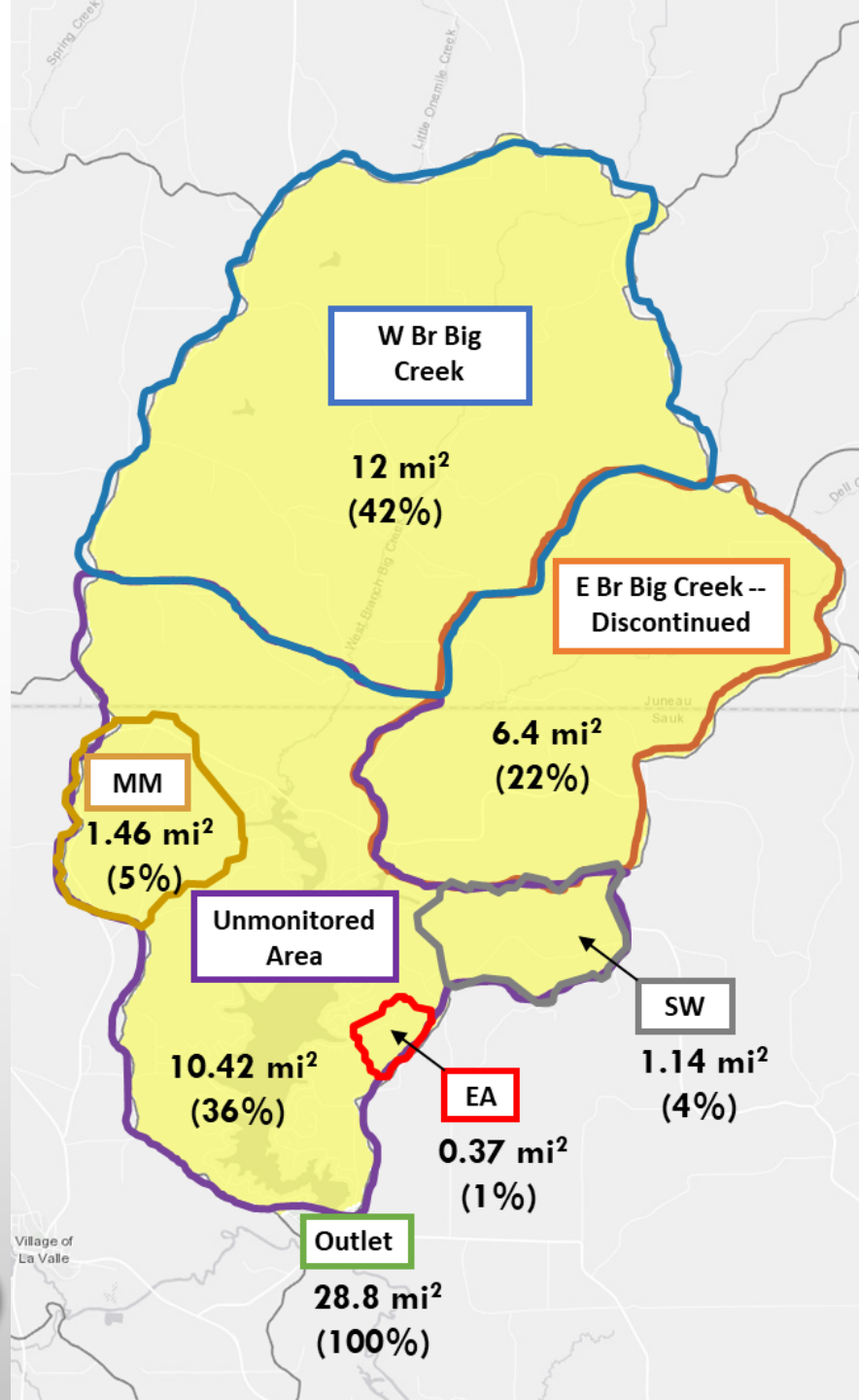
USGS-LAKE REDSTONE WY24 TRIBUTARY MONITORING

- Water Year 2024 (WY24) was 5th and final year of this project
- **Project Goal**: Better understand what's entering and exiting Lake Redstone via stream water

*All data in presentation is preliminary USGS data unless noted otherwise

WY24 MONITORING

- 2x Continued sites: **W Br. Big Ck.**, **Outlet**
  - Standard USGS monitoring for loads: Continuous Flow data, 80-100x Discrete Samples analyzed for Total Phosphorus (TP) and Suspended Sediment (SS)
- 1x Discontinued sites: **E Br. Big Ck.**
  - Estimate this year using **W Br. Big Ck** instead
- 3x New mini-monitoring sites: **Martin Meadowlark Bay Trib. (MM)**; **Swallow Bay Trib. (SW)**; **Eagle Bay Trib. (EA)**;
  - Less intense data collection: 5-10x Discrete flow measurements, ~25x samples
  - Not enough data to directly calculate load contributions
  - Instead: try to relate to continuous **W Br. Big Ck.** data; estimate load contribution relative to their drainage area size



