



Mining Infrastructure Solutions for North America

Delivering All Elements of Project Execution with a Superior Safety Record



BLACK & VEATCH



Black & Veatch Mining

Black & Veatch, a global leader in engineering, procurement and construction (EPC) services for energy, water and telecommunications, has been delivering proven infrastructure solutions in North America for more than 100 years.

Black & Veatch has a team of mining industry veterans who fully understand the unique water, energy and environmental challenges that mining companies face today. These experts are dedicated to bringing integrated solutions that promote efficiency, resilience and sustainability.

Learn more about our services for the mining sector at bv.com/mining.

Power Generation and Delivery

Energy usage can account for a significant percentage of mine operating costs, so it stands to reason that companies should closely examine the most efficient ways to generate and consume power.

We have built transmission lines across some of the world's toughest terrains. Our teams use innovative approaches to provide planning, routing and construction solutions.

Our expertise applies to:

- **Conventional Power:** fossil fuels, LNG integration, cogeneration
- **Renewable Energy:** solar, wind, hydropower and geothermal
- **Transmission:** power delivery lines stretching hundreds of miles
- **Distributed Generation:** microgrids, energy storage and bioenergy along with grid management tools

Water and Environmental Solutions

Our water and environmental solutions include:

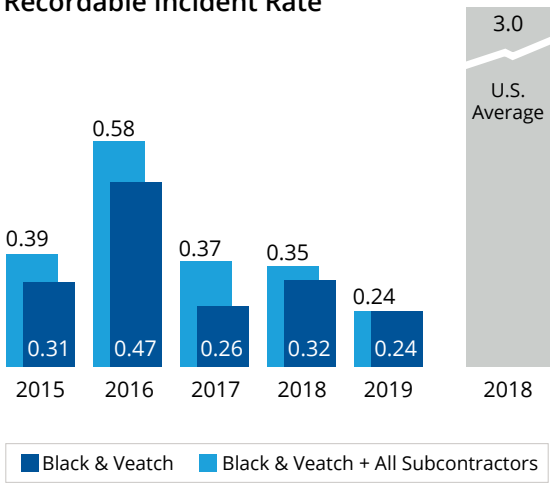
- Water treatment, reuse and management
- Permitting, closure, remediation and Environmental Impact Assessments (EIA)
- Tailings dam and reservoir design, heap leach pads and dry stack facilities
- Conveyance, including tunnels and pumping systems
- Water supply including desalination and resource planning

Leading with Safety

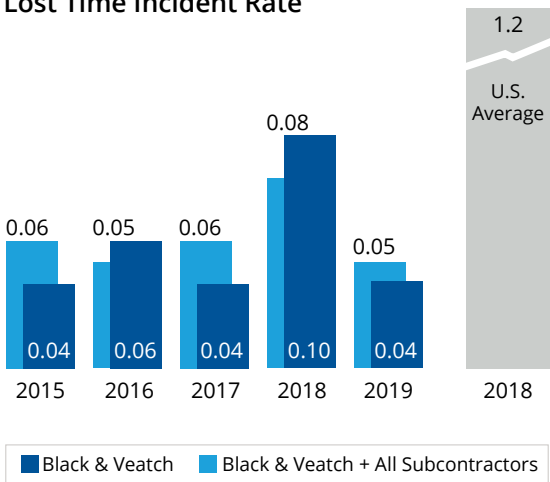
Black & Veatch places the highest importance on the safety and health of our professionals, subcontractors and clients. Strong leadership and commitment, coupled with zero incident expectations have resulted in industry credibility. Black & Veatch has 13 Voluntary Protection Program awards from the Occupational Safety and Health Administration (OSHA) and 10 consecutive years at Silver and Gold Level from The Royal Society for the Prevention of Accidents in the United Kingdom.

Our incident rates are historically lower than national averages, which demonstrates our commitment to sending every professional home safely every single day.

