



# 2024

## ESG Report

# ENERGIZING OUR FUTURE

A Path to Sustainable Growth



Klohn Crippen Berger



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# Introduction

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*Purpose, Mission, Vision, Values*

*Land Acknowledgement*

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*Strategic Focus*

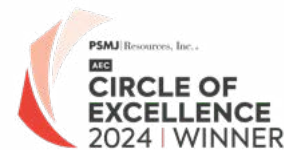
*ESG Approach*

*Energizing Our Future: A Path to Sustainable Growth*



# About KCB

KCB is a global award-winning engineering, geosciences and environmental consulting firm with offices in Canada, USA, Australia, Peru, Brazil, Ecuador, Ireland and the UK. Since 1950, we have helped to sustainably develop resources, reclaim developed 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.



# Awards & Accolades



## Canada's Safest Employer

KCB was named Excellence Awardee for Canada's Safest Mining & Natural Resources Employer in 2024. Committed to developing safe workplace, we are proud to be recognized as one of Canada's Safest Employers since 2019.



Platinum member

## Best Managed Company

KCB has retained our status as one of Canada's Best Managed Companies for sixteen consecutive years. 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 marking the 16th consecutive year awarded.



## ABA Employer of Choice

For the 10th consecutive year, 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.

# Personnel Awards



**CIM Selwyn Blaylock Canadian Mining Excellence Award**

Len Murray, KCB Board Chair and former CEO, was awarded the Selwyn Blaylock Canadian Mining Excellence Award by the Canadian Institute of Mining (CIM). This prestigious honour is awarded to individuals who have demonstrated significant contributions to Canada through exceptional achievements in mining, metallurgy, or geology.



**CIM District Distinguished Service Award (Eastern)**

Senior Civil/Water Resources Engineer Maggie Mackay was honoured with the District Distinguished Service Award (Eastern) by the Canadian Institute of Mining (CIM) for her significant contributions to the mineral industry and to the CIM.



**Daniel G. Bertrand's 15 Years of Volunteer Service with CyGS**

At this year's Calgary Geotechnical Society (CyGS) Annual General Meeting, the organization recognized long-standing volunteer committee member Senior Geotechnical Engineer & Associate, Daniel G. Bertrand, for his 15 years of volunteer service.



# Personnel Awards



## KCB's VP, Alberta Joe Quinn named a Fellow of The Engineering Institute of Canada

This prestigious recognition highlights Joe's outstanding contributions to engineering and his dedicated service to the profession and industry.

## Nahyan Rana and Andy Small Receive Prestigious Publication Awards

Geoscientist Nahyan Rana, Senior Geotechnical Engineer Andy Small, and the co-author team from the CanBreach Project were honoured with the prestigious Edward Burwell Jr. Award from the Geological Society of America for their paper on "Global magnitude-frequency statistics of the failures and impacts of large water-retention dams and mine tailings impoundments". Nahyan was principal author of the paper, with review provided by Andy Small.

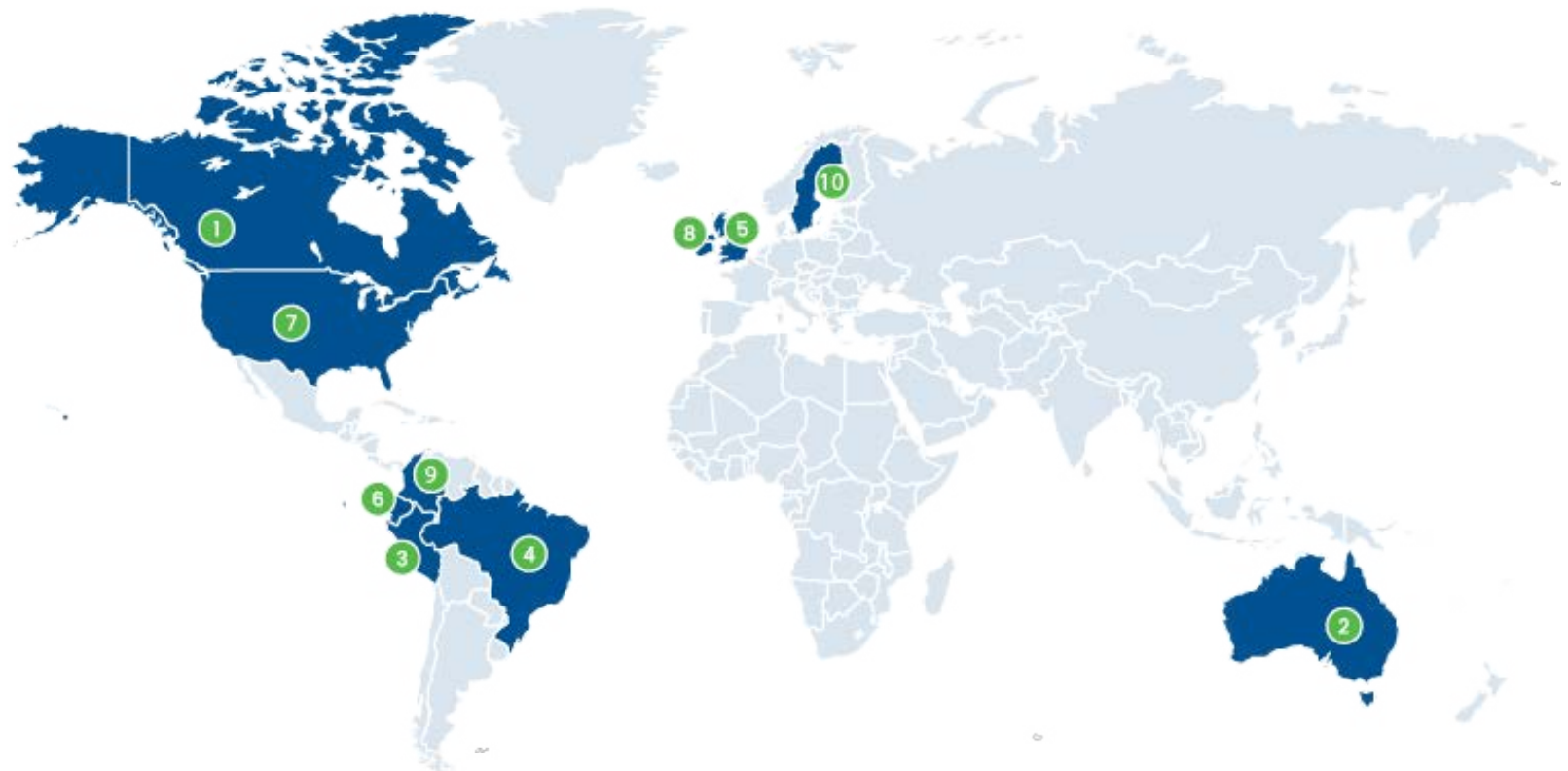
In addition, Nahyan's paper "Catastrophic mass flows resulting in tailings impoundment failures", supported by Andy Small, has been named the 2024 Best Paper by Engineering Geology, a leading journal connecting earth sciences and engineering.



# Global Presence

## EMPLOYEES

1	Canada	497
2	Australia	185
3	Peru	110
4	Brazil	26
5	UK	20
6	Ecuador	8
7	USA	4
8	Ireland	5
9	Colombia	1
10	Sweden	1





# Our Purpose, Mission, Vision, Values

## Purpose

Creating robust, resilient and location-appropriate solutions that stand the test of time.

## Mission

Delivering sustainable solutions for the natural and built environment, everywhere.

## Vision

To attract and develop talented employees who work closely with our clients and stakeholders.

