

# Le Roy TOC Removal Pilot Study

Le Roy, IL

Midpoint Review – 11/20/2025



## Agenda

- Le Roy WTP Testing Overview
- Preliminary Results
- Schedule Update
- Other Topics

# Le Roy has challenging water to treat

## Water Quality Challenges

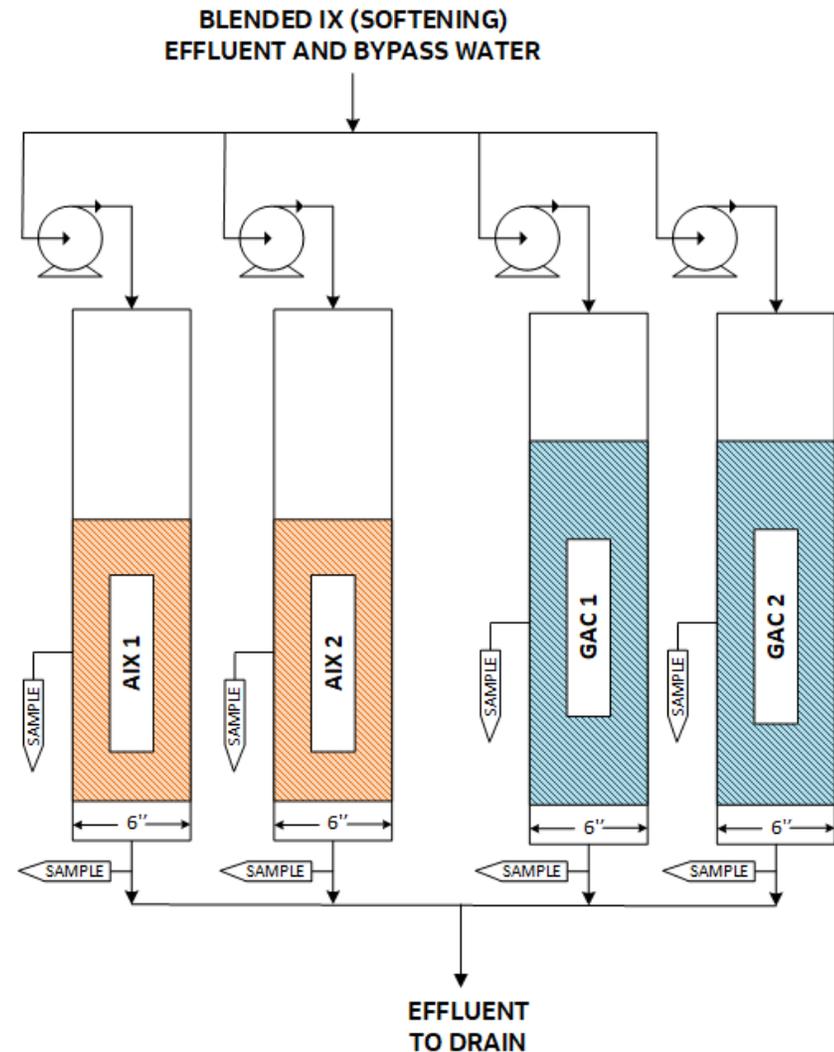
1. Iron
  2. Manganese
  3. Arsenic
  4. Hardness
  5. Ammonia
  6. Disinfection byproducts (DBPs)
  7. Lead and copper corrosion
  8. Low total chlorine residuals
  9. **Total Organic Carbon (TOC)**
- Addressed in Jacobs  
2024 and 2025 studies
- Requires additional testing**
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## Pilot Study Goals

- Evaluate GAC and AIX treatment media and operational configurations
- Select the most cost-effective treatment technology that meets goals
- Gain operational data to ensure future design includes required ancillary systems
  - AIX regeneration frequency, volume, and chemical (sodium chloride vs. bicarbonate)
  - GAC backwashing and replacement rate
- Finished water chemistry impacts from AIX
- Assess operation and maintenance requirements for economic and non-economic evaluation

## Baseline Pilot Approach

- Two Anion Exchange resins
  - Backwash capability
  - Regeneration capability with brine
- Two GAC medias
  - Backwash capability
- Influent, mid-column, and effluent sample ports



# Pilot Plant Photo

Anion Exchange Media (24")



