# Canadian Reclamation

An official publication of the Canadian Land Reclamation Association /
Une publication officielle de l'Association canadienne de réhabilitation des sites dégradés

FALL/WINTER 2025

## CLRA's 50th: Reflections and celebrations

Ask the regulator

Addressing challenges in growth media development for mine rehabilitation and reclamation

Keeping an open mind about herbicide safety in reclamation

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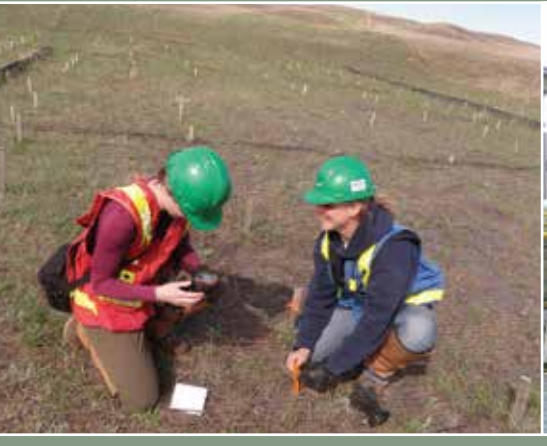

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# National president's message

## KELLY ZADKO, B.Sc., P.Ag.

This year has been an incredible honour as I served as president during the Canadian Land Reclamation Association's 50th anniversary. It has been a time to reflect on our history, celebrate our successes, and look ahead to the future of reclamation in Canada.

In March, I had the privilege of opening the 50th Annual General Meeting along side the president of the Alberta Chapter, Amber Flamand, at the conference in Edmonton, Alberta. The energy in the room was inspiring as members from across the country gathered to share research, best practices, and new ideas. It was a reminder of how our work continues to evolve and how essential collaboration is to the success of reclamation.

Later in the year, I traveled to Guelph, Ontario, to join the Ontario Chapter for their mining conference and their own 50th anniversary celebration. Meeting several founding members of the CLRA, including Sarah Lowe, was a highlight of my presidency. Listening to their stories about the early days of our organization was both humbling and motivating. Their vision built the foundation for the strong national community we are part of today.

While anniversaries invite us to look back, they also challenge us to look forward. The need for reclamation remains greater than ever as we balance development with environmental responsibility. Across the country, CLRA members are leading innovative projects that restore landscapes, support biodiversity, and strengthen communities.

I want to thank our board, chapter leaders, volunteers, and members for your continued dedication. Your efforts make the CLRA not only a professional association but also a community. Together, we will carry this proud legacy forward into the next 50 years.

***Warm regards,***

***Kelly Zadko, B.Sc., P.Ag.***

***President, Canadian Land Reclamation Association***

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The GREEN RETORT

*with* CLRA CORRESPONDENT
Chad Green

# FULL DISCLOSURE

I know you have been a scofflaw a time or two. Driving 110 per cent of the speed limit is an exceedance and you're likely guilty. You changed lanes and before doing so, maybe you failed to signal your intention several seconds prior to veering over. You've probably avoided making a complete stop at the intersection before making a right turn. A complete stop. Did at least one second of zero motion elapse before you proceeded to turn right. A red light is a red light, even when rounding the corner. Aha!

You've also been on a road trip and made it home unscathed. No traffic violations received. No problems. Everything was fine.

Now imagine you have a duty to self report your exact route, speed, lane changes, stops, acceleration rate, and fuel consumption. You incriminate yourself by turning yourself in and promise to do better next trip. In fact, your next trip may even require a management plan proposal and authorization.

Hyperbole? Perhaps. But metaphorically it's not an exaggeration for industry to be highly regulated and legislated to self disclose non-compliances. Adherence is mandatory, and the public expects no less. It's an effective compliance policy model. Except when the industry corporation is at or approaching bankruptcy, in which case, indications of compliance risk will be apparent to the regulator who may intervene.

It follows that clear and sensible guidelines are essential so that expectations are set and can be applied with practical methods. But we work within the environment and environmental practitioners are faced with so called "grey areas" in site conditions and guideline phrasing all the time. Fifty shades of grey? No. Even more. Therefore, using professional discretion and making judgements has inherent risk. Be careful.

Alberta Environment's (1999) Code of Practice for the Release of Hydrostatic Testing of Petroleum Liquid and Gas Pipelines needs a refresh. I disagree with a zero freshwater discharge allowance for bogs. The hydrology regime and vegetation sensitivity is unique in bogs, but why absolutely zero? And there is no mention of discharge to industrial land such as a gravelled yards or stripped (of topsoil) workspace, or exemption of soil sampling in those areas not susceptible or sensitive to minor SAR or pH influences from clean, fresh water. An oversight perhaps? Certainly, it is simultaneously vague and unnecessarily stringent.

The Alberta Environment (2022) Turbidity Monitoring for In-Stream Construction Activities turbidity threshold above background is not well suited to small silt-bottomed watercourses not to mention other instances. Silt substrates can be disturbed simply by fish salvage or setting a pump intake according to plan. This easily causes an insignificant, yet reportable excursion of turbidity. Reportable immediately to the emergency call centre despite the fact the environment is suited to minnows adapted to some silt. This is unnecessarily stringent in many cases.

The Alberta Energy Regulator's (AER) Directive 58 (2025) for oilfield waste management is currently under review for improvement. This is encouraging and an example of setting clear and sensible expectations.

As an industry, contractors and consultants all have to share information, work together, and stay compliant. Regulators will hopefully be pragmatic and maintain reasonable expectations.

I'm going to stuff this into the suggestion box over at the AER.

***In science,***
***Chad***

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# WHY JOIN THE CLRA/ACRSD?

## Reclamation isn't just for scientists in steel-toed boots

By Shannon King, CLRA/ASRD Magazine Committee Chair

Let's get one thing straight: you don't need a PhD in soil science or a hard hat collection to be part of the Canadian Land Reclamation Association (CLRA/ARSD). If you care about restoring land, protecting ecosystems, or just want to hang out with people who do, you're already halfway there. CLRA/ARSD has been a welcoming community to me as a reclamation artist. It is a place where technical experts, students, policy gurus, and everyday advocates come together to share knowledge, spark ideas, and build friendships.

As one wise attendee once said, "I came for the science, stayed for the people, and left with a notebook full of inspiration."



### NETWORKING WITHOUT THE AWKWARD SMALL TALK

Joining CLRA/ARSD opens the door to a network of passionate professionals and curious minds. Whether you're attending a local chapter event, a Lunch and Learn, or the Annual General Meeting (AGM), you'll find yourself surrounded by people who genuinely want to make a difference and who don't mind explaining the difference between a sedge and a shrub.

The 2025 AGM in Edmonton was a prime example. With nearly 1,000 attendees, it was a whirlwind of ideas, laughter, and "aha!" moments. The keynote by Anthony Morgan on The Age of Misinformation had everyone leaning in, and the UofA researchers? Absolute rockstars. The enthusiasm from research associates like Behzad (Benji) Ahvazi, and from Muhammad Irfan (talking about chicken feathers), was contagious. One hand gesture from Stephanie Chute-Ibsen, PhD, (the earth doctor), or Anya Batycky had the entire room suddenly fascinated with soil.

### FEED YOUR BRAIN, FUEL YOUR PASSION

CLRA/ARSD events are designed to satisfy your thirst for learning. The field trip to the University of Alberta during the AGM was a sensory experience – touching soil samples, hearing the buzz of lab equipment, and seeing firsthand how research dollars translate

into real-world impact. It was a reminder that reclamation isn't just theory – it's tactile, visual, and deeply human.

Even if you're not a technical expert, you'll leave these events with a deeper understanding of the challenges and triumphs in the field. And who knows? You might even find yourself inspired to write an article, paint a picture of your reclamation site, start a project, or mentor a student.

## HOW TO JOIN THE PARTY (AND THE MOVEMENT)

Becoming a member is easy: just visit clra.ca and sign up. You'll get access to newsletters, magazines, and invites to events that range from casual coffee chats to full-blown conferences. And don't forget to register early for the 2026 AGM – it's shaping up to be another unforgettable gathering of minds, boots, and big ideas.

So, whether you're a reclamation rookie or a seasoned soil whisperer, CLRA/ARSD has a place for you. Come for the knowledge, stay for the community and maybe even leave with a new best friend who knows way too much about moss.

# CLRA's National Awards

## DR. EDWARD M. WATKIN AWARD — 2024 RECIPIENT: DARREN CHERNIAK

The award is presented in recognition of the major contributions of the nominee to land reclamation, especially through service to foster advances in regulation, reclamation success, or development of personnel or students. The efforts for which the individual is nominated do not need to span a major portion of the recipient's career and may be project focused. A recipient may have made major contributions to CLRA/ACRSD, which has led to the advancement of the association. The recipient may be an individual or agency, institution, or company.

## DR. JACK WINCH EARLY CAREER AWARD — 2024 RECIPIENT: BRODY ANDERSEN

This award honours Dr. Jack Winch principal founder and inaugural president of the Canadian Land Reclamation Association/ Association Canadienne de Réhabilitation des Sites Dégradés (CLRA/ACRSD). The award acknowledges the efforts of early career reclamation professionals.

## IN-TECH RECLAMATION AWARD — 2024 RECIPIENT: MILLENNIUM EMS SOLUTIONS LTD. (MEMS)

The IN-TECH Reclamation Award (formerly the Noranda Land Reclamation Award) is one of three prestigious awards of the Canadian Land Reclamation Association / Association Canadienne de Réhabilitation des Sites Dégradés (CLRA/ACRSD). This award celebrates innovative techniques that advance the practice of reclamation in Canada within any sector of industry (i.e mining, forestry, oil & gas). The award will be presented in recognition of outstanding contributions of the nominee in the areas of professional practice, teaching, research and/or regulatory development as they relate to innovation within the profession of land reclamation in Canada. Nominees should be widely recognized for their contributions in the field of land reclamation. The award can be presented to an individual person.

## ANDREA MCEACHERN MEMORIAL SCHOLARSHIP — FIRST RECIPIENT: SIENNA KOLOCHUK

The award honours Andrea McEachern and will be awarded annually to a candidate that exemplifies volunteerism and initiative in the reclamation/remediation industry.

In her industry, she was a trailblazer in all ways, growing as a strong female leader. She broke barriers and became an incredible mentor to others throughout her career, many of whom credit some of their own success to her paving the way.

## CLRA AWARD COMMITTEE

- Chair – Maria Kudienko
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# REFLECTIONS ON THE CLRA'S ORIGINS AND FOUR OF THE FIRST VISIONARIES

## Presented by Sarah Lowe, Founding Member of CLRA

A big thank you to the organizers for the invitation to your celebration. And congratulations on 50 years of the Canadian Land Reclamation Association!

I would like to reflect on the origins of the CLRA and four of the first visionaries who were involved. Two were academics, one was from industry, and one from government.

### THE COVER CROPS COMMITTEE 1970 TO 1975

It all started in 1970 with the Cover Crops Committee, which met in the University of Guelph's Crop Science department. This group held an annual workshop to discuss research and extension to promote forage crops that could improve unproductive and eroded land. The lands could then be left under the cover crop or used for forage.

Jack Winch was the person who headed up the group, and he is my first visionary.

Jack was an impressive character. He had signed up with the Royal Canadian Airforce in 1939 at the tender age of 18 and served in Canada and the UK during the war. He survived two plane crashes and eventually returned to finish his education at Guelph and Cornell.

By the 1970s, he was a well-dressed, pipe-smoking, rather military gentleman, and his office was just along the hall from mine. He was an expert in forages and was especially interested in increasing the use of the legume Birds Foot Trefoil. He had wide connections throughout North America and travelled to countries as exotic as Inner Mongolia.

The Cover Crop Committee's research and membership also extended to lands disturbed by construction activities (e.g. hydro lines, pipelines and roadsides) and mining.

This leads to my next visionary, Tom Peters, another graduate from Guelph.

Tom was at INCO (International Nickel Company), now VALE, in Sudbury, in the company's agricultural department, and he collaborated with researchers at Laurentian, as well as the group at Guelph.

INCO was testing different ways to revegetate mine tailings and the industrial barrens around the smelters and former roast beds.

Tom was a good company man. He understood the need for some promotion of his reclamation program, and so he made

a film about it. One of the most successful grasses at the time was fall rye. I assume it was Tom who dreamed up the catchy name for the film. Can you guess what he called it?

## "RYE ON THE ROCKS!"

Around the same time, my third visionary came on the scene. This was Ed Watkin, an ecology graduate from Wales.

He was also a research scientist in the Crop Science department, and he was employed under a contract with Noranda Mines in Quebec.

I was doing research on the tropical crop cassava in the same department when Ed Watkin gave one of the department's weekly seminars. I attended out of curiosity, not having any idea what to expect. The subject was this: The Use of Cover Crops to Revegetate Mine Tailings.

The concept was absolutely revolutionary to me, and the seminar was a real "aha" moment: in fact, it became a life-changing experience.

The CLRA was founded in 1975, with the first AGM in 1976, and subsequent AGMs and field trips in Edmonton and Sudbury.

After four years, it became clear the Cover Crop Committee had a wide relevance across Canada and needed to expand. A group of 17 members voted to form a national association at their meeting right here at the Arboretum in December 1975.

