"On account of the fact that there is no glory attached to the foundations, and that the sources of success or failure are hidden deep within the ground, building foundations have always been treated as stepchildren, and their acts of revenge for lack of attention can be very embarrassing.

LEONOFF

NIGERIA

CANADA

Harvey McLeod in Nigeria, 1975

AUP

STRONG GFaundations

Arvind Dalpatram in East Timor, 1977

2018 – 2019 Sustainability Report

Klohn Crippen Berger

Klohn Crippen Berger people are working in some of the most complex and specialized areas of geotechnical engineering. They work on dams all around the world. They work with some immense mine-tailings projects for the mining industry.

Their clients go to them because of their expertise in the fields that they're in. Whether they have problems with dams, groundwater problems, structural geotechnical problems, mine-tailings problems, whatever it is, they're known in the industry for solving those problems. They are seen as being at the forefront of the field, and being thought leaders.

> JIM STAMATIS, CHIEF EXECUTIVE OFFICER OF Louis Berger Group (now WSP Global), 2017



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Len M. Murray, P.Eng., P.E. President and CEO



From the President

or the past two years, we've been working with author Katherine Palmer Gordon on a large to the the Palmer Gordon on a legacy book telling the history of Klohn Crippen Berger (KCB). This new book builds on Cyril Leonoff's book published in 1991: A Dedicated Team. The new book Strong Foundations: The Klohn Crippen Berger Story 1950-2020 will mark our 70th anniversary in 2020.

The book spans 70 years of KCB's people and projects, beginning in the 1950s with our four founding companies: Pitt Polder Ltd. in 1950, Ripley & Associates in 1951, Louis Berger in 1953, and Crippen Wright Engineering in 1954.

In reading the draft manuscript, it strikes me that the challenges our founders faced in those early decades are very similar to the ones we face today. We may use different engineering and scientific tools and communicate at the push of a button or a swipe of a finger, but the company's Strong Foundation is still based on trust. That is the trust of our clients, our employees, our industry colleagues and the public.

Taking the title of our upcoming book Strong Foundations as the theme for this year's Sustainability Report, we report on our corporate governance, our people and their involvement in the scientific community and industry associations, and some of our recent projects showcasing sustainability in our design.

COMPANY UPDATE FOR 2018-2019

ECONOMIC IMPACTS: The year 2019 marks 20 years since we registered our Quality Management System to the ISO 9001 standard. I have no doubt that by instilling a culture of quality in the way we manage our



business and our projects, we have benefited our clients and provided a Strong Foundation for launching and supporting the notable careers of many of our employees. The product of this success is strong financial performance built on respect and trust in our technical solutions.

ENVIRONMENTAL IMPACTS: In reading our history, environmental sustainability has always been a Strong Foundation of our business commitments. We continue to meet the increasing demand for environmental services as part of complex infrastructure development projects in a changing landscape of social and regulatory acceptance. By keeping on top of the regulations and guiding industry best practices, our scientists help clients implement engineering design in a sustainable way.

I continue to be impressed by the creativity and energy of our employees, and the diligence of our clients. Our story since 1950 has been about doing things right, being self-aware and learning from experience. KCB is as strong as ever, built on a Strong Foundation of excellence and innovation.

I welcome your feedback on our 2018-2019 Sustainability Report at lmurray@klohn.com



Vancouver office staff. 2018

SOCIAL IMPACTS: We recently migrated to the new international standard for occupational health and safety - ISO 45001, replacing OHSAS 18001. Building on a Strong Foundation of quality management, we applied riskbased thinking to the safety and health of our employees and those we work with. It was a natural transition for us, and the impact is a workplace where the well-being of our staff is respected, and we encourage our people to speak up if something does not seem right.

Company Outlook



his report follows the Global Reporting Initiative's (GRI's) Sustainability Reporting Guidelines - the international reference for sustainability reporting - and is the disclosure of KCB's performance related to selected environmental, social and economic topics (or "Standard Disclosures"). Each report section is mapped to the corresponding GRI Standard Disclosure listed on page 29.

REPORT SCOPE

This annual report is for KCB's stakeholders, including our employees, clients, shareholders, industry peers and the public. The scope of this report includes material information from our global operations from July 2018 to the date of publication in July 2019.

Where available, we include comparative historical data to demonstrate trends, following on from our previous report published in June 2018.

