

September 7, 2021

Michele Coleman; P.Geo., P. Eng.
Treasurer, CLRA Atlantic Chapter
216 Carriage Hill Drive
Fredericton, NB E3E1A4

Dear CLRA Award Committee,

I am honoured to have been able to compile this nomination for Nova Scotia Lands Inc. for the 2021 IN-TECH Reclamation Award to acknowledge the outstanding work the organization has done throughout Nova Scotia in a diverse array of reclamation projects. These projects have improved receiving waters, restored community access to previously degraded land, protected resources and employed innovative technologies. The engagement of the employees with several Nova Scotia academic institutions has spawned dozens of research projects, numerous field trips, assisted professors in developing new university courses and course material, provided the source material for more than a hundred publications and presentations and counting and supported more than 40 graduate degrees (Masters, PhD and post graduate level).

Their initial project, the clean up of the Sydney Tar Ponds, has been presented in textbooks on Environmental Management because of the magnitude and long-term history of the contamination and is an internationally known case study in how to reclaim severely degraded land and return it to the local community. A unique solution to remove and/or stabilize the almost 160-hectare site in the heart of Sydney, Nova Scotia, would impact the future development opportunities of the area. The resulting use of innovative technology for stabilization/ solidification and several other reclamation techniques created an approximately 121 ha commercial park with access to a deep-water harbour and an approximately 37-hectare open space community park with an amphitheatre, playing fields, 3.6 km shared use pathway, skating area with a warming hut, dog and bike park areas, a children's play area and parking and restroom accommodations. Truly a boon to Sydney, the second largest city in Nova Scotia.

Their success on this project has expanded the reclamation work of Nova Scotia Lands Inc. to include environmentally sensitive projects such as the removal of the shipwrecked MV Miner from the Scatarie Island Wildlife Management Area and removal of abandoned vessels in inland and near shore waters, to reclaiming degraded industrial sites into environmentally stable sites that can be used to enhance the economic status of the local community, to being the managing entity of cleaning up a long-operating pulp effluent disposal area and returning it to a natural estuary. This latest project has again involved significant engagement with First Nations communities, adjacent communities, Regulators, consultants and the academic community.

Nova Scotia Lands Inc. is widely recognized and respected for its work and the entity is frequently requested to submit proposals for reclamation/ restoration projects that require a vast knowledge of range of reclamation techniques or the experts required to supply that information, the ability to engage local communities including First Nations, and the willingness to provide educational experiences with the academic community.

Nova Scotia Lands Inc. is a strong supported of the CLRA Atlantic Chapter, having served on the Board of Directors since 2014, including having a member serve a term as Chapter President. They have also financially supported numerous Chapter events.

I trust that the enclosed information supports my nomination of Nova Scotia Lands Inc. for the 2021 IN-TECH Reclamation Award for an agency.

Best Regards,

A handwritten signature in cursive script that reads "Michele Coleman". The signature is written in dark ink and is positioned centrally below the "Best Regards," text.

Michele Coleman; P. Geo., P. Eng.
CLRA Atlantic Chapter Treasurer

Background on Nova Scotia Lands Incorporated

Nova Scotia Lands Incorporated (NSLI) is a provincial crown corporation founded initially in 2007, to oversee the demolition and brownfield redevelopment of the former Sydney Steel Corporation (SYSCO) in Sydney Nova Scotia. In addition to these duties, senior officials from NSLI served as members of the Secretariat and the Project Management Committee of the Federal-Provincial Sydney Tar Ponds and Coke Oven Cleanup Project. In this role initially, they provided provincial oversight of the cleanup. However, this role grew as the project proceeded to include Project Management of various aspects of the cleanup for the Sydney Tar Ponds Agency (STPA). NSLI is the agency responsible for the Long-Term Monitoring and Maintenance (LTMM) of the lands associated with the cleanup, as well as the lands that formed part of the Sysco portfolio.

Given the skill developed by NSLI, through both the brownfield redevelopment activities and remedial efforts on the former Sysco and STPA properties, they began to build a niche within the province in dealing with complex environmental and/or demolition projects within Nova Scotia. NSLI began branching out within the province performing asbestos abatement and demolition of provincial assets province wide. Then along came the MV Miner.

The MV Miner was a Canadian lake boat that was part of the fleet of Upper Lakes Shipping from 1994–2011. In 2011 the vessel was taken out of service and sold as scrap. In 2011, while under tow to a scrapyards in Turkey, the ship broke away and ran aground on Scatarie Island off the coast of Nova Scotia in 2011. This island and its surrounding waters is a pristine wilderness and the Government of Nova Scotia had designated the entire island as part of the Scatarie Island Wildlife Management Area in 1976.

