

# Water Treatment Evaluation

Brunswick County - Board of Commissioners Meeting

Bill Dowbiggin, PE, BCEE  
Reed Barton, PE

*January 16, 2018*



**CDM  
Smith®**

# *Today's Agenda*



- 01 **Intro to CDM Smith's Team**
- 02 **Project Overview**
- 03 **Project Schedule**
- 04 **Key Highlights and Questions**

# Introduction to CDM Smith

- Employee-owned Engineering, Architectural, and Construction firm
- 5,000 staff, primarily in the U.S.
- Began 70+ years ago as Water/Wastewater Treatment Firm
- More than 60% of Revenue in Water/Wastewater Engineering Services
- Ranked among the ***Top 10 Design and Water Engineering Firms*** in the U.S.
- Award winning R&D Program and in-house Laboratory



## CDM Smith in NC and Project Team

- Working in NC since early 1980's, currently 130+ staff in NC
- Raleigh Office is a Regional Design Center
  - All disciplines and experts under 1-roof
- Project team includes regional and national experts
  - chemical, treatment technologies, piloting/bench studies, etc.



**Excellence** AWARDS  
Unmatched North Carolina WTP Design

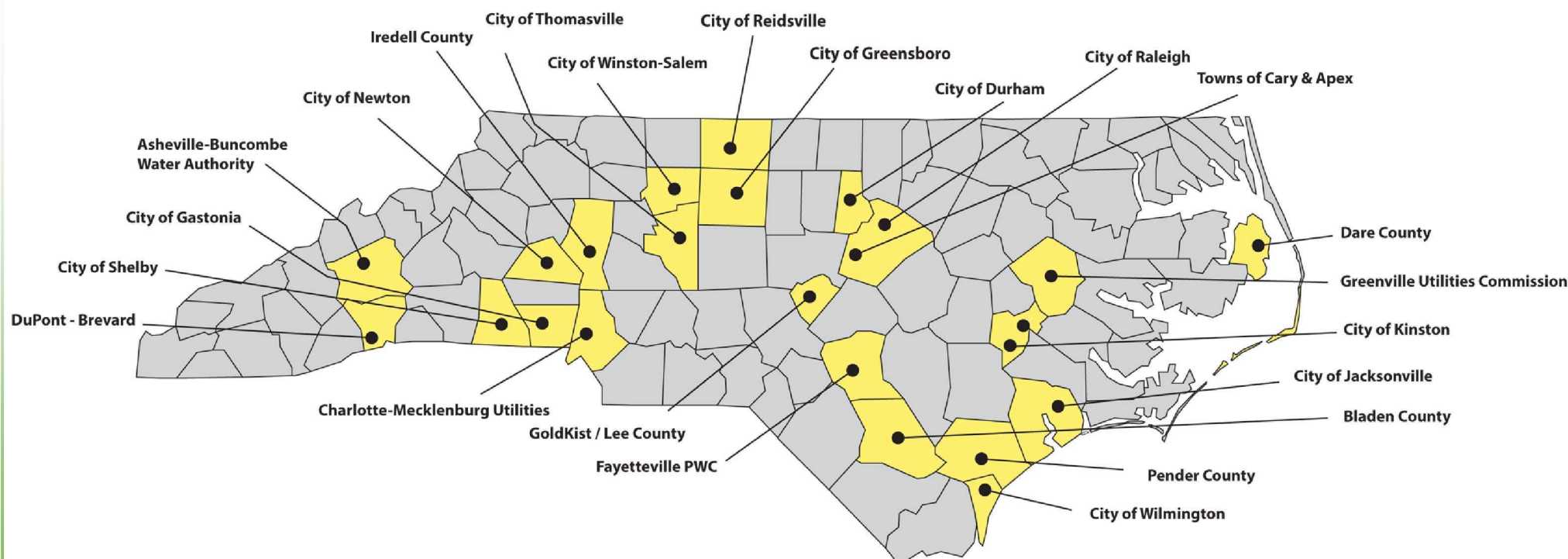
**650** mgd  
of membrane  
treatment capacity