REPORT FOCUS

In this report, we focus on the sustainability of our operations and highlight the sustainable attributes of five of our recent projects in Canada.

We report on the progress of our operations under the following categories:

- ♦ About Us
- ♦ Performance Summary
- ♦ Strong Foundations
- ◊ Our Projects
- Our Communities

If you have any questions or comments, please contact us at info@klohn.com.



Hidden Valley Mine, Papua New Guinea, 2019

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Topics included in this report are selected based on interactions with our invested stakeholders: our employees, clients, shareholders, industry peers and the public. Report content is also influenced by thirdparty stakeholders such as industry associations, the scientific community, government and regulatory agencies, and the communities where we work. Our stakeholder engagement activities are listed below.

EMPLOYEES

- ♦ Employee meetings
- ♦ Employee feedback surveys ♦ Employee reports on ethics or conduct ♦ Safety reports

CLIENTS

Ripley, Klohn & Associates, 1963

ower tunnel, BC, 1991

Brisbane office staff, 2018

ing

- ♦ Client feedback surveys
- ♦ Pre-qualification surveys
- ♦ Project requirements
- ♦ Contract requirements
- ◊ Participation on client technical review boards

SHAREHOLDERS

♦ Shareholder meetings ♦ Annual general meetings ◊ Shareholder reports on ethics or conduct

- ♦ Partnering agreements
- ♦ Subcontractor agreements ♦ Industry association participation
- ♦ Scientific research and sponsorship

GOVERNMENT AND REGULATORS

- ♦ Regulatory committee participation
- ◊ Adherence to employment and labour regulations

PUBLIC COMMUNITY

- ♦ Public consultation for projects
- ♦ Volunteer initiatives
- ♦ Sponsorship of community events
- Ocompany donations to charities and community groups

INDUSTRY PEERS AND SCIENTIFIC COMMUNITY

Adherence to occupational health and safety, and environmental laws ◊ Adherence to laws governing engineering, geoscience and other disciplines

- 4 -

CB is an award-winning engineering, geoscience and environmental consulting firm with offices in Canada, USA, Australia, Peru, Brazil, 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.



Resolution Copper Project, Arizona, 2019



FEE REVENUE BY COUNTRY

65%	CANADA
13%	AUSTRALIA
7%	PAPUA NEW GUINEA
6%	USA
3%	PERU
2%	ECUADOR
4%	OTHERS
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CORPORATE GOVERNANCE

KCB's Board of Directors consists of three members nominated by the employee shareholders and three members nominated by WSP Global. The Board of Directors appoints the President, who in turn appoints the Operating Committee, an advisory group which meets quarterly to review company performance.

CORPORATE GOVERNANCE COMMITTEES

♦ Operating Committee ♦ Audit Committee Risk Assessment Committee ◊ Project and Proposal Monitoring Committee ◊ Global Quality, Health & Safety and Environment (QHSE) Group ♦ Pension Committee ◊ Donations Committee

VOLUNTEER COMMITTEES

◊ Joint Health and Safety Committees ♦ Sustainability / Environmental Committees ◊ Women-in-Klohn Committees ◊ Young Professionals Committees

INTEGRATED MANAGEMENT SYSTEM

KCB's business is governed using an integrated management system (IMS) consisting of quality, health and safety, and environment procedures. This system steers our business conduct, the way we undertake our projects, and how we interact with our clients, the community and the environment.

Our IMS meets the requirements of the ISO 9001, 14001 and 45001 standards, which promote good behaviour, while keeping us honest through regular audits. We regularly assess the effectiveness of our IMS by carefully listening to client feedback, seeking input from employees and others we work with, conducting audits and inspections of our activities, and reviewing progress of all our active projects each month. We believe that this approach leads to strong client satisfaction, high employee engagement and the continued success of KCB.

BUSINESS CONDUCT AND ETHICS

KCB's success, including our ability to positively impact invested stakeholders, depends upon the integrity of our employees, the quality of our services, and on the trust and confidence of the people we work with. We are guided by KCB's Charter, a moral compass for our daily work.

We conduct our business ethically, with integrity and honesty, and reinforce this expectation in our Code of Business Conduct and Ethics for employees, and for subconsultants, subcontractors and suppliers. Violations of our Charter or Code of Conduct may be reported to our Ethics Officer who reports directly to KCB's Board of Directors.



