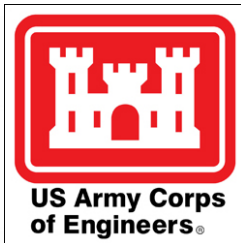


Hazen



Falls Lake Reallocation

**Securing Raleigh's Water Supply Future in Conjunction
with the Corps of Engineers
Chris Belk – April 2, 2019**

Agenda for Today's Discussion

- Project Background
- Falls Lake Reallocation Project: Regulatory Authority, Process & Timeline
- Lessons Learned

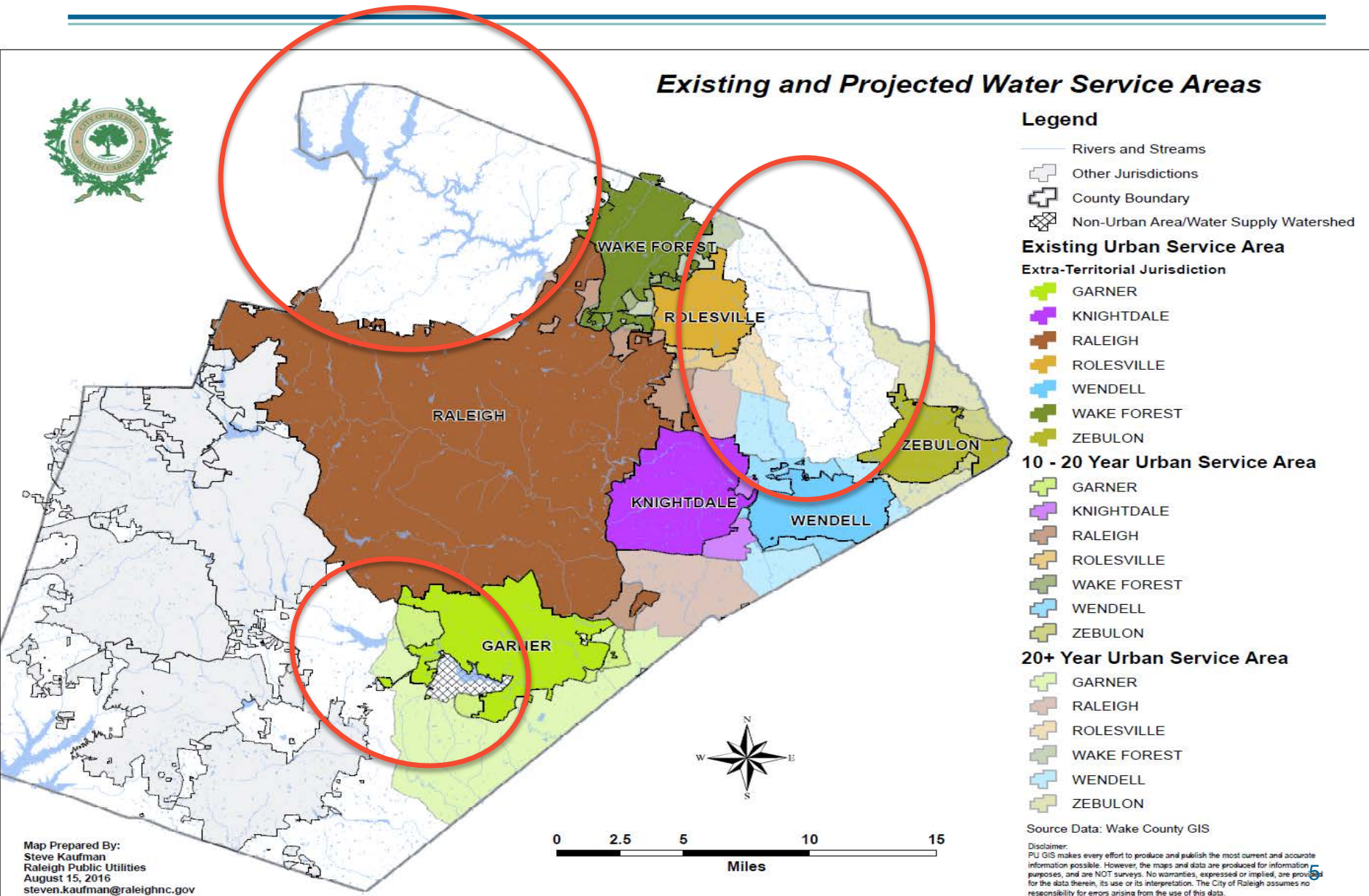
Project Background



Purpose and Need

- To develop a safe and dependable water supply for the City of Raleigh and its Merger Partners that, together with existing supplies, will satisfy estimated water demands for a planning period ending in year 2047.
- To support continued growth of the service area
- Service area includes City of Raleigh and Towns of Garner, Knightdale, Rolesville, Wake Forest, Wendell, and Zebulon.