Recordable Incident Rate



Lost Time Incident Rate



Industry Leadership

Our latest rankings from Engineering News-Record (ENR) include the following:

- 12th in Top 500 Design Firms
- 12th in Top 100 Design-Build Firms
- 15th in Top 100 Construction Management-for-Fee Firms
- 20th in Top 50 Program Management Firms
- 27th in Top 150 Global Design Firms
- 36th in Top 225 International Design Firms

We also rank high across ENR's Power, Telecommunications, Environmental and Petroleum categories. A selection include:

- 1st in Top 50 Telecommunications
- 1st in Top 5 Transmission Lines and Cabling
- 2nd in Top 50 Power
- 3rd in Top 25 Sanitary and Storm Sewers
- 5th in Top 50 Water Supply
- 9th in Top 25 Refineries and Petrochemical Plants

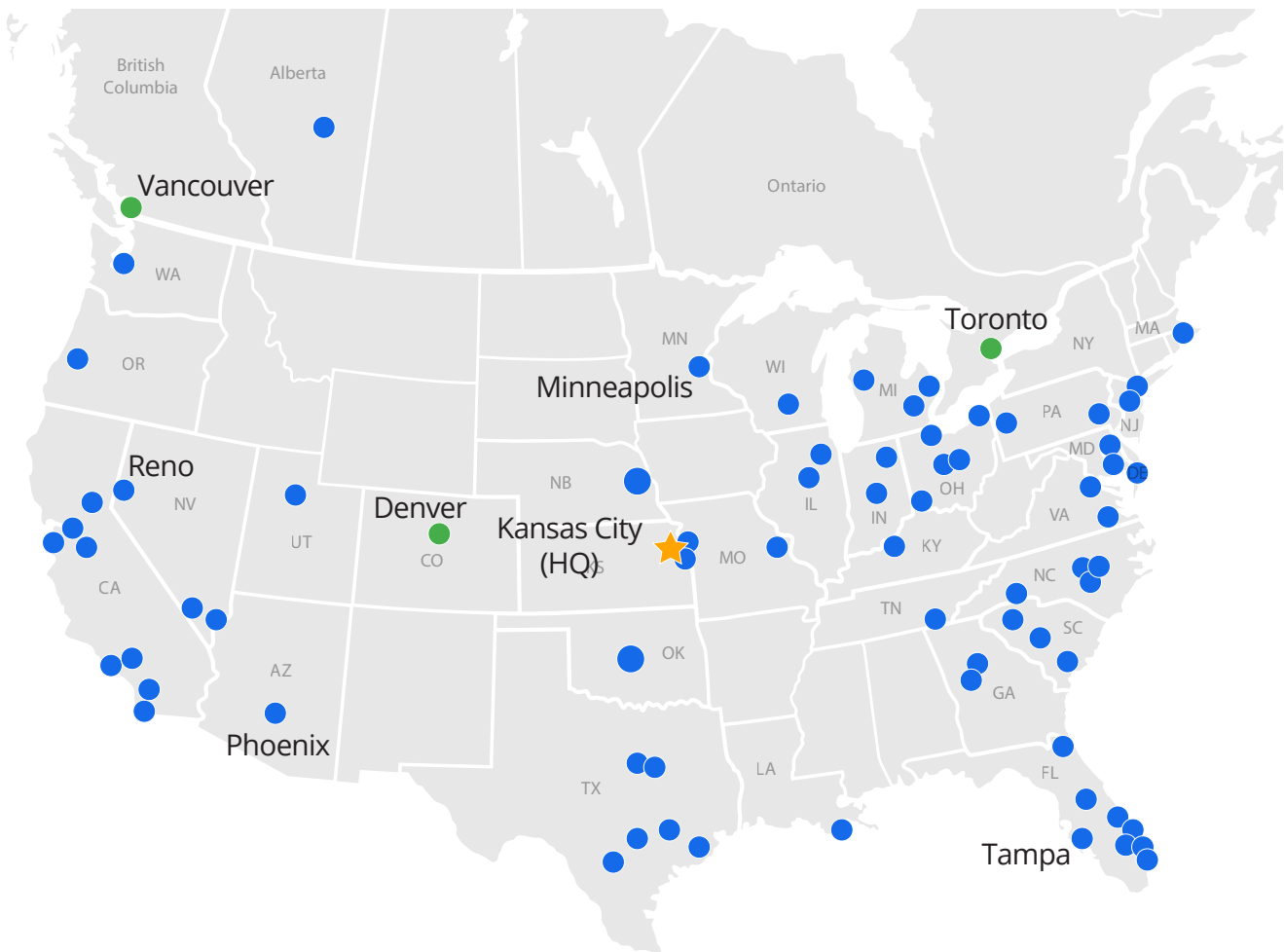
History

Black & Veatch was founded in 1915 as a two-person partnership between Ernest Bateman (E.B.) Black and Nathan Thomas (N.T.) Veatch. The company began with 12 employees and an office in Kansas City, Missouri.

