International Minerals Innovation Institute

# MentorSTEP

University of Saskatchewan

IMII ET2018-3

# Final Report

November 30th 2021

# Executive Summary

*We acknowledge that we stand on Treaty and Homeland territory, and we pay our respect.*

MentorSTEP was a two-year pilot project co-led by the Saskatoon Tribal Council and the University of Saskatchewan, designed to support Saskatchewan Indigenous women to pursue STEM (Science, Technology, Engineering, and Math) and related careers that support Saskatchewan's mining industry. MentorSTEP student participants included both high school students from within the Saskatoon Tribal Council, and students at the University of Saskatchewan. Student participants were supported via both mentorship relationships and internship positions.

MentorSTEP was originally created using a circle-mentorship model, designed on the advice of elders at the Saskatoon Tribal Council. The elders stressed that models of Indigenous mentorship are different than western mentorship, which favours a hierarchical relationship where one mentor teaches one mentee. Within the Indigenous worldview embedded in MentorSTEP, mentorship is equal and shared among more than two people, with each participant bringing learning and teaching into the relationship. As a result, mentorship circles were created with two students (one high school, one university) and up to three mentors from university and industry within a circle. This was an important component as the mining community, represented by iMii and participating mentors within the circle mentorship model, brought a sense of listening and learning, to better understand issues facing Indigenous women interested in pursuing STEM careers and eventually, entering the mining industry.

The elders who supported the initial creation of MentorSTEP also specified that Indigenous mentorship usually involved shared learning. As such, the mentoring component was built on shared events, held roughly monthly, which brought together mentors and mentees. The logistics of bringing together all mentors and mentees for every event was not always successful given scheduling and responsibilities, but there were some good connections made at shared events. These events included a rock lab at USask, a virtual reality tour of K+S Potash mine, a visit to SaskPolytech in conjunction with Girls in the Classroom, a visit to the Saskatchewan Research Council Diamond Lab, and events in conjunction with the .cAISES Gathering 2020 (Canadian USask arm of the American Indian Sciences and Engineering Society) including a visit to the Canadian Light Source Synchrotron. BHP had also worked to create a site visit to their signature Jansen mine site in March of 2020.

Unfortunately, the MentorSTEP initiative sustained heavy impact from the onset of the global coronavirus pandemic. MentorSTEP was mere weeks away from the Jansen mine trip, with other mentor circle events planned, when all in-person events were halted. The impact was particularly problematic for the mentorship circle component, due to unequal and inadequate access to wifi and technology needed to move mentorship completely online. Given that some of the students were minors in high school, these mentorship circles required additional supervision, and could not be left for one-on-one continuation; one-on-one mentorship also ran counter to the elders' teachings about sharing knowledge, which were foundational to the development of the mentorship component. The in-person circle mentorship via events never fully recovered from the pandemic and had to be discontinued.

One shining success from MentorSTEP which was able to continue, despite the issues of the pandemic, were the summer internships. In summer 2020, seven internships went forward, some on-campus with faculty, others off-campus with industry, including the Canadian Light Source and RESPEC Consulting. In summer 2021, nine internships went forward, five off-campus with industry (two students at Canadian Light Source, one each at WSP, Cameco and RESPEC Consulting), and four on-campus with faculty.

The internship component of MentorSTEP, along with the iMii iMpowered scholarship calls, highlighted some gaps that have a particular impact on Indigenous students. In searching for, identifying, and succeeding in chosen career paths, students need a high measure of not only technical skills, but professional skills: high self-worth, ability to self-advocate, communication, confidence, and determination. To address these gaps, both summer 2020 and summer 2021 students were supported by the Office of the Vice-President Research at USask to engage in additional training and events via the SURE: Student Undergraduate Research Experience program which promotes increased communication, management, and professional/entrepreneurial development skills. In addition, the summer 2021 MentorSTEP interns had extra opportunities for connection with the USask Mitacs INDRA pilot program, including the highly successful Tea with Aunties and Uncles to discuss their summer internship work. These first steps would be better supported within a larger, holistic and integrated program for Indigenous students to gain the skills needed to define, target, and achieve success.

Overall, the MentorSTEP program was highly successful. We can see its impact in four particular ways. First, MentorSTEP became an example to support the creation of another Indigenous high school mentorship program at USask, BIRM: Building Intercultural Resilience Mentorship Program, led by the Office of the Vice Provost Indigenous Engagement, which connects Saskatoon Indigenous high school students to USask Indigenous students through shared experiences, leadership events, and skill development. Second, MentorSTEP led directly to Mitacs awarding the University of Saskatchewan four of its pilot MitacsINDRA (Indigenous Research Assistantships). That pilot program ran in tandem with MentorSTEP, and some of the successful MitacsINDRA students also received support from MentorSTEP to build a more complete summer research project. The MitacsINDRA program will continue and expand in summer 2022. Third, the MentorSTEP summer internship program grew year over year, particularly with Saskatchewan's mining industry, to the point where mining companies are already requesting, and planning, summer 2022 Indigenous internships. It is clear that the potential internship component, in part due to the pandemic and in part due to other mentorship opportunities being created, offers the most resilient path forward. Fourth, through a holistic lens that considers both STEM+ training and internships, MentorSTEP's successes and results indicate that restructuring support for Indigenous students in STEM in Saskatchewan will lead to a larger, more confident and resilient group of students ready to make a difference in Saskatchewan's mining industry.