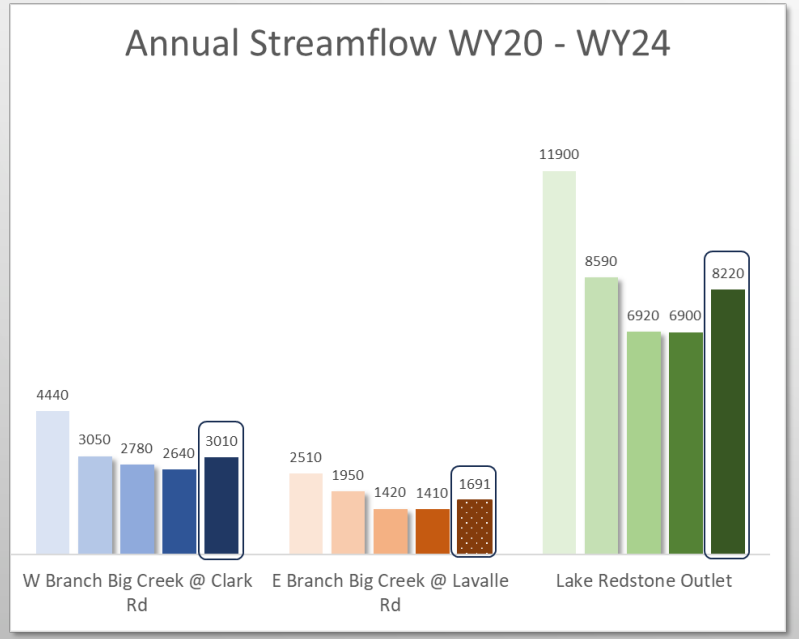
WY24 PRELIMINARY RESULTS – ORIGINAL SITES

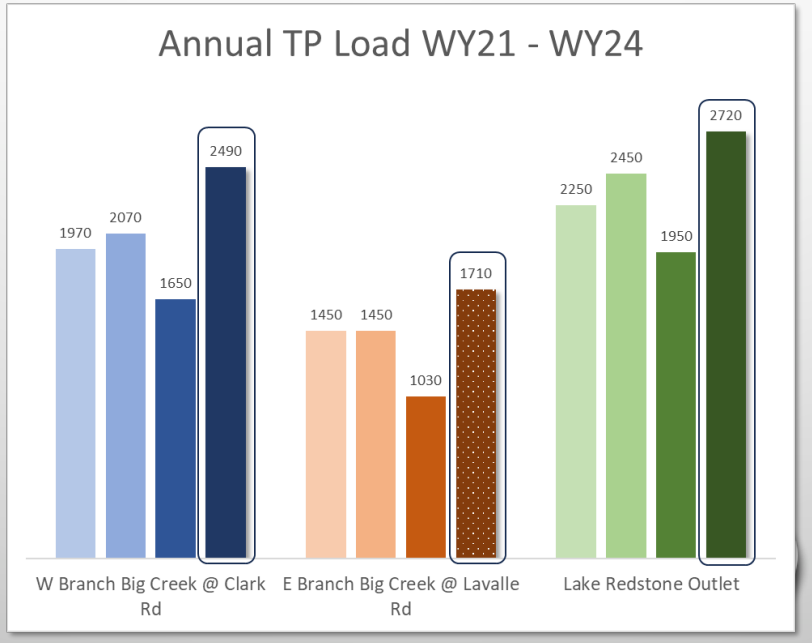
* Estimated WY24 Flow and Loads for **E Br. Big Ck.**