And so the Canadian Land Reclamation Association was formed, with Jack Winch as president and Ed Watkin as secretary.

Along with Tom Peters, these names have become iconic in the CLRA, with several awards given in their honour. I believe one is being awarded at this symposium.

The first AGM was also held at Guelph in 1976, with 140 delegates from industry, government and universities. The 60 people who signed up as members in that year (1975-1976) were called charter members (now we're called a founding member).

Then the AGM moved to Edmonton in 1977 (by invitation from ecologist Phil Lulman at Syncrude) and to Sudbury in 1978 (invitation from Tom Peters at INCO). Delegates came from across Canada and the US, including North Dakota and New Mexico.

Field trips were now an essential part of the meetings, and the first two focused on mine reclamation and remediation.

I was very lucky to be working at the Ar-

boretum by then. I had been encouraged to learn as much as I could about land reclamation because the Arboretum had a small pit on site that was to be developed as one of the plant collections, to demonstrate species suited for land reclamation.

The field trips were exceptional. Imagine how exciting it was to fly up to Fort McMurray from Edmonton in 1977 and visit the "tar sands", which had only just opened up a few years earlier.

There were only two companies at that time: the Great Canadian Oil Sands and Syncrude. Both companies were already planning ahead with reclamation staff and facilities and had developed partnerships with government. It was another year before Syncrude began production.

We toured the stabilization of muskeg and overburden "dumps", climbed up huge tailings dikes, inspected test sites to establish trees and methods to control the mice.

The following year, in 1978, the AGM was held at Sudbury. This was a few years after the super-stack had been built at Copper Cliff and the one at Coniston de-commissioned (1972). The field trip featured the establishment of vegetation on tailings ponds, and the industrial barrens surrounding Sudbury. We visited the reclaimed tailings ponds at INCO, with a demonstration of specialized agricultural equipment, and visited the Limestone plant used to neutralise the pyrrhotite tailings at the Falconbridge site.

The tour also included Laurentian's grass trials at Coniston, the tailings reclamation at Denison mines in Elliott Lake, and several revegetation test plots by government (CANMET and MNR).

## AGGREGATES REHABILITATION: A GOVERNMENT VISIONARY

Let's move on to the Ontario aggregate industry and my fourth visionary. The industry was also becoming active in rehabilitation in the 1970s. The industry association (Aggregate Producers Association of Ontario) had already instigated an award program in 1975, as encouragement to its members.

Interestingly, the very first paper given at the first AGM in November 1976 was on rehabilitation of pits and quarries in the UK and Canada. It was by Sherry Yundt, my fourth visionary and a fellow founding member of the CLRA. She later became a director on the national board and eventually the CLRA president.

Sherry was an influential government person in the '70s. She was lands manager in the Division of Mines at the MNR and a geography graduate from Guelph and Waterloo. She had been very inspired by three years in the UK working for their aggregate association and was convinced that their rehabilitation techniques and standards were far ahead of Ontario's!

She was a passionate advocate for good rehabilitation practice and raised the bar significantly by commissioning a series of manuals on various after-uses: recreation, trees and shrubs (which we did here at the arboretum), agriculture, fish and wildlife, and forestry. Throughout her career in government, and later in consulting, she encouraged industry to write cases studies of our work and to travel and learn from others.

(I say our work, because in 1980, I had joined the aggregates industry and was lucky enough to be involved in planning

and rehabilitating many pits and quarries).

## CLOSING THOUGHTS

So those are my recollections on four of the visionaries who helped develop the practice of reclamation 50 years ago, and how our association came about.

A few things have changed over the past 50 years:

- The initial meetings included only a handful of women; now there is a fairly equal representation
- Technology that can potentially be applied to reclamation and remediation has diversified significantly
- Standards have become more demanding and target much more sophisticated end uses
- Specialized consulting firms have developed to advise and implement reclamation and remediation
- The association has expanded to include chapters in all provinces, with annual meetings and field trips, and collaboration with other organisations.

But much remains as originally conceived half a century ago!

The CLRA is an organization that includes researchers and practitioners, in a wide variety of disciplines. We are still learning and sharing knowledge – to improve the reclamation and remediation of lands and waterways.

Learning and sharing!

Very best wishes for the next 50 years.

*Sarah trained in Botany (BSc) and Agriculture (Msc) and emigrated to Canada in 1973. (Not Dr.) She worked as a research scientist at the Crop Science department at the University of Guelph, then research coordinator at the arboretum before joining the aggregate industry in 1980, where she had a career as a property manager. This included overseeing the licensing and rehabilitation of pits and quarries to a variety of after uses, including the big quarry in Milton on the escarpment.*

*In 1985, Sarah received the CLRA's Noranda award for rehabilitation of a pit in Fonthill on the Niagara Escarpment to tender fruit.*

*Sarah joined the CLRA as a founding member in 1975-1976 and remained a member throughout her career, travelling to meetings across the country. She was a director on the CLRA national board in 2005-2006, retiring in 2006.*

*CLRA participants enjoying the biodiversity tour of a reclaimed gravel pit in Guelph University arboretum. The initial reclamation was under the direction of Sarah Lowe, a founding member of the CLRA in Guelph, Ontario.*

# CELEBRATING CLRA'S 50TH AT THE ONTARIO MINE RECLAMATION SYMPOSIUM

By Peter Beckett

The Ontario Chapter of the CLRA marked the 50th anniversary of the CLRA on June 24-25, 2025 in Guelph, Ontario. The Annual Ontario Mine Reclamation Symposium, in conjunction with the Ontario Mining Association, was held at Guelph University, the birthplace of the CLRA. The indoor meeting, with 12 presentations, brought together professionals, researchers, industry, and students to discuss a range of topics including DNA-based biodiversity assessments, soil microbiology, legacy mine site redevelopment, and Green Alder biology.

In addition to a brief awards ceremony, the highlight was a celebratory luncheon to recognize and celebrate the 50 years of CLRA history and achievements. A rousing personal account of the activities, importance, and benefits of the CLRA was given by Sarah Lowe, a founding member of the CLRA. The presence of Kelly Zadko (CLRA national president) and Fannie DesRosiers (CLRA national treasurer) was greatly appreciated. Both ran the CLRA national financial AGM during the meeting.

The second day included a tour of the Guelph University Centre for Biodiversity Genomics, a leader in the developing DNA-based systems for species identification. Attendees explored the present biodiversity status of a reclaimed gravel pit that was established by Sarah Lowe in 1976 (almost as old as the CLRA) in the Guelph Arboretum (see figure). After lunch, several sites in different states of reclamation were visited at CBM Aggregates. Participants enjoyed celebrating 50 years of the Canadian Land Reclamation Association and the reclamation dialogue, as well as the social time on Tuesday evening at a local Guelph microbrewery.

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MESSAGE FROM MARIA KUDIENKO,
CLRA NATIONAL AWARD COMMITTEE CHAIR

# WHY DID SCARECROW GET AN AWARD? IT WAS OUT STANDING IN HIS FIELD!

For more than 20 years, I have been admiring our hard-working reclamation industry achieve amazing things, but unfortunately, we are not good at celebrating and talking about these achievements. At CLRA, we strive to recognize outstanding accomplishments through several awards, which you can find on our website: https://www.clra.ca/awards/.

If you are a student, intermediate, or a senior professional, there are several awards to choose from. Receiving an award provides a great motivation, it's good for public relations and business development, and it also encourages younger generations to join our exciting community of reclamation professionals. So go on, be brave, get onto the throne and nominate yourself or someone for an award right now.

*Photo: Courtesy of Maria Kudienko, Throne at Nahanni Butte, NWT.*


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# SASKATCHEWAN MINISTRY OF ENERGY AND RESOURCES

Ministry of Energy and Resources (ER) Remediation and Reclamation team is responsible for the Acknowledgement of Reclamation (AOR) Program administered by the Government of Saskatchewan. The team oversees the reclamation and remediation of all well and facility sites licensed under The Oil and Gas Conservation Regulations, 2012. Most of our time is spent reviewing AOR applications and answering questions from the public and industry about site-specific concerns. Here are commonly asked questions and ER's responses to each.

***How do you assess pipelines and spills that are outside of lease boundaries?***

All spills that are associated to a well or facility site, regardless of whether they are within or outside of lease boundaries, must be investigated within the AOR at the end of life of the site to ensure they were properly remediated and reclaimed. The spills must be addressed within the Phase 1 Environmental Site Assessment to determine if they were appropriately remediated.

For pipelines that tie into a well or facility site, they must be shown to be comparable to the surrounding area for the length of the pipeline. For pipelines that are outside of lease boundaries that ER receives complaints about, our team works with the responsible licensee to ensure the pipeline is reclaimed to be comparable to the surrounding area.

***Does ER accept site-specific questions prior to AOR submission?***

Yes. In fact, the ministry prefers a cooperative and collaborative approach to reclamation and remediation, because it leads to a much better AOR process, from start to finish. When our team and the wider ministry can work together with licensees during remediation and reclamation, it makes for a more successful process. When site-specific questions are left until the AOR application, it often leads to revisiting sites and doing additional investigation, which can lead to more and avoidable visits to a site, effectively delaying the overall process.

The Remediation and Reclamation group can be reached through the ER service desk at 1-855-219-9373 or ER.servicedesk@gov.sk.ca.

## COMMON IRIS QUESTIONS

***What if a mistake was noticed in a Routine AOR, after submission?***

Please contact the ER service desk and ER will work with you to fix the error. The AOR approval may need to be revoked, and a new application would be required; however, ER will work with you through this process.

***What if a mistake was noticed in a Non-Routine AOR, after submission?***

Please contact ER service desk and the ministry will work with you to fix the error. All information entered within an IRIS AOR application cannot be edited, except for the document that is attached. If it is the document, ER staff can remove the old one and upload a new one. If it is an error on the IRIS application, the application will need to be withdrawn prior to review or denied if it has been reviewed by ER. If this latter version is the case, a resubmission will be required.

***If errors are found in an application after it has been reviewed by ER, what happens?***

The ministry will reach out to the consultant who submitted the application and work with them to fix minor errors or request additional information where required. If additional investigation is required, the application will be denied. ER prefers to work with industry to correct errors within applications, when possible, as opposed to rejecting them outright.

***Where can I find additional information regarding the AOR process?***

Additional information, including links to the governing directives, landowner information letters, Phase 1 forms, Detailed Site Assessment forms, previous webinars, additional supplemental information, and how to apply for each application, can be found at: https://www.saskatchewan.ca/business/agriculture-natural-resources-and-industry/oil-and-gas/liability-management/acknowledgement-of-reclamation.

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# ASK THE REGULATOR

# THE ALBERTA ENERGY REGULATOR

By Carrie Robertson, P.Ag, Reclamation Audit Specialist, Enterprise Reclamation

The Alberta Energy Regulator's, Enterprise Reclamation team is responsible for reclamation certification of oil & gas sites and in-situ facilities. These sites/facilities can include, but are not limited to wells, pipelines, plant sites and associated facilities such as borrow pits, roads, and remote sumps. Much of our time is spent answering site specific and general questions. Here are some questions and answers that we want you to be aware of.

***Is there a difference in reclamation certification requirements and processes for different types of energy developments?***

Yes! Each type of energy development has its own reclamation program and/or certification requirements and processes to follow.

Sector specific requirements can be found on the AER's website: www.aer.ca/regulations-and-compliance-enforcement/site-closure-requirements/reclamation.

***Conventional Oil & Gas***

Please refer the AER's web page for additional information and documents including but not limited to:

i. Specified Enactment Directive (SED) 002: Application Submission Requirements and Guidance for Reclamation Certificates for Well Sites and Associated Facilities (updated July 2025)

ii. 2010 Reclamation Criteria for Wellsites and Associated Facilities (Cultivated, Forested, Peatlands, Grasslands)

***EPEA Approved***

Energy developments held under an Environmental Protection and Enhancement Act (EPEA) approval should engage with the regulator though a pre-application meeting to discuss sector and site-specific reclamation requirements, and the appropriate reclamation certification processes.

More information on the reclamation certification process for EPEA-approved sites can be found on the AER's website.

- Checklist for Preparing a Complete Reclamation Certificate Application for EPEA-Approved Activities www.static.aer.ca/prd/documents/forms/ReclamationCertificate_EPEAApprovedActivities-Checklist.pdf
- Frequently Asked Questions: Reclamation Certificate Process for Energy Development Activities under an Environmental Protection and Enhancement Act Approval (August 2016) www.static.aer.ca/prd/documents/enforcement/EPEA_ReclamationCertification_FAQs.pdf

***Do pipelines require a reclamation certificate?***

Yes, this has been a requirement since the release of the Environmental Protection and Enhancement Act in 1993 and the associated Conservation and Reclamation Regulations. Operators are expected to obtain a reclamation certificate and collect detailed site assessment information required as per the 2010 Reclamation Criteria. Pipelines should be assessed as a linear feature when conducting the detailed site assessment. Site-specific questions related to sampling intensity can be submitted to the AER.

***How do we meet the requirements of our public land disposition approval conditions regarding seed mix authorization?***

While requests for seeding approval are often sent to the AER, ultimately, it's the responsibility of the operator to ensure their sites meet the applicable end land-use reclamation criteria.