**2,500+**  
WTP  
Projects



# Unmatched NC Water Treatment Experience

Fifteen New or Expanded Surface WTPs in NC greater than 10-mgd





**William B. Dowbiggin, PE, BCEE**

- *Senior Vice-President*
- *NC Water Treatment Practice Leader*

## **PROJECT MANAGER**

- *MS Environmental Engineering, BS Civil Engineering*
- *33 years of experience in water treatment*
- *Designed more than 50 major water treatment projects (ranging 1- to 225 million gallons per day)*
- *Design experience with ALL treatment technologies under consideration for Brunswick Co.'s NWTP*
- *Currently leading advanced treatment studies for:*
  - *Town of Cary, NC*
  - *UOSA, Centreville, VA*
  - *Gwinnett County, GA*
  - *Washington Aqueduct, Washington D.C.*



# BRUNSWICK COUNTY

## NORTH CAROLINA

### CLIENT SERVICE LEADER

Reed M. Barton, PE

### ADVANCED TREATMENT SPECIALIST

Gregory D. Wetterau, PE, BCEE  
Michael A. Zafer, PE  
Christopher R. Schulz, PE, BCEE

### PROJECT MANAGER/ TECHNICAL DIRECTOR

William B. Dowbiggin, PE, BCEE

### EMERGING CONTAMINANT EXPERTS

Charles E. Schaefer Jr., PhD

#### Water Treatment and Chemistry

Philip C. Singer, PhD, PE, BCEE\*

#### Emerging Contaminants/ Cape Fear River

Detlef Knappe, PhD\*

### WATER TREATMENT EVALUATION AND PILOT TESTING

Colin M. Hobbs, PhD, PE, BCEE

Neerja Rastogi, PE

Reed M. Barton, PE

Jorge M. Arevalo, PhD, PE

### LAB AND BENCH TESTING

#### CDM Smith Bellevue Lab

Jennifer L. Hooper, PE

#### Contract Lab

■ Eurofins Central Laboratory

■ Axys Lab

# Project Overview

## ■ Project Drivers

- Unregulated Contaminants in the Cape Fear River
- Sources of contaminants (point & non-point sources)



## ■ Project Objectives

- **Determine what contaminants are present** in the Cape Fear River
- **Establish treatment goals** for removal of contaminants
- **Evaluate treatment alternatives** for effective removal of contaminants
- **Make recommendations** for the most appropriate treatment technology
- **Prepare a plan**, including cost and schedule for expansion of the Northwest WTP to 36-mgd



# Project Overview

- Major Project Steps/Tasks
  - Desktop Treatment Alternatives Analysis
  - Pilot Testing / Bench Testing
  - Treatment Recommendations and Final Report
  - Pre-Permit Application Services
  - Concentrate Discharge Dilution Study & Toxicity Testing
  - NPDES Permitting Services
  - Laboratory Services

# Pilot-Scale Testing Low Pressure Reverse Osmosis

- What is Low Pressure Reverse Osmosis (LPRO)?
- What is a Pilot-Scale Study?
- Why Pilot test LPRO?





# Bench-Scale Testing UV-AOP

- What is UV-AOP?
- What is Bench-Scale Testing?
- Why Bench Test UV-AOP?

