



Down to Earth. Up to the Challenge.



IEG CONSULTANTS CLEANING UP NORTH OF 60

IEG Consultants Ltd. (IEG) is the joint venture company between the Inuvialuit Development Corporation (IDC), and Klohn Crippen Berger (KCB). IEG conducts environmental work in the north for territorial, aboriginal and government agencies, as well as industrial, military and petroleum industries. From our office in Inuvik, IEG has developed extensive experience in the Inuvialuit

Settlement Region and our services have now expanded into the Canadian Central Arctic.

For KCB, IEG is imperative to succeed in the north, as Brian Rogers; Vice President Alberta says, 'IEG provides us the opportunity to work closely with northern residents and local businesses within the Inuvialuit Settlement Region on a diverse range of environmental and engineering projects.'

Project work in the north certainly has its challenges! The remote location provides not only unique landscape but unique project scope. Environmental assessments have been carried out on industrial tank farms, abandoned military sites, gas exploration leases, landfills, sewage lagoons and explosive magazines. Sometimes all on one site. Geotechnical studies include assessments of seismic hazards for pipelines and site facilities, landfill stability assessments, borrow sources and the site investigations and foundation designs for offshore drilling platforms sites.

Many of our remote sites are abandoned resource exploration bases or former DEW Line military sites. The DEW Line sites are the Distant Early Warning radar stations that the United States and Canada established in the early 1950s to detect possible bombers entering North American airspace. At the time these sites were operational, environmental stewardship did not have the same...

Continued on next page



Brian Rogers
Vice President, Alberta

Message from the VP

Welcome to the December issue of our Alberta based newsletter. As we reach the end of 2010, on behalf of KCB, I would like to thank you all for your continued support this year and wish you a very Happy Holiday!

Message from the Editor: Many thanks for all your feedback in regard to the launch edition (Summer 2010). Your feedback is valuable to us in order to develop our newsletter. Please keep sending your comments.

~Kirsten Dunbar, Business Development and Marketing Coordinator

Regional profile

... priority that it now commands. Many sites have extensive contamination from heavy metals, fuel, PCBs and general debris, and hazardous materials are often contained in the building materials that were used to construct them. Consequently environmental assessments and monitoring programs at these sites encounter a wide range of contaminants. Field crews sample for all of these substances in either soil, water or the building materials themselves.

Unlike more temperate climates, the thermal regime of the ground plays a dramatic role in the movement of contaminants in soil and groundwater in the north. The thickness of the active layer and stability of permafrost must be kept in mind when conceptual designs, sampling plans, well installations and remedial action plans are developed.

To protect the delicate arctic ecosystem from the wide range of contaminants and remain financially responsible, remediation options for these remote sites must be creative. At some sites landfills are constructed to encapsulate many site materials, while more hazardous materials are hauled away. At other sites, all of the waste may be removed by barge or ice road for disposal at facilities in the south.



Abandoned Transport Barge & Garbage Incinerator, Banks Island

Hydrocarbon contamination of soil is the most commonly encountered environmental problem in the north. At many sites IEG has successfully remediated hydrocarbon containing soils by aeration, bioremediation or chemical augmentation of the soil.

Following remediation, environmental monitoring is often undertaken to ensure that any material disposed of onsite has been successfully encapsulated. IEG has conducted post construction monitoring and landfill assessments at many arctic sites. At most sites soil and groundwater samples are analysed for contaminants of concern, the landfill caps are assessed for signs of failure and the temporal thermal profile of the ground is measured with thermistors.

Half the challenge is just getting there...

Before embarking on field programs, a lot of consideration is given to site history and the possible sources of contamination that may exist on each site. This however is just the start. There are many geographical limitations and facts to consider, not least when the site is 600 km from the nearest town and has no overland road access.



Banks Island Fuel Cache, Johnson Point

IEG field programs succeed on logistics. The season determines the type of travel to the site, by ice road or aircraft. The condition of the site determines the type of aircraft that needs to be used, and the equipment taken is determined by the limitations of the aircraft. A drill rig that doesn't quite fit through the aircraft door or can't be unloaded without lifting equipment won't be much use, and getting through some of the brush could be a problem without a chainsaw!

The challenges of the area are unique and drive IEG to strive for and continuously refine creative, cost effective, workable solutions for their clients. As Sam Bird, Environmental Scientist for IEG says 'Half the fun is just getting there.'

For further details about the services utilized in the north please contact:

*Chris Langton
Manager Environmental
T 403.730.6830 | clangton@klohn.com*

or

*Kirsten Dunbar
Business Development & Marketing Coordinator
T 403.648.4303 | kdunbar@klohn.com*

Did You Know...

