Surface Water/Groundwater Interaction Study

Progress Update – September 2020

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Purpose of Study

- Explore and quantify surface/groundwater interactions
  - Direction of flow (surface to groundwater or vice-versa)
  - Rate of flow
  - Flow volume
  - Seasonal fluctuations
  - Longer-term fluctuations
  - Significance of alluvial storage and surface/groundwater interactions in overall water budget

GAM Limitations

- Recently updated GAM incorporates modifications for improved surface water/groundwater interactions:
  - Two new model layers: Alluvium and Shallow/Transition
  - Refined grid in areas where rivers/streams cross formation outcrops
- New layers and refined grid theoretically allow for more-accurate simulations
- Very little real-world data to support the refinement

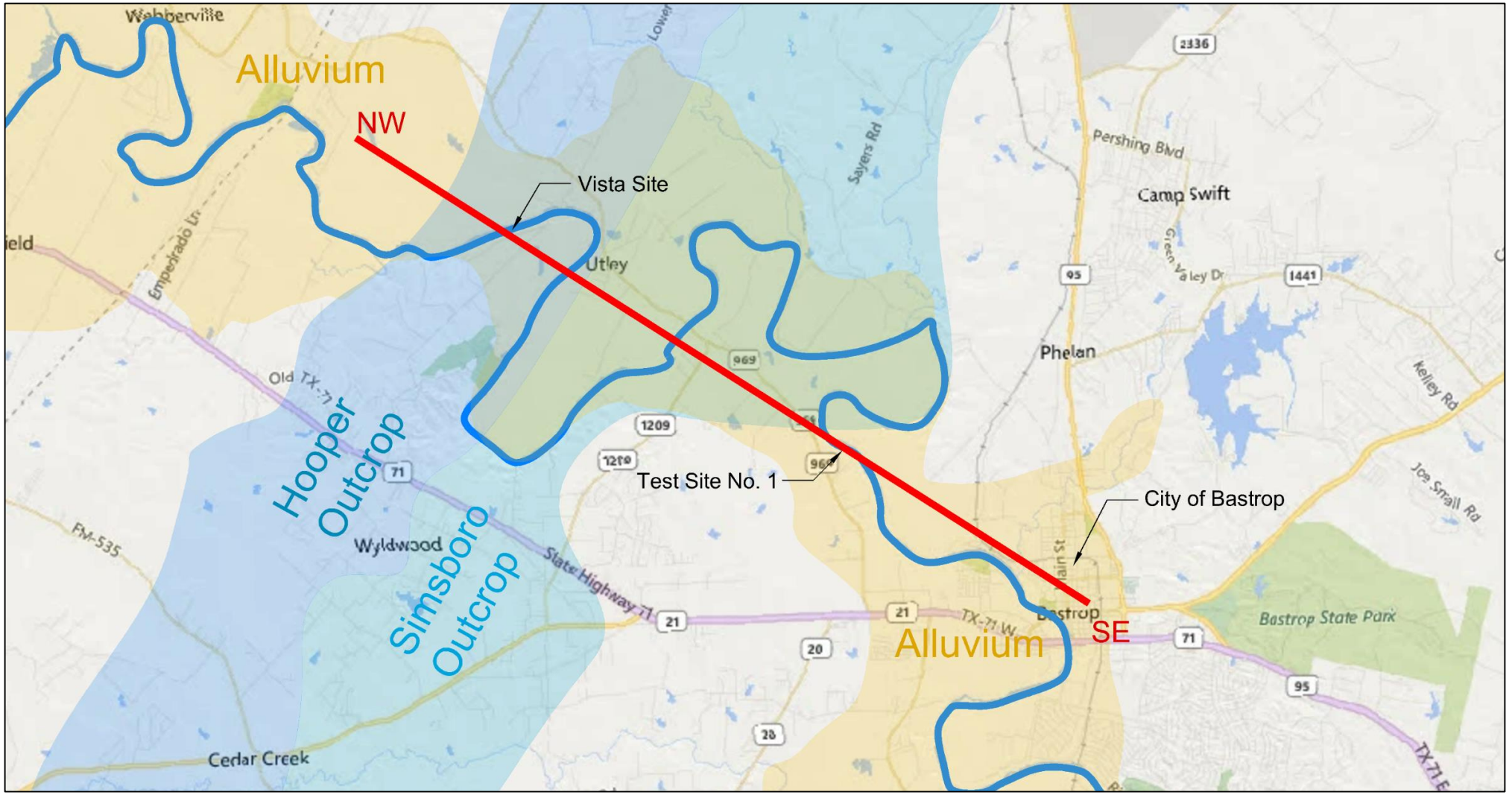
Study Goals

- Explore and assess various data collection and evaluation techniques
- Obtain long-term measurements from one location
  - River level oscillations, temperature and conductivity
  - Alluvial groundwater level, temperature and conductivity
- Assess surface water/groundwater interaction
  - Data uploaded via telemetry for five years (minimum)
- Guide future work as funding becomes available