After a failed attempt, with a private company to remove the vessel, NSLI was tasked with finding a solution to remove this vessel and maintain the environmental integrity of Scatarie, all of which from a remote location. NSLI developed a Request for Proposal (RFP) to remove the vessel, in a sustainable manner, in 2014. The project successfully wrapped up in the spring of 2015.

In the midst of the work on the MV Miner, NSLI was commissioned by the Province of Nova Scotia in the summer of 2014 to engage with Northern Pulp and the Community of Pictou Landing First Nation to develop a retirement/remediation plan for the Boat Harbour Effluent Treatment Facility which treated the wastewater from the Kraft Pulp and Paper Mill in nearby Abercrombie, Nova Scotia. The goal that was set for the Boat Harbour Remediation Project is to return Boat Harbour to its original state - that of a tidal estuary.

Since 1967 Boat Harbour has been receiving wastewater effluent from industry. In 1972, a dam was built cutting Boat Harbour off from the ocean. This turned the saltwater estuary into a freshwater lake. From that time to today, Boat Harbour has been receiving wastewater from the pulp mill at Abercrombie Point. In the early years, Canso Chemicals also used Boat Harbour to treat their wastewater.

The Government of Nova Scotia owns the Boat Harbour Effluent Treatment Facility and operated the Facility until December 1995. In January 1996, the Facility was leased to the owners of the pulp mill at Abercrombie Point, who have operated it since. In 2015, the Government of Nova Scotia passed The Boat Harbour Act. This law orders that Boat Harbour will cease to be used for the reception and treatment of effluent by January 31, 2020.

Amid these remediation projects, the Commercial Park side of our operation experienced significant growth. In 2015, NSLI was tasked with the brownfield redevelopment and operation of the Former Abitibi Bowater Pulp and Paper Plant and its' associated properties, now known as Port Mersey Commercial Park, in Liverpool, Nova Scotia. The following year we were asked to remediate and manage the Former DSME Trenton Facility, now known as Trenton Commercial Park, in Trenton, Nova Scotia. To date we continue to manage our way out of these facilities into the hands of private industry.

Realizing our effectiveness in remediation and brownfield redevelopment province again called upon NSLI to manage the remediation and closure of the Former RDM Recycling Facility, a failed C&D disposal facility in Harrietsfield, Nova Scotia. In the fall of 2017, Nova Scotia Department of Natural Resources (NSDNR) engaged NSLI to manage the Closure of Mine Site Tailings Facilities in Montague and Goldenville, Nova Scotia. A year later project, NSDNR tasked NSLI to undertake the environmental review, prioritization, and future remediation of 67 other abandoned mine site operations on Crown Lands within the province of Nova Scotia.

NSLI also works in the field of waterway reclamation work in relation to provincial dams throughout Nova Scotia. NSLI is leading an assessment program for seven government departments for all provincially owned dams across Nova Scotia.

NSLI staff have routinely presented at numerous CLRA Atlantic Chapter ARC conferences over the past decade. This also included many consultants and academics who also presented on their work for NSLI at various ARC conferences. NSLI staff also presented at National CLRA conferences in the past few years.

NSLI is a supporter of the core values of CLRA in promoting advancements in brownfield redevelopment and participating in sharing information with other professionals working in this field. NSLI is especially supportive of promoting learning opportunities for youth interested in entering the environmental field. NSLI routinely hires summer students and have been successful in retaining some of these students for full-time employment with NSLI. NSLI is a fervent supporter of the role of academia in the field of environment reclamation research and often partners with academic institutes in Nova Scotia.

In addition to attending and presenting at CLRA conferences, NSLI staff have participated on the Atlantic Chapter and National Board of Directors over the past decade and continue to support the Atlantic Chapter.

Sample of Presentations and Publications by NSLI Staff and Contracted Consultants

Burke, D. 2016. The Future in the Environmental Field is Looking Down (Drone Technology). Atlantic Reclamation Conference, Halifax, NS, November 2016.

Burke, D. and Muise, J. 2016. Sydney Tar Ponds Clean Up. Construction Specifications Canada – Building on History Conference, Halifax, NS, May 25-29, 2016.

Burke, D., MacDonald, D., and Noble, B. 2011. Future Land Use and Sustainable Remediation at the Sydney Tar Ponds and Coke Oven Sites Remediation Project. Real Property Institute of Canada Conference, Banff, AB, 2011.