- Inuvik is located on the East Channel of the Mackenzie Delta, approximately 100 km from the Arctic Ocean and approximately 200 km north of the Arctic Circle.
- Due to its northern location, Inuvik experiences an average of 56 days of continuous sunlight every summer and 30 days of polar night every winter.
- Access is via the Dempster Highway for the majority of the year. The highway relies on ferries and ice bridges to get across the rivers. It is thus closed during the time of freeze-up (roughly late-October to mid-December), for ice to form and allow ice bridges, and thaw (roughly mid-May to mid-June) to allow the ferry to run. At these times, there is air access only.
- A distinct feature of Inuvik is the use of "utilidors" – above-ground utility conduits carrying water and sewer – which are covered by corrugated steel. They run throughout town connecting most buildings, and as a result there are many small bridges and underpasses. The utilidors are necessary because of the permafrost underlying the town.

UP AND RUNNING IN SASKATOON

The Klohn Crippen Berger (KCB) Saskatoon office opened on July 19, 2010. The office provides a full range of KCB engineering and environmental services to the mining, infrastructure and oil and gas sectors.

KCB has been involved in projects in Saskatchewan on a regular basis. The opening of the office recognizes the need to service our current clients locally, and a growing need for KCB's services in the vibrant Saskatchewan economy.



Joel Hilderman, who leads the Saskatoon office, hails from Wolseley, Saskatchewan. After graduating with a civil engineering degree from the University of Saskatchewan in 2002, Joel joined KCB's Calgary office where he gained experience on water infrastructure, mining and oil sands projects. Joel returned to the University of Saskatchewan in 2008 to complete a Masters degree in Environmental Engineering, conducting his thesis research on infiltration issues associated with mine reclamation surfaces. He returned full time in July 2010.

During 2010, KCB has been contracted for a number of projects in Saskatchewan, including: SaskPower for dam safety review assignments; Shore Gold Ltd. for feasibility level designs for processed kimberlite storage facilities at the Star Orion South Diamond Project; SNC-Lavalin for prefeasibility tailings design at the KP-488 potash project; and by Talisman Energy for projects in western Saskatchewan.

Through our new office, we are committed to sustaining our existing client relationships and to creating long-term client relationships with new clients, where we can add value to Saskatchewan business through high-quality and innovative engineering and environmental solutions.

Case Study: Island Falls Hydropower Project Client: SaskPower, Location: Sandy Bay, Saskatchewan



The 95 MW Island Falls hydropower project is located on the Churchill River near the Manitoba border. It was constructed in stages between 1929 and 1958 by the Hudson Bay Mining and Smelting Co. to provide electricity to its mining operations and to the Town of Flin Flon. The facility was purchased by SaskPower in 1981 and major repairs and upgrading has since been carried out. The project includes the main dam and spillway, powerhouse, A dam spillway, several saddle dams, and the Whitesand Dam and spillway located on Reindeer Lake. The main dam has a maximum height of 24 m and creates a reservoir with approximately 1.7 billion m³ of storage, while the reservoir created by the 10.4 m high Whitesand Dam has 1.7 million m³ of storage.

Klohn Crippen Berger is the prime consultant responsible for performing the annual inspection of the concrete and earth dams, powerhouse, and spillways, and analyzing of instrumentation data.

For further information on the services offered by the Environmental Services Group please contact:

*Joel Hilderman, P. Eng. T 306.974.1520 | jhilderman@klohn.com
Warren Vincent-Lambert, P. Geol. T 403.730.6836 | wlambert@klohn.com*

KCB SUPPORTS TAILINGS RESEARCH



Klohn Crippen Berger would like to extend sincere thanks to everyone who attended our reception hosted in conjunction with the University of Alberta (U of A) at the Faculty of Science on November 8th, 2010.

The collaboration was held to celebrate the opening of the U of A North Lecture Theatres at the Centennial Centre for Interdisciplinary Science. The guest speaker for the evening was

the honourable Dr. Preston Manning who gave a presentation on "Facilitating Innovation". Mr. Manning's talk proved to be very interesting and insightful, and was well received by all.

"The purpose of the Centennial Centre for Interdisciplinary Science is to promote collaboration between the sciences to drive innovation," said Bryan Watts, CEO of Klohn Crippen Berger and University of Alberta alumni. "At KCB, we are strong believers in collaboration and have been integrating social, environmental and geotechnical sciences for over 20 years. Bringing a balanced approach to major projects is the best way to meet the needs of society."

To further support innovation in the sciences, Klohn Crippen Berger presented a gift of \$60,000 to the University of Alberta to be put towards tailings research. "Earle Klohn was a pioneer in tailings dam design in the 60s and 70s," said Bryan. "We feel it's critical to

drive research in this speciality to continue to improve the management of Canada's most important resources."