- It is encouraged that natural recovery revegetation be utilized in reclamation activities.
- If seeding is deemed necessary for reclamation success (e.g. high erosion risk), it's the responsibility of the operator to select a seed mix that results in establishing a target native plant community for the ecosite.
- Seed mixes should be free of species in the Weed Control Act and all species, including agronomic species, that would be considered undesirable for the ecosite.

***Is there an age limit for Detailed Site Assessments (DSA) for the purpose of reclamation certification?***

Yes! The July 2025 updated version of SED 002 clarifies the age limits for DSA.

A reclamation application must be submitted within three years of the DSA to be valid for certification purposes. This applies to soils, landscape and vegetation assessments.

***Common OneStop Questions***

OneStop Error reporting form – If you

are experiencing technical issues with OneStop, please complete the form on our website. www.aer.ca/applications-and-notices/onestop/onestop-error-reporting-form

***Herbicide use*** – The reclamation criteria states that one growing season is required prior to a DSA assessment for the purposes of submitting a reclamation application. However, OneStop requires this timeline to be 365 days, which does not align with the criteria. Reclamation Certificate Variance (RCV) submission to accompany your application explaining the situation is required. Select the variance as other for both the RCV and application, and discuss the site specifics with weed control dates, DSA dates and any other pertinent information (weed control documentation) for your site.

***Submission Errors*** – Phase 1 and 2/3 submissions cannot be withdrawn, re-opened, edited, or returned. If there's an error, a new, accurate submission must be made, noting that the previous one is invalid. RCV and CARL submissions cannot be withdrawn, re-opened or edited. A request to have the submission returned can be submitted, however it must come from the operator.

***Drafts*** – AER does not provide support for drafts saved in the OneStop system and the AER can not see or edit drafts. Operators/consultants must manage drafts themselves as the OneStop system is designed for required regulatory submissions not draft file storage and due to system maintenance drafts could disappear at any time. It's recommended that operators/consultants mange drafts to ensure they are submitted as soon as possible and at maximum within three years of creation to help reduce potential of duplicates, maintain data integrity, ensure the data submitted reflects site conditions, and is in alignment with the DSA age requirements.

*Carrie Robertson earned her BSc of ENCS: Land Reclamation, Conservation and Remediation from the University of Alberta in 1999. She is a Professional Agrologist (P.Ag) who for the past 26 years has worked for both the GOA and AER. Over her career she has worked as a range agrologist, reclamation inspector, reclamation approval coordinator, and currently is a reclamation audit specialist with the AER. During her time with GOA, she was involved in reclamation criteria development and testing, reclamation certificate inquiries, inspections of activities considered specified land under EPEA, landowner complaint resolution, reclamation certificate audits, appeal mediations and hearings and EPEA approval development for in-situ facilities as well as sand and gravel pits. Her current job duties at the AER includes internal program/process development and audit program management, including the management of the subsurface contamination audit program/contract.*

# BC'S ENERGY REGULATOR

The British Columbia Energy Regulator's Environmental Management and Restoration Verification Team is responsible for the review of submissions related to the restoration life cycle of activities, such as wells, pipelines and facilities regulated under the Energy Resource Activities Act (ERAA). Like Alberta, our team is spent reviewing files and answering general questions.

***Is there a difference in reclamation certification requirements and processes for different types of energy developments?***

Any energy resource activity regulated under the Energy Resource Activities Act (ERAA), may apply for a Certificate of Restoration at the end of the life of the activity. Activities not regulated under ERRA will be required to follow their regulatory body.

***Do pipelines require a Certificate of Restoration?***

The Energy Resource Activity Act (ERAA) Section 41.1 indicates permit holders (pipelines have a permit) may apply for a Certificate of Restoration (CoR) if the restoration conditions of the permit are met. While a CoR is required to discontinue tenure payments and return the surface land to the Crown, a CoR is not mandatory. The Dormancy and Shutdown Regulation (DSR) under ERAA is a pathway to get permit holders to move their permitted activities through restoration requirements and conditions. While pipelines don't have the tenure obligations as surface installations (unless surface impacts from the pipeline occur), they have the potential cause contamination and adverse effects to the environment – which is why there are site assessment and restoration closure requirements for pipelines beyond their abandonment.



***How do we meet the requirements of our public land disposition approval conditions regarding seed mix authorization?***

Any Crown land sites in B.C. that have a permit issued under ERRA, are required to restore the land as per the Environmental Protection and Management Regulation and follow the Ecological Suitable Species Guideline.

- Environmental Protection and Management Regulation
- www.bc-er.ca/files/operations-documentation/Environmental-Management/Ecological-Species-Guideline.pdf

***Is there an age limit for a Schedule B for the purpose of a Certificate of Restoration?***

A reclamation application must be submitted within three years of the Schedule B to be valid for certification purposes.

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*Looking to the future*

# JACK WINCH AND THE FOUNDING OF THE CLRA

By Lyndon McLean*

*This article previously appeared in the Fall/Winter 2017 edition of Canadian Reclamation*

*Jack Winch 1 - 1977 CLRA/ACRSD Conference and AGM, Edmonton, Alberta. Group flying to Fort McMurray for the Athabasca Tar Sands field trip. First CLRA/ACRSD president, Dr. Jack Winch, second from the left. Photo courtesy of Sarah Lowe, Dufferin Aggregates.*

*Jack with fellow founding members Sarah Lowe and Sherry Yundt.*

Taking a new direction, finding a better way to get things done, and bringing together the best ideas takes leadership, passion and vision. Those who know Jack Winch know that he exemplifies those qualities, qualities that led him to groundbreaking research and the formation of the Canadian Land Reclamation Association.

Born John Earl Esworthy Winch in Paris, Ontario, Jack attended Paris Public School and Paris High School, after which he enlisted in a militia unit of the Stormont Dundas Highlanders in Peterborough. In 1941, with his brother Aubrey, he enlisted in the Royal Canadian Air Force, and after time in Trenton, Winnipeg, and Lethbridge, Jack was posted to #2 CAC Detachment at Dartmouth, Nova Scotia, then transferred to #5 CAC Torbay, Newfoundland. Jack was sent to Bournemouth, England in July 1943, where he was involved in a number of missions with various crews – even surviving a crash in December 1943 – until he retired from the RCAF in 1945.

Jack soon got a job in the Field Husbandry Department of the Ontario Agricultural College (OAC) in Guelph. After obtaining his Grade 13 certificate in Kitchener, he entered the OAC, receiving his Bachelor of Science in Agriculture (BSA). He entered graduate school at OAC, working under Dr. J. R. Weir, graduating in 1953 with a Master of Scientific Agriculture. Jack was then awarded a fellowship in the Department of Plant Science at Cornell University in New York, where he majored in agronomy with minors in genetics/plant breeding and crop physiology. After receiving his PhD in 1958, Jack was offered a position in the Agronomy Department of Cornell University, which he declined. However, he was invited on a number of occasions to attend and give lectures at Cornell.

Jack accepted a position as assistant professor in the Crop Science Department of the University of Guelph, where he taught crop and forage production, as well as plant physiology, to diploma, undergraduate and graduate students, until his retirement in 1986.


*Jack with Bryan Tisch.*


*Jack with his daughters.*

Jack's research focused on the evaluation and introduction of bird's-foot trefoil and crown vetch, which became widely used in Ontario. As a result, a sizeable trefoil seed industry developed and large farm acreages were established.

Jack was also involved in the extension of the use of trefoil, which was rapidly accepted by the beef industry, due to the availability of green nutritious forage in the mid-summer months. He travelled throughout Ontario, speaking at meetings and installing demonstration projects, and he became interested in the quality of forage, developing an in vitro method for evaluating forage crops. Jack established a quality laboratory in the Crop Science Department and "three-cuts/per practice" methodology resulted in marked changes in the cutting times for forage and was well received by the dairy industry. Interest in this method increased markedly, and Jack saw an increase in the number of graduate students from Canada and other countries. He travelled extensively in the process of supervising his student's theses and, as a result of these trips, became interested in global agricultural development. He travelled to Finland, South America, Mexico, France, Italy, Great Britain, the United States, and China – often at the request of local and/or federal authorities – for agricultural assessment and assistance.

## CANADIAN LAND RECLAMATION ASSOCIATION

While at the University of Guelph, Jack recognized the need for a professional organization supporting the developing multi-disciplinary field of land reclamation. In 1970, he was instrumental in forming the Ontario Cover Crops Committee (OCCC). The OCCC held an annual informal workshop in Guelph, with Jack serving as president and Dr. E. M. Watkin as secretary. Members – researchers and practitioners from universities, government, and industry – hailed from Ontario, as well as Alberta and British Columbia,


*Jack at home.*

**Following a number of meetings, motions and discussions on December 9th and 10th, 1975, the CLRA was formed. The first official business meeting was held December 11th in the Arboretum Centre at the University of Guelph, and Jack was elected to a three-year term as president.**

and later the United States and United Kingdom.

After a few years, the OCCC, under Jack's leadership, recognized the need for a broader-based and more formal organization as a means to consolidate and develop the diverse group of professionals and practitioners in the field of land reclamation across Canada.

At the December 1974 OCCC meeting, a suggestion was made to form a Canadian association "which would concern itself with the problems and solutions to land reclamation in the broadest sense". The following September, it was announced that half a day during the December meeting would be devoted to "the discussion of the proposal that the Ontario Cover Crop Committee be dissolved and be replaced by a national organization called the Canadian Association for Land Reclamation."

Following a number of meetings, motions and discussions on December 9th and 10th, 1975, the CLRA was formed. The first official business meeting was held December 11th in the Arboretum Centre at the University of Guelph, and Jack was elected to a three-year term as president.

The newly formed association had 60 founding members from six provinces, the U.S., and U.K. Jack led the association through its initial years, developing professional affiliations, establishing the bylaws and objectives, which have largely guided the association since its founding. Jack's impact was felt immediately, and membership grew from those first 60 to 300 during his initial term as president, with a world-wide mailing list of 1,200.

The association quickly established a forum for annual conferences, with an emphasis on technical papers and field trips, and a journal for publishing papers in the field of reclamation, which until then had been scattered across many other publications. The first annual general meeting (AGM) was at the University of Guelph on November 1976.

Some years later, in 1991, the vision to have a truly international association was realized when the International Affiliation of Land Reclamationists was formed. Canada (through the CLRA/ACRSD) was one of the five participating countries, along with the US, UK, Australia, and China.

Jack's vision and passion made possible what the CLRA does today as it continues to provide a valuable forum for professionals, educators, and practitioners across Canada and internationally. In addition to the national organization, most provinces are now members of provincial or regional chapters. Members represent the entire scope of land reclamation, from areas associated with reclaiming mined and disturbed land and waterways, to agriculture and forestry, from earth and natural sciences to social sciences. Today, the CLRA has approximately 800 members, with a continued increase in corporate membership.

As well as being a founder and first president of the Canadian Land Reclamation Association, Jack was involved in other associations, including the Canadian Society of Agronomy, the Canadian Agriculture Institute, and the American Forage and Grassland Society. He also received many awards of merit, including the CLRA's Distinguished Land Reclamation Award, the University of Guelph Alumni Association's Distinguished Teaching Award, and the 1993 Distinguished Grasslander Award from the American Forage & Grassland Association.

Jack's impact on the field is probably best summed up by founding members Sarah Lowe and Sherry Yundt:

"Looking at photos of Jack in the field 30 years ago brings back memories of the enthusiasm he brought to the subject, his great charisma and strong leadership in the early days, and his continued interest and participation as the CLRA developed into a large and internationally affiliated association of professionals and practitioners with the broadest scope imaginable."

**With information provided by Tracy Patterson, Sarah Lowe, Sherry Yundt, and "The History of the CLRA".*

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# ADDRESSING CHALLENGES IN GROWTH MEDIA DEVELOPMENT FOR MINE REHABILITATION AND RECLAMATION

Developing suitable growth media to support post-mining land use remains a significant challenge for many operations at closure. In practice, not all mine sites have sufficient soil resources available, and the accessibility of scalable amendment options is often limited, particularly in remote locations where organic materials such as manure or peat are not practical to source (Miller & Naeth, 2020). Addressing these constraints requires scientifically informed strategies that identify feasible, scalable amendments and evaluate them under site-specific conditions to inform the amendments' implementation.

