

# /Contents



### Introduction

- 3 About KCB
- 4 Message from the President
- 6 Evolving world, Evolving practice
- 7 Setting purpose
- 8 Material Issues impacting stakeholders



### People

- **22** Employee stats
- 23 Diversity and inclusion
- 24 New Principals & Associates
- 27 Indigenous collaboration
- 28 Health and safety
- **32** Training and education
- Industry and professional associations
- 34 Awards and accolades



### Governance

- 10 Operating Committee
- 11 Conducting business ethically
- 12 Integrated Management System
- **13** Assessing risks
- **14** ERP
- **15** EcoVadis



### **Prosperity**

- **36** Community investment
- **37** United Way
- 38 Move for mental wellness challenge
- 39 Community initiatives
- **41** Research and development



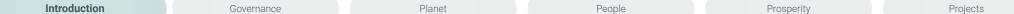
### **Planet**

- 16 GHG emissions
- 17 Material usage
- 18 Sustainable community initiatives



### **Projects**

- 44 UN sustainable development goals
- **45** Glenmore Dam
- 47 St. Mary low-level outlet valve replacement
- 48 Ricardo Ranch flood fringe study
- 49 Low-flow groundwater sampling and analysis
- 51 Use of cyclone sand in tailings storage facilities
- 2 Greens Creek Mine
- 53 Glencore tailings manager academy
- 54 GIS data collection





# **/About KCB**

CB is an award-winning engineering, geosciences and environmental consulting firm with offices in Canada, USA, Australia, Peru, Brazil, Ecuador, and the UK. Since 1950, we have helped to sustainably develop resources, reclaim landscapes, build communities and stimulate economies by participating in some of the largest and most challenging projects in the world. We have a strong reputation for quality work and technical experience. Our commitment to excellence is the driving force behind everything we do.





**Ryan Douglas, P.Eng.**President

# **/Message from the President**

ur journey to sustainability in our business began 10 years ago with the publication of our first Sustainability Report in 2012. Over the last decade, we have built steadily on our achievements and in recent years have found ways to make a greater impact — in 2019, we began offsetting carbon emissions, and in 2020 we introduced the IntegrityCounts service. This year, we launched our EDI Initiate Committee, with the responsibility of refocusing our efforts on equity, diversity, and inclusion.

Of increasing importance to our clients has been information about the Environmental, Social and Governance (ESG) aspects of our business. Communicating about our ESG contributions remains a priority and we strive to achieve this both internally and externally. Internally, we formed an ESG Committee who will drive our ESG strategy across the company. Externally, I am pleased that we are once again a carbon-neutral company through our involvement with ClimateCare and, like many other organizations, are continuing to work towards achieving net-zero status.

On the climate change front, we are supporting our clients as they deal with the consequences of extreme weather and place a greater emphasis on sustainability in their projects. The importance of sustainable design options has evolved over the last 10 years, and today the most sustainable option is the option of choice for most projects. This is an encouraging development and having partners that are committed to ESG principles is both inspiring and a necessity as we push forward.

Knowledge transfer and succession are an important aspect of the consulting industry, and our long-term success is dependent on how well we meet these challenges. This year we celebrated the promotion of Mary-Jane Piggott, the company's first female Principal, to Vice President of one of our largest business units. Not only is Mary-Jane KCB's first female Vice President, but she is also the first woman in KCB to lead a business unit. Following the retirement of long-time Vice President Technical, Alex Sy, Bob Chambers was appointed to succeed Alex. Further strengthening our senior leadership team, Dan Etheredge was named as a Vice President, leading KCB's new Latin America business unit. Simon Douglas was appointed Vice President, Power & Transportation.





Governance

The COVID-19 pandemic, now nearing the end of year three, has continued to impact our employees and offices across the world as we slowly return to our workspaces and project sites and adapt to the various pandemic restrictions. I am pleased, although not surprised, at the adeptness of our employees, project teams, and our leadership teams in navigating the upheaval while continuing to meet our clients' expectations.

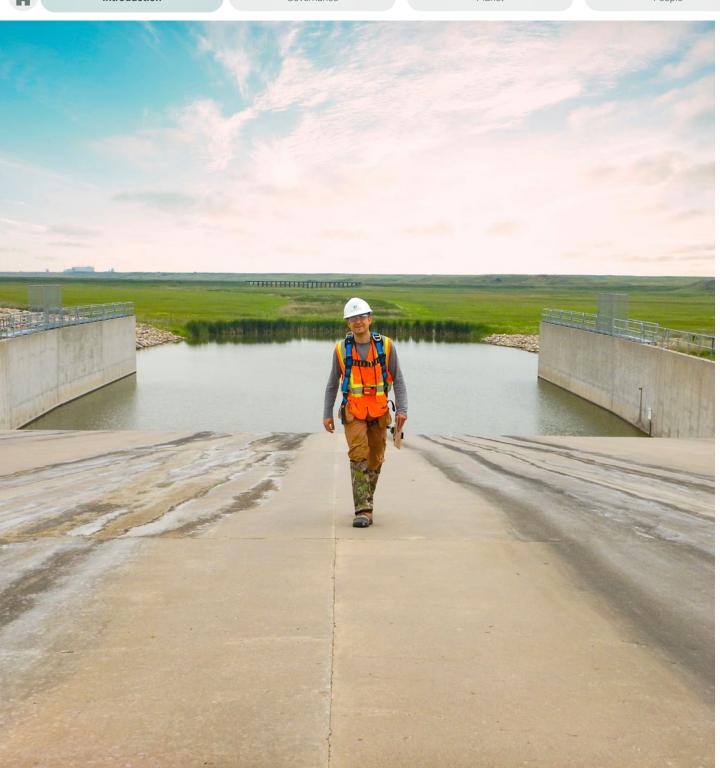
Safety continues to be an issue of importance within our industry. We strengthened our commitment this year by making our annual safety refresher training mandatory for all employees. And while we have always been strong in the area of proactive safety reporting, we are reinforcing that success by making safety reporting a key performance indicator in which individual contributions will be measured. Proactive reports, whether they are positive or negative, are considered a leading safety indicator and we believe the more observant our employees are, the safer they will be.

It is heartening to see the generosity of our employees extend, year after year, to help each other and those in need. With catastrophic flooding in southern British Columbia, and in Queensland, Australia, where severe rainfall caused floods across eastern parts of the state, our employees banded together to raise donations for impacted communities. KCB employees continue to support United Way, supporting the Period Promise campaign for 2 years and participating in our annual giving campaign for the last 30 years.



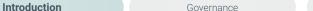






# Evolving **World**Evolving **Practice**

In the theme of the report, Evolving World, Evolving Practice, we aim to capture our progress as a company and as professionals in some of the world's most rapidly changing domains. In the important area of Equity, Diversity, and Inclusion, we are taking concrete steps befitting our responsibilities as individuals, as well as our broader role in society. Similarly, as the world's relationship with natural resource extraction shifts, we continue to be at the forefront, designing solutions that recognize an evolving world and keep pace with the priorities of our clients and communities.





Planet





# /Setting purpose

CB's Purpose is captured in our Charter, which guides all aspects of our business and describes the way we approach the environment, our communities, clients, and our employees.

**Our Purpose** — creating robust, resilient and location-appropriate solutions that stand the test of time — commits us to developing appropriate solutions by drawing on our years of combined experience and the best of our education and training. Our solutions satisfy technical examination, withstand environmental conditions, and achieve social acceptance for the long term. Our designs, whether they



are for the resource industry, transportation, or civil sectors, meet the needs of local communities and broader society by elevating life experience — we play a part in managing earth's resources, protecting the environment, sustaining economic well-being, and building human relationships.

### MATERIAL ISSUES IMPACTING STAKEHOLDERS

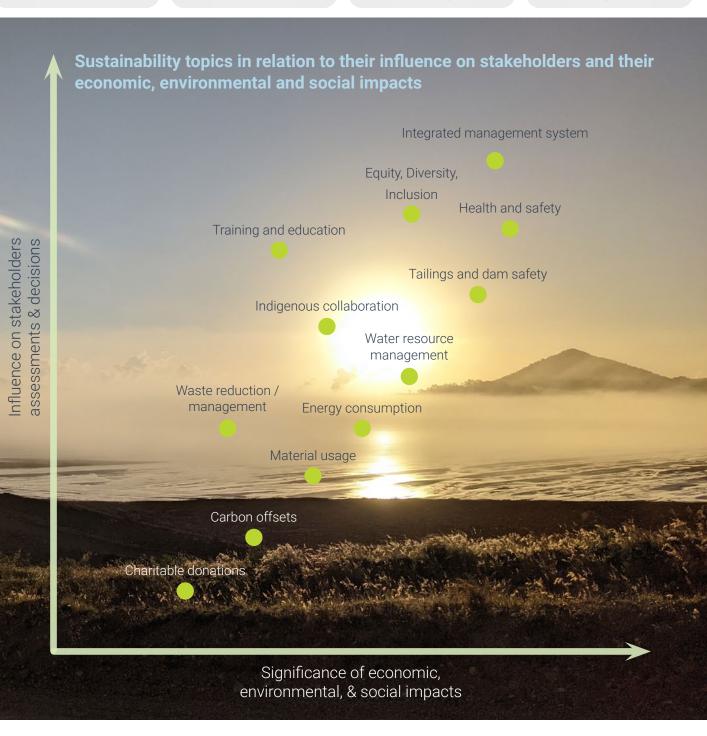
Governance

KCB takes a number of approaches in identifying the impact of these sustainability topics — quantitative due diligence, such as comparisons over time; surveys of employees and clients; qualitative feedback from clients and employees; the expectations of industry regulators and those who set guidelines; the goals of society at large; and the overall direction of our practice, are some of the ways we gauge the impact of our activities.