If you are interested in attending KCB sponsored events such as this please contact:

*Kirsten Dunbar
Business Development & Marketing Coordinator
T 403.648.4303 | kdunbar@klohn.com*



KCB Out and About

Conferences – KCB Sponsored

Event: City of Calgary Partnering with Industry Symposium 2011

Date: January 2011

Location: Calgary, Alberta

Event: Alberta Irrigation Projects Association Conference 2011

Date: February 2011

Location: TBA

Event: CWRA Alberta Branch Annual Conference 2011

Date: April 10-12, 2011

Location: Red Deer, Alberta

Event: 2011 Nunavut Mining Symposium

Date: April 5-7, 2011

Location: Iqaluit, NWT

CEA 2011 KCB Award Submission

A KCB team led by Project Manager Bill Marsh (KCB Edmonton) has submitted an entry for the 15th Annual CEA Showcase Awards based on the Wolf Creek Golf Resort Wastewater Treatment Plant Project. Winners will be announced at the CEA Showcase Awards Gala, February 2011.

CANCOLD

In October, KCB was honoured as one of the original founding members of the Canadian Committee on Large Dams (CANCOLD) and their contribution in advancing the knowledge of dam and their safety. CANCOLD held its inaugural meeting in 1960.



Andrew Brunson, Geotechnical Engineer, CGY

Andrew joins the Oil Sands group from Wales, UK with 7 years in the industry. His experience includes site supervision on the Bargoed Highway bypass (built predominantly on colliery spoil), design of cut & cover tunnels for the Dubai LRT and Cross-Rail (London), and geotechnical analysis of the proposed coastal Eastern Bay Link, Cardiff.

Project Wins

Oil Sands

In 2010 Klohn Crippen Berger continues to provide geotechnical support to a major, global oil and gas company's research of innovative methods for oil sands tailings management. The research is now focused on 'mud farming' and 'atmospheric drying', two new technologies for fine tailings.

Oil and Gas

Klohn Crippen Berger completed site assessments and hydrotechnical evaluations for a series of exposed pipelines in B.C. and Alberta for a major Alberta pipeline company. Our river engineers completed designs of each crossing and will be working closely with construction contractors to implement cost-effective solutions.

Environmental/Oil and Gas

Klohn Crippen Berger was contracted by a major gas company to conduct soil remediation, groundwater assessment, and air monitoring in order to mitigate soil and groundwater impacts associated with the operations at a former facility. This work is part of a comprehensive 15 year plan to remediate and reclaim the site.

Environmental/Oil and Gas

Klohn Crippen Berger designed, managed, and executed baseline and operational soil, groundwater, and air program proposal for a midstream oil and gas company. The purposes of the monitoring programs are to fulfill requirements outlined in the facilities approval.

Awards

Gold at Premier's Award of Excellence Ceremony



Tom Murray (Manager, Geotechnical, CGY) along with team leaders Syed Abbas and Brian Soutar

of Alberta Transportation, were presented with a Gold Award by Premier Ed Stelmach at the Premier's Award of Excellence Ceremony in Edmonton on October 6th. The award was accepted on behalf of the project team for the Carseland-Bow River Main Canal and McGregor Dam Rehabilitation Project. The Premier's Award of Excellence advances best practices within government to continuously enhance programs and services to Albertans. A huge achievement, congratulations to the team!

KCB People

New Staff

We are delighted to welcome all newcomers to KCB, including:

Rob Cheetham, Senior Civil Engineer, CGY

Rob joins the Water Resources and Civil Engineering team with over 16 years in project management. He has experience in urban drainage, catchment management, wastewater analysis, river engineering, flood risk, and design of hydraulic structures.

Kim Kovacs, Environmental Scientist, Lloyd

Kim joins with six years of experience in research on greenhouse gas emission projects, mine site reclamation and revegetation. Kim has also worked at potash, uranium and base metal mines in Saskatchewan.

Daniel McCrank, Environmental Scientist, CGY

Dan has over 8 years of experience in project management, hydrogeology, and contaminated sites. He has extensive experience in environmental site assessments, sitting assessments, drilling supervision, aquifer testing, soil excavations, and groundwater monitoring.

Alberta Calgary T 403.274.3424 | Edmonton T 780.444.0706 | Lloydminster T 780.871.0711

British Columbia Head Office: Vancouver T 604.669.3800 | Castlegar T 250.365.0054 **Ontario** Sudbury T 705.522.1367

Saskatchewan Saskatoon T 306.974.1520 **Northwest Territories** Inuvik T 867.777.8520

International South Brisbane, QLD, Australia T +617.3004.0244 | Kew, VIC, Australia T +61.416.978.955 | Lima, Peru T +51.1.651.1025

www.klohn.com

From the
Ground Up

Kirsten Dunbar T 403.274.3424

To unsubscribe please email: kdunbar@klohn.com



Klohn Crippen Berger