

Gregory Ziegler, P.E.

Senior Vice President

Mr. Ziegler has extensive experience in ground freezing, construction dewatering using deep wells, wellpoints and ejector systems for dam remediation and structural applications; groundwater and potable water treatment plant installation; landfill gas well system installations; slurry trenching; large-scale mechanical/earthwork projects; and industrial infrastructure work. In addition to fulfilling a corporate role as a Senior Vice President, Mr. Ziegler serves as the Operations Manager for the company's Special Projects group. In this capacity, his primary roles are proposal development, including design and analysis; cost estimating and budget oversight; project design and implementation; scheduling; and overall management of the project team.

EDUCATION: M.S. Engineering Management, University of Missouri-Rolla, MO, 1999
B.S. Environmental Engineering, United States Military Academy, West Point, NY, 1994

CONTINUING EDUCATION: Advanced Management Program, Association of General Contractors, 2016
Finance & Accounting for the Non-Financial Manager Certification, University of Pennsylvania Wharton School, 2015
Grouting Fundamentals and Current Practice, Colorado School of Mines, 2008
Construction Project Managers Course, Associated General Contractors, 2005

LICENSES: Professional Engineer, State of Missouri

YEARS OF EXPERIENCE: Since 1994

PROFESSIONAL HISTORY:

2017 to present:	Senior Vice President, Moretrench, Rockaway, NJ
2012 to 2017	Vice President, Moretrench, Rockaway, NJ
2004 to 2012:	Project Manager, Moretrench, Rockaway, NJ
2000 to 2004:	Layne Christensen Company, Bridgewater, NJ
1994 to 2000:	U.S. Army Corps of Engineers

HEALTH AND SAFETY: OSHA 40-Hour HAZWOPER Training
OSHA 8-Hour HAZWOPER Refresher
OSHA 10-hour Construction
Corporate Drug and Alcohol Testing program
Annual Medical Monitoring program

PROFESSIONAL AFFILIATIONS: Member, American Society of Civil Engineers.
Member, The Moles
Member, the Underground Construction Association of the Society for Mining, Metallurgy and Exploration (UCA of SME)

SELECTED PROJECT EXPERIENCE:**GROUND FREEZING**

Shaft DST-1, Dugway Storage Tunnel, Cleveland, OH: Project Executive for ground freezing to provide groundwater control and excavation support to allow completion of a 48-foot diameter water tunnel access shaft. During excavation of the shaft, repeated soil and groundwater ingress under the liner plate excavation support had occurred that other remediation methods attempted over time had failed to rectify. The scope of the ground freezing contract included design and furnishing of the 63-pipe freeze system; provision of field engineering and on-site supervision during freeze pipe installation; and monitoring of ground freezing operations through excavation.

First Street Tunnel, Washington, D.C.: Project Executive for installation of three frozen shafts, three frozen tunnel connections, and one frozen SOE for the First Street Tunnel, which will serve as a CSO for District of Columbia Water. The project involved drilling of over 300 freeze pipes and installation of two 12-inch Supply/Return headers and three freeze plants. The overall scope of Moretrench's work also included installation of a dewatering well system for the client's main TBM launch shaft; installation of a well and battered wellpoint system to dewater a deep open cut excavation from the main shaft to existing infrastructure on First Street; and several weeks of polyurethane grouting, requested by the JV team, in different areas of the cast-in-place adit tunnel linings.

Access Shaft #3, Buenos Aires, Argentina: Project Manager for ground freezing to provide groundwater control and excavation support to allow completion of a 35.4-foot diameter water tunnel access shaft. During excavation of the shaft repeated soil and groundwater ingress between the slurry panel excavation support had occurred that other remediation methods attempted over time had failed to rectify. The scope of the ground freezing contract included design and furnishing of the freeze system; provision of field engineering and on-site supervision during freeze pipe installation by the owner's drilling subcontractor; and monitoring of ground freezing operations through final concrete liner installation. The project was successfully completed without further issues.

South West Pipeline Project, Beulah, North Dakota: Project Executive for ground freezing to allow construction of a concrete segmented liner shaft, 26.5 feet in excavated diameter and 160 feet deep, for water intake from a large reservoir. This project required a frozen bottom plug to provide water cut off. Concrete liner segments were installed top down.

Port Mann TBM Rescue, Vancouver, British Columbia Canada: Project Executive for a liquid nitrogen ground freezing program to permit repairs to a 3.5-m diameter TBM that developed mechanical issues 900 m into a 1300 m drive below the Fraser River. Ten freeze pipes were installed in front of the TBM to freeze the soil mass, providing the groundwater cut-off and soil stability required to allow repairs to take place.