### Who is affected?

Our sustainability topics impact KCB global offices and our clients' project sites. Our charitable donations and volunteer work impact employee stakeholders, the receiving organizations, and our local communities, as does our collaboration on Indigenous projects.

In our project work, our activities impact host communities, and society at large.









Governance

Planet





# **/Operating Committee**

overning KCB's global operations is the Operating Committee (OC). Members of the OC include KCB's President; CEO; Chairman of the Board of Directors; Vice President, Technical; Vice President, Finance; and Vice Presidents appointed by the President. The role of the OC is act as an advisory group to the President.

OC meetings are held quarterly and are the forums to report on all aspects of our operations, including business performance and financials. Decisions made by the OC during these meetings guide the future direction of KCB.

In 2022, several members of our senior management team were appointed as members of the OC.



Bob Chambers stepped into the role of Vice President, Technical, following the retirement of Alex Sy.



Mary-Jane Piggott, Regional
Manager, Mining Environmental
Group, took over from Bob Chambers
as Vice President, MEG. She becomes
the first woman to hold the position
of Vice President in the company's
history.



Dan Etheredge was appointed Vice President of KCB's newly formed Latin America business unit.



Simon Douglas was appointed Vice President of the Power & Transportation Group.



## **/Conducting business ethically**



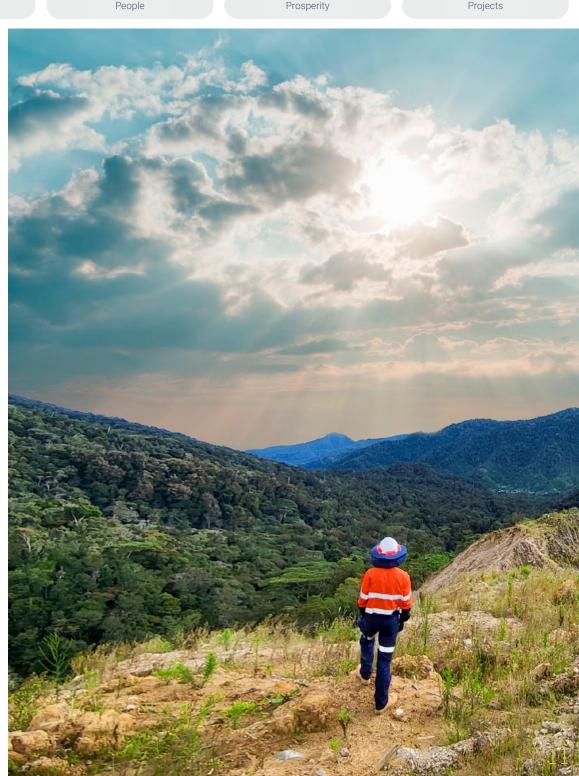
KCB conducts our business ethically, with integrity and honesty, and we reinforce this expectation in our Code of Business Conduct and Ethics for employees, subconsultants, subcontractors and suppliers.

### CODE OF CONDUCT

The Code of Conduct is based on the Values in KCB's Charter Violations to the Code of Conduct or the Charter are reported to the Ethics Officer, or to a third-party provider, IntegrityCounts, which ensures reports are anonymous and protected, whether they come from employees, community members, subconsultants or clients. Any violation to the Code of Conduct is not tolerated and is investigated thoroughly.

### ANTI-BRIBERY AND CORRUPTION

KCB takes pride in its ethical business practices and conducts itself according to applicable laws and standards in our region of business. Training on bribery and corruption is provided to all employees, during their onboarding process and all employees are required to complete an annual refresher.





# /Integrated Management System

CB's business is governed using an integrated management system (IMS) consisting of quality, health and safety, and environment policies and procedures. The IMS steers our business conduct, the way we undertake our projects, how we interact with clients, the community, and the environment, while meeting the legal requirements in each jurisdiction we work in. The IMS is audited externally once per year and internally on a quarterly basis.

It encompasses our approach to the following:

- Health and Safety
- Training
- Environment
- Project success
- Client satisfaction
- · Quality design

Our IMS is registered to the following standards: ISO 9001, ISO 14001, ISO 45001.



ISO 9001: Quality

- Client focus
- System for managing project risk
- System for loss prevention



ISO 14001: Environment

- Environment focus
- System for understanding our interaction with the environment
- System for reducing environmental impact



ISO 45001: Occupational Heath & Safety

- People focus
- System for managing workplace hazards
- System for preventing harm

For risk related to the company's operations and projects, KCB has developed the following tools:

- The Compliance Register
- Safe Work Practices (SWPs)
- Job Hazard Analyses (JHAs)

More details on these tools are available in Health and Safety.



# /Assessing risks

ost of the risks associated with KCB's business are related to the projects in which the company undertakes. Risks related to KCB's project work are overseen by the company's Risk Assessment Committee (RAC). The purpose of the RAC is to ensure that our project opportunities are within the business risk tolerances of the Company, and that risky clients or projects are objectively assessed.

The RAC comprises three members: the President, the Vice President, Technical, and the Vice President, Finance. In May 2021, Bob Chambers joined the Risk Assessment Committee, taking over the role from CEO, Len Murray.



Governance

Planet





# /ERP



In early 2022, KCB began the transition to a new enterprise resource planning (ERP) software to replace our existing system and streamline our business processes. The project is ongoing but the first phase, the implementation of our payroll and human resources systems, was completed in October this year.



Governance

Planet





# **CSR** Assessment

Having transparent, well-documented ESG practices provides a means for both internal and external stakeholders to monitor a company's contribution to the global effort of achieving net zero and becoming a more equitable and inclusive society. As such, there is a growing interest from our clients to not only have their own ESG policies well-stated but also to ensure each company in its supply chain is doing the same.



As a result, we completed a Corporate & Social Responsibility (CSR) assessment through EcoVadis, a third-party company that uses a comprehensive sustainability questionnaire to evaluate how well a company has integrated the principles of Sustainability into their business and management systems.

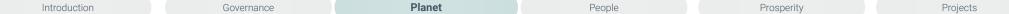
The questionnaire was based on four main categories: Environment, Labour and Human Rights, Ethics and Sustainable Procurement. The EcoVadis CSR

experts conducted a comprehensive review of all information provided by KCB and rated KCB to be in the top 81st percentile for companies in our industry. Per EcoVadis' scoring criteria, a score between 45-64 is considered 'Good' and 65-84 is considered 'Advanced'. KCB received an overall rating of "Good", which earned us an EcoVadis Silver Medal.

We performed better than the average industry score in all the categories. Since the questionnaire was broad-based for our industry, some questions were not applicable to our business

and as such there is little we can do to improve on those questions/scoring; however, the evaluation provides a good benchmark of our progress and identified areas for which we can make improvements. We will be working to review our policies and procedures to incorporate these improvement opportunities.

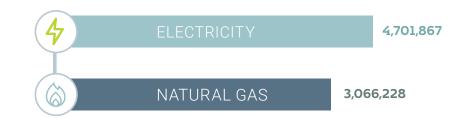




# /GHG emissions (scope 1&2)

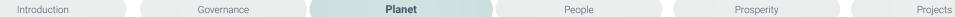


### **ENERGY CONSUMPTION (KWH)**







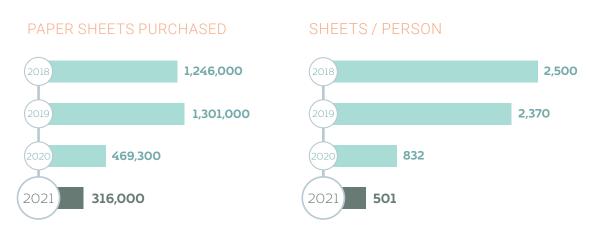






# /Material usage

### PAPER CONSUMPTION





# **/Sustainable Community Initiatives**

### SUDBURY TREE-PLANTING

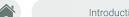
Volunteers from our Sudbury office, and their family members, participated in a tree plantation drive along Sudbury's Maley tributary of Junction Creek. Together, the team planted 80 trees and shrubs across 3 sites of the Maley tributary.

