GRIFFIN

THE DRAWDOWN

September 2022

In the July issue of *The Drawdown*, we examined some of the basic principles of groundwater treatment including; why treatment may be required, planning of system design, common dewatering effluent constituents necessitating treatment and system components.

Now we will take a detailed look at an award winning water treatment project.

ABC Excellence in Construction Awards

AWARDS 2021 tcdi Groundwater Treatment Systems

Alexan Old Town Water Treatment Project

The site, called the Alexan Old Town Project, located in Alexandria, VA, served for many years as a repair and maintenance depot for city busses. Trammell Crow Residential (TCR) was developing the site into a multi-family residential building. TCR reached out to Griffin early in the design phase of the project to develop and implement a comprehensive groundwater control plan.

Griffin has extensive experience in the area and was aware of the potential for high levels of naturally occurring iron in the groundwater. Based on the site's past use, the TCR/Griffin team anticipated additional contamination might be present in the groundwater. Very early in the process, we used our knowledge of the area to provide a draft project design and rough order of magnitude (ROM) cost to TCR.

Pump Tests for Water Quality Data

Prior to initiating the site demolition process, our team installed a test well and piezometers for a preliminary pumping test. The testing provided aquifer parameters used for the design of the dewatering system and verified the presence of contaminants as along with verifying excessively high levels of naturally occurring iron in the groundwater.

Custom Designed Deep Well System

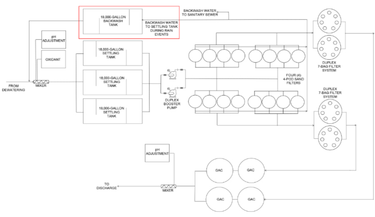
The final dewatering design consisted of deep wells and a sumping system.

- Deep well system composed of ten wells: eight around the perimeter of the excavation & two within
- 30-inch diameter boreholes were drilled 60-feet deep using bucket-auger
- Five horsepower submersible turbine pumps were placed in each well & connected to a header pipe that ran along the outside of the perimeter
- The discharge header for this system was a total of 1,200 feet & was routed to the treatment system
- Sumping component (used for removal of surface/rainwater) consisted of two submersible pumps and 300 feet of pipe/hosing to discharge

Water Treatment System

Griffin designed, installed, and operated the treatment solution to incorporate oxidation-filtration, sand filters, bag filtration, and adsorptive media.

- The removal of naturally occurring iron & manganese required chemicals for oxidation as well as acid & caustic feeds for pH adjustment, with the addition of a flocculant/coagulant
- Multiple sand & bag filters were used to remove the oxidized iron, manganese, & total suspended solids (TSS)
- Adsorbers with granular activated carbon were installed at the end of the treatment train to remove any volatile organic compounds (VOCs) & oxidants prior to discharge of the processed water to the storm sewer



Treatment of Iron & Manganese

The iron concentration averaged 150 ppm over the life of the project, approximately three times the initial design level from the water quality in the single test well. Griffin was able to successfully modify the treatment system to provide adequate treatment at the higher iron levels while still meeting the objectives in the discharge permit.

- Large chemical storage tanks were necessary to lower the frequency of chemical deliveries required
- Our competent field service technicians provided daily operation of the treatment system & keep it operating continuously during the entire project
- Regular daily maintenance was required to keep the equipment operational with the high iron levels

Learn more about our groundwater treatment capabilities

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Minimizing Project Costs

Minimizing Costs With Monitoring Systems

Once the dewatering and treatment systems were installed, Griffin managed costs by simultaneously optimizing the flow of the dewatering wells and the treatment system. Adjustments to the dewatering flow minimized treatment costs while maintaining a safe site with the required drawdown of the water table to the desired depth.

Optimizing Treatment Discharge Design

The treated water was discharged to the storm sewer and the liquid waste from settling tanks and sand filters was discharged to the sanitary sewer. This maximized the treatment efficiency while limiting costs associated with hauling and disposal of the wastewater. All discharges complied with the water quality requirements for each discharge location and the volume for the wastewater were within the permit limits.

The Griffin Difference

Griffin was able to successfully design, install, monitor, and remove the full system while allowing TCR to meet their excavation and construction requirements and stay on schedule. Griffin faced a tight schedule, limited geotechnical information, no water quality data, and a high level of contaminants at this location. We overcame these challenges by using our experience, knowledge of treatment and design, and our superior operations team.

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