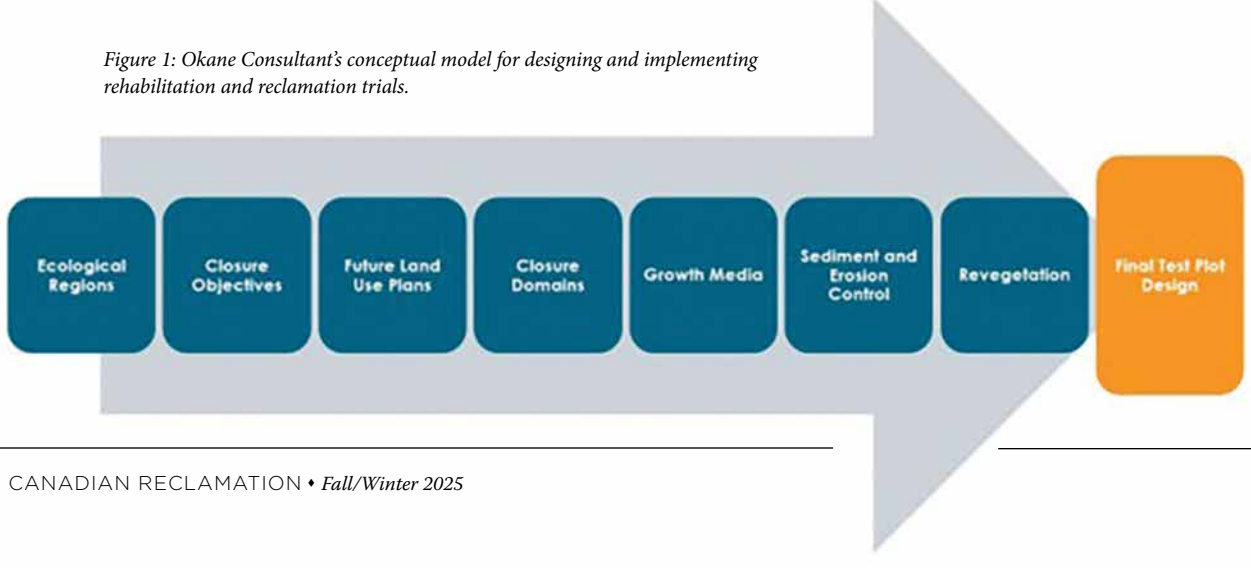
Optimal growth media must be compatible with the site's domain (such as mine rock stockpiles [MRS] or tailings facilities), closure prescriptions like engineered cover systems, material availability, landform designs, and water balance. Equally important is the growth media's ability to support the long-term establishment of targeted vegetation, which highlights why soil health and quality play a significant role in the rehabilitation and reclamation of mine-affected landscapes.

For instance, healthy soil used in an engineered cover system of an MRS can facilitate targeted vegetation establishment, which helps minimize the risk of cover system erosion. Additionally, if the cover system aims to limit water ingress into the underlying mine material and reduce the risk of acid and metalliferous drainage/acid rock drainage, the rate and extent of vegetation growth become important in minimizing net percolation through evapotranspiration (ET).

Whether due to limited availability of suitable cover materials or degradation of soil properties from mining activities, applying and maintaining healthy soil is essential for the long-term success of mine rehabilitation and reclamation projects. However, some soil resources or cover materials lack the necessary health and quality properties to support a self-sustaining ecosystem. To overcome this challenge, suitable growth media on mine sites often requires the addition of soil amendments to modify specific soil properties chemically, nutritionally, biologically, and/or physically to influence plant establishment and long-term ecological function.

Chemical amendments such as buffering agents or pH adjusters, like lime, are used to modify soil acidity or alkalinity, thereby enhancing micronutrient availability essential for plant growth. Nutritional amendments, including mineral fertilizers and organic sources like compost and manure, supply macro- and micro-nutrients to soils with typically low fertility (Urra et al., 2019). Biological amendments, such as biochar or microbial inoculants, can enhance microbial activity and nutrient cycling, which are vital for increasing primary productivity, carbon capture, and biomass (Mosquera et al., 2024). Lastly, physical amendments like soil condition-

*Figure 1: Okane Consultant's conceptual model for designing and implementing rehabilitation and reclamation trials.*



ers or aggregates, such as peat, are applied to improve soil structure and optimize water retention or drainage.

To develop an optimal growth medium, a systemic approach is required, beginning with evaluating the ecological region, material characterization, and a clear understanding of the site's closure and future land use objectives (Figure 1). Well-informed revegetation trials can then be conducted to identify which amendments will most effectively and practically address site-specific risks and establish plant growth.

Initial investigations can be conducted in laboratory or climate-controlled facilities to evaluate soil properties, nutrient composition, and amendment reactions under site-simulated conditions. These insights can then be tested in small-scale trials onsite, such as in planter containers, to assess practical performance under near-natural conditions. Eventually, successful growth media treatments can be scaled up to larger field trials (e.g., multiple 20 × 20 m plots) to measure outcomes and evaluate site-wide feasibility. Ultimately, the mine site can implement the full rehabilitation prescription, which can be refined continuously as part of the progressive rehabilitation program, optimizing the growth medium to support plant establishment and long-term cover system performance.

For example, in supporting the closure of a mine site located in eastern Canada, Okane Consultants collaborated with researchers from the University of Saskatchewan's Multi-purpose Slope Testing (MOST) Facility and Profile Products to assess the impact of a surface amendment combining a biotic soil technology and a flexible erosion-resistant growth medium on vegetation establishment and ecohydrological functions within cover systems (Millar, 2023).

The study assessed the amendments' effects on vegetation growth, infiltration, percolation, and ET using four constructed cover systems, where all trial plots were seeded with local vegetation, and two trial plots contained soil amendments (Millar, 2023). The trial plots were monitored over three four-month growing seasons under site-specific conditions to simulate practical cover system applications. The results demonstrated that the amended plots had faster vegetation establishment and produced greater above-ground biomass than the non-amended plots. Likely due to increased vegetation density and surface cover, the amended covers also exhibited higher ET rates.

While full-scale implementation at this site is still under discussion, the study indicates that soil amendments can effectively accelerate cover system stabilization, enhance ecohydrological functions, and improve growing conditions of cover systems on mine-affected lands with low-quality growth media. A pragmatic, science-based approach to optimizing growth media can allow sites to implement a practical, scalable solution that supports successful mine closure and post-mining land use objectives.

Ultimately, optimizing growth media is a critical step in supporting the stability and ecological function of cover systems. Through systematic evaluation and site-specific trials, sites can implement scalable solutions that facilitate successful plant establishment and meet mine closure objectives.

## REFERENCES


Millar, C., Barber, L., Robeson, M., Sump, D., & McDonnell, J.J. (2023). Soil amendments improve vegetation establishment and evapotranspiration on store and release mine cover systems. In B. Abbasi, J. Parshley, A. Fourie & M. Tibbett (eds), Mine Closure 2023: Proceedings of the 16th International Conference on Mine Closure, Australian Centre for Geomechanics, Perth. https://doi.org/10.36487/ACG_repo/2315_049

Miller, V.S. & Naeth, M.A. (2020). Amendments to improve plant response under simulated water-limited conditions in diamond mine Anthroposols. Canadian Journal of Soil Science 101(1). https://doi.org/10.1139/cjss-2019-0121

Mosquera, H.Q., Torres-Torres, J.J., & Pérez-Abadía, D. (2024). Influence of mining on nutrient cycling in the tropical rain forests of the Colombian Pacific. Forests 15(7). MDPI. https://www.mdpi.com/1999-4907/15/7/1222

Urra, J., Alkorta, I., & Garbisu, C. (2019). Potential benefits and risks for soil health derived from the use of organic amendments in agriculture. Agronomy 9(9). MDPI. https://www.mdpi.com/2073-4395/9/9/542


Photo Citation: Miles, T. (2024). Implementing revegetation trials to optimize mine rehabilitation and reclamation [Digital Image]. Okane Consultants. https://okaneconsultants.com/ideas/implementing-revegetation-trials/

*Sharing our stories*

# WHY MEMBER CONTRIBUTIONS MATTER TO CLRA/ARSD

By Shannon Carla King, CLRA/ARSD Committee Chair

## A COMMUNITY BUILT ON KNOWLEDGE AND PASSION

At the Canadian Land Reclamation Association (CLRA/ARSD), we believe that the best way to restore and enhance our environment is by learning from each other. Across Canada, incredible reclamation work is happening! From innovative techniques in soil remediation to Indigenous-led restoration projects, we want to hear about it all. That's why member contributions to our national magazine are so important. They help us showcase the diversity of approaches, perspectives, and successes that make our field so dynamic.

## MORE THAN JUST A MAGAZINE

Our newsletters, magazine, and annual conference proceedings aren't just updates, they're tools. They keep our members informed with the latest technical information and empower us to play an informal yet vital role in decision-making processes related to reclamation projects. These resources also serve as a platform for sharing ideas and best practices, helping us grow as professionals and as a community.

By contributing an article, you're not just writing, you're educating, inspiring, and connecting.

## EDUCATIONAL AND INFORMATIONAL IMPACT

Whether you're sharing a new technique, a student perspective, or a look back at a historical project, your article can be both educational and informational. It might:

- Introduce readers to emerging technologies or equipment
- Break down complex policy questions
- Offer seasonal tips and tricks for fieldwork
- Highlight biodiversity wins or challenges
- Share mentoring stories that encourage the next generation

Your voice adds depth to our collective understanding and helps others see reclamation through a new lens.


## WHY YOU SHOULD WRITE FOR US

Here's what you gain by contributing:

- An Engaged Audience: Our readers are already passionate about reclamation they're eager to learn from you.
- Thought Leadership: Position yourself as an expert and build credibility in the field.
- Networking Opportunities: Your article could spark collaborations or open doors to new partnerships.

- Support for CLRA/ARSD: Sharing knowledge sustains our organization and strengthens our professional community.

## READY TO SHARE YOUR STORY?

Articles typically range from 300 to 700 words and can include high-resolution photos (300 dpi in jpg, tiff, or png format). Deadlines are September 1 for the fall issue and February 1 for the spring issue. Late submissions will be held for the next issue to ensure quality and timely publication.

So whether you're busting myths, sharing a "view from your office," or diving into research, your contribution matters. Let's keep the conversation going and keep Canada's reclamation community thriving. Back issues of the magazine are now available to the public. Access the complete archive of *Canadian Reclamation* magazine all in one place. Discover past and current editions filled with industry insights, project highlights, research, and innovations shaping land reclamation across Canada. Go to our web page, under News and Events to see the archive collection of the *Canadian Reclamation* magazine.

We can't wait to read what you have to say.

## TWO LAURENTIAN FACULTY HONOURED WITH KING CHARLES III CORONATION MEDAL FOR OUTSTANDING CONTRIBUTIONS

# DR. PETER BECKETT AND DR. NADIA MYKYTCZUK RECOGNIZED FOR THEIR IMPACT IN ENVIRONMENTAL RESTORATION AND MINING RESEARCH

Laurentian University proudly celebrates the remarkable achievements of two esteemed faculty members – Dr. Peter Beckett and Dr. Nadia Mykytczuk – who have been honoured with the prestigious King Charles III Coronation Medal, it was announced in March. They join Dr. John Gunn, professor emeritus and renowned environmental scientist, who was announced as a recipient in February. This accolade recognizes Canadians who have demonstrated exceptional dedication to their communities and service to the country.

### *Dr. Peter Beckett: A Pioneer in Environmental Restoration*

A professor at Laurentian University for nearly five decades, has been instrumental in transforming Sudbury's landscape. His pioneering efforts in environmental restoration have played a crucial role in combating years of ecological damage, leading to the region's renowned regreening initiatives. Dr. Beckett's dedication to environmental education and restoration has not only revitalized local ecosystems but has also positioned Sudbury as a global example of successful environmental rehabilitation.

### *Dr. Nadia Mykytczuk: Innovator in Mining Research and Community Leadership*

Serving as the president and CEO of MIRARCO (Mining Innovation, Rehabilitation, and Applied Research Corporation) and the executive director of the Goodman School of Mines at Laurentian University. She also holds an NOHFC Industrial Research Chair in Biomining and Bioremediation. Dr. Nadia Mykytczuk is a leading figure in biomining research and innovation. Her leadership extends beyond academia into community service, where she has been recognized for her commitment to advancing the mining sector, promoting women in mining, and fostering community engagement. Dr. Mykytczuk's work exemplifies the integration of scientific research with practical applications, benefiting both the industry and the broader community.

The King Charles III Coronation Medal, produced by the Royal Canadian Mint, is bestowed upon individuals who have made outstanding contributions to Canada in various fields. The recognition of Drs. Beckett and Mykytczuk not only honours their individual achievements but also highlights Laurentian University's dedication to excellence in research, innovation, and community service.

The accomplishments of Drs. Beckett, Mykytczuk, and Gunn serve as an inspiration to colleagues, students, and the broader community, reinforcing Laurentian University's commitment to fostering leadership and addressing pressing environmental and societal challenges.

• *Courtesy of Laurentian University*

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# CHANGING [YOUR] PERSPECTIVE: KEEPING AN OPEN MIND ABOUT HERBICIDE SAFETY IN RECLAMATION

By Whitney Braun

## Where's your hazmat suit?
## Don't spray that s*** near me – my dog – my child – my truck!
## You're killing the bees!

PINEVIEW
VEGETATION MANAGEMENT


These are all questions and "suggestions" the Pineview team receives every season because of our herbicide application services. All these responses result from two things: a lack of education and a closed mind.

Pineview Vegetation Management has been serving the B.C. Peace Region since 1996 with herbicide application on industrial sites, among other vegetation management services.

We understand that when a mind is made up, it takes a lot of work to change it. The year 2020 and subsequent years of uncertainty were proof of strong and differing opinions. We understand that there's only so much we can do to educate the reclamation industry and the public when it comes to the topic of herbicides. However, our Pineview team plans on doing everything we can to teach you everything we know about the effectiveness and safety of herbicides.

### IT STARTS WITH US

The first thing we can do to open your mind to herbicides being a safe and effective way to manage invasive and noxious weeds is to tell you our story – a story that is 29 years long. Pineview was founded by a father with two young children, a man

who had no intention of bringing harm to himself or his family. Despite the enticing wages and fair-weather work, education was a top priority to see if the risks outweighed the reward.