Fort Hills Basal Aquifer Trials, Fort McMurray, Alberta, Canada: Project Manager for a ground freezing system composed of over 75 freeze pipes installed to a depth of over 500 feet to test the viability of freezing a deep aquifer. Design challenges included a 480-ton freeze system, a 1,500 gpm brine pumping system, specialized freeze pipes and temperature monitoring wells, and a custom instrumentation and SCADA system.

Northern Boulevard Crossing, East Side Access, Queens, NY: Project Manager for a program of horizontal ground freezing to create a canopy of stabilized soil above the tunnel crown for mining of a 125-foot long tunnel through difficult ground beneath a pile-supported elevated New York City transit rail line, a 5-track subway tunnel, and the heavily travelled Northern Boulevard.

Woonasquatucket CSO Interceptor Main, Narragansett Bay Commission, Providence, RI: Project Manager for ground freezing of a 30-ft diameter shaft to a depth of 200 ft.

Southeast Collector Trunk, Sewer Shaft 11, Toronto Canada: Project Manager for ground freezing to provide excavation support and groundwater control for the sinking of a 180-feet deep access shaft for TBM maintenance.

Southeast Collector Trunk, Sewer Shaft MS-1, Toronto, Canada: Project Manager for ground freezing to provide excavation support and groundwater control for sinking of a 100-feet deep shaft with launch block for TBM.

Safe Haven, East Side Access Project, New York, NY: Project Manager for the installation of a mass freeze to allow tunnel boring machines a “safe haven” to allow inspection and cutter head changes. The frozen mass was 50 ft by 50 ft in plan and more than 100 ft deep. A total of 110 freeze pipes were drilled on compound angles due to surface location access issues. All pipes within the alignment were heated and pulled as the TBM entered the frozen mass.

Gibson County Coal, Princeton, IN: On-site engineer/manager during the installation/layout/survey of all freeze pipes, instrumentation wells and piezometer wells for a ground freezing system to allow the construction of a 550-foot deep mine access shaft.

City Water Tunnel #3, New York, NY: Project Engineer for ground freezing to provide groundwater control and excavation support during construction of shafts 28 and 29.

DEWATERING, GROUNDWATER CONTROL & GROUNDWATER TREATMENT

ConocoPhillips Bayway Refinery Sludge Lagoon Operable Unit, Linden, NJ: Project Manager for the installation of a contaminated groundwater collection system within the Sludge Lagoon. The project entailed installation of 21 recovery wells with associated concrete vaults, pumps & piping; installation of over 12,000 LF of HDPE force main; installation of 170 helical piles; installation and startup of a 150-gpm central treatment system; and site improvements including roads & drainage swales.

ConocoPhillips Bayway Refinery, Linden, NJ: Project Manager for the installation of a 600-ft long, 25-ft deep permanent biopolymer trench and 6-inch collection line for removal of groundwater contaminated with petroleum products. The trench was lined with interlocking HDPE panels. The collection system was constructed on the shore of a lake adjacent to active fueling terminals.

Dry Dock # 8, Portsmouth, VA: Project Manager for the installation of a total of 60 deep wells along either side of a dry dock, 1,100 feet in length and 55 feet deep, to lower water levels 3 feet below the dry dock's base concrete slab to allow wall and floor rehabilitation to take place. The system operated continuously 24 hours per day, 7 days per week, pumping over 4,000 gpm.

Thorn Run Dam, Butler County, PA: Project Manager for the installation of 25 permanent shallow relief wells and 8 permanent deep relief wells to intercept seepage at the toe of the dam. Additionally, 22 temporary dewatering wells were installed to facilitate excavation for existing spillway expansion and new stilling basin construction.

Canton Lake Dam, Blaine County, OK: Project Manager for the installation of 11,000 LF of wellpoints to facilitate installation of a permanent toe drain by the general contractor. This work was undertaken as part of a multi-phase dam upgrade initiated by the Tulsa District Corps of Engineers.

Reelfoot Lake Dam, Tiptonville, TN: Project Manager for the installation of 20 deep wells to a depth of 120 feet to facilitate construction of a new spillway. Scope of work included installation of a HDPE header system for discharge and electrical distribution. The operating system pumped a total of 21,000 gpm.

Cannelton Hydroelectric Power Plant, Hawesville, KY: Project Manager for the installation of 20, 10-inch diameter deep wells to a depth of 130 feet within a perimeter slurry wall to dewater the bathtub excavation during foundation installation at the site of a new power plant on the Ohio River. The total system pumped 7,000 gpm.

