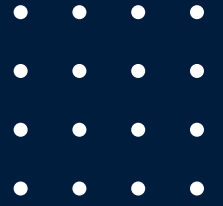




Klohn Crippen Berger



# HYDROPOWER



Down to Earth.

Up to the Challenge.

## Looking for engineering, geoscience and environmental services to successfully design your hydropower projects?

Does that winning combination mean working with:

- A firm that delivers practical technical solutions?
- A firm that supports your community engagement and social license to operate?
- A firm that provides you with the environmental services to manage your project development responsibly and meet regulatory requirements?
- A firm that understands the needs of your investors?

Klohn Crippen Berger (KCB) is that engineering, geoscience and environmental consulting firm with over 70 years of experience serving clients worldwide. KCB has designed and collaborated on constructing hydropower and water supply projects globally. We have the experience required by project owners and Design-Build constructors.



# HYDROPOWER ENGINEERING, GEOSCIENCE, & ENVIRONMENT FOR OVER 70 YEARS



BRILLIANT DAM, BC, CANADA - 265 MW

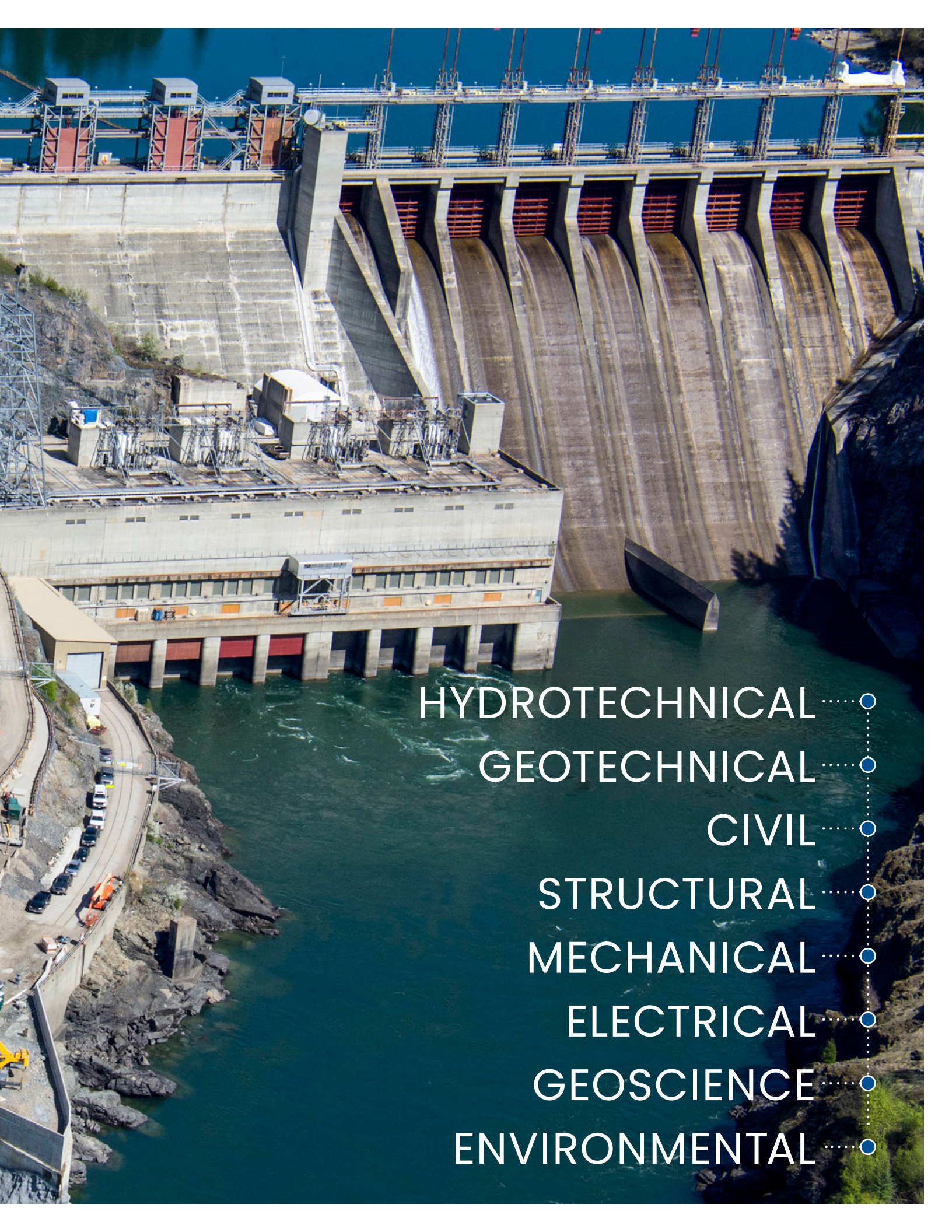
# INTEGRATED SERVICES



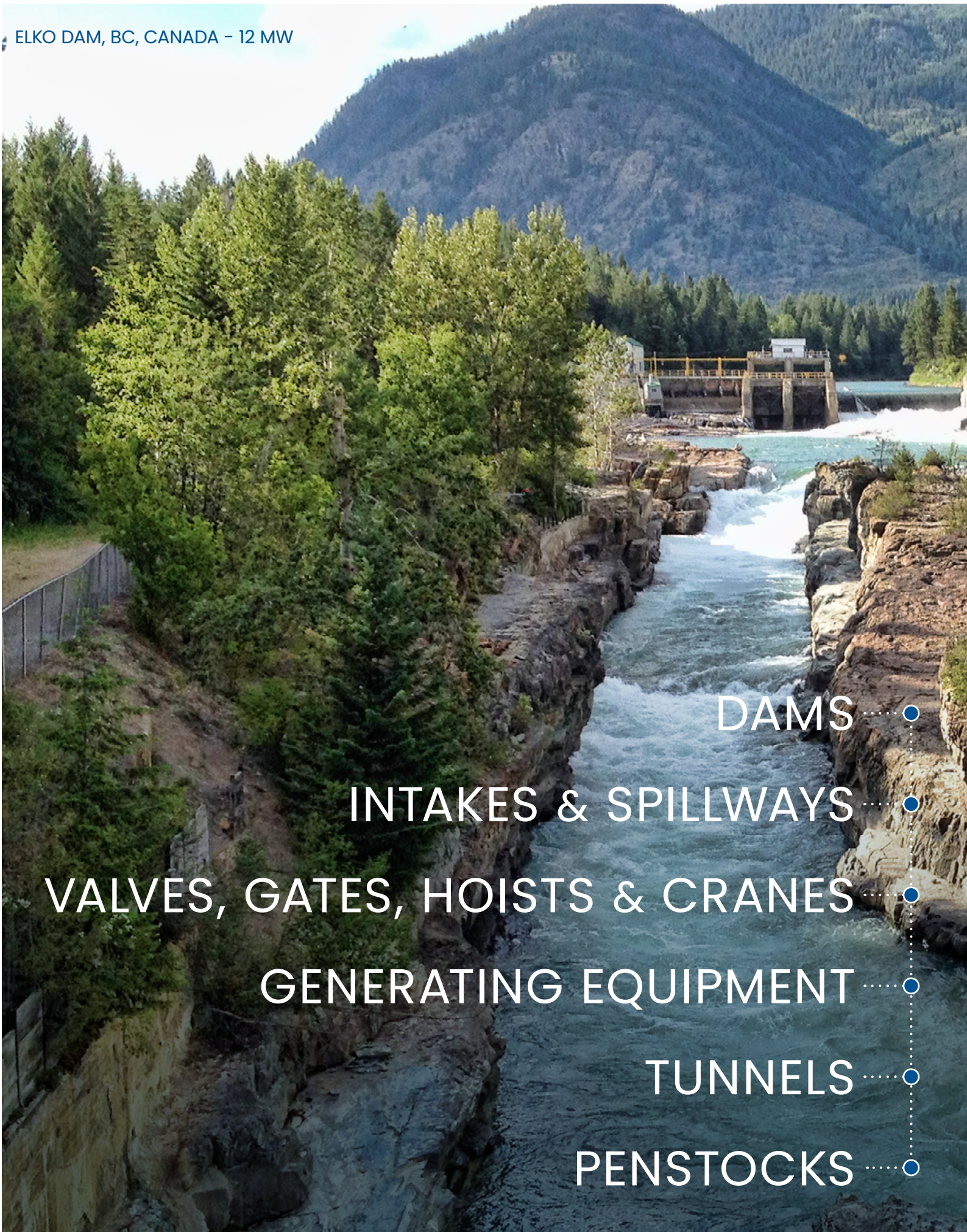
Apply our services to design and monitor the construction of your hydropower projects. Our clients, some of whom have worked with us for decades, have trusted us with the design, development and commissioning of some of the most challenging hydropower facilities in the world.