The event supports the non-profit organization, Junction Creek
Stewardship Committee, in their ongoing initiative to restore the
shoreline of Junction Creek, an urban stream that flows through Greater
Sudbury, and build resilience to mitigate flooding and climate change.
Trees and shrubs are planted instead of seedlings to generate an
immediate positive impact and maximize plant survivorship. Trees and
shrubs along the shore create a buffer system that supports healthy
waterways by filtering contaminated runoff, preventing erosion, providing
habitat, and cooling the surrounding environment in the summer.

# CALGARY ANNUAL PATHWAY AND RIVER CLEANUP

Our Calgary office participated in The City of Calgary's Annual Pathway and River Cleanup. Team members, along with their family and friends, collected 7 bags of garbage from parks, greenspaces, pathways and riverbanks located around the city.







**Planet** 



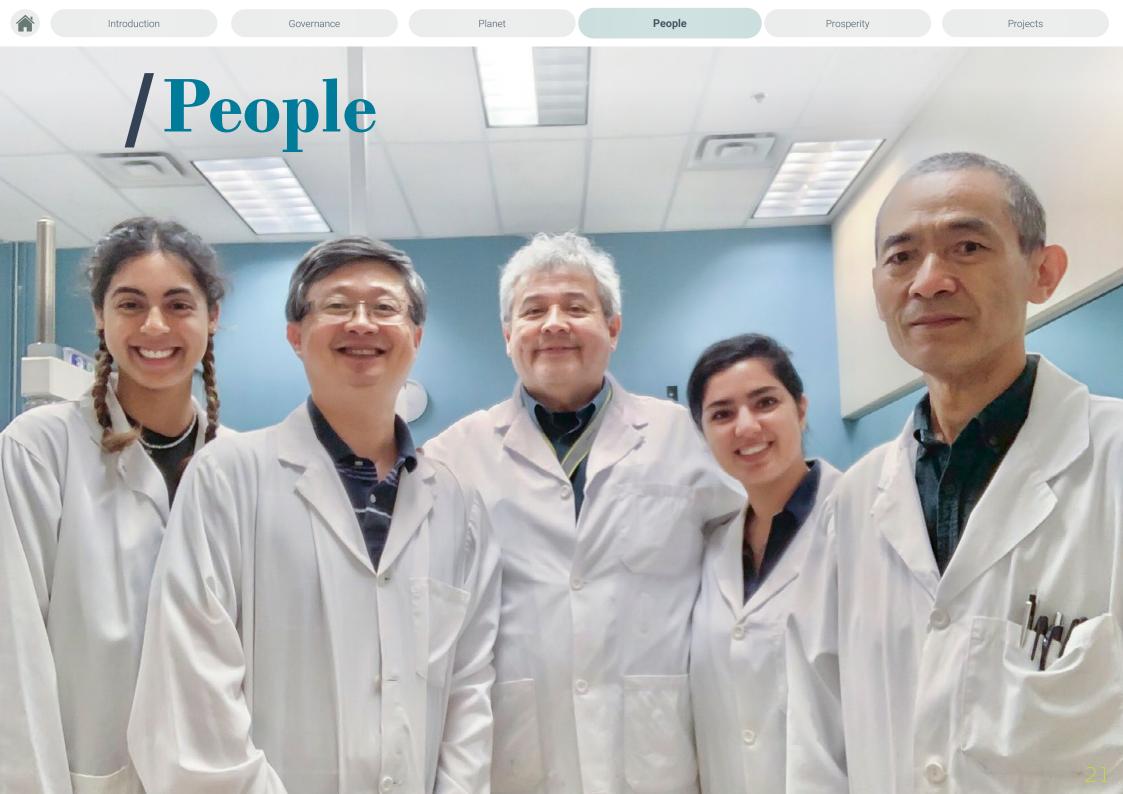


### EDMONTON "GREENS" THE OFFICE

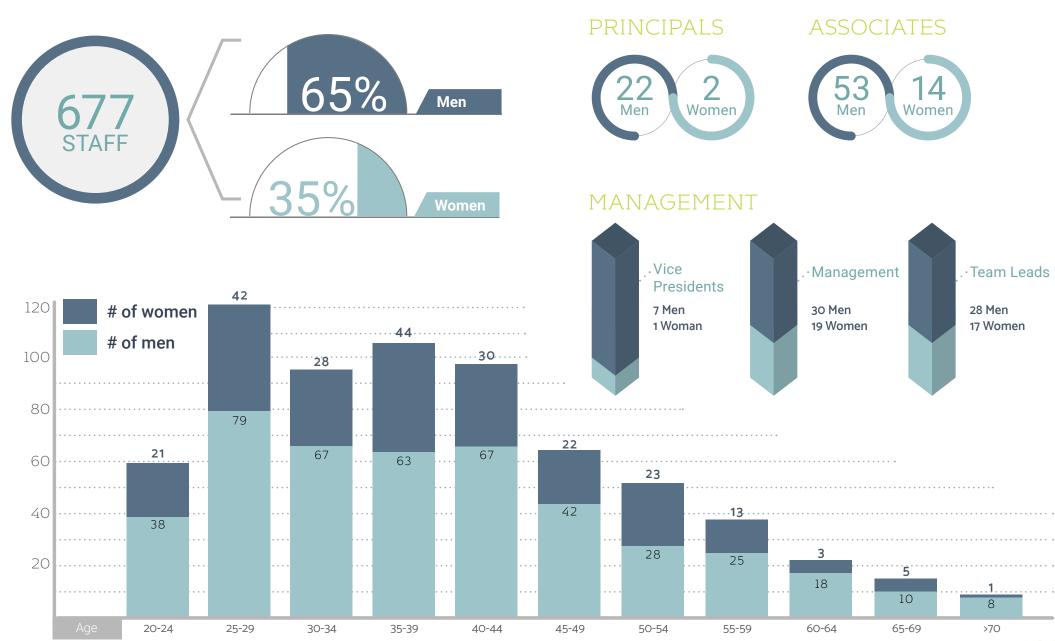
The KCB Edmonton office was relocated to a new office space in August of 2022. A substantial collection of plants made the move to the new space and Edmonton staff seized the opportunity to re-pot many of the plants during an afternoon. Plants were then installed in suitable locations throughout the new office to "green" the space, creating a more welcoming environment for all.

### GREAT CANADIAN SHORELINE CLEANUP

Nanaimo employees and their families participated in the Great Canadian Shoreline Cleanup. Together they collected 11kg of litter. Data on the types of amounts of items collected is shared in an annual report compiled as part of the event. The data will also be submitted to the City of Nanaimo and added to the International Coastal Cleanup's tracking of global shoreline litter. Tracking helps identify key items of concern over time, compare data to different locations around the world, and measure the impact of volunteer efforts.



# /Employee stats





# /Diversity and inclusion

### EDI INITIATE COMMITTEE

As part of our ongoing commitment to EDI, we created the EDI 'Initiate Committee'. The committee's mandate is to develop a comprehensive EDI roadmap and strategy for KCB. Members of the committee include leaders from across our offices who will act as EDI champions within KCB, and our industry overall, and be responsible for ensuring our strategies are appropriate and impactful.

### SUPPORTING NEW MOTHERS IN LIMA

As we welcomed staff back to our offices in early 2022, many of those returning to our Lima office were new mothers, previously on maternity leave. Recognizing their need for privacy and comfort through various parts of the day and to assist them in their transition back to work, we set up a lactation room.







# / New Principals & Associates

### PRINCIPALS



Rob McLachlan, P.Eng.

Rob McLachlan is a Senior Mechanical Engineer with over 22 years of experience with the design, inspection, and commissioning of large-scale mechanical equipment. He has been working at KCB for over 15 years, and during that time has led a wide variety of hydroelectric, water control and dam safety projects. In 2021 Rob became the manager of the KCB hydro group, and in that role he continues to lead KCB's multi-discipline group of engineers and technologists.



Kate Patterson, P.Eng., M.Eng., P.E.

Kate is a Senior Civil Engineer with over
15 years of experience in mine waste
management with a focus in tailings and
water strategic planning and design. Joining
KCB in 2007 as a new grad, she has worked
on all aspects of tailings, water resource and
environmental projects including baseline
environmental studies, from concept to
detailed design, impact assessment/mitigation
and closure



Andrew Witte, P.Eng., M.Eng.

Andrew is a Senior Geotechnical Engineer with over 17 years of consulting on a variety of mining, infrastructure, municipal, and industrial-related projects. His more recent experience has focused on the geotechnical aspects of mining projects, specifically the design, construction, safe operation and closure of earth and rock fill embankment dams. He has specialized northern engineering experience in Canada, USA, and Russia.

### **ASSOCIATES**



Ramin Latifi, Ph.D., P.Eng., PMP

Dr. Ramin Latifi is a Senior Structural Engineer who brings 26 years of experience in structural design, construction, and project management on a variety of projects in Canada and internationally. He joined KCB's Power & Transportation group in 2019.



