



- **ONE TEAM.**
- **ONE FOCUS.**
- **YOUR SUCCESS!**

Recirculation Technologies, LLC

Your Full Service Resource For Water System Improvement

Reverse Osmosis Membrane Restoration

Situation

RTI has teamed up with Membrane Services of Houston, TX to address all reverse osmosis needs of any water system, both with membrane cleaning and expert consulting services.

Pure water is the lifeblood of every process plant. Ensuring that enough high-quality water is generated at optimal costs is therefore a key strategic goal for high-performing industrial water systems. However, the variability of surface feed water continues to challenge the capability of aging water treatment systems to keep pace with steady and often growing demands.

Reverse osmosis membranes are the heart of many water treatment systems, and those membranes must be maintained so that they can properly remove hardness elements, particulates and other microbiological and natural organics that are suspended in the treated water that flows through it. Fouled membranes lower permeate flow rates and drive up operating costs.

Over a 3 year period, untreated membranes can:

- Decrease permeate flow rates by 30%
- Quadruple the risk of available water
- Add 30% to the operating costs associated with running your water treatment facility

Traditionally, fouled membranes are cleaned in house by inexperienced personnel or replaced. However, the quality of those cleanings is variable and the high cost of new membranes keeps escalating ... creating additional issues for plant operation managers everywhere!

RTI's Predictive Restoration™ Service

RTI solves the problem of fouled membranes by offering a better and far less costly solution...by *restoring* membranes, rather than replacing them. RTI's **Predictive Restoration RO Membrane Services** combines *Chemical Restoration* with *Predictive Maintenance* to ensure that RO systems remain at peak effectiveness.

Chemical Restoration:

- Removes organic and hardness fouling
- Extends the life of the RO membranes
- Performed either on-site at your plant or off-site at a highly qualified plant in Houston, TX
- Substantially increases permeate flow rates and significantly decreases operating costs
- ...all for **less than half the cost** of membrane replacement

Predictive Maintenance:

- Restoration based on water conductivity ...not the calendar
 - Regularly scheduled restoration may be ineffective and costly since surface feed water quality varies
 - Waiting too long to restore membranes drives up costs
 - EconoTrac™ normalization and prediction models based on actual membrane samples determine the best timing to optimize costs and water availability
- Reduces operational costs and associated water risks
- Ensures that water purification systems are operating in a proper manner

Consulting Services and products:

- Expert and thorough analysis of membranes with detailed analytical reporting
- Expert reviews of current systems, including:
 - Equipment design and capability
 - Improvements to current procedures
 - Operator performance and training
- Availability of new and used membranes

Service Delivery

The Chemical Restoration portion of RTI's approach is an **on-site or off-site process** that is delivered either by utilizing mobile cleaning tractor-trailers, equipped with cleaning vessels and testing capability, and operated by a highly trained, two-man crew, or by sending membranes to a centrally located very experienced cleaning facility. There is no plant process disruption and wastes can be handled normally through existing plant processes. The proprietary chemical mixture used in the cleaning process is shipped and delivered separately to your facility to coincide with the arrival of mobile unit.



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RTI's Mobile Cleaning Unit

The Predictive Maintenance portion of the RTI approach includes proprietary data monitoring methodology to predict improved plant performance. RTI's **EconoTrac™** software provides a true understanding of the economics of reverse osmosis operations using your actual plant data. Every month, the EconoTrac analysis is executed to provide the water plant with on-going, valuable economic data. EconoTrac plots the monthly cost of operating the water plant and shows the savings being accrued from the cleaning. It is also used to forecast when the next cleaning will be needed and even when the membranes may need to be replaced.

Benefits

With experience over one hundred plants serving the energy utility, refinery, chemical and paper production industries, the benefits of RTI's RO membrane restoration process include:

- **Restoration of RO membranes to “like new” condition**
- **Reduction in the operating costs of the water system**
- **Higher permeate flow rates, resulting in a more consistent and reliable operation**
- **Tailored restoration planning based upon monitored data and flow rate demands**
- **Overall operational risk reduction**
- **Fewer unplanned operating issues that often lead to expensive quick fixes**
- **Consistently higher quality water through the system, extending equipment life and ensuring that it operates at peak performance**

- **On-site or off-site services – whatever is most convenient for your operation**
- **Less waste leaving the plant, improving sustainability initiatives**
- **Peace-of-mind that purified water is available to meet a facilities product needs...day and night**
- **Valuable economic data that plots monthly cost of operating the water plant compared with the accrued savings of restoring the membranes**
- **Known hard cost savings, particularly related to operating costs and membrane replacement avoidance**
- **A demonstrated return on investment usually in less than three months**

How to Get Started

- Membrane samples are collected and RTI performs an analysis of them...*at no cost to you*
- Data is generated and recorded specific to your system's performance and capabilities
- Together with you, RTI examines other water system issues impeding system performance
- RTI prepares a comprehensive improvement plan...**ready for implementation!**

ReStore.....Don't Replace!

Reduce Water Risk

Improve Water Quality

Cut Operating Costs

Call or Contact RTI at (215) 682-7099

www.rtiservices.com

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