Poggemeyer Design Group worked with the City of Nelsonville to update their dated water treatment plant process. The updates consisted of a 1,000 gallon per minute iron removal and zeolite ion exchange type water treatment. Included in the new process is (2) two horizontal pressure filters, (3) three softener units, a (2) two 200,000 gallon clearwells, low service pumping, high service pumping, and a building to house treatment units.

The new water treatment plant was construction adjacent to the existing plant. The new 1.44 MGD water treatment plant will provide residents of the City with improved water quality by softening the municipal water supply to approximately 130 mg/l. The existing 3 wells supply water for the new water treatment plant. The project also included new raw waterlines from the wells to the plant. Construction also included a new backwash holding tank and standby emergency power for full plant function during an electrical utility power outage. Demolition of the existing water treatment building was included after start-up of the new water treatment plant.
As part of a new hotel/resort complex on the corner of Las Vegas Boulevard and Flamingo Road, Poggemeyer designed a water treatment plant to provide high quality water for the 8-acre front water feature at the Bellagio. A non-potable water system was designed, including three deep wells, vertical turbine pumps, sand separators, hydromatic tank system, and a distribution loop to provide non-potable water to the on-site irrigation and the front lake feature. The overall recirculating treatment system for the artificial lake feature included recirculating pumps, pressure filters, a 500,000-gallon per day reverse osmosis system, and a bromine disinfection system. The system was designed to recirculate the water volume in the lake feature five times a day. The reverse osmosis system had to be designed to fit into a small area due to limited space in the five-star resort.
PDG was the engineer for the new groundwater treatment plant in Forest, Ohio. The plant was designed to initially treat 288,000 gallons of water per day with the capability to be expanded to 0.576 gallons of water per day on the present site. The regional water plant serves the Village and surrounding areas. PDG worked closely with Artesian Equipment to provide a custom plant that perfectly suited the needs of the Village. Many custom features were added to enhance the performance and meet the demands of operations staff. The new plant is a groundwater treatment plant with iron and manganese filtration and ion exchange softening to provide safe high quality water for Village residents. The plant design is based on an average daily flow of 175,000 GPD and a peak design flow of 288,000 GPD.

The groundwater treatment process includes aeration to oxidize iron and manganese followed by vertical pressure filters. From the pressure filters, water is piped to the ion exchange...
softeners. A portion of the flow bypasses the softening units to provide a finished water hardness of approximately 13 mg. Caustic soda is added to adjust PH and chlorine for disinfection. High service pumps provide pressure into elevated storage and the distribution system. In order to maximize system reliability, the plant has been equipped with a SCADA computer system, which displays all of the plant variables on a central monitor and provides alarm and data logging capabilities. The project cost was $1.9 million, with significant grant and loan funding obtained with PDG assistance through the Ohio EPA, OPWC, CDBG Water and Sewer.
The project included an entirely new Well field and Water Treatment Plant for the Village of Deshler to replace an aging, inefficient plant that has outlived its useful life. The existing wells did not meet current OEPA standards for isolation radius. The existing WTP had not had a major update since approximately 1968.

There are two new wells each with a capacity of approximately 500 gpm. The water quality is better than expected and will provide a good raw water source for the Village. The new water treatment plant is a masonry building with steel joists and a metal roof. There is an administrative area with office space for the billing operation and superintendent, laboratory space, restrooms and a break room. The rest of the building houses the treatment process, chemical feed areas, electrical room, and pumping facilities.
The treatment process is a membrane system using a combination of ultrafiltration and RO membranes. The plant is designed with two 150 gpm membrane trains able to produce approximately 432,000 gallons of drinking water per day. After the water passes through the membranes it flows through a degassifier to reduce hydrogen sulfide gas and strip of CO2 to raise the pH of the water. Chlorine and Caustic soda are added for disinfection and pH adjustment. The water is then stored in a new 200,000 gallon clearwell and pumped into the distribution system via two new 20 HP high service pumps.

