Additional Reservoir Safe Yield Results

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Agenda Item 6

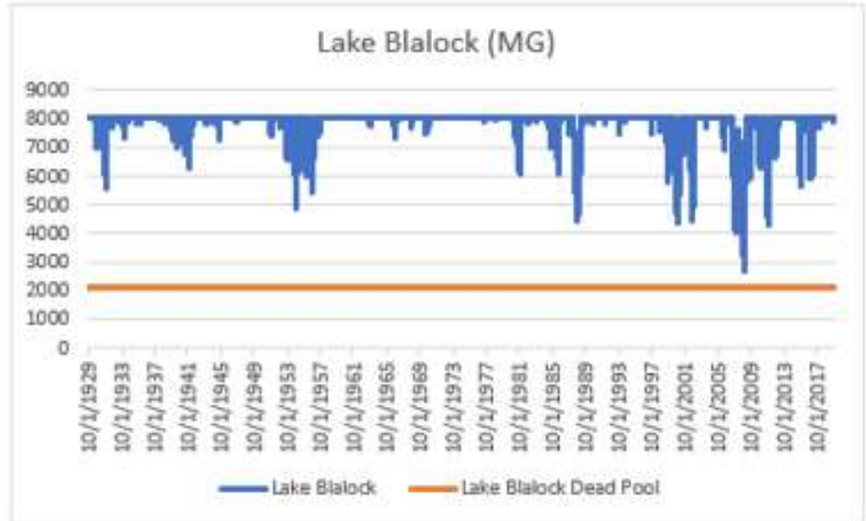
Reservoir Safe Yield

- **Definition**:
  - *The Surface Water Supply for a reservoir or system of reservoirs over the simulated hydrologic period of record*
  - Maximum annual average demand that can be sustained through the period of record without depleting available storage
- **Purpose:** Determine the amount of water that is physically/hydrologically available at a reservoir
- **Method:**
  - Based on the shallowest intake for an essential water use in a reservoir, but also computed for deeper intakes of other users if applicable.
  - Calculations apply current reservoir operating rules.
  - Based on **Current Demand, Permitted and Registered Demand, and 2070 High Demand Scenario**.
- **Note:** Reservoir Safe Yield is DIFFERENT than basin safe yield used by SCDHEC for withdrawal permitting
  - **Reservoir Safe Yield:** Hypothetical maximum withdrawal volume used for planning
  - **Basin Safe Yield:** Statistical availability of free-flowing water in a river, used for permit evaluation

Method

- Remove permit / intake / treatment constraints at the reservoir
- Suspend target elevation rules
- Maintain downstream release rules
- Apply appropriate demand scenarios upstream
- Consolidate withdrawals from the reservoir to a single hypothetical user at the reservoir
- Gradually increase continuous annual withdrawal (with seasonality) until:
  - lowest storage over period of record = dead pool / lowest allowable level
  - No Shortages