It turned out that the risks were incredibly low, and so Pineview Vegetation was born in 1996. That spring, the founder began, first, with a full physical, including blood work. After six months of mixing and applying herbicides with the recommended PPE (coveralls, boots, safety glasses, rubber gloves for mixing, regular work gloves for application), he revisited the doctor for updated blood work. After months of exposure, there was zero trace of any herbicides or their chemical make-up in his results.

And 29 years later, the results remain the same because herbicides are designed to only target plant species, unlike insecticides, which target respiratory and nervous systems.

## WORKER EDUCATION

Since then, Pineview has developed and implemented a thorough staff training program focusing on the differences between types of pesticides (i.e. herbicides, insecticides, rodenticides, etc.), provincial regulations, proper handling, storing, mixing, and application methods, toxicity levels, and personal protective equipment.

Unfortunately, we found it necessary to add public relations training because often, our workers are met with negative or hostile members of the public who are uneducated regarding herbicides.

We aim to send our workers out informed, comfortable, and most importantly, safe. We all intend to go home to our families at the end of the day. Why would we put ourselves at risk?

Once we know that our staff understands the difference of herbicides, specifically designed to target plants only, compared to other types of pesticide, we move onto toxicity.

Take note of this simple diagram we use to introduce toxicity levels (based on LD50 scores) to our workers. Additionally, we review LD50 more in depth. For example, household vinegar – or acidic acid – has a score of 3,310 mg/kg per Health Canada, while Roundup® has a lower toxicity of >5,000 mg/kg. (Remember: the higher the number the less toxic it is!)

The engaging graphic gives workers an immediate relatable understanding of the toxicity of Roundup® versus common household consumables.

Although our training includes more detailed data and infographics, the diagram gives us a starting point with other contractors, personnel on site, or even the public if they have questions about the herbicides we are using.

## OUR APPROACH TO PUBLIC ENGAGEMENT

First and foremost, we do not engage with anyone who shows any type of hostility or anger. We have supervisors on staff who will be contacted in those situations, while our team members are instructed to leave the work site. Someone who is angry is not up for a calm, educational conversation about job safety.

Secondly, we acknowledge any questions we receive about herbicide safety as valid. We are here to answer your questions or address your concerns in the most effective way possible. No one wants to cause harm to ourselves, others, or the environment. In the instance where someone presents a question to our staff that cannot be answered immediately, we do our best to follow up as soon as possible with the most accurate information. Leaving someone hanging can only amplify their concerns.

Thirdly, if someone is openminded, we love to tell you about how great our job is! Working with herbicides is only part of it; we also get to drive UTVs in Canada's wilderness most of the day, take in all the wonderful wildlife, and be a part of protecting Canada's native plant species.

Pineview is all about taking the best and most effective approach to controlling noxious weeds, and that starts with building a practical pest management plan. Integrated pest management starts with prevention, identification, monitoring, decision making, and after all that, finally management followed by evaluation. Herbicides fall into the management category. But guess what? So do the following methods that can be used in place of herbicides or in conjunction with them to provide the most effective management:

- Manual removal
- Mechanical removal
- Biological control
- Chemical control

That means herbicides are only decided upon when other methods of action are ruled out because of least effectiveness.

Pest management plans are provincially regulated documents listing the approved herbicides that can be used at listed locations. When we are applying a certain herbicide at a certain location, it is for that specific environment. For example, we use herbicides in a municipality that we will not use on a wellsite access road due to the nature of the environment and noxious weeds present.

This idea of integrated pest management is a concept easy to explain to anyone. And once we all understand that everyone's purpose is the same – protect people, wildlife, and the environment, we can expand on the intricacies of the safety of herbicides.

Keep an open mind, and don't worry about the bees. We promise they are going to be okay.

# PROTECTING PEOPLE AND THE ENVIRONMENT: SCG'S COMMITMENT TO ENVIRONMENTAL REMEDIATION IN THE MARITIMES

By Shyla Richard, Health and Safety Manager, SCG – Saint John

Across the Maritime provinces, environmental remediation has become an essential part of ensuring communities can thrive alongside the ever-growing industries. From managing contaminated sites to restoring land for safe use, remediation projects demand technical expertise and ultimately, a deep commitment to safety. At SCG Industries, we see our role not just as contractors, but as partners in protecting both workers and the environment.

Our company is, and has been, actively involved in environmental remediation projects to varying degrees across New Brunswick, Nova Scotia, and Prince Edward Island. These projects often involve system installations that control, treat, or safely remove contaminants from soil and water. While projects are ongoing, our employees use a balance of their practical field experience combined with their various safety trainings to help return sites to safe, usable conditions while minimizing impacts on surrounding communities.

## SAFETY AT THE HEART OF EVERY PROJECT

Environmental remediation work comes with unique risks – whether it is working in the Maritime's famously rugged and diverse terrain, handling hazardous materials, or operating specialized equipment. Due to these risks, among many others, safety is not just a requirement; it is our culture. Every employee is trained in WHMIS (Workplace Hazardous Materials Information System), ensuring they understand how to identify and handle potentially dangerous substances. Not to mention, due to the high variety of types of projects we may take on, sometimes it's necessary for our workers to get job-specific training. For example, a recent installation job required two of our field technicians to receive Working from Elevated Platforms training. Safety isn't reserved for specific tasks – it's part of the way we work every day.

Our dedication to safe practices has earned us our COR Certification through New Brunswick Construction Safety Association. This certification demonstrates our commitment to meeting nationally recognized standards in health and safety. From structured hazard assessments to routine safety audits, COR helps keep us accountable and continuously improving.

## COMPLIANCE WITH MARITIME STANDARDS

Operating in environmental remediation means working with strict provincial and federal regulations. Each Maritime province has its own occupational health, safety, and environmental standards, and SCG ensures compliance is built into every project plan. By staying aligned with these regulations, we not only protect the environment but also contribute to the long-term health and resilience of the communities where we work.

## CREATING SAFE, SKILLED JOBS

A vital part of remediation is the workforce behind it. SCG invests heavily in training programs, ensuring that our employees possess the skills and confidence to undertake challenging work safely. From WHMIS to emergency response and equipment training, our people are supported every step of the way. This investment not only protects workers but also strengthens the quality of remediation outcomes.

## LOOKING FORWARD

As environmental challenges continue to grow in the Maritimes, SCG Remediation Services remains committed to leading with responsibility. By focusing on worker safety, maintaining COR certification, staying compliant with provincial regulations, and investing in training, we are doing our part to create safer jobs while protecting the environment. Every remediation project is more than just a contract – it is an opportunity to leave communities stronger, healthier, and better prepared for the future.

www.scgindustries.com

# READY FOR RESEARCH: PREPARING STUDENTS TO STEP INTO THEIR CAREERS

Preparing learners for a career, with hands-on experience and opportunities to practise skills, is at the core of Lethbridge Polytechnic. Students across campus have access to supportive instructors, work-integrated learning opportunities, field trips and more as they get ready to step foot into their chosen fields. Beyond the regular program offerings, students can also get involved in the polytechnic's many research programs as a research assistant, senior project student or volunteer.

Adriana Morrell, Agriculture Sciences and Environmental Sciences instructor and scientific lead for the institution's Mycology Research Laboratory, says students may be required to perform research as part of their work, but that doesn't mean they already know how.

"Having researchers on-site to guide and mentor students not only enriches our work but also gives students a deep sense of pride," Morrell says. "Students get to take an idea from its very beginning to the finish line, owning every step of the process, while being supported along the way."

Morrell secured $249,995 in funding from Alberta Innovates to support her multi-year research project, which began in 2024, aimed at bridging a gap in traditional land reclamation efforts by focusing on the role of arbuscular mycorrhizal fungi. The remaining project costs were funded by the polytechnic's Centre for Applied Research Internal Fund and in-kind support from the Nature Conservancy of Canada (NCC), Lethbridge Polytechnic and Athabasca University. The project will test the effectiveness of mycorrhizal amendments and soil probiotics for efficient grassland restoration.

From seeding to establishing grasses and inoculating them with fungi, Morrell and a team of five students grew more than 1,000 native grasses in the institution's greenhouse. After testing in control conditions, Morrell, together with project partners and

students from Lethbridge Polytechnic, Athabasca University and NCC, relocated the plants to the Crowsnest Pass area in southern Alberta. Now that the plants are in the ground, Morrell says the next step is to see which microbial inoculations thrive and test their potential as soil probiotics to enhance grassland ecosystem restoration.

"Everything is information – even if it's not positive, it's still valuable information," says Morrell.

This information is equally valuable not only to the restoration community, but to the students who have worked on the project. Jo Johnson, a 2025 Renewable Resource Management graduate and current Bachelor of Ecosystem Management student, has worked with Morrell for the past year.

Johnson says he discovered a strong love and respect for the outdoors and natural world while living in Washington. Wondering what to do with that newfound passion, he returned home to Lethbridge to enrol in the polytechnic's highly regarded Environmental Science program. Experiences, like field practicums, have helped him prepare for a career, he says.

"Getting the chance to have hands-on experience and actually do some of the work that would be required in a future career is the best way to build the skills we need. It sets the expectations for what we'll need to do in the future and how to do it."

In his role as a research assistant, Johnson has taken on a variety of tasks – from working in the on-campus greenhouse taking care of plants and going through soil samples to identifying and cataloguing spore families and species and lending a hand in the field. The opportunity has provided him technical and specialized skills, learned in a safe environment from an experienced mentor.

Johnson says his most memorable experience has been completing field work at the research site and collaborating with several groups to accomplish a single objective.

"We got the satisfaction of knowing we were doing something to better the environment as a group and strategized about how we could do things better in the future to make things easier," Johnson says. "Our main goal has always been to restore the site, but it feels like an unspoken agreement among all of us at the lab that we look after each other just as much."

As Johnson continues his education, his experiences in the lab ensure he'll be ready for his future.

For information about Lethbridge Polytechnic's School of Environmental Sciences, visit lethpolytech.ca/programs.

# CELEBRATING SUCCESS: GLENCORE'S SUDBURY INO WINS 2024 TOM PETERS MEMORIAL MINE RECLAMATION AWARD

## Submitted by Sudbury Integrated Nickel Operations

Glencore Sudbury Integrated Nickel Operations (Sudbury INO) was recently awarded the 2024 Tom Peters Memorial Mine Reclamation Award by the Canadian Land Reclamation Association (Ontario Chapter) and the Ontario Mining Association for the work completed at the Thayer Lindsley (TL) Mine site, which transitioned from operations to full closure with the goals of environmental excellence and integrity.

This achievement is a direct result of the vision, dedication, and collaboration of many of our employees throughout the years, including our Environmental Team at the helm, and with numerous partners, and community stakeholders.

Located just four kilometres north of Sudbury, the TL Mine operated from 1992 to 2009. In 1992, TL Mine was established as one of the first mines in Ontario that followed provincial requirements for a closure plan along with financial assurance to cover the cost of mine closure.

At that time, we actively participated with the Ministry of Northern Development and Mines and the Ministry of the Environment to help develop new cost-effective mine closure technologies. The project team needed to get creative to develop a new mine under a new regulatory framework.

Over a decade of detailed planning and execution led to the successful completion of a comprehensive mine closure and land restoration project. Not only does the TL closure celebrate our support for responsible mining, but it also reinforces the importance of sustainable development and community engagement principles.


*Samantha McGarry, Sudbury INO site rehabilitation specialist, Environmental Department, accepted the Tom Peters Memorial Mine Reclamation Award at the CLRA Ontario Mine Reclamation Symposium, held in Guelph on June 24.*

*From left to right: TL Mine Site in operation facing east, with onsite ballast stockpiles and main access road under construction (A, 1992) and in a State of Temporary Suspension (B, 2011).*

## WHAT THE TEAM ACHIEVED TOGETHER:

- Successful Closure: Executed a mine closure plan, safely decommissioning the site and returning over 155,000 $m^3$ of material underground, reducing the long-term surface footprint.
- Environmental Stewardship: Surface water quality downstream of the site has measurably improved, with nickel levels now below 1992 background minimum average values.
- Biodiversity Regeneration: Over 50,000 native trees and shrubs were planted in partnership with the City of Greater Sudbury, Collège Boréal, and Tree Canada, to name a few, with a survival rate exceeding 85 per cent.
- Circular Approach: Approximately 90 per cent of demolition materials were recycled, and assets were redeployed across operations, supporting resource efficiency and cost-effectiveness.
- Strong Partnerships: Continued collaboration with four Indigenous communities and multiple local organizations have been foundational to the success of the closure and ongoing land use planning.

## REACHING FOR THE STANDARD IN MINE CLOSURE

The TL Mine Closure was audited internally against the International Council on Mining and Metals (ICMM) Closure Maturity Framework 14 closure elements Site and achieved Good Practice across all elements with Leading Practice noted in Closure Activities, Closure Execution Plans, and Closure Costing.

