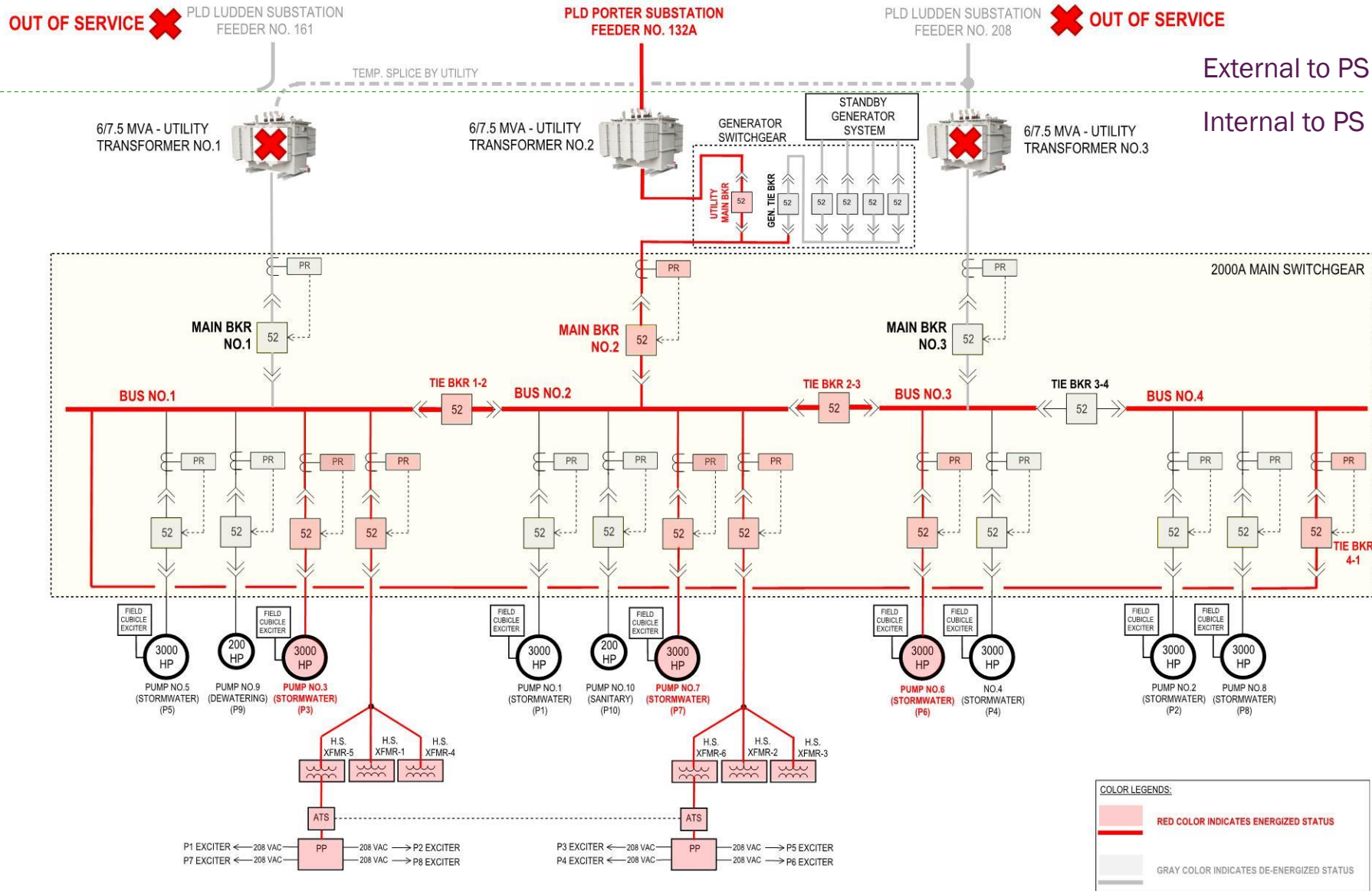
External to PS

Internal to PS