## Introduction

MentorSTEP (full title: Mentoring Indigenous female students in science, technology, engineering and math to STEP into careers in the mining industry in Saskatchewan) was a co-led project between Saskatoon Tribal Council and the University of Saskatchewan Office of the Vice-President Research, to address two challenges put forward in the iMii Diversity and Inclusion Challenge competition in 2018. The two challenges addressed, specifically, were to enhance workplace cultures in supply chain companies, and to encourage alternate career choices and success for women in trade, production, and technical occupations. The project received a total of $133,000 in funding budget from iMii.

The application was supported in kind by Dr. Shafiq Alam of the Metallurgy & Materials Society of the Canadian Institute of Mining, Metallurgy and Petroleum, and the USask student CIM Met-Soc student chapter. Additional funding and support came from the Mining Industry Human Resources Council in the form of a Gearing Up grant for student support, and from the students and leaders of the USask chapter of .cAISES, the Canadian arm of the American Indian Science and Engineering Society.

Mentor STEP aimed to provide a suite of mentorship, hands-on learning, industry-networked, and paid summer research internships to Indigenous girls and women learners. In this way it aimed to pave the way for women in the province of Saskatchewan to choose careers in Science, Technology, Engineering and Math (STEM) and stepping into welcoming careers in the mining industry. MentorSTEP aimed to contribute to resolving persistent inequity in the mining industry by using good practices and engaging a wealth of resources on campus and within industry to enable Indigenous female students to select and succeed in science programs leading to careers in the mining industry and by proactively informing and upskilling the industry to provide welcoming and representative inclusion of Indigenous women.

The MentorSTEP program sought to include Indigenous female academics and career practitioners to serve as mentors within the program. In addition, it welcomed both Indigenous men and other leaders in STEM and mining willing to share their expertise, and to learn within MentorSTEP's mentorship model of Indigenous learning circles. Through this model, mentors beyond STEM – working in areas of operations, human resources, research and development, management, marketing, and more – became valued professionals within the mentorship circles, offering a wider view of the mining industry and more ways for students to 'see' themselves achieving success within this field.

MentorSTEP was launched in October of 2019 with a launch event in the Gordon Oakes-Red Bear Centre at the University of Saskatchewan, followed by the first mentor circle cohort event, a rock lab organized by Dr. Donna Beneteau, a USask geological engineer. It operated before the pandemic, and continued in a modified form during the pandemic with two sets of summer research internships. The MentorSTEP pilot finishes on schedule in the fall of 2021.

## Project Team

Celebrate who participated, their involvement, and their background

Original project leads for the application were Kara Loy of the University of Saskatchewan, and Dawn Pratt of the Saskatoon Tribal Council. Their initial vision and drive are to be commended.

Michelle Blackmon, BA & BEd, is the Education Partnerships Manager at Saskatoon Tribal Council. Michelle's expertise includes: career education, Indigenous studies, mentorship programs, corporate partnerships, event coordination, career promotion in areas of STEAM (Science Technology Engineering Arts and Mathematics) and promoting post-secondary institutions & connections to careers. In addition to providing leadership across multiple educational and career-pathway initiatives, she is notable for designing and heading the Super Saturday education program that connects member STC First Nations' youth to consider non-traditional career pathways through hands-on learning and education, some of which happens at the University of Saskatchewan campus. Thanks to this initiative, elementary and high-school students from STC member nations receive experiential learning experiences in medicine, natural sciences, engineering, fine arts, mathematics, and technology with attention to First Nations' traditional paradigms.

Merle Massie, BA MA PhD, is the Coordinator, Undergraduate Research Initiatives in the Office of the Vice-President Research, and an adjunct professor in the School of Environment and Sustainability, University of Saskatchewan. Merle's background as a community events organizer, combined with extensive experience in professional research and communications, brought strength to the MentorSTEP program. Students in MentorSTEP were encouraged and supported to engage in additional professional and communication development through SURE: Student Undergraduate Research Experience, a program created and run by Merle Massie in her role as coordinator of undergraduate research. Several MentorSTEP students accepted the additional challenge of presenting on their internship work at the SURE summer Symposiums in both 2020 and 2021.

Merle took over the role from Kara Loy just as Michelle Blackmon took over from Dawn Pratt; together, the two worked hard to lay a good foundation for MentorSTEP, co-coordinate and co-lead all events that took place prior to the onset of the global pandemic, and maintained regular updates and check ins with summer student interns.