Burke, D., Guirgis, F., Noble, B., and Pinto, S. 2011. Onsite Odour Management for a Remediation Project in an Urban Setting – Sydney Tar Ponds and Coke Oven Sites Remediation Project. SS TECH 2011, Cape Breton University, Sydney, NS and RemEast 2011, Halifax NS.

Burke, D. and LeBlanc, R. 2012. Sydney Tar Ponds Agency Canadian Land Reclamation Association – National Conference Seeding Changed – Cooperative Reclamation, September 25-28, 2012.

Burke, D. Panelist, 2012. Can Urban Parks be Catalysts for Real Estate Investment, Sydney Tar Ponds. ULI Fall Meeting and Urban Land Expo, Denver, Colorado, 2012.

Francisco, R., Ingraham, D., MacCormack, S., MacNeil, J., MacDoanld J., and McNeil, W. 2012. 100% Performance Demands Collaborative Quality Management – Managing Challenging Environment Remediation Projects. SS Tech 2011, Cape Breton University, Sydney, NS Goora, C. 2011. Coke Ovens Rail Culvert Installation, Managing Challenging Environment Remediation Projects. RemEast, 2011.

Ingraham, D. 2011. Managing Quality on the \$400M Sydney Tar Ponds and Coke Ovens Cleanup Project. 3 rd International/9th Construction Specialty Conference, Ottawa, ON, June 14-17, 2011.

Ingraham, D. 2011. Sydney Tar Ponds and Coke Ovens Remediation Update Phase I Completion & Moving Forward. The Mining Society of Nova Scotia – AGM Presentation, June 9-10, 2011.

MacAskill D., Thalheimer, A., Walker, T., and Weaver, P. 2013. Assessing Sydney Tar Ponds Remediation and Natural Sediment Recovery in Nova Scotia, Canada. 2nd International Symposium on Bioremediation and Sustainable Environmental Technologies, Jacksonville, FL, June 10-13, 2013.

MacAskill, D., Thalheimer, A., Walker, T., and Weaver, P. 2013. Assessing Sydney Tar Ponds Remediation and Natural Sediment Recovery in Nova Scotia, Canada. Dallas, TX, 2013.

MacAskill, D., Rushton, T., Walker, T., and P, Weaver. Sediment and water quality indicators: Case study evaluation of remedial activities at the Sydney Tar Ponds and natural recovery rates of sediments in Sydney Harbour, Nova Scotia. RemEast Conference, Halifax, NS, 2011.

MacDonald, T. 2012. The Applicability of the Excellence Study on an Engineering-based Project. Real Property Institute of Canada Conference, 2012. MacDonald, T. 2010. A Feature on “Site Remediation Solutions for the 21st Century” on Today in America. 2010.

Burke, D. 2016. The Future in the Environmental Field is Looking Down (Drone Technology). Atlantic Reclamation Conference, Halifax, NS, November 2016.

Burke, D. and Muise, J. 2016. Sydney Tar Ponds Clean Up. Construction Specifications Canada – Building on History Conference, Halifax, NS, May 25-29, 2016.

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Burke, D., Guirgis, F., Noble, B., and Pinto, S. 2011. Onsite Odour Management for a Remediation Project in an Urban Setting – Sydney Tar Ponds and Coke Oven Sites Remediation Project. SS TECH 2011, Cape Breton University, Sydney, NS and RemEast 2011, Halifax NS.

Burke, D. and LeBlanc, R. 2012. Sydney Tar Ponds Agency Canadian Land Reclamation Association – National Conference Seeding Changed – Cooperative Reclamation, September 25-28, 2012.

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MacAskill, D., Thalheimer, A., Walker, T., and Weaver, P. 2013. Assessing Sydney Tar Ponds Remediation and Natural Sediment Recovery in Nova Scotia, Canada. Dallas, TX, 2013.

MacAskill, D., Rushton, T., Walker, T., and P, Weaver. Sediment and water quality indicators: Case study evaluation of remedial activities at the Sydney Tar Ponds and natural recovery rates of sediments in Sydney Harbour, Nova Scotia. RemEast Conference, Halifax, NS, 2011.

MacDonald, T. 2012. The Applicability of the Excellence Study on an Engineering-based Project. Real Property Institute of Canada Conference, 2012.

MacDonald, T. 2010. A Feature on “Site Remediation Solutions for the 21st Century” on Today in America. 2010.