Brine Batch Tank

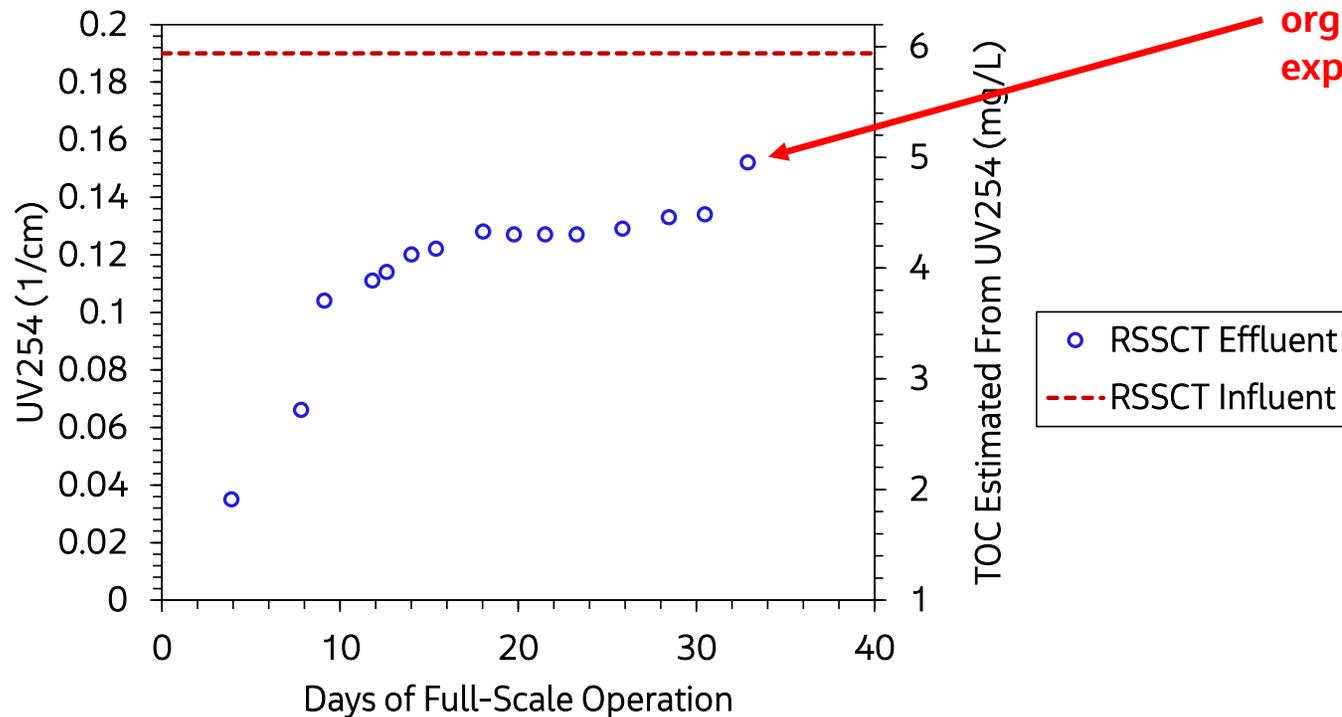
GAC Media (60")