## Values

*Collaboration*

*Passion*

*People First*

*Professionalism*

*Quality and Innovation*

*Respect*

*Sustainability*

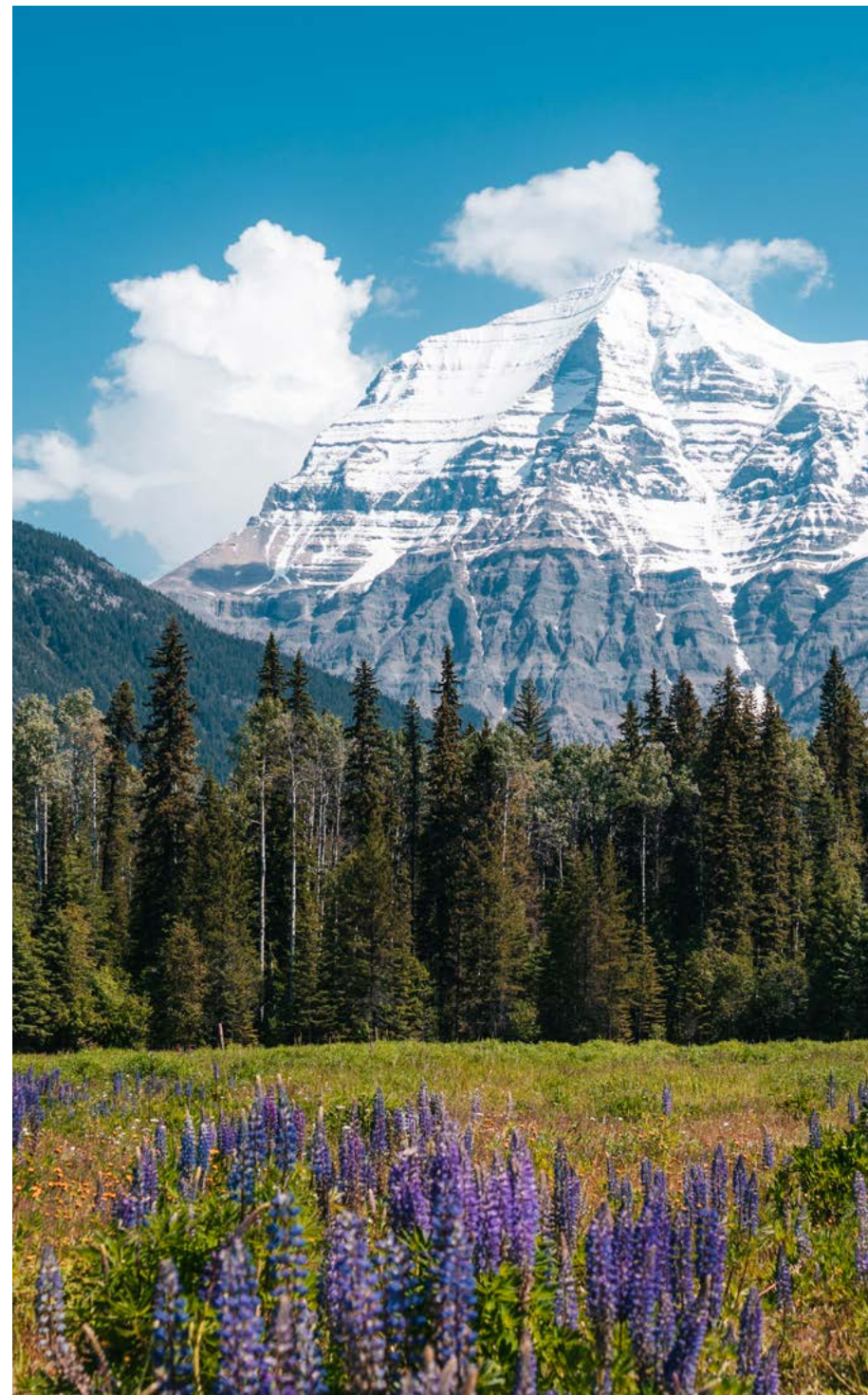
*Technical Excellence*

# Land Acknowledgement

Headquartered in Vancouver, British Columbia, KCB respectfully acknowledges the traditional and unceded territories upon which we work and operate. We deeply honour the cultural, spiritual, and ancestral connections that Indigenous peoples maintain with these lands.

As an international company, KCB also acknowledges the Indigenous peoples across North America, South America, and Australia, who have stewarded and continue to care for their lands and waterways in which we operate in since time immemorial. We share our heartfelt appreciation to the elders—past and present whose wisdom, resilience, and leadership have sustained and guided their communities across generations.

We encourage readers of this report to take a moment for self-reflection and consider the history and significance of the lands on which you reside. We also invite you to learn more about the First Nations and Indigenous histories of your region and to actively foster awareness and empathy towards the ongoing impacts of colonization and the settler past.





# Message from the President



**Ryan Douglas, P.Eng., P.E.**  
*President & CEO*

A handwritten signature in black ink that reads "R. Douglas". The signature is fluid and cursive, with the first name "R." and the last name "Douglas" clearly visible.

2024 was a year of uncertainty. Across the world, extreme socio-political instability coupled with a prevalingly negative economic outlook brought unpredictable challenges to our industry. Despite the uncertainty, the engineering consulting industry remains in a strong position, driven by trends in Energy Transition, Environment/Climate Infrastructure Repair and Resilience, and Digital Advancement. As we navigate the challenges and embrace the possibilities, KCB reaffirms our commitment to building a sustainable and climate-resilient future.

This year marked the second year of our 3-year strategic plan, which charts our path to responding to these challenges and building a better future. We continue to make progress on the goals we set forth in our plan by investing in our most

important asset, our people, and adopting innovative technological practices across all aspects of our business. All the while, our focus continues to be increasing our geographic reach and growing our global workforce who will help us meet the evolving needs of the industries we serve.

Looking back at the progress we've made thus far, I am proud of how we've matured in our thinking regarding Environmental, Social and Governance (ESG) practices. KCB remains committed to upholding sound ESG business practices, forming a Global ESG Committee in 2022, and introducing an ESG Charter in 2024, which lays the groundwork for future actions and strategic initiatives targeting our ESG objectives.

In our work, we recognize the significant impact that our

projects in the hydropower, mining, transportation, infrastructure and energy sectors have on the environment and local communities and continue to demonstrate our commitment to minimizing our environmental footprint while maximizing positive outcomes in the regions where we operate.

Beginning in 2023, KCB began formally tracking UN Sustainable Development Goals (SDGs) that align most closely with our project work. Aligning our project work with these SDGs is not just a matter of company governance, it is a core element of the commitment to excellence that is laid out in our ESG Charter. We are dedicated to delivering sustainable solutions that balance the needs of the natural and built environment while prioritizing the well-being of our people and maintaining robust governance practices.



Within the industry, the rapid pace of technological advancement is presenting both challenges and opportunities to engineering consulting firms. At KCB, we are adapting by actively exploring the implementation of artificial intelligence (AI) and machine learning into company operations to enhance our competitiveness, efficiency, and overall business performance. We established a 'Digital Future Committee' who developed a strategy for operating our business in an increasingly digital future. This strategy includes the review and adoption of new technology for streamlining our business processes to better serve our clients, improve how we do things, and give us a competitive edge.

Our investment in people extends to the deliberate focus we've put on equity, diversity and inclusion, as we strive to be an employer of choice. We are committed to offering a workplace for our staff that is flexible, collaborative, and inclusive, and where employees feel respected, valued, and accepted; and our values around diversity, teamwork, innovation, and knowledge-sharing remain strong. Our work around ESG and EDI are journeys, and we continue to explore and develop initiatives that are right for KCB and our culture.

Working in regions around the world, we endeavour to develop positive relationships with community members and leave a positive impact wherever we are. Included in this year's report is our first-ever land acknowledgement which expresses our gratitude and recognition of the Indigenous Peoples whose lands we operate our business. Throughout the areas they live and work, our staff continue to showcase their unwavering generosity by volunteering their time, raising donations and bringing awareness to those most in need.

Amidst all this, we continue to do what we do best—delivering world-class projects, collaborating with top-tier multi-national clients, and solving some of the toughest engineering problems. It is fitting that the theme of this year's report is 'Energizing the Future: A Path to Sustainable Growth', as I am energized by the accomplishments of the last year and look forward to the opportunities that await us as we continue our work to achieve a better future.



# Material Issues Affecting Stakeholders



In 2024, our Global ESG Committee completed its second Materiality Survey. The survey identifies the key issues material to KCB's business and the industries and sectors we operate in, defining their level of importance.

The issues identified range from those impacting our global offices and project sites, to our employee stakeholders, receiving organizations, local communities, and society at large.



## 2023–2025

# Strategic Focus

2024 marks the end of the second year of our 3-Year Strategic Plan. The plan charts our path forward as we respond to the key challenges facing the engineering consulting industry.

### Digital Advancement



Doubling our investments in research and development to support the adoption of innovative technological practices that help us maintain our reputation for technical excellence.

### Retention & Recruitment



Providing well-rounded development opportunities that prioritize internal growth and ensure our teams have a global perspective on industry challenges.

### Equity, Diversity & Inclusion



Developing a workplace that is founded on the principles of equity, diversity and inclusion, where employees feel respected, valued and accepted and are able to achieve their full career potential.



# Our Approach to ESG

Our ESG Charter lays the groundwork for future actions and strategic initiatives targeting the company's Environmental, Social, and Governance (ESG) objectives.

**Mission:** Committed to ESG excellence, Kohn Crippen Berger delivers sustainable solutions for the natural and built environment, prioritizes our people, and upholds rigorous governance.

**People:** Fostering, equity, diversity, and inclusion (EDI) initiatives, as well as implementing programs that promote growth and career development.

**Planet:** We continue to pursue our operational aspiration of 'Net Zero' and to minimize the environmental impact of our daily activities on the land, water, and air.

**Governance:** KCB upholds a strong ethical business practice based on integrity and transparency through management frameworks such as our Integrated Management System (IMS), Quality, Health, Safety and Environment (QHSE) standards, and ESG commitments

**Prosperity:** We strive to foster prosperity by building strong relationships with the communities where we operate, promoting a culture of giving back and encouraging community engagement.



# Energizing our Future:

## *A Path to Sustainable Growth*

The theme of our report **Energizing our Future: A Path to Sustainable Growth** highlights the progress we've made in our work towards building a better future. To do this, we are growing a global workforce of qualified professionals who share our ESG values and are motivated to achieving our sustainability goals. Across our business, we are taking proactive steps to minimize our carbon footprint, investing in renewable energy sources as we work towards Net Zero emissions. In our project work, we are aligned to the United Nation's Sustainable Development Goals, tracking against these goals to drive sustainable progress.





# Governance

## IN THIS SECTION

*Operating Committee*  
*Integrated Management System*  
*Conducting Business Ethically*  
*Assessing Risks*  
*Digital Future*



# Operating Committee

The Operating Committee (OC) is responsible for governing KCB's global operations. Members of the OC include KCB's President & CEO; Chair of the Board of Directors; Corporate and Business Unit Vice Presidents; and Corporate Leads appointed by the President. The role of the OC is to 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. Together, the OC is responsible for the implementation, review, and continual improvement of our IMS.



# Integrated Management System (IMS)

KCB's business is governed using an integrated management system (IMS) consisting of quality, health and safety, and environmental policies and procedures.

KCB's 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. Our IMS is audited externally every year and internally on a quarterly basis.

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

## Global Quality, Health & Safety Team, and Related Committees

The Global QHSE Team and the Director, Business Processes, manage and maintain our IMS. Their responsibilities include developing initiatives and an improvement plan based on audit results, business objectives, and stakeholder consultation and feedback. Local Joint Health and Safety Committees and ESG Committees, established across KCB's offices, support the work of the QHSE team.



### ISO 9001 Quality

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



### ISO 45001 Occupational Health & Safety

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



### ISO 14001 Environment

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

# Conducting Business Ethically

KCB conducts our business ethically, with integrity and honesty. 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. All reports are investigated and if found in violation, are acted upon. Violations to our Code of Conduct are not tolerated.

## 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.



# Assessing Risks

Many of the risks associated with KCB's business are related to the projects for our clients. Risks related to KCB's project work are overseen by the company's Risk Assessment Committee (RAC), which includes assessments of the work that we undertake are within business risk tolerances of the Company, and that risky clients or projects are objectively assessed.

The RAC comprises three members: the President & CEO; Vice President, Technical; and Vice President, Finance.

