

# Beaverlodge uranium mine closure – balancing current expectations with past practices

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## Abstract

*The former Beaverlodge uranium mining and milling properties are located in the northwest corner of Saskatchewan, Canada and were operated by Eldorado Mining & Refining Ltd., a former federal crown corporation, between 1952 and 1982. Decommissioning and reclamation of the Beaverlodge properties was completed in 1985. With the establishment of closure end-point objectives agreed to by both the federal and provincial regulatory agencies, the properties entered a period of transition phase monitoring, originally envisioned to last ten years. However, with no formal exit agreement or strategy in place, transition phase monitoring has continued to this day.*

*In 2007 the province of Saskatchewan brought forth an innovative approach to the long-term management of decommissioned industrial properties. The province's institutional control program provides industry with clear direction and expectations that once they meet their obligations for decommissioning there will be a responsible authority to accept custodial responsibility of the property in perpetuity. Some of the Beaverlodge properties have recently been transferred to institutional control, while the rest remain in the transition phase.*

*Cameco Corporation, responsible for the management of the properties on behalf of the Canadian government, has collaborated with the regulatory agencies and stakeholders to develop a management framework to guide the assessment and decision-making process regarding potential additional remedial activities for the Beaverlodge properties. The management framework seeks to balance current decommissioning expectations with the presence of legacy issues and past close-out agreements, ultimately relying on benefit-cost evaluation to arrive at final criterion that is acceptable to the majority of the relevant stakeholders. By working through the management framework process, the remaining Beaverlodge properties should eventually meet decommissioning expectations and be allowed to transfer to institutional control.*

## 1 Introduction

### 1.1 Location

The former Beaverlodge mining and milling properties are located approximately 8 km east of the Northern Settlement of Uranium City located north of Lake Athabasca in the northwest corner of the Province of Saskatchewan (Figure 1). The Beaverlodge/Uranium City area is remote and accessed primarily by aircraft. Uranium City is the only community with road access to the former Beaverlodge properties. In July 2010, the population of permanent residents in Uranium City was estimated to be 85, according to Saskatchewan Ministry of Health (2010).

### 1.2 Background

As described by MacLaren Plansearch Inc. (1983), uranium-bearing minerals were first discovered in the Beaverlodge area of northern Saskatchewan in 1934. Eldorado Mining and Refining Ltd. (Eldorado), a Crown corporation owned by the Government of Canada, commenced detailed exploration in 1944, leading to start-up of a mine and mill in 1952.

The primary focus of mining activity was north and east of Beaverlodge Lake where the mine shafts were sunk. Production from these mines and numerous “satellite mines” continued until 1982.