Regional Water Utility



Source Water Supply Yield

Meeting current and long-term demand

- Raw water supplied from Falls Lake to the E.M. Johnson Water Plant results in a 100 MGD instantaneous yield and 63.4 MGD reliable yield for the drought of record.
- Raw water supplied from the Swift Creek lake system to the D.E. Benton Water Plant results in a 20 MGD instantaneous yield and 11.2 MGD reliable yield for the 50-year reoccurring drought

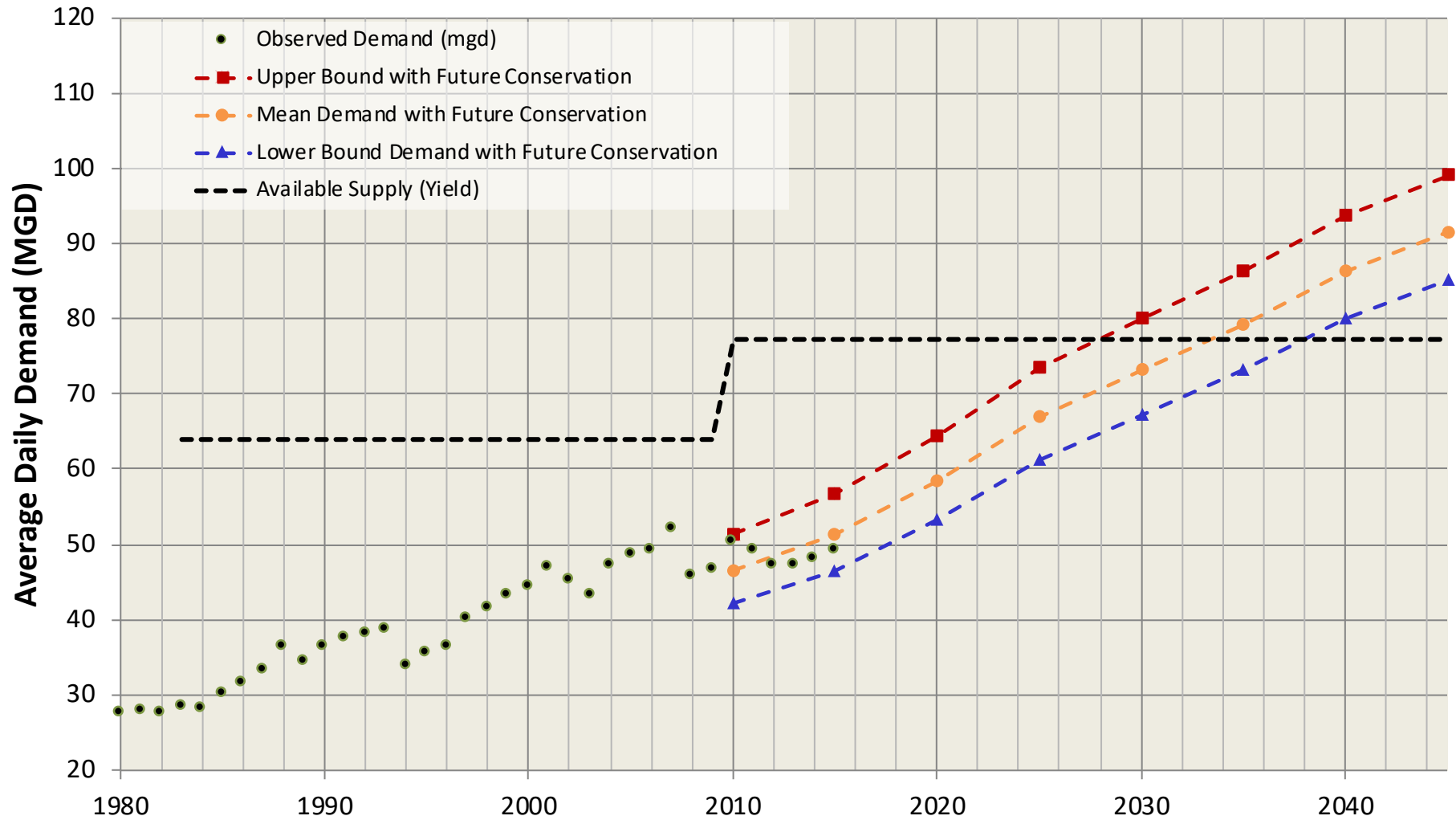


Year	Population Served	Water Demand	Available Supply
2015	549,112	49.9 mgd	75.9 mgd*
2047	1,048,700	97.9 mgd	75.9 mgd