Example from Broad River Basin



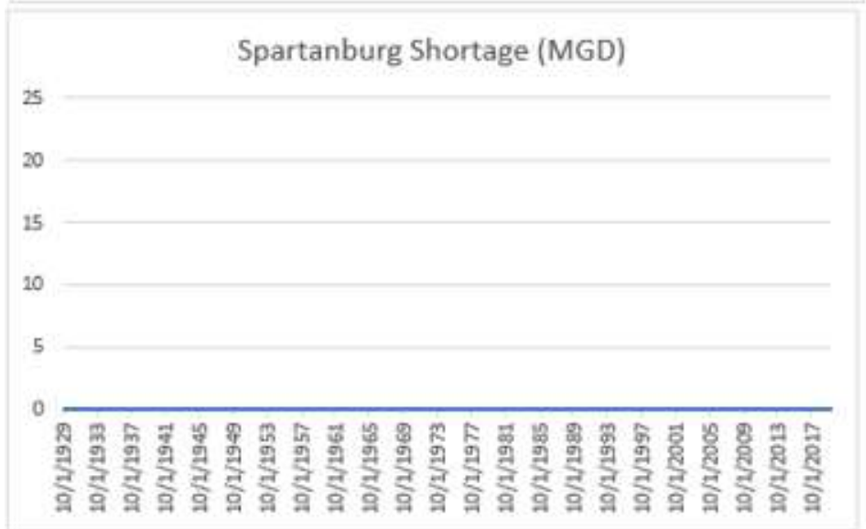
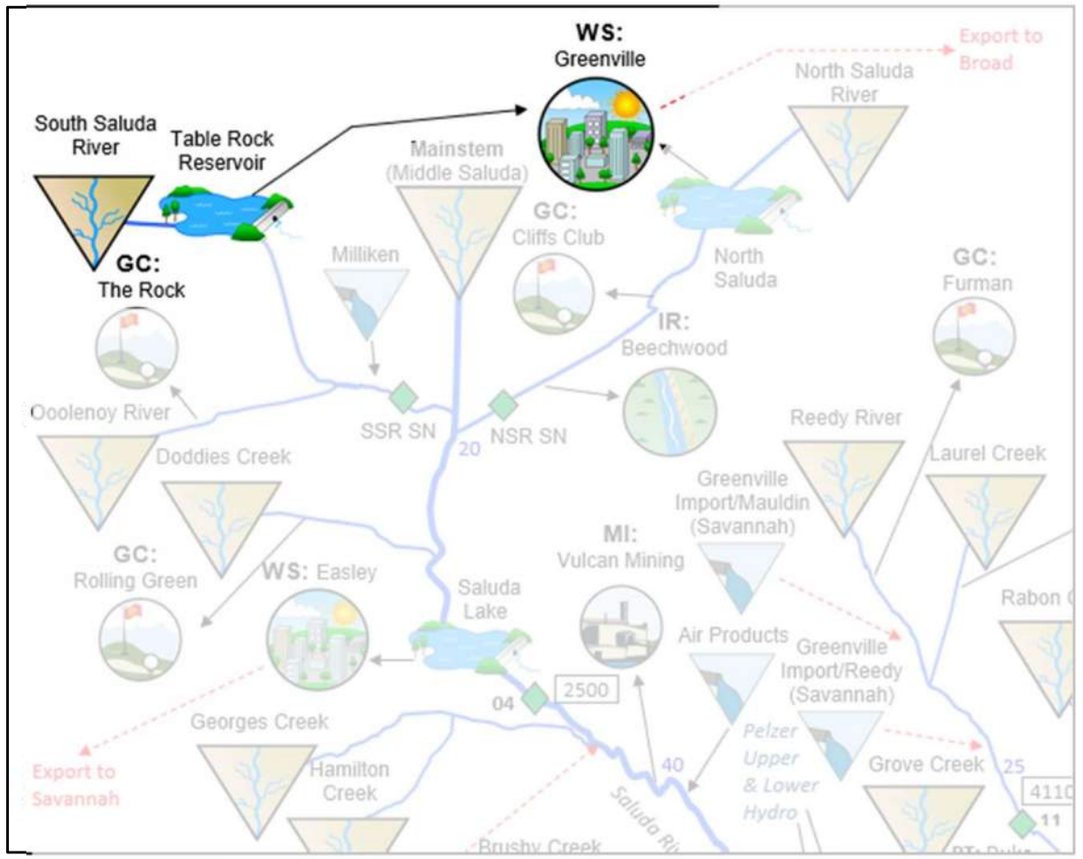
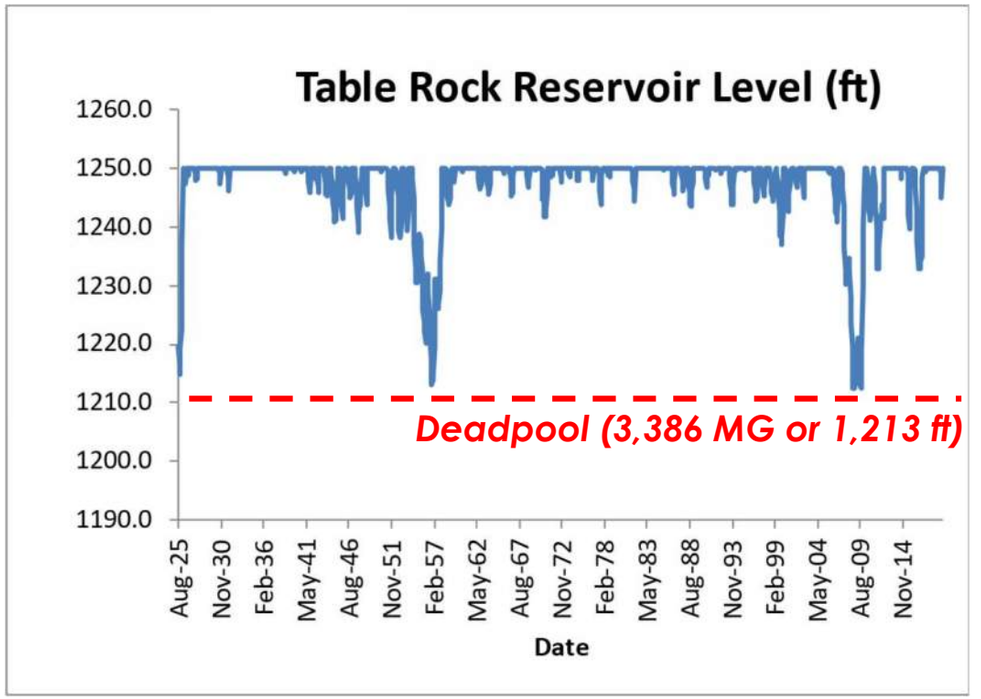


Table Rock Reservoir Safe Yield - Baseline



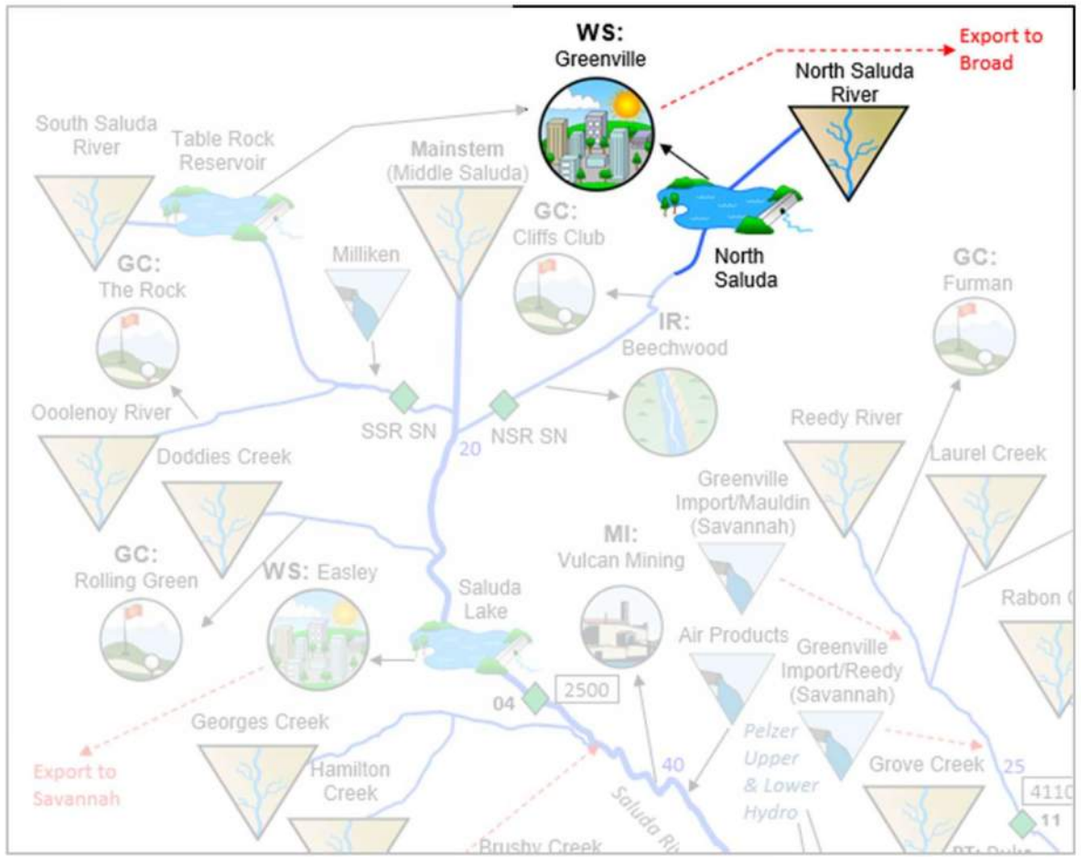


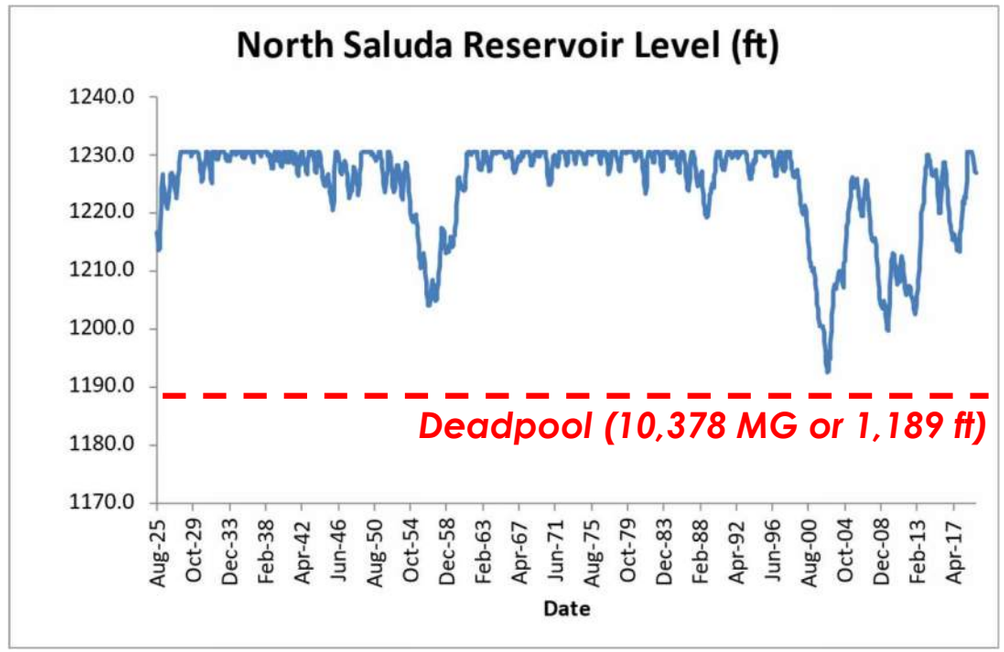
Summary of Scenario Demands and Safe Yield on Table Rock Reservoir (MGD) (for reference)

Scenario	Demands*	Safe Yield
Current	**18**	**19**
2070 High	**36**	**19**
P&R	**65**	**19**

*Demands are ½ of WS: Greenville total Demands per Scenario

North Saluda Reservoir Safe Yield - Baseline





Summary of Scenario Demands and Safe Yield on Table Rock Reservoir (MGD) (for reference)

Scenario	Demands*	Safe Yield
Current	**18**	**16**
2070 High	**36**	**16**
P&R	**65**	**16**

*Demands are ½ of WS: Greenville total Demands per Scenario

Table Rock and North Saluda Reservoirs Safe Yield: Variations

Table Rock Safe Yield (MGD) under Different Scenarios

	2002 Drought	2008 Drought
With Min. Release (4.65 cfs)	27.4	19.2
No Min. Release	30.1	21.9

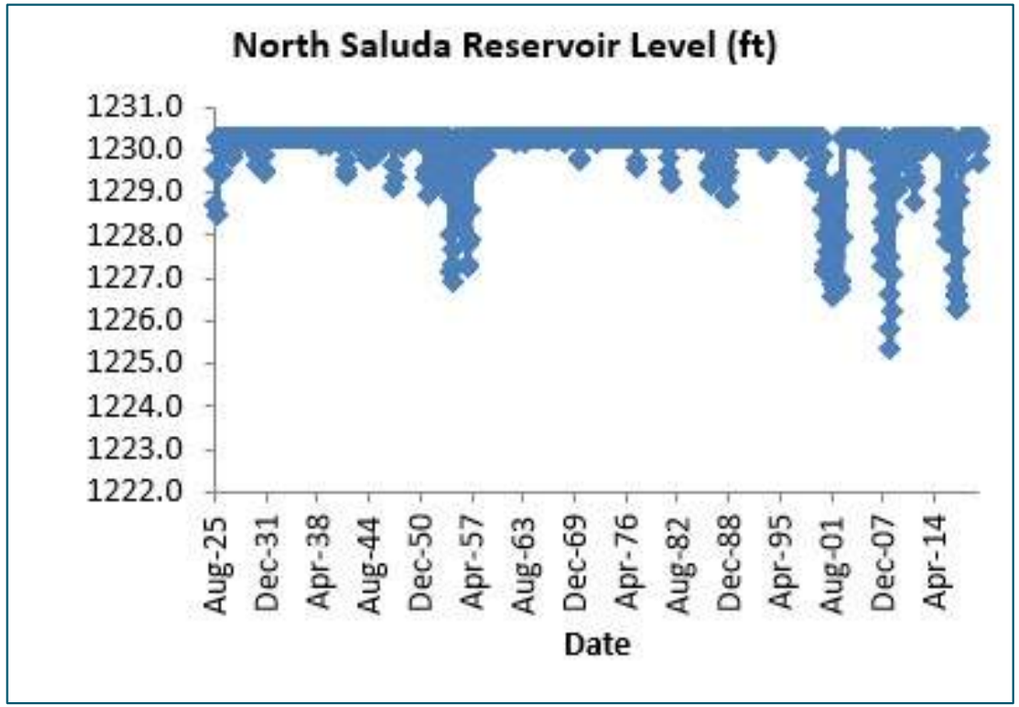
North Saluda Safe Yield (MGD) under Different Scenarios

	2002 Drought	2008 Drought
With Min. Release (4.65 cfs)	16.4	17.8
No Min. Release	19.2	20.5

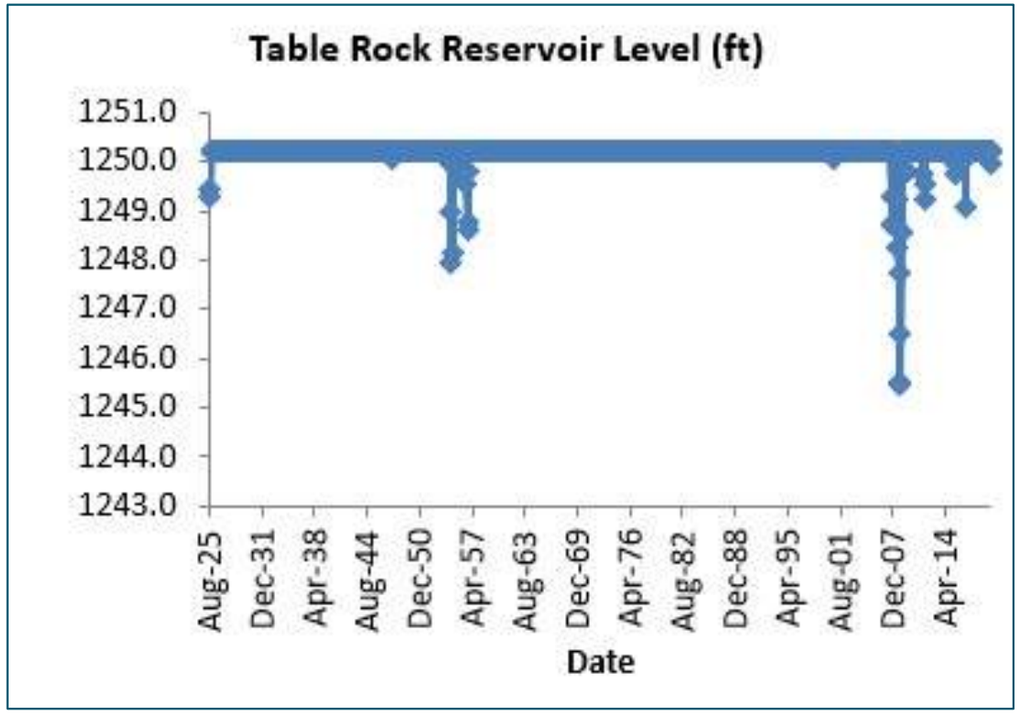
North Saluda and Table Rock Yield:

5-foot maximum drawdown
minimum release = 4.65 cfs

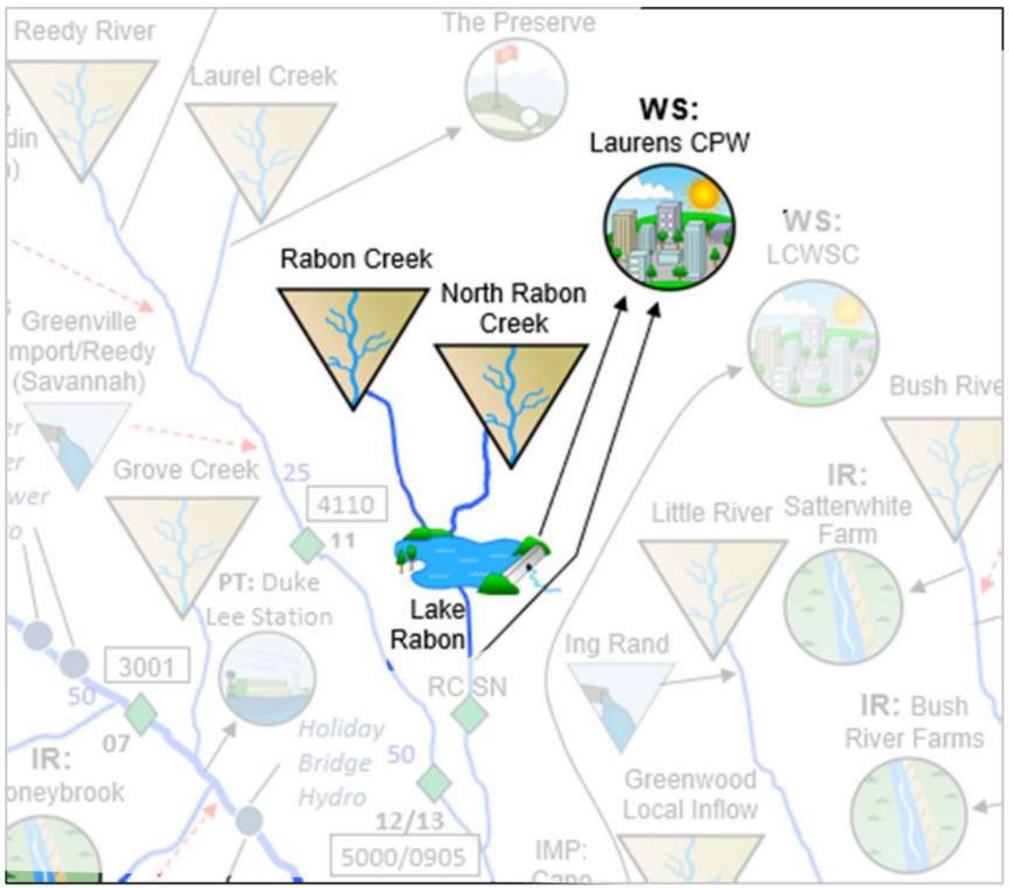
Yield = 7.4 MGD

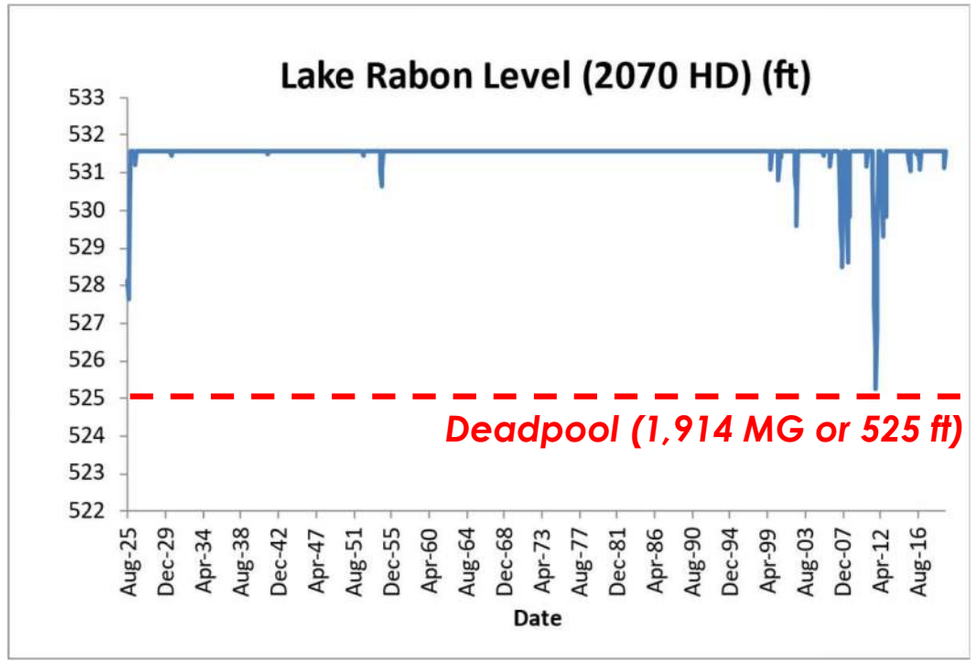


Yield = 6.8 MGD



Lake Rabon Safe Yield

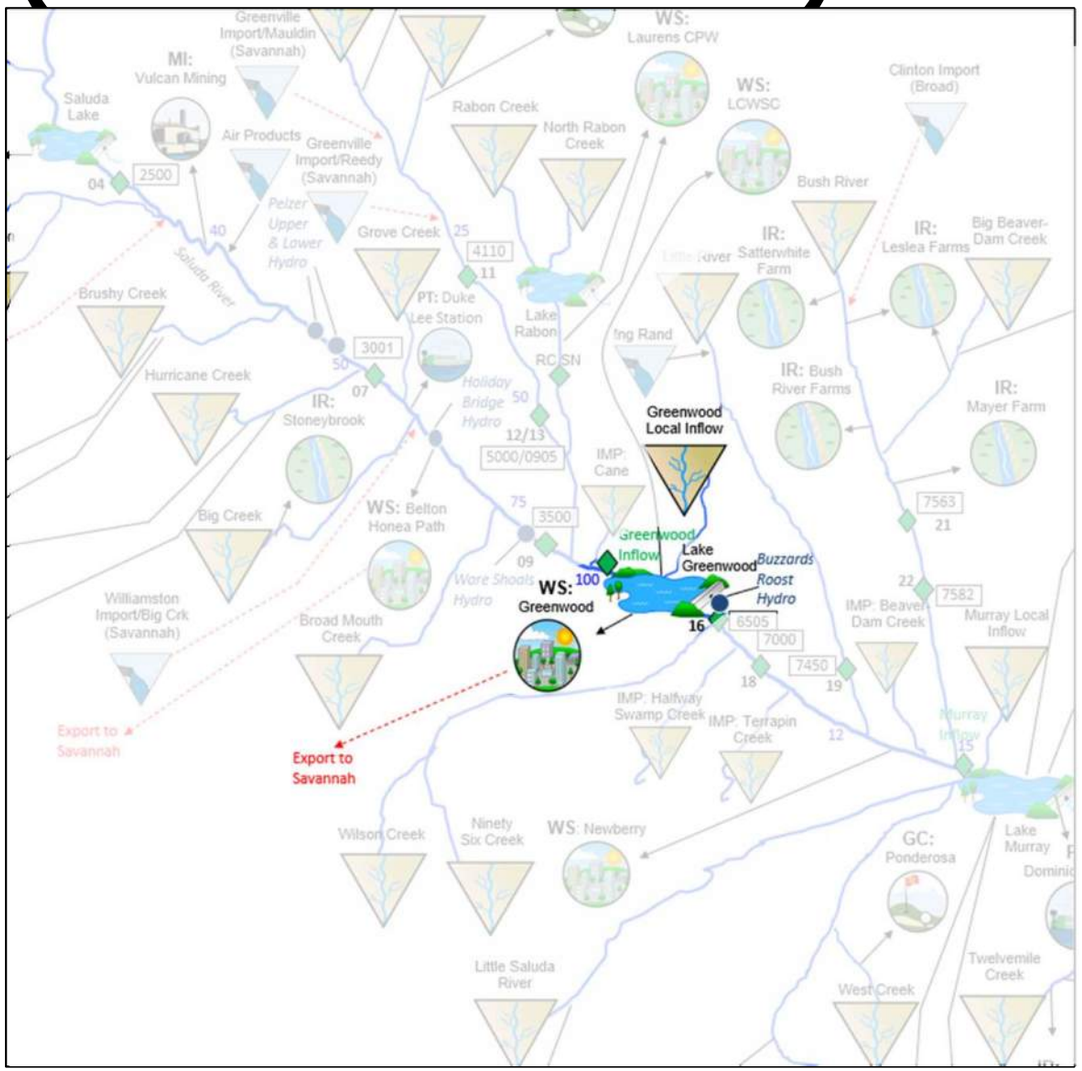


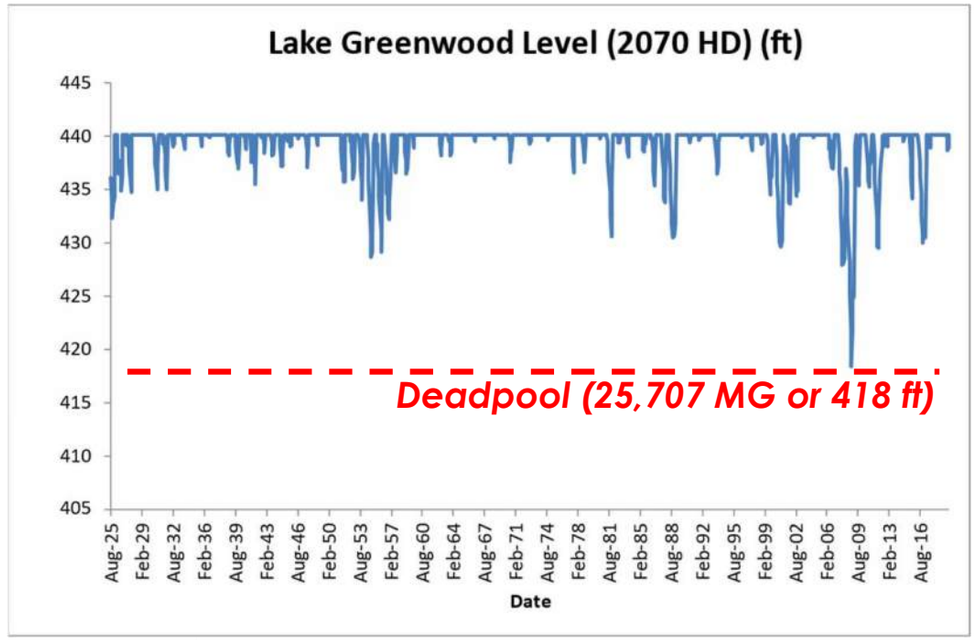


Summary of Scenario Demands and Safe Yield on Lake Rabon (MGD)
(for reference)

Scenario	Demands	Safe Yield
Current	1.5	2
2070 High	2.42	2
P&R	30	2

WS: Greenwood (Lake Greenwood) Safe Yield

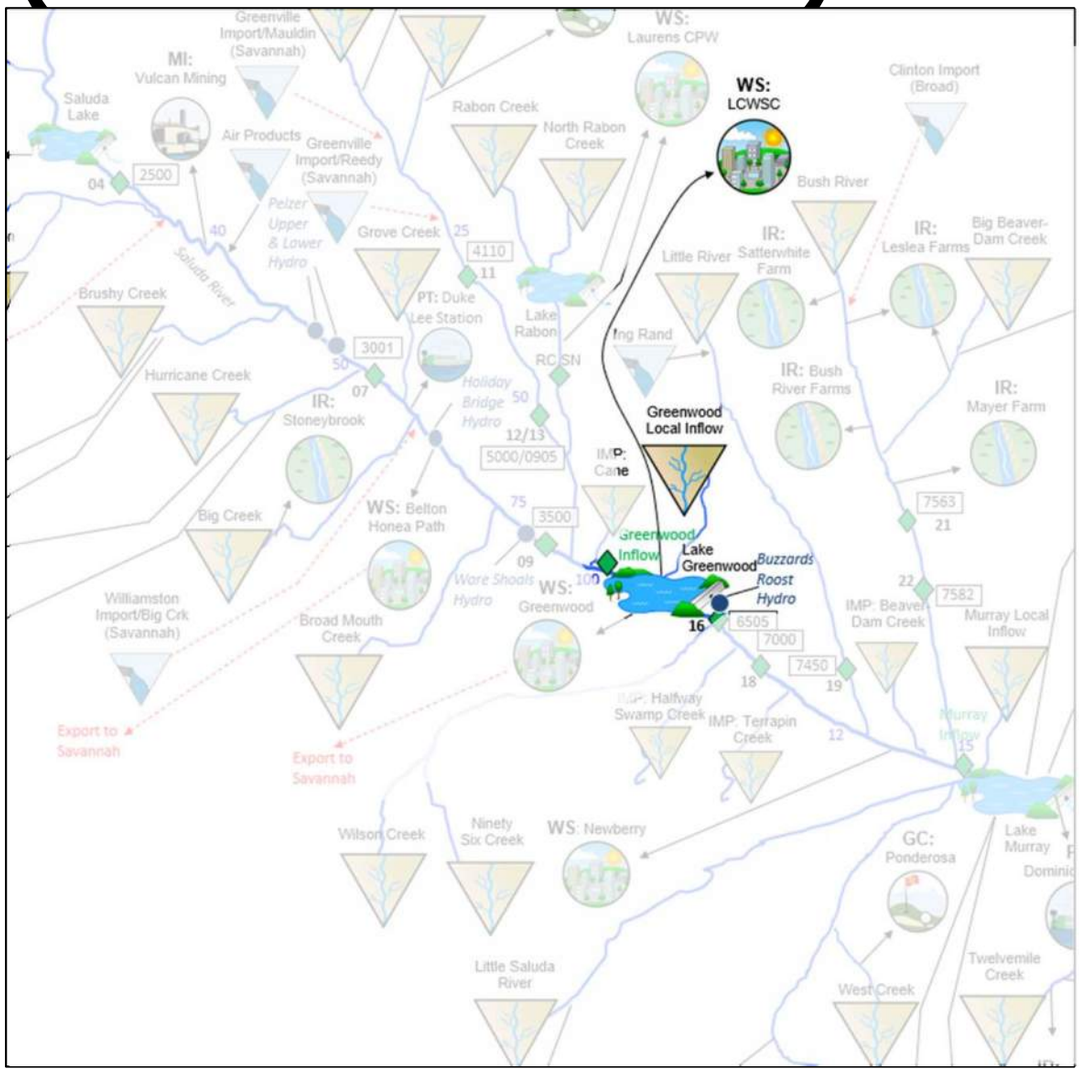


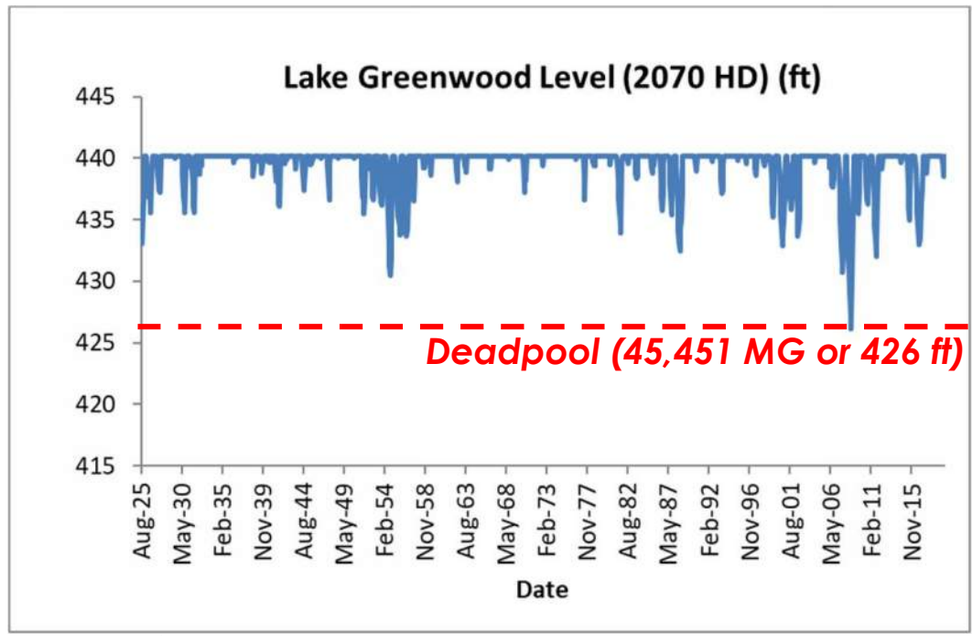


Summary of Scenario Demands and Safe Yield for WS: Greenwood on Lake Greenwood (MGD) (for reference)

Scenario	Demands	Safe Yield
Current	12	260
2070 High	20	247
P&R	74	219

WS: LCWSC (Lake Greenwood) Safe Yield





Summary of Scenario Demands and Safe Yield for WS: LCWSC on Lake Greenwood (MGD) (for reference)

Scenario	Demands	Safe Yield
Current	12	162
2070 High	20	153
P&R	74	184

Lake Greenwood Safe Yield Comparison to Intakes