Liberty Industrial Finishing Site, Farmingdale, NY: Project Manager for installations and upgrades at an existing treatment plant. This superfund project included the drilling of eight extraction wells and nine piezometers with associated below-grade vaults and piping. The treatment plant work included demolition and removal of existing equipment, installation of two auto-backwash filter systems and 14 granular activated carbon vessels, electrical upgrades, and installation of a new control and SCADA system.

Bear Creek Dam, Franklin County, AL: Project Manager for the installation of a series of deep wells into karst underlying a leaking earthen dam, and installation of an ejector system to drain the overburden, to facilitate excavation for construction of a new, roller-compacted concrete dam downstream of the existing structure. Responsibilities also included management of the installation of two tied back soldier pile and lagging support systems for excavation to subgrade at the existing spillway and the in-service sluiceway.

Lyman Run Dam, Galeton, PA: Project Manager for dewatering to facilitate construction of a new concrete roller-compacted dam to replace a failing existing structure. Work included the drilling and installation of 43 deep wells and associated piping on the upstream and downstream sides of the dam alignment.

Watres Dam, Moscow, PA: Project Manager for the installation of a dewatering system to address seepage through an existing earthen dam, including drilling/installation of nine deep wells on the crest and mid-slope of the dam and 36 pressure relief wells on the collection trench alignment of the dam. Additionally, instrumentation was installed on existing and new piezometers.

City Water Tunnel #3, New York, NY: Project Engineer during the installation of the dewatering systems, water treatment systems, and micropile geotechnical work at Shafts 28, 29, and 30 of New York City's Water Tunnel #3.

Warnerville Pump Station, Rosedale, NY: Project Manager for the installation of wellpoints and deep wells to dewater the trench alignments for the installation of 4000+ LF of new sewer line, and construction of a new pump station for the NYCDEP. All groundwater was treated prior to discharge by two, on-site temporary treatment plants.

Tice Boulevard, Woodcliff Lake, NJ: Project Manager for the drilling and installation of a wellpoint dewatering system for the construction of a 3-story, 300,000 SF office building.

Valero Refinery, Paulsboro, NJ: Project Manager for the installation and operation of a 1,500 LF wellpoint dewatering system to allow the reconstruction and lining of a storm water runoff at the refinery. This system required the pumping of over two million gallons per day to maintain a dry subgrade.

Fox Hills Water Treatment Plant Addition and Well House 14 Construction, Rockaway, NJ: Project Manager for the construction of a well house and treatment plant. Work included all electrical systems, treatment equipment, controls, and concrete / mason building construction work.

Denville Technical Park, Denville, NJ: Project Manager for the installation of 13 wells, 2,000 LF of trenched pipeline, and plant construction for the treatment of contaminated soils/water on an active superfund site. Treatment equipment installed included a low profile air stripper, vapor phase carbon units, vapor knockout-pots, blowers, process cooler and associated equipment.

Lakehurst Naval Station, Lakehurst, NJ: Site Coordinator for construction dewatering and groundwater treatment to facilitate construction of the Navy's new aircraft launching system catapult and support structures.

Market Street Gas Works, Newark, NJ: Site Supervisor for the drilling and installation of 65 deep wells to a depth of 96 feet inside sheeted cofferdams along the Passaic River. Contaminated water from the dewatering system was treated in a treatment plant which included settling tanks, oil water separators, bag filters, organoclay filter and carbon filtration units.

LANDFILL GAS SYSTEMS

Cumberland County Improvement Authority, Millville, NJ: Project Manager for expansion of the Cumberland County landfill's gas extraction system. Work included the drilling of an additional 18 landfill gas wells; installation of 3 horizontal collectors; installation of all interconnecting HDPE piping and valves; and installation of odor control piping and manifolds on the perimeter of the landfill.

Brookfield Avenue Landfill, Staten Island, NY: Project Manager for the installation of 82 gas extraction wells to a depth of 20 feet at a landfill site in the process of closure.

Landfill Gas Well Drilling: Project Manager for gas well installation projects at:

- New Jersey: Linden, Pennsauken, Atlantic County, Cumberland County, Burlington County, Galloway Township and Salem County landfills
- New York: Colonie and Sullivan County landfills
- Maryland: Hobbs Road landfill

GROUTING

PCS Phosphates, White Springs, FL: On-site Project Manager for low mobility grouting to seal the throat of a phosphogypsum stack sinkhole measuring approximately 300 feet in diameter at the surface, 100 feet in diameter at the throat, and extending to a total depth of 320-340 feet. Moretrench operated two on site grout plants, fed by four silos, which manufactured and injected 3,600 cubic yards of grout.