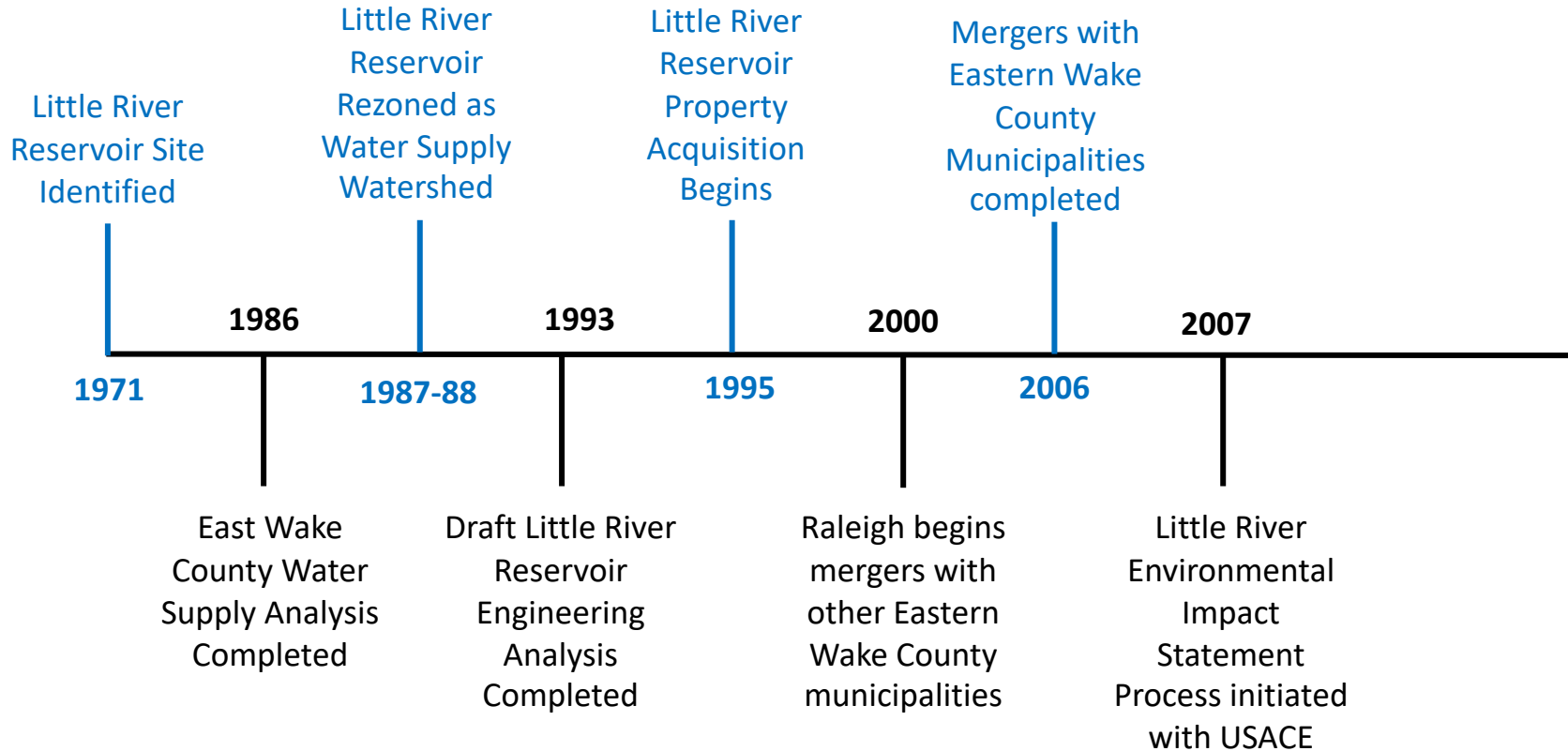
22 MGD Shortfall

*For drought of record at Falls Lake the Swift Creek yield is actually 12.5 mgd (2007-08)