*Thayer Lindsley site field trip highlighted at the Canadian Land Reclamation Association Annual Symposium and Field Trip in Sudbury, ON (September 2024).*

*Current transformation of the TL Yard and transportation corridor (photo taken in September 2024)*

# MORE THAN JUST RECLAMATION

*Reclaimed Gowanlock Pit.*

*Reclaimed mine tailings at Strathcona Mill in 2025 (Source: Glencore).*

At Walker Industries, land management means more than just restoring land. It's about working to enhance biodiversity, improve soil health, and create lasting positive impacts for our communities. As a fifth-generation, Canadian-owned business, Walker understands the importance of positive environmental impacts that span generations. With deep roots in the circular economy through our resource recovery operations, reclaiming resources is second nature to us. We are committed to continuously advancing our land reclamation practices and proudly support our partners in strengthening reclamation efforts across Canada.

## WALKER ENVIRONMENTAL MINE RECLAMATION

For over a decade, Walker Environmental has proudly partnered with Glencore's Sudbury Integrated Nickel Operations (Sudbury INO) through a proactive and innovative approach that aims to progressively reclaim mine tailings at the Strathcona Mill site in Northeastern Ontario. Sudbury INO's dedication to environmental stewardship is evident in their efforts to progressively reclaim land while operations are ongoing, reduce long-term liabilities and transform landscapes into ecologically functional spaces. This long-standing partnership has re-

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sulted in the successful reclamation of over 30 hectares of tailings using a tailored blend of Walker's N-Rich® biosolids-based fertilizer and Gro-Bark compost. Progressive application of this blend can be highly effective because it can improve soil structure and microbial activity, suppress dust, enhance nutrient retention, and support sustained vegetation growth. But the benefits extend beyond aesthetics and erosion control. Reclamation can restore biodiversity, improve water quality, and contribute to potential carbon sequestration. Together, Walker and Sudbury INO demonstrate how trust, technical expertise, and shared environmental values can help drive long-term success in mine site rehabilitation while working to create meaningful environmental legacies.

## WALKER AGGREGATES QUARRY RECLAMATION

Walker Aggregates shares the Environmental Division's strong commitment to land reclamation. This alignment is possible through the leadership of Walker's Environmental Performance Department, which oversees environmental compliance across divisions. Walker began operations 138 years ago as a single stone cut quarry. One of the most recent success stories is the Gowanlock Pit in Flesherton, Ontario. After a 15-year rehabilitation effort, reclamation was completed in 2024. The project was focused on leveling the pit floor, stabilizing slopes and preparing the land for future agricultural use. In 2025, a corn crop can now be seen covering what was once the Gowanlock Pit on over 14 acres of restored land. This crop represents the first of what is expected to be decades of agricultural use.

## POST-CLOSURE SUCCESS STORIES

Located within Ontario's Greenbelt, many Walker sites are ideal for agricultural use following closure. Today, our rehabilitated lands produce honey, maple syrup, and wine in collaboration with our partners. More than 4,500 beehives are situated across Walker properties supporting Canada's vital pollination efforts. Benefiting from the native plant diversity on Walker's sites, these hives help to sustain Niagara's $90 million tender fruit industry by boosting fruit production. By maintaining our partnership with Niagara's beekeepers, we continue to strengthen local biodiversity, support agriculture, and contribute to a thriving ecosystem. At Walker's Vineland Quarry, our commitment to land rehabilitation led to the creation of Edgerock Vineyard, which earned the Ontario Viticulture Sustainability Certification from the Grape Growers of Ontario. In 2024 alone, Edgerock sold 222 tonnes of grapes to nine different wineries, demonstrating the long-term value of sustainable land use.

We understand our responsibilities for the lands we manage and operate, and we understand the importance of positive environmental impacts across generations. Walker expects more from our sites than rehabilitation – we strive for positive environmental outcomes that will support our community for generations to come.

# PROFESSIONAL BIOLOGISTS: SIGN-OFF AUTHORITY, SCIENCE-DRIVEN RESTORATION

Biologists have always been at the forefront of reclamation and remediation in Alberta – but did you know that professional biologists (P. Biols) are one of only seven regulated professions authorized to provide professional sign-off on reclamation work in the province?

The Alberta Society of Professional Biologists (ASPB) is currently a self-regulated profession under the authority of the Professional and Occupational Associations Registration Act (POARA), regulated by the Government of Alberta. In 2025, Alberta passed Bill 40 – the Professional Governance Act (PGA) – which will modernize the regulation of professional organizations like ASPB when it comes into force (expected in 2026). This transition will reinforce ASPB's regulatory framework and its commitment to protecting the public interest.

ASPB-regulated professionals are held to high standards in education, experience, ethics, and accountability. Professional biologists bring scientific integrity, ecological expertise, and a duty of care to every project – and are trusted by industry, regulators, and the public.

P. Biols are also recognized in Saskatchewan and enjoy labour mobility under the New West Partnership Trade Agreement (NWPTA), which includes Alberta and British Columbia. This means ASPB registrants are well-positioned to practice across Western Canada, where environmental and reclamation challenges often cross provincial boundaries.

Professional biologists are leading reclamation and remediation efforts by:

- Designing site-specific, ecologically sound restoration plans
- Applying advanced tools like GIS, remote sensing, and biological monitoring
- Conducting risk assessments and ecological evaluations
- Providing professional sign-off on regulatory submissions with full accountability

With over 1,800 professional biologists, ASPB continues to grow – and values its long-standing relationship with CLRA to promote the critical role of P. Biols in land reclamation.

If you're leading a reclamation or remediation project in Western Canada, make sure you have a P. Biol on your team – a qualified, regulated, and competent professional in the practice of biology.

Executing projects in all types of environments in Western Canada from remote locations to congested urban settings, farm fields to muskeg, creek crossings to the Bow River.

# JSK Consulting Ltd. celebrates 30 years of excellence in decommissioning oil & gas infrastructure



In 2025, JSK Consulting Ltd. proudly marks 30 years in business – a milestone that reflects three decades of dedication, resilience, and expertise in the oil & gas sector. Since our founding in 1995, we've grown to become a trusted leader in the decommissioning of end-of-life oil & gas facilities and pipelines throughout Western Canada.

From our earliest projects to the complex decommissioning work we undertake today, our mission has remained clear: to deliver safe, efficient, and environmentally responsible solutions in some of the most challenging environments – from remote field sites to urban centres. Our work helps bring closure to aging infrastructure in a way that respects both the land and the legacy of the energy industry that has supported the communities we work in.

## Built on Experience. Powered by People.

At JSK Consulting, our greatest strength has always been our people. Our experienced team of project managers, field technicians, and support personnel bring a deep understanding of the technical and regulatory landscape of the oil & gas industry. Their expertise ensures that every project is completed to the highest safety and environmental standards, while minimizing risk and disruption.

Over the past 30 years, our team has earned a reputation for professionalism, integrity, and reliability.

Whether operating in remote northern sites or dense urban locations, our crews adapt to each project's unique challenges – bringing with them the confidence that comes from decades of hands-on experience.

## A Legacy of Progress

Throughout our journey, JSK has had the privilege of working with some of the most respected operators and partners in the energy sector. We've completed over 17,000 successful projects, grown our team, and embraced new technologies and practices that improve safety, efficiency, and environmental performance.

This 30-year milestone is also a moment to reflect on how the industry – and the world – has evolved. As the energy sector continues to transition, we're proud to be part of the responsible and necessary work of decommissioning, helping to restore sites and support a sustainable future.

## A Sincere Thank You

To our clients, industry partners, and the communities we work in – thank you for your trust and collaboration over the past three decades. Your confidence in our team has allowed us to grow, innovate, and continually raise the bar in decommissioning work across Western Canada.

And to our dedicated staff — both past and present — thank you for your skill, your commitment to safety, and your relentless work ethic. You are the heart of JSK, and the reason we've reached this remarkable milestone.

As we look ahead, we do so with pride in our past and optimism for the future. Here's to the next chapter of JSK Consulting Ltd.

# NAIT'S CENTRE FOR BOREAL RESEARCH OFFERS A WEALTH OF SEED EXPERIENCE

The ultimate goal of reclamation is to achieve equivalent land capacity (Alberta Government, 2018) and return disturbed land back to its former state (Natural Resources Canada, 2025). Reclamation requires a reliable source of high-quality seeds and access to multiple seed lots to ensure there is genetic diversity. In some cases, there are tight regulations on seed sources including where vegetation propagated from seeds can be planted. In particular, Alberta is divided into various seeds zones that are based on factors including latitude, elevation, ecotype and climatic conditions, where trees and shrubs can only be planted within the zone from which the seeds were collected (Alberta Forest Genetic Resource Management and Conservation Standards, 2016).

The Plant and Seed Program at the Northern Alberta Institute of Technology (NAIT) Centre for Boreal Research (CBR) in Peace River, Alberta has extensive experience in seed research. In fact, our seed bank is frequently utilized for research with community and industry partners. The Plant and Seed Program is addressing the shortage of seed supplies by helping partners develop their own

seed banks. NAIT CBR has helped Indigenous communities across Alberta and British Columbia by providing opportunities for capacity building and training in seed collection, extraction, testing, and storage.

Developing a seed supply starts with identifying plant species and understanding the important characteristics of native plant species, including leaf and steam shape and flower colour. Our team utilizes plant field guides and floras to help identify plants. However, we find that the best way to learn is to head into the field and explore! Being in the field also helps us understand the environmental conditions where plants grow, which is beneficial when collecting seeds.

Seed collection begins with scouting and identifying the locations to collect from. In Alberta, there are guidelines that indicate how many plants one must collect to register a seed lot. These numbers will differ depending on whether the plants are clonal or non-clonal in nature. The seeds are then monitored for ripeness, which is often indicated by the fruit ripeness or colour in angiosperms (flowering plants). Similarly, cones of gymnosperms (non-flowering plants), are monitored for colour. Remember, not all seeds are ready at different times and seeds must be checked regularly.

We utilize a variety of different techniques to extract seeds. Species like aspen, poplar, willow, and catkins are dried on racks, which will encourage the capsules to open and release their seeds. The seeds are then vacuumed to separate the seeds from the pappus. Fleshy berries like chokecherries and blueberries are extracted using jelly bags. After, modified food processors will separate the seeds from the fruit flesh and skins. Subsequently, the seeds are then cleaned with water and passed through multiple sieves. The seeds are then dried to ensure long-term viability in storage. NAIT CBR seeds have high germination rates even after a decade in storage. Regular testing is important to ensure that seeds have high germination rates, and seed lots are of high quality.

At the heart of reclamation are the plants and seeds, and NAIT strives for responsible harvesting and maintaining biodiversity in ecosystems. To support our partners and communities, we offer courses on plant identification, seed collection and extraction and storage. We also offer customized courses to build capacity in communities.

To view our technical resources and for more information regarding training and capacity building, please visit nait.ca/research or contact Dr. Ricky Kong at rkong@nait.ca.

# OIL & GAS OR ELECTRIC CARS?

## Regardless our future, let's first clean up our past!

Across North America, countless oilfield sites suffer from varying degrees of soil contamination – often the result of spills involving crude oil or produced water. Historically, remediation efforts have been hindered by high costs and the logistical challenges of remote locations. But a new approach is changing the equation.

RemediMaker, a proprietary spray-on treatment, offers an innovative and cost-effective solution for both legacy and recent contamination. Unlike traditional methods that rely on excavation, trucking, and landfilling – processes that merely relocate the problem – RemediMaker enables in-situ remediation, treating the soil directly at the spill site.

Our approach minimizes logistics, reduces emissions, and restores contaminated land. Our approach makes land usable again – without trucking and dumping into a landfill.

This method not only eliminates the need for transporting contaminated soil, but also drastically reduces greenhouse gas emissions associated with hauling and landfill operations. It also mitigates long-term environmental risks, such as leakage from aging landfill liners.

The economic advantages are equally compelling. In-situ treatment with RemediMaker typically costs just 15 per cent of conventional remediation methods, allowing operators to remediate multiple sites within the budget previously allocated for one.

Independent laboratory testing has confirmed that treated soils show over 80 per cent improvement within approximately 2.5 months, addressing both oil and produced water contamination.

Beyond its technical merits, RemediMaker's development and deployment reflect a commitment to inclusivity. The team includes experts from diverse gender backgrounds and maintains a meaningful partnership with Indigenous communities – bringing both scientific rigor and cultural insight to the forefront of environmental stewardship.

As the industry seeks sustainable, scalable solutions to legacy pollution, RemediMaker stands out as a transformative tool – cleaning up the past while protecting the future.


# PIVOTAL GROUND: HOW ALBERTA IS REIMAGINING ORPHAN WELL RECLAMATION

Alberta has long been tackling the issue of a growing inventory of orphaned wells. In 1974, there were fewer than 80 licensees operating in Alberta, and by 1995, that number had jumped to 700.[1] Today, there are around 400 active oil & gas licensees in the province.[2] In 1989, it was estimated that Alberta had 25,000 inactive wells and 243 orphan wells.[3] Even then, there was concern that more and more licensees would be unable to manage their environmental liabilities and meet their abandonment and reclamation responsibilities.