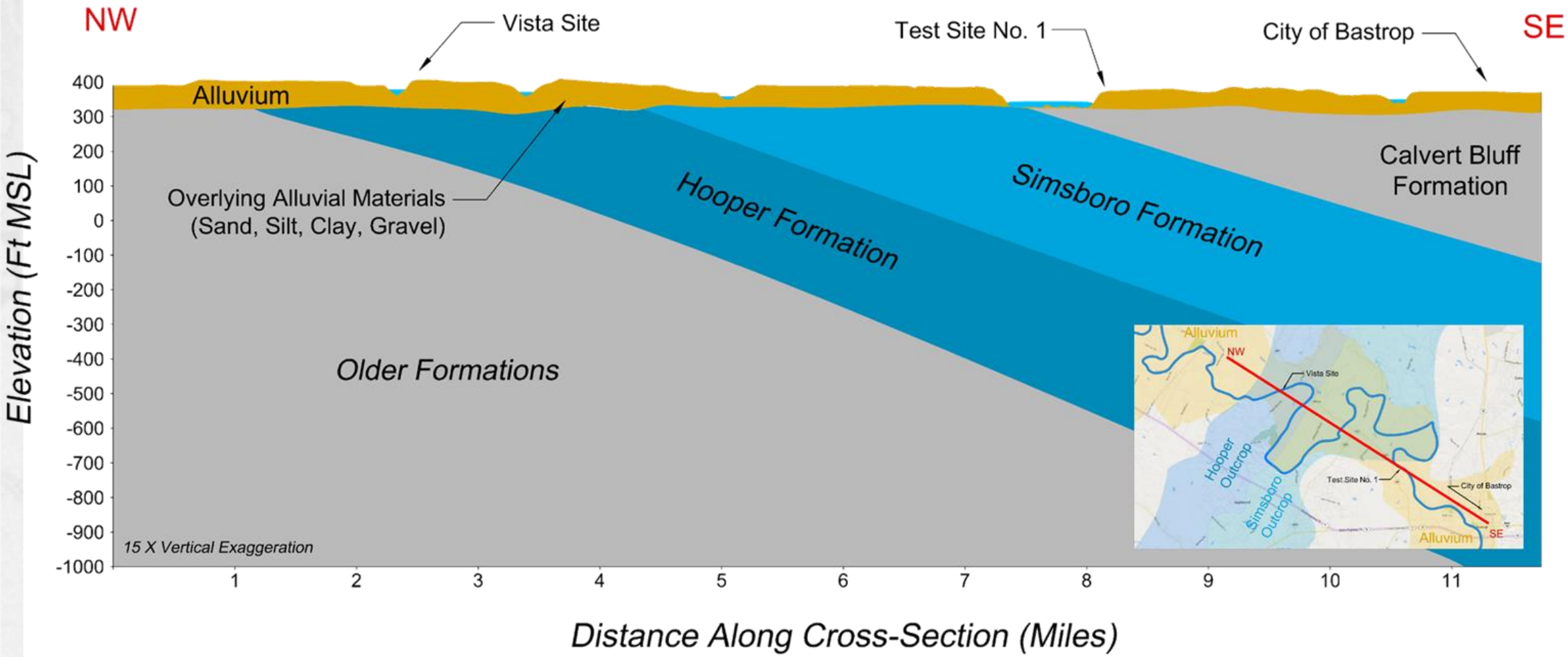
Project Progress

- May 2019 - Unsuccessful test drilling results at initial site
- Fall/Winter 2019 - Alternate site search
- Spring/Summer 2020
  - Successful test drilling
  - Monitor well construction
  - Transducer installation and calibration
  - Initial data collection and analysis

Area Overview



Regional Cross-Section Diagram



Drilling Test Site 1 (LCRA Lift Station)