Additional support and advice for the project came from:

- **Dr. Shafiq Alam**, faculty advisor for the USask MetSoc Student Chapter, College of Engineering, University of Saskatchewan, who worked to help conceptualize MentorSTEP and offered support.
- **Dr. Sandy Bonny**, Team Lead, Indigenous Student Achievement Pathways and STEM Access Initiatives, College of Arts and Science, University of Saskatchewan, who worked alongside MentorSTEP, provided direction and guidance, brought students into the program, supported .cAISES events in tandem with MentorSTEP, was a supportive and vocal mentor within the program, and is leading a new project proposal for iMii to take MentorSTEP learning to its logical next step.

- **Donna Beneteau**, P.Eng, Assistant Professor, Civil Geological and Environmental Engineering, College of Engineering, University of Saskatchewan, who was a valued contributor and supporter, a mentor within the program, and acted as a student summer internship advisor.
- **Matt Dunn**, Senior Strategic Officer, Indigenous Engagement, Office of the Vice-Provost Indigenous Engagement, University of Saskatchewan, who provided steadfast guidance and helpful ideas throughout.
- **Deb Shewfelt**, MSc, P.Geo of RESPEC Consulting, who worked alongside MentorSTEP through her Girls in the Classroom initiative, acted as a mentor for MentorSTEP, and supervised a MentorSTEP internship across two summers.
- **Al Shpyth** (Executive Director) and **Marylou Langridge** (Finance and Operations Coordinator), International Minerals Innovation Institute. Al spent time as a mentor in the program, and both Al and Marylou were essential in both the continuing smooth operation of MentorSTEP, and in giving critical and timely advice.
- **Eric Anderson** of SIMSA who helped connect a summer 2021 MentorSTEP intern.
- **Sheila Naytowhow, and Julia Doucette-Garr**, MentorSTEP student interns who worked with Merle Massie as student assistants for the program.

**High School Students in MentorSTEP (2019-2020)**
Gracie Bonaise, Keisha Slippery, Cassie Daniels, Danielle Gardipye, Lydia Bigsky, Mariah Pechawis, and Treanna Moreau.

**University Students in MentorSTEP (2019-2021) including summer interns underlined**
Sydney Kuppenbender, Chenoa McArthur, Ashley Carlson, Danielle Brewster, Marissa Fleury, Jordon Redbear, Julia Doucette-Garr, Michaela Mirasty, Samantha Moore, Agacos Carriere, Jessica McLeod-Mitchell, Deserae Goodhand, Janice Osecap, Heather Poirier, Kate DeVito-Porter, Tia Montgrand.

**University supervisors for MentorSTEP interns**
Colin Sproat, MJ Barrett, Kalowatie Deonandan, Joyce McBeth, Tim Jardine, Heather Foulds, Donna Beneteau, Doug Clark.

**Industry supervisors for MentorSTEP interns**
Tanner Kirby (WSP), Deb Shewfelt (RESPEC Consulting), Nathan Rolston (Cameco), Tracy Walker and Bernie Petit (Canadian Light Source)

**Volunteer Circle Mentors for MentorSTEP (in addition to those mentioned above)**
Dawn Pratt, Melanie Stare, Vanessa Calayan, Tanya Smith, Rob Martell, Fabien Jean, Jodi Derkatch, Jachym Rudolf, Heather Wells, Jeremy Veszi, Desiree Hainealt, Sarah Gauthier, Rod McEachern, Helen Yin, Craig Hamilton, James Hatley, Maeghan Dubois, Jerri Light, Raelynn Jackson, Tanner Soroka.

**MentorSTEP high school contacts/supporters/drivers**
Dexter Kakakaway, Raelyne Bird, Ian Worme, Tracy Thomas, Shelley Moreau, Pam Fosseneuve, Pamela Peekeekoot, Rob Heppner, Mona Brass, Roberta Bear, Cyrus Smokeyday.

## Activities and Results

**Major milestones:**

**Project organization and launch:** MentorSTEP transferred from one set of leadership (Kara Loy and Dawn Pratt) to new USask-STC leadership (Merle Massie and Michelle Blackmon) right at the start of the project. We took the time to meet with elders, USask Indigenous leaders, and related supporters, including issuing a call for mentors and student mentees, prior to the successful launch in October 2019. MentorSTEP's unique circle mentorship model of shared experiences, drawn from Indigenous elders and their teachings, was foundational to the project. Equality in relationships and learning from, and with, one another replaced the hierarchical traditional mentorship model. The launch at Gordon Oakes-Red Bear Centre on the USask campus was combined with the first shared learning event, a rock lab organized and led by Donna Beneteau of geological engineering at USask.