Dan Hughes-Games, P.Eng.

Based in our Nanaimo office, Dan Hughes-Games is a Geotechnical Engineer with 20 years of experience. After starting with a broader background in geotechnical engineering, his work experience since 2008 has been mainly focused on water and tailings dam engineering. Other projects have included route selection and geotechnical engineering for linear infrastructure projects, terrain hazard assessment, rock mechanics, and foundation engineering.



Abel F. Najarro, M.Sc.

Abel Najarro is a Civil Engineer specializing in geotechnical engineering. He has over 18 years of experience in various aspects of both large and small mining projects in South America (Peru and Colombia) and North America. He is based in our Peru office.



Dustin Bailey, P.Biol., R.P.Bio.

Dustin Bailey is an Aquatic Biologist based in our Edmonton office. With 16 years of experience in his field, he has a thorough knowledge of the environmental assessment and regulatory processes, which he applies to support projects in a wide range of markets. Dustin has supported the development and continued growth of KCB's environmental service team since joining the company in 2010.



Mark Ferrier, B.Eng., B.A.Sc.

Mark Ferrier is a Civil Engineer with over 25 years professional experience predominantly around tailings storages, and the associated earthworks and water management. He has performed the role of Lead Civil Engineer on a range of tailings storage projects.



Anton Kirsten, M.Sc., PR.Eng.

Anton Kirsten is a Senior Geotechnical Engineer specializing in geomechanics as it applies to rock, soils, and derivative materials where engineering solutions are sought. He joined KCB in 2020 and is based in Brisbane. He brings over 22 years of experience including tailings storage facility (TSF) and small dam design, TSF operation and decommissioning, foundation design, rock slope design, stabilization design for underground mine openings, geotechnical assessment of karstic/dolomitic ground conditions and pipeline design.





Louis Kirsten, Ph.D., CPEng, RPEQ

Dr. Louis Kirsten is a Geotechnical/Civil Engineer with 30 years' experience, which includes an extensive range of geotechnical engineering application on projects for the resources, infrastructure, and public sectors. He has been involved in research, consulting and contracting activities in design, review, contract, and management roles. He has been engaged in and managed projects from conception to closure and post-closure including arbitration and dispute resolution.



Luke Palmen, B.Eng., RPEQ

Luke Palmen is a Senior Civil Engineer with 15 years' experience in the design and construction of civil and water infrastructure projects and has been recognized through project and technical awards. Luke specialises in regional hydrology, hydraulic structures, and numerical modelling of water dam and tailings storage facilities. Luke is passionate about advancing the technical accuracy of dam break modelling using emerging methods and models to improve estimation of breach and runout behaviours.



Daniel G. Bertrand, P.Eng.

Daniel has over 33 years of civil and geotechnical engineering experience with a focus on heavy industrial foundations and major earth embankments for mining and water storage projects. He has worked in a variety of industries - oil sands and conventional mining, power generation, transportation, municipal, and industrial; and in geotechnically challenging environments - remote and rugged, marine, and highly seismic - in Canada and internationally. He joined KCB's Alberta Group in 2019.



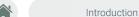
Younger Muñoz, Eng.

Younger is a Senior Geotechnical Engineer and tailings subject matter expert with over 25 years of experience in mining and engineering projects. He is based in our Peru office and his experience includes water and tailings dam design; cyclone sand dams; liquid-solid fluid and slurry transportation; and other geotechnical- and hydraulic-related projects for dams.



Ross Waters, ME, RPEQ, CPEng, P.Eng.

Ross is a Civil / Geotechnical Engineer specialising in embankment dams. He has over 12 years of experience including design of tailings storage facilities, water dam remediations, construction monitoring of large earth dams, site investigations, dam safety reviews and geotechnical laboratory research. He has worked in remote and challenging sites including Australia, Canada, Mongolia, Indonesia, Papua New Guinea, and South America.









# /Indigenous collaboration

September 30 marked National Day for Truth and Reconciliation in Canada, a day to recognize the tragic loss and suffering caused by the legacy of the country's residential school system, and a day to honour the survivors and their families by showing our support for reconciliation. To commemorate the day, we invited Lana Eagle, an Indigenous relations strategist to present to KCB. Lana is a member of the Whitecap Dakota Nation of Saskatchewan, and she shared several suggestions for building meaningful relationships with Indigenous communities.



# /Health and Safety

# OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT SYSTEM

KCB's occupational health and safety (OHS) management system is part of the company's integrated management system registered to ISO standards. Our OHS management system is also COR-certified in British Columbia, Alberta and Saskatchewan.

Our OHS management system is designed to instill a health and safety mindset in our employees, for managing workplace hazards, and for preventing injury or illness. It is governed by the principle that everyone in the workplace is accountable and responsible for health and safety, and we recognize that our employees, subcontractors, and visitors have the right to work in a safe and healthy environment. We consult and collaborate with our employees, and train and coach our supervisors, to promote a strong, safe, and healthy culture by identifying workplace hazards and planning for hazard mitigation. Wherever we work, our goal is to always work safely and prevent harm.

Our system is implemented to ensure we comply with applicable legislative, regulatory and client requirements for occupational health and safety. Our employees are expected to actively participate in understanding, following and continually improving the system, and we reinforce this responsibility through leading by example, training, audits, and setting company objectives. We are committed to continually improving the effectiveness of our system in collaboration with our employees, clients, and other stakeholders.



Main types of work-related injury
Strong allergies and food
sensitivities, and highaltitude sickness



Governance

Planet

### Projects

### **EXPANDED SAFETY REPORTING**

In 2022, we expanded our company safety reporting, requiring all employees, including those in our administrative, finance, and marketing departments, to complete two proactive safety reports per year.

### HEALTH AND SAFETY TRAINING

All employees are required each year to complete QHSE Refresher training, which includes recent updates to applicable OHS regulations and improvements to our OHS management system.

Employees are trained for working effectively and safely based on their role and expected activities. All new employees complete an orientation program consisting of mandatory and role-specific training in discussion with their manager and their progress is monitored at the end of their 3-month probationary period. Mandatory training includes Health and Safety 101, Ergonomic Awareness, Hazard Assessments and Managing Hazardous Products (formerly WHMIS training).

When an employee takes on a new role in the company, such as a first aid attendant, emergency floor warden, or supervisor or manager (including project manager) they take additional training related to their new role.

When an employee is assigned to a project with a field component, they are required to complete a hazard assessment and demonstrate an understanding of the client's requirements, as well as complete site-specific orientation and other training, and drug and alcohol screening, before they can go to work on site.

Annually, the offices participate in safety-related campaigns, including Safety and Health week (formerly NAOSH week) and mental health campaigns such as the "R U Ok?" campaign in Australia and Bell's "Let's Talk" campaign in Canada.

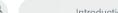


Prosperity

KCB engineers, (center and left) from the Calgary office answered questions from a BSI external auditor during a site visit. The site visit is part of the continuing surveillance audit of our Integrated Management System for quality, health & safety, and environment.



Our Alberta offices kicked off Safety and Health Week with some healthy snacks and an address by Vice President, David Mack, about the importance of working in a safe and healthy environment. During the week, the Alberta teams raised awareness for workplace health and safety with employee-led info sessions on emergency preparedness and personal wellbeing.





### COMMUNICATING HEALTH AND SAFETY

e keep health and safety "top of mind" by sharing safety shares at the start of meetings. Safety shares are short stories about recent health and safety items, and we maintain a safety share library for company presentations and/or client meetings.

Each month, our President includes a safety or health-related notice in his monthly message to employees; and each quarter, the senior management team reports on the status of our safety culture, based primarily on employees' safety reporting and incident statistics. Quarterly summaries are issued to employees and compiled into an annual IMS performance report.

During the current COVID-19 pandemic, our communication about health and safety is a significant component of our business continuity plan. We created

a COVID-19 Response Team who met daily at the beginning to manage our transition to telecommuting and tracking employees impacted by travel restrictions. A year later, the team continues to meet once per week to track COVID-19 cases and vaccination progress in each of our locations, and to coordinate and plan communication for employees.

Information about recent updates to our OHS system is communicated through monthly Global QHSE meetings, where representatives from each location report on local issues, and the group discusses suggested improvements and implementation strategies.

# PREVENTION AND MITIGATION OF HEALTH & SAFETY HAZARDS

azard assessments at KCB occurs at multiple levels, including at the company, manager/ supervisor, project, and employee levels.

Governance

At the company level, we assess the potential health and safety hazards related to our work, along with their operational controls, and related regulatory and other requirements. The Compliance Register is the foundation of the company's risk assessment for OHS, and maps the hazards related to our work to legislation and KCB's controls, with the goal of reducing the risk to as low as reasonably achievable.