Justification for nomination of Nova Scotia Lands Inc for the CLRA IN-TECH Award

Dear CLRA Awards Committee members,

Please accept this nomination for Nova Scotia Lands Incorporated (NSLI) for the 2021 IN-TECH Reclamation Award for an organization because of their contributions to innovation in reclamation practices, furthering the knowledge in several sectors of reclamation including mining, industrial brownfields, pulp and paper, with resulting economic and environmental benefits to the local human and natural communities, for their support engaging the academic community in these endeavours so as to further academic research in many fields (biology, chemistry, civil engineering, environmental etc) and in providing research and real problem field study opportunities from a diverse area of expertise for students. Their impact furthered knowledge on both terrestrial and aquatic terrains and included biological, social-economic and cultural improvements to the reclamation projects which spanned the province of Nova Scotia.

Nova Scotia Lands Inc. is the Crown Corporation agency in the province of Nova Scotia responsible for environmental remediation and redevelopment of contaminated lands or waterways that have been impacted by industrial or anthropomorphic activities on Crown lands (provincial government owned) or on abandoned properties (former industrial sites) where the provincial government is now involved. Their mission is to ensure proper remediation and improving the quality/ removing the contaminant of provincial land assets while employing innovated techniques and employing outreach to engage the local community, First Nations and a wide range of academic teachers and researchers.

Nova Scotia Lands Incorporated was founded in 2007 to oversee the demolition and brownfield redevelopment of the former Sydney Steel Corporation in Sydney, Nova Scotia and was expanded to include the project management of aspects of the Federal-Provincial Sydney Tar Ponds and Coke Oven Cleanup Project. This project created the Harbourside Commercial Park (a deepwater harbour access commercial park) and the Open Hearth Park (a recreational and performing arts area) in Sydney, Nova Scotia and transformed the formerly internationally known contaminated site into an economic and community stimulus source for the city.

Given the skill developed by NSLI through both the brownfield redevelopment activities and remedial efforts, they began to build a niche within the province in dealing with complex environmental and/or demolition projects including the removal of the MV Miner, which had run aground in the Scatarie Island Wildlife Management Area. They have recently been awarded a contract to remove 14 abandoned vessels which are currently impacting navigation and shoreline stability on waterways in Nova Scotia.

The most recent project is to engage with the Community of Pictou Landing First Nation to develop a remediation plan for Boat Harbour, a pulp effluent treatment facility and return it to its original state - that of a tidal estuary. NSLI was commissioned by the Province of Nova Scotia to collaborate with Regulators, First Nations, local communities, consultants, and academia.

Less glamorous projects included the remediation and brownfield redevelopment of abandoned and contaminated industrial sites into commercial parks, manage the remediation and closure of a failed C&D disposal facility and manage the closure of several mine site tailings facilities so as to stabilize environmental impacts and improve economic sustainability of the adjacent communities. Due to their successes, they have been directed to undertake the

environmental review, prioritization, and future remediation of 67 other abandoned mine site operations on Crown Lands within the province of Nova Scotia.

Finding letters of support for the remediation work and the methods was not a difficult task as glowing letters poured in from consultants, academics and regulators.

A former consultant and now regulator stated “NS Lands brings an appreciation for innovative solutions, consideration of social indicators, and value for technical learning to the projects they lead. For example, they often promote involvement of the local community in their projects by identifying and promoting employment opportunities, including via the procurement selection process, as well as emphasizing communication and engagement. Collaboration with local universities is also frequently leveraged in their projects to promote innovation and technical learning.”¹

In the areas of research and teaching, Nova Scotia Lands has been extremely integrated into several universities, with the disturbed land and local community benefitting from world class research and students benefitting from hands on knowledge about local disturbed land impacts, monitoring and solutions.

Two professors from Cape Breton University (CBU) have been intricately involved in research aspects of the tar ponds and Boat Harbour and have incorporated the material to enhance real life example teachings in their curriculum over the past eight years. Professors Xu Zhang and Assistant Professor Ken Oakes², focussed “on undergraduate courses where students compared the post-remediation Sydney Tar Ponds site with lecture material highlighting the pollutant legacy of the steel plant and adjacent coke ovens”. These professors commented that the extra effort by Nova Scotia Lands to have their experts be available for question and answer sessions on site enhanced the learning experience for the students because they could “bring the material to life”.

Drs. Zhang and Oakes summarized the interactions as being very impressed with NS Lands as an entity, their staff professionalism, and dedication to using the best available technology and practices through continuous consultation with academia, consultants, stakeholders and the general public before and during remediation of diverse contaminated sites in Nova Scotia. High praise indeed.