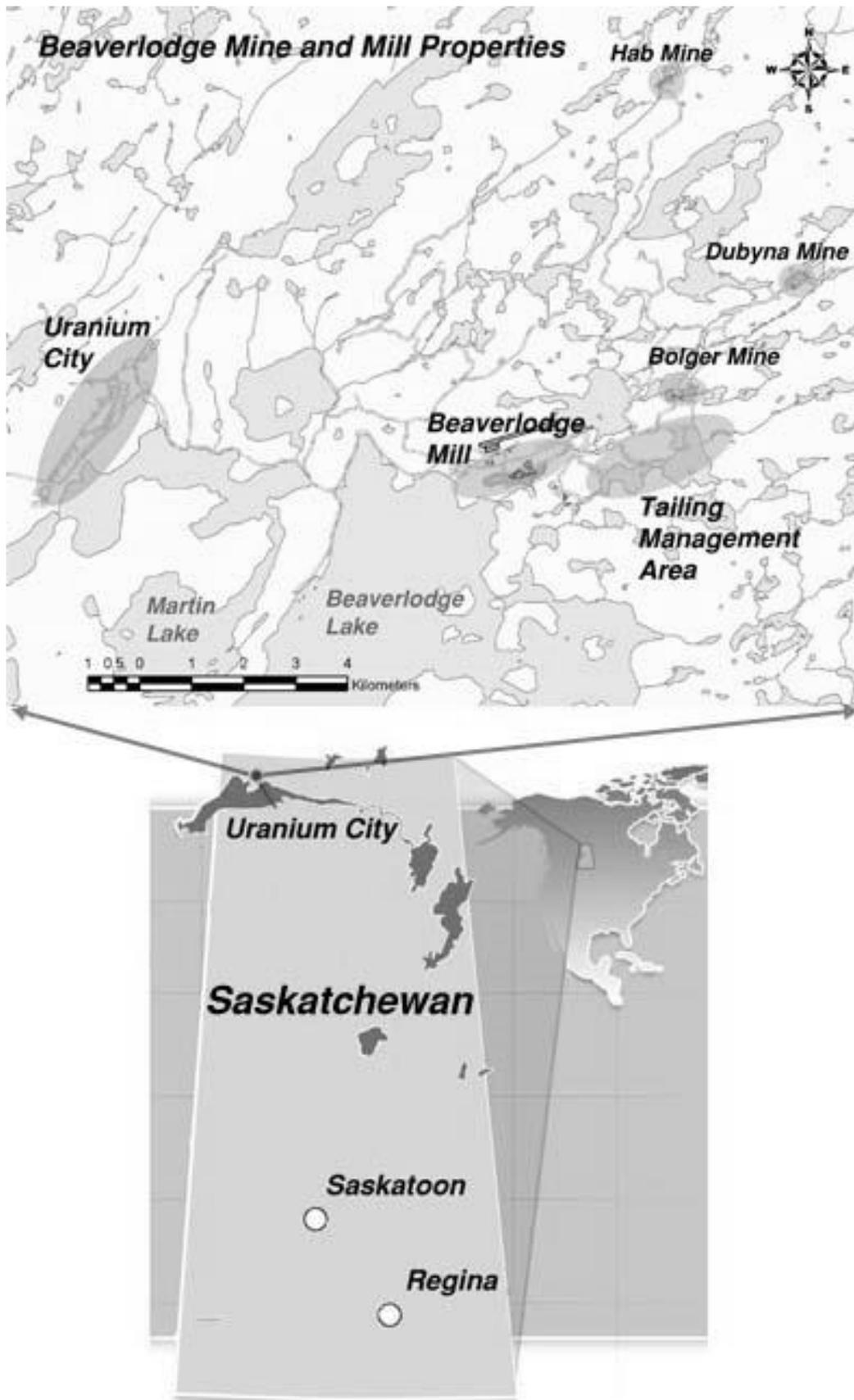


Figure 1 The Beaverlodge site is located north of Lake Athabasca in northern Saskatchewan

By modern standards for Saskatchewan uranium deposits, the uranium content of the ore was relatively low. The generally clean nature of the orebody in terms of secondary metal contaminants, as well as its carbonate nature made the waste rock relatively benign. In total, approximately 4.8 million tonnes of waste rock was generated, with an average uranium content of 190 ppm U (0.019%).

During the initial period of operation, comprehensive environmental protection regulations did not exist. It was not until the mid 1970s, over 20 years after operations began, that a federal Atomic Energy Control Board (AECB) licence was issued (1977) and effluent treatment processes were initiated in response to discussions with provincial and federal regulatory authorities. Provincial requirements were maintained through a surface lease.

Mill tailings were managed through a combination of underground disposal and surface placement into the tailings management area (TMA). Tailings were separated by grain-size with the coarse fraction (approximately 40%) being disposed of underground to fill voids created by the removal of the ore. The remaining fines fraction was discharged into the TMA, located within the Fulton Creek sub-watershed of Beaverlodge Lake. The TMA consisted of three natural waterbodies, each with a control structure constructed at their outlet to maintain a constant water elevation.

In 1982, after nearly 30 years of operations, the Beaverlodge operation shut down due to economic factors. Mining and milling operations ceased during the summer of 1982. The AECB issued a decommissioning approval in November 1983, after which Eldorado initiated site decommissioning. Regulatory-approved site decommissioning and reclamation activities were completed in 1985. Transition phase monitoring was initiated at that time to verify decommissioning predictions.

The majority of the site remains in a transitional monitoring phase, which was initially expected to last for about ten years following completion of the work in 1985. Despite meeting most of the predicted recovery targets soon after decommissioning was complete the transition phase is now in its 26th year. Failure to bring an end to the transitional monitoring phase can be attributed to many factors, such as the:

- Length of time between completion of decommissioning activities and final site closure, which still has an uncertain end date.
- Loss of institutional memory with the passage of time.
- Change of those involved with site management and regulation.
- Modification and expansion of environmental criteria used to judge the work.
- Decommissioning expectations for uranium mines have increased.

However in retrospect, a formal and documented agreement for long-term stewardship when the original decommissioning plan was formulated would have helped drive the work to a satisfactory and timely conclusion.