KCB Marks 20 years of ISO registration including registration to the new ISO 45001 standard for occupational health and safety



Performance Summary



CB's performance and impact on our stakeholders is reported in terms of selected economic, social and environmental metrics and results.

LEGAL COMPLIANCE

In this report, we confirm that KCB continues to comply with applicable employment, occupational health and safety, and environmental laws and regulations, including regulations related to professional engineering, geoscience and environmental services. KCB has no pending court orders or fines related to non-compliance with these legal requirements.



Disclosure on our economic impact on clients, employees, shareholders, local communities, and business partners, including subconsultants, subcontractors and suppliers.

COMMUNITY INVESTMENTS

§ In 2018, KCB employees donated over \$38,000 to the United Way, which was matched by the company, for a total donation of over \$77,000.

Since 1992, employees have donated \$502,000 to the United Way, matched dollar-for-dollar by the company.

◊ Across our offices in 2018, we donated over \$82,000 to various charitable organizations and fundraising events.

CANADA'S BEST MANAGED COMPANIES - II YEARS

For the 11th consecutive year, KCB is one of Canada's Best Managed Companies, recognizing our continued financial success, effective strategic planning and commitment to improvement.

PSMJ'S CIRCLE OF EXCELLENCE - TOP 20% OF COMPANIES

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 for every year since 2009.

EMPLOYER OF CHOICE

For the 4th 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.



BEST

MANAGED

COMPANIES



employed in 2018 (CAD) Paid out





-7-

Platinum

member

HEALTH & SAFETY

SAFEST EMPLO SILVER WINNER KCB promotes a proactive safety culture by encouraging employees to report safety observations, near miss incidents and incidents resulting in injury, illness or property damage (minor losses). The statistics below are from 2018.



KCB was presented with a Silver award at the 2018 Canada's Safest Employers Awards in the Mining and Natural Resources category. Canada's Safest Employers awards recognize companies from across Canada with outstanding accomplishments in promoting the health and safety of their workers.

We are very honoured to receive this award. We strive to continually improve our HSE system in collaboration with our employees through training, measurement of our performance, sharing of lessons learned, and annual reviews of the effectiveness of our HSE system. I would like to thank all our employees for their commitment to health and safety. I would also like to thank our clients for their continued support and inspiration in helping us develop our safety culture.

Len Murray, President and CEO

TRAINING & EDUCATION

\$1,280,000 invested in training

\$2,600 invested in training per employee



employees involved in

a mentoring program

FIRST NATIONS SUPPORT

KCB has established a scholarship fund of \$2,000 per year at the University of Northern British Columbia (UNBC). This scholarship will encourage indigenous residents of British Columbia to enroll in engineering, environmental or mining services studies at UNBC.

KCB has also agreed to work with Engineers and Geoscientists British Columbia on a pilot project to develop a series of training sessions for its members and the public on how to develop respectful relationships when collaborating with First Nations groups.

AUSTRALIA STAFF ENGAGEMENT SURVEY

Our engagement survey 'How's it going Australia?' was the first engagement survey specifically for our Australasia business unit. We have baseline information from previous engagement surveys; however, these were reported at the company level. We surveyed staff in October, approximately six weeks after moving into our new office, to see how people were feeling about the move. Approximately 60% of our staff responded, and the results were shared at the annual strategy sessions. Following this feedback we are improving how we track employee resourcing on projects, establishing graduate programs for continuing professional development and improving data management, among other items. A clear message from employees is to keep our unique culture. Based on this success, we'll run the survey again in October 2019.

Disclosure on our impact on natural systems, including our paper and energy consumption, and our move to use less paper. Per-person data is based on full-time equivalent employees at year end. Our goal for 2019 is to reduce our paper consumption by 10% compared to 2018, based on sheets per person.



KCB RUN CLUB AT THE BRISBANE OFFICE

Every Wednesday • Prizes every week • We also hike!



ENVIRONMENTAL IMPACTO

Materials used by weight/volume





MARY-JANE PIGGOTT, P.ENG. REGIONAL MANAGER, NORTH AMERICA, MINING ENVIRONMENTAL GROUP

Mary-Jane Piggott has been appointed as the Mining Environmental Group's (MEG's) first Regional Manager of North America. Mary-Jane is a senior water resources engineer with 20 years of experience in investigation, design and project management of mining, civil and water resource projects. Under this new role, Mary-Jane will manage all of MEG's offices in Canada and USA.

