

CFPUA Action Plan to Implement
Gen-X Response Measures
September 28, 2017

Cape Fear Public Utility Authority

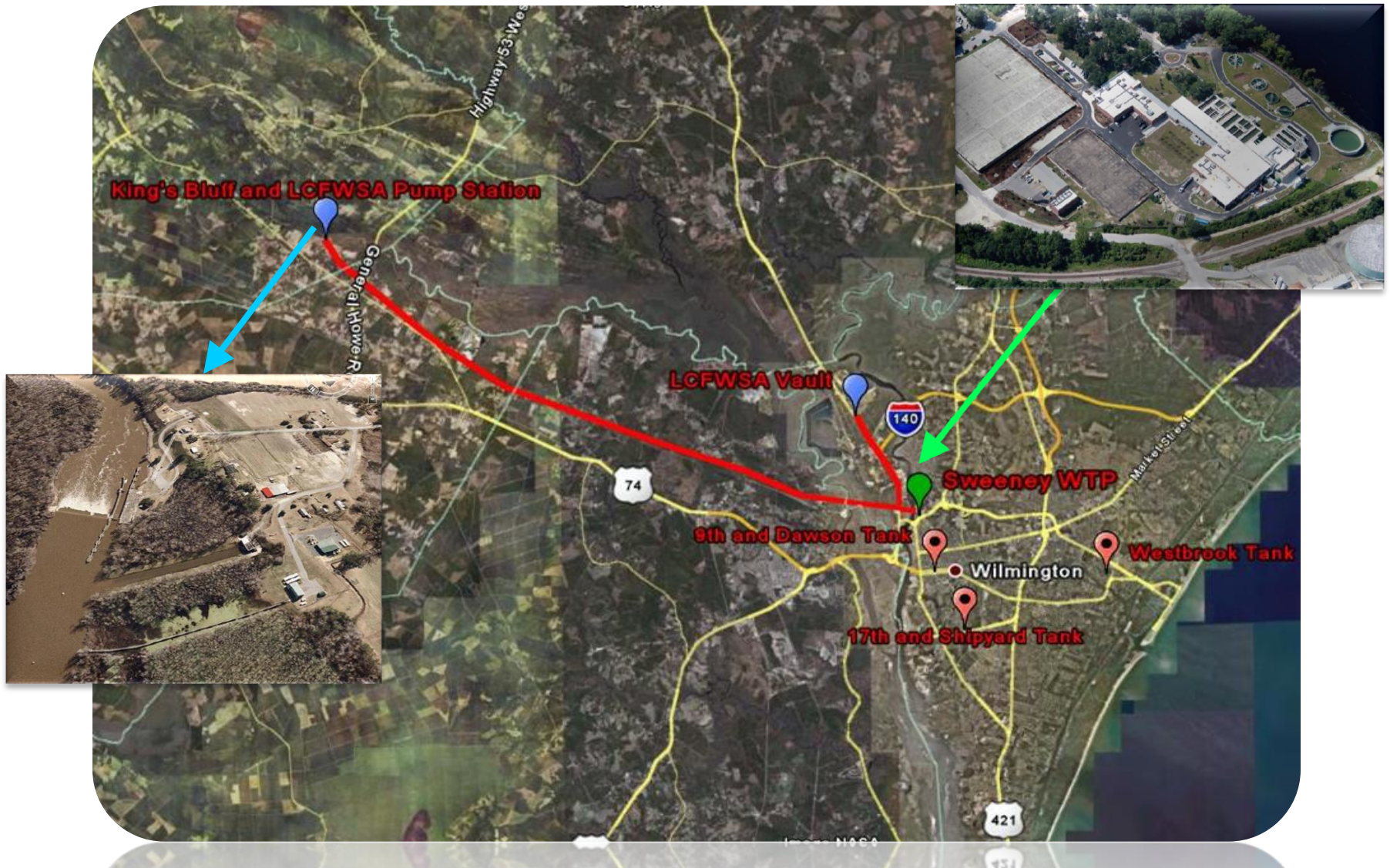
1. Became operational July 1, 2008
2. Service area includes approximately 68,000 customer accounts
3. Michael E Richardson Nanofiltration Plant operational 2009, permitted capacity 6 mgd, supplied by 25 wells
4. Sweeney WTP upgraded 2012, permitted capacity of 35 mgd, surface water facility
5. 23 mgd raw water purchase agreement with LCFWASA