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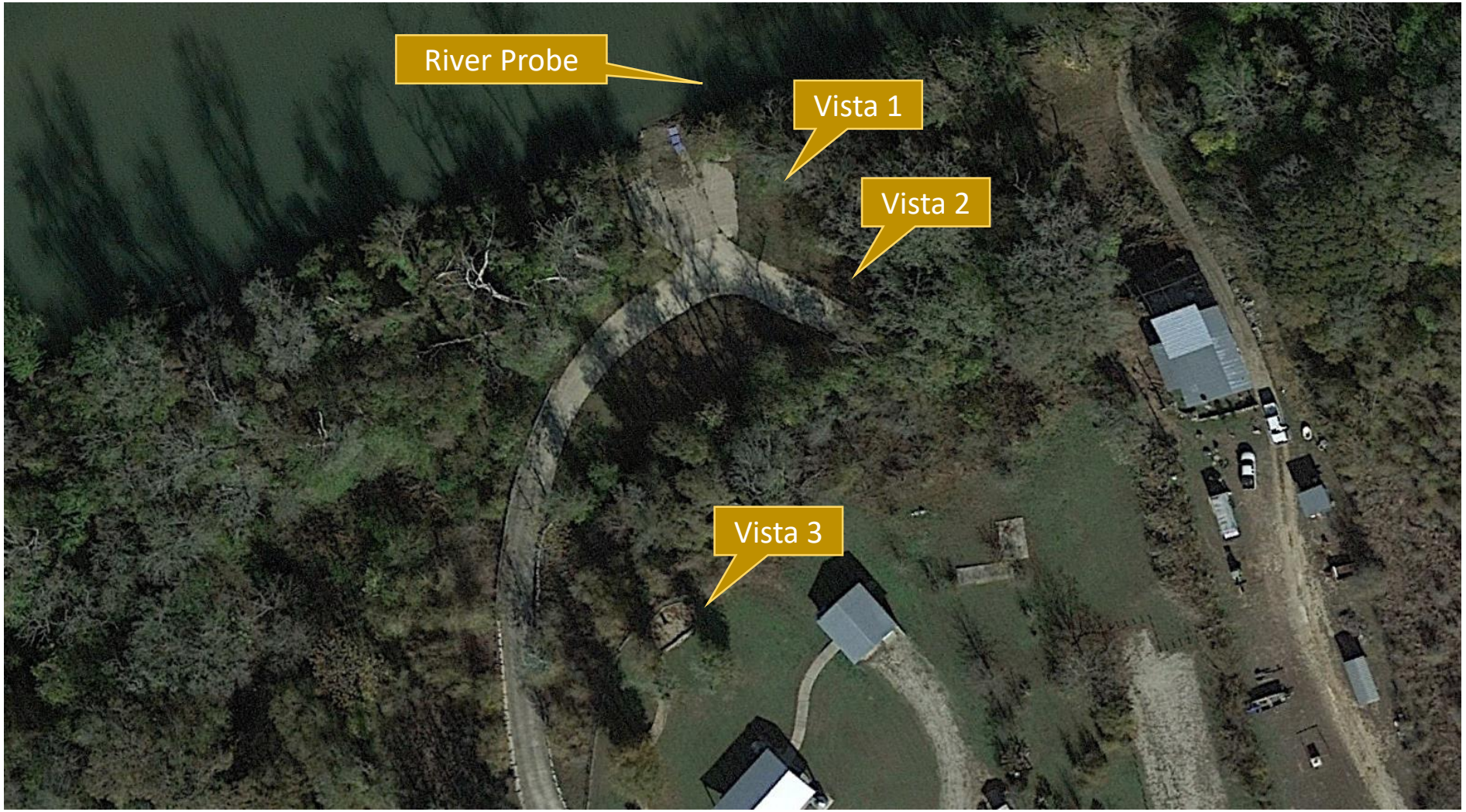
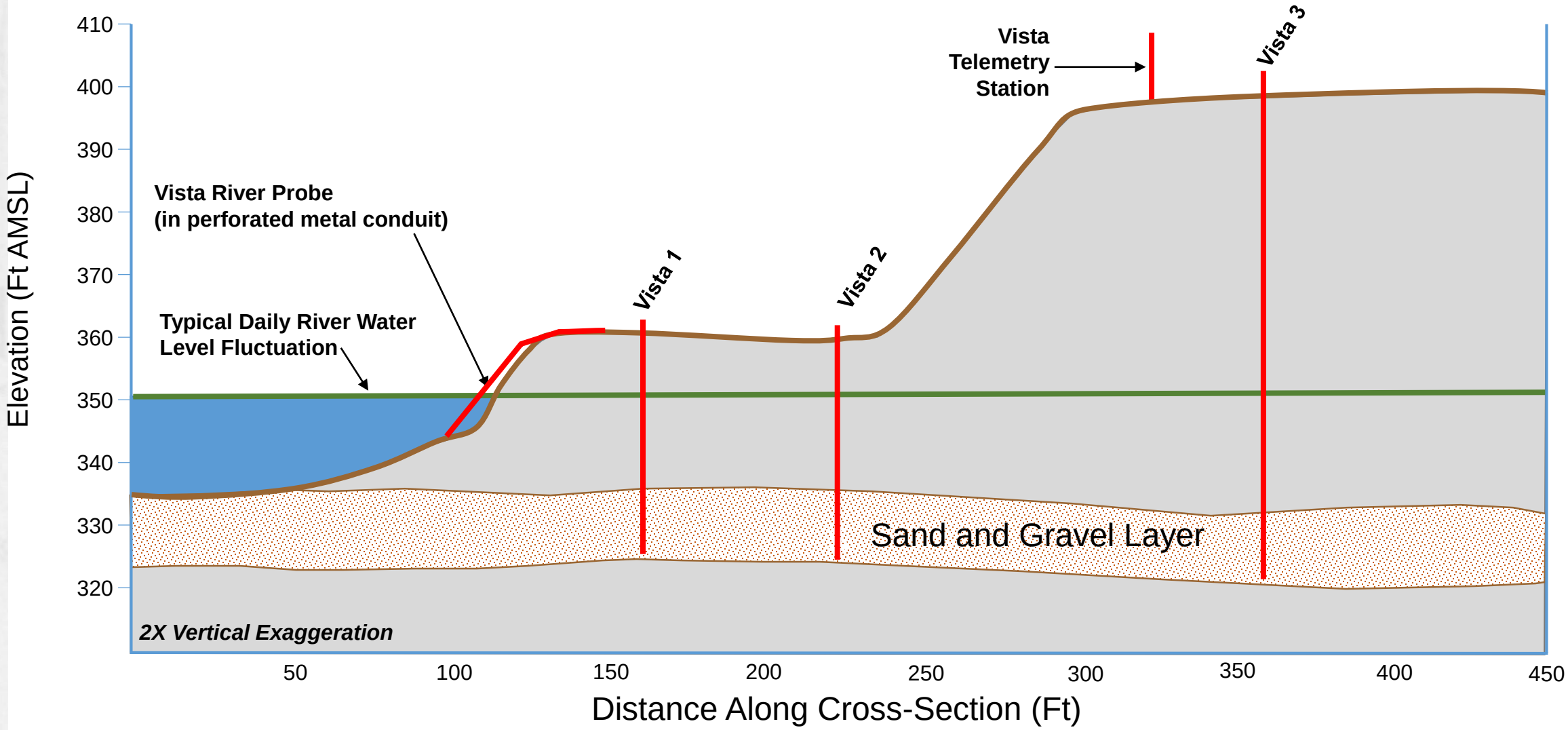
Drilling Test Site 2 (LCRA Vista)