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RON BRAAM

Ron is a senior mechanical engineer with 27 years of experience in hydroelectric power generation, with broad experience in both mechanical and electrical hydroelectric equipment and systems. His extensive experience covers assessments, design, operations and maintenance.

KIMBERLY CHAN

Kimberly has 15 years of structural engineering experience in the design and analyses of hydroelectric and transportation facilities. Her experience includes the design, rehabilitation, retrofit and analysis of intake structures, stilling basins and spillways, dam stability analyses, caisson gate and intake tower seismic studies, and the design of penstock and bifurcations using finite element analysis.

MIKE CHIN

Mike is a design-build practice leader with 30 years of experience in engineering, construction, and management of transportation and infrastructure projects. His experience includes significant transportation, industrial and infrastructure development projects. He has consistently been involved in design-build and public private partnership projects since 1995 as a designer, contractor and procurement advisor.

JIM HEASLOP

Jim is a senior civil/water resources engineer with 15 years of experience in managing water engineering and water resource projects in the mining and infrastructure sectors. His experience includes planning, risk management and water infrastructure design for projects from the approval stages and over the life of the project.





Strong Foundations

n this section we highlight our newly appointed Regional Manager and Associates, as well as how we support our employees. We also focus on our partnerships with various universities and our support for industry associations.

ASSOCIATES APPOINTED IN 2019

Emma Hill

Emma is a geological engineer with 15 years of experience in engineering geology and geotechnics in the Canadian mining and UK engineering consulting sectors. Her experience includes construction supervision, earthworks, tailings dam design and dam safety, site investigation program planning, ground modelling and geotechnical design.

DAVID JOHNS

David is a senior geotechnical engineer with 15 years of experience in the design, construction, auditing and monitoring of hazardous, industrial and mine waste facilities. He has worked on tailings dams, water dams, and waste rock dumps in Africa, Australia and Papua New Guinea.

LANCE PARSONS

Lance has 10 years of experience in mechanical and electrical design, product selection, commissioning and inspection. He has experience with several hydropower projects, including design, cost estimating, site inspection, construction monitoring, and project technical review. He is also familiar with materials testing and analysis, and industrial safety procedures.

JONATHAN SANDERS

Jonathan is a senior environmental scientist with 10 years of global consulting and onsite project experience in the hydropower and mining industries. His experience includes environmental management systems, mine closure planning, environmental assessments and permitting.

GREENER CHOICES IN OUR OFFICES

We are always looking for ways to reduce our impact on the environment in our offices.

Our Brisbane employees recently moved to a new open plan office which is flooded by natural light and enhanced by motion-controlled lighting. The group also started a recycling program and implemented a check-in system for visitors using a tablet.

In the Vancouver office, we phased out single-use plastic utensils in the kitchen, replacing them with reusable metal utensils. We also started recycling hard hats by sending them to a facility that converts hard hats into plastic pellets for manufacturing new products.

In our offices in Alberta, we launched the Office Supplies Zero Waste Box. This initiative by TerraCycle's Zero Waste Box program means that our Edmonton and Calgary offices now recycle office supplies, diverting this waste from local landfills.



risbane office, 2018

SUPPORTING OUR YOUNG PROFESSIONALS

Our offices in British Columbia, Alberta and Australia have reinvigorated their Young Professionals groups, who meet frequently in a casual setting to network, collaborate and focus on topics related to professional and technical development.

SAFETY AND HEALTH WEEK

KCB participates every year in the North American Occupational Safety and Health Week, an important annual celebration focusing on preventing injury and illness and advocating for safer workplaces. This year we organized activities for staff across several of our Canadian offices, including safety trivia games, safety lunch and learns, an ergonomics workshop, and individual ergonomic assessments.



Alberta business unit Vice President Dave Mack kicks off Safety & Health Week at the Calgary office, 2019

T O A S T M A S T E R S C L U B

In 2018, KCB started a local Toastmasters Club to help staff develop and improve their presentation and communication skills. Club membership dues are paid for by KCB.