Gen-X Response Measures

1. Water treatment alternative evaluation for removing PFASs, Gen-X and emerging compounds
2. UNCW Support
3. Aquifer Storage and Recovery Program

Raw Water System



Sweeney Water Treatment Plant



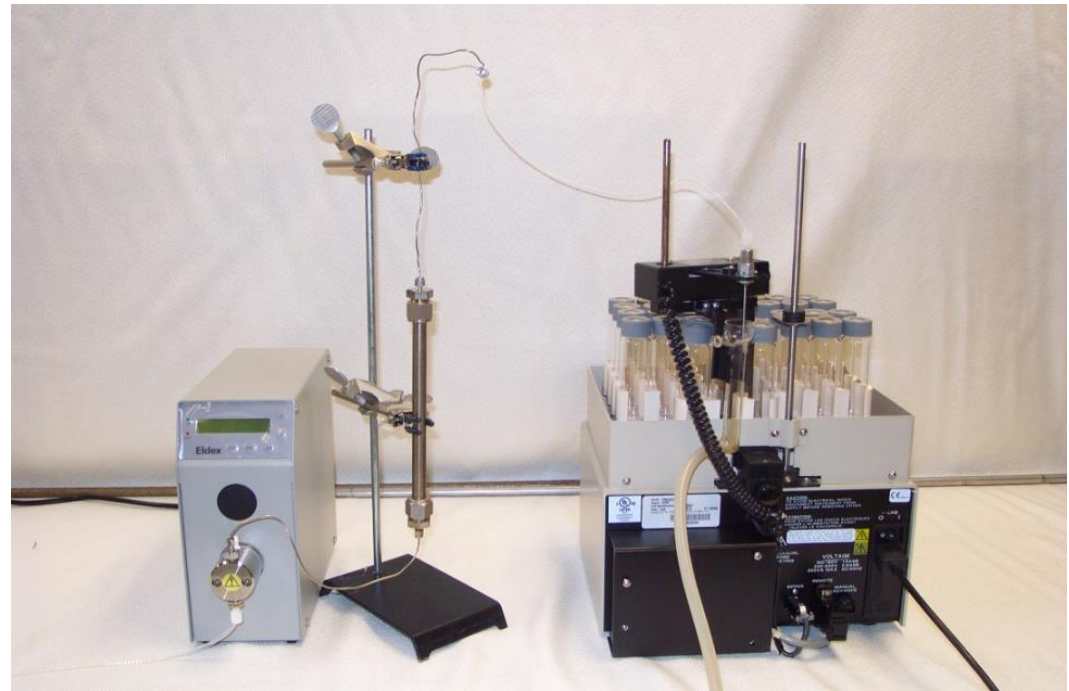
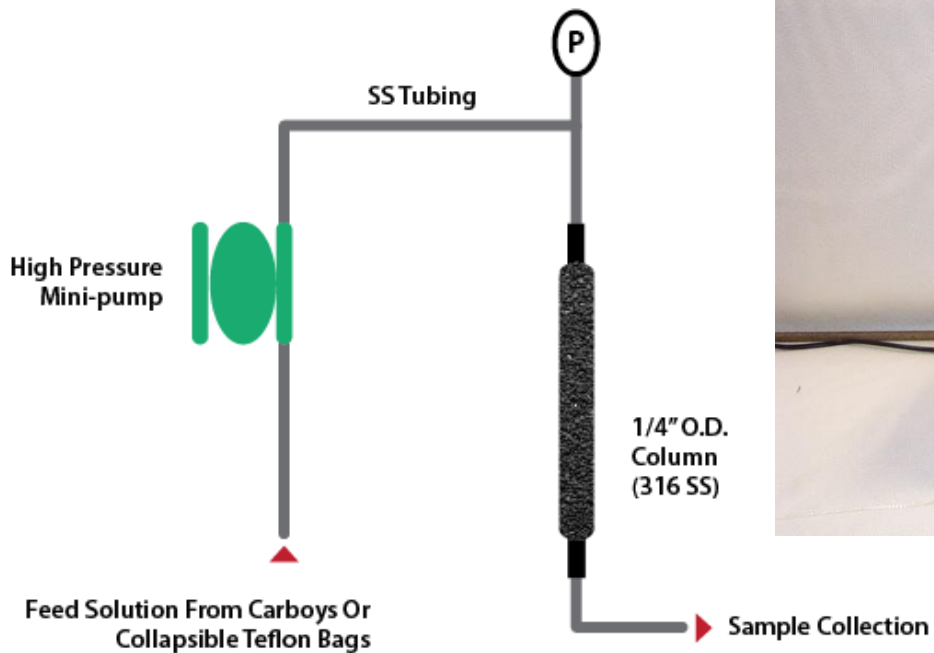
GAC Pilot Testing