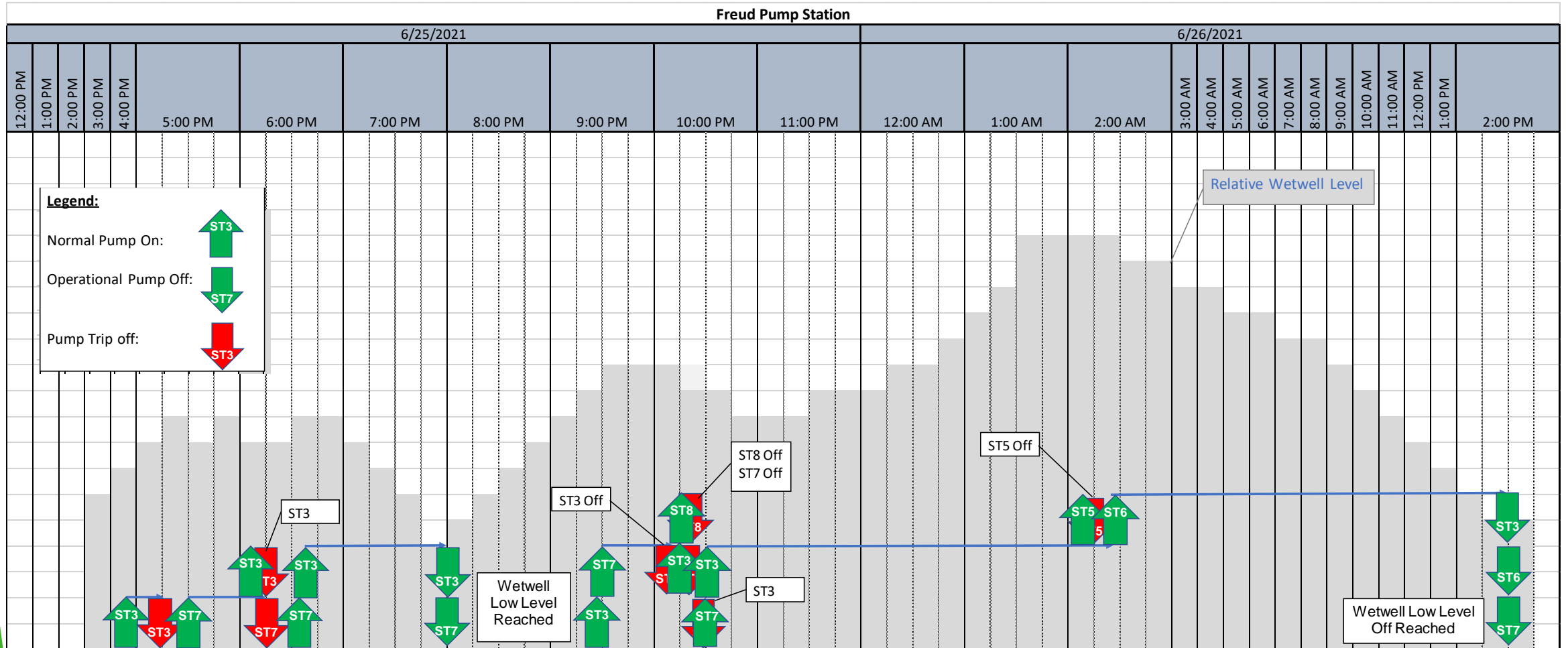
Preliminary, subject to further investigation and analysis

