



**LANDFORM  
DESIGN  
INSTITUTE**

# Landform Design Quarterly

## Institute takes message online and worldwide

During the social distancing required to combat the COVID-19 outbreak, the Landform Design Institute (LDI) is embracing virtual alternatives to continue educating mining practitioners and students about responsible mine reclamation.

The Vancouver-based Institute has launched a lecture series consisting of

slides and narration provided by Institute founder Gord McKenna.

The first two lectures are available on the Institute's website, and all six are being offered at the University of British Columbia through courses conducted by Prof. Dirk Van Zyl, a member of the Institute's Technical Advisory Panel.

McKenna and board member Mike

O'Kane have also recorded the first episode of a new landform design podcast series. It is available as a stand-alone recording on the website.

Originally envisioned by O'Kane as a way to interview experts and reach audiences around the world, the podcast now poses as a means of virtual communication during the pandemic lockdown.

These virtual initiatives build on in-person lectures McKenna delivered earlier this year to the Geotechnical Society of Edmonton, and discussions O'Kane led at the University of Minnesota Natural Resources Research Institute.

The LDI is forging ahead with implementing its action plan, including compiling landform design case histories (page 2), soliciting sponsors and members (page 4), producing a landform design textbook, and kickstarting associated post-secondary courses on landform design in Canada and abroad.



**LDI Board Member Mike O'Kane delivered a lecture on landform design at the University of Minnesota earlier this year. In-person appearances are on hold due to COVID-19 restrictions.**

## Making landform design routine worldwide

The Landform Design Institute is dedicated to creating and supporting a community of landform design practitioners. Its intention is to help their teams design and build truly sustainable mining landscapes. Its mission is to make landform design routine in the mining industry worldwide by 2030.





# What works and what doesn't: Toward a compilation of case histories

The Landform Design Institute has begun compiling an unprecedented record of 500 case histories on successes and failures in landform design. The compilation will help practitioners benefit from the experiences of mines worldwide over recent decades. A symposium will be held early in 2021 for contributors to share their experiences, with a call for papers going out later this year. Succinct summaries of these presentations will become part of the compilation. The intent is to illustrate the measures needed to perform landform design effectively and with success. The compilation is slated for completion in 2022.

“Case histories provide invaluable real-world lessons in landform design,” said Gord McKenna, founder of the Institute. “They allow us as students and practitioners to visualize activities at actual mines, to learn what works and what, unfortunately, can fall short in actual mine sites around the world.”

At the Institute’s inaugural landform design course in Edmonton last December, lecturers described dozens of case histories from countless mine sites, covering a full range of landform design activities, including landform grading and surface design, designing groundwater, designing cover systems, effective adaptive management, and monitoring and maintenance. The LDI website profiles some Canadian case histories.

## Sphinx Lake

**Type:**  
Pit lake and watershed

**Company:**  
Teck Coal  
**Location:**  
Cadomin, AB



## Pond 1 Wapisiw Lookout

**Type:**  
External tailings facility

**Company:**  
Suncor Energy Inc  
**Location:**  
Fort McMurray, AB

## Sandhill Fen

**Type:**  
In-pit soft tailings facility

**Company:**  
Synkrude Canada  
**Location:**  
Fort McMurray, AB



Gord McKenna



Dirk Van Zyl

## LDI team to contribute to new tailings standard

Gord McKenna, the founder of the Landform Design Institute, and Dirk Van Zyl, a member of the Institute’s Technical Advisory Panel and a professor at the University of British Columbia, have been invited to submit a chapter on landform design and tailings reclamation for a new international standard for the safer management of tailings storage facilities.

The standard is being developed by the International Council on Mining and Metals (ICMM), the United Nations Environment Programme (UNEP), and the Principles for Responsible Investment (PRI). To coordinate production of the standard, they established a Global Tailings Review Expert Panel, chaired by Bruno Oberle, one year after the Brumadinho dam collapse in Brazil. The standard is expected to be completed this spring. Van Zyl is also a member of the expert panel.

The review evaluated global practices in the mining industry and lessons learned from catastrophic failures of tailings storage facilities, including Brumadinho and Mariana in Brazil, and Canada’s Mount Polley. The standard is expected to include a global and transparent consequence-based tailings facility classification system, requirements for emergency preparedness, and a system for credible and independent assurance of tailings facilities. The standard will become an ICMM company member commitment, along with other sustainable development performance expectations. Co-convening partners in the standard will encourage other companies to join in advocating for it to be broadly accepted.

More information about the review is available at [globaltailingsreview.org](http://globaltailingsreview.org).