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

- Company Risk Register
- Compliance Register
- Safe Work Practices (SWPs)
- Job Hazard Analyses (JHAs)
- Proposal Go/No Go's
- Field Assignment Forms (FAFs)
- Journey Management Plans (JMPs)

## Staff Safety While Travelling

We are working in more corners of the globe than ever before, often in locations with social and political instability; prioritizing staff safety is crucial. Staff travelling for any business-related purposes, including field assignments and meetings abroad, are required to fill out a Field Assignment Form (FAF) and Journey Management Plan (JMP) prior to their departure, ensuring travel plans are documented and communicated, in the event a concern or emergency arises.

## Update to Compliance Risk Register

As part of our ongoing commitment to effective risk management, KCB updated its Risk Register. The register serves as a tool for identifying potential risks that could impact company operations and project execution, ranking these risks by priority, defining mitigation strategies and assigning responsibility for each risk.

In 2024, KCB conducted a risk assessment using the Failure Mode and Effects Analysis (FMEA) method

to identify ways in which a system or process can fail and assess their impact to prioritize implementing mitigation measures. By using the FMEA methodology in our risk register updates, we aim to proactively address potential threats, safeguard projects outcomes, and establish a more resilient project management process.

## Addition of Legal Counsel

As KCB continues to grow and take on increasingly complex, large-scale projects around the globe, we welcomed our first in-house legal counsel in 2024. The introduction of a dedicated legal counsel will be instrumental in helping us navigate the sophisticated procurement and contracting models required for today's intricate projects.

We aim to remain aligned with evolving regulations and best practices across the jurisdictions where we operate, enhancing our commitment to excellence, compliance, and integrity in all aspects of our business.

# Digital Future

## Formation of Digital Future Committee

As advancements in artificial intelligence (AI), generative AI, and machine learning continue to transform industries, KCB is actively exploring ways to leverage these cutting-edge technologies to enhance our operations. By integrating AI and machine learning, we aim to improve efficiency, optimize processes, and deliver even greater value to clients.

To guide this digital transformation, we established the 'Digital Future Committee,' a dedicated governing body tasked with developing a strategic roadmap for navigating the digital era. The committee will focus on evaluating and adopting new technologies that streamline internal workflows, improve client services, and strengthen our competitive advantage. This approach will allow KCB to be adaptive in a rapidly evolving digital landscape, allowing us to remain responsive to both technological advances and client needs.

KCB's commitment to innovation and future-focused strategies underscores our dedication to long-term success. By embracing AI and other emerging technologies, we endeavour to be a leader in an increasingly digital marketplace, ready to seize new opportunities and deliver cutting-edge solutions to our clients.



## AI Survey

In May 2024, we took a significant step forward in our digital transformation by distributing an AI survey to KCB staff across our offices. This survey was designed to gather insights from employees on how AI can complement the work we do, streamline our processes, and improve our service to clients. The feedback from this survey will play a crucial role in shaping our AI roadmap and provide a framework that aligns with our long-term goals. Results from this survey will guide the implementation of Generative AI platforms across our network in early-2025.

# Planet

## IN THIS SECTION

*GHG Emissions*

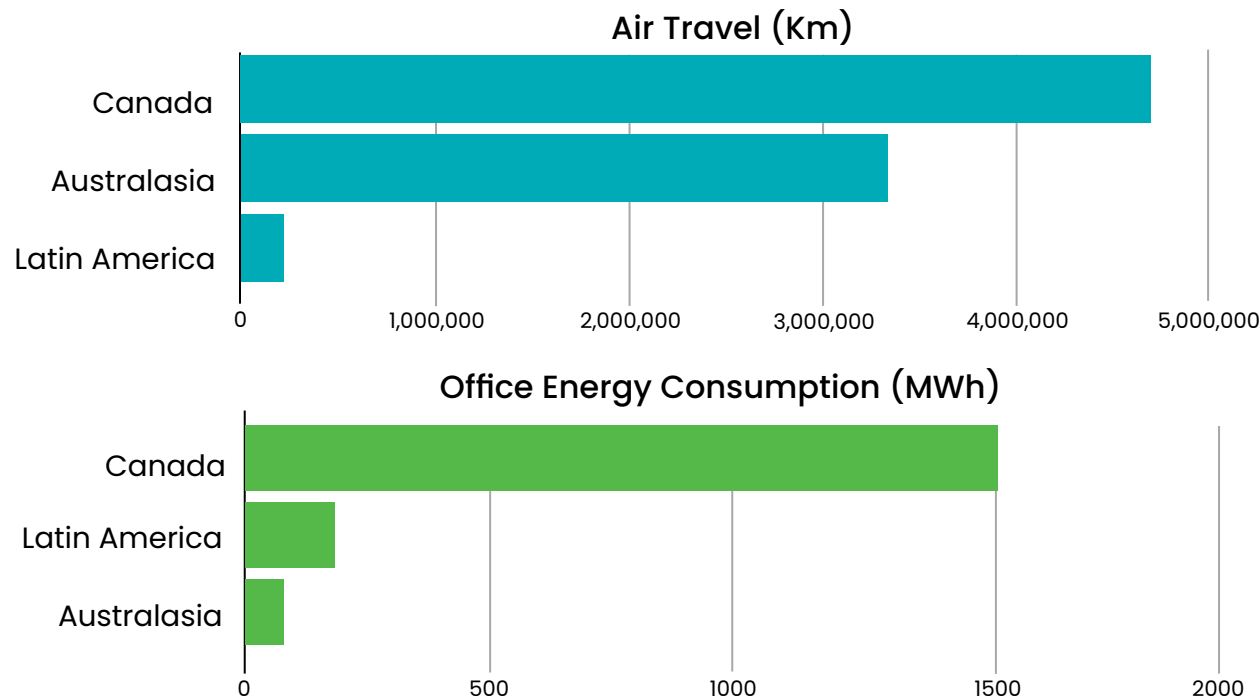
*2024 Commuter Survey*

*Material Usage*



# GHG Emissions

Over the past four years, KCB has made continuous strides in refining our carbon accounting process to more accurately track CO<sub>2</sub> equivalent emissions generated by our operations. This initiative began in 2020 with tracking air travel emissions and later expanded to include energy consumption from heating and electricity in at our major offices. In 2023, we broadened our efforts to cover regional offices and project vehicle usage. This year, KCB took steps to further reduce its carbon footprint by purchasing International REC Standard energy and Green-e Energy certified renewable energy certificates (RECs). These RECs ensure that the electricity we use is sourced from renewable resources, further minimizing our reliance on non-renewable energy.



Due to operational size our European offices GHG emission are incorporated in our Canada office data represented above. With the rate of projected growth, European office data will be a separate jurisdiction during the 2025 reporting period.



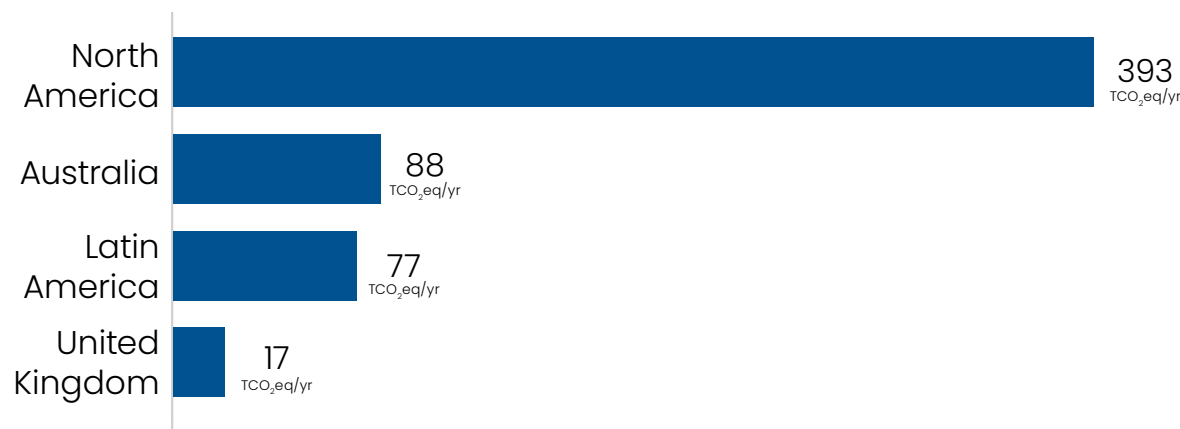
## Belo Horizonte Goes Green (Energy)

In August of this year, our Belo Horizonte office took an important step forward in our ESG strategy and commitment to sustainability by partnering with Evolua Energia. Founded in 2020, Evolua Energia offers an alternative to traditional energy suppliers by using photovoltaic technology to deliver clean, solar-generated power back into the nation's energy grid. Belo Horizonte becomes the first of our offices to be fully powered by a renewable energy source.

# 2024 Commuter Survey

In alignment with our ESG Charter values and aspiration to achieve 'Net Zero', in April 2024, KCB took another step forward to understand how much office commuting contributes to KCB's total footprint by conducting a Commuter Survey across our global offices. Studies have shown that office commuting-related emissions can account for 10% to 30% of a company's carbon footprint. The results of the survey will serve as a guide for future ESG initiatives and will be incorporated into our overall CO<sub>2</sub> emissions footprint.

