



## How Wide Area Remote Device Control Simplifies Salt Water Disposal

Salt water disposal is critical in oilfields. A byproduct of hydraulic fracturing, salt water is separated from natural gas and crude oil once extracted from the ground. This contaminated water must be disposed of properly and safely. And there's a lot of it—for every barrel of oil extracted, there can be five times (or more) of that amount in salt water byproduct. Typically, salt water is pumped back into the ground where it came from, using deep disposal wells to bypass any aquifer. Networks of production well sites can pump salt water to a single disposal site, which could be several miles away.

The process of transporting and disposing of salt water has historically been complex and costly, with a high risk of contamination if there are any system failures or oversights. But advancements in edge technology allow for remote monitoring and automation of tanks, pipelines, and pumps. Below are common challenges that companies in the oil and gas industry face, plus scalable, flexible industrial IoT solutions from ControlByWeb®.

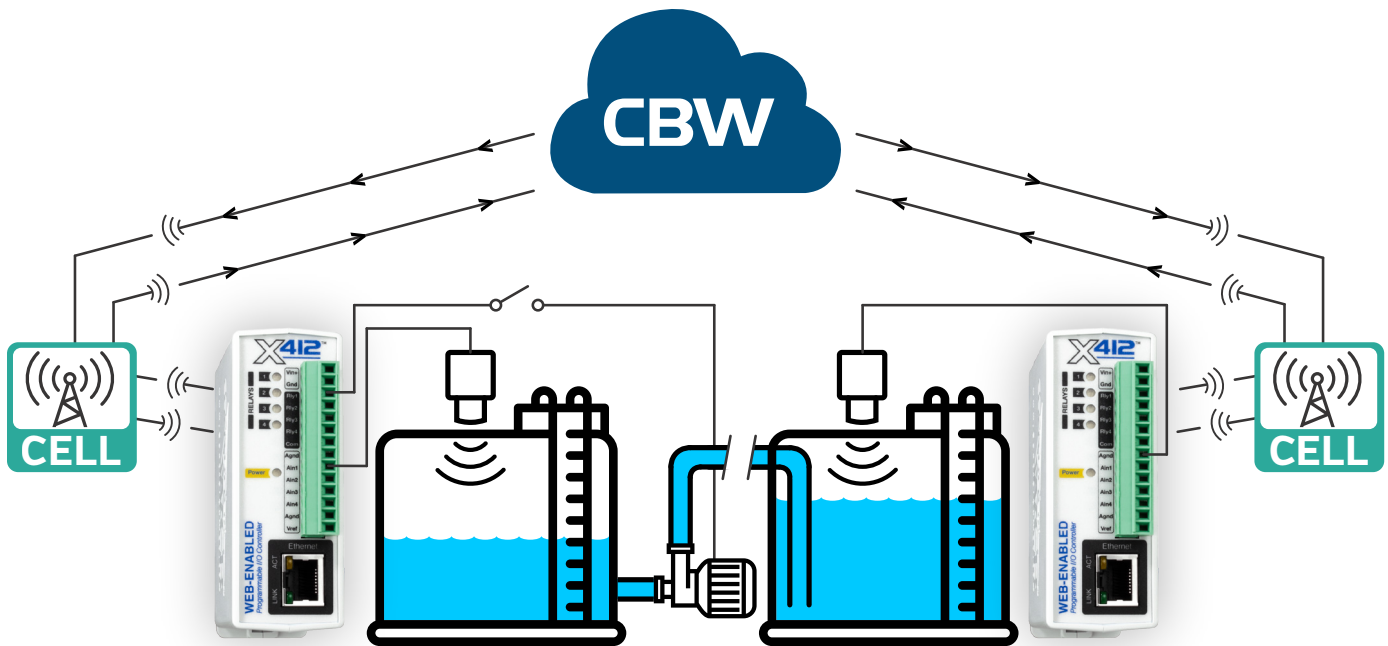
### Typical Challenges with Salt Water Disposal Automation

Salt water disposal automation requires careful coordination between remote sites and is therefore rife with challenges. Chief among them is the availability of reliable control hardware that can communicate directly (peer-to-peer, or P2P) over long distances. Capable hardware comes at a high premium, requires custom programming, and still needs compatible telemetry to network the hardware together correctly.



Complexity is another significant issue for salt water disposal. Controls are not designed to talk to each other effectively out of the box. Detailed customization at the hands of a capable programmer is the only way to establish communication and build in the appropriate logic. Third party software or cloud-based solutions are needed to manage communication between devices. The result is a complicated integration that must be carefully and continuously maintained to stay operational.

Finally, each site must have a failsafe mode for inevitable interruptions in communication. When control hardware cannot communicate between sites, satellite pumps can overwhelm the storage capacity at the disposal site, causing an overflow. All pumping, including the wellhead pump jack, needs to stop when communication has failed and local capacity is full. Once communication has been restored, tank level data at each site can be reassessed by the system and pumping can resume.



This all takes substantial time to program, install, and maintain. ControlByWeb simplifies this coordinated monitoring and control application while reducing risk, lowering cost, and significantly boosting ease of implementation.

## Solving Salt Water Disposal Controls

Fixing complexity is a challenging task. Luckily, emerging IIoT technology provides new capabilities that focus on these very issues. New communication tools facilitate native peer-to-peer and machine-to-machine coordination. Improved micro-processors allow smaller, more powerful, and flexible controls. Embedded cellular technology reduces hardware and simplifies integration.

ControlByWeb combines these technologies in novel ways to create a flexible line of edge controllers that coordinate remotely over their own wide area network. This is possible through their unified platform.

Each device shares a common firmware that gives the user a robust user-interface they can access on their favorite web browser. In addition, the ControlByWeb Cloud provides each controller a link, both for remote users and for native peer-to-peer communication. Finally, ControlByWeb devices feature a built-in gateway for device networking, with embedded cellular, WiFi, and Ethernet options.

Together, this robust set of features makes salt water disposal easier, solving a litany of historically difficult problems with one inexpensive, easy to use platform.

ControlByWeb logic controllers communicate directly to each other, P2P, on both local area networks and installed remotely—creating a wide area network of edge devices. The cloud platform facilitates P2P communication using any networking medium, be it Ethernet, WiFi, cellular, etc. This enables I/O and logic sharing between controllers installed at well sites and at disposal sites, regardless of the distance.

This P2P connection is simple to establish, requires no coding or special programming. ControlByWeb controllers are designed to work together out of the box.

Not only is the P2P communication simple to set up, but so is the rest of the installation. Connecting and configuring sensors, building out pump control logic, and creating dashboards for remote access and notifications is all simplified with a fully user-configurable, browser-based, no-code interface. When coding is required, the script language is BASIC, an easy to learn and well-documented script that has been around for many years.

Each ControlByWeb control module works on a common platform, so creating robust failsafe operation between remote devices is straightforward. Each controller can share I/O endpoint data as well as internal register data. When connectivity fails, the controllers can be configured to quickly note the failed updates from remote devices and execute a user-configurable action, in this case entering a failsafe mode. Simply use the no-code logic builder to turn off all pumps until communication is re-established.

ControlByWeb offers an elegant and comprehensive solution for remote tank level and pump control over a wide area network. The cloud backbone facilitates native P2P mesh communication for coordinated monitoring and control with robust user-configurability, reliability, and failsafe operation. This is all available for a fraction of the cost of traditional controls, often saving operators 50-90% for equivalent capabilities.

## ControlByWeb Unlocks the True Potential of IIoT

Harnessing the power of IoT in industrial settings can unlock powerful capabilities at surprisingly low costs. This is what ControlByWeb offers. The simplified user configuration, flexible application,

and robust features is a game changer across the spectrum of industrial monitoring and control.

Salt water disposal is just one example where significant time, money, and labor can be saved with a system that is equally or more reliable than its predecessor. Tank level monitoring and pump control throughout the oilfield stands to benefit for the same reasons.

The ControlByWeb platform also uses open communication protocols and a REST API, making integration with control systems and/or IIoT platforms easy. This extends the usefulness of ControlByWeb devices to a wide variety of oilfield applications. Current customers are monitoring flow and pressure on a fracking site while controlling pumps and valves. Others monitor and control onsite wastewater treatment processing built on large skids or built into shipping containers. The ControlByWeb platform can handle any kind of monitoring and control of environmental parameters, fluid handling processes, or providing remote notifications of local alarm states and equipment status.

Beyond the oilfield, ControlByWeb performs similar functions as a broadly capable, low-cost, and easy-to-use logic controller for industrial monitoring and control. The innovation is combining these three benefits into a single device and across a cohesive hardware platform, unlocking the true potential of the Industrial Internet of Things.

*Let us help you spec the right product for your oilfield applications. Contact us to speak with a Sales Engineer and get a free step-by-step guide to implementing IIoT controllers for more efficient, flexible salt water disposal.*