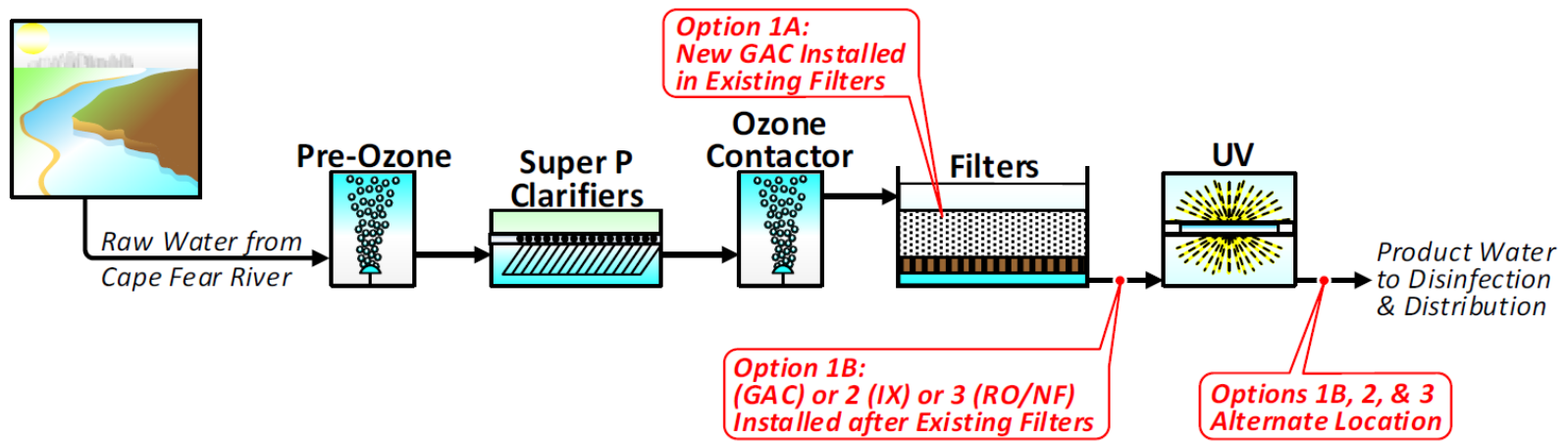
Ion-Exchange Resin Testing



Accelerated Column Test (ACT)



Location of Options on Treatment Process Diagram



Treatment Evaluation Cost Estimates

• Treatment Option Evaluation	\$ 50,000
• <u>Testing costs</u>	<u>\$ 40,000</u>
• Total	\$ 90,000

Summary

DESCRIPTION	GAC in Existing Filters	OPT 1-B, GAC Contactors Post-Filtration	Deep Bed Version of 1B	RO/NF Post-Filtration
Initial Cost	\$1.7 million	\$28 million	\$32 million	\$113 million
Annual Operating Costs	\$2.0 million minimum	\$3.3 million to \$6.3 million	\$3.4 million to \$6.4 million/yr	\$3.3 million/yr

- GAC operating costs are based on 6,000 to 12,000 Bed Volumes (BV) based on experience elsewhere with PFAS removal, but not Gen-X. Site specific GAC testing is being conducted to determine the correct BV to assume for treating Cape Fear River water.
- Option 1A's initial cost includes an initial load of GAC media and one-time replacement of sand and gravel. (e) The options would have higher initial costs if standby filters/contactors were added to provide full capacity when units are off-line during GAC replacement events.
- A detailed cost opinion was not prepared for Ion Exchange (IX); however, it is the engineer's opinion that TPW for IX would be roughly in line with Post GAC. As a contingency CFPWA is conducting IX testing.

UNCW Support

• Identify Compounds in raw water	\$ 75,000
• Study river sediment & other compounds	\$ 150,000 (FUTURE)
• <u>Evaluate compounds in finished water</u>	<u>\$ 75,000 (FUTURE)</u>
• Total	\$ 300,000

Aquifer Storage and Recovery (ASR)

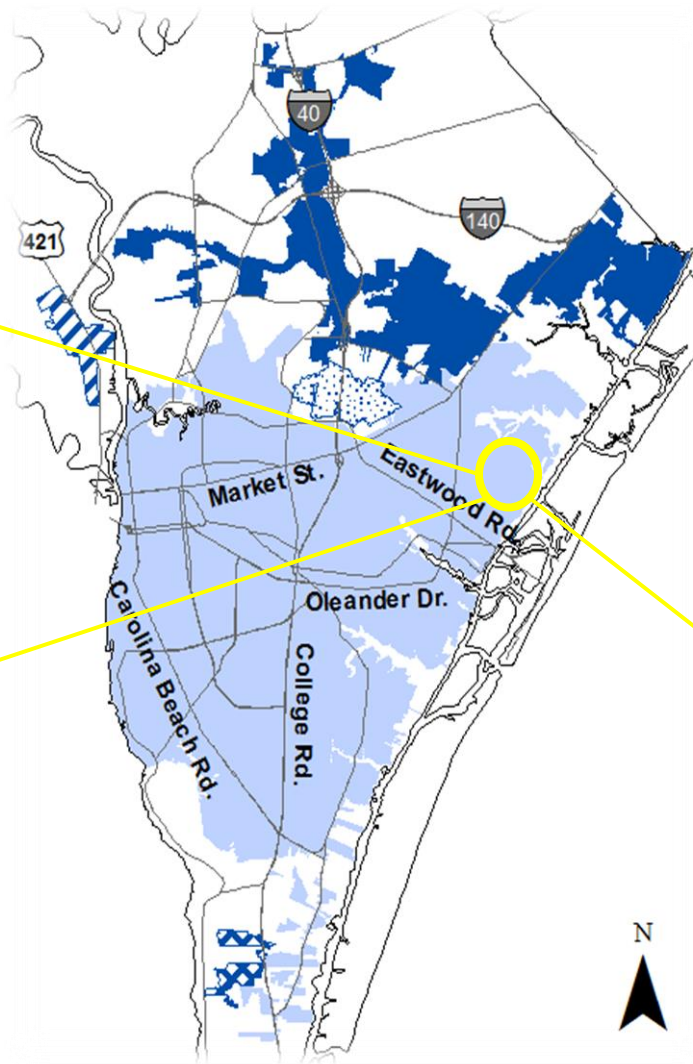
- Cost effective seasonal storage of finished water
- Capacity – 3/4 MGD
- Store water in PeeDee Aquifer at 140 to 185 ft.



Benefits

- Peak demand source
- Water quality
- Emergency supply

ASR Well



ASR Temporary Withdrawal and Discharge to Sewer

- **50 million gallons stored drinking water from surface water source containing Gen-X**
 - Groundwater at CFPUA ASR Well was 830 ppt Gen-X on June 22nd
 - Groundwater at Wrightsville Beach Well #11 was 26 ppt Gen-X on June 22nd
 - Wrightsville Beach Well #11 is approximately 3,400 feet east of CFPUA ASR Well
- **Temporary discharge piping and additional monitoring wells were installed**
 - Installed temporary discharge piping from CFPUA ASR Well to sanitary sewer
 - Installed two new monitoring wells and sampled all for Gen-X to establish baseline
 - Pumping ASR groundwater to WWTP: Effluent is under 140 ppt health limit
- **Began withdrawal from CFPUA ASR Well at 500 gpm September 20th**
 - Currently highest level in any production or monitoring well is 91 ppt at ASR site
 - Drawdown cone of influence reaches Wrightsville Beach Well #11
 - Pump until 50 million gallons have been withdrawn, with periodic sampling

ASR Program Cost Estimates

• Engineering	\$ 100,000
• <u>Construction, testing & Monitoring</u>	<u>\$ 500,000</u>
• Total	\$ 600,000

Summary of Anticipated Short Term Costs

Water treatment evaluation	\$ 90,000
UNCW support	\$ 300,000
ASR remediation	\$ 600,000
Ongoing Gen-X Monitoring	\$ 85,000
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Total	\$ 1,075,000

Costs do not include permanent upgrades to Sweeney



Cape Fear Public Utility Authority

Mike Brown
Board Chairman

Frank Styers, PE
Chief Operations Officer