Today, the company continues to experience strong growth across its core markets. Black & Veatch currently has a global workforce of more than 10,000 working in over 100 offices worldwide with projects completed in more than 100 countries on six continents.

In the U.S. and Canada, Black & Veatch has more than 60 regional offices (not including project offices).

Black & Veatch Office Locations in North America



Integrated Infrastructure

We have dedicated Telecommunications and Management Consulting teams that specialize in:

- Infrastructure corridors
- Outsourcing/finance solutions
- Strategic planning & options analysis
- Remote operations control & automation
- Monitoring & data analytics
- Cyber and physical security

Sustainability

We work with our clients to convert their sustainability goals into real solutions. Mine site closure and remediation presents a variety of risks and a wide range of environmental challenges. Black & Veatch works with clients to manage these risks and solve these challenges through our more than 50 years of experience and relationships with federal and state regulators.

Black & Veatch has the tools to accurately assess carbon footprint impact and how to make meaningful reductions. Our work in alternative solutions in power and water helps mines to maintain a sustainable operation, while being good stewards of the environment.

Proven Results

Black & Veatch is proud of its relationships with several mining companies, such as Newmont, Rio Tinto, BHP, Goldcorp, Anglo American, Kinross and many more.

Brewer Gold Mine, Jefferson, SC

The Brewer Gold Mine, located near Jefferson, South Carolina, operated intermittently between 1828 and 1995. After the site was abandoned in 1999, the U.S. Environmental Protection Agency (EPA) took over the site's water treatment operations to contain acid rock drainage that could harm Little Fork Creek and the Lynches River. In 2005, the EPA placed the site on the Superfund program's National Priorities List (NPL) and selected Black & Veatch to perform remedial investigations and feasibility studies to protect surface water. Work also included reviewing and streamlining operating procedures for the existing water treatment plant, which reduced costs without decreasing operating efficiency.

Mining Client, AK

Black & Veatch provided a fuel supply study, "island" power distribution and a cold weather / remote man camp construction execution plan. Other work included engineering design, risk assessment and financial evaluation.

Electricity Purchase Support for Large Mining Customer, USA

Black & Veatch continues to provide support to a large mining customer in the United States to implement new electricity supply agreement. This support includes analysis of agreement structure, identification of data to validate invoicing, analysis of electricity procurement options available under the agreement including analysis of day ahead versus forward purchasing, development of electricity price forecasts, development of electricity demand forecasts and statistical analysis of forecast electricity budgets.

Gross Reservoir Expansion Project, Denver, CO

As Owner's Representative, Black & Veatch will assist Denver Water with project controls — including schedule, cost and document control, and eventually construction management — starting in May 2017 and extending through the first filling of the reservoir, expected in April 2026. Once permits are secured, dam construction is expected to occur in three phases over a total of four to five years. The project will raise the height of the existing 340-foot-dam by 131 feet, increasing reservoir capacity from 42,000 acre feet of water to 119,000 acre feet of water. The project will also increase the total output of Gross Dam's hydroelectric power plant from 7.6 megawatts (MW) to 8.1 MW.

- The project, with an estimated cost of \$380 million, will make Gross Dam the tallest dam in Colorado and will increase the dam to 1.5 million cubic yards of concrete, about half the volume of Hoover Dam.
- The expansion will also provide environmental benefits, with agreements in place to protect the South Boulder Creek and the Fraser, Williams Fork, Blue and Colorado rivers.



Geotechnical Evaluation Major Dam, Canada

Black & Veatch participated in an investment level geotechnical evaluation for the design of a major dam for a mining client in the Arctic region of Canada. The dam was located in a permafrost region, with a likelihood that the permafrost would melt once the structure was filled. This was a particularly challenging project, especially given the harsh climatic and challenging geotechnical conditions encountered in the region. The dam was a critical component of the project, and required the high level of expertise that Black & Veatch could bring to the project.