## COMMUTING EMISSIONS BY REGION



## BY COMPARISON



Office emissions in 2024 totalled 689 TCO<sub>2</sub>eq/yr



Staff air travel in 2024 totalled 2,667 TCO<sub>2</sub>eq/yr





# Material Usage

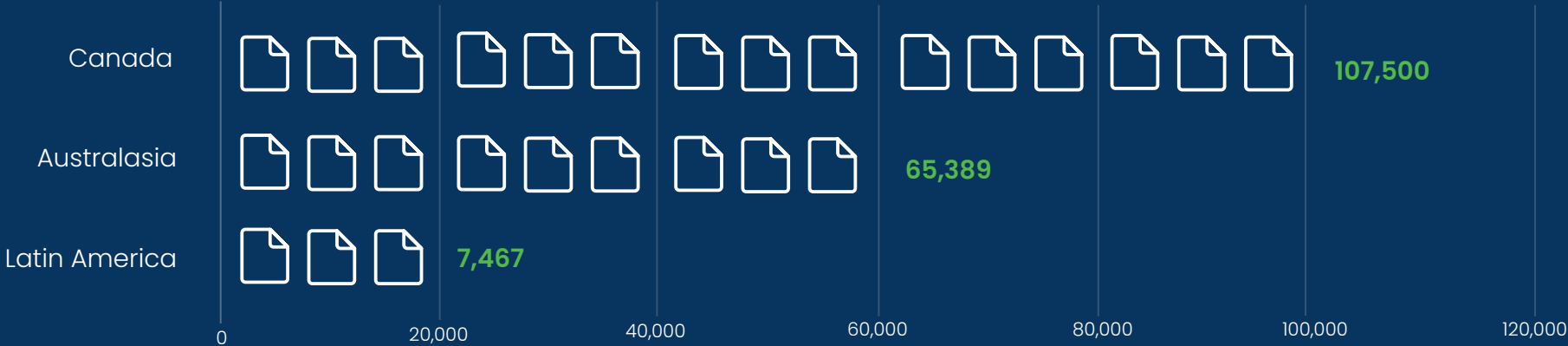
## Paper Consumption (Sheets)

107,500  
Canada

65,389  
Australasia

7,467  
Latin America

### 2024 Paper Consumption





# People

## IN THIS SECTION

*Employee Stats*

*New Hires*

*Health & Safety*

*Training & Education*

*Industry & Professional Associations*

*New Associates*

*Indigenous Collaboration*

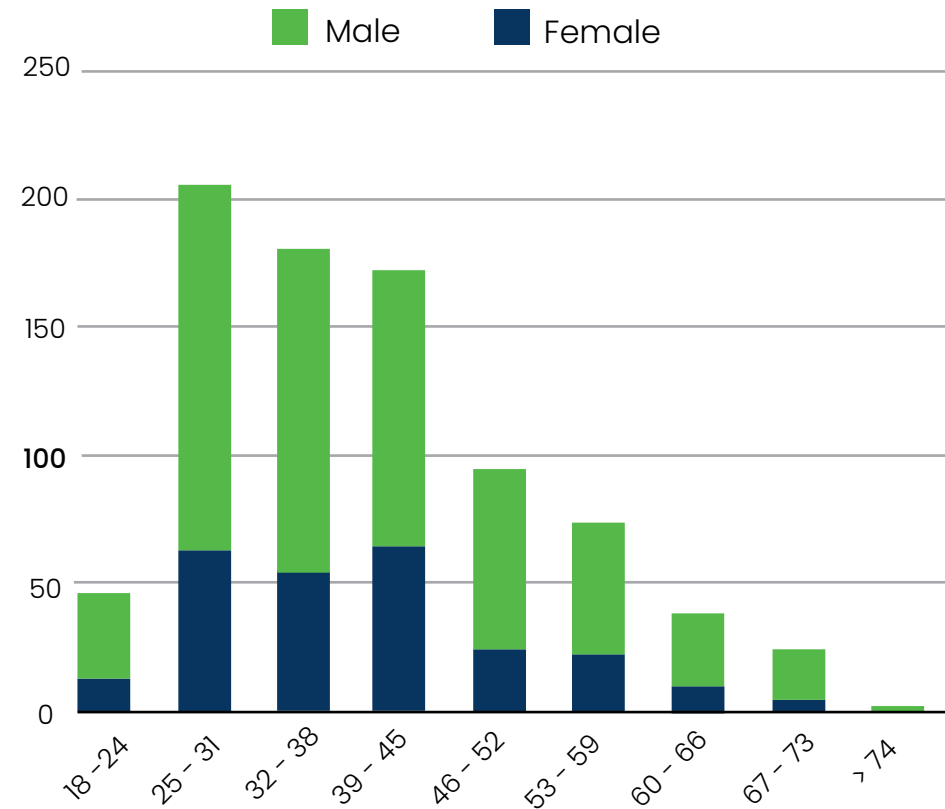


# Employee Statistics

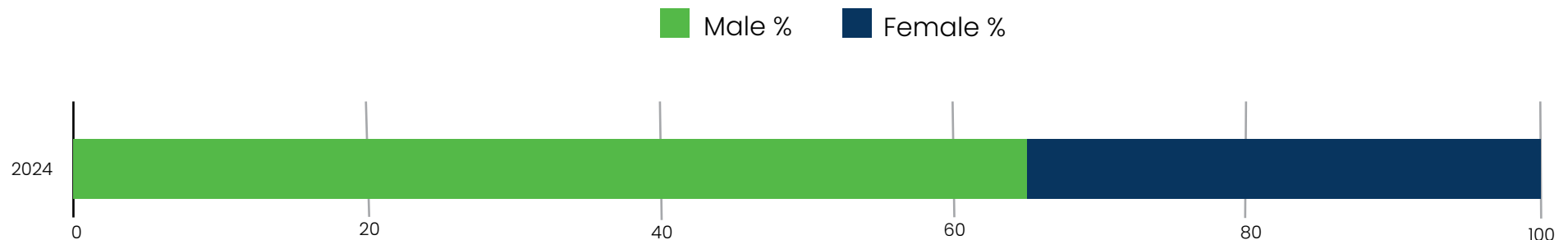
KCB values a workforce made up of diverse backgrounds and unique perspectives, enabling us to generate innovative ideas while cultivating an environment that promotes growth, collaboration, and mutual respect among peers.

In 2024, our employee count grew by 14% to 850. Within our staff, 33% identify as female, and 66% identify as male. This is line with gender statistics across our industry.

## 2024 Age & Gender



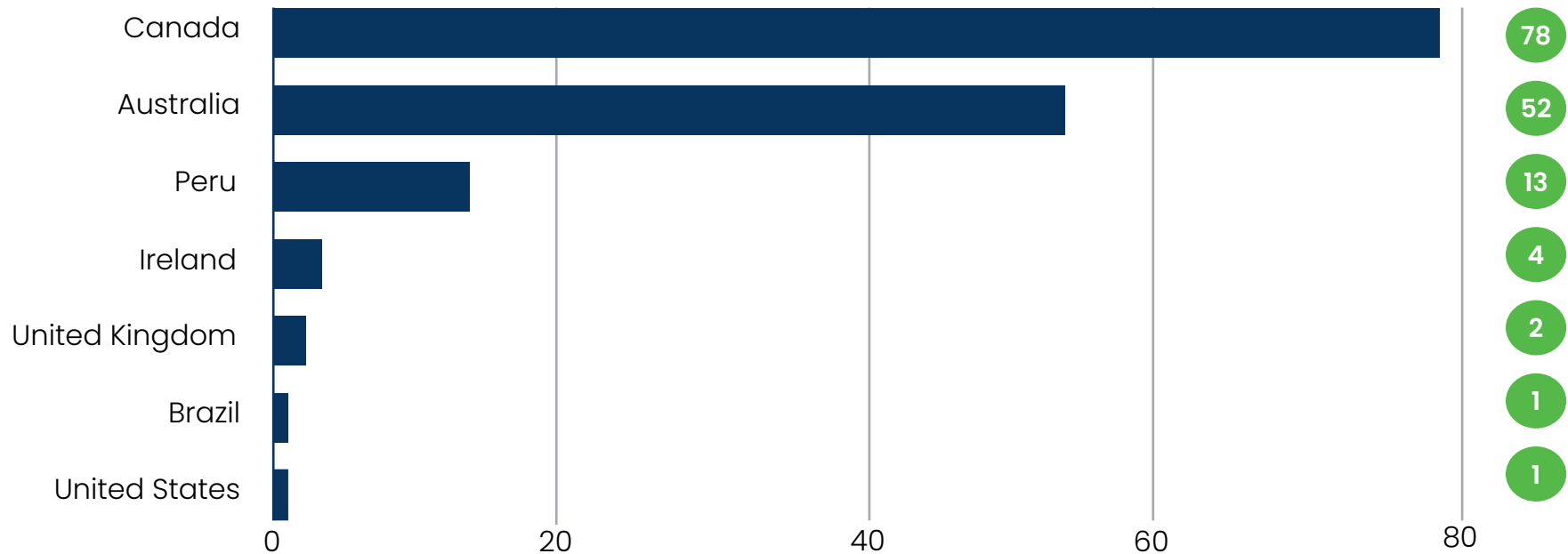
## 2024 Gender Breakdown





## New Hires

KCB is committed to growing our global workforce through a measured and organic approach. We are pleased to have welcomed new hires across our offices this year, adding qualified professionals who align with our values and will help us meet the evolving needs of the engineering consulting industry.



# Health & Safety

KCB's health and safety management system is COR-certified in British Columbia, Alberta and Saskatchewan.

**1,387,705**

hours worked

**5** minor medical aid injuries

**0** fatalities

## Occupational Health and Safety Management System

At KCB, we take a proactive approach to occupational health and safety, integrating it with our management system and instilling a mindset of health and safety in our employees through policies, training and ongoing feedback and communication.

Our OHS management system is for workplace hazards and the prevention of 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. 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.

## Health and Safety Training

Each year, our employees are expected to complete two proactive safety reports. New employees complete mandatory and role-specific training, and their progress is monitored until the end of their probationary period.

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. Mandatory training includes Health and Safety 101, Ergonomic Awareness, Hazard Assessments and Managing Hazardous Products (formerly WHMIS training).

## Certificate of Recognition (COR)

- Has developed, implemented and audited a Health & Safety management system that meets the approved industry standards.
- Demonstrates continuous commitment to raising the standard of worker health and safety in the province of British Columbia, Alberta and Saskatchewan.

Annually, our 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.

### **Communicating Health and Safety**

In addition to mandatory safety reporting, we encourage employees to share first-hand experiences in the field by presenting 15-minute presentations as part of our ‘KlohnSafe’ sessions and we periodically survey our employees on company health and safety culture.

We keep health and safety “top of mind” by presenting safety shares at the start of meetings. Safety shares are short stories

about recent health and safety items which are saved in our safety share library for company presentations or client meetings.

Our President includes a safety or health-related notice in his regular 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.

### **Preventing and Mitigating Occupational Health and Safety Hazards**

Hazard assessment at KCB is undertaken at multiple levels, including at the company, manager/supervisor, project, and employee levels.

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.

Our OHS management system continues to evolve with changes to work environments, geographic locations, regulatory framework and/or market sectors.