Demand History and Projections



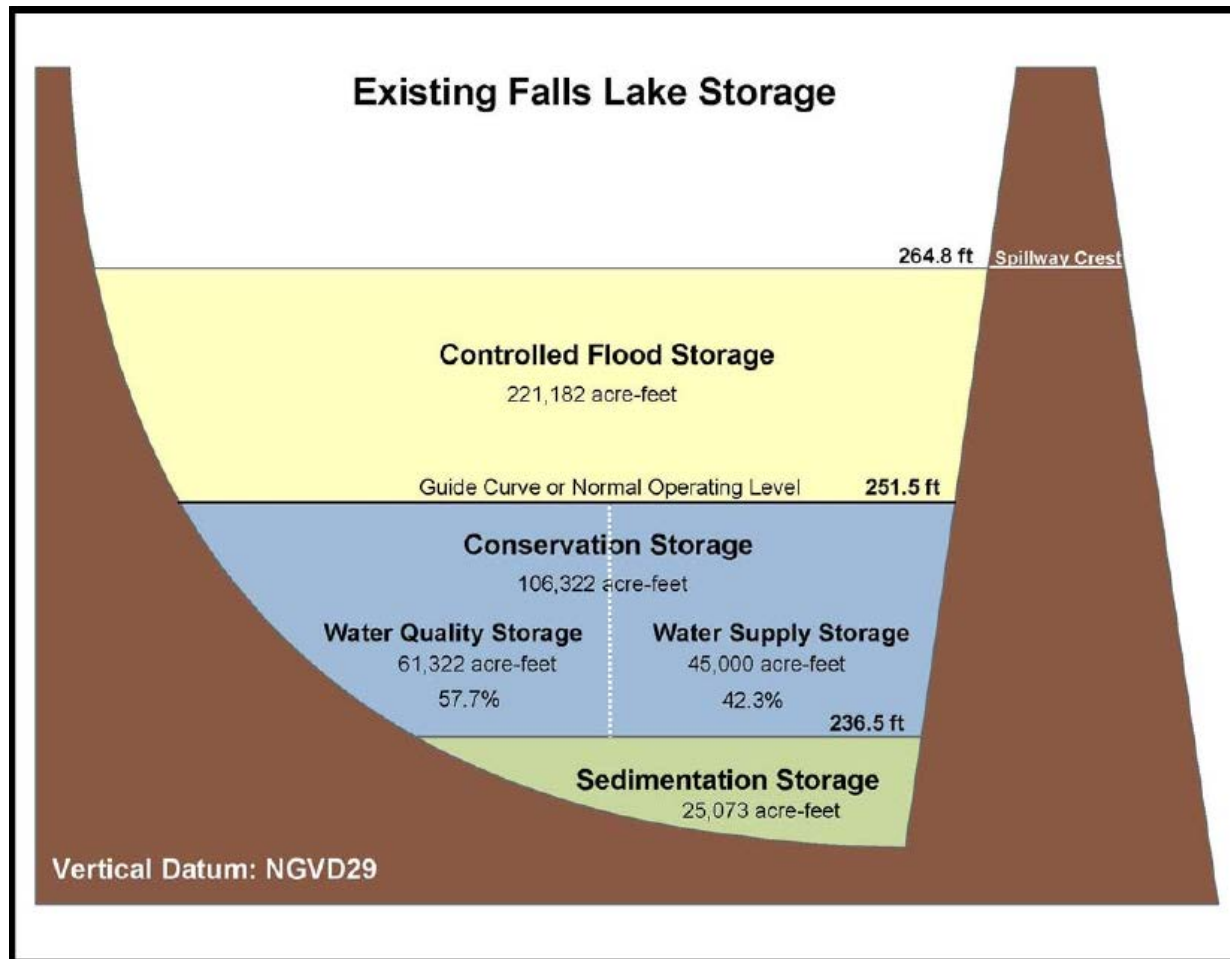
Little River Reservoir Timeline



Alternatives Considered in EIS Process

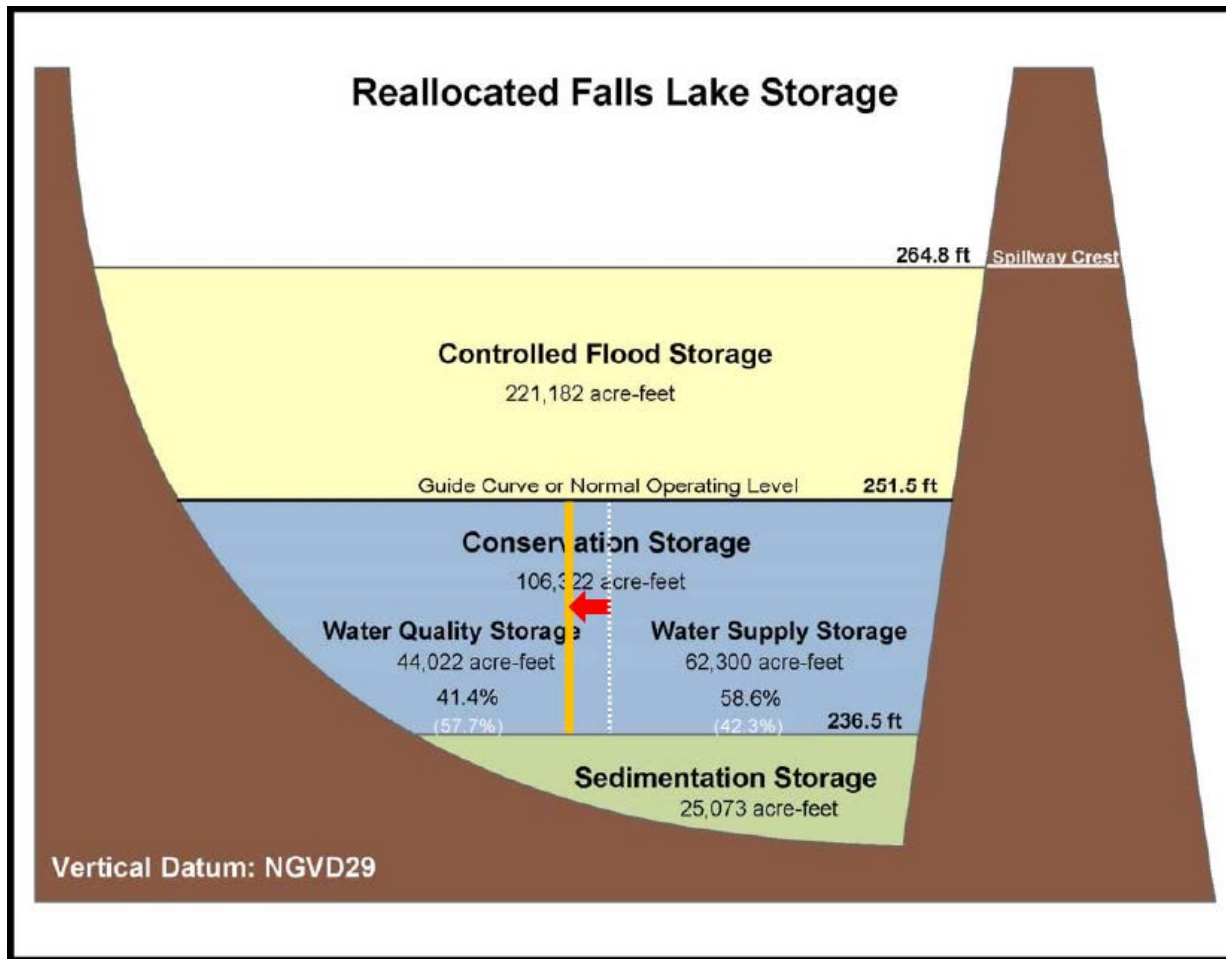
1. No-Action Plan
 - 2. Falls Lake - Reallocation of Storage within Conservation Storage**
 3. Falls Lake - Seasonal or Permanent Raising of Normal Pool (Flood Storage)
 4. Falls Lake - Reallocation of Storage in Sediment Pool to the Water Supply Storage
 5. Falls Lake - Dredge Lake to Increase Volume
 6. Falls Lake - Raise Dam to Provide Additional Water Supply Storage
 7. Obtain Water Supply from Lakes Benson and Wheeler (Reservoirs)
 - 8. Neuse River Intake Near Richland Creek**
 - 9. Construct Offline Storage, Neuse River at Richland Creek**
 - 10. Neuse River Intake Upstream of City Wastewater Treatment Plant**
 - 11. Construct Offline Storage Upstream of City Wastewater Treatment Plant**
 12. Convert Existing Quarries to Reservoirs
 13. Development of Groundwater Supplies using Multiple Local Wells
 14. Development of Groundwater Supplies by Aquifer Storage and Recovery (ASR)
 15. Development of Groundwater Supplies by using PCS Phosphate-owned Pumped Groundwater
 16. Reallocation from John H. Kerr Reservoir
 17. Obtain Allocation from Jordan Lake
 18. Purchase Water from Existing Systems
 19. Construct Middle Creek Reservoir
 20. Construct Buffalo Creek Reservoir
 - 21. Water Conservation/Efficiency Measures**
 - 22. Wastewater Reuse from City Wastewater Treatment Plant**
-