Today, the numbers are eye-popping. According to the Orphan Well Association's (OWA) website, its inventory includes 4,622 sites awaiting decommissioning and 8,122 sites requiring reclamation.[3] Province-wide, Alberta has 89,000 inactive sites and 100,000 sites requiring reclamation. A notable development was the conclusion of Sequoia Resource's insolvency process in early 2025, which more than doubled the OWAs' inventory in a single day.[4]

Perhaps the most pivotal decision ever made to protect against orphan wells was the Redwater ruling.[5] The Supreme Court of Canada determined that environmental obligations take precedence over creditors in bankruptcy proceedings. The decision was immediately tested by the collapse of Trident Exploration Corp., and the Redwater ruling was ultimately cited and upheld. The sales from Tridents' assets were used to fulfill abandonment and reclamation obligation; however, OWA and the Alberta Energy Regulator (AER) were left managing the remaining liabilities.

Over the decades, both industry and government have attempted to reduce the inventory of sites requiring abandonment and reclamation. Initiatives such as the Site Rehabilitation Program, Liability Management Framework, and Reduced Well Site Pilot Program have all contributed in some measure.[6][7][8]

In April 2025, Alberta finalized the Mature Asset Strategy (MSA) to help address the growing challenges posed by legacy oil & gas infrastructure and the associated environmental and financial liabilities.[9] Public perception of the MSA is deeply divided, and regulating abandoned and inactive wells remains a complex issue.

Many licensees operating in Alberta today are committed to returning their inactive sites to functional equivalence, while supporting their communities, municipalities, and reclamation obligations. Companies and regulators are increasingly adopting innovative approaches to bring inactive and abandoned wells to closure. Technologies such as remote sensing, drones, artificial intelligence, and regulatory modernization are helping shift Alberta from reactive cleanup to proactive, tech-driven reclamation.

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Despite the challenges, Alberta stands at a pivotal moment where innovation, collaboration, and accountability can reshape the reclamation landscape. With emerging technologies, stronger regulatory frameworks, and growing public awareness, the province has the tools to turn legacy liabilities into opportunities for ecological renewal and economic resilience.

The path forward is not only about restoring land – it is about restoring trust, stewardship, and a shared vision for a sustainable future. Alberta's reclamation story is still being written, and the next chapter holds promise.


1. Yewchuk, D., Fluker, S., & Olszynski, M. (2023). A Made-in-Alberta Failure: Unfunded Oil and Gas Closure Liability. The School of Public Policy, University of Calgary. https://doi.org/10.11575/sppp.v16i1.774681[1] (https://citation.doi.org/)

2. Alberta Energy Regulator. (2025). Licence Reports. Retrieved from https://www.aer.ca/data-and-performance-reports/activity-and-data/licence-reports

3. Orphan Well Association. (2025). Official Website. Retrieved from https://www.orphanwell.ca

4. Orphan Well Association. (2025). 2024/25 Annual Report. Retrieved from https://www.orphanwell.ca/about-us/annual-reports

5. Orphan Well Association v. Grant Thornton Ltd., 2019 SCC 5

6. Government of Alberta. (2024). Summary of oil and gas sites with closure work funded through the Site Rehabilitation Program. Open Government Portal. Retrieved from https://open.alberta.ca/dataset/summary-of-oil-and-gas-sites-with-closure-work-funded-through-the-site-rehabilitation-program

7. Alberta Energy Regulator. (2020). Liability Management Framework. Retrieved from https://www.aer.ca/understanding-resource-development/how-we-regulate/liability-management

8. Alberta Energy Regulator. (2024). Bulletin 2024-05: Site Reduction Reclamation Certificate Pilot. Retrieved from https://www.aer.ca/about-aer/media-centre/bulletins/bulletin-2024-05

9. Government of Alberta. (2025). Mature Asset Strategy: What We Heard and Recommendations Report. Ministry of Energy and Minerals. Retrieved from https://open.alberta.ca/publications/mature-asset-strategy-what-we-heard-and-recommendations

# LAKELAND PROVIDES HANDS-ON RECLAMATION EXPERIENCE

By Melissa Barr, Lakeland College

Lessons learned in the classroom are only a small part of Lakeland College's Bachelor of Applied Science: Environmental Management Program (BASEM).

Most BASEM students first complete a two-year Environmental Sciences diploma at Lakeland's Vermilion campus. The applied degree adds another year of study in labs, classrooms, and the surrounding fields, farmland, wetlands, and rivers. Then comes an eight-month practicum, where students – guided by faculty and supported by workplace supervisors – plan and carry out their own capstone projects. In March, they return to campus to present their findings at the Conference on Environmental Management.

The hands-on and practicum aspects of the program were a key factor that convinced Katie Diamond from Pierceland, Saskatchewan to enroll in the program after graduating in 2023 from the

> "I learned tons working at Cenovus thanks to the mentorship from my supervisors," Diamond says.

environmental sciences diploma, majoring in conservation and reclamation.

"Instead of going to university, the applied degree program at Lakeland was a really good option," says Diamond, who graduated from the program in 2025. "Lakeland gave me the hands-on learning, the field work that you use every day. It prepared me for the environmental regulations."

Following eight months of class at Lakeland, Diamond completed an eight-month practicum at Cenovus Energy. She worked in the Lloydminster Earthworks office as a frontline supervisor for lease construction and reclamation for the observation program. Her boss at Cenovus was the one who suggested the topic of her capstone project: Monitoring the success of ephemeral wetland reclamation using LiDAR, GIS, and satellite imagery.

"We follow a lot of regulations when we are constructing oil leases," Diamond explains. "This is a good way to show that we're doing a good job reclaiming them and putting them back the way they were."

Diamond designed the parameters of her project herself, including the data she would need and how best to collect it. While challenging, her faculty advisor at Lakeland and the team at Cenovus supported her along the way.

"Cenovus was really helpful with anything I needed for my practicum," she says. "They made sure I had the resources and time I needed to complete my fieldwork. A couple of people out of Calgary set me up with the software I needed to collect the data. It's a great group of people there, and they helped me with everything I needed."

Her colleagues at Cenovus also helped her with her presentation, giving her feedback and advice before she returned to Lakeland to share it with faculty and industry representatives at the conference.

"I learned tons working at Cenovus thanks to the mentorship from my supervisors," Diamond says. "They're a really great company and the Earthworks office is amazing."

Diamond has since accepted a full-time position with Cenovus.

# WESTMET ERS IS RECLAIMING THE PAST AND EMBRACING THE FUTURE

WestMET ERS (Earth Reclamation Services) is a leading provider of environmentally sustainable mineral, energy, and technology (MET) products and services. The team is committed to establishing and maintaining environmental protection programs that prevent injury or harm to the environment in its operating communities. WestMET ERS strives to set the benchmark for environmental stewardship and takes pride in all project work to enhance our reputation as a good corporate citizen and an industry leader in environmental and engineering services.

WestMET ERS is also involved in the energy transition through the development of advanced agricultural products, environmental services, and emerging energy technologies.

Final reclamation is ongoing at our legacy mine site, the Sheerness Mine, located south of Hanna, Alberta, where the team actively mines humalite for agricultural and soil amendment products rather than thermal coal. WestMET ERS is committed to provide and expand our supply of professional services in the consulting industry focusing on environmental, engineering, regulatory approvals and compliance, and reclamation projects across Western and Northern Canada. Experience and insights gained from the team's mining and operational experience in Alberta can be applied to neighbouring provinces, territories, and states.

The WestMET ERS team is composed of a diverse group of professionals with decades of experience in coal mining and consulting. Their experience is drawn from years of work in Alberta and Saskatchewan at Westmoreland sites, as well as other mining and consulting projects. This range of experience makes the WestMET ERS team a robust and unique group with specialized skills across mining, environmental, and consulting disciplines.

Providing clients with a unique combination of mine engineering and operations, environmental, and consulting experience allows our team to deliver exceptional technical support in any capacity required to create a collaborative partnership. Areas of specialization include, but are not limited to, the following:

## EXPLORATION ENGINEERING

- Drill data analysis
- Model analysis

## MINE DESIGN ENGINEERING

- Pit design and geotechnical inspections
- Optimization of dozer and truck fleets
- Budget and forecasting
- Production and productivity efficiency studies
- Drill and blast planning
- Drainage design, water retention, and pond development

## SUPERVISION

- Working with unionized workforce
- Negotiating collective bargaining agreements
- Extensive equipment operating experience

## REGULATORY LIAISON

- Direct communication and interaction with the AER and other regulatory agencies
- Involvement in regulator site inspections and tours
- Development of innovative concepts

## ENVIRONMENTAL MONITORING AND REPORTING

- Application preparation and submission
- Compliance program development and implementation
- Reclamation monitoring and closure activities
- Soil and water sampling programs

## INDIGENOUS ENGAGEMENT

- Site tours and reclamation collaboration

A strong commitment to safety and positive culture underpins WestMET ERS' approach of conducting business with integrity while delivering exceptional customer service. Employee and client safety is our number-one priority and staff members adhere to the established safety program. WestMET ERS is committed to working in a way that places the highest priority not only on our own safety and health, but also on the safety and health of coworkers, contractors, and members of the community. These programs are structured to comply with and exceed applicable laws and regulations and show the company's commitment to maintaining our reputation as an industry leader in safety. A testament to this commitment is displayed at our Sheerness Mine who recently celebrated 30 years without a lost time incident.

Safety is everyone's responsibility, and WestMET ERS staff support the company's commitment to health and safety by the letter and spirit of safety laws, the company's code of conduct and individual location policies. WestMET ERS is active on ISNetworld (ISN) and AVETTA.

The WestMET ERS team approaches every project with a client mindset, as we are also an active operator. This mentality leads to successful collaboration with clients resulting in developed efficiencies, regulatory compliance, environmental stewardship, and high safety standards. Our team looks forward to developing new relationships and advancing our services and market sectors in 2026 and beyond.

# OVERCOMING THE CHALLENGES OF ESTABLISHING NATIVE VEGETATION

By Elizabeth W. Murray, Mitchell Alberts, Craig Nicolay, Chelsea Toft, and Adam Dunn, Earthmaster Environmental Strategies Inc.

Revegetating soil using native seed can be challenging, especially when the soil has been disturbed, is compacted, is nutrient poor, has naturally elevated salinity, or the site experiences extended drought conditions. Native species can be slow growing and are easily outcompeted by weeds and non-native species before plants can be established. Plant growth-promoting rhizobacteria (PGPR) can be used to facilitate seed germination and plant establishment by providing phytohormones and reducing stress ethylene production (1); however, not all PGPR are beneficial for all native species.

## FIELD TRIAL

In 2020, Earthmaster seeded a former oil & gas site using a commercial native seed reclamation mix suitable for the central mixedwood subregion. As a trial to determine if PGPR treatment improved plant establishment, the site was divided in half with the west side receiving untreated seed and the east side receiving seed treated with PGPR (Figure 1). Plant height and percentage coverage measurements were collected from six sample locations in each half of the site for three years. In addition, biomass samples were collected in 2021. Surprisingly, treated seed produced 53 per cent less biomass, the plants were shorter, and had less percentage coverage consistently over the three-year trial period (Figure 2). These results surprisingly showed that this combination of seed species and bacteria type was detrimental to plant establishment on this site.

## GERMINATION TRIALS

To better understand the results of the field trial, Earthmaster undertook germination studies in the laboratory to exam the relationship between its two commercial PGPR species (UW4 and CMH3) and native species of seed used in reclamation applications in Alberta. Examples of the results are shown in Figure 3. Tolerance to produced water (LC50 expressed as mg/L Cl-) was used to assess seed response to environmental stress. Blue Grama grass (Bouteloua gracilis) responded positively to both CMH3 and UW4; however, it was very sensitive to the concentration of bacteria used. For CMH3, the lowest concentration of bacteria showed increased tolerance to chloride (stress) while the highest concentration was detrimental. For UW4, intermediate concentrations were more beneficial for stress tolerance. Slender wheatgrass (Elymus trachycaulus) was very sensitive to the type of bacteria used. CMH3 was detrimental to stress tolerance regardless of concentration, while UW4 improved stress tolerance regardless of concentration.

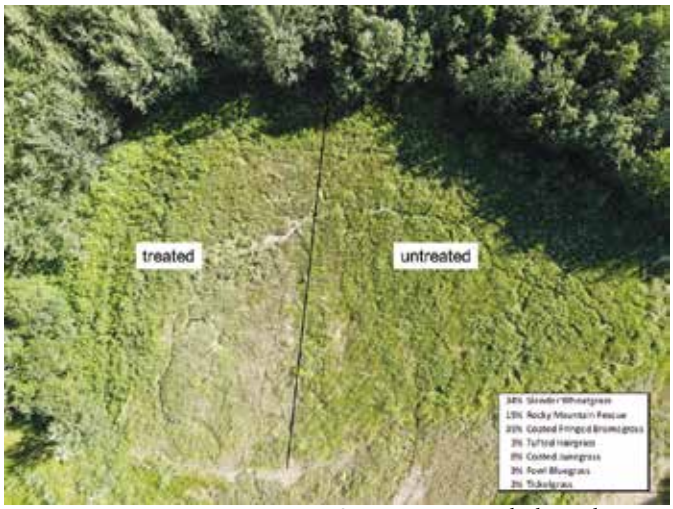

*Figure 1. Site vegetation growth observed in 2021.*

## CONCLUSIONS

PGPR can benefit the establishment and growth of native seed in reclamation applications; however, the relationship between PGPR and seed species is complex. Laboratory-scale plant-bacteria interaction studies are required to determine the most beneficial combination of bacteria and plant species, as many combinations can inhibit plant establishment.