Vista Site Overview

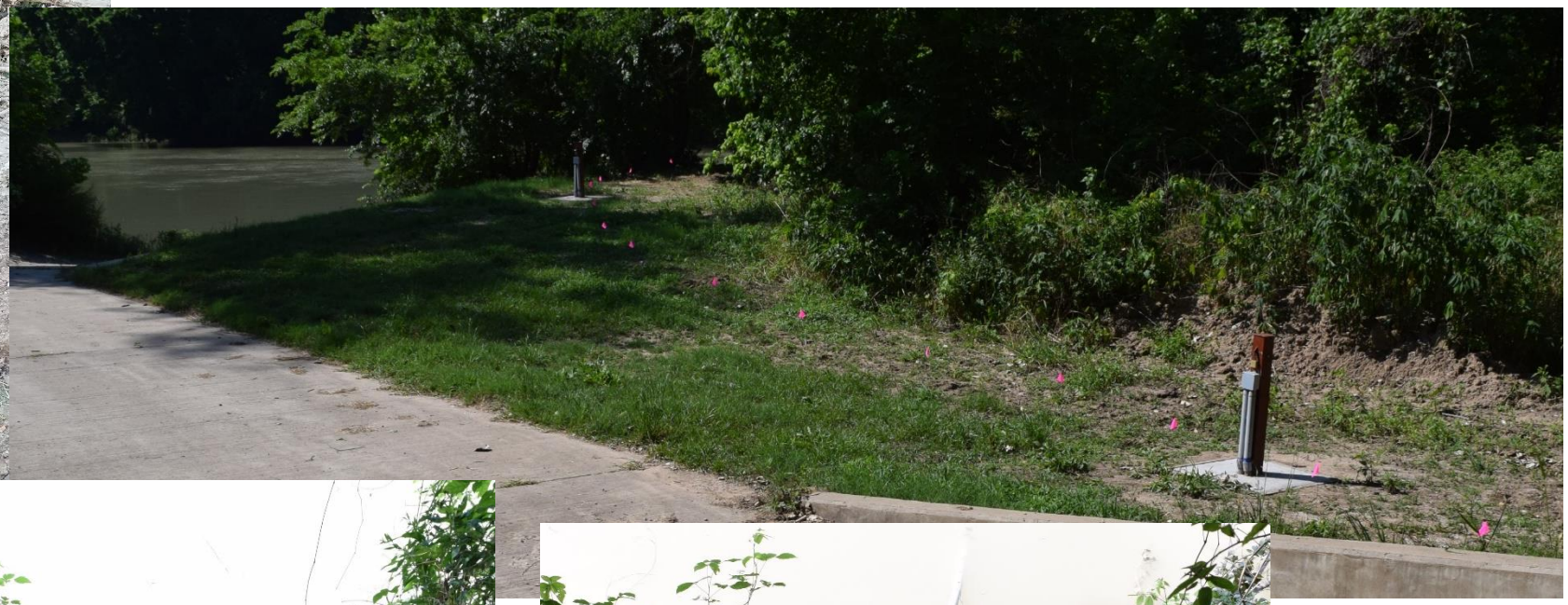


Vista Site Cross-Section Diagram



Monitor Well Construction

Monitor Well Installation



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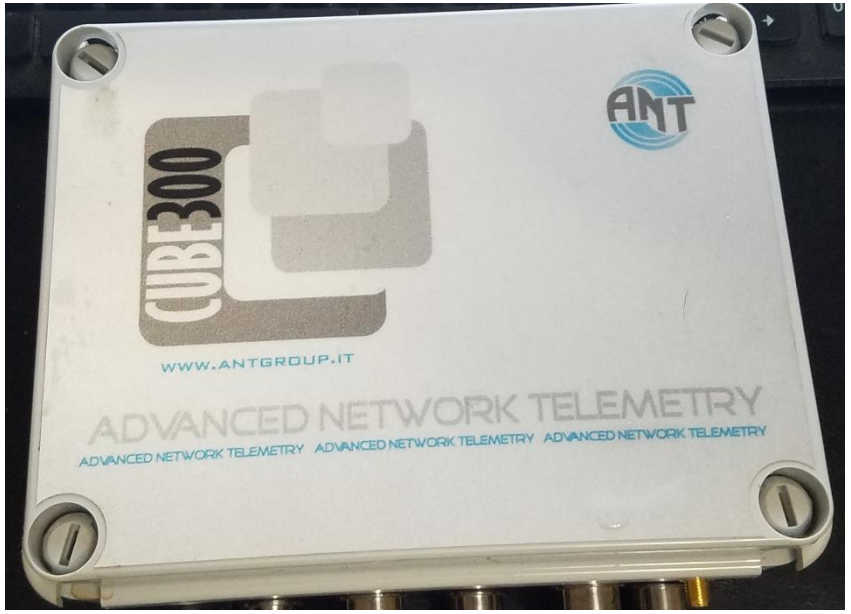
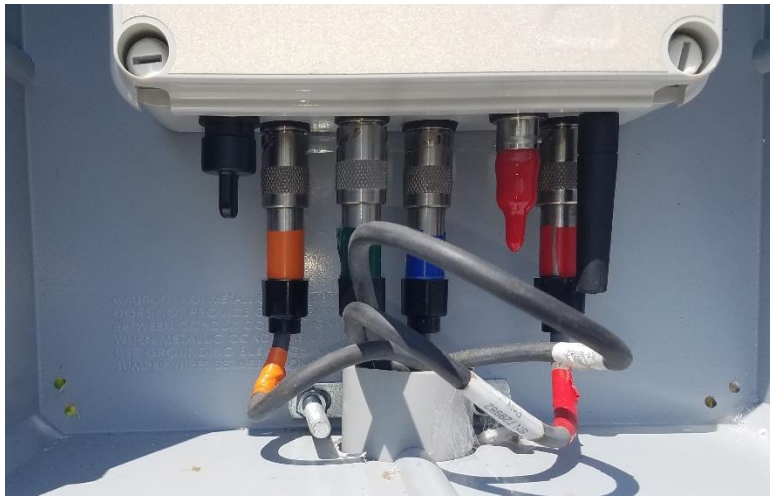
Telemetry Station