Vancouver Young Professionals, 2019

WOMEN IN KLOHN - DIVERSITY AND MENTAL HEALTH WORKSHOP

Seven years ago, KCB established a Womenin-Klohn (WiK) group, with the aim to attract, retain, engage and support women working at KCB. Since 2012, the group has participated in over 30 events, including community support activities, networking sessions and mentoring initiatives. Women at KCB continue to take on leadership roles as Associates or group leads, or as mentors to others in the Company. In 2018, WiK was recognized by the Alberta Women in Science Network for supporting and encouraging women in the STEM fields (science, technology, engineering and mathematics).

Every year, WiK hosts a global workshop or networking event, and all employees are invited to attend. In 2018, the workshop topic was stress and mental health, and the value of diversity and inclusion in the workplace.



Toastmasters in action in Vancouver, 2019



KNOWLEDGE SHARING

Laval University

Imperial College UK

for Geomechanics (ACG)

University of Queensland

Waterloo / Queen's University

University of Toronto

University of Alberta

UK Space Agency (HR Wallingford)

Queen's University

In April 2019, we held a webinar to share our knowledge of how geochemistry should be integrated into the design and management of mine waste facilities. The webinar, presented by Dr. Brent Usher, senior hydrogeochemist and Associate at KCB, explained the fundamentals of mine waste geochemistry and acid mine drainage. He also described several case studies illustrating the interface between geochemistry and engineering design.

The recording of this and all our other webinars are available at https://www.klohn.com/webinars/

DAM SAFETY FOR MINING DAMS AT ICOLD 2019

Andy Small, P.Eng., one of our senior geotechnical engineers led a one-day workshop offered by the Canadian Dam Association (CDA) on dam safety for mining dams, held at the ICOLD (International Commission on Large Dams) 2019 conference. This workshop covered topics from the CDA's Bulletin on Application of Dam Safety Guidelines to Mining Dams, and other guidance on tailings dams, including the role of the Engineer of Record in a dam safety management system. Participants had the opportunity to share updates on international guidance for mining dam safety.











Existing service flip bucket spillway and

ndoned service spillway heritage site, 2019

St. Mary Riparian Turnout

he St. Mary Dam Riparian Turnout project located near Lethbridge, Alberta, was initiated by Alberta Environment and Parks and sponsored by Alberta Transportation. It is an ancillary project to the St. Mary Dam Low Level Outlet (LLO) Valve Replacement project, which is to replace two valves (a 1.8 m diameter guard valve and 1.5 m diameter hollow jet valve) at the end of their service life. KCB was contracted by Alberta Transportation to develop a plan to replace the valves, which is scheduled to take place in the summer/fall 2019.

Water released from the dam's LLO supplies riparian flows into the St. Mary River. The LLO will be temporarily shut down while the valves are replaced. KCB designed a "riparian turnout" or diversion to supply water to the river during valve replacement, and aligned the diversion along an existing water pipeline conveyance to minimize disturbing native vegetation and soils.

The St. Mary River valley is a designated Key Wildlife Biodiversity Zone by the Government of Alberta, partly because it is as an important over-winter deer habitat. In consultation with Alberta Environment and Parks, KCB established an adaptive monitoring plan to mitigate the potential impacts of construction activities on deer during the winter.

As part of the project's environmental evaluation, one of our wildlife biologists determined that the site is also suitable habitat for nesting cliff swallows. During construction, the contractor hired a wildlife biologist to periodically inspect for nesting migratory cliff swallows and trained construction crews to identify the birds. Using this adaptive wildlife monitoring plan, the team avoided costly work shutdowns and bird nesting deterrent measures.

During construction, rather than using polymer silt fencing, which is typically used once and discarded, the construction crew installed biodegradable straw wattles for temporary erosion and sedimentation control. Wherever possible, in situ materials were excavated, salvaged and reused, reducing the quantity of primary manufactured materials. The salvaged and reused materials included polyvinyl chloride (PVC) and corrugated steel pipes (used for surface water cross drains), precast manholes, and steel bollards used as vehicle barriers. All other existing infrastructure, including extra precast manholes and PVC pipes, were salvaged for other projects. Unsalvageable or damaged concrete structures were broken down and the steel rebar and concrete recycled.

Skins Lake Spillway Repairs



- RCB SUSTAINABLE PROJECT ATTRIBUTES
- D3 Design to improve safety conditions
- E1 Responsible water management
- E2 Special consideration for flora and fauna
- E3 Rehabilitation





he Skins Lake spillway regulates the level of the Nechako Reservoir, about 200 km east of Prince George, in British Columbia. The spillway was constructed in the early 1950s as part of the 1,000 MW Kemano Hydroelectric Project, which generates electricity for Rio Tinto's Kitimat Aluminium Smelter.