Existing Falls Lake Storage

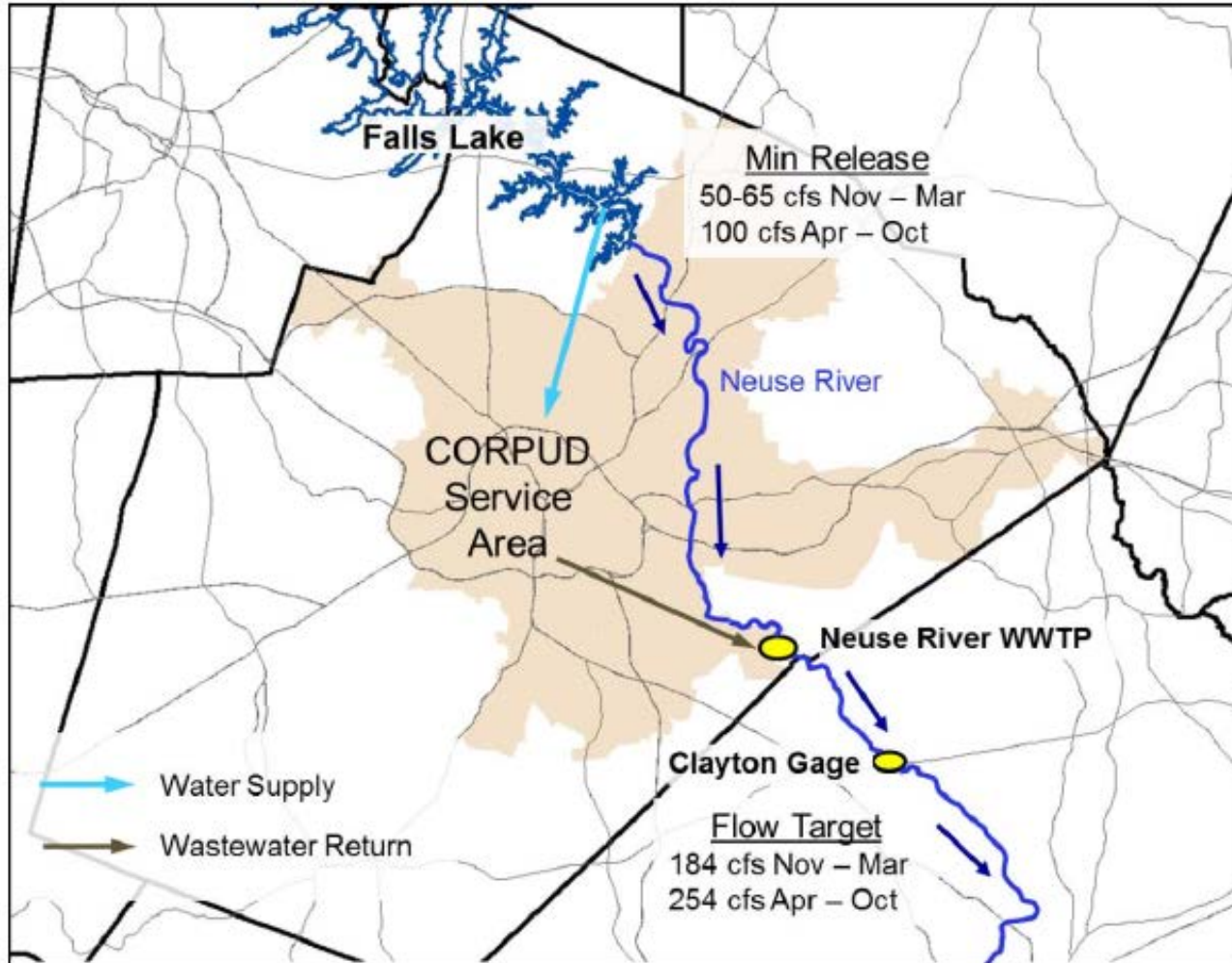


Proposed Falls Lake Storage Reallocation

Move 17,300 acre-feet to the Water Supply Pool

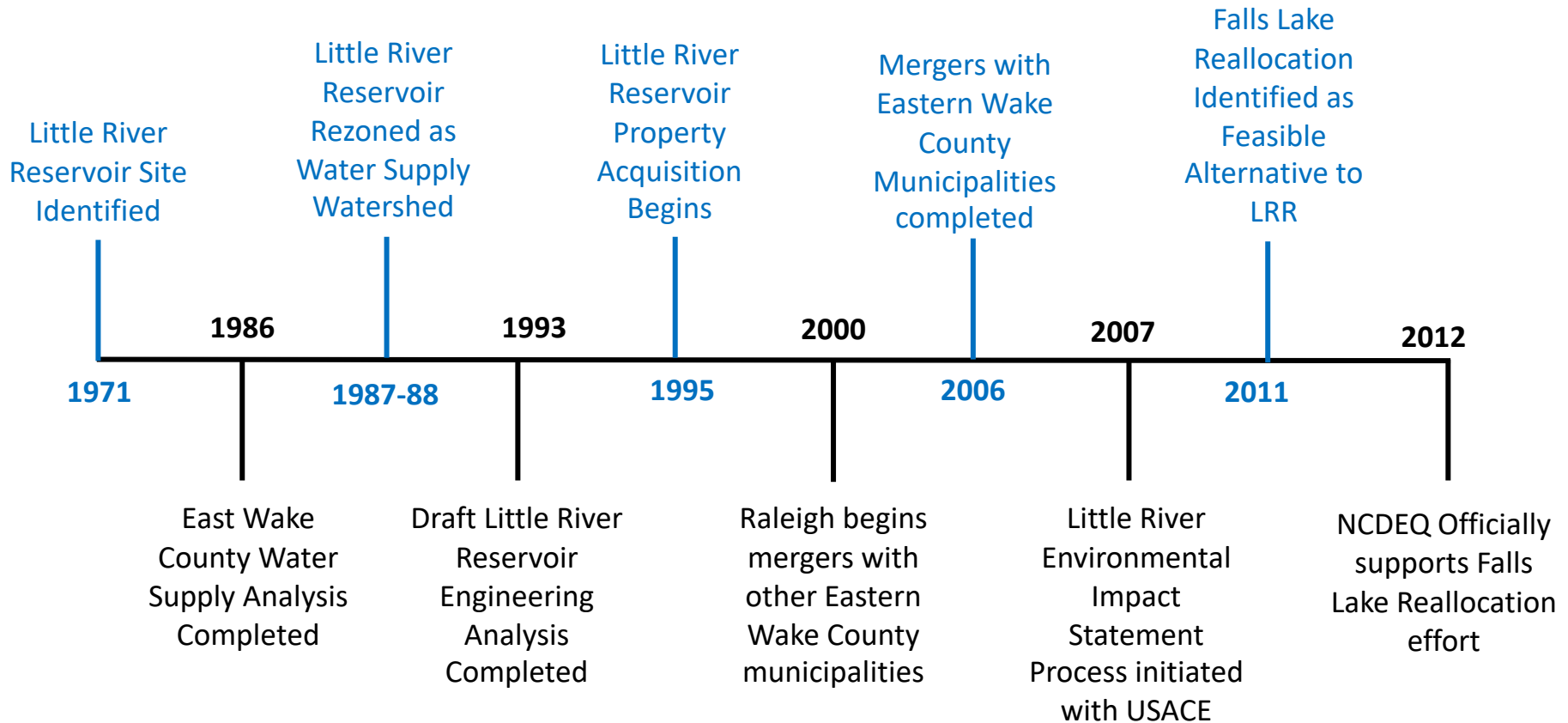


Water Quality Pool – Water Supply Relationship



CORPUD = City of Raleigh Public Utilities District

Little River Reservoir Timeline





Falls Lake Reallocation Project: Regulatory Authority, Process, & Timeline

Study Purpose

- Evaluate the City of Raleigh's request for reallocating 17,300 acre-feet water conservation storage within Falls Lake, North Carolina