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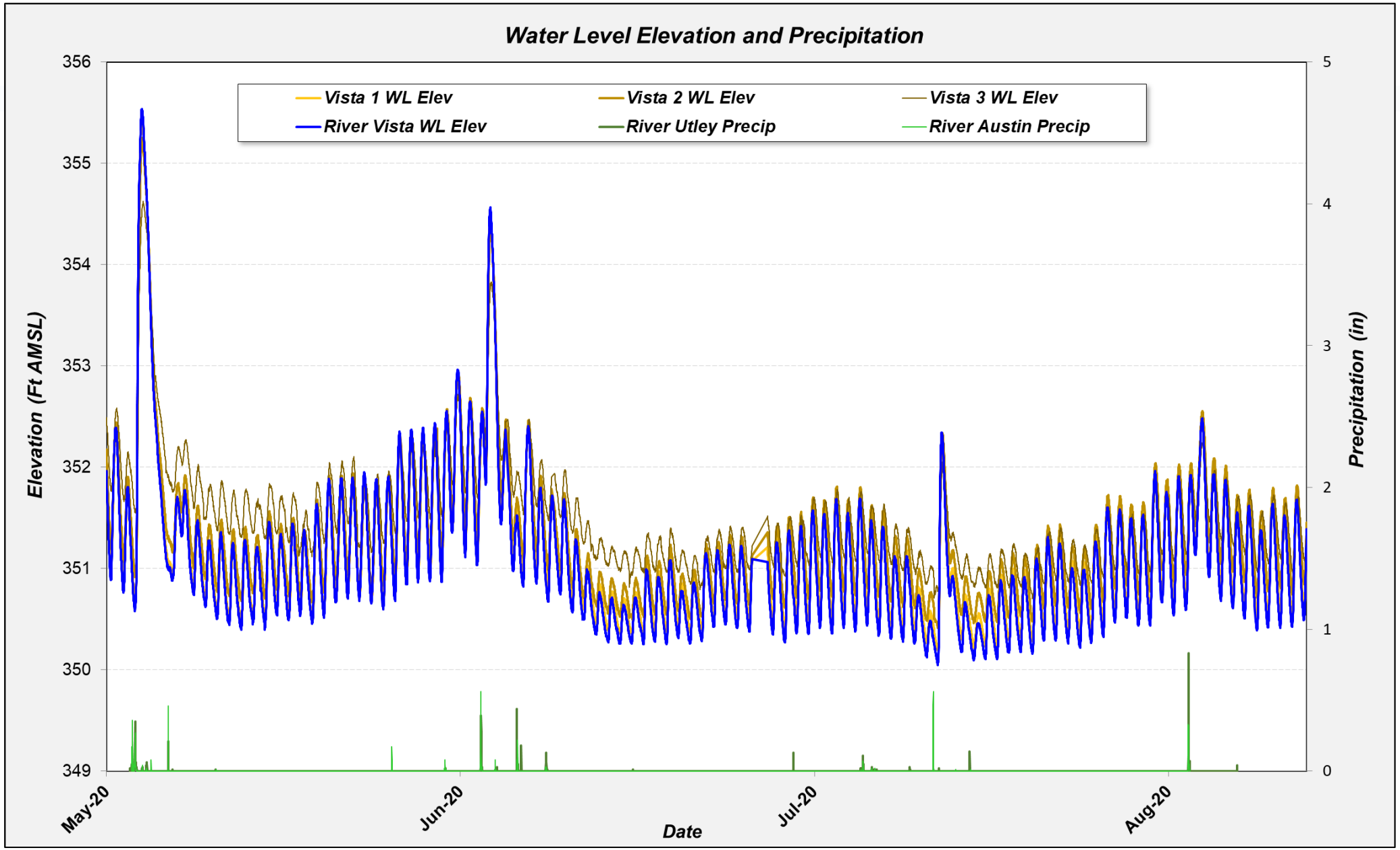