KCB integrates the application of engineering and geoscience with environmental, community and safety-by-design principles. This approach drives our reputation as a leading-edge provider of professional services.



HYDROTECHNICAL .....○  
GEOTECHNICAL .....○  
CIVIL .....○  
STRUCTURAL .....○  
MECHANICAL .....○  
ELECTRICAL .....○  
GEOSCIENCE .....○  
ENVIRONMENTAL .....○



DAMS .....●

INTAKES & SPILLWAYS .....●

VALVES, GATES, HOISTS & CRANES .....●

GENERATING EQUIPMENT .....●

TUNNELS .....●

PENSTOCKS .....●

# PROJECT DESIGN



KCB has a long history of working on hydropower projects around the globe.



Recent projects include:

- The redevelopment of the 54 MW Snoqualmie Falls hydropower facility in Washington, USA;
- The design and construction monitoring of the 1,074 MW Nam Theun 2 hydropower facility in Laos; and
- The Site C Clean Energy Project - a new 1,100 MW hydropower generating station on the Peace River in British Columbia, Canada - to be commissioned in 2024.



Engage KCB to design your projects and ensure contractors deliver your projects according to the technical, environmental and commercial terms of the contract.

## CLIENTS INCLUDE

Alberta Environment

Andritz Hydro

BC Hydro

City of Calgary

Columbia Power Corporation

KPMG

Northwest Territories Power Corporation

Ok Tedi Mining

PT Inco

Puget Sound Energy

Public Works and Government Services Canada

Rio Tinto Alcan

SaskPower

TransAlta Utilities Corporation

Voith Hydro

Yukon Energy Corporation

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Private Investors

Lenders

Hydro Constructors

# DAM SAFETY

Our team of professionals performs comprehensive inspections and reviews of the design, operation, maintenance, condition and performance of earthfill, rockfill, concrete and roller-compacted concrete (RCC) dams and associated equipment.

KCB provides innovative flood and earthquake assessment solutions on a diverse range of projects, from small tropical irrigation schemes to major hydro and flood control systems. We provide extensive experience in seismic assessment, through our involvement in the design of dams in active seismic regions of the world.

Our experience enables development of cost-effective remediation or replacement solutions. In addition, we will prepare your operation and maintenance manuals and train your operations staff.