The Compliance Register is reviewed and updated on an on-going basis with input from our Global QHSE group, whose members collate feedback from employees in their location. In March 2021, we refreshed our Compliance Register by reviewing each hazard, through the lens of the COVID-19 pandemic, and reassessed the company's risk assessment for OHS.

At the project level, project managers lead the hazard assessment of project field assignments by developing a health, safety, and environment plan with the project team.

At the employee level, we coach our people to become safety leaders who can identify and act to address hazards they observe in the workplace. We involve our employees in preparing safe work practices, which are general guidelines on how to safely perform common work tasks, and job hazard analyses, which include a series of detailed steps for safely completing a critical task.



# **/Training and education**

\$1,005,080 invested in training

24,386 employee training hours



# /Industry and professional associations







American Railroad Engineering and Maintenance-of-Way Association (AREMA)



ANCOLD Tailings Dam Operators Forum 2022



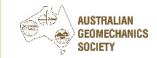
Association of Consulting Engineering Companies (ACEC-BC)



Association of Consulting Engineering Companies (ACEC-SK)



Association of Professional Engineers and Geoscientists of Saskatchewan (APEGS)



Australian Geomechanics Society (AGS)



British Columbia Geophysical Society (BCGS)



Canadian Dam Association (CDA)



Canadian Geotechnical Society (CGS)



Canadian Institute of Mining, Metallurgy and Petroleum (CIM)



Canadian Land Reclamation Association (CLRA) - Atlantic



Canadian Standards Association Group (CSA)



ARC Centre of Australian Biodiversity and Heritage (CABAH)



Closure Planning Practitioners Association (CPPA)



Colorado School of Mines (CSM)



Consulting Engineers of Alberta (CEA)



Engineers and Geoscientists BC (EGBC)



Geoprofessional Business Association (GBA)



International Committee on Large Dams (ICOLD)



Institute of Electrical and Electronic Engineers (IEEE)



International Association of Hydrogeologists Australia (IAH)



International Geosynthetics Society (IGS)



Mining Association of Canada (MAC)



Nature Alberta



Ontario Mining Association (OMA)



Queensland Resources Council (QRC)



Queensland Tailings Group (QTG)



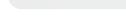
Society for Mining, Metallurgy & Exploration (SME)



United States Geological Survey (USGS)



United States Society on Dams (USSD)



# **/Awards and accolades**

### **BEST MANAGED COMPANY**



KCB retained our status for another year as one of Canada's Best Managed Companies. We are recognized for our continued financial success, effective strategic planning, and commitment to improvement.

### PSMJ'S CIRCLE OF EXCELLENCE



Each year we compare our performance to about 300 industry peers in North America by participating in PSMJ's Financial Performance Survey. Based on 13 metrics, KCB continues to be in the top 20% of companies and is the only company to achieve this result every year since 2009.

### SAFEST EMPLOYER



KCB won Excellence Awards in the categories of Best Health, Safety and Environment Management Program and Canada's Safest Mining & Natural Resources Employer by the Canadian Occupational in 2021, and was recognized as Canada's Safest Mining & Natural Resources Employer in 2022.

### ABA EMPLOYER OF CHOICE



For the 8th year in a row, KCB's Australasia group was recognized as an Employer of Choice at the Australian Business Awards. This award is given to organizations that maximize the full potential of their workforce through effective employee recruitment, engagement, and retention.

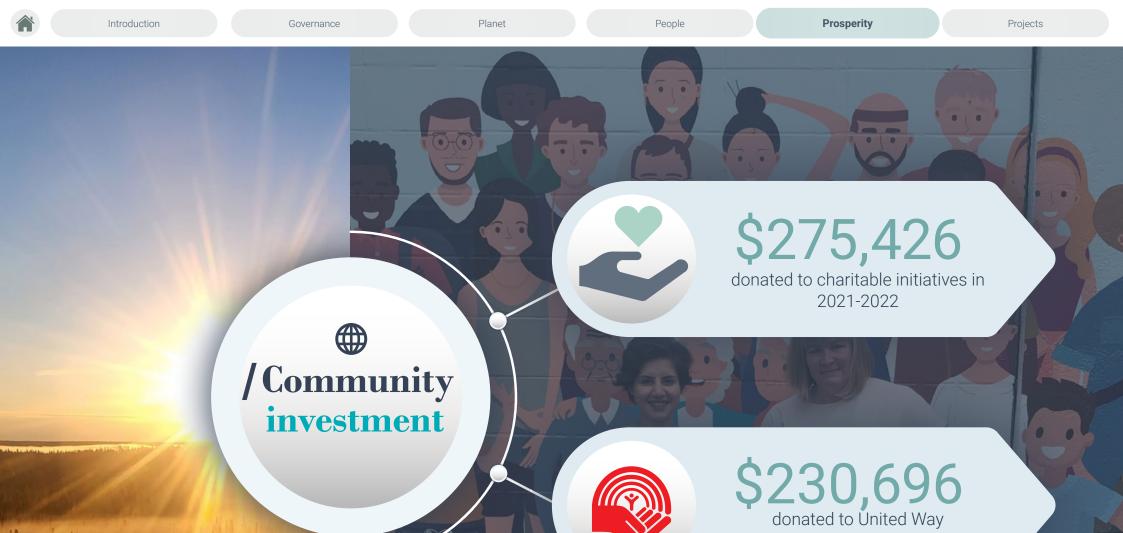
### BIV TOP 100 FASTEST GROWING COMPANIES



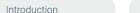
Klohn Crippen Berger ranked #64 on Business in Vancouver (BIV)'s Top 100 Fastest Growing Companies in BC for 2022. Top 100 Fastest Growing Companies in BC recognizes companies based in BC with the highest percentage growth in revenue between 2017 to 2021, based on self-reported numbers and survey and research-based findings conducted by BIV.







in 2021-2022





Planet









2 022 marks the 30th year KCB has supported United Way and the organization's work to provide local communities with access to basic needs and resources. This year, KCB supported the organization through the following initiatives:

- BC Flood Relief Fund Supported critical relief and recovery efforts for those impacted by the flooding and mudslides in Southern BC in November 2021. The donations collected went to addressing urgent community needs including housing, food, trauma, and mental health support.
- Period Promise Campaign Raised donations to provide menstrual products to in need communities.
- Annual Corporate Campaign Our annual campaign supports United Way's work to improve the health, education and economic mobility of those in our communities.

# MOVE for mental wellness CHALLENGE











## Calgary Corporate Challenge

As part of this year's participation in the Calgary Corporate Challenge, our Calgary office raised donations for hygiene kits for the Calgary Drop In & Rehab Centre Society.









### Pi(e) Day

MEG Vancouver hosted a Pi(e) Day on
March 14 to raise funds to support the Red
Cross's Queensland and New South Wales
Flood Appeal campaign. A number of Team
Managers generously agreed to have their
face pie-ed to raise funds for those affected by

## Serving Meals to Those in Need

Our Calgary team volunteered at the Calgary Drop-In Centre to help serve meals to those in need. Nine volunteers participated and KCB sponsored the meal.





People

## RSPCA Cupcake Day

Our Brisbane team hosted their annual Cupcake Day to raise donations for the Royal Society for the Prevention of Cruelty to Animals (RSPCA). KCB sponsored the cupcakes, with all sales going to the RSPCA.

### **World's Greatest Shave**

Brisbane team member, Charles, shaved his hair and used the opportunity to raise donations for the Leukemia Foundation.

The donations raised were matched by KCB.



### **Brazil Bands Together**

After a period of strong and continuous rainfall resulted in damages to a friend's home, Brazil team member Tiago, with the support from the Brazil office, raised donations to provide the friend with a new stove and kitchen tools.







### **Mulli's For Charity**

During this year's Annual Vancouver Golf Tournament, we introduced "Mulli's For Charity". Participants purchased two mulligans with proceeds benefiting the BC Cancer Society. The event raised \$230.







# /Research and development

PROJECT NAME	R&D PROVIDER/ORGANIZER	
Development of a Mini Calibration Chamber	Australian Centre for Geomechanics (University of Western Australia)	
Tailings Rheology (in collaboration with CanBreach)	Carleton University	
Geotechnics Industrial MSc Bursary Scheme	Imperial College UK	
TAILENG Research	Georgia Tech	
Implementation of New Monitoring Approaches for Geohazard Risk Management in Canada	University of Alberta	
Partially Saturated Tailings Liquefaction	University of Alberta	
Self-centering rocking steel bridge piers for seismic regions	University of British Columbia, Okanagan	
Canadian Tailings Dam Breach Research (CanBreach)	University of British Columbia / Waterloo / Queen's University	
4-year Sponsorship of the GEC	University of Queensland - Geotechnical Engineering Centre	
Assessment of Residual Strength of Tailings Using the Cone Penetration Test and Simplified Numerical Modelling	University of Toronto, Department of Civil Engineering	

# TAILINGS CHARACTERIZATION RESEARCH WITH UNIVERSITY OF WESTERN AUSTRALIA

In 2022, KCB and several research partners expect to publish the last of the group's findings into tailings characterization tests and the consistency with which they are applied in the world's foremost geotechnical laboratories, including at KCB.