- Identify the most cost-effective means of providing water supply storage to the City of Raleigh and its partners, for the period 2017 to 2047.



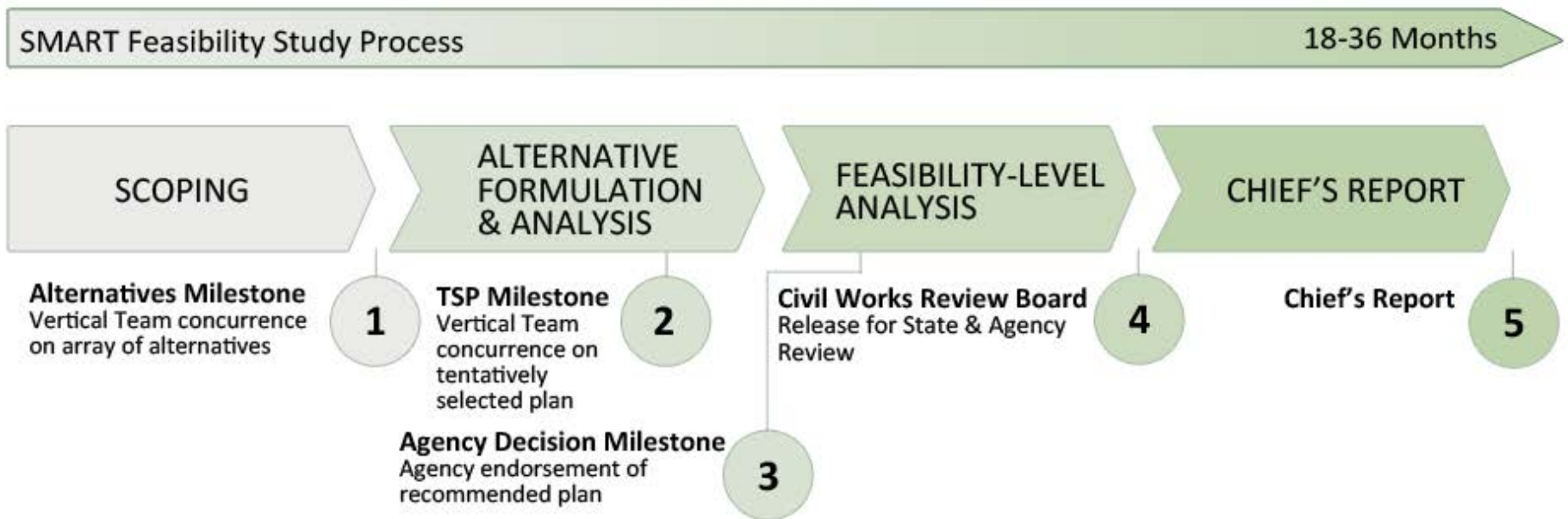
Legislative Authority

- Public Law 85-500, Title III, Water Supply Act of 1958 (43 USC 390b; P.L. 85-500), as amended.
- Congress intended for the Corps to use this authority to assume an active role, in conjunction with State and local interests, by including storage for water supply in the planning for new Corps projects or by allowing the use of storage in existing Corps projects for water supply, to the extent it could not already be used for that purpose. - 43 U.S.C. 390b(a)