## Pilot Column Design Conditions

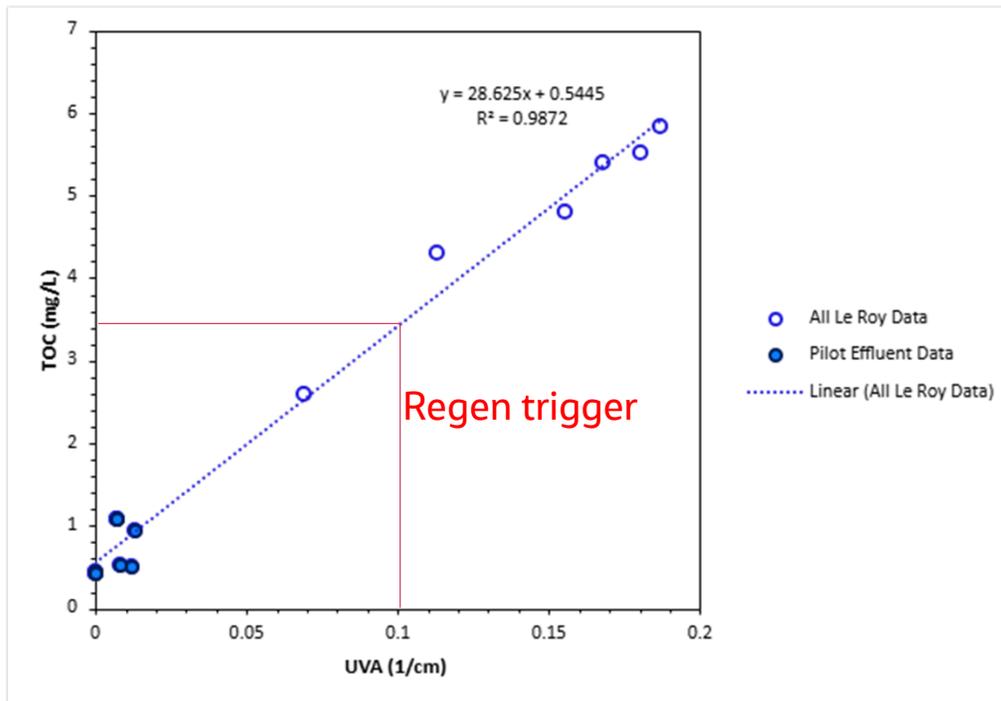
Media	GAC	AIX
EBCT (minutes)	20	7.5
Column diameter (in)	6	6
Adsorbent media depth (in)	60	24
Column flowrate (gpm)	0.37	0.39
Surface loading rate (gpm/sf)	1.9	2.0
Bed volumes per week (actual)	~400	~1100

## Previous TOC removal testing

- TOC removal technologies:
  - Granular activated carbon (rapid small-scale testing)



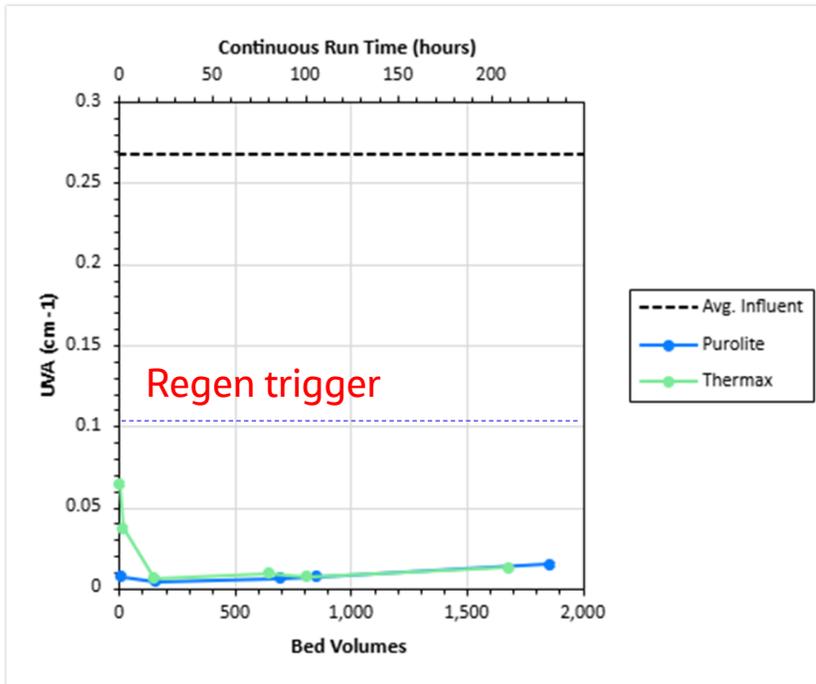
# Organics Removal



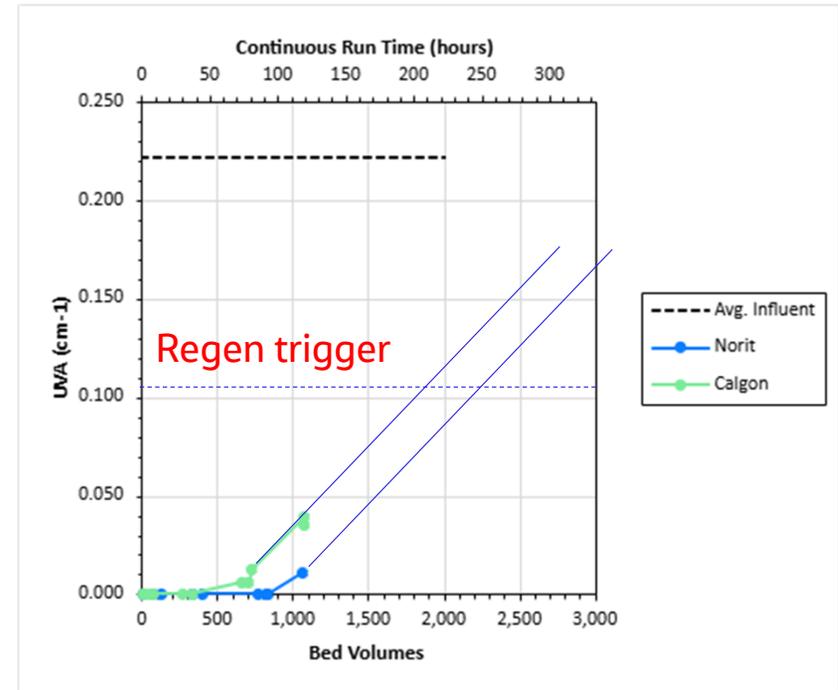
Estimated maximum regeneration target of 0.1 cm<sup>-1</sup>  
= ~ 3.5 mg/L TOC

# Organics Removal

Very good organics removal in early going, well under regeneration target



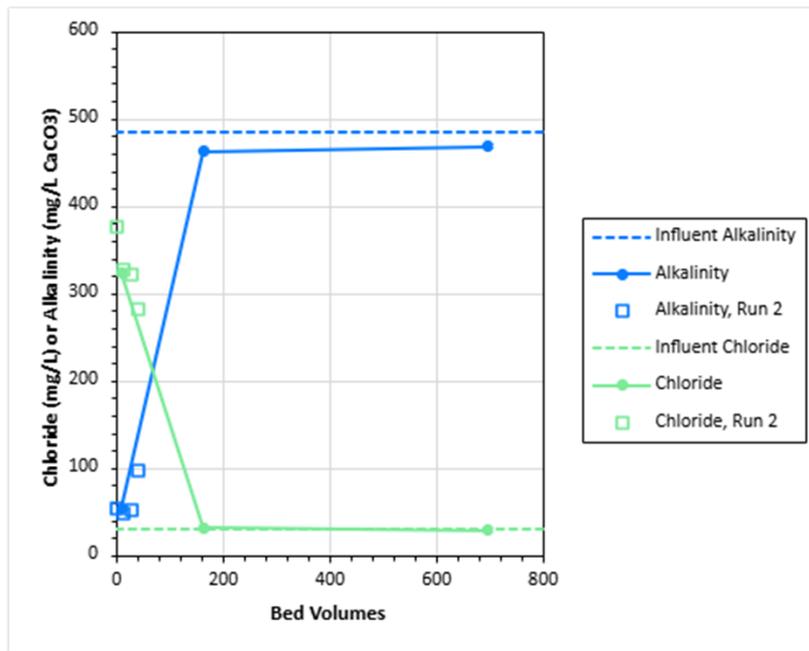
AIX Media (24")



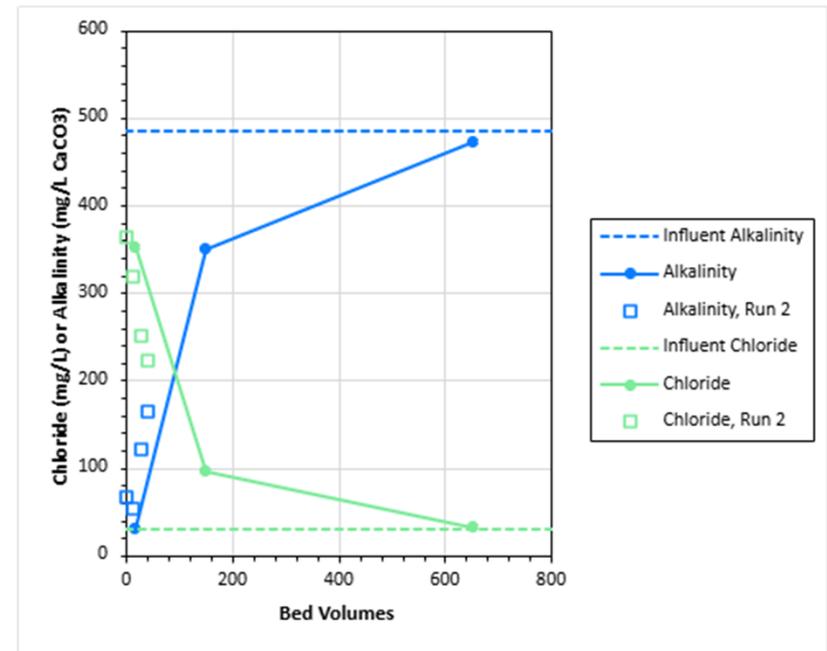
GAC Media (60")

