As part of the City’s Combined Sewer Long Term Control Plan, the existing tertiary sand filtration system, ultra-violet disinfection system and grit removal had to be upgraded to treat a peak hydraulic flow of 30 mgd in a phased approach.

PDG is the prime consultant for the investigation, design, bidding and construction of improvements to the City’s Wastewater Treatment Plant. Improvements include the following:

**Project Elements**
- Upgraded existing tertiary sand filtration system from a capacity of 16 mgd to 30 mgd
- Replacement of the existing tertiary treatment system with an innovative multiple fabric filter media disk system.
- Replacement of existing UV disinfection system with an energy efficient high intensity low pressure system capable of treating 30 mgd.
- Replacement of the existing aerated grit removal system with a high performance grit separator utilizing a stacked tray design capable of removing 75 micron size grit at a flow rate of 30 mgd.

**Project Relevance**
- Wastewater Treatment Plant
- Construction Administration
- Construction Observation
- UV Disinfection System
- Grant Administration

**Location**
- Bowling Green, Ohio

**Services Provided**
- Environmental, Electrical Engineering, Bidding, Construction Administration and Observation

**Cost**
- UV Disinfection System $2.6 million
- Tertiary Filtration System $3.1 million
- Grit Removal $

**Project Funding**
- $725,000 – OPWC Grants

**Size**
- 1.5 MG Storage

**Schedule**
- 13 months to meet EPA deadlines

**Project Team**
- Jack A. Jones, P.E. – Principal-in-Charge
- Michael Atherine, P.E. – Project Manager
- Steven Wonderly, P.E., Project Engineer
- Dan Knott, P.E. – Electrical Engineer

**Reference**
Doug Clark, Superintendent
City of Bowling Green
419.354.6274
Bowling Green Wastewater Treatment Improvements

- Addition of two (2) perforated plate type self-cleaning fine influent wastewater screens with 3mm openings.
- Odor control systems for new headworks building existing ATAD system and existing septage receiving station.
- Integration of all improvements into the existing SCADA system.
The City of Delphos Wastewater Treatment Plant utilizes membrane bioreactor (MBR) technology to adequately treat high strength wastewater tributary to the facility prior to discharge to Jennings Creek. The facility at one time was the largest flat plate membrane bioreactor facility in the world. The membrane bioreactor portion of the facility consists of five separate parallel trains each including an anoxic basin, pre-aeration basin and membrane reactor tank. Each membrane reactor houses 26 double stacked membrane units housing 10,400 individual membrane plates for a total of 52,000 plates within the five trains. The facility when constructed had an average day design capacity of 3.83 MGD with a peak day capacity of 12.0 MGD.

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Since the plant’s initial operation in 2006, the facility has experienced on-going damage to many of the individual membrane plates due to equipment problems. This on-going damage has drastically reduced the capacity of the wastewater treatment facility. The individual membrane plate damage is so severe that two of the five trains are totally off-line with the other three trains having a lower than original design capacity due to membrane plate damage within the individual trains. These problems are drastically limiting the City’s ability to meet its Ohio EPA NPDES permit requirements.

Poggemeyer Design Group, Inc. (PDG) has been retained by the City of Delphos to investigate various options to rectify the on-going problems at the facility. PDG is investigating various membrane replacement options along with other activated sludge alternatives to enable the City to meet its NPDES permit requirements now and into the future in a cost-effective manner. Included in the investigation by PDG is review of construction, equipment replacement, and power and labor costs associated with all of the viable options. Included, also, will be a non-monetary review and ranking of options. A 20 year life cycle analysis will be included to help select the best option. Once an option is selected, a phased approach will be developed to maximize possible grants and low-interest funding opportunities.
PDG and HRG attended several meetings with WWTP and Village staff and prepared a comprehensive SSES proposal to address the Village’s WWTP and collection system problems. The investigative process addressed issues at the WWTP, including review of existing sanitary sewer plans and data, demographic profile analysis, existing collection system evaluation, existing WWTP evaluation, growth and development analysis, identification of alternatives, evaluation of alternatives and costs, financing options, and an implementation schedule. This included the potential for constructing a new WWTP. PDG assisted the Village in pursuing OWDA and other funding for this study, as well as for design and construction.

PDG was the prime consultant for the design and construction of the new WWTP. The project involved a new headworks facility (screening, grit removal and submersible raw sewage pumps), two new SBR tanks for the waste activated secondary treatment process, post aeration, NPW systems, and ultraviolet disinfection. The existing wastewater treatment tanks were converted to aerobic sludge holding/digester tanks. The existing raw sewage pump station was converted to a septage receiving station.

PDG and HRG assisted GOTL with a 2009 OPWC project, which included a new sludge press at the WWTP. Based on the wastewater system investigation proposal and problems with the plant flow meter, GOTL, PDG and HRG reviewed alternatives and costs to solve problems while paving the way for a longer-term solution.