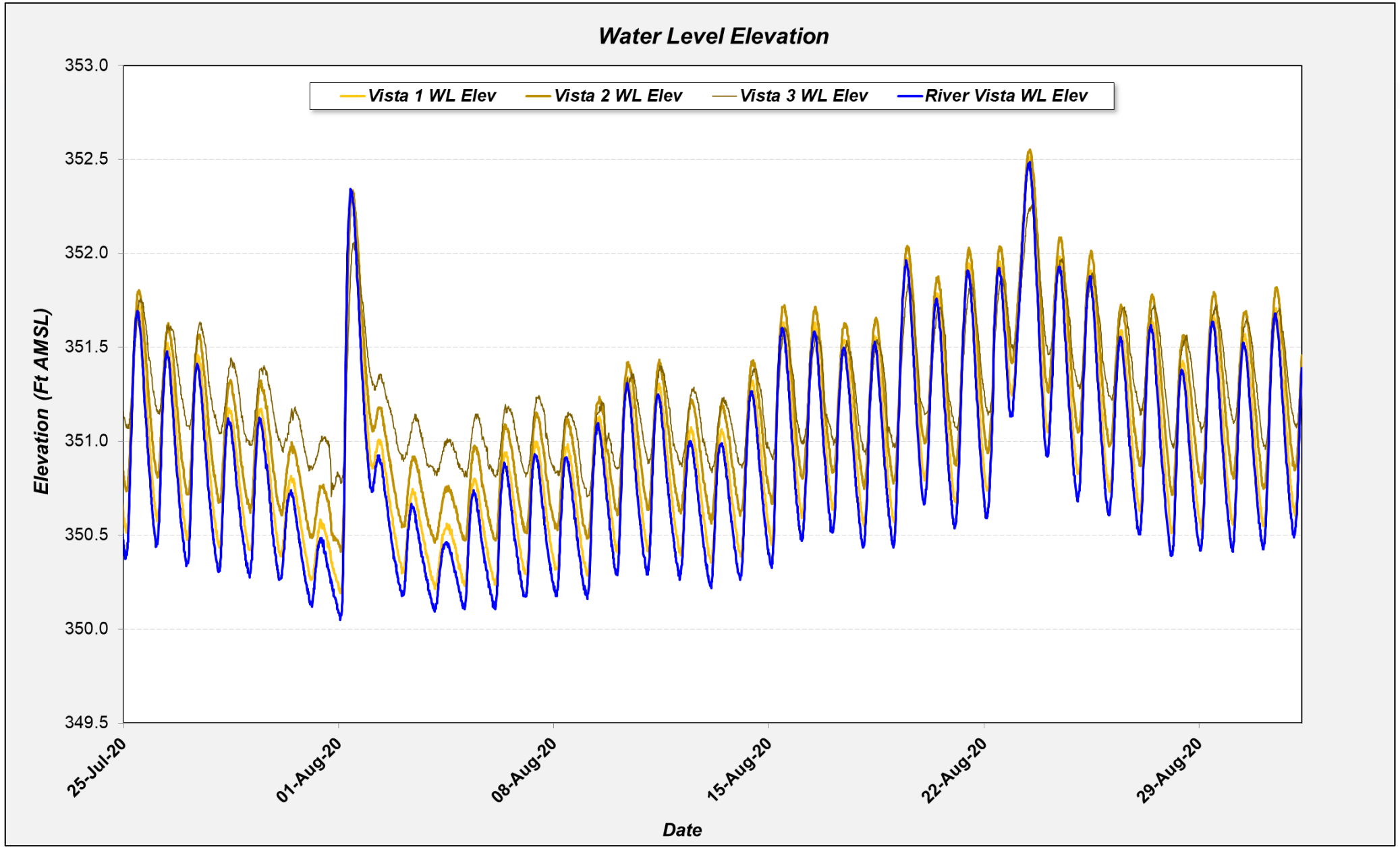
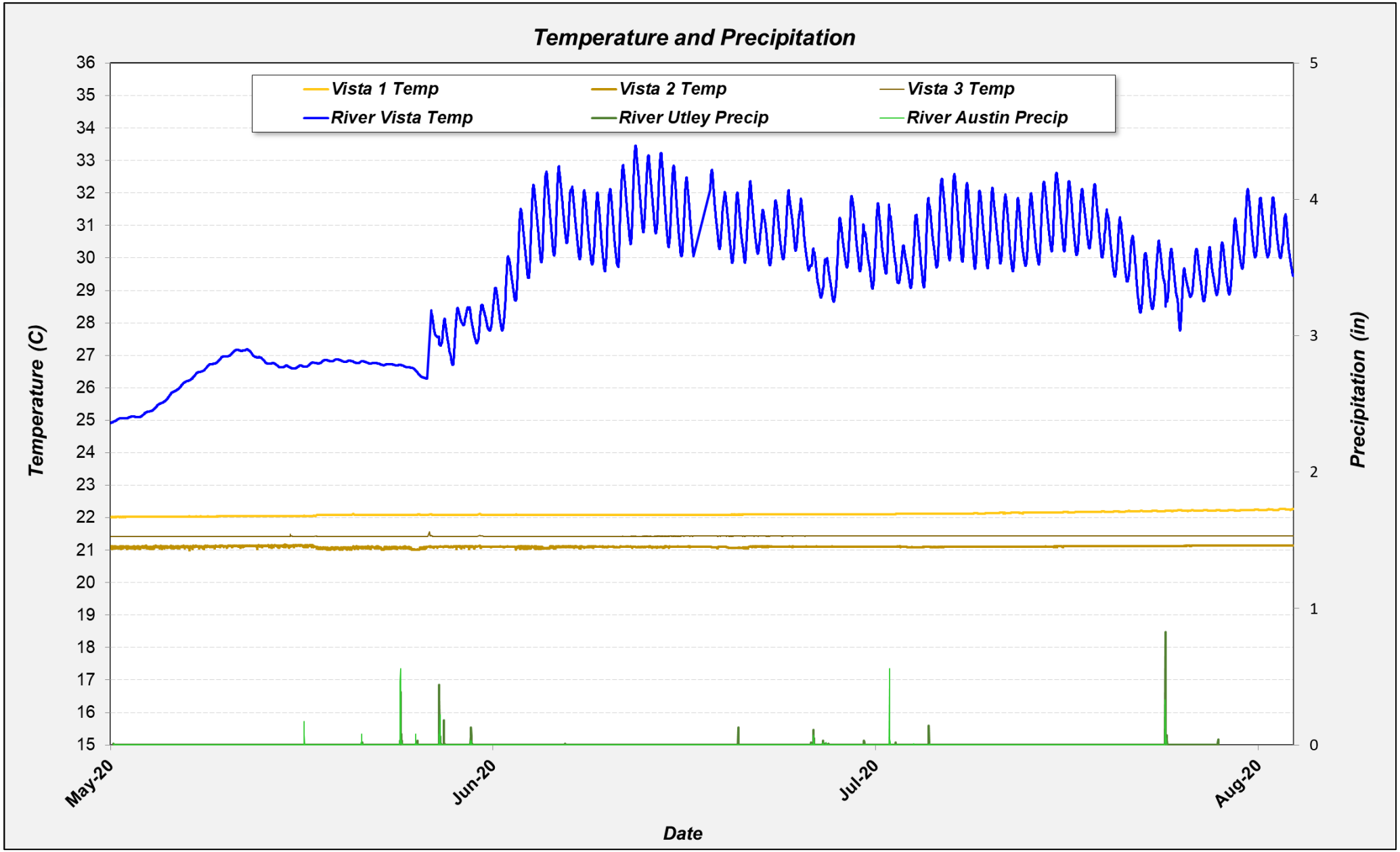