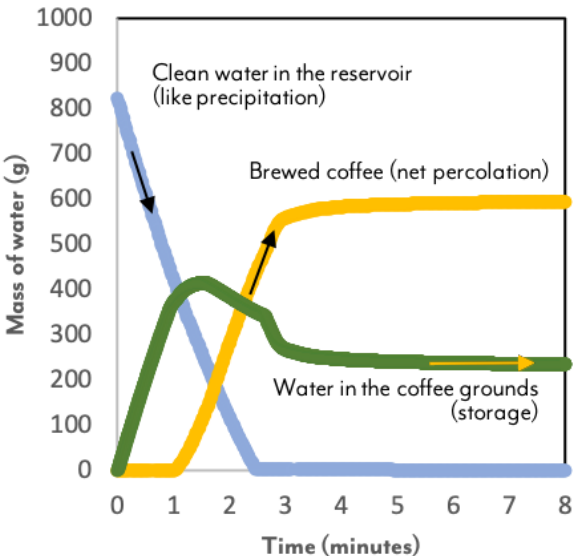
# The great geotechnical coffee experiment



Water flow in the unsaturated zone of cover systems and mine waste isn't always easy to understand. But many are familiar with the process of brewing coffee – the wetting up and drawing down processes in coffee grounds are the same as those in covers and mine waste. To demonstrate these geotechnical processes, University of Alberta's Nick Beier and LDI founder Gord McKenna worked with staff and students in the UofA Geotechnical Lab in early March to perform 28 coffee brewing trials using 12 different coffee grinds (from gravel-sized whole beans to silt-sized Turkish grind). Results of the demonstration are being used to create a conference paper and lectures to teach students and practitioners about unsaturated flow.



**Clockwise from top:** the raw materials; University of Alberta co-op student Abby Paul; graphing the results; research associate Ahlam Abdunabi; comparing the brews; Assist. Prof. Nick Beier.





# Introducing the future of landform design



Students and lecturers at the inaugural LDI-sponsored five-day course in landform design, which was held in Edmonton in conjunction with the University of Alberta. Over 40 professional practitioners from Canada and abroad attended the Dec. 5–10 course, and heard some of the world's leading experts describe revolutionary and sustainable new approaches to mine reclamation.

## ... and an ambitious agenda for the rest of 2020

In the spring, the LDI will be actively seeking sponsors and new members to help support the Institute's ambitious slate of activities, which include completing the new podcast series and lecture series, creation of a textbook and developing post-secondary courses, putting together a compilation of landform design case histories worldwide, and planning for the next landform design short-course.

In recent months, board member Rob Abbott and founder Gord McKenna completed a draft business plan that sets out target accomplishments over the next five years, pending board approval. The Institute is also arranging for its members to lecture to any specific companies, government department or other interested organizations (although the current climate has put in-person lectures on hold).

The first meeting of the full board will take place over the internet

this April. The board is still actively consulting with individuals far and wide to round out its initial membership of Gord McKenna (chair), Rob Abbott, Lois Boxill, Anne Naeth, Mike O'Kane, and June Pollard.

This spring, Institute members intend to begin consulting with mining companies to gauge interest in supporting its varied activities, and a call for membership will also be sent out. Members will gain the advantage of ready access to the member-only portal on the Institute's website that will house research, publications, and presentations on landform design. Meanwhile, everyone is urged to join the mailing list on the Institute's website and follow the organization on social media, including Facebook, LinkedIn, and Twitter.



Rob Abbott



**LANDFORM  
DESIGN  
INSTITUTE**

The *Landform Design Quarterly* is a publication of the Landform Design Institute, a not-for-profit corporation based in Vancouver, BC. All contents are protected by copyright and may be used only for non-commercial purposes. All other rights are reserved and commercial uses including publication, broadcast, or redistribution in any medium are prohibited. Permission to copy may be sought from the Landform Design Institute. © 2020 The Landform Design Institute

### CONTACTING THE LDI

5223 Laurel Drive  
Delta, BC, V4K 4S4  
Canada  
+1.604.838.6773  
info@landformdesign.com

Web: [landformdesign.com](http://landformdesign.com)  
Twitter: @LandformDesign

**Publisher:** Gord McKenna, Landform Design Institute/McKenna Geotechnical Inc

**Editor:** David Wylynko, West Hawk Associates

**Designer:** James Hrynyshyn, West Hawk Associates

**Photos:** Jennifer Stogowski and Gord McKenna; **Illustration:** Derrill Shuttleworth