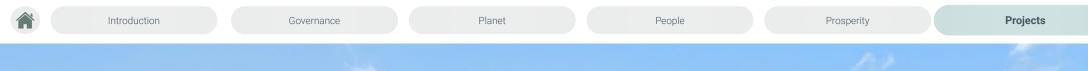
Co-ordinated by the University of Western Australia, the group of 10 international commercial and university laboratories tested identical tailings samples over a series of four testing programs. Some of the programs required the laboratories to determine their own sample preparation and testing methods. The test results and the methods were compared to gauge the overall reliability of critical state line (CSL) testing as it is carried out in different laboratories.

CSL testing, which determines the point at which sheared soils become mobile, is becoming more common among mining clients seeking to understand the behaviour of mine tailings. With several catastrophic tailings dam failures in recent years, tailings management is an important topic among mine owners and engineers working to improve the safety of communities and other stakeholders.

Staff in the KCB laboratory in Vancouver spent more than 100 hours conducting tests on the research samples.

This research places KCB's laboratories among the top in world contributing to sound tailings management programs.







## /United Nations sustainable development goals

dopted by the United Nations in 2015, the 17 Sustainable Development Goals (SDGs) are a plan for addressing the world's social, economic, and environmental challenges by 2030 with the intent of creating a sustainable future for all people. At KCB, we align with the UN SDGs and continually look for ways to contribute to the Goals in our operations and project work.





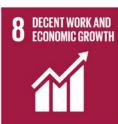






















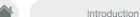






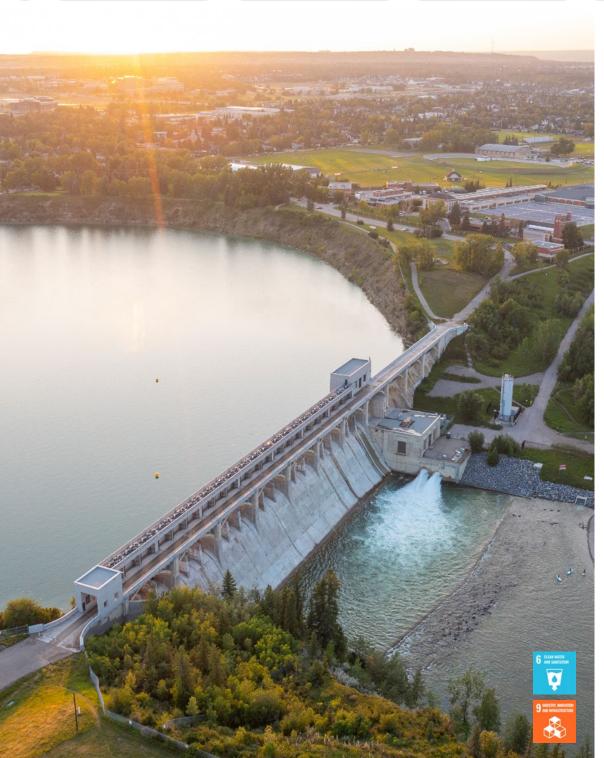






dion Governance





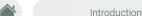
### Glenmore Dam

Calgary, Alberta, Canada



lenmore Dam is a 30 m high, 320 m long concrete gravity dam situated within the heart of the City of Calgary. The dam impounds the Glenmore Reservoir which is a critical source of raw water to the adjacent Glenmore Water Treatment Plant that supplies potable water to the communities in south Calgary. The dam, which began operations in 1933, is also important for mitigating more frequent flood events within the Elbow River. In addition to the dam's utilitarian functions, the bridge deck along the top of the dam links the City's highly used regional pathway system and the reservoir allows for boating activities.

Recent dam safety reviews and inspections identified several deficiencies with the dam facilities. These included the need for replacement of the manually operated timber stoplog system and deteriorated bridge deck, and repair of damaged concrete on the dam.





- Alberta, Award of Excellence in Concrete

(Restoration)



The City of Calgary retained Klohn Crippen Berger and its subconsultant GEC Architecture to provide geotechnical, hydrotechnical, structural, mechanical, and electrical engineering and architectural services for rehabilitating and improving the capabilities of the dam and replacing the bridge deck.

Detailed inspections and investigation programs were used to categorize the damaged concrete areas and develop targeted demolition and repair solutions. This information was also used to determine the improvements needed to accommodate the proposed rehabilitation works.

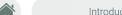
To replace the stoplogs, twenty-one vertical lift steel gates that can resist ice loads were provided. Each gate has an electric hoist that allows for ondemand operation.

KCB used three-dimensional (3D) finite element dynamic analysis for seismic modelling of the dam given its height. The 3D model was also used to

facilitate the design of the new structural elements including the intermediate piers within the gate bays and the elevated hoist platform. Stability analyses confirmed that post-tensioned anchors extending through the concrete dam into the rock foundation were also required.

Glenmore Dam is unique, not only because of its remarkable history, but because of its multi-purpose nature as a part of the City's critical infrastructure and pathway network. The integrated designs by KCB and GEC created a functional public space that not only improves the dam's industrial performance but preserves the architecturally important attributes of the iconic dam.

The many experiences gained from the Glenmore Dam Improvement Project can be used as a model for other high-profile sites where public amenities and historical interest must be intertwined with industrial functionality.











## St. Mary low-level outlet valve replacement



he low-level outlet (LLO) at St. Mary Dam, is a concrete lined tunnel used to discharge riparian flows into the St Mary River. The spillway controls the reservoir level when the reservoir is near full supply level and there are large inflows into the reservoir. Riparian flows must be maintained to provide habitat for local species and maintain water supply to farmers, ranchers, and small towns downstream. The supply of irrigation water from the dam's irrigation tunnel to the St Mary Irrigation Canal is the lifeblood of Southern Alberta's agriculture industry.

Klohn Crippen Berger (KCB) was contracted to replace critical valves within the LLO, while maintaining water flows to agriculture and wildlife.

The work of this project required a stoppage of flow through the LLO to unwater and remove the equipment. During the winter months, the irrigation canal is shut down and drained into the St Mary River. The project involved the use of remotely operated vehicles (ROVs) to conduct 3D underwater surveys to install a temporary isolation barrier within the LLO. Prior to installing the temporary isolation barriers, the ROVs were used to cut and remove portions of the LLO's old trash racks, which were later replaced with a new trash rack section.

The original drain pipeline was too small to provide the minimum riparian flow rate to the St Mary River during the LLO shut-down period. KCB created construction drawings and specifications to replace the irrigation canal drain line with a pipeline that discharges the required riparian flowrate at the base of the spillway. The new pipeline, named the 'riparian turnout', is a buried HDPE pipeline 1 km long.

## Ricardo Ranch flood fringe study





he City of Calgary commissioned the Ricardo Ranch Flood Fringe Study to help evaluate potential land-use scenarios for the Flood Fringe area of Ricardo Ranch - the last significant unplanned and undeveloped flood hazard area within Calgary's City limits. The project was also intended to contribute to The City's growing understanding of the implications of Flood Fringe development, following up on other studies and mitigation project undertaken subsequent to the 2013 flood. KCB was retained by O2 Planning + Design to provide technical input and support for the study.

Governance

The project was undertaken as a collaborative process where a Stakeholder Working Group, including The City, consultants, developers, and other interested parties, were invited to participate. A series of workshops were planned where stakeholders had the opportunity to help identify critical success factors. Based on this input, the Study Team developed six distinct land-use scenarios aimed at achieving these success factors. The scenarios represented alternatives that balanced opportunities for conservation of natural areas, promoting recreation and community amenities, reducing public costs, and capturing potential land

value. During subsequent workshops, stakeholders were invited to evaluate the options using a Triple Bottom Line (TBL) assessment that was developed by the Study Team as a quantitative measurement tool comprising economic, social, and environmental indicators. A resilience assessment was then performed to evaluate the long-term viability of the scenarios against economic and environmental headwinds, such as a reduction in property values, or climate change impacts.

KCB contributed to the development of the TBL methodology and was an active participant at the workshops. KCB's input included hydrotechnical assessment of the river meander belt and flooding potential. KCB also supported the assessment process by providing input on potential environmental risks and opportunities for enhancement to be considered for development scenarios and evaluation metrics. Through review of existing information, discussions with stakeholders, and attendance at the Working Group site visit, key environmental sensitivities were identified including wildlife movement corridors, wetlands, habitat connectivity, unique landscape features, and sensitive wildlife habitats. This information was used to help identify conservation priorities for the development scenarios.