Another enthusiastic endorsement came from Dr. Tony R. Walker³ who worked on both the Sydney Tar Ponds cleanup project (as an environmental professional), and as an academic advisor serving on the Boat Harbour Environmental Advisory Committee (BHEAC). Dr. Walker reported that his role serving on the BHEAC” has not just been restricted to the occasional board room meeting, it has been a fruitful collaboration working closely with Nova Scotia Lands, Pictou Landing First Nation, provincial and federal regulators, consultants, and academia. Dr.

¹ Maylia K. Parker; P. Geo. Director, Air Quality & Resource Management, Nova Scotia Department of Environment and Climate Change. Email support letter to M. Coleman for NSLI Nomination. August 11, 2021.

² Xu Zhang, Ph.D. Tier II Canada Research Chair, Assistant Professor of Chemistry. Ken Oakes, Ph.D. Associate Professor of Biology. Cape Breton University. Sydney, Nova Scotia. Letter of support for NSLI nomination. August 6, 2021.

³ Tony R. Walker, PhD. Associate Professor, School for Resource and Environmental Studies, Dalhousie University. Halifax, Nova Scotia. Letter of support for NSLI nomination. August 6, 2021.

Walker offered full support of the nomination as Nova Scotia Lands have supported over a dozen applied graduate research projects which have resulted in training of at least ten masters and one PhD graduate students” under his supervision.

Dr. Craig Lake’s⁴ letter of recommendation stated that the establishment of the BHEAC committee “is evidence of the forward thinking of Nova Scotia Lands in their pursuit of impartial input of the committee’s experts in addition to the various consultants working on the project. Nova Scotia Lands interest in developing research capabilities for this project is impressive....” A partnership between Dr. Lake’s research group, Nova Scotia Lands and SCG Industries led to the development of new technology for the assessment of the distribution of contaminated sediment in the Boat Harbour stabilization basin. This work has allowed developments in novel approaches to reclamation of contaminated sediments and has resulted in several journal and conference publications as well as training opportunities for graduate students.

For both the Sydney Tar Ponds and the Boat Harbour project, Dr. Lake found Nova Scotia Lands staff “extremely willing and eager to develop research questions and solutions to solve unique problems”. His research interest related to cement-based S/S as well as access to data resulted in many publications in international peer reviewed journals and conferences as well as book chapters. NSLI involvement and support attracted world experts in land reclamation to the International Stabilization/Solidification Technology Forum held in Cape Breton, Nova Scotia. The highlight of the conference was touring the ongoing field project and learning about the innovations of the project from NS Lands staff. Dr. Lake gave strong support of this nomination because of the NSLI support for innovative techniques, international recognition and wide ranging educational exposure.

Christine Moore⁵, a consulting senior scientist, worked with NSLI on abandoned historic mine projects and noted that NSLI developed reclamation plans with consideration of the 100+ years of ecosystem recovery which has taken place since the historic mining ceased while encouraging recovery in affected wetland areas and evaluating potential residual risks to humans and aquatic life and wildlife using these areas. Ms. Moore noted that Nova Scotia Lands has encouraged academic research in this project, with studies related ecosystem effects being undertaken by researchers and graduate students at Saint Mary’s University and has offered her full support for the nomination for the IN-TECH award.

In closing, Nova Scotia Lands Inc. is a strong supporter of the core values of CLRA in promoting advancements in brownfield redevelopment and participating in sharing information with other professionals working in this field. The Sydney Tar Ponds Clean-up Project was the highlight and field trip attraction of the 2012 CLRA National Conference. NSLI staff and their consultants have routinely presented at numerous CLRA Atlantic Chapter Atlantic Reclamation Conference (ARC) events. NSLI staff also presented at National CLRA conferences in 2017 and 2018. Nova Scotia Lands Incorporated staff have been long standing Directors and executive members on the CLRA Atlantic Chapter Board, also serving on the CLRA National Board while as Atlantic Chapter President.

⁴Craig Lake; BEng, PhD, PEng, FEIC. Professor, Department of Civil Engineering, Dalhousie University. Halifax, Nova Scotia.

⁵Christine Moore, M.Sc., Senior Scientist. Intrinsik Corp. Halifax, NS. Letter of support for NSLI nomination. August 10, 2021.