The original spillway was constructed on bedrock located between two earthfill saddle dams. Following its commissioning, a natural plunge pool developed bordered by a resistant bedrock ridge at one end. This bedrock ridge caused water to flow laterally, causing erosion near the toes of the saddle dams. Between 1991 and 2000, the rate of erosion increased, because significant flows from the Nechako reservoir were continually released through the Skins lake spillway to meet fisheries requirements. Further erosion also occurred during flood events, threatening the integrity of the saddle dams and the spillway. In 2000, a new spillway plunge pool was constructed to prevent further erosion at the toe of the saddle dams and to dissipate the energy from the released flows.

In 2018, the plunge pool was dewatered for inspection and KCB was hired to design its repair using computational fluid dynamic modelling to compare water velocity patterns with results from analyses in 2000. KCB recommended applying fibre-reinforced shotcrete with rock anchors.

In 2019, the spillway repair was put out to tender and a contractor selected for the twomonth construction program. The spillway flows will be diverted though a bypass pipe, to dewater the plunge pool. The rock faces will be prepared or scaled, anchors installed, and fibre-reinforced shotcrete will be applied. KCB will be on site to observe the construction.

KCB's design and construction planning for the plunge pool repair needed to account for the bird nesting and salmon spawning seasons, while maintaining minimum flow releases. Fish trapped in the plunge pool during dewatering will be salvaged and taken downstream according to the approved dewatering plan.



Iskut Project

Johnny Mountain Mine Reclamation



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he Iskut Project is located northwest of Stewart, British Columbia, Canada. The property includes the former Johnny Mountain mine, an underground gold mine which operated from 1988 to 1990, and for a brief period in 1993.

The tailings storage facility (TSF) at the mine is a 10-hectare pond containing potentially acid generating (PAG) tailings. In 2018, mine owner SnipGold (a subsidiary of Seabridge Gold) started a five year multi-million-dollar reclamation and closure plan for the dormant Johnny Mountain mine.

SnipGold's plan is to reduce the long-term dam safety risk while maintaining or improving discharge water quality from the facility. The aim is to reduce the potential for metal leaching (ML) and acid rock drainage (ARD) from waste rock located in the portal pad areas, access roads, air strip, and other locations.

The long-term closure objectives for the TSF are to:

- ◊ maintain long-term tailings and waste rock stability (physical and geochemical);
- ◊ centralize long-term placement of potential ML/ARD material;
- ◊ develop a closure strategy that balances technical, regulatory and fiscal requirements; and
- ◊ minimize long-term maintenance requirements.

KCB researched the options for closing the TSF, including ways to safely store PAG rock. We performed a dam safety review of the TSF and helped improve the instrumentation and monitoring program. KCB continues to complete annual dam safety inspections following regulatory requirements.

Mine Environment Neutral Drainage (MEND) Study of Tailings Management Technologies





KCB SUSTAINABLE PROJECT ATTRIBUTES

E1 Responsible water management

> Advancement in research and technology



Mine site, northern British Columbia, 2017



CB completed a study for the Mine Environment Neutral Drainage (MEND) Program to examine and compare alternatives to storing mine tailings as

a conventional slurry. Conventional slurries have a high water content which require ongoing monitoring and management through the life of a mine. First, we identified the types of tailings dewatering processes used in Canada and in other jurisdictions with similar climatic conditions; and second, we compared the risks of each technology in terms of its strengths, limitations, and physical and environmental impacts.

When designing tailings management facilities and processes, the risks to public safety and the environment are paramount. In our study, we identified the need for tailings management professionals to adopt risk-based thinking and to plan for the entire life of the mine, when selecting the best tailings management strategies.

The report is available at: <u>http://mend-nedem.org/wp-content/</u> uploads/2.50.1Tailings Management TechnologiesL.pdf

Consulting First Nations in Construction Projects A Bella Bella Case Study



KCB SUSTAINABLE PROJECT ATTRIBUTES

- E1 Responsible water management
- E2 Special consideration for flora and fauna
- E3 Rehabilitation
- S2 Design or service to improve social conditions
- First Nations **S**4 integration and application of traditional knowledge

ella Bella is the largest community on the central coast north of Oueen Charlotte Strait, British Columbia, Canada

he remote community of Bella Bella is located on the east coast of Campbell Island, approximately 180 km north of Port Hardy, British Columbia, Canada. Bella Bella's potable water supply comes from the Upper and Lower Kwakiutl Creek Dams.