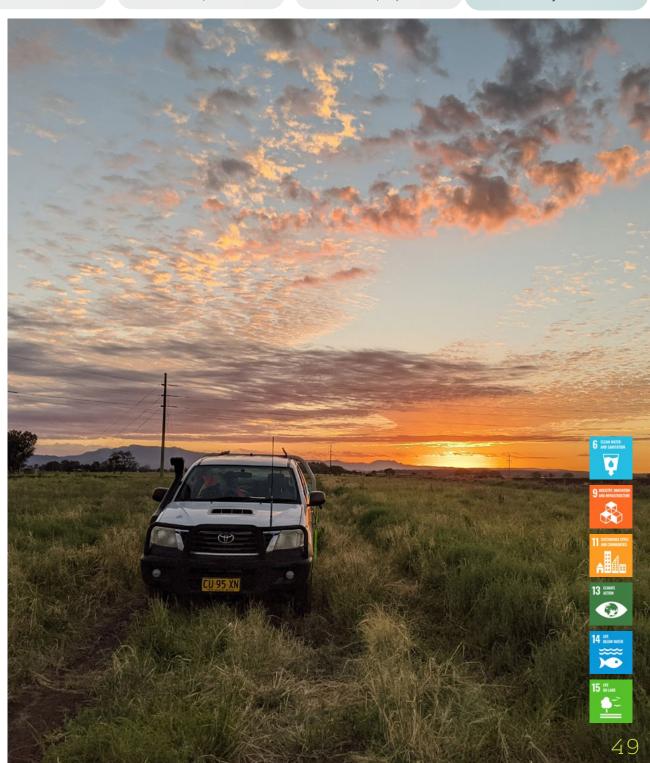
# Low-flow groundwater sampling and analysis

New South Wales, Australia

clean and safe supply of groundwater is essential for the drinking water needs of country towns, major industries (especially agriculture) and to support groundwater dependent ecosystems. The decline in groundwater quantity and quality can create serious threat to human and animal health and the degradation of wetlands and rivers.

In 2021, the NSW Dept of Planning and Environment completed the first NSW-wide sampling program of groundwater quality. This type of information is crucial in assessing how groundwater resources respond to abstraction and climate change over time. This one year-study visited 588 bores at over 332 locations and collected 957 samples. For the project, NSW was divided into four zones and commercial contracts were developed for those regions for collection of the samples. KCB and our subcontractor Reditus were one of three groups engaged.

The KCB team travelled 20,000 km across three campaign and safely spent 1,800 hours in the field. KCB staff faced challenges like floods, COVID-19 restrictions and navigating a mouse plague, but despite this, >90% of planned locations were visited, and samples were collected at those that were accessible. A vast range of bores and locations were visited multiple times





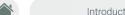


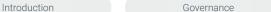


during the study. This ensured the impacts of different events (e.g., pumping season, flooding) at these locations were accounted for in the data.

Over 3,000 water quality samples were analysed that contributed to the baseline data collection. This included sampling of the Great Artesian Basin, an aquifer that is under high artesian pressures and can experience elevated temperatures. This aquifer in some places is 1000 m below the ground surface and can be tens of thousand of years in age.

Samples collected were analysed for water quality parameters including major ions, metals, nutrients and stable isotope tracers. This data base will provide information to better understand regional hydrogeological properties such as aquifer recharge rates, water ages and pathways, and pollution stressors. Access to the data is available through the WaterNSW data service team at waterdataservice@waternsw.com.au and will be of benefit to Government agencies, prospective groundwater users, academic researchers and industry.





Planet





# Use of cyclone sand in tailings storage facilities

CB is involved in the design and construction of several tailing storage facilities (TSFs) around the world that utilize cyclone sand as a construction material. Examples of such projects in British Columbia include the Highland Valley Copper Mine, Copper Mountain Mine, and the Gibraltar Mine. Cyclone sand is a coarse material created by passing mine tailings through a centrifuge, or "cyclone". The cyclone separates out water and finer tailings material, leaving behind coarse material referred to as cyclone sand. The resulting cyclone sand is both strong and permeable, making it a favourable material for TSE construction.

In contrast to traditional earthfills, cyclone sand offers an abundant and less energy intensive construction option with reduced cost, effort and emission when compared to hauling in fill material from other locations (either onsite or offsite).

The use of cyclone sand from mine tailings also reduces the volume of tailings that need to be stored in the TSF. With course material removed from the tailings, the finer tailings stored in the TSF also have a lower permeability and reduced seepage potential that can replace traditional seepage barriers or "cores" in embankment dams. This further reduces land disturbance of specialized care materials and promotes safer closure by allowing long-term drain down of the tailings.





### **Greens Creek Mine**

Admiralty Island, Alaska, USA

he Greens Creek Mine is located on Admiralty Island in Southeast Alaska, approximately 29 km southwest of Juneau. The mine is the largest silver mine in the United States. For over 25 years, KCB has supported tailings and water management at the Greens Creek Mine.

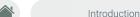
The underground mine and half of the tailings stack are located in the Admiralty Island National Monument, a protected area known for one of the largest populations of brown bears in the world, and home to species of salmon, birds, whales and deer.

The project's remote location and mountainous terrain, combined with a high annual precipitation and regional seismic activity, pose challenges for tailings and water management. Despite these challenges, Greens Creek has constructed a filtered tailings stack (i.e., dry stack) and is comingling tailings and waste rock to reduce the total disturbed footprint within the National Monument.

The filtered tailings facility at Greens Creek is a first of its kind in the world and has been recognized as a world-class case history of successful tailings management. Through the innovative approach to sustainable tailings management, the mine has had continuous permitting for over 25 years of operations and has successfully undergone three Environmental Impact Assessments, in 1983, 2003, and 2013. The project is currently undergoing another Environmental Impact Assessment.

Sustainable practices at Greens Creek extend to the site's water management, which includes:

- Two water treatment plants are used on site to allow re-use of water in the mill/processing, thereby reducing the intake of freshwater needed for mining operations.
- Water contained within excavations is captured and treated to avoid metal leaching and acid rock drainage (ML/ARD).



# Glencore tailings manager academy

In 2021, Glencore launched a series of online training courses that will advance the knowledge of its employees involved in tailings management at sites across the globe. Klohn Crippen Berger supported Glencore, one of the largest mining companies in the world, in developing the Tailings Management Academy, or TMA, by contributing knowledge and writing the content for the learning modules, as well as technical translation review for the French, Spanish and Russian versions of the courses.

The TMA courses are designed for the breadth of employees involved in tailings management: operators and technicians; owners, managers, and executives; and responsible persons and engineering staff. The material teaches the skills needed to safely design, build, operate, and close tailings storage facilities (TSFs), covering technical components, such as soil behaviour, liquefaction, and water /environment aspects, but also non-technical skills such as stakeholder consultation and governance. It places an emphasis on learning the impact a TSF has on communities and the environment. Best practices in TSF design planning and governance are key parts of the TMA. It reinforces the importance of evaluating designs, operational processes, and risk assessments throughout



the TSF lifecycle to ensure dam stability and minimize risks to project areas and communities

KCB started work on the TMA in 2020, with a large multi-disciplinary team from across the globe collectively spending over 5,000 hours on the project. Harvey McLeod appears in videos throughout the courses to guide learners through the content. Harvey, Len Murray and Joe Quinn, three of KCB's most experienced professional engineers, share insights and wisdom in video presentations in the online courses. The KCB team provided knowledge and prepared content on topics including characterization of TSF sites, water management, geochemistry, dam construction materials, and closure of a TSF once mining is finished. In addition to drafting and reviewing module content, the KCB team helped in conceptual development of imagery for the modules, as well as preparing quiz and examination questions similar to a post-secondary level course.

With the launch of the TMA, KCB is contributing to the education of a generation of tailings professionals, helping them make good decisions in engineering, governance, and the day-to-day operations of TSFs.