**Mentorship events, Site Visits, Learning labs:** Subsequent MentorSTEP events included a visit to K+S Potash corporate office to engage in a virtual reality tour of K+S mines, a co-led event with Girls in the Classroom to visit SaskPolytech, a visit to the Saskatchewan Research Council's exclusive Diamond Lab, and a well-attended .cAISES Gathering in Saskatoon, where the MentorSTEP students visited the Canadian Light Source and enjoyed a fantastic lecture on Indigenous science and agriculture in North America. A major event to visit BHP's Jansen mine site was completely organized, but the onset of the covid-19 pandemic cancelled all remaining in-person events for MentorSTEP for the remainder of the 2019-2020 season, which continued into 2020-2021. No second cohort was called or matched.

**Internship development and internships:** MentorSTEP recruited for summer internships, and supported summer internships in both 2020 and 2021, with one internship bridging through the fall of 2020 and winter 2021 into the next summer. While all internships experienced some restrictions and changes due to pandemic protocols at their respective sites, overall, the internships were a major success of the program despite the pandemic. In the summer of 2020, eight interns were matched with supervisors, though one stepped away from the internship. Of the seven who completed, five were matched with on-campus faculty and two with off-campus industry. Three of the interns participated in the SURE: Student Undergraduate Research Experience Symposium and one won Third Prize Overall across the university. Two of the interns also volunteered and supported the ISAP Indigenous Student Achievement Pathways Summer Start training program.

In summer 2021, the program grew to nine matched internships, five off-campus and four on-campus. All of the students were welcome to participate in the SURE: Student Undergraduate Research Experience summer program, and the students were cross-connected with students and activities in the MitacsINDRA program, including the highly successful Tea with Aunties/Uncles. One intern presented at the SURE Symposium, garnering a judge's recommendation for her work. One summer intern has been accepted to medical school but has deferred her entrance for a year, to continue working full time for the same company in which she completed summer internship. One is advancing to graduate school in the School of Environment and Sustainability.

## Impact of MentorSTEP

MentorSTEP has had an enormous impact on the students involved, on programming at the University of Saskatchewan, in leveraging other projects and programs at the University of Saskatchewan, and in growing the appetite for industry internships for Indigenous women in STEM, in the mining industry in Saskatchewan.

### Communications

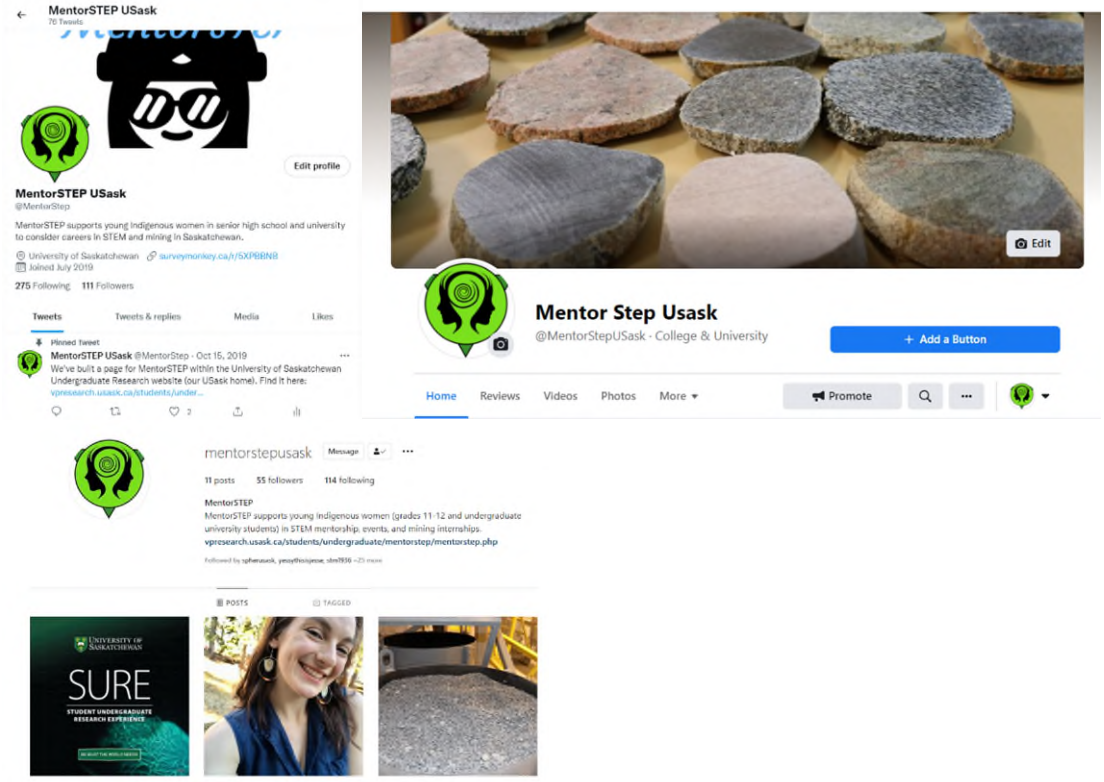
MentorSTEP has successfully profiled three of the student interns, two of whom completed at least two internships. These can be found at:

**A World of Difference: Shining a Light on Indigenous Women in Science – profile of student Julia Doucette-Garr at the Canadian Light Source**

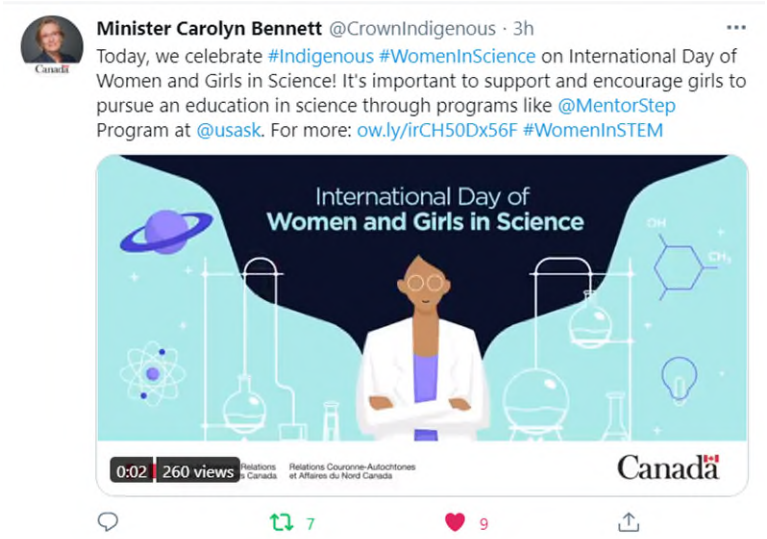
**Embracing my Background: MentorSTEP chat with Samantha Moore**

**Stay Deadly: Sydney Kuppenbender**

Throughout its tenure, MentorSTEP operated three social media accounts: Facebook, Instagram and Twitter. In total, the three social media avenues garnered 189 followers; however, when the pandemic forced MentorSTEP into a quieter format, there was less activity across these accounts. They could be repurposed and shared to a successor project.



On February 11th 2021, Carolyn Bennett, at the time Minister of Crown Indigenous Relations, tweeted out in support of International Day of Women and Girls in Science, and pointed specifically at the MentorSTEP program at the University of Saskatchewan:




The student interns at the Canadian Light Source were involved in creating several communications videos. Two can be found here:

**CLS Careers: Janice Osecap, Education Team Assistant (MentorSTEP)**

**The Science of Bannock with Julia Doucette-Garr**

In addition, MentorSTEP has received numerous emails, texts, Facebook messages and other connections from both the high school students and interns, as well as supervisors and other supporters of the program, including industry. It's been a clear connector piece between outlying high schools and the university, and between the university and industry. One MentorSTEP intern had multiple offers for summer employment from different industry companies – that kind of enthusiasm and support showcases the strength of the program.

**Photos from MentorSTEP events**


*Albert Scott, Language and Culture Coordinator at Saskatoon Tribal Council at the Launch of MentorSTEP October 2019*

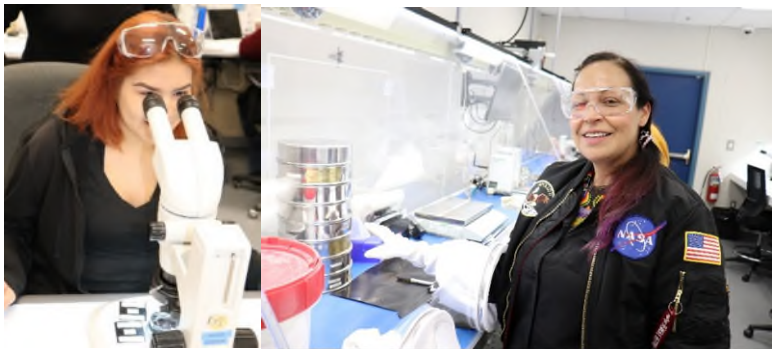

*MentorSTEP students and mentors at the first Rock Lab October 2019. Coasters made by MentorSTEP mentor Donna Beneteau.*

*At the Virtual Reality mine tour event at K+S Potash corporate office*

*MentorSTEP mentors discussing leadership, mentorship at K+S Potash corporate office, November 2019*

