

82 Million Gallons In. Zero PFAS Out.

Sharp Water System with ResinTech SIR-110-HP Delivers Exceptional Results

EXECUTIVE SUMMARY

A major water utility's ion exchange resin system has successfully treated 82 million gallons of water while maintaining complete PFAS removal as of July 31, 2025. The system, utilizing ResinTech SIR-110-HP resin and provided by Sharp Water, is sized at 100 cubic feet and performing at 90% of its projected 91 million gallon capacity before breakthrough, with no detectable PFAS compounds in treated water. This represents the utility's first operational PFAS treatment system using ion exchange technology.

PROJECT OVERVIEW

System Details:

- **Location:** Major Mid-Atlantic water utility treatment plant
- **Technology:** Ion exchange (IX) resin system using ResinTech SIR-110-HP
- **System Size:** 100 cubic feet (designed for 200 gpm, expandable to 700 gpm)
- **Future Expansion:** Two additional 100 cu ft vessels planned (15% efficiency improvement through optimized flow distribution)
- **System Provider:** Sharp Water
- **Resin Manufacturer:** ResinTech
- **Online Date:** September 5, 2023



PERFORMANCE PROJECTIONS VS. RESULTS

Initial Projections (July 2022):

- **Expected Throughput:** 913,029 gallons per cubic foot (4-model average methodology)
- **Projected Capacity:** 91 million gallons before breakthrough
- **Raw Water Total PFAS:** 35.2 ppt
- **Target Treated Water:** 4.24 ppt endpoint

Actual Performance (July 31, 2025):

- **Volume Treated:** 82 million gallons
- **PFAS Detection:** No detects on all analytes
- **Status:** Still operational, no breakthrough observed
- **Operational Period:** 23 months
- **Capacity Utilization:** 90% of predicted with zero breakthrough

KEY PERFORMANCE MILESTONES

October 2024: 43.5 million gallons treated, no detects (13 months operation)

July 2025: 82 million gallons treated, no detects (23 months operation)

INNOVATION AND CONTINUOUS IMPROVEMENT

ResinTech and Sharp Water continue collaborating to advance system design and operation. Data and experience from this installation have driven improvements in software modeling and modular equipment design.

Enhanced Modeling Development: The original 4-model average methodology used for this project has been refined into a more accurate single-model approach with improved throughput and leakage predictions.

Operational Benefits Achieved:

- **Extended Performance:** Resins lasting longer than initially projected
- **Higher Capacity:** Treatment of higher volumetric flow rates than expected
- **Reduced Costs:** Equipment and installation costs significantly reduced through design optimization
- **Minimal Maintenance:** Operation and management requirements are minimal

Performance Validation: This successful validation of the original 4-model average projection methodology provides confidence for future projects where actual versus projected performance can be compared using the enhanced single-model approach.



STRATEGIC IMPACT

Immediate Benefits:

- First PFAS system installation validates ion exchange technology for this utility
- Performance data supports state-funded project requirements
- Consistent “no detect” results provide regulatory confidence

Space and Capacity Advantages:

- Compact Footprint: 100 cu ft IX system handles same flow rate as 267 cu ft GAC unit (2.67x smaller)
- Superior Capacity: GAC system of equivalent size would treat less than 25 million gallons versus 82+ million gallons achieved
- Installation Flexibility: Reduced space requirements enable treatment at sites with limited footprint availability

Future Applications:

- Additional projects proposed using similar technology
- Plans for rebedding existing GAC filters with IX resin technology at other sites
- Expansion to 700 gpm capacity with proven modular design

Industry Leadership: The ongoing collaboration between ResinTech and Sharp Water continues driving innovation in PFAS treatment system design, reducing costs while improving performance and reliability.

CONCLUSIONS

This project demonstrates exceptional performance of ResinTech SIR-110-HP resin in municipal PFAS treatment applications. Key achievements include:

- 90% capacity utilization with no breakthrough after 23 months
- Zero PFAS detects consistently exceeding treatment targets
- Proven modeling accuracy validating design methodology
- Minimal operational requirements reducing complexity and costs
- Strategic technology validation supporting broader implementation

The success validates ion exchange as a reliable, predictable solution for municipal PFAS treatment and positions both ResinTech and Sharp Water as industry leaders in this critical application.

TECHNICAL SPECIFICATIONS

System Configuration:

- **Resin:** ResinTech SIR-110-HP (100 cubic feet)
- **Design Flow:** 200 gpm (expandable to 700 gpm)
- **Online Date:** September 5, 2023
- **Total Treated:** 82 million gallons (23 months)
- **Performance:** Non-detect PFAS (all compounds)
- **Capacity Utilization:** 90% of predicted
- **Target Endpoint:** 4.24 ppt
- **Raw Water PFAS:** 35.2 ppt total



PFAS Projection

Date: 7/11/2022

Company: Sharp Water

Contact Name: DJ Shanahan

Location: Major Mid-Atlantic water utility
treatment plant

PRODUCT: SIR-110-HP

CATIONS	RESULT	UNIT
Iron (Fe)	0.015	ppm
Calcium (Ca)	74.4	ppm
Magnesium (Mg)	31.7	ppm
Potassium (K)	2.49	ppm
Total Hardness	316	ppm as CaCO ₃

ANIONS	RESULT	UNIT
Nitrate as N	5.88	ppm
Sulfate (SO ₄)	28.6	ppm
Chloride (Cl)	452	ppm
Alkalinity	216	ppm as CaCO ₃

PFC's	RESULT	UNIT
PFBS	6.61	ppt
PFHpA	4.14	ppt
PFHxS	2.80	ppt
PFHxA	8.09	ppt
PFOS	4.23	ppt
PFOA	9.33	ppt
Total PFC's	35.2	

TARGET ENDPOINT: 4.00

Throughout to	4.00
Bed Volume	122,063
Gallons/Cubic Feet	913,028

Capacity and throughput calculations are estimates only. These estimates are offered in good faith and are based upon the best available data. Specific operating conditions may affect the actual performance of ion exchange resins.

Recommended Service flowrate: 2 to 4 gpm per cubic foot Once-through, non-regenerable.