In 2014, the Heiltsuk Tribal Council (HTC) appointed KCB to design and implement emergency repairs to the Upper and Lower Dams, and to assess if the dams should be upgraded or replaced following contemporary design criteria. The Upper Dam had a significant leak at its left abutment and the Lower Dam's bedrock foundation was eroding. The remedy would involve bringing in a large construction crew to complete the work.

As part of the assessment of the dams, KCB collaborated with HTC and the Heiltsuk Integrated Resource Management Department (HIRMD) to address the potential risks of the construction project. A key opportunity was identified to develop construction management systems that promoted knowledge transfer and reduced the potential for First Nations workers losing their newfound technical skills after the construction project is finished.

KCB developed a construction management system for the project that included a Construction Execution Plan and Construction Environmental Management Plan, which governed the procedures related to the construction phase, including responsibilities for the construction workers. The construction management system was implemented with assistance from a local contractor and newlytrained HTC environmental monitor to measure and record performance during the construction activities.

Lessons learned from the project:

& Local community engagement must be genuine and in person, and throughout the entire lifecycle of the project.

◊ Integration of the local community's vision, values and skills is essential to project success.

◊ Both the project and the local community benefit when local workers are employed for their tacit knowledge and experience, and when new skills are transferred to workers from the host community.

◊ Planning for construction projects must consider the social and environmental impacts on a community, including how newly trained workers can apply their skills when the project ends.





ince 2015, KCB has donated to a variety of charities, educational institutions, sporting activities and associations. Of the approximately 120 donations, over half were initiated by employees. One of our major charities is the United Way. In 2019, we will hit a significant milestone of over \$1 million in total company and employee contributions since 1992.



ENGINEERS AND GEOSCIENTISTS BC SCIENCE GAMES

KCB was proud to sponsor an interactive science competition where students showcased their scientific talent. Two staff members volunteered at the interschool event organized by Engineers and Geoscientists BC as part of National Engineering and Geoscience Month.

CALGARY PATHWAY AND RIVER CLEANUP

KCB staff from our Calgary office and their guests participated in the annual City of Calgary Pathway and River Cleanup. They hauled a lot of garbage, including interesting finds such as a golf ball, car parts and a truck brake drum. During the cleanup, thousands of volunteers helped remove litter in Calgary's parks and along the city's pathways and river banks.



EPILEPSY AWARENESS DAY

Brisbane staff organized a morning tea to raise funds for Purple Day, an international grassroots effort for increasing awareness about epilepsy worldwide. KCB matched all funds raised.

Australia's Biggest Morning Tea

Staff from our Brisbane office organized a morning tea to raise funds in support of cancer research in Australia.





Staff from our Brisbane office joined more than 13,000 women and men in an annual run, raising funds for breast cancer research and support services.



Movember

In 2018, over \$5,000 was raised to support men's health initiatives; the biggest fundraising year for our Brisbane office to date!

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DESIGN

D2

D3

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kcb sustainable project attributes						
, , , , , , , , , , , , , , , , , , ,		CATEGORY	PAGE(S)			
ENVIRONMENTAL	E1 E2 E3	Responsible water management Special consideration for flora and fauna Rehabilitation	20, 21, 23, 24, 26 20, 21, 26 21, 23, 26			
	S1	Mentoring local neonle				
SOCIAL	S1 S2 S3	Design or service to improve social conditions Transfer of technology	26			
	S4	First Nations integration and application of traditional knowledge	26			
INNOVATION	I1	Advancement in research and technology	24			
	D1	Responsible land use	23			

Through our group-wide dam integrity and safety assurance program, we require our TSFs [Tailings Storage Facilities] to be audited by Klohn Crippen Berger (KCB), one of the world's leading experts on integrity and safety of tailing storage facilities.

https://www.glen

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KLOHN-CRIPPEN 780223 LS

Design to improve safety conditions

Design to reduce, repurpose or reuse remaining materials

20

21,23

GLENCORE (https://www.glencore.com/sustainability/Tailings)

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2018-2019 SUSTAINABILITY REPORT

ISSUED JULY 2019