*Sandbox Lab at Saskpolytech, December 2019*

*At the 3D Printing Lab at SaskPolytech December 2019*



*At the Saskatchewan Research Council Diamond Lab January 2020*


*At the Canadian Light Source, during the .cAISES event in February 2020.*

**Student responses to the program:**

*My Internship is with RESPEC Geological Consulting. One of the reasons I chose this company was due to the female management and co-ownership. I cannot emphasize enough how supportive, patient and available their team has been in teaching the business and allowing me to 'feel' my way through this internship. Over the summer I've been able to 'shadow' and have one-on-one attention with Project Managers, Completion Specialists, GIS Specialists, Environmental Monitoring, Geological Engineers, and SRC Lab staff. All this was made available and under a senior geologist I've had an introduction to drilling and core processing and wire-line interpretation, something I won't enough touch till my final year. I was also invited and encouraged to prepare an ED&I session with an emphasis on Indigenous engagement. I've sat in on meetings and presentations with some First Nations and assisted in preparing a Project Bid in which I was consulted for land and First Nation background. This has always been a driving factor in my key considerations as I come from a background heavily involved in Land Settlements and First Nation history here in Saskatchewan, growing up I was exposed to language and seated at board meetings at a very young age where I listened to elders, proponents, lawyers, consultants, surveyors, government representatives and everyone in between. So, to continue with RESPEC in my geological and educational journey has been a no-brainer. I have you and Deb to thank for this. I am ever so appreciative.* **Chenoa McArthur, with RESPEC consulting 2020 and 2021.**

*The MentorSTEP internship allowed me to expand my professional skills and really enabled me to focus on the work that I was doing during the summer research project. As a single mother in school full time, programs such as this are invaluable in supporting the learning and growth of students. They serve to build our potential, professional skills, and support us on our educational journey. I greatly appreciate the opportunity that MentorSTEP assisted in providing me during the summer of 2021. The skills that I had the opportunity to expand on will serve me in my professional life going forward and has already increased my capabilities in graduate studies.* **Heather Poirier, working with Kalowatie Deonandan of Political Studies, project on Indigenous women and mining in northern Saskatchewan.**

*I would not be where I am today without MentorSTEP. I got two summer internship positions through the program, the second of which brought me to my current position. We were such an excellent match that we have been working together for 18 months and she is now my Master's supervisor. I am forever thankful for the opportunities brought to me by MentorSTEP through Merle.* **Sydney Kuppenbender, working with M.J. Barrett of the School of Environment and Sustainability.**

*I just wanted to say that I thoroughly enjoyed my experience as an intern and learned extremely valuable stuff related to my geology experience! I worked with Dr Joyce McBeth, a faculty member of Geological Sciences at USask who proposed a summer project for me, working on studying microbes in mine wastes. The work includes culturing, isolating, and studying DNA from acidophiles and other mine waste microbes.* **Tia Montgrand, working with Joyce McBeth in Geology.**

*My experience in the position I was placed with MentorSTEP has helped me narrow down and discover how I would like to make use of my Education degree. I think the displayed professionalism, tact, and commitment to inclusion are a few of some of the areas in which I learned lessons.* **Janice Osecap, working with Tracy Walker of the Canadian Light Source.**

*My experience as a MentorSTEP intern supported my academic journey by giving me the opportunity to work in a position where I could apply knowledge and skills I have learned throughout my education. I also got the opportunity to learn new skills and use software that I will use in my future career. My position taught me a great deal, such as learning how to communicate effectively with other departments and personnel and learning from trial and error. I got to complete projects independently which also helped with my confidence in the workplace as a student intern. Additionally, this position has furthered my interest in a mining related career. I am very grateful to have had the opportunity to participate as an intern through MentorSTEP. It was one of the best work experiences that I have had.* **Deserae Goodhand, working with Nathan Rolston at Cameco.**

*MentorSTEP created an opportunity for me to be emersed in the field of my degree, which I hadn't experienced prior, other than through academia. Seeing the program from a planning perspective, and as an intern, I really saw the passion and dedication Merle, and her team, put into helping create these spaces for a lot of Indigenous students. Whether those students were in high school or university. I feel like creating these spaces for Indigenous peoples in STEM programs is incredibly important and MentorSTEP truly achieved that in the two short years that it was running. The support of MentorSTEP allowed me to make connections with those who are already in science and doing great work. Those connections have given me a sense of confidence in a lot of different ways that I can carry on to my next ventures in life.* **MentorSTEP program assistant and CLS summer intern Julia Doucette-Garr**

**Industry and Mentor responses to the program**

*I am starting to plan hiring for next year and I would like to stay involved with MentorSTEP and find another student. Our experience with Deserae this summer was very positive and I would like to find another student for next year.* **Nathan Rolston, Cameco**

*I have really enjoyed volunteering with MentorSTEP and it has been rewarding to see students from our STEM access and first year ISAP STEM-focused learning community stepping into some of the MentorSTEP research and internship positions in their upper years of study. Connecting them back to youth to share stories and experiences strikes me as a very organic way to make STEM pathways real to those navigating high school and post-secondary options. I found a lot of value in the opportunities that MentorSTEP provided to establish relationships between high school, university and professional participants in advance of conversations about post-secondary pathways and career and summer student opportunities. The hands on activities and open conversations among the group provided organic connection points to engage with everyone's areas of interest and passion in STEM.* **Sandy Bonny, USask Arts and Science Indigenous Student Achievement Pathways lead.**