August 10, 2021

Michele Coleman, Nomination Coordinator
CLRA Atlantic Board of Directors
Michele.m.coleman@gmail.com

RE: IN-TECH Reclamation Award Nomination

Dear Michele Coleman,

I understand that Nova Scotia Lands Inc. (NS Lands) has been nominated for the IN-TECH Reclamation Award. I have worked with NS Lands in my previous private sector positions as an environmental consultant, including my role as the former Atlantic Canada representative for Sustainable Remediation Forum (SuRF) Canada. I am currently knowledgeable of the work of NS Lands in my capacity of Director, Air Quality and Resource Management (AQRM) at Nova Scotia Department of Environment and Climate Change. The AQRM portfolio includes contaminated sites assessment and remediation.

NS Lands has led and is leading several pivotal reclamation projects in Nova Scotia, including the ongoing work at historic gold mine sites and Boat Harbour. Before 1967, Boat Harbour was a natural tidal estuary that the Pictou Landing First Nation (PLFN) nicknamed A'Se'K, which means "other room" in Mi'kmaq, because it was where many community activities took place. In 1967, the Province of Nova Scotia constructed the Boat Harbour Effluent Treatment Facility for a pulp and paper mill and in 1972 a dam was built that cut Boat Harbour off from the ocean. The result was that the tidal estuary was transformed into a treatment basin that is contaminated with metals, polycyclic aromatic hydrocarbons (PAHs) and dioxins and furans. The reclamation work at Boat Harbour is estimated to take 4 to 7 years with a cost of over \$200 million and will return Boat Harbour to a tidal estuary that can once again be "A'Se'K" for the PLFN community. ([Boat Harbour Remediation Project | A'se'k Waqma'tasik \(boatharbourproject.ca\)](http://BoatHarbourRemediationProject|A'se'kWaqma'tasik(boatharbourproject.ca)))

From my experience, NS Lands brings an appreciation for innovative solutions, consideration of social indicators, and value for technical learning to the projects they lead. For example, they often promote involvement of the local community in their projects by identifying and promoting employment opportunities, including via the procurement selection process, as well as emphasizing communication and engagement. Collaboration with local universities is also frequently leveraged in their projects to promote innovation and technical learning.

Please consider this letter of support in your consideration of Nova Scotia Lands Inc. for the IN-TECH Reclamation Award.

Sincerely,

A handwritten signature in cursive script that reads "Maylia K. Parker". The signature is written in dark ink on a light-colored background.

Maylia K. Parker, P.Geol.



Michele Coleman

Nomination Coordinator

CLRA Atlantic Board of Directors

August 6, 2021

Re: NS Lands Nomination for CLRA In-Tech Reclamation Award

Dear Ms. Coleman

We are happy to contribute this letter in support of the Nova Scotia Lands nomination for the CLRA In-Tech Reclamation Award as we have been privileged to work closely with Nova Scotia Lands on numerous projects over the past 8 years. Initially, our interactions focussed on undergraduate courses where students compared the post-remediation Sydney Tar Ponds site with lecture material highlighting the pollutant legacy of the steel plant and adjacent coke ovens. The questions and answer sessions with NS Lands experts on site who actually oversaw the remediation brought the material to life. Later, additional *Ecology* and *Sustainable Land Use* courses studied post-remediation plant diversity on the former Sydney Tar Ponds site, now Open Hearth Park, with NS Lands supplying a data co-ordinator contract to facilitate and organize the student data collections. Graduate students from across Canada studying in water-related disciplines as part of a Canadian Water Network course and University of Alberta Landscape Reclamation program also toured the remediated Tar Ponds site (a national draw due to the infamous designation as one of Canada's most toxic sites prior to remediation), as a focal point of both workshops. Being guided by (and asking technical questions of!) numerous NS Lands professionals was a central and valued learning experience for these graduate-level students, many of them who are now environmental professionals.

Ken Oakes has also served on the Boat Harbour Remediation Advisory Committee, along with faculty representing most of the Maritime universities. While ostensibly providing scientific advice, it equally has been a valuable learning opportunity for the universities involved, faculty, graduate, and undergraduate students alike. Few have the opportunity to see "behind the scenes" how large scale remediation projects, such as \$292 M Boat Harbour project unfold. As individual expertise of any one person is limited, interacting with and learning from those with diverse expertise is truly an educational process for all involved. The Advisory Committee participation also lead to hands-on opportunities for students supervised by Ken Oakes and Xu Zhang, with 8 graduate students, undergraduate students, or Postdoctoral Fellows benefitting from research opportunities afforded by projects associated with Boat Harbour. Projects ranged from developing novel water treatment strategies to treat persistent organic pollutants and metals in Geotube™ filtrate of Boat Harbour sediment pore-water, to projects quantifying the pre-remediation freshwater fish community, to researching traditional foods and medicines at A'se'k, prior to pulp mill effluent addition. In addition to the "real-world" learning opportunities, the resultant research generated 5 publications to date with at least 3 more forthcoming.