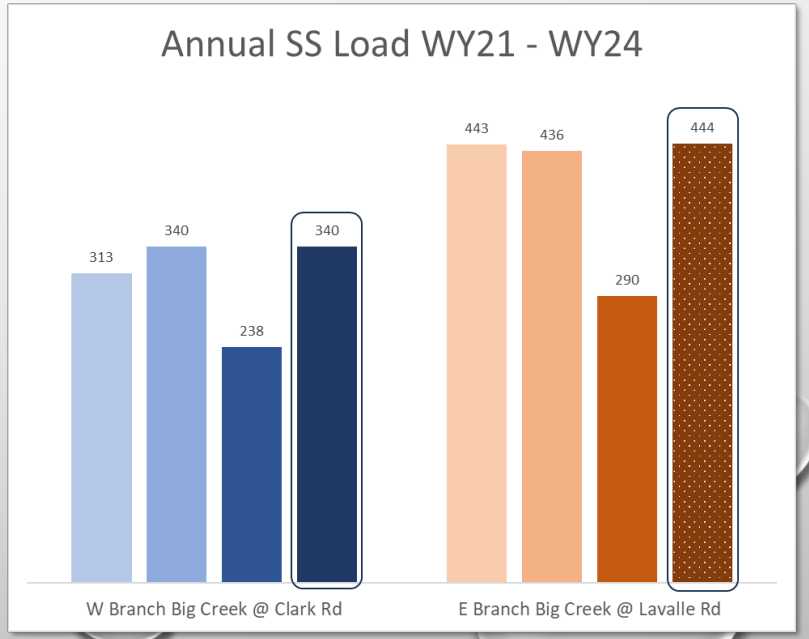
WY24 Flow:
- Lower than WY20
- Similar to WY21
- Higher than WY22 and WY23

WY24 TP Load:
- Highest of the four years

WY24 SS Load:
- Similar to WY20 and WY21
- Higher than WY23



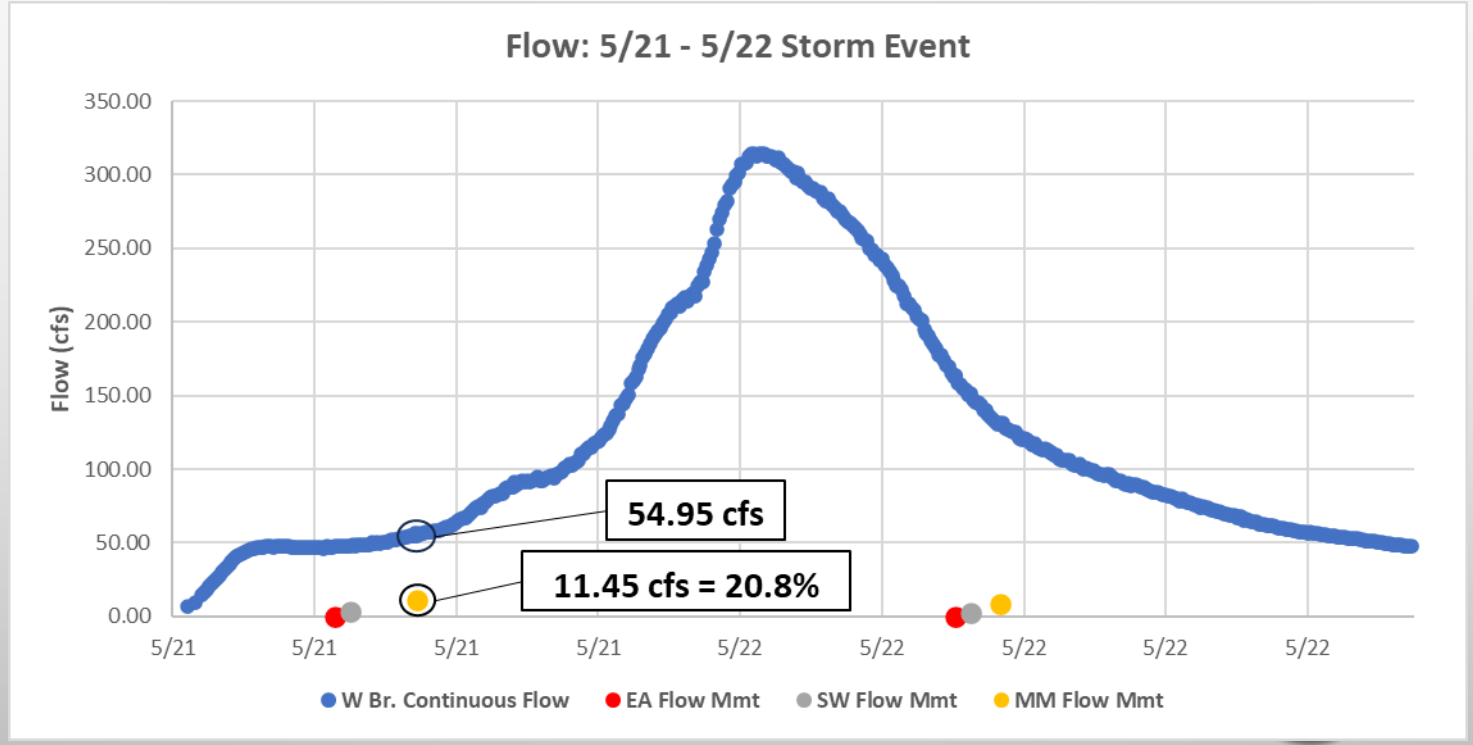




WY24 PRELIMINARY RESULTS – NEW SITES

Flow:

- 5-6 Discrete flow measurements made at each new site this year
- Each flow measurement then compared to **W. Br Big Creek** flow at the same measurement time
- Example: 5/21 – 5/22 Storm Event (2x flow measurements made for each site this event)

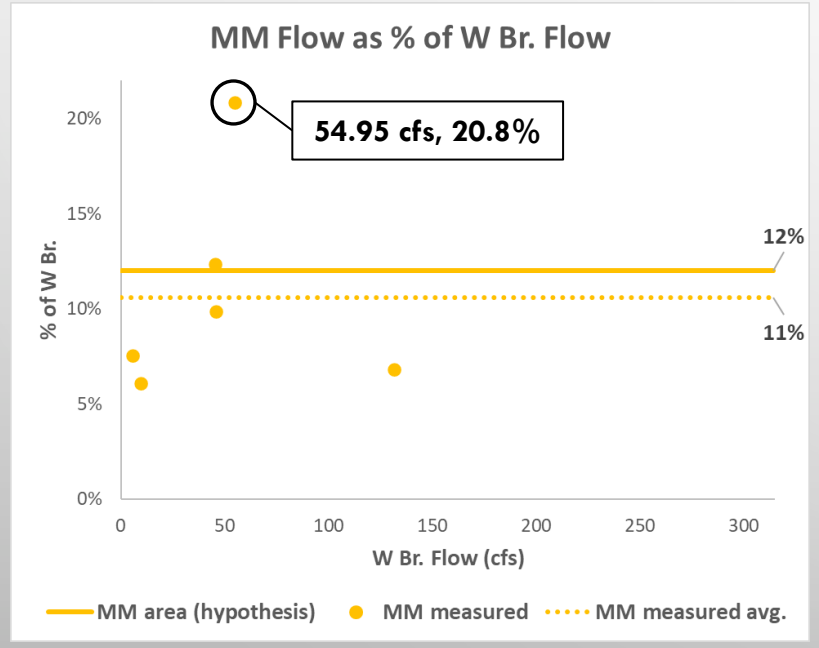


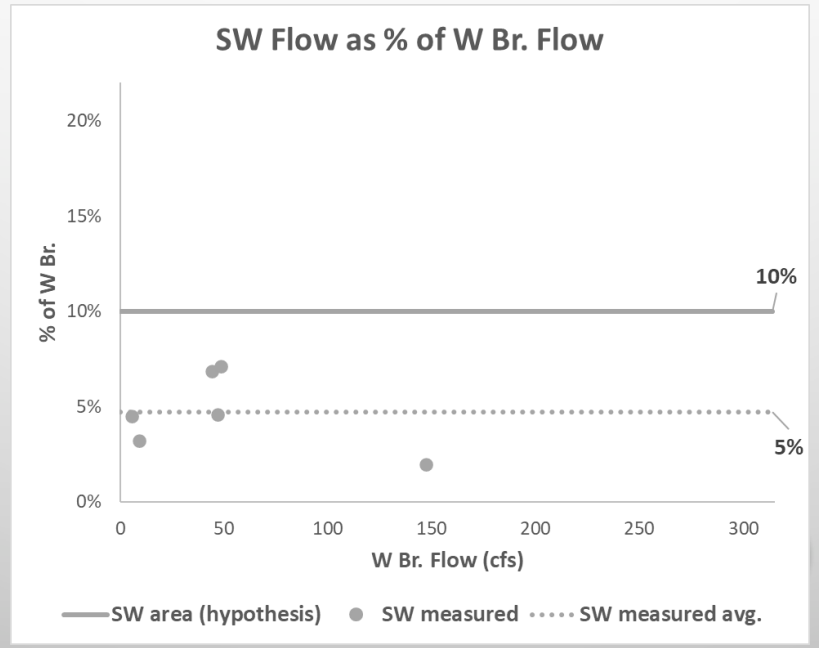
WY24 PRELIMINARY RESULTS – NEW SITES

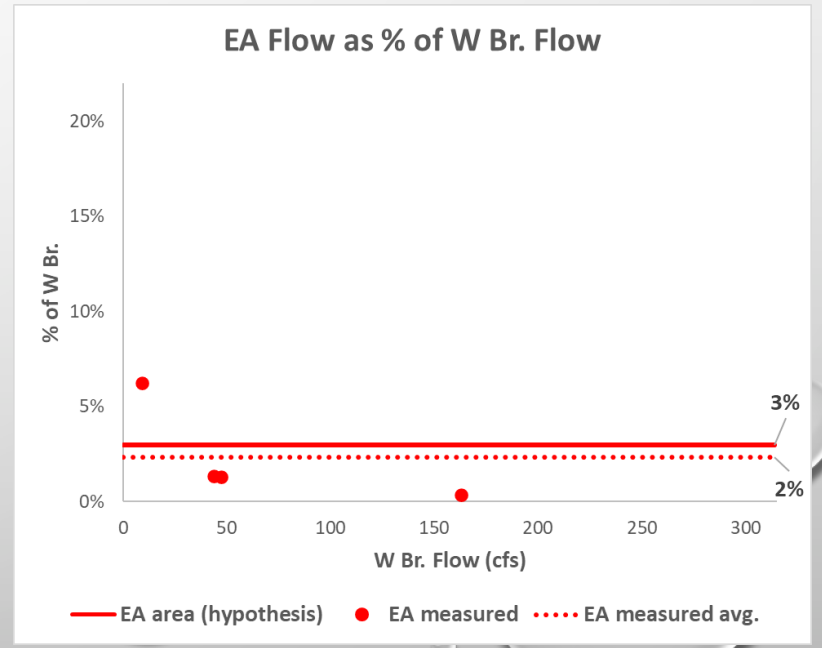
Flow continued:

- Compare avg. of all measurements as % of W. Br flow (dotted lines) to % of W Br. area (solid lines)
  - Similar locations for dotted and solid lines (**EA** and **MM**) indicates expected discharge for drainage area
  - Dotted line below solid line (**SW**) indicates less than expected discharge for its drainage area

*Note: These are rough estimates based on only a few measurements – would need more flow measurements at the new tributary sites to verify relationships with W. Br (especially at higher flows)