## Training & Education in 2024

**\$8.2M**

Invested in  
training

**29,591**

Employee training  
hours

# Industry and Professional Associations



# New Associates

## Alex Mayot, P.Eng.

Alex is a Geotechnical Engineer with fourteen years of experience in engineering consulting and construction within the infrastructure and resource sectors. He has extensive experience in the operation and management of in-pit and ex-pit tailings storage facilities, pit walls, mine waste dumps, surface water management systems, MSE walls, and haul roads as a consultant and member of the mine operator team. Alex has designed and executed numerous geotechnical and environmental site investigations and characterizations across Canada.



## Chris Johnson, P.Eng.

Chris is a Geotechnical Engineer with over a decade of experience in the design and construction of hydroelectric dams, roads, railways, bridges and overpass structures, ports, industrial facilities, mines and tunnels. His design experience covers a variety of soil, rock and groundwater conditions. Chris has taken on various roles including field engineer, design lead, project coordinator and project manager where he has been involved in all project stages from conceptual design to detailed design, site investigations and construction.



## Diana Alvarez, P.Eng.

Diana Alvarez is a Senior Water Resources Engineer with over eighteen years of international experience in consulting engineering in the areas of hydropower and mining. During her career, she has worked on hydrology and hydraulic water modelling projects for mine sites located in extreme weather environments including arid, tropical and sub-Arctic, adapting traditional hydraulic designs to the unique conditions of each site. She has led water balance modelling projects throughout the mining lifecycle and collaborates with multidisciplinary teams to optimize water management.





# New Associates

## Jay Johnson, P.Eng.

Jay is a Civil Engineer with twelve years of experience primarily on hydroelectric, highway, railway, mining and industrial building projects. His hydrotechnical design experience includes Computational Fluid Dynamic (CFD) modelling, transient analysis, spillway, tunnel and intake design, river hydraulic analysis, erosion protection, flood routing, flood frequency analysis and energy modelling. Jay is proficient with civil design, construction monitoring, site inspection, project scheduling, quantity/cost estimating and project management.



## Nat Gullayanon, P.Eng., P.E., C.P.Eng.

Nat is a Senior Geotechnical Engineer and project manager with twelve years of experience in tailings dam safety and construction, including concept-level to detailed design, performance monitoring, construction support, risk assessment, and dam safety review. He also has experience in geotechnical numerical modelling, advanced site investigation and laboratory testing, and project management. Nat has worked on various projects across Canada, the USA, Ecuador, and Mongolia.



## Vicki Nguyen, P.Eng.

Vicki has fourteen years of experience working as a Geotechnical Engineer in Alberta and British Columbia. She has been involved in a wide variety of projects that include tailings dykes, dam facilities, commercial and residential buildings, retaining walls, and transportation infrastructure. As part of these projects, she has completed advanced numerical and deformation modelling, calibrated constitutive model parameters, characterized materials based on relevant data, conducted probabilistic seismic hazard assessments, completed slope stability and seepage modelling, and performed liquefaction assessments.



# Indigenous Collaboration

## NAIDOC WEEK

From July 4 to July 14, our Brisbane office proudly celebrated National Aborigines and Islanders Day Observance Committee (NAIDOC) Week. Embracing the impactful theme, “Blak, Loud, and Proud,” the week highlighted Indigenous identity, drawing attention and fostering meaningful dialogue in support of Australia’s Aboriginal and Torres Strait Islander communities. To raise awareness and share knowledge, the office launched a week-long email campaign, featuring highlights on art, culture, and influential figures from these communities.



## National Day for Truth and Reconciliation

In recognition of Canada’s National Day for Truth and Reconciliation, we were honoured to welcome Shelley Joseph (Hekwa’gila’owgwa), a member of the Kwakwaka’wakw Nation and founder of the Ladders to Kindness organization, to present to KCB. Shelley shared her powerful lived experience as a First Nations woman and offered insights into Indigenous history, Canada’s colonial legacy, and the ongoing impact of the residential school system. Her presentation invited each of us to reflect on the personal meaning of reconciliation, challenging us to consider our individual roles in supporting this journey. Shelley left us with the Kwak’wala word “Namwayut,” which means “we are all one”—a message of unity that resonates deeply in our shared commitment to fostering understanding and empathy.



# Prosperity

## IN THIS SECTION

*Giving Back*

*Research & Development*



## Giving Back

KCB has long recognized the importance of giving back to our local communities and have for many years donated generously to numerous local charities. Our employees continue to make a positive impact in their communities, volunteering their time, fundraising and raising awareness for causes that they care about.

Over \$140,000  
donated to United Way in 2024



For over 30 years, KCB has proudly partnered with United Way (UW) to support local communities across Canada. Throughout the year, our staff raise donations for the UW's work, fundraising for the organization's Period Promise campaign, as well as hosting an annual KCB donation drive in the Fall. Staff donations are matched dollar for dollar by KCB.

\$10K

Raised by employees  
for local charitable  
initiatives

200+

Hours volunteered by  
employees



### Calgary Foodbank

KCB's Alberta Young Professionals came together at the Calgary Food Bank, dedicating their time and effort to support the local community and make a positive impact.



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### Meewasin's 42nd Annual Clean Up Campaign

Our Saskatoon office proudly joined Meewasin's 42nd Annual Clean Up Campaign, working to preserve the natural beauty of the Meewasin Valley, a nearly eighty-kilometre stretch along the South Saskatchewan River that offers a cherished destination for outdoor enthusiasts.



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### Norman Creek Clean-up

Volunteers from the Brisbane Water Engineering team joined forces with the local Bushcare group at Morehen Flats to weed the bushland along Norman and Kingfisher Creeks and help transform once desolate inner-city creek banks into a lush green space.

### Daisy Hill Conservation Park

Geotechnical engineers and engineering geologists from our Brisbane office took time away from their desks to support volunteers at Daisy Hill Conservation Park, collaboratively hand-pulling invasive Lantana bushes and enjoying fresh air, good company, and the satisfaction of making a positive environmental impact.



### Nature Reserve Clean Up

The York office team spent their day enhancing Clifton Backies Nature Reserve to create a welcoming space for visitors while supporting local wildlife, including voles, kingfishers, frogs, and toads.

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# Research and Development

KCB supports scholarship programs at universities including the University of British Columbia, University of Northern British Columbia, University of Alberta, University of Calgary, and Imperial College London. We also partner with universities around the world to support research and innovation in engineering and geosciences that helps address some of our industry challenges.

Scholarship Name	University/Association
The Klohn Crippen Berger Scholarship in Memory of Walter Shukin	University of British Columbia, Department of Civil Engineering
Earle Klohn Graduate Scholarship in Geotechnical Engineering	University of Alberta, Faculty of Engineering
Klohn Crippen Berger Undergraduate Scholarship in Civil Engineering or Geology	University of Calgary, Schulich School of Engineering
Sheri Plewes Scholarship for Women in Engineering	Engineers and Geoscientists BC
Geotechnics MSc Industrial Bursary Scheme	Imperial College London, Department of Civil and Environmental Engineering
Klohn Crippen Berger Award	University of Northern British Columbia





Institution	Research Project
Australian Centre for Geomechanics (University of Western Australia)	Red Mud Research
University of Toronto	Characterization of Slurry Deposited Tailings for Static Liquefaction Assessment
University of British Columbia, University of Waterloo, Queens University	Canadian Tailings Dam Breach Research (CanBreach)
Georgia Institute of Technology, Colorado State University, University of California, Berkeley, University of Illinois Urbana-Champaign	TAILENG Research
Queens University	Geosynthetic Liners in Mining Applications
British Columbia Institute of Technology	Pledge commitment for Technical Lab

# Projects

## IN THIS SECTION

*UN Sustainable Development Goals*

*Geohazard Change Detection Research Project*

*Downtown Flood Barrier and Public Realm Improvements*

*Reducing Uncertainty in Long-Term Void Water Quality Predictions*

*Senex Atlas Stage 3 Gas Project – Impact Assessment*

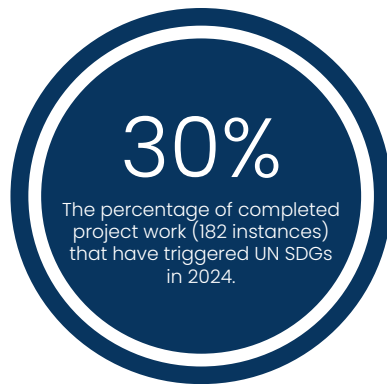
*Rogue Creek Sediment Trap and Culvert Rehabilitation*

*Galloping Goose Regional Trail Bridge Improvements*

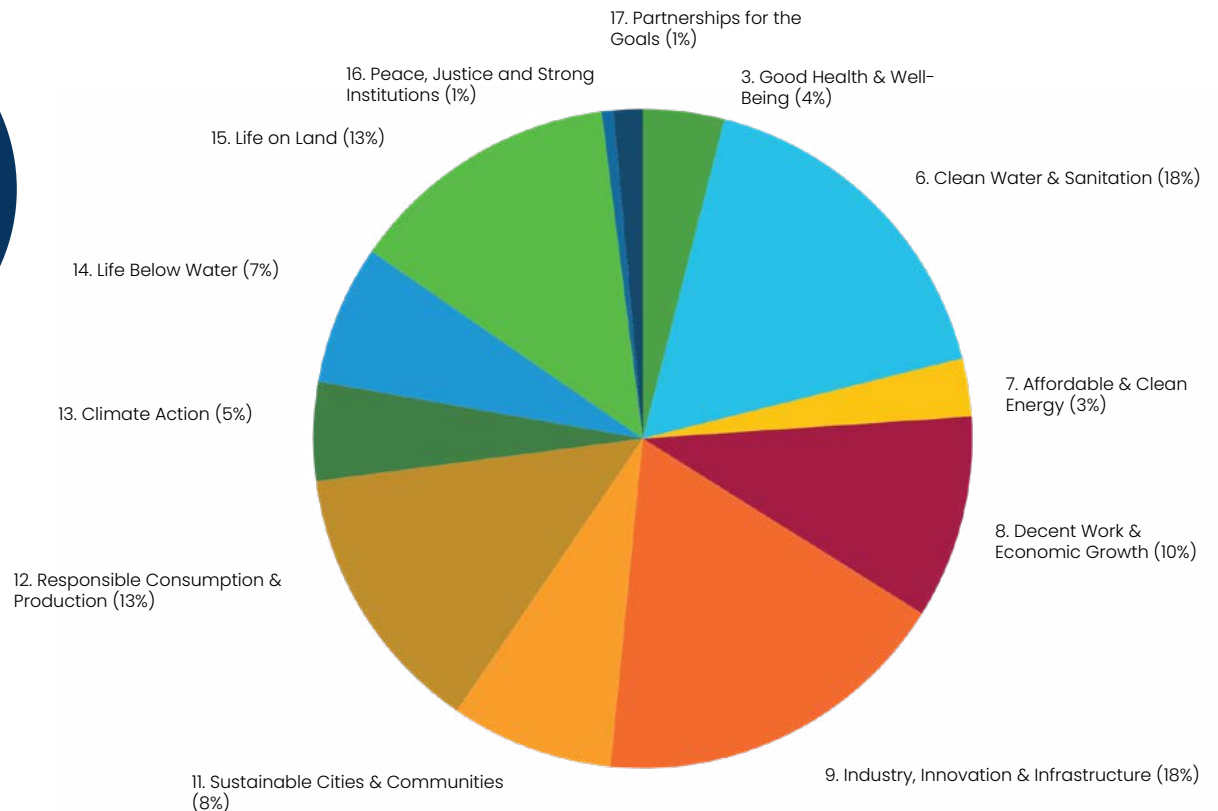
*Ok Tedi Mine Tailings Management Study*