*Strengths of MentorSTEP program:*

- *For me: an opportunity to work with and learn from a great Indigenous undergraduate student.*
- *For the student: an opportunity to investigate a new area of research and passion – and lay important groundwork for her successful application to graduate school.* **MJ Barrett, School of Environment and Sustainability, USask**

*It was my pleasure to assist bridging the MentorSTEP program to the Canadian Light Source Inc. To have a bright light like Julia Ducette-Garr join our team has truly been a blessing. I am so happy that the CLS staff have opened a space for Indigenous scientists to grow, flourish, and be mentored by the best*

*scientists at Canada's only Synchrotron. It was a joy that Julia could see herself and be herself within the science. Creating opportunity for a student to incorporate Traditional Knowledge within the Physics of a Synchrotron was enriching. Observing a student believing in themselves, seeing their future unfold before their eyes, and see many opportunities the world has offer is beautiful process to be part of. Watching the exchange of perspectives and knowledges a mentor/student carries, has been great soul food! MentorSTEP creates great opportunities for the student and organization to grow together, but it also makes my heart happy to know that my children, grandchildren and great-grandchildren will have a pathway into science well marked out as a direct result of this funding. Thank you MentorSTEP and Merle Massie for creating opportunity and investing in the future!* **Bernie Petit, Canadian Light Source**

*I like helping students and this program connected me to a mentee that I really connected with and who needed someone to talk with. We still keep in touch and I have also learned from her. Without the program, we would not have met.* **Donna Beneteau, College of Engineering, University of Saskatchewan**

*I think something that MentorSTEP, and other programs like it, offer students that they don't necessarily receive as part of their regular classes is one-on-one time with a researcher. Jessica and I made some important progress on the research that she was working on but she mentioned that she really appreciated having someone to talk to about what research looks like and how she might plan out her path through academia if she chooses to pursue a graduate degree. Obviously the funding is useful too. With traditional sources of funding through the college disappearing, it's extremely beneficial to have programs like MentorSTEP to support ambitious undergrads that want to get a taste for what a career in research might hold for them.* **Colin Sproat, Department of Geology, University of Saskatchewan**

*It was great to see the willingness to participate from both sides - mentees and mentors. The program did remind me about how difficult it can be to move from community to a corporate environment. I can better reflect now on the differences between my own community and family, where humour and relaxed interactions were important, and a corporate mining office in which the environment does not lend itself to either of these relational ways of being. That said, I know I would have enjoyed a program like this when I were younger, so I hope that the mentees also found it valuable. It is unfortunate that COVID cut things short.* **Sarah Gauthier, mentor**

## Lessons Learned, Recommendations, and Next Steps

MentorSTEP had many successes, and as many lessons learned.

**Lesson #1:** A focus on Indigenous women in STEM can possibly be viewed as too narrow, for two reasons: 1. Indigenous men also face many of the same barriers to university participation, including in STEM careers; 2. The Saskatchewan Mining industry employs people from a wide variety of backgrounds, from communications through finance, human resources, education/training, strategy, through environmental impact through technical on-site mining needs. Throughout MentorSTEP, we were aware of these limitations and sought to be more inclusive rather than restrictive when it came to potential site visits, or to internship matches and summer projects.

- **Recommendation: build future iMii projects that consider the immense diversity of needs in Saskatchewan mining companies, and be open to projects that include a non-gendered focus on Indigenous peoples participation in mining.**

**Lesson #2:** Indigenous mentorship looks quite different than western-understood one-on-one mentorship matching. The circle mentorship, built using elders' knowledge from the Saskatchewan Tribal Council, led to a more holistic view of mentorship to include learning and teaching in both directions, and in participating in shared events for learning together. The downside of this methodology is that mentors who volunteered from industry, but were based far away from Saskatoon, had a more difficult time connecting. Related, the pandemic and the move to more online communication created problems, as online communication requires connectivity, including devices, which created distancing and uneven connection. Although the circle mentorship model was significantly hampered by the covid-19 pandemic, it remains a good practice and alternative way of forming future mentorship models.

- **Recommendation: in building future mentorship programs, be mindful of creating equal, not hierarchical relationships, where mentors/mentees learn from one another and each brings important knowledge and skillsets to the table. Consider ways to support rural and remote connectivity, and ways to bridge space and time via shared mentorship events.**

**Lesson #3:** Some of the major challenges for the Indigenous women and girls who participated in MentorSTEP were issues of digital literacy, writing strategies, career awareness, and most importantly, self-advocacy and confidence. Indigenous cultural trust in a new program, or a new career direction, takes time to develop, and there are hidden 'rules' in both academia and industry. It became clear that the MentorSTEP program worked as well as it did in part because it deliberately connected students to mentors who were able to help on an individual basis or to connect students to extra resources to help and give support in these areas, such as the SURE Student Undergraduate Research Experience or the ISSE Indigenous Student Scholars Experience, modeled on SURE. However, students continue to require support in these areas. Industry will benefit from supporting a mechanism for students to develop confidence and self-advocacy through deliberate connection and training, as a way to combat Indigenous attrition in professional programs.