The treatment process is automated and is operated and monitored by a PLC which is available for the operators for logging and adjustments. Chemicals are monitored to provide information on usage and remaining chemicals. Telemetry was also installed from the elevated water storage tower to the new WTP to provide accurate tower water levels.
The project included an entirely new Water Treatment Plant, three new wells and connecting waterlines and sanitary sewer pump station and force main for the City of Wapakoneta to replace an aging, inefficient plant. Some of the City’s existing wells did not meet current OEPA standards for isolation radius and the new wells will replace them. The existing WTP had not had a major update since the mid 1980’s.

The new water treatment plant is a masonry building with steel joists and a metal roof. The architecture is similar to many other city buildings throughout the area. The WTP has an administrative area with office space for operators and superintendent, laboratory space, and a restroom. The rest of the building houses the treatment process, chemical feed areas, electrical room, and some of the pumping facilities.

Project Relevance
- Ground Water Plant
- Review of WTP Operations
- Investigation of Options
- Plans and Specifications

Project Team
- Michael Atherine, P.E., Officer in Charge
- Thomas Borck, P.E., Project Manager
- Richard Heyman, Environmental Planning
- Daniel Knott, P.E., Electrical Engineer
- Scott Schroeder, P.E., Structural Engineer

Reference
Brent Hamel
Water Superintendent
City of Wapakoneta
419.736.7439
The treatment process for this groundwater plant includes three gravity filters for iron and manganese removal with four pressure ion exchange softeners to soften the water to a usable level. The plant is designed to produce approximately 2,500,000 gallons of high quality drinking water per day. Water passes through one of two aerators to oxidize the iron and manganese, then flows through the filters and on to ion exchange units. Chlorine and Caustic soda are added for disinfection and pH adjustment. The water is then stored in two new 200,000 gallon clearwells and pumped into the distribution system via three new 150 HP, 2,300 gpm high service pumps.

The treatment process is automated and is operated and monitored by PLC’s. This information is available for the operators for logging and adjustment of the process. Telemetry was also installed from the elevated water storage towers to the new WTP to provide accurate tower water levels.
PDG was the prime consultant for the design and construction of a highly complex regional water transmission and distribution system in a seasonal resort area. The project consisted of a 6 mgd surface water coagulation sedimentation treatment plant (expandable to 18 mgd), low and high-service pumping, 150 miles of waterline ranging from 3-inch to 30-inch diameter, three 500,000 gallon elevated water storage towers, two 750,000 gallon clearwells, and a state-of-the-art monitoring system with particle counting for cryptosporidium and giardia. To meet a tight design schedule, the project was designed in the field. Construction coordination included eight government regulatory agencies, 12,000 assessments, 9,300 parcels of land, meter pit installation for each parcel, acquisition of over 400 easements, and multiple grants and loans from six funding agencies. Over 1,100 sheets of construction drawings were developed.
The project was constructed simultaneously in three segments under 12 construction contracts with 11 prime contractors. Water service was maintained throughout construction requiring timely abandonment and connection to 130 privately-operated water systems and two public water systems. Although faced with a variety of challenges such as major river and stream crossings, rock excavation, adverse weather, contaminated soils, and the default of one contractor, the project was completed on time and within budget. The system serves Oak Harbor, Port Clinton and six townships.

After five years of operation, the Ottawa County Regional Water Treatment Plant made plans to expand the plant from 6MGD to 9MGD. PDG developed plans and specifications for the expansion, two additional pretreatment basins, an additional clarifier, four new filters, and upgraded control systems were completed in 2005.

- Nationally recognized by the American Consulting Engineers Council
- Outstanding Achievement Award, Consulting Engineers Council of Ohio

$56+ MILLION IN FUNDING ASSISTANCE

- Ohio Public Works Commission ............................................ $1.3 million
- Ohio Rotary Commission .................................................... $950,000
- U.S. Department of Agriculture ........................................ $3 million
- CDBG ........................................................................... $814,500
- OEPA ............................................................................... $21 million
- OWDA ............................................................................. $29 million