### **1.3 Current management structure and regulatory oversight**

In 1988, the Government of Canada and the Province of Saskatchewan announced their intention to establish an integrated uranium company as the initial step in privatising their respective uranium investments. Cameco Corporation was created from the merger of the assets of the Saskatchewan Mining Development Corporation and Eldorado.

Under the terms of the asset transfer agreement, the federal government, through Canada Eldor Inc. (CEI), a subsidiary of the Canada Development and Investment Corporation, retained responsibility for all costs associated with the monitoring and maintenance of the decommissioned Beaverlodge properties, while Cameco retained responsibility for carrying out these activities.

The current regulatory regime responsible for the Beaverlodge properties is made up of the Canadian Nuclear Safety Commission (CNSC), Saskatchewan Ministry of Environment (SkMOE), Environment Canada (EC), and the federal Department of Fisheries and Oceans (DFO), collectively referred to as the Joint Regulatory Group (JRG).

The CNSC sets regulatory policy direction on matters relating to health, safety, security and environmental issues affecting the Canadian nuclear sector, and licences Cameco to manage the Beaverlodge facilities through a Waste Facility Operating Licence. Licence applications are made to the CNSC Commission, a quasi-judicial tribunal, regarding the management of facilities containing nuclear substances. The Beaverlodge properties are currently in the midst of a three year operating licence, which was granted in November of 2009.

A surface lease is granted for these properties by the Province of Saskatchewan. The most recent surface lease was negotiated in 2006 and expires in 2026. Unique to the Beaverlodge surface lease was a provision that allows properties listed on the surface lease to be transferred to the Province of Saskatchewan's Institutional Control (IC) Program. The properties would then become the responsibility of the Crown without renegotiating the surface lease. The role of the remaining agencies is to provide guidance and oversight for aspects of any projects or studies that may fall under their jurisdiction.

In November 2009, following 24 years of transition phase monitoring SkMOE recommended that Cameco be granted a release from decommissioning and reclamation for five minor satellite Beaverlodge properties. During the November 2009 CNSC relicensing hearing, the CNSC Commission agreed to exempt these properties from further CNSC licensing, allowing these properties to become the first decommissioned uranium properties transferred to a formal IC program in Canada.

In managing the Beaverlodge site, Cameco has broadly applied the same environmental management approach used at its operating sites. Measures are taken to assess the environmental interactions that are occurring and, if shown to be significant, these interactions are studied to see what could be done to further mitigate the risk and determine if this mitigation can be justified.

## **2 Decommissioning**

At the request of the AECB, a conceptual decommissioning plan was submitted in June 1981. On 3 December 1981, Eldorado announced that operations at Beaverlodge would be shut down.

### **2.1 Decommissioning plan approved**

The Beaverlodge facility was the first uranium mining and milling operation in Canada subjected to the development and regulatory approval of a formal decommissioning and reclamation strategy. Each phase of the shutdown, decommissioning and reclamation was subject to detailed discussion between Eldorado and the regulatory agencies, including representatives from the AECB (now the CNSC), EC, Saskatchewan Environment (now SkMOE), Saskatchewan Labour (now Saskatchewan Ministry of Labour Relations and Workplace Safety), and the federal Ministry of Labour. Regular and detailed inspections were carried out by the various regulatory agencies during all of the decommissioning and reclamation activities.

Eldorado developed an integrated approach to the decommissioning and reclamation of the Beaverlodge mine and mill and associated wastes. A schedule was developed and consisted of seven distinct, though not independent, activities which were to culminate in the transfer of title to the Province of Saskatchewan after satisfactory performance has been demonstrated. The activities listed were identified to allow an orderly and reasonable approach to decommissioning and reclamation of the Beaverlodge site.

1. Develop a decommissioning and reclamation plan.
2. Orderly shutdown of the mine and mill.
3. Record operational history, characterise waste, and regional environmental conditions.
4. Predict transition phase impacts resulting from decommissioning and reclamation of the site.
5. Engineering and design costing of potential remedial options.
6. Implement preferred schemes.
7. Demonstrate declining release rates during transition phase.

The Eldorado approach to decommissioning and reclamation presented in Eldorado Nuclear Limited (1982) reflected a philosophy directed towards the protection of employees and residents, and the natural

environment surrounding the mine and mill site. The Eldorado philosophy and objectives established environmental objectives for the reclamation activities and committed to applying good engineering practices, such as the elimination or minimisation of man-made structures in closing out the site.

The AECB granted approval for decommissioning the Beaverlodge mill and related mