



# Water Treatment

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## Water Treatment Chemical Feed Prediction Model Simplifies Operations

Water systems with multiple wells have a number of complexities to deal with. Each well may have a different flow rate and water quality, each treatment system has unique feed rates and treatment combinations. To assist the operators in determining the chemical feed dosages, Engineers at CEI recently developed a treatment prediction model.

### Example Project

The example water treatment facility is equipped with pressure filters containing GreensandPlus and anthracite for removal of arsenic, iron and manganese. Chemical feed systems are provided for sodium hypochlorite (oxidation and disinfection), sulfuric acid (initial pH adjustment), ferric chloride (arsenic co-precipitation) and potassium hydroxide (final pH adjustment). The facility was designed to treat water from seven bedrock wells, each with a different flow rate and quality. The varied sources can lead to a high degree of difficulty for operators to achieve optimum treatment when the raw water combination changes. There are over 30 separate treatment combinations that facility operators may select depending on well rotation and needed capacity supply ranging from 500 to 1,500 gpm.

### Summary

CEI's engineers can develop a custom model of operating scenarios for your system. Ideally adapted to water systems with multiple sources of water, the model allows operators to set optimal treatment easily and quickly.

CEI's model predicts the raw water quality for each treatment scenario and then provides the needed chemical feed dosages, chemical feed rates and chemical pump setpoints (stroke and speed). The chemical pump stroke is set at the pump while the chemical pump speed may be adjusted at the facility SCADA computer. The needed chemical feed rates in gallons/hour from the treatment model were evaluated in order to determine the optimum stroke setpoint, so that the operators only need to adjust the speed from the PLC. This allows the operator to adjust the chemical dosage remotely simplifying operations. The model was developed based on theoretical feed dosages for each chemical and then verified in the field during facility startup. Field testing showed that the model was accurate, allowing operators to set chemical feed pump speeds in the morning without having to adjust throughout the day, as long as the raw water combination remained the same.

*For more information or to have CEI's engineers help you develop a process specific model, contact Comprehensive Environmental Inc.*

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