

# Surface Water Demand Scenarios

Scott Harder

Hydrology Section Chief

S.C. Department of Natural Resources  
Land, Water and Conservation Division



Edisto River Basin Council  
Meeting #9 (Virtual)  
January 6<sup>th</sup>, 2021

# Surface Water-Demand Scenarios



- Planning Framework requires four scenarios to be reviewed by each River Basin Council:
  1. Current Surface Water Use
  2. Permitted and Registered Water Use Scenario
  3. Business-as-Usual Water-Demand Projection
  4. High Water-Demand Projection
- Optional scenario – simulation of unimpaired surface water hydrology.
- Scenarios focus on “water demand” side as opposed to “water supply” side.
- Additional water demand scenarios can be recommended by the RBC:
  - Based on different assumptions used in existing projections (more aggressive growth rates, for example)
  - New water-demand projection scenarios must be submitted to SCDNR in writing by the RBC for consideration.

# Surface Water Demand Scenarios



## 1. Current Surface Water Use Scenario

- Demand based on “current” water use defined as recent 10-year average (2009-2018) of reported water use.
- Simulates Surface Water Supply and Shortages resulting from a repeat of the historic drought of record (2002) under current withdrawals.
- Shortages would highlight the need for *short-term planning*.



## 2. Permitted and Registered Water Use Scenario

- Water demand based on maximum legally allowable water use for surface water permits and registrations.
- Identifies shortages that would occur under a repeat of the drought of record under maximum legally allowable withdrawals.
- Addresses whether surface water source is currently over-allocated.
- *“Baseline” scenario:*
  - Defines Surface Water Supply when no Surface Water Shortages are identified.
  - Surface Water Supply estimated under this scenario denotes unallocated available water.
  - RBC must consider shortages under this scenario when developing Surface Water Management Strategies.

# Surface Water Demand Scenarios



- Two Water-Demand Projection Scenarios:
  3. **Business-as-Usual Water-Demand Projection Scenario** – demand based on projection of water use assuming normal climate and moderate population and economic growth.
  4. **High Water-Demand Projection Scenario** – demand based on projection of water use assuming drier conditions and high population and economic growth.
- Provide information on when and where shortages are likely to occur:
  - 50-year Planning Horizon
  - Simulations completed in 5- to 10- year intervals.
- If projections exceed registered and permitted amounts:
  - Surface Water Shortages will be larger than identified in the Permitted and Registered Water Use Scenario.
  - Surface Water Management Strategies should be developed to address the Shortages identified in the projection scenarios.

# Methods for Evaluating Groundwater Availability



- **Definitions:**
  - **Groundwater Supply** – the volume of water that can be withdrawn annually from a specified aquifer in a designated location without violating any applied Groundwater Conditions on the groundwater source.
  - **Groundwater Conditions** – a physical limitation on the amount of groundwater that can be withdrawn from an aquifer and which can be applied to evaluate Groundwater Supply for planning purposes.
  - **Groundwater Shortage** – occurs when current or future groundwater withdrawals from a specified aquifer are violating or are expected to violate a Groundwater Condition applied on that aquifer.
  - **Groundwater Area of Concern** – an area where current or future groundwater withdrawals from an aquifer are causing or are expected to cause unacceptable impacts to the resource or to the public health and well-being.
- **Groundwater Demand Scenarios**
  - Predevelopment Groundwater Use Scenario
  - Current Groundwater Use Scenario
  - Permitted Groundwater Use Scenario
  - Business-as-usual Water-Demand Projection Scenario
  - High Water-Demand Projection Scenario