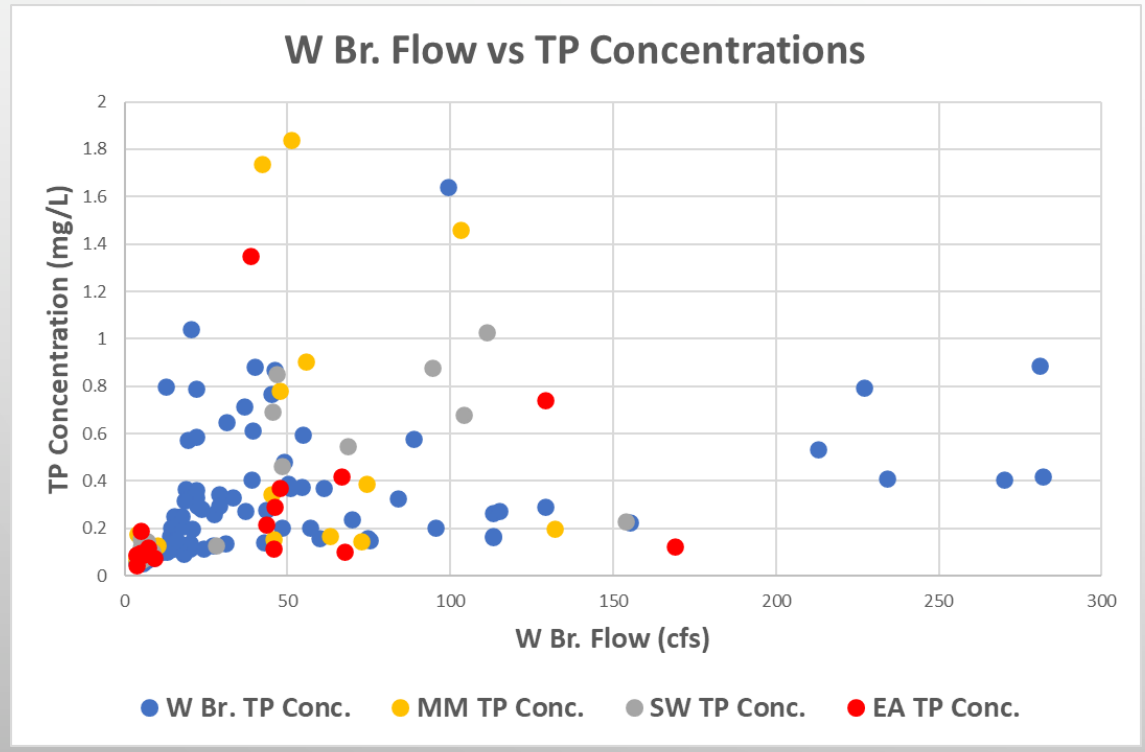


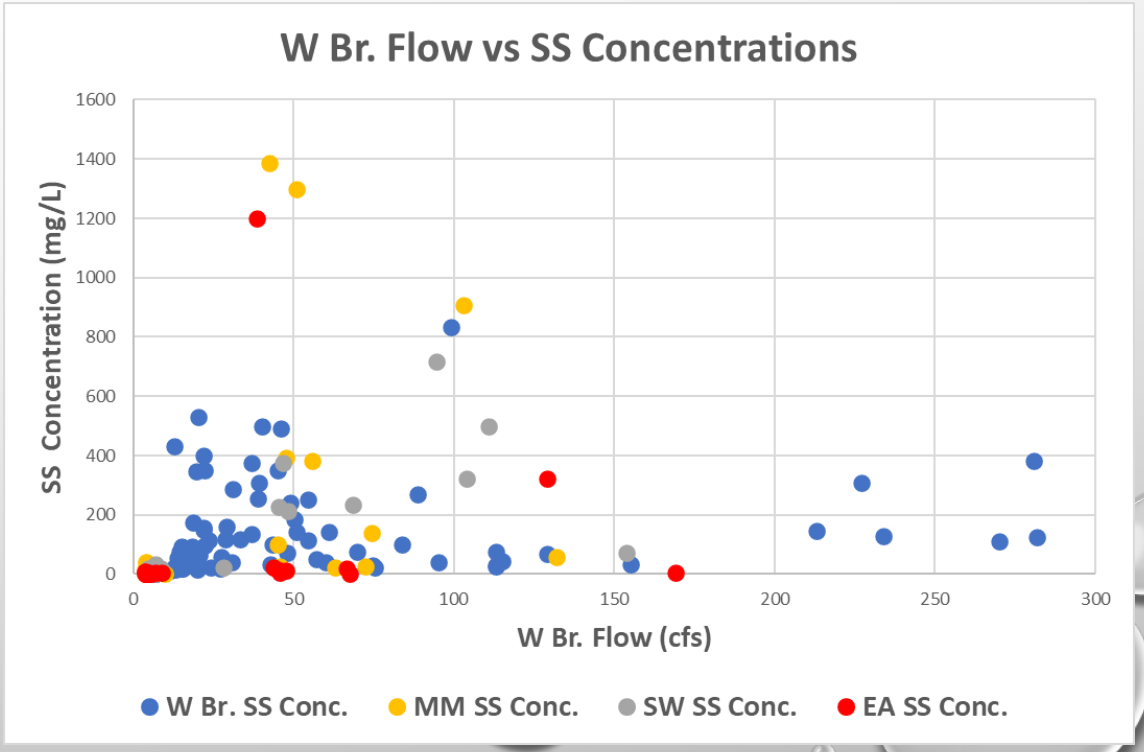
WY24 PRELIMINARY RESULTS – NEW SITES

Sample Concentrations:

- TP and SS concentrations typically increase with flow; since we don't have continuous flow for the new sites, plot with **W Br. Big Ck** flow instead
- Distributions for all sites look fairly similar; low concentrations at baseflow, quite a bit of variation during storm event flows

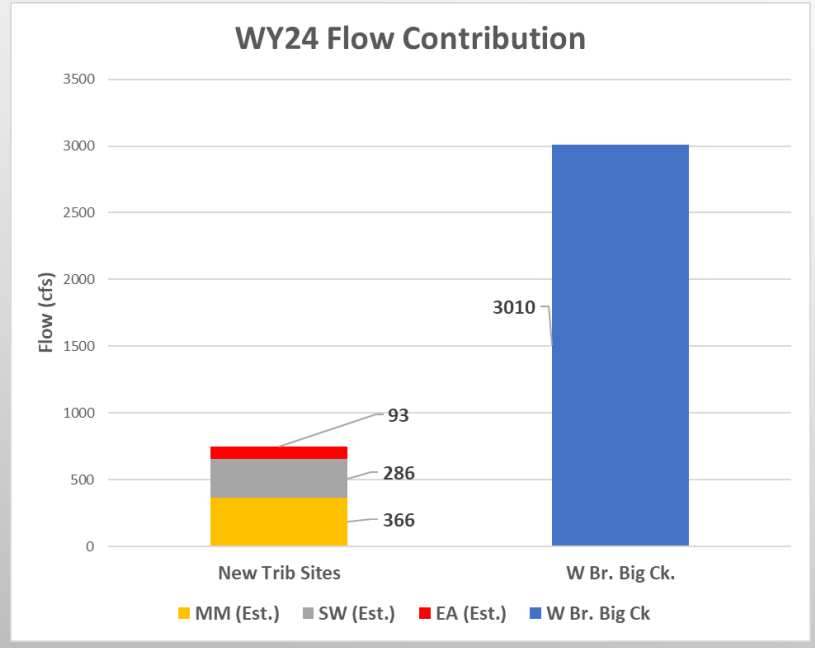
*Note: As of 10/29/24 UWSP Lab has only sent back sample results through mid-July. Planning to update this analysis once all results are back.

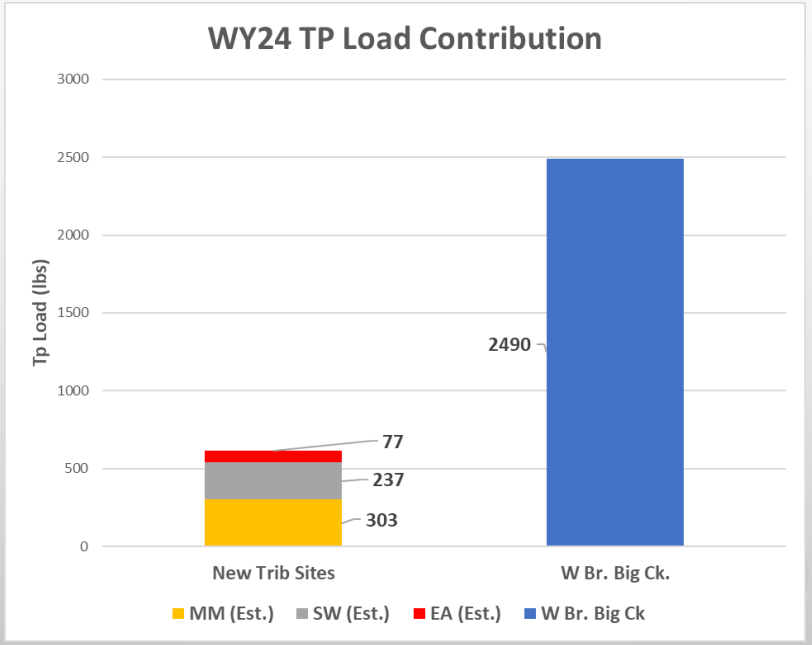


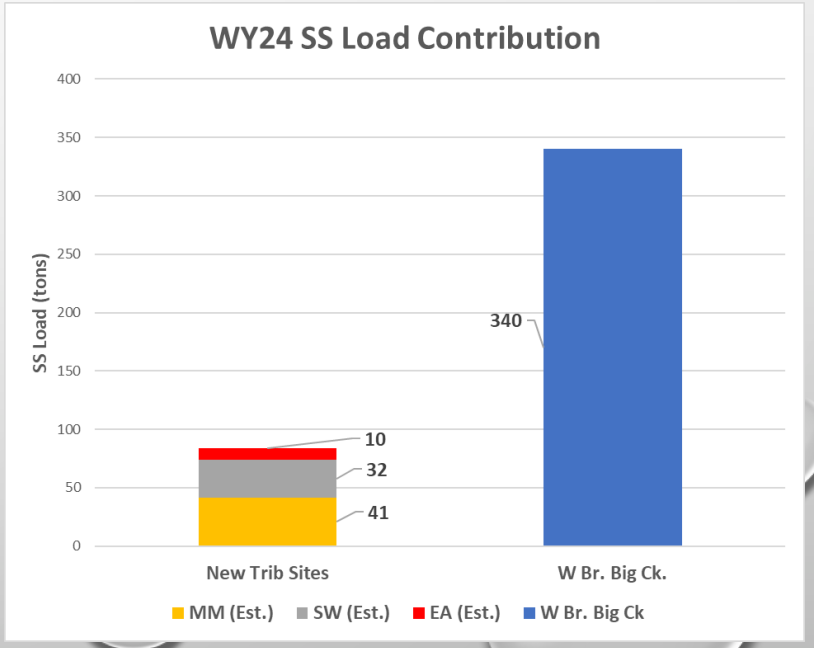


ESTIMATING WY24 NEW SITE / UNMONITORED AREA CONTRIBUTIONS

- No clear indication from data collected this year that flow or load contributions from MM, EA, or SW this year drastically differed from their expected amounts relative to W Br. Big Ck.
  - ➢ Therefore, estimates just computed relative to W Br. Big Ck. based on drainage area size







PRELIMINARY WY24 SUMMARY

Flow:

- **Outlet** >> **W Br. Big Ck.** > **Unmonitored Area** > **E Br. Big Ck.**

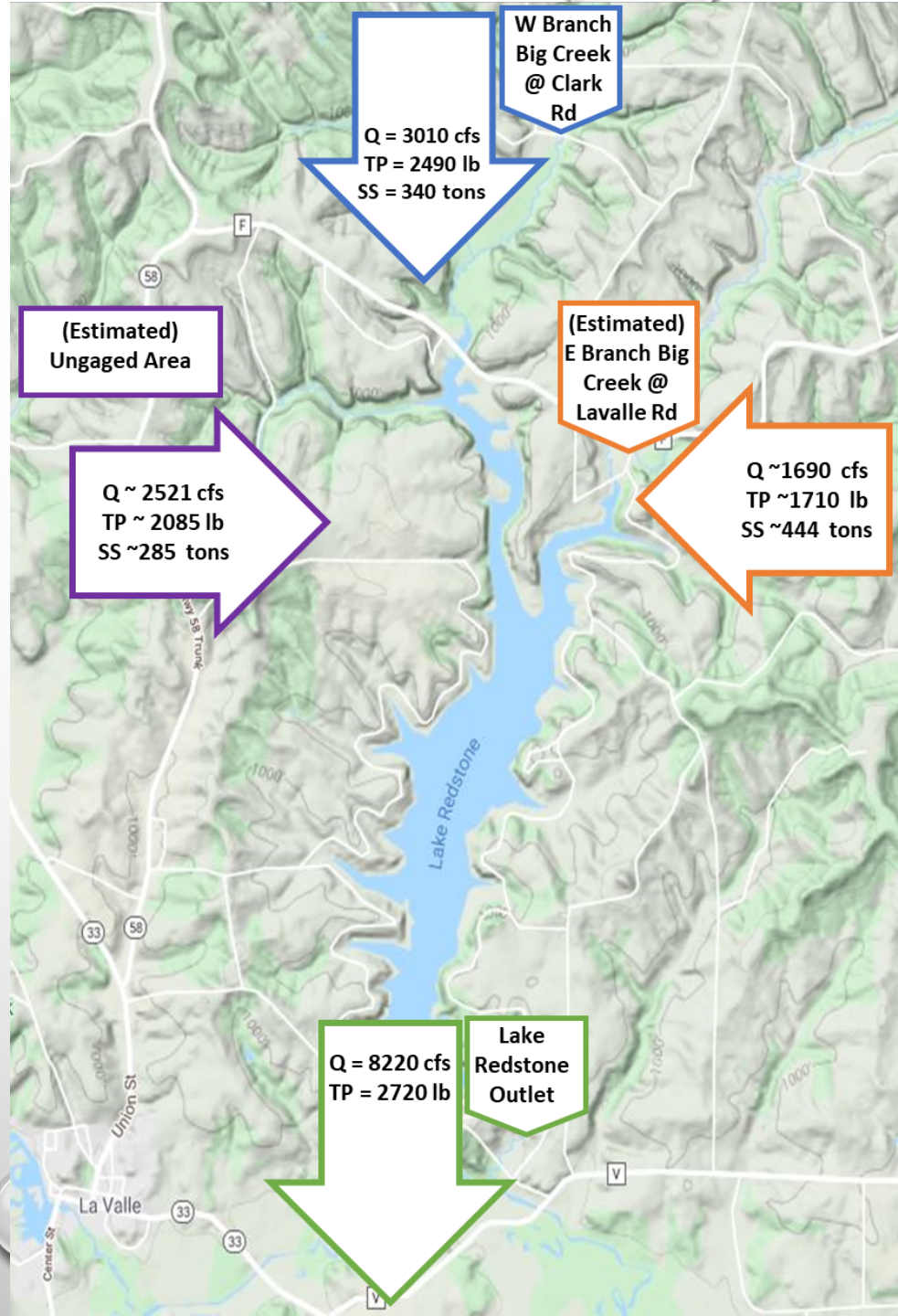
TP Load:

- **Outlet** > **W Br. Big Ck.** > **Unmonitored Area** > **E Br. Big Ck.**

SS Load:

- **E Br. Big Ck.** > **W Br. Big Ck.** > **Unmonitored Area**

*Note: Once all data has come back and been fully worked up, USGS will complete an updated analysis and will notify the LRPD if anything changes.



FOR REFERENCE:
RESULTS FROM PREVIOUS YEARS (WY20-WY23)

Flow:

Outlet >> **W Br. Big Ck.** > **E Br. Big Ck.**

- **E Br.** ~56% of **W Br.** Flow; close to drainage area proportions (53%)

TP Load:

Outlet > **W Br. Big Ck.** > **E Br. Big Ck.**

- **E Br.** ~69% of **W Br.** TP Load; slightly higher than drainage area proportions

SS Load: (SS not measured at **Outlet**)

E Br. Big Ck. > **W Br. Big Ck.**

- **E Br.** ~131% of **W Br.** SS Load; much higher than drainage area proportions