# Finished Water Quality Impacts

- Significant Chloride, Alkalinity, and pH Impacts in first 24 hrs.



Purolite



Thermax

## Initial Results

- GAC-
  - Both media performing well for TOC removal.
    - Norit required a backwash due to headloss accumulation but currently performing better than Calgon for organics removal.
  - Expect GAC life to be longer than previous estimate. Still may require 4 changeouts per year and cost \$>300,000/yr.
  - Does provide potential dual benefit for PFAS removal if wells became contaminated.
- AIX-
  - Both media performing well for TOC removal. Expect a regeneration frequency full-scale to be 2-4 weeks.
  - Brine regen increases chloride and reduces alkalinity, need to use bicarbonate instead OR manage via operational changes in design to reduce impact on lead/copper.

## Remaining Steps

- December
  - Evaluate bicarbonate regeneration on AIX
  - Need to address caustic feed comment by IEPA
  - Check in Call with IEPA
- January
  - Complete testing, demobilize equipment
  - Update cost estimates and equipment options for GAC and AIX
- February/March
  - Pilot report delivery (next spring)

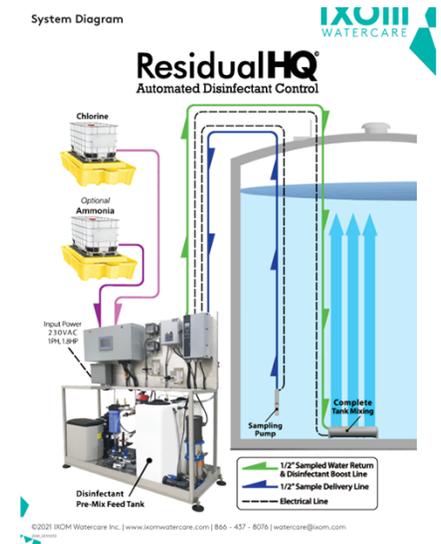
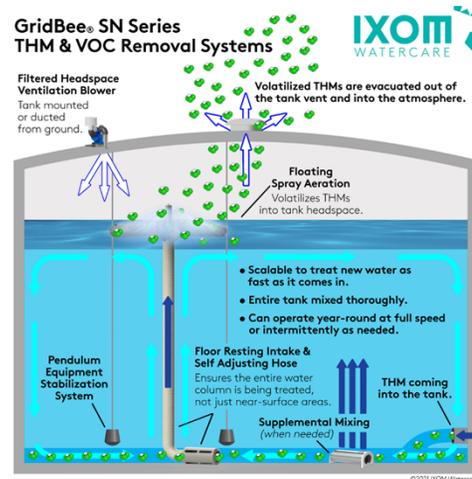
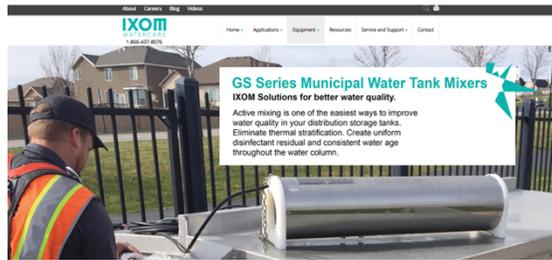
## Other Topics

- Chlorine Feed in South Water Tower
  - Adjustments ongoing
- Caustic Feed at Water Plant
  - IEPA requires planned approach by Dec 31



# South Water Tank Improvements

- Internal Mixer – We used this in Oshkosh WI to great success to improve low residuals in the remote water tower



- They also sell spray aerators to reduce TTHMs and hypo feed systems