Gila Bend Solar Power Plant, Arizona Public Service, Gila Bend, AZ

Black & Veatch was awarded an Engineering, Procurement and Construction (EPC) contract to design and build the 32 MW utility-class Gila Bend Solar Power Plant located on 400 acres in Gila Bend, Arizona.

Using innovative solar power technologies and the energy source of the sun, the plant generates enough solar energy to power 8,000 Arizona homes and businesses. The end result is also the continuing creation of a sustainable energy future for Arizona.

Nacimiento Water Project, San Luis Obispo, CA

Black & Veatch performed preliminary and final design and construction for the 45-mile raw water distribution system, which conveys more than 15,000-acre-feet per year from Lake Nacimiento to participating agencies in the county's flood control and water conservation district. This was the largest project ever constructed by the district and stands as an icon for collaboration between communities across the county. The storm-water system reduced erosion of waterways, limited flood potential, restored sensitive habitats, and created green space.

Choke Cherry and Sierra Madre Wind Project, Carbon County, WY

Conceptual design for 3,000 wind mill facility which, when constructed, will be the largest in the world. Conceptual design of wind farm includes collection system, substation siting, underground and overhead design, internal transmission system and permitting assistance.

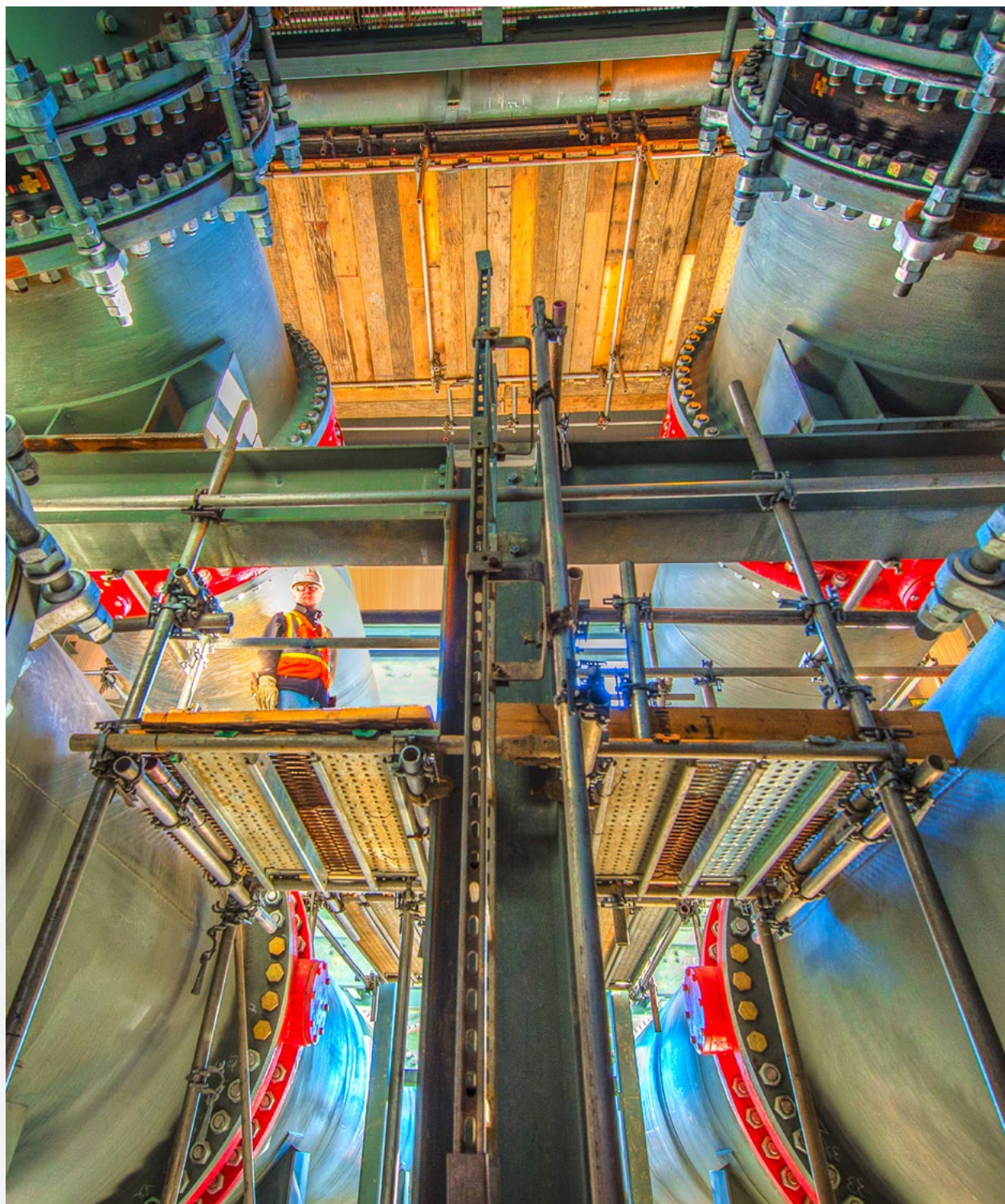
Cane Run Unit 7, Louisville Gas & Electric, Louisville, KY