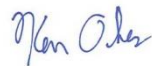
Throughout our interactions, we have been very impressed with NS Lands as an entity, their staff professionalism, and dedication to using the best available technology and practices through continuous consultation with academia, consultants, stakeholders and the general public before and during remediation of diverse contaminated sites in Nova Scotia. Consequently, in the strongest terms, we commend NS Lands for full consideration in their nomination for the CLRA In-Tech Reclamation Award.

Please don't hesitate to contact the undersigned should further information be required.



Xu Zhang, Ph.D.

Tier II Canada Research Chair, Assistant Professor of Chemistry



Ken Oakes, Ph.D.

Associate Professor of Biology

Michele Coleman
Nomination Coordinator
CLRA Atlantic Board of Directors
Email: Michele.m.coleman@gmail.com

August 6, 2021

Letter of support for the CLRA IN-TECH Reclamation Award for Nova Scotia Lands

Dear Michele

It is with great pleasure that I offer this letter of support for the nomination for the CLRA IN-TECH Reclamation Award for Nova Scotia Lands.

I have worked closely with Nova Scotia Lands for well over a decade. First, as an environmental professional working on the Sydney Tar Ponds cleanup project, and more recently as an academic advisor serving on the Boat Harbour Environmental Advisory Committee (BHEAC). Since 2015 I have served on the BHEAC assisting Nova Scotia Lands by gathering baseline data and contaminant characterization to help with remediation planning and decision making for the Boat Harbour Remediation Project (A'se'k Waqma'tasik).

My role serving on the BHEAC has not just been restricted to the occasional board room meeting, it has been a fruitful collaboration working closely with Nova Scotia Lands, Pictou Landing First Nation, provincial and federal regulators, consultants, and academia. Nova Scotia Lands has worked tirelessly with all stakeholders working towards making informed remedial decisions to cleanup Boat Harbour (A'se'k). Many of these decisions have been based on evidence-based research by graduate students under the supervision of many academic partners who also serve on the BHEAC. I have been honoured to play some small role to assist with the cleanup of Boat Harbour (A'se'k) with generous support from Nova Scotia Lands. To date, Nova Scotia Lands have supported over a dozen applied graduate research projects which have resulted in training of at least ten masters and one PhD graduate students.

Therefore, I have no hesitation in offering my full support for the nomination for the CLRA IN-TECH Reclamation Award for Nova Scotia Lands. Thank you for your consideration.

Yours sincerely,



Tony R. Walker, PhD
Associate Professor
School for Resource and Environmental Studies
Dalhousie University
Halifax, Nova Scotia



Canadian Land Reclamation Association /
Association Canadienne de Réhabilitation des Sites Dégradés (CLRA/ACRSD)
Michele Coleman
Nomination Coordinator
CLRA Atlantic Board of Directors
Michele.m.coleman@gmail.com

August 5, 2021

Re: Nomination of Nova Scotia Lands For the National CLRA In-Tech Reclamation Award (Group)

To the Members of the Selection Committee:

It is my pleasure to provide this nomination letter in support of Nova Scotia Lands for the National CLRA In-Tech Reclamation Award (Group). I have worked either indirectly or directly with Nova Scotia Lands since approximately 2006. During this time, I have been an observer of their progressive view towards reclamation of contaminated sites. Specifically, I have been an indirect observer of their work related to the Sydney Tar Ponds project and a direct observer of their work related to the Boat Harbour Project. These projects represent major reclamation projects for the province of Nova Scotia but also represent large scale efforts at the national level with budgets exceeding \$700M. I will focus on these two projects in this letter with an emphasis on the research developed as a result of this reclamation work. For each of these projects I found Nova Scotia Lands staff extremely willing and eager to develop research questions and solutions to solve unique problems on these projects.

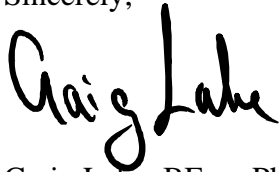
Sydney Tar Ponds Project. As noted in Nova Scotia Lands application package, the Sydney Tar Ponds project represents a significant chapter in Canada's reclamation history. Due to the novel approach to this project in Canada (i.e. cement-based S/S treatment), it stimulated a research interest for me and led to a path of cement-based S/S research in my group since this time. Although my research was not directly involved in decision making of this project, my positive interactions with Nova Scotia Lands stimulated my interest in this type of research. Access to site visits and discussion with staff members provided me with an avenue to further my knowledge in this area. My research interest related to cement-based S/S as well as access to data produced from the project resulted in many different publications in international peer reviewed journals and conferences as well as book chapters in this subject area (see attached Bibliography). As the technical co-chair of the International Stabilization/Solidification Technology Forum held in Cape Breton, Nova Scotia, their involvement and support allowed us to attract world experts in land reclamation to Cape Breton for the conference. The highlight of the conference for all the international attendees was touring the ongoing field project and learning about the innovations of the project from NS Lands staff.