- **Recommendation: support and fund programs that deliberately address issues of self-advocacy, confidence, communication, and professional development as the most important way to leverage technical or disciplinary learning and bring it into a professional context. An example is the STEM+ proposal from USask.**

**Lesson #4:** MentorSTEP achieved some measure of success due to its ability to connect with and leverage existing local, regional and national programs, such as Girls in the Classroom, Mining Industry Human Resources Council, Indigenous Student Achievement Pathways in Arts and Science at USask, Canadian chapter of the American Indigenous Science and Engineering community (.cAISES), the Saskatchewan Indigenous Mentorship Network (SK-IMN), the College of Engineering Indigenous initiatives program, the Saskatchewan Research Council's Aboriginal Mentorship Program (AMP), and its ability to work directly with industry on internships. The lesson is this: a program becomes stronger BECAUSE it has other programs to work with and draw from, creating a larger and more robust community committed to supporting Indigenous people to succeed.

- **Recommendation: When making funding decisions, remember that building something that can link with or bridge with existing cognate programs can lead to higher success than building a new program that has fewer links or existing supporters.**

**Lesson #5:** Engaging high school students with mentorship is different from connecting university students to internships. Both are valuable, but they require different skillsets and ways to connect. It was clear during MentorSTEP that university students found it more problematic to attend in-person mentorship events during the school year, while high school students were supported, encouraged, and chaperoned to attend.

- **Recommendation: supporting internships with appropriate additional supports for professional development can be separated from strategic mentorship programs working to support high school students to transition to university.**
- **Recommendation: the internship component was successful even during covid. Saskatchewan mining industry and related businesses are in full support of continuing an internship program for Indigenous students.**
- **Significant outcome/result:** MentorSTEP success in creating mentorship relationships for high school students via events and circle mentorship supported the development of the new **BIRM: Building Intercultural Resilience Mentorship Program** for high school students, operating out of the Office of the Vice-Provost Indigenous Engagement at USask. This program will work specifically within high school mentorship opportunities for Indigenous high school students, connecting them to a university Indigenous student for mentorship.
- **Significant outcome/result:** University of Saskatchewan partnered with Mitacs Canada to pilot the new **MitacsINDRA** (Indigenous Research Assistantship) program in summer 2021. USask won this competitive pilot opportunity in large part due to its experience with the MentorSTEP program. The MitacsINDRA pilot was successful and will be expanded for 2022 – but its learning, as reported to Mitacs, is similar to MentorSTEP – **students require additional supports for self-advocacy, communication and professional development, such as the STEM+ potential program. It aims to bundle opportunities with support.**
- **Significant outcome/result:** the STEM+ application from USask (under consideration by iMii) contains two key components learned from MentorSTEP: 1. Internships, which provide significant opportunities for Indigenous students; 2. Increased support for self-advocacy, communication and professional development for Indigenous students.

While those who supported and held the institutional responsibility for MentorSTEP are not applying for further funding, MentorSTEP's lessons have been incorporated into two existing programs (BIRM and MitacsINDRA), and we fully recommend that iMii support the STEM+ program application currently under consideration from the University of Saskatchewan.

## Financial Report

The original budget for MentorSTEP included cash commitments of $143,000, split between the University of Saskatchewan ($10,000) and iMii ($133,000). Due to financial support from Mining Industry Human Resources Council and the Saskatoon Tribal Council, additional funding in the amount of $2000 (round numbers) from MiHR and $1000 from STC were contributed directly to the University of Saskatchewan to offset cash costs of the program.

MentorSTEP submitted a letter of rebudget during the pandemic. It was soon found that costs originally budgeted for networking, advertising, site visits, field trips, hands-on experiential learning and tours would not be fully used due to the pandemic. Close to $5000 was rebudgeted into internship expenses.

Final costs: MentorSTEP came in under proposed budget, in part due to less spending on finishing the first year, and costs that would have come up during the second year of the mentorship, experiential learning, site visits, field trips and events component. If more students and projects had been matched for internships, MentorSTEP would have been able to support more students.

| Project Cost – **Cash Contribution** | Original Budget Amount | Total Spent | Remaining budget – unused as of Sept 1 2021 |
|---|---|---|---|
| Salaries & Benefits | $135,000 | $120993 | $14007 |
| Hands-On Experiential Learning and Professional Development[1] | $3000 | $804 | $2196 |
| Networking, advertising, events, Site Visits, Field Trips & Tours[1] | $5000 | $2612 | $2388 |
| | | | $4584 rebudgeted to salaries/internships |
| Total | **$143,000** | **$124,409** | **$18,591** |
| Cash amount committed by University of Saskatchewan | $10,000 | $3530 | $6470 |
| Cash amount committed from iMii | $133,000 | $120,879 | $12,121 |