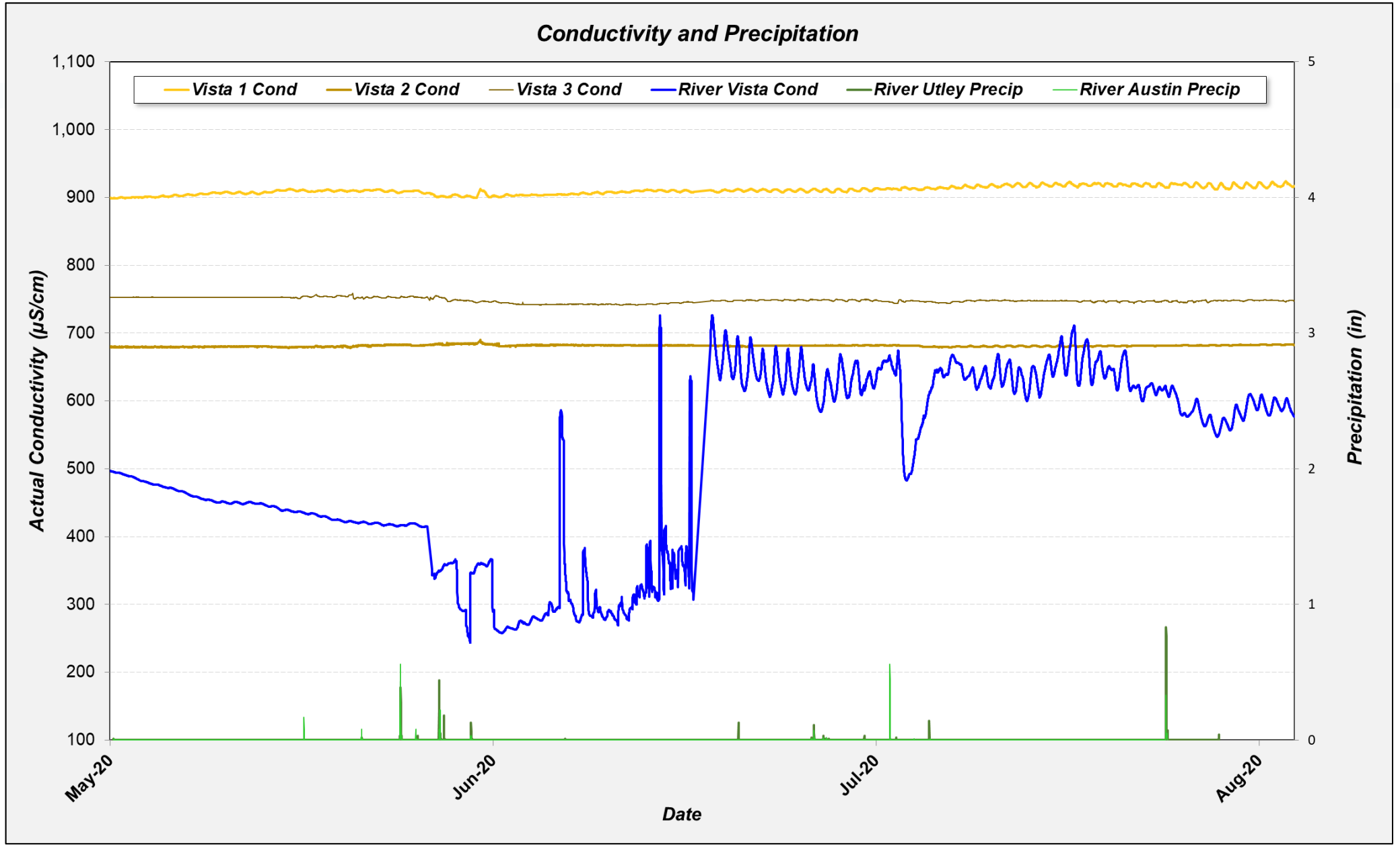
Initial Data Collection