Boat Harbour Project. I have had the pleasure of serving on the Boat Harbour Environmental Advisory Committee as an impartial academic representative. As noted in the application package, this upcoming reclamation project represents a significant undertaking that will involve input of both technical and socio-perspectives. The establishment of the committee is evidence of the forward thinking of Nova Scotia Lands in their pursuit of impartial input of the committee's experts in addition

to the various consultants working on the project. Nova Scotia Lands interest in developing research capabilities for this project is impressive, having participated as a partner in many targeted research projects related to the reclamation project. For example, a partnership between my research group, Nova Scotia Lands and SCG Industries led to the development of new technology for the assessment of the distribution of contaminated sediment in the Boat Harbour stabilization basin. This work and other related to baseline monitoring, sediment dewatering and sediment characterization has resulted in several journal and conference publications as well as training opportunities for graduate students (see Bibliography). This type of engagement has been meaningful for myself and my students and has allowed developments in novel approaches to reclamation of contaminated sediments.

In summary, I offer my full support for the nomination for the CLRA IN-TECH Reclamation Award for Nova Scotia Lands and hope the committee considers the indirect and direct impact that Nova Scotia Lands has made towards academic research in land reclamation when reviewing the attached bibliography from my research group.

Sincerely,

A handwritten signature in black ink that reads "Craig Lake". The signature is written in a cursive, flowing style.

Craig Lake, BEng, PhD, PEng, FEIC
Professor, Department of Civil Engineering, Dalhousie University

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Research Publications Indirectly Related To Sydney Tar Ponds and Soil Cement

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Michele Coleman
Nomination Coordinator
CLRA Atlantic Board of Directors
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August 10, 2021

Letter of Support for the CLRA In-Tech Reclamation Award for Nova Scotia Lands

Dear Michele:

This letter is being offered in support for the nomination of Nova Scotia Lands for the CLRA In-TECH Reclamation Award.

I have worked closely with Nova Scotia Lands starting in 2018 as a senior environmental consultant managing one of their major projects, the reclamation of two abandoned historic gold mines (Montague Mines and Goldenville). I am also aware of Nova Scotia Lands work on many files, such as the Sydney Tar Ponds cleanup project, the Boat Harbour cleanup project, and Harrietsfield environmental cleanup, amongst others. I am very familiar with the complexities of reclamation on both the Sydney Tar Ponds and Boat Harbour projects, as I completed environmental and /or human health risk assessment projects on both of these sites for various levels of government (joint federal and provincial assessments on both sites, as well as several provincial assessments on the Boat Harbour site). Therefore, I am familiar with Nova Scotia Lands works on these projects for well over a decade, in addition to my direct experience as a lead contractor on the abandoned historic mines project which is still currently underway.

In the abandoned historic mines project, I have worked closely with Nova Scotia Lands, as the lead project manager of the reclamation project, which includes our firm and 3 sub consulting firms. These sites are complex due to the length of time that has passed since the contamination was released, the complicated geochemistry of these sites, the location of these sites relative to urban settings/public use areas, and potential risks that elevated arsenic and mercury may present. The approach being taken is a science-based approach, using advanced scientific tools to support decision making on the path forward to reclamation. Careful consideration of the 100+ years of ecosystem recovery which has taken place since the historic mining ceased, relative to the need for intrusive remediation, is being weighed and considered, along with methods to further encourage recovery in affected wetland areas, with careful evaluation of potential residual risks to humans and aquatic life and wildlife using these areas. Nova Scotia Lands has also encouraged academic research in this project, with studies related ecosystem effects being undertaken by researchers and graduate students at Saint Mary's University.



With consideration of my direct experience with Nova Scotia Lands, as well as my knowledge of several other of Nova Scotia Lands projects, I offer my full support for the nomination for the IN-TECH award.

Yours truly,

A handwritten signature in black ink that reads "Christine Moore".

Christine Moore, M.Sc.,
Senior Scientist cmoore@intrinsic.com