See the Earthmaster website at www.earthmaster.ca for more information.

## REFERENCES

1. Chauhan, A, R Saini, and JC Sharma. 2021. Plant growth promoting rhizobacteria and their biological properties for soil enrichment and growth promotion. Journal of Plant Nutrition 45(2):1-27. DOI: 10.1080/01904167.2021.1952221

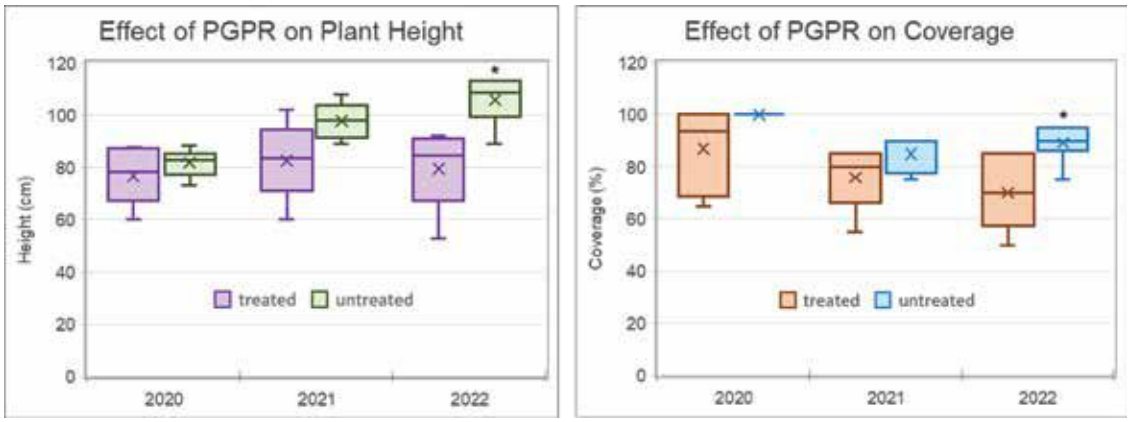


*Figure 2. Effect of PGPR treatment on plant height (left) and percentage coverage (right). * indicates a statistically significant difference between untreated and PGPR treated seed (n=6).*

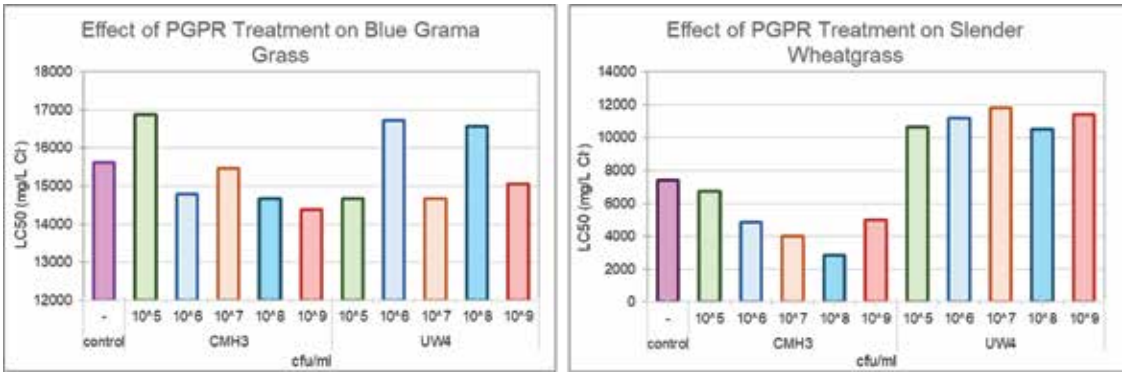


*Figure 3. Effect of PGPR treatment on tolerance (LC50) for elevated chloride for Blue Grama grass (Bouteloua gracilis, left) and slender wheatgrass (Elymus trachycaulus, right). LC50 is expressed as mg/L chloride (Cl-).*

# OLDS COLLEGE ENVIRONMENTAL SCIENCE & TECHNOLOGY DIPLOMA PROGRAM

## Experiential learning equips students for the workforce

Olds College of Agriculture & Technology has been preparing students to work in reclamation, remediation, and environmental science for over 35 years. Graduates from this program have a reputation for being able to hit the ground running as soon as they're hired, thanks to the combination of in-class and hands-on training that is the trademark of an Olds College education.

The core set of 20 courses provides students with a strong foundation in soils, vegetation, water, wildlife and reclamation through both theoretical classroom instruction, hands-on labs and field learning experiences. Field trips to various ecosystems and industry sites complement classroom learning, offering students real-world exposure to the subjects they study.

In the first year of the program, students study a diversity of ecosystems including parkland, grassland, boreal forest and mountain landscapes. In the second year, students complete Riparian Health Assessments (RHAs), pre-disturbance site assessments, Detailed Site Assessments (DSAs), Phase 1 and Phase 2 site assessments, soil and wetland classifications, streamflow measurements, wildlife identification and surveying, and native plant identification. Technical and industry-style report writing are an integral part of these assessments and the program. Students also graduate with a solid understanding of Alberta and Canadian Environmental Legislation and the regulations around land use and reclamation.

Students gain skills and experience using the technologies required for their future careers, such as Geographic Information Systems (GIS), remote sensing, Global Positioning Systems (GPS), drones, cellphone data collection apps, as well as water and soil analytical tools. An added bonus is that all students will have an opportunity to participate in a work-integrated learning experience after the first year of their program.

Feedback from students, instructors and industry plays a key role in ensuring the program remains current, practical and aligned with industry needs. This ongoing input helps maintain a relevant and purposeful curriculum that prepares graduates for success in the field.

One of our recent graduates reflected on her experiences with the program:

"This program taught me valuable skills within the environmental industry to walk

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- With strong industry connections, Olds College prepares graduates for careers like Land Reclamation Technician, Environmental Consultant, Surface Land Agent, Water Quality Technician, Research Assistant and more.

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into any stream of work with confidence and relevant knowledge. The hands-on experience and dedication from instructional staff bolstered my learning experience and success towards the career of my dreams."

After completion of the program, graduates are eligible for membership in the Alberta Institute of Agrologists (AIA) to pursue the Agrology Technologist in Training (ATT) designation, leading to Registered Technologist in Agrology RT(Ag). Graduates are also eligible for membership in the Alberta Society of Professional Biologists, where they can pursue the Biological Technologist in Training (BTT) designation, progressing to Registered Technologist in Biology (RT.Biol.). Finally, the Canadian Association of Certified Planning Technicians (CACPT) is currently evaluating the program for possible continued student certification.

We are proud to continue the legacy of over 35 years of environmental education at Olds College with the new Environmental Science & Technology Diploma program, and we thank our industry partners for their tremendous support over this time.

# DYNAMIC, WELL-PAID, FLEXIBLE CAREERS AWAIT GRADUATES OF LAND RECLAMATION PROGRAMS

By M. Anne Naeth, PhD, PAg, PBiol

There's no better time to embark on a land reclamation career than now. Land reclamation practitioners are in high demand due to a continually increasing focus on the environment and improving environmental performance; the growing human population and concurrent decreasing usable land base; and the increasing development of policy and legislation for reclamation, restoration and remediation of degraded lands. Land reclamation careers have projected longevity. There will always be a need for land reclamation to address land negatively affected by human activity, whether the causes were urban, industrial, warfare, natural disasters, or a changing climate. Land reclamation plays too crucial a role in shaping a sustainable future for generations to come to become obsolete. Even the United Nations has recognized the importance of land reclamation, designating 2021 to 2030 as the Decade of Ecological Restoration, aimed at preventing, halting and reversing ecosystem degradation on every continent and in every ocean.

Land reclamation is defined as the process of returning degraded land to productive use. That productive use may be different than

what it was before a disturbance, or it may embody specialized approaches such as ecological restoration to get back to pre-disturbance conditions. It may include soil and/or water contamination remediation. It may be done in short or long periods of time, with high or low technology inputs, with simple or highly complex trajectories to the desired outcome, and with exceedingly high or very low budgets.

Reclamation projects abound in Alberta, across Canada, and globally. The types of sites and disturbances are wide ranging, not just relegated to one sector such as the extractive industries. Reclamation takes place following natural disasters, such as flooding, earthquakes, and wildfires, which are becoming more common. It occurs on lands ravaged by war and civil unrest. Lands dominated by non-native plant species in urban, rural and natural areas require reclamation. So do contaminated sites and vacant or underutilized commercial or industrial sites, including brownfields. Reclamation is needed when constructing subdivisions and installing underground utilities, including pipelines. Parts of cities are built on land reclaimed from the sea, as in the Netherlands, Shanghai, Dubai and the United Kingdom. Various abandoned sites are in need of reclamation including mines, well sites, landfills, pipelines, roads, pits and quarries. Reforesting lands is critical for reducing greenhouse gas emissions. Finding solutions to contaminated water is essential for our health and wellbeing, and part of land reclamation. Land reclamation is even required in areas that have been mismanaged for recreation and agriculture. With half the land on planet earth considered degraded by human and natural disturbances – now exacerbated by climate change – resilient reclaimed landscapes that can adapt to our changing world, are needed to provide services and necessities for life on earth. Reclamation professionals are increasingly in demand to address these challenges.

There is a current decline in those seeking a career in land reclamation. Unfortunately, land reclamation has become associated with what is often perceived by the media and the public as dirty energy (oil, gas, coal, mines, pipelines). We know it is so much more. Some are concerned that land reclamation will no longer be needed once we make the switch to non-fossil fuel energy. Even if we could stop all non-renewable energy today, we have decades of legacy disturbances to reclaim throughout the world. Renewable resource-based energy, such as wind, solar and biofuel, impact ecosystems and each project require a reclamation plan. Even intact protected environments feel human footprints and require restoration and reclamation.

The land reclamation field is rich with rewarding career opportunities. The work is diverse, including project design and management; contaminated soil and water remediation; landscape building; revegetation; soil building; technology and process development reducing environmental impacts; stakeholder and community engagement; and policy and criteria development. Alberta has a robust reclamation economy. Projects are never the same, and can involve laboratory, office and field time, working alone or with teams of experts, and learning new skills and technologies. Consulting firms, industry, all levels of government,

and not-for-profit agencies hire those with land reclamation expertise. The land reclamation industry is progressive, and it values work-life balance, safety, wellness, and professional development. Some practitioners only want to conduct field work, while others are only happy in the office; some love the long field days and others want to be home when their kids get out of school. There's plenty of work to be done in all these scenarios. Technologies, such drones, apps and remote sensing, are being adapted to reclamation applications to reduce the need for intensive on-the-ground monitoring. Positions in land reclamation are well paid, and according to Energy Safety Canada average annual salaries range from $70,000 to $164,000. ECO Canada, reports that about 30,000 workers perform the core competencies of reclamation and an additional ~379,000 workers occasionally perform reclamation; this accounts for about 21 per cent of Canada's environmental workers.

The University of Alberta (UofA) land reclamation programs are unique in Canada and the world. By harnessing teaching and research capacities of one of Canada's top five universities, our offerings benefit students at all stages of studies and careers. Undergraduate programs prepare students to step directly into a job. Graduate programs focus on research or management. Graduates are eligible to apply for Professional Agrologist (PAg) or Professional Biologist (PBiol) designations, needed for professional sign off reclamation projects in Canada.

UofA students can take a four-year Bachelor of Science in Environmental and Conservation Sciences program majoring in land reclamation. They combine natural and applied sciences to understand and assess environmental impacts; conduct remediation, soil reclamation, revegetation and monitoring; and develop skills in site assessment, land use planning, stakeholder engagement and managing the complex ecological relationships of natural and anthropogenically disturbed environments. Our professors are well connected with those working in the industry, so they can add real experience to the curriculum. Two-year diploma programs at Lakeland or Olds colleges, the Northern Alberta Institute of Technology and other institutions, can be used for transfer to UofA. UofA graduate programs include thesis-based masters (MSc) and doctoral (PhD) degree programs in land reclamation, and a course-based master's program with an independent project. The course-based master's is ideal for those already working in the industry and wishing to upgrade their knowledge and skills.

UofA is home to the Land Reclamation International Graduate School (LRIGS), a unique, award-winning program complementing degree or diploma programs. LRIGS provides education and professional development in land reclamation to students and practitioners. Members increase knowledge, skills, and employability, and connect in an engaging environment with others passionate about land reclamation.

Whatever your interests and career goals are, the UofA has a program for you. Come join us in the challenging and rewarding field of land reclamation and make an impact on the world we share!

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UTILIZING PROFESSIONAL STAFF, ADVANCED TECHNOLOGY, FORWARD THINKING AND INTEGRATED RISK MANAGEMENT AS THE FOUNDATION OF A MODERN RECLAMATION PROGRAM FOR CLIENTS IN ALBERTA AND SASKATCHEWAN.

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- GEOPHYSICS
- REMEDIATION PLANNING & SUPERVISION
- RECLAMATION SUPERVISION
- DETAILED SITE ASSESSMENTS
- RECLAMATION CERTIFICATE APPLICATIONS
- SPILL RESPONSE SERVICES
- GROUNDWATER MONITORING
- RISK ASSESSMENT AND MANAGEMENT
- REGULATORY GUIDANCE AND REPORTING
- ARO PROGRAMS AND LIABILITY REDUCTION