Freud PS – Electrical System: June Rain Event

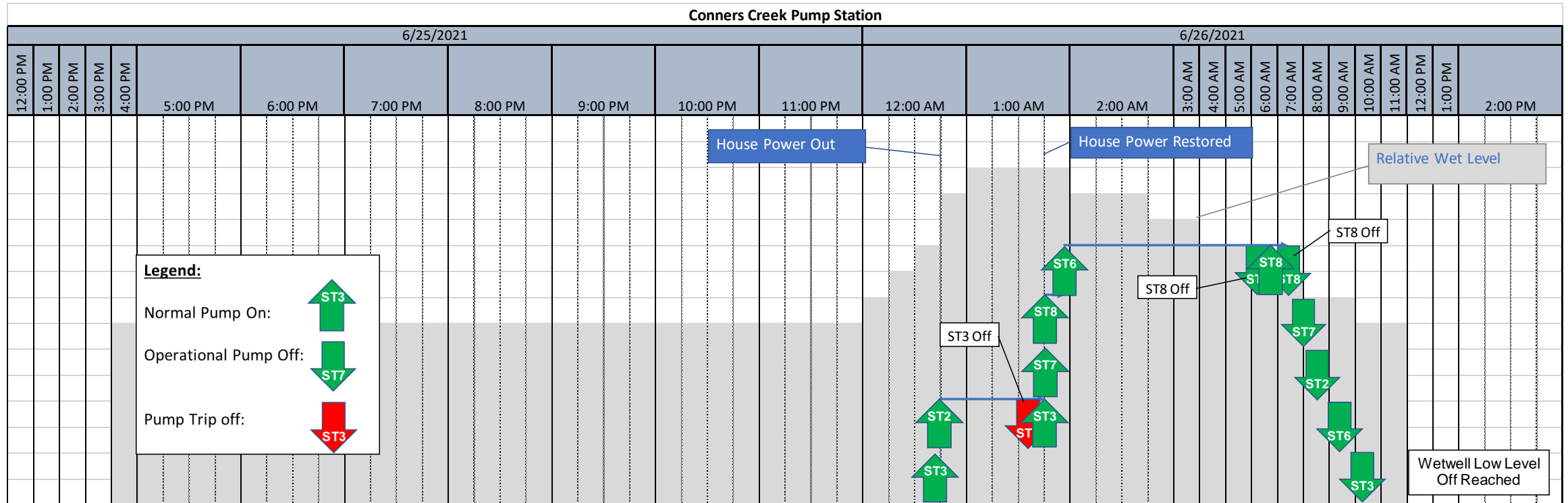


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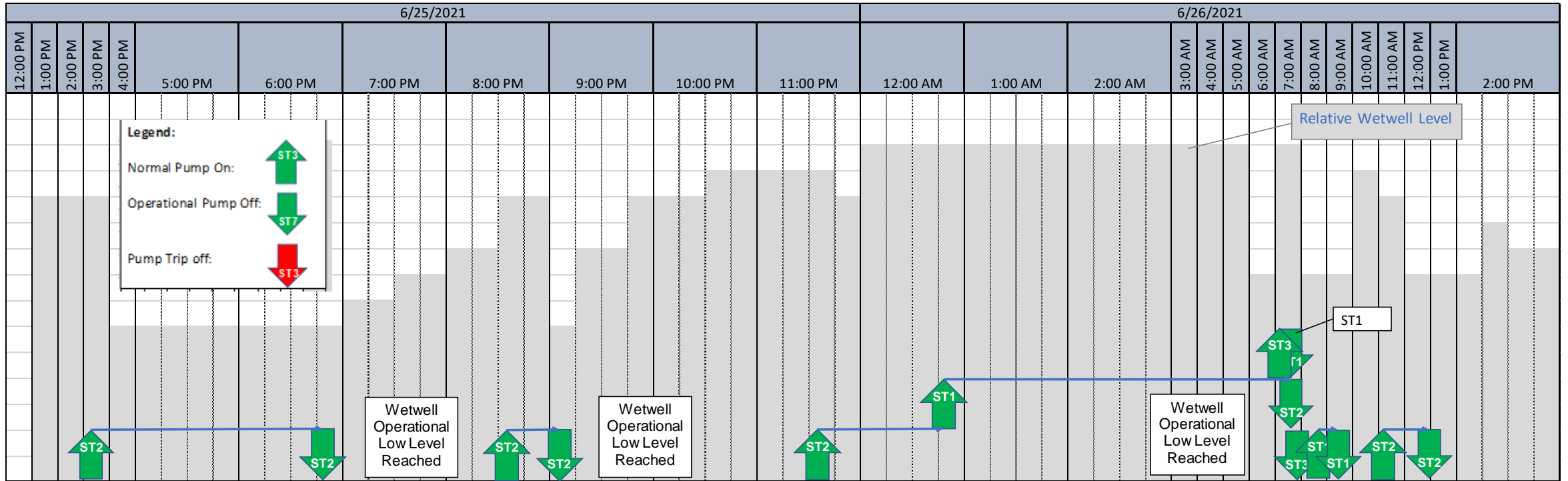
Freud Pump Station – June Event Timeline



