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.
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

<table>
<thead>
<tr>
<th>Year</th>
<th>Population Served</th>
<th>Water Demand</th>
<th>Available Supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>549,112</td>
<td>49.9 mgd</td>
<td>75.9 mgd*</td>
</tr>
<tr>
<td>2047</td>
<td>1,048,700</td>
<td>97.9 mgd</td>
<td>75.9 mgd</td>
</tr>
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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

- Observed Demand (mgd)
- Upper Bound with Future Conservation
- Mean Demand with Future Conservation
- Lower Bound Demand with Future Conservation
- Available Supply (Yield)
Little River Reservoir Timeline

- **1971**: Little River Reservoir Site Identified
- **1986**: East Wake County Water Supply Analysis Completed
- **1987-88**: Little River Reservoir Rezoned as Water Supply Watershed
- **1993**: Draft Little River Reservoir Engineering Analysis Completed
- **1995**: Little River Reservoir Property Acquisition Begins
- **2000**: Raleigh begins mergers with other Eastern Wake County municipalities
- **2006**: Mergers with Eastern Wake County Municipalities completed
- **2007**: Little River Environmental Impact Statement Process initiated with USACE

Additional details:
- **1993**: Raleigh begins mergers with other Eastern Wake County municipalities
- **2000**: Little River Environmental Impact Statement Process initiated with USACE
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

- **Controlled Flood Storage**: 221,182 acre-feet
- **Conservation Storage**: 106,322 acre-feet
  - Water Quality Storage: 61,322 acre-feet (57.7%)
  - Water Supply Storage: 45,000 acre-feet (42.3%)
- **Sedimentation Storage**: 25,073 acre-feet

Guide Curve or Normal Operating Level: 251.5 ft

Vertical Datum: NGVD29
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
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2011
Falls Lake Reallocation Identified as Feasible Alternative to LRR

2012
NCDEQ Officially supports Falls Lake Reallocation effort
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


• 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

SMART Feasibility Study Process

18-36 Months

1. SCOPING
   - Alternatives Milestone
     - Vertical Team concurrence on array of alternatives

2. ALTERNATIVE FORMULATION & ANALYSIS
   - TSP Milestone
     - Vertical Team concurrence on tentatively selected plan
   - Agency Decision Milestone
     - Agency endorsement of recommended plan

3. FEASIBILITY-LEVEL ANALYSIS
   - Civil Works Review Board
     - Release for State & Agency Review

4. CHIEF’S REPORT
   - Chief’s Report
City of Raleigh request letter

MOA signed with Raleigh

RP/IEPR waiver request

Water demand model approved

DSAC Waiver Received

Non-Federal funds received (Official Start)

Hydro demand model approved

IEPR Waiver received

AMM

TSP Milestone

19 Jun 2013

25 Mar 2015

5 Jun 2015

4 Aug 2016

6 Sep 2016

21 Jul 2016

9 Aug 2016

14 Nov 2016

25 Jan 2017

2 years

1.5 years
TSP Milestone

Jan. 25, 2017

Release of the Draft Report for Public, Policy and Agency Review

March 17

Public Comment Period Closes

April 17

Review Public, Policy and Agency Comments

April 18

Agency Decision Milestone

September 29, 2017

Submit Final Report to SAD

January 2018

Division Engineer’s Transmittal/ HQ Policy Compliance Review Begins

August 2018

HQ Policy Compliance Review Ends

April 2018

Final Report Approval (Director’s Report)

September 2018

Water Supply Agreement & ASA (CW) Approval

January 2019

1 year

1 year
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
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.