Black & Veatch's wholly owned subsidiary, Overland Contracting Inc. (OCI), along with joint venture partner PCL Industrial, was awarded the EPC contract from Louisville Gas & Electric Company (LG&E) and Kentucky Utilities Company (KU) to design and build a natural gas combined cycle generating unit at LG&E's Cane Run location in Jefferson County, Kentucky. The new combined cycle plant, Cane Run Unit 7, replaces older, existing coal-fired units located at the same site. The plant will be fueled by cleaner burning natural gas and will provide up to 660 MW of capacity.

This is the equivalent of powering approximately 660,000 homes.

Shepard Energy Centre, Enmax Energy, Calgary, Alberta, Canada

Black & Veatch, in partnership with a Canadian constructor, provided EPC for ENMAX Energy's new Shepard Energy Centre. This 800 MW natural gas-fired combined cycle facility uses the most advanced natural gas technologies available in the marketplace today. It will provide reliable electricity for over half of Calgary's 1.2 million metropolitan residents.



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“Gas-fired plants like Shepard Energy Centre will be a good first start in replacing aging infrastructure. This will also improve our overall emissions profiles while providing a safe and reliable course of electric generation.”

David Rehn, Executive Vice President, Generation, ENMAX Corporation

Expansion of Network Coverage and Capacity for a Major U.S. Communications Company

Black & Veatch implemented a program to enhance network coverage in eight regions stretching from New York to California for a global communications company. These services consisted of phone/data capabilities or broadband data transmission over the client's network and the Internet. This client provides voice and data communications services for businesses, individuals and government. Black & Veatch is enhancing the communication experience for its clients through the implementation of new infrastructure technologies, such as distributed antenna systems (DAS), Ethernet and fiber backhaul to allow more data more quickly.

Microgrid with Energy Storage System, Black & Veatch World Headquarters, Overland Park, KS

To help clients realize greater levels of sustainability and to ensure reliable operations, Black & Veatch constructed a microgrid to power the company's Innovation Pavilion at its World Headquarters in Overland Park, Kansas. Black & Veatch's microgrid uses renewable energy, natural gas and battery storage. It also features three rooftop solar photovoltaic (PV) panel groups that provide 50 kilowatts (kW) of electricity, and a geothermal field with 15 wells drilled 500 feet deep. Black & Veatch continually monitors its microgrid system through ASSET360®, the company's robust, cloud-based analytics platform.

Investment Due Diligence & Value Assurance Support for Critical Infrastructure

Power Supply Investment Evaluation, USA

Black & Veatch participated in an investment committee review process for a North American mining site to evaluate potential options for mine power supply. The options included repowering of existing generation facilities, construction of new power generation facilities, utility power purchase agreement, and market power purchase agreement with a third party energy company.

The evaluation also considered transmission to the mine site location.

Hydro Facility Power Supply Risk Evaluation, Canada

Black & Veatch participated in an investment committee review process that evaluated various scenarios to reduce power supply disruption risk at an existing large high head hydro-electric facility in Canada that provided power to an aluminum smelter and power to the grid. The evaluation considered potential to buy backup power, reinforce the existing transmission system, construction of secondary tunnel for backup, and other alternatives to ensure high reliability to the smelter.