Conners Creek Pump Station – June Event Timeline



Bluehill Pump Station – June Event Timeline



System-Wide Operational Overview

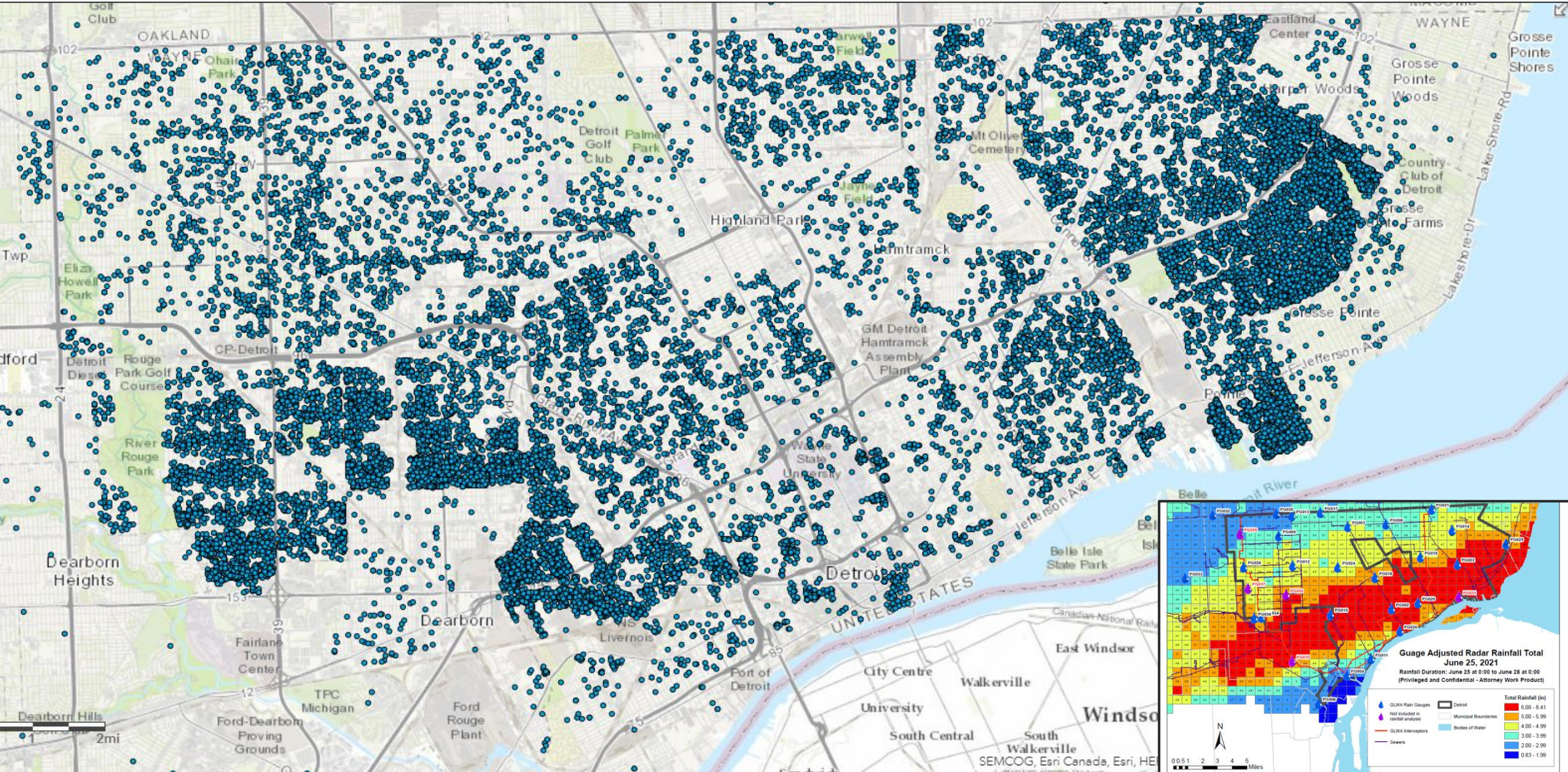
System-Wide Operational Overview - June 25th Event

- CSO treatment facilities
- WRRF
- Pump stations
- Collection system

Preliminary Mapping of Claimants

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Preliminary, subject to further investigation and analysis



Thank you!