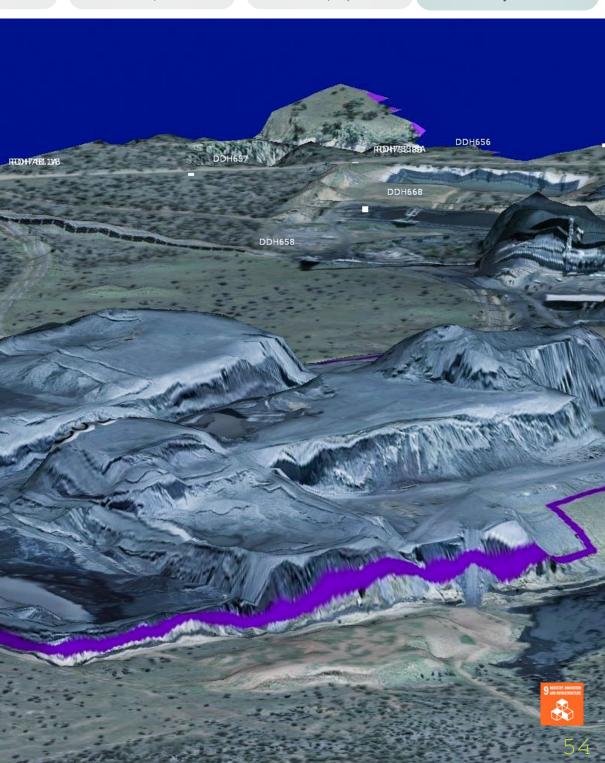
### GIS data collection

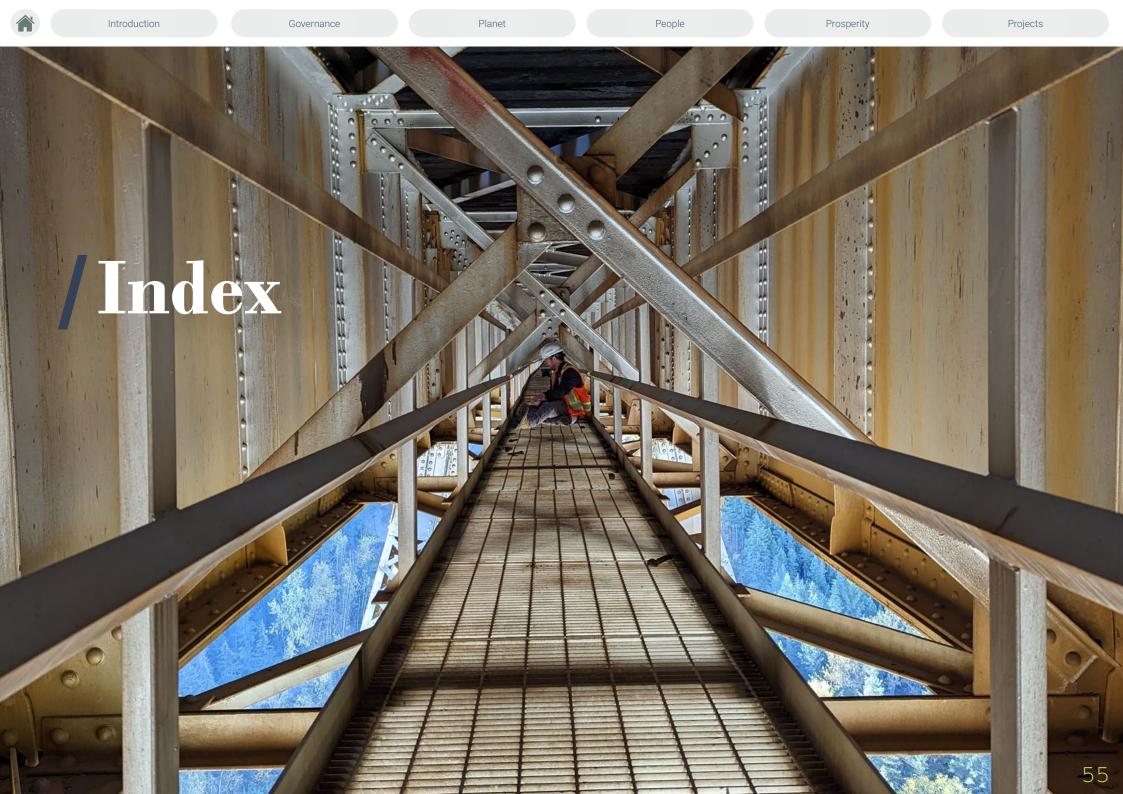
patial data plays an important role in the design, construction and monitoring of roads, bridges, dams, and other infrastructure. The maps, datasets, and images that make up a successful project originate with geographic information system (GIS) data collected in the field, often from remote project sites.

This year, KCB launched two new mobile apps, ArcGIS Survey123 and Field Maps, that staff take into the field to collect point, line, and polygon data, as well as photos and annotations. The apps are part of the implementation of KCB's Enterprise Geodatabase (EGDB), which manages GIS data company wide.

The apps, which are synced directly to KCB's EGDB, reduce paperwork, staff time, and effort, not only in data collection, but in generating outputs such as maps and online applications. Spatial data collected for one purpose can be easily reinterpreted for another purpose, reducing the need for re-collecting and rehandling the data.

Another important feature of the EGDB is that the data and visualizations can be shared with KCB's clients. For example, client-focused web map applications can be developed to share information like drillhole or instrumentation locations with clients who do not have their own GIS. Clients can also collect data directly into the KCB EGDB using Survey123 or Field Maps, without needing to purchase GIS software.







# **/WEF Reporting Framework**

KCB's 2021-2022 ESG Report references the 21-core metrics of the World Economic Forum's Stakeholder Capitalism Metrics. The metrics are related to four pillars: governance, planet, people, and prosperity. The metrics were developed by WEF to create a unified global standard for ESG reporting and includes disclosures from the Global Reporting Initiative (GRI), Sustainability Accounting Standards Board (SASB) and the Taskforce on Climate-Related Financial Disclosures (TCFD). Our report addresses all metrics that are material to our business as an engineering consulting firm.



## /Content Index

<b>Core Metric</b>	Disclosure	Location/Comment
Organizational Profile		
	About the organization	About KCB - Pg. 3
	About the report	Message from the President - Pg. 4, Evolving World, Evolving Practice - Pg. 6
Governance		
GRI 102-26	Setting Purpose	Pg. 7
GRI 102-22	Governance body composition	Governance - Pg. 9
GRI 102-21, 102-43, 102-47	Material issues impacting stakeholders	Pg. 8
GRI 205-2, GRI 205-3	Anti-corruption	Conducting business ethically - Pg. 11
GRI 102-17	Protected ethics and reporting mechanisms	Conducting business ethically - Pg.11
GRI 102-15	Integrating risk and opportunity into business processes	Integrated Management System - Pg. 12, Assessing risks - Pg. 13
Planet		
GRI 305:1-3, TCFD	Greenhouse gas (GHG) emissions	Pg. 17
TCFD	TCFD implementation	KCB tracks Scope 1 and 2 emissions but does not track Scope 3 emissions as part of the recommendations of the Task Force on Climate-Related Disclosures (TCFD).
GRI 304-1	Land use and ecological sensitivity	Projects - Pg. 43
SASB CG-HP-140a.1	Water consumption and withdrawal in water-stressed areas	Projects - Pg. 43

Governance

Core Metric	Disclosure	Location/Comment	
People			
GRI 405-1b	Diversity and inclusion	Our People - Pg. 21	
		Note: Employee statistics are reviewed for a 12-month period ending in June. The data in this section reflects the reporting period of June 2021-June 2022.	
GRI 405-2	Pay equality	At KCB, we are committed to equality and opportu-	
GRI 202-1	Wage level	nity for all employees regardless of race, nation of origin, religion, sex, marital status, physical disability.  All decisions regarding compensation are determined based solely on an individual's qualifications and job performance.  Employees are offered a robust compensation package which includes a competitive salary, benchmarked against the industry and reviewed annually.	
GRI 408-1b, 409-1	Risks for incidents of child, forced or compulsory labour	The sub-consultants and subcontractors whose services that KCB engages are of a very low likelihood for this type of risk. We do not hire factory workers or manufacturers and very rarely hire labourers. KCB does not hire sight-unseen subs to conduct labour work. KCB identifies such risks and potential mitigations through applicable procedures. All subs are required to agree to abide by our Code of Conduct.	
GRI:2018 403-9a&b, GRI:2018 403-6a	Health and safety	Pg. 28	
GRI 404-1	Training provided	Training and education - Pg. 32	



### **Location/Comment Core Metric Disclosure**

Governance

### Prosperity

GRI 401-1a&b

Absolute number and rate of employment

### New Hires by Gender by Employee Classification

Planet

	Men	Women	Not dis- closed
A-	3	6	
A-	12	5	
В	9	3	
С	10	4	
D	5	2	
Е	3		
A1	1	2	
C1		1	
C2	1	4	1
01		2	
SCI 1	1		
SCI 2	1	1	
SCI 3	1		
T1	4	1	
T2	1		
T3	2		
T4	2		
Total hires	56	31	1

<sup>\*</sup>numbers include co-op students and casual employees

Note: Employee statistics are reviewed for a 12-month period ending in June. The data in this section reflects the reporting period of June 2021-June 2022.

Core Metric	Disclosure	Location/Comment	
GRI 201-1, GRI 201-4	Economic contribution	As a private firm, KCB does not publicly disclose financial information related to operating revenues, operating costs, wages and payments.	
		Community investment - Pg. 36	
IAS 7	Financial investment contribution	As a private firm, KCB does not publicly disclose this financial information.	
US GAAP ASC 730	Total R&D expenses	KCB supports research in the engineering and geosciences through both monetary and in-kind donations.	
GRI 201-1	Total tax paid	As a private firm, KCB does not publicly disclose financial information related to taxes.	





### **CONTACT US:**

- ♀ 500-2955 Virtual Way, Vancouver BC, Canada
- **)** 604.669.3800

www.klohn.com in f © y