**Geneva-on-the-Lake Wastewater Treatment Plant**

- **Location**: Geneva-on-the-Lake, Ohio
- **Services Provided**: Environmental Engineering, Construction Administration and Observation
- **Project Cost**: $7 million
- **Project Funding**: CDBG, OPWC, WPCLF
- **Size**: 600,000 GPD Capacity, 2.5 MGD Peak Capacity
- **Schedule**: Design Services: 2010-2014, Construction: 2015-2017
- **Project Team**: Michael Atherine, P.E., Project Manager, Jack A. Jones, P.E., Steve Wonderly, P.E., Emil Diener, Construction Observation

**Project Relevance**
- Construction Observation
- Project Funding

**Reference**
Mr. Larry Severino, WWTP Superintendent
Village of Geneva-on-the-Lake
4843 North Broadway Ave/Lewis Lane
Geneva-on-the-Lake, Ohio 44041
440.466.8698
PDG worked with the Village of Mount Gilead to explore affordable options to expand and upgrade its wastewater treatment plant. The main objective was to eliminate EPA violations while optimizing operating costs at the activated sludge facility. Various design alternatives for mixing and aeration of the waste activated sludge were evaluated. PDG compared complete aeration systems with various combinations of aeration and hydraulic mixing methods and helped the Village select an innovative system with an aerobic digester and sludge holding tank design using fine bubble aeration combined with hydraulic mixing. The project also included a 610 KW standby diesel generator system.

The new system has an increased digester loading capability to effectively digest thicker solids up to five-percent, thereby minimizing aeration and decreasing the maximum total online horsepower from 270 to 210. The Village has reported a savings of $40,000 per year in operation costs, as well as an additional estimated savings of $128,000 through optimized energy consumption within the digestion process.

“I was pleased to be working with Poggemeyer on this project from day one,” said Mr. Rogers. “The staff’s communication and teamwork were critical to securing funding and developing the affordable, efficient system we need.”
The system, which is being considered as a case study in USEPA’s forthcoming sludge manual, included two new 62-foot aerobic digester holding tanks and an existing 45-foot diameter digester tank. The aeration and mixing system exceeded design expectations, leaving the second tank available to be used as a standby sludge holding tank with the added benefit of an installed hydraulic jet mixing system.

PDG was invited to give a presentation on innovative wastewater treatment technology at the Water Environment Federation’s Annual Technical Exhibition and Conference held in Chicago.
PDG was the prime consultant for the evaluation, design and construction of the replacement to Elmore’s wastewater treatment plant consisting of new variable speed suction lift raw sewage pump station, self-cleaning raw sewage screening, two (2) channel looped reactor type oxidation ditch, final clarification, return/waste activated sludge pumping, two (2) circular aerobic sludge digestion tanks with diffused aeration, ultraviolet disinfection, standby power generator and a chemical feed system for phosphorous removal. The upgraded plant has an average day capacity of 0.280 mgd and a peak capacity of 1.87 mgd.
PDG worked with Danbury Township to improve and upgrade its wastewater treatment plant. The project provided improvements to the existing lagoon treatment system, including new rotary screens and grit removal equipment housed in a new building, lagoon aeration blowers, piping and diffusers, chemical phosphorous reduction equipment in a new building (Actiflo), cleaning the existing lagoons, and various site improvements. Other components of the project included updating the chemical feed systems, improving the outfall structure, and evaluation of the wastewater treatment plant discharge sewer.

The improvements upgraded the treatment capacity to a design flow of 3.8 MGD and a peak flow of 6 MGD. Additional improvements were made to the aeration system providing better air distribution in the existing lagoon cells, including new air distribution piping, blowers, submerged air laterals, and air diffusers. These upgrades provided better biological activity in each cell and improved treatment during the hot summer months.
The City of Oberlin’s Water Environment Protection Facility Tertiary Filtration System was in need of replacement to improve phosphorous removal and increase wet weather treatment capacity. The upgraded system needed to fit within the footprint of the existing system, handle peak flows with minimal backwashing volume and accomplish a higher degree of phosphorus removal.

PDG was the prime consultant for the investigation, design and construction of improvements to the City’s Water Environment Protection Facility Tertiary Filtration System.

**Project Elements**
- Upgraded existing sand filtration system from a capacity of 3 mgd to 6 mgd
- Replacement of the existing sand filtration system with an innovative fabric media 5 micron cloth disk filter system
- Enhanced phosphorous removal
- Minimal backwash water volume
- Retrofitted within existing structures
- Does not require down time for backwashing

**Project Relevance**
- Phosphorus Removal
- Tertiary Filtration System
- Construction Administration
- Provided Alternate Design with New Technology
- Modified Original Design

**Reference**
Steve Hoffert, Wastewater Superintendent
City of Oberlin
440.775.7280