# UN Sustainable Development Goals

Adopted by the United Nations in 2015, the 17 Sustainable Development Goals (SDGs) provide a global blueprint for addressing the world's most pressing social, economic, and environmental challenges by 2030. These goals aim to create a sustainable, equitable, and prosperous future for all people. At KCB, we align with the UN's SDGs, looking for ways to contribute to them in our operations and integrate their principles into our project work.



To date, our projects have aligned with 12 of the 17 SDGs, totalling 182 individual instances where an SDG was triggered. Notably, we have made significant contributions to Clean Water & Sanitation (17%), Industry, Innovation, and Infrastructure (18%), and Responsible Consumption and Production, reflecting our commitment to addressing critical global challenges.





# Geohazard Change Detection Research Project

ALBERTA, CANADA



## AWARD

CEA Award of Merit – Studies, Software and Special Services

Alberta's sustainable economic growth relies on the continued operation and construction of safe and efficient economic corridors. Geotechnical assets—such as soil and rock slopes, retaining walls, embankments, and subgrades—are crucial to the functioning of transportation networks. However, deteriorating conditions, rising maintenance costs, and potential catastrophic failures of these assets pose significant threats to the transportation system.

Recognizing these challenges, the Alberta Transportation and Economic Corridors (TEC) through its Geohazard Risk Management Program (GRMP), oversees the identification, classification, investigation, monitoring, assessment, prioritization, and repair of more than 500 active geotechnical sites across Alberta's highway network.

These sites include natural and constructed soil and rock slopes, earth embankments, retaining walls, and subgrade issues like frost heave, swelling, settlement, erosion, and sinkholes. Highway geohazards not only endanger public safety but also threaten the stability and reliability of transportation networks, leading to far-reaching economic, social, and environmental impacts.

To enhance TEC's geohazard management strategy, KCB and the University of Alberta (UofA) partnered to establish a dedicated research program with TEC. This initiative focuses on evaluating geohazard monitoring techniques, improving risk management practices, reducing environmental footprints, and minimizing impacts beyond the highway right-of-way.





In 2018, KCB managed and identified a need for improved monitoring techniques for large geohazards in the Central and Southern regions of the GRMP (later expanded to the Grande Prairie South region in 2021). To address this, a collaborative multi-year research project was established to study and pilot various remote-sensing technologies that could enhance geohazard monitoring and optimize the management of selected GRMP sites. The investigated technologies proved to be effective, economical, and practical, avoiding many disadvantages of traditional in-situ instrumentation programs. The project also included a technology and knowledge transfer component, benefiting graduate students and other professionals who have since joined the industry in Alberta.

A notable milestone was the installation of differential Global Navigation Satellite System (dGNSS) units at site S005 (Chin Coulee landslide site near Taber), marking the first use of this technology in Alberta. This was soon followed by other applications of Geocubes and other dGNSS units (including low-cost dGNSS Arduino system units fabricated in-house by KCB) at other landslide sites including at the Hwy 49 landslide at the Little Smokey River bridge. KCB also utilized other innovative monitoring methods for change detection monitoring of slopes including:

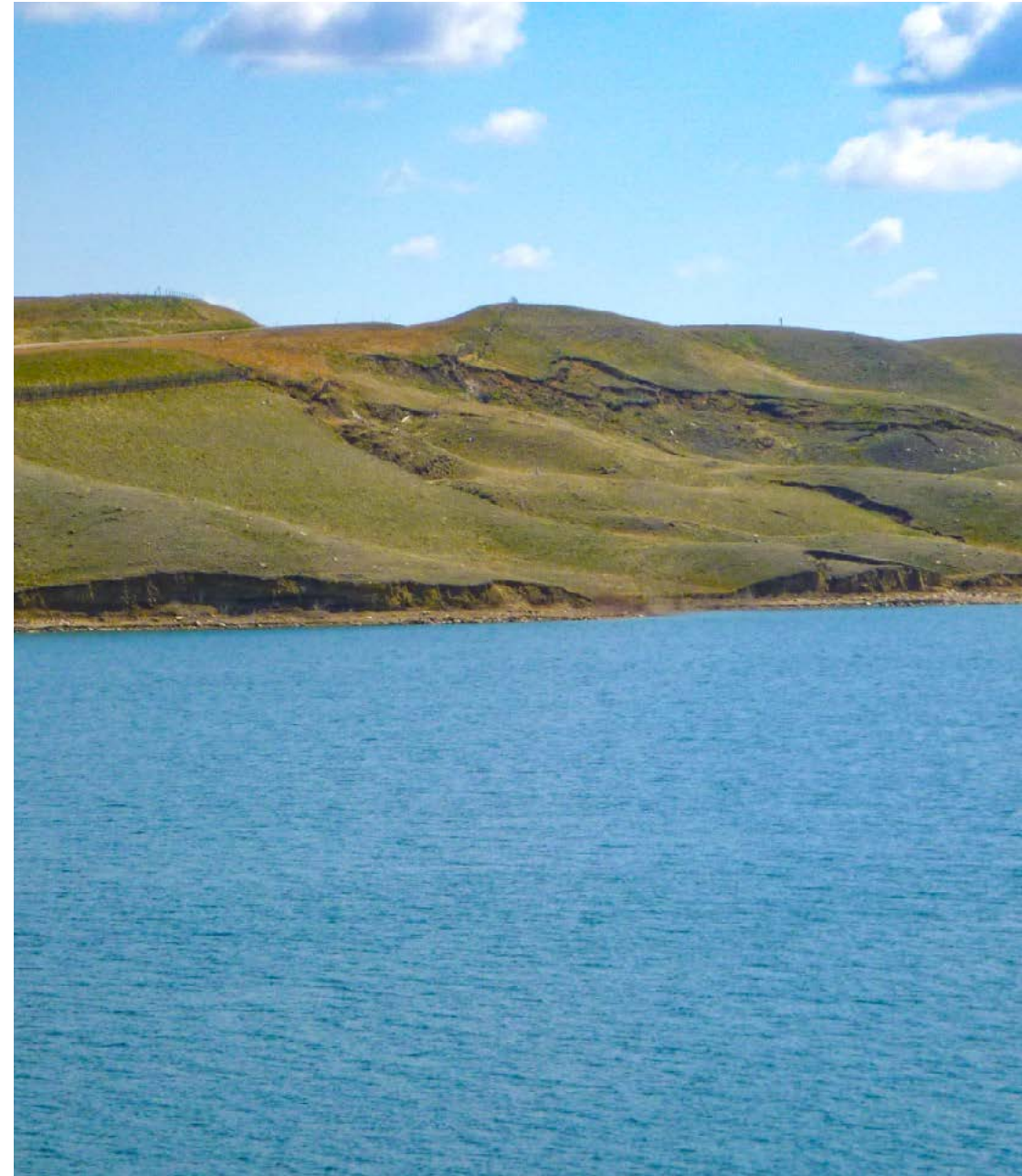
- Light Detection and Ranging (LiDAR) – a remote sensing method using laser scanning, conducted from the ground or via airborne methods
- Interferometric Synthetic Aperture Radar (InSAR) – a satellite-based remote sensing method
- Ground-based InSAR – radar remote sensing method conducted from the ground; and
- Drone or unmanned aerial vehicle (UAV) – based ultra-high-resolution photogrammetry and thermal imaging.



Comparing these models over time highlighted zones of slope movement across the entire geohazard area, not just at discrete instrument locations. These technologies enable objective evaluation of large-scale geohazards, leading to improved decision-making and mitigation design compared to conventional instrumentation programs. With remote-sensing and real-time data-logging capabilities, these methods reduce or eliminate the need for repeated physical access to sites for installation and data collection.

Traditional geotechnical drilling and instrument installation require drill rig access, resulting in tree clearing, disturbance of natural habitats, and adverse environmental impacts. They also necessitate temporary field authorizations and private landowner permissions, leading to schedule delays and additional costs. In contrast, the innovative technologies deployed by the research project are low-impact methods that involve minimal disturbance during installation—using hand tools and field crews without heavy equipment—or require no physical access at all through remote sensing.

These researched technologies significantly reduce the carbon footprint associated with conventional drilling and installation and can be redeployed at different sites. Real-time monitoring of remote locations is feasible using relatively low-cost GNSS units made from off-the-shelf components, further reducing the carbon footprint by minimizing site visits. This enhances the environmental sustainability of geohazard monitoring approaches, leading to practical and effective reductions in environmental impacts.