- ..... CONDITION ASSESSMENTS
- ..... DAM BREACH AND INUNDATION MAPPING
- ..... EMERGENCY PREPAREDNESS PLAN
- ..... HYDROLOGY AND FLOOD PASSAGE STUDIES
- ..... OPERATING AND MAINTENANCE PROCEDURES
- ..... DEFICIENCY INVESTIGATIONS
- ..... REHABILITATION
- ..... RISK AND DECISION ANALYSIS
- ..... STABILITY ANALYSIS



MICA DAM, BC, CANADA - 1,736 MW





- ..... SEISMIC UPGRADES
- ..... CAPACITY ADDITIONS & EFFICIENCY IMPROVEMENTS
- ..... POWERHOUSE & UNIT UPGRADES
- ..... CONCRETE ASSESSMENTS & REPAIRS
- ..... TUNNEL ASSESSMENT & UPGRADES
- ..... SINGLE DEVICE ISOLATION STUDIES
- ..... PENSTOCK CONDITION ASSESSMENTS
- ..... PMF STUDIES & SPILLWAY UPGRADES

# REHABILITATION & RETROFIT

KCB has considerable experience in the rehabilitation of dams and powerhouses. We offer a full suite of engineering services to meet your needs. Our project services include project management, planning, design, and construction management.

Our rehabilitation services include power and energy studies, condition assessments, prefeasibility and feasibility studies, cost estimates, and environmental studies and permitting. Our engineering design includes civil, mechanical and electrical design for the redevelopment of generating stations, and structural and mechanical designs for the rehabilitation of dams, spillways and intake works.





SNOQUALMIE FALLS, WASHINGTON, USA - 54 MW

# ENVIRONMENT

To build successful projects, KCB applies the environment-by-design principle, integrating environmental considerations into project planning and design.

KCB offers sustainable, effective environmental services. We have extensive experience in all types of geographic, environmental and social settings. We can successfully monitor environmental impacts identified during your project's environmental assessment. We offer site-specific remedial options involving modelling, design, remediation strategies and risk assessments.

- ..... AQUATIC BIOLOGY
- ..... ENVIRONMENTAL ASSESSMENTS
- ..... ENVIRONMENTAL SYSTEMS DEVELOPMENT
- ..... CONSTRUCTION MONITORING
- ..... REMEDIATION MONITORING

# WHERE OUR HYDROPOWER PROFESSIONALS WORK

## PROJECT LOCATIONS

### AMERICAS

Brazil  
Canada  
Colombia  
Panama  
Peru  
USA

### ASIA

Indonesia  
Laos  
Philippines  
Sri Lanka  
Thailand  
Vietnam

### AUSTRALASIA

Australia  
Papua New  
Guinea

WE HAVE OFFICES IN STRATEGIC LOCATIONS ACROSS THE GLOBE



# HOW WE WORK



Platinum member



**ISO** 9001  
14001  
45001

QUALITY  
ISO 9001

ENVIRONMENT  
ISO 14001

HEALTH & SAFETY  
ISO 45001

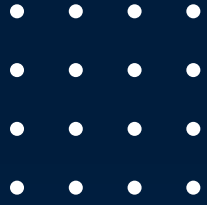
KCB has a strong reputation for quality work and technical experience in a range of services. Our commitment to excellence is the driving force behind everything we do and, as a result, we are the recipient of multiple national and international awards for major projects and corporate governance. We are committed to sustainability in our business operations and professional services, and we publish our progress in an annual Sustainability Report on [www.klohn.com](http://www.klohn.com). We strive to balance social, environmental and economic considerations to meet the needs of our clients, the community, our employees and other key stakeholders.

Our business is governed using an integrated management system consisting of quality, health and safety, and environment (QHSE) procedures. Our management system, which meets the requirements of the ISO 9001, 14001 and 45001 standards, steers our business conduct and the manner in which we undertake our projects. Our QHSE policy includes our goals of fostering quality services, promoting a safe and healthy culture, reducing our environmental impact and committing to sustainability.

In addition to the ISO standards, we are guided by the frameworks developed by the Global Reporting Initiative, the Institute for Sustainable Infrastructure, the International Council of Mining and Metals, and the Mining Association of Canada's Towards Sustainable Mining, among others.

To meet our clients' requirements for health, safety, and the environment we subscribe to several subcontractor management systems. We are an approved contractor on Avetta, ISNetworld, Contractor Qualification Network, ComplyWorks and BROWZ.

klohn.com



BC, CANADA