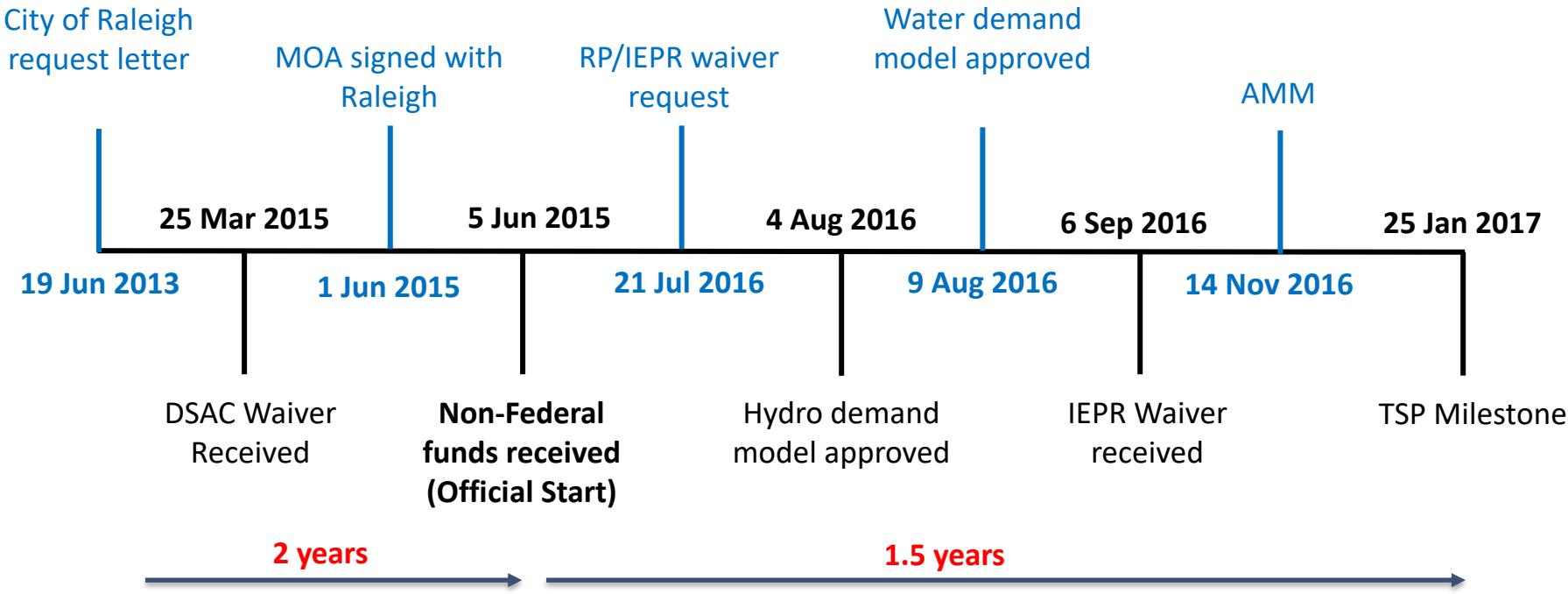
Project Funding

- Request to home district on agency letterhead stating why the reallocation is needed, and how much is needed in acre-feet
 - USACE then will request O&M funding to do the study or
 - Requestor can fund with 100% non-federal funds
- Congressional Approval Required to approve use of non-federal funds