# Downtown Flood Barrier and Public Realm Improvements

ALBERTA, CANADA



**AWARD**

CEA Award of Excellence – Community Development

To date the June 2013 flood on the Elbow and Bow Rivers located in Calgary, Alberta has been the costliest natural disaster in Canadian history. The extensive damage to one of the province's major economic drivers led The City of Calgary to conduct a Flood Mitigation Measures Assessment which concluded that a combination of watershed-level, community-level and property-level flood mitigation measures be pursued to reduce Calgary's flood risk. This assessment became the foundation of Calgary's Flood Resilience Plan.

At the same time, The City was addressing high downtown office vacancies through a Downtown Strategy, which included revitalizing the public realm along the Bow River's south bank and Eau Claire area, a historical centre of Calgary's social and economic development for over 130 years.

In 2014, in alignment with The City's Flood Resilience Plan, a Downtown West Eau Claire Park revitalization project that focused on pedestrian and cycle pathway improvements was expanded to include a flood barrier between Peace Bridge and Eau Claire, completed in 2018. To further enhance flood mitigation and public realm improvements for downtown communities, The Downtown Flood Barrier & Public Realm Improvements (DTFB) Project was commissioned and included extending the flood barrier from Eau Claire Plaza to Old Reconciliation Bridge.

Construction of the DTFB project commenced in 2021 and was completed in 2023. The DTFB involved integrating a sheet pile and earth fill flood barrier within a revitalized public realm, which included a new platform for the Prince's Island lagoon, a new pathway under Centre Street Bridge, gaps in the flood barrier (with temporary stop logs) to allow access and drainage, and new pathways and cycle paths. The new flood barrier protects downtown Calgary against flooding during a 1:200-year event.

For the first time on a City of Calgary project of this scale, two-dimensional modelling of the Bow River was implemented. KCB calibrated this model against data collected from the 2013 flood, predicting lower river levels than previous one-dimensional models allowing for a lower flood barrier design. A hydrogeological analysis revealed a net groundwater gradient away from the Bow River, partly due to the dewatering system in basements and parkades, which further reduced the required barrier size and environmental footprint by reducing the amount of steel that was fabricated, transported, and installed for the project.

The project required constructing a retaining wall within the Bow River. A fish and fish habitat

assessment led to recommendations to install riprap micro spurs to improve fish habitat and to construct a cofferdam to isolate instream works from the Bow River during the restricted activity period. Baseline studies documented the condition of vegetation, soils, wildlife, fish, and aquatic habitat, informing a Biophysical Impact Assessment that detailed the existing environment, potential project effects, and necessary mitigation measures. Over 300,000 plantings were incorporated to restore native riparian vegetation and enhance biodiversity. Public spaces were designed to educate people about interacting with natural systems in urban environments.

The Bow River is one of the primary landmarks in the Calgary area and has been used since time immemorial by the original stewards of the land. Recognizing the Bow River's significance to Indigenous communities, the project included perspectives from seven First Nations in the area and the Métis Nation. The team contributed to a comprehensive traditional land use study across Calgary. On-site infrastructure features Elder interviews (accessed via QR codes) on bookend signs within the project space, which shares information with the public that The Nations wish to share.







# Galloping Goose Regional Trail Bridge Improvements

VICTORIA, BRITISH COLUMBIA



**AWARD**

ACEC-BC Award of Excellence

The Galloping Goose Regional Trail (GGRT) is a 55 km multi-use corridor managed by the Capital Regional District (CRD), spanning between Victoria and Leechtown, British Columbia. With 3.8 million annual visits, the trail serves as both a recreational asset and an active transportation route. To maintain safety and accommodate increasing usage, the CRD initiated a bridge improvement project targeting four aging structures on the trail.

In 2018, KCB was engaged to assess 13 trail bridges and develop a capital management plan. By 2021, detailed designs for key improvements were approved, and by 2023, the Bilston Creek Bridge #1 and #2 replacements, Veitch Creek Bridge foundation rehabilitation, and Charters Trestle deck replacement were completed—all within a budget of \$2.5 million. Each project presented unique challenges, including environmental sensitivities, archaeological concerns, and trail use disruptions.

The Bilston Creek Bridge replacements were designed to meet future hydraulic demands from climate change and increased future user volumes. With the project sites generally located in urban areas with high amounts of public exposure, strict adherence to the environmental and cultural management plans was vital to the project. Prefabricated structural steel plate girders, full-depth precast concrete deck panels and prefabricated galvanized steel barriers were selected for the superstructure to minimize the construction schedule and reduce impacts to the public.

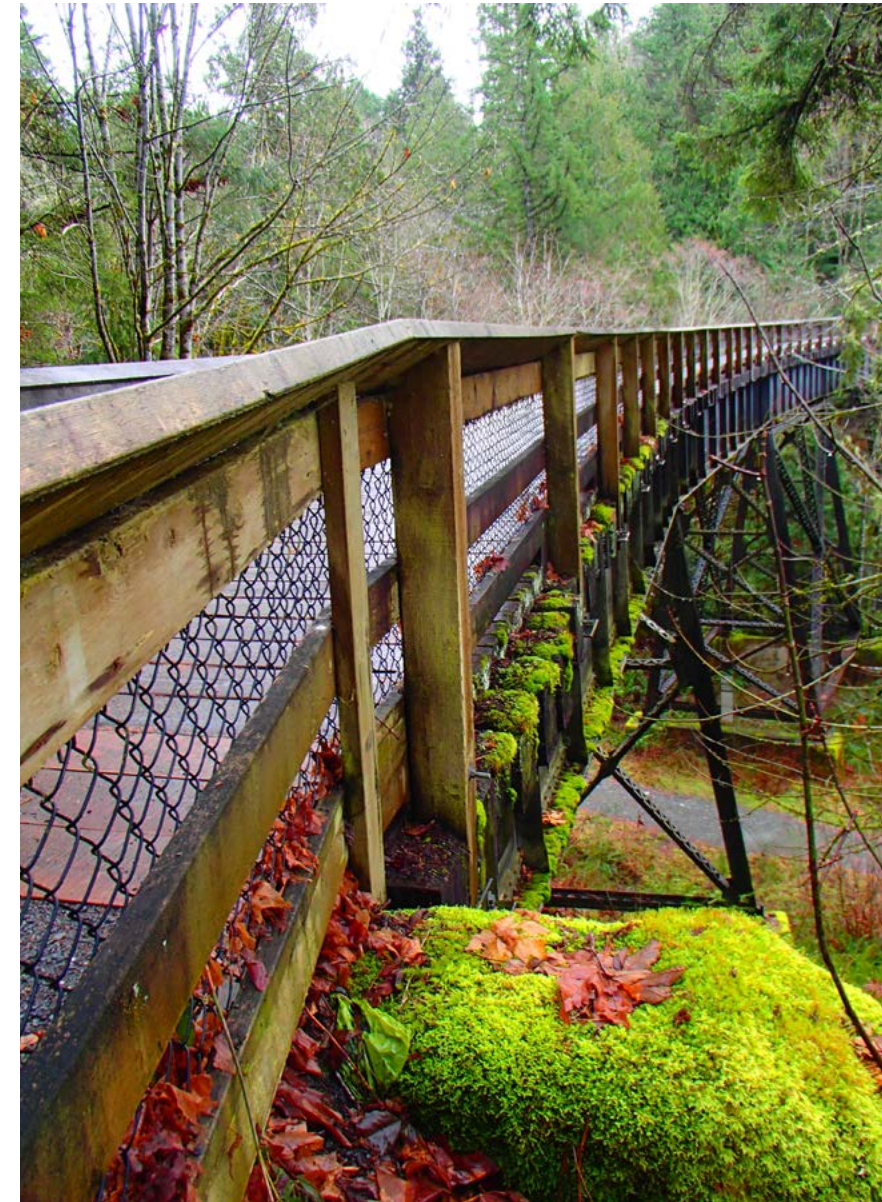


The Veitch Creek Bridge rehabilitation addressed scour under three of the pier footings. Repairs involved placing cast-in-place concrete under the piers and installing cut-off walls to prevent future scour. Sensitive construction techniques were implemented to minimize ground disturbance at the archaeological site and the tidally influenced creek habitat. The work was divided into two carefully planned diversion phases. During the first phase, a bypass pipe allowed streamflow and fish passage to be maintained while two of the piers were repaired, with fish salvage operations in place. In the second phase, the remaining pier was repaired as the flow and fish passage were reinstated adjacent to the repaired piers. This staged approach, combined with full-time environmental monitoring, ensured that disruptive instream work was performed during the least-risk construction window, minimizing impacts on aquatic ecosystems and fish populations.

At the Charters Trestle, the deck replacement preserved the historical character of the converted railway trestle while ensuring ongoing public safety. Design and construction of the Charters Trestle deck replacement was phased to allow for deck panel removal, subdeck inspection, and deck panel reinstatement to be done concurrently, which reduced the time the trestle was closed to the public.

Minimizing disruption to trail operations and the surrounding community and limiting environmental and archaeological disturbance were key objectives throughout the project. This was achieved through extensive public engagement and communication, and collaboration between stakeholders—including utility owners, Indigenous groups, and regulatory agencies. The completed bridges now provide safe, resilient, and accessible crossings, preserving the GGRT as a vital recreational and commuter route.

The project was recognized with the 2024 ACEC-BC Award of Excellence for projects under \$2.5 million.



# Reducing uncertainty in long-term void water quality predictions for final void management

QUEENSLAND, AUSTRALIA



Current mining operations are facing community and regulatory pressure to rehabilitate voids for post-mining use. Leading practice for closure of final voids requires that water quality changes over centuries are predicted with reasonable certainty so that post-mining use(s) can be assessed, and post-closure objectives can be met. This is particularly relevant to Australian coal mines with the introduction of legislation that requires new mines to undertake progressive rehabilitation as mining proceeds.

In final voids (i.e. post-mining pit lakes), water quality is influenced by various factors including climate, surrounding terrain, and the contributions of surface water and groundwater. For coal mine final voids, there are significant uncertainties in understanding the physical and chemical properties of the spoils which are often deposited in these voids, and how the spoils interact with pit lake water.

Predictive models have been built for evaluating and managing risks associated with pit lakes and evaluating post-mining use. A comprehensive multidisciplinary approach coupling hydrology, hydrogeological and geochemical models has been utilized in those models. The project conducted sensitivity analyses to test geochemical, hydrological, physical and climatic controls on long-term void water

quality predictions based on scientific justification and project understanding. It highlights the significant role of a field-lab load scaling factor and geochemical characteristics of spoils regarding the long-term final void water quality prediction.