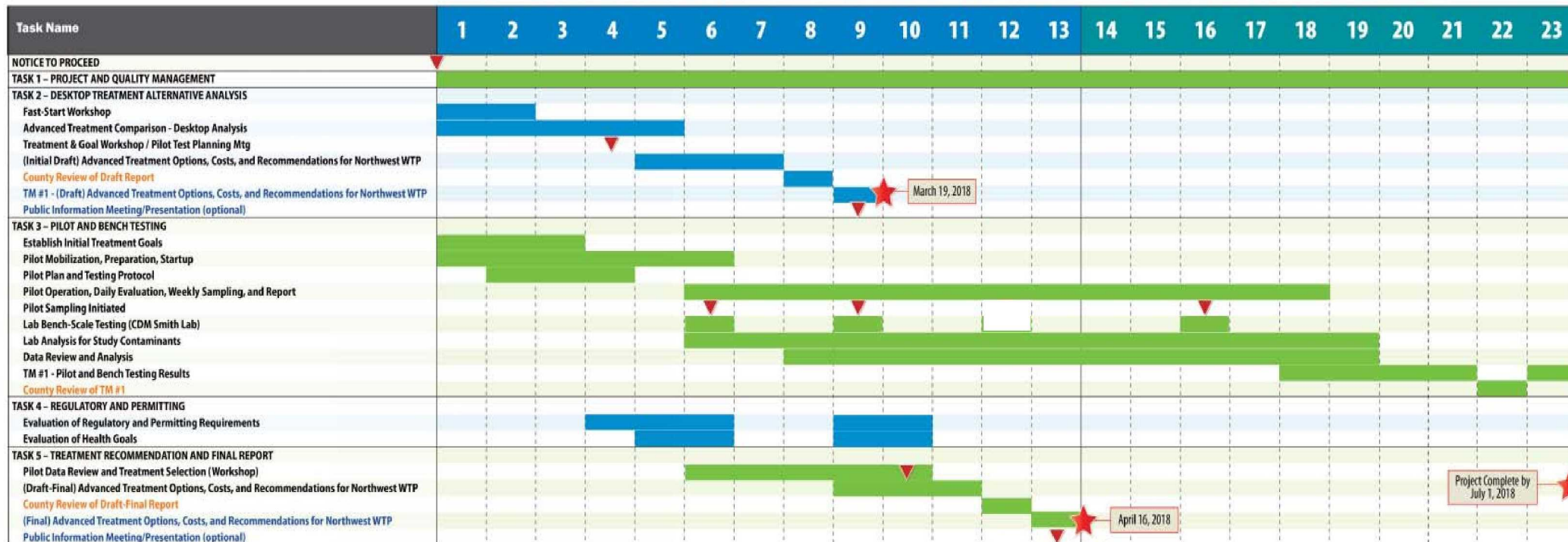




# Project Schedule

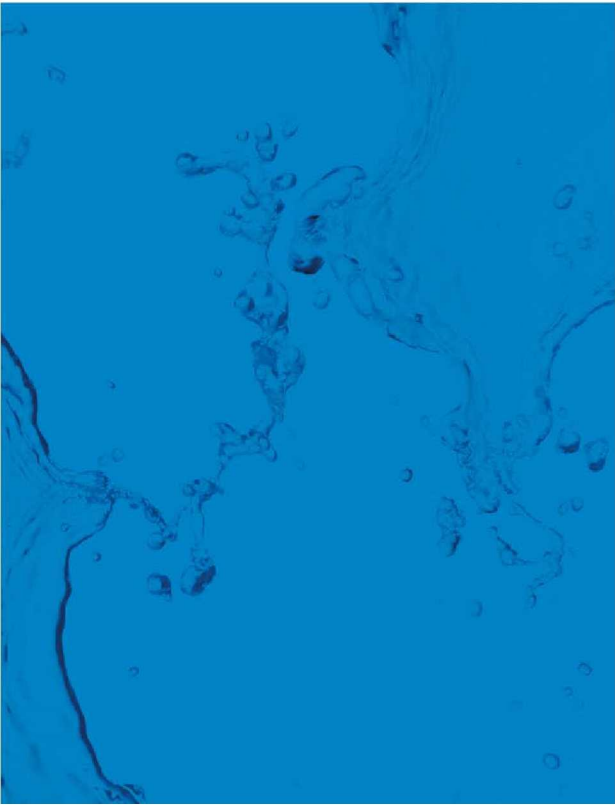
## PHASE 1 - ALTERNATIVE EVALUATION, PILOTING, AND TREATMENT SELECTION

## PROJECT PHASE 2 - FULL PILOT EVALUATION



## Key Highlights

- Project will take a comprehensive look at contaminants in the source water, not limited to PFASs like GenX
- Project will not duplicate prior studies
  - Rather it will utilize existing data, including CFPUA pilot study
- Project will be tailored to improving the Northwest WTP
- Project will complete due diligence on permitting issues
- Project will result in recommendations and budgetary costs
- CDM Smith's R&D Program is contributing in-kind equipment/materials/services of approximately \$40,000



# *Questions?*





**Neuse Regional WTP** | *Kinston, NC*



**Sweeney WTP** | *Wilmington, NC*



**Bladen Bluffs WTP** | *Bladen County, NC*



**Pender County WTP** | *Pender County, NC*



**Franklin WTP** | *Charlotte, NC*



**Cary/Apex WTP** | *Town of Cary, NC*



**Williams WTP** | *Durham, NC*



**Brown WTP** | *Durham, NC*



**E.M. Johnson & D.E. Benton WTPs** | *Raleigh, NC*



**Mitchell WTP** | *Greensboro, NC*



**Mills River WTP** | *Asheville, NC*



**Townsend WTP** | *Greensboro, NC*



# How does LPRO work?