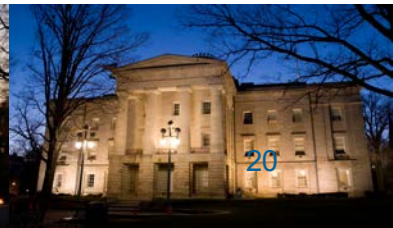
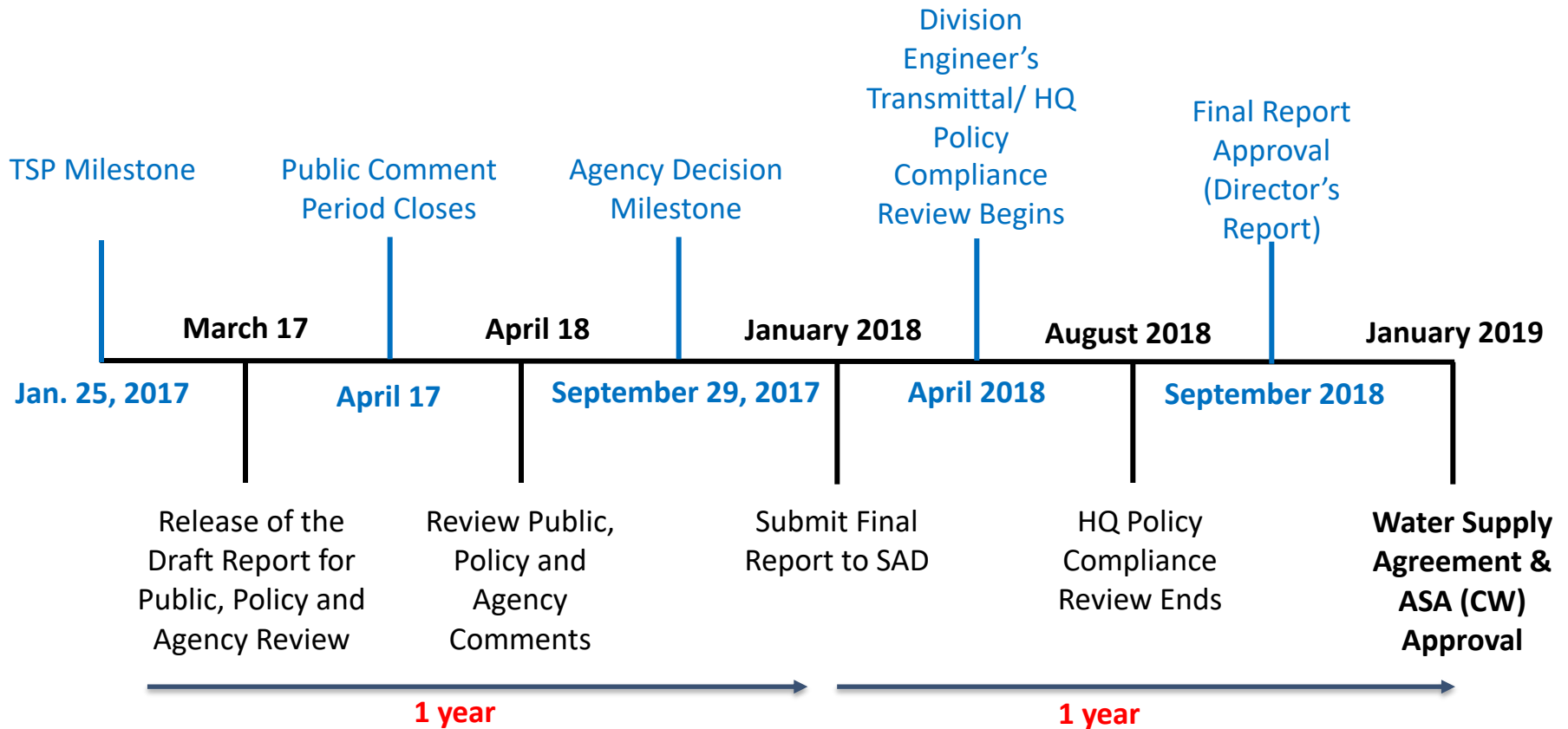
Feasibility Study Process



Project Timeline



Project Timeline



Lessons Learned



Reallocation Studies

- Know and understand the factors that will complicate a reallocation study to include:
 - More than one state involved (unless all will benefit);
 - Multiple owners (unless all will benefit)
 - Complex benefits issues
 - hydropower (i.e. J H Kerr)
 - use of flood pool;
 - contentious stakeholders (States, tribes, resource agencies, downstream users benefitting from status quo or current relationships);
 - current argument over state allocations;
 - T&E species issues.

Reallocation Studies

- Know and understand your reservoirs DSAC Rating (Dam Safety Action Classification)
 - DSAC I – Urgent and Compelling (Unsafe)
 - DSAC II – Urgent (Unsafe or Potentially Unsafe)
 - DSAC III – High Priority (Conditionally Unsafe)
 - DSAC IV – Priority (Marginally Safe)
 - DSAC V – Normal (Safe)
- USACE will not do a study where DSAC ratings are 1, 2, or 3; without a waiver
- Falls Lake has a DSAC 3 designation; however the 3 rating is for “consequences after failure” not for “structural deficiency” reasons.

Reallocation Studies

- Engage stakeholders early!
- All models used must be confirmed by the USACE Center of Expertise, to include:
 - Water Quantity and Quality models
 - Water Demand models
- Obtain confirmation of Study Planning Horizon;
 - 30-year?
 - 50-year?
- Applicant can offer assistance to the USACE but this is the **Corps** document
- Water Supply Agreement
- Cost Updates

CONTRACT BETWEEN THE UNITED STATES OF AMERICA
AND
THE CITY OF RALEIGH, NORTH CAROLINA
FOR
WATER STORAGE SPACE IN FALLS LAKE

Contract No. DAWN 54-72-C-0022

THIS CONTRACT, entered into this 24th day of FEBRUARY,
1972, by and between the United States of America (hereinafter called
the Government), represented by the Contracting Officer executing this
contract, and the City of Raleigh, a municipal corporation organized and
existing under the laws of the State of North Carolina (hereinafter
called the City),

WITNESSETH THAT:

Falls Lake Specific Challenges

- Falls Lake Nutrient Management Strategy
- Downstream water quality question?
- Endangered Species?
 - Atlantic Sturgeon
 - Neuse River Water Dog
 - Carolina Madtom
 - Others?
- New Assistant Secretary of the Army
- Unknown National allocation challenges



Thank You!

- To the USACE Wilmington District Staff for their extensive efforts to secure this future water supply for the City and its Merger Partners.



US Army Corps
of Engineers ®
Wilmington District

FALLS LAKE, NORTH CAROLINA
FINAL INTEGRATED WATER STORAGE
REALLOCATION FEASIBILITY STUDY AND
ENVIRONMENTAL ASSESSMENT



FINAL REPORT - APRIL 2018

Wilmington District – U.S. Army Corps of Engineers

City of Raleigh Service Area Demand Projections

[upper/lower bounds based on 2011-2015 data]