A list of ongoing monitoring items was recommended based on the project outcomes in support of reducing uncertainty in long-term pit lake water quality predictions for final void management.

The project highlights key environmental parameters in reducing uncertainties of long-term pit lake water quality prediction (e.g. climatic conditions and geochemical characteristics of rocks). The project also recommends monitoring items that future final void management teams can focus on regarding long-term void water management, as well as supports the development of environmental values of pit lake systems, lowers long-term mine closure costs, and eventually maximizes benefits to different stakeholders, including the post-mining land users and the broader community. A publicly accessible report has been made available to increase awareness and knowledge sharing of sustainable development in the community.



# Senex Atlas Stage 3 Gas Project – Impact Assessment

QUEENSLAND, AUSTRALIA



The Atlas Stage 3 Gas Project (the Project) covers an area of approximately 98 km<sup>2</sup> and is located approximately 10 km southwest of the township of Wandoan in the Western Downs Region of Queensland. Wandoan is the centre for local cattle and wheat industries.

The Project is located within the Upper Dawson River sub-basin, which is part of the Fitzroy River Basin. Key watercourses within the Project area include Woleebee Creek and Wandoan Creek. Watercourse flows in the Project area are characteristically ephemeral and episodic in nature.

Senex Energy Pty Ltd (Senex) proposed to develop, operate, decommission, and rehabilitate new coal seam gas (CSG) wells and the infrastructure in the central part of the Surat Basin in Queensland. The proposed production activities include the installation of up to 151 CSG wells and their connection to gas and water gathering lines, water separation and treatment facilities, water management facilities and the associated infrastructure.

The target units for CSG production for the Project is the Walloon Coal Measures (WCM), a formation within the Surat Basin. The Surat Basin forms part of the Great Artesian Basin (GAB), which comprises several aquifers and aquitards. Aquifers of the Surat Basin are a significant source of water for public use, agriculture, stock and domestic supply, with the majority of water being used for stock and domestic purposes in the vicinity of the Project.







Senex required federal approval to progress with the project as it activated the 'water trigger' under Australia's Environment Protection and Biodiversity Conservation Act (EPBC Act). A water resources impact assessment was prepared to accompany Senex's EPBC Act Referral for Project Atlas to the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW). The Project was assessed by both DCCEEW and the Independent Expert Scientific Committee (IESC), which provides independent advice to DCCEEW.

KCB undertook an assessment which considered the potential impact to water resources and water-dependent assets under the EPBC Act, as a result of the proposed Project activities. The assessment has been conducted with reference to the relevant Significant Impact Guidelines and the Independent Expert Scientific Committee (IESC) on Coal Seam Gas and Large Coal Mining Development information guidelines for proponents preparing coal seam gas and large coal mining development proposals.

Groundwater Dependent Ecosystems (GDEs) within the Project area include stygofauna, and potential terrestrial GDEs associated with the alluvium. These could be impacted by groundwater level drawdown or deterioration of groundwater quality, if the alluvium was connected to underlying units.

To assist Senex with the understanding of the hydraulic connection between the alluvium and the underlying Surat Basin units, drilling and monitoring bore installations were completed across the Project area in early 2023. Eight monitoring bores were installed as adjacent pairs at four locations: four bores installed in alluvium, and four in underlying Surat Basin units (Springbok Sandstone and Westbourne Formation). There are 669 registered existing potential groundwater bores within the Project boundary and in the 25 km buffer zone outside of the Project. Potential impacts considered included excessive drawdown in groundwater levels at water supply bores and deterioration of water quality.



Subsidence was also considered as a potential impact of the project. Should subsidence occur it could have an effect on infrastructure, buildings, rivers and streams, farm irrigation systems, and aquatic ecosystems. If the water used by nearby landowners for domestic, stock, and irrigation purposes are impacted negatively by the mining activities, the livelihoods of the farmers could be impacted.

The field investigations provided both hydraulic and hydrochemical evidence to support the interpretation that these units are disconnected, and evidence includes water level data and water quality/isotope data.

As part of this assessment, KCB also conducted a thorough review of all existing monitoring data and provided the client with a comprehensive water resource monitoring plan which includes groundwater quality and level trippers, Trigger Action Response Plans (TARPs) as well as various mitigation measures to mitigate risk of unacceptable harm to the environment or water users.

KCB evaluated the potential impacts against the guidelines and criteria mentioned above, and provided the client with detailed comments and rationale regarding the potential impacts that would alter the water quality, hydrogeological characteristics (i.e. low regime, inter-aquifer connectivity, groundwater levels). The assessment concluded that the project will not have a significant impact on water resources.

In July 2024 the Project gained environment approvals from DCCEEW to progress.





# Rogue Creek Sediment Trap and Culvert Rehabilitation

COQUITLAM, BRITISH COLUMBIA



Rogue Creek is located approximately 1 km from the Buntzen Lake park entrance gate and is conveyed under Sunnyside Road through a pair of Corrugated Steel Pipe Culverts. Sunnyside Road is the main access road from the entrance gate to the Buntzen Lake Public Use Area (PUMA) and connects to Powerhouse Road, the only land access to the Buntzen Dam and powerhouse. Historically, the creek channel upstream of the culverts was excavated during periodic maintenance to remove sediment build-up and improve channel conveyance. After environmental concerns over the disturbance of natural habitat, upstream channel dredging of this nature is no longer performed.

During heavy rain events, road washout was a significant concern as large amounts of debris and gravel were transported toward the culverts. Regular channel dredging maintenance was necessary to mitigate the risk of losing entry to the Buntzen Dam and powerhouse. Additionally, both culverts exhibited severe corrosion of the inverts, with some areas being completely corroded. The sediment trap would allow for future maintenance to be limited to the area immediately upstream of the culverts, without disturbing the area's natural surroundings. By collecting the sediment into a defined basin, it minimizes the impact of dredging long-term. The sediment trap was strategically laid out to avoid tree clearing and bank excavation. Natural materials were selected for the sediment trap to increase visual appeal for park users.

Following an assessment of culvert rehabilitation and replacement options, a cast-in-place concrete liner was selected as the preferred solution. The rehabilitation of the culvert will extend the life of the infrastructure and prevent future erosion, while being a cost-effective solution that reduces the risk of potential road closure.





# Ok Tedi Mine Tailings Management Study

## WESTERN PROVINCE, PAPUA NEW GUINEA

Ok Tedi Mining Ltd (OTML) is proposing to further develop the copper-gold Ok Tedi Mine located in the Star Mountains region of the Western Province, Papua New Guinea near the Indonesian province of West Papua. The mine began operating in 1981 and currently processes about 60,000 to 70,000 tpd of ore, producing copper/ gold concentrate for market and mill tailings waste.

Mill tailings currently go through a desulphidisation process, referred to as the tailings processing plant (TPP), and remove a high sulphur-content (pyrite) concentrate (PCon) bi-product. Under current operations, the desulphidised tailings known as TPP tailings or simply “tailings” are considered non-potentially acid forming (NAF) and discharged into the nearby Ok Tedi system. The PCon however is potential acid forming (PAF) and is transported as a slurry by pipeline to a permanent storage facility at Bige. The PCon slurry is deposited sub-aqueously in engineered pits on the banks of the Ok Tedi, located at Bige about 120 km south of the mine.

The Lower Ok Tedi Dredge Project commenced in March 1998 to alleviate floodplain die-back by reducing river bed levels, and thereby reducing the frequency of over bank flooding. The dredged NAF sediments removed from the Ok Tedi channel are placed on engineered stockpiles on the east and west banks of the Ok Tedi. On the

west bank this cover NAF material is required to limit acid rock draining (ARD).

KCB in Australia is assisting OTML with the evaluation of the technical feasibility and cost associated with construction of an on-land tailings storage facility (TSF) to stop riverine tailings disposal at the Ok Tedi Mine. The study considers PCon (PAF tailings) and TPP tailings (NAF) being transported via pipelines to a TSF site at Ok Birim located on the western bank of the Ok Tedi about 60 km south of the mine. The PCon at the Ok Birim TSF will be stored sub-aqueously within TSF cells using a very similar methodology to that applied at the Bige stockpiles. The TPP NAF tailings will be cycloned to generate a coarse-grained cyclone sand material which will be used to raise the external TSF embankments. The TPP tailings spigotted upstream of the TSF embankments will envelope the PCon storage cells to maintain saturation of the PCon and reduce the potential for oxidation long-term.

The technical studies will advance to feasibility level during 2025 and the TSF is scheduled to receive tailings during 2030. The dredging of alluvial sediments is scheduled to cease around 2032 which will bring the OTML operation in line with the ICMM Mining Principles.



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	About the report	President's Message – Pg. 11 Energizing our Future: A Path to Sustainable Growth – Pg. 16
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Core Metric	Disclosure	Location/Comment
<b>People</b>		
<b>GRI 405-1b</b>	Diversity and inclusion	People – Pg. 27
<b>GRI 405-2</b>	Pay equality	At KCB, we are committed to equality and opportunity for all employees regardless of race, nation of origin, religion, sex, marital status, physical disability. All decisions regarding compensation are determined based on an individual's qualifications, job performance, and external market data. Employees are offered a robust compensation package which includes a competitive salary, benchmarked against the industry and reviewed annually.
<b>GRI 202-1</b>	Wage level	
<b>GRI 408-1b, 409-1</b>	Risks for incidents of child, forced or compulsory labour	We do not hire factory workers or manufacturers and very rarely hire labourers. KCB does not hire sight-unseen subs to conduct labour work. The sub-consultants and subcontractors whose services that KCB engages are of a very low likelihood for this type of risk. KCB identifies such risks and potential mitigations through applicable procedures. All subs are required to agree to abide by our Code of Conduct.
<b>GRI:2018 403-9a&amp;b, GRI:2018 403-6a</b>	Health and safety	Pg. 30
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GRI 401-1a&b	Absolute number and rate of employment	People - Pg. 27

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.  Prosperity - Pg. 37
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.



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