- Vista Site
  - River Probe, Vista 1, Vista 2, Vista 3
    - Pressure, temperature and conductivity
  - Telemetry Station
    - Barometric pressure
  - Data recorded at 15-minute intervals and uploaded to In-Situ HydroVu website
- Colorado River
  - Austin gage, Utley gage, Bastrop gage
    - River stage and precipitation


Water Level Elevation and Precipitation
Vista 1 WL Elev
Vista 2 WL Elev
Vista 3 WL Elev
River Vista WL Elev
River Utley Precip
River Austin Precip
Elevation (Ft AMSL)
Precipitation (in)
356
355
354
353
352
351
350
349
5
4
3
2
1
0
May-20
Jun-20
Jul-20
Aug-20
Date


Water Level Elevation
Vista 1 WL Elev
Vista 2 WL Elev
Vista 3 WL Elev
River Vista WL Elev
353.0
352.5
352.0
351.5
351.0
350.5
350.0
349.5
Elevation (Ft AMSL)
25-Jul-20
01-Aug-20
08-Aug-20
15-Aug-20
22-Aug-20
29-Aug-20
Date


Temperature and Precipitation
Vista 1 Temp
Vista 2 Temp
Vista 3 Temp
River Vista Temp
River Utley Precip
River Austin Precip
Temperature (C)
Precipitation (in)
Date
May-20
Jun-20
Jul-20
Aug-20
36
35
34
33
32
31
30
29
28
27
26
25
24
23
22
21
20
19
18
17
16
15
5
4
3
2
1
0


Conductivity and Precipitation
Vista 1 Cond
Vista 2 Cond
Vista 3 Cond
River Vista Cond
River Utley Precip
River Austin Precip
Actual Conductivity (µS/cm)
Precipitation (in)
1,100
1,000
900
800
700
600
500
400
300
200
100
5
4
3
2
1
0
May-20
Jun-20
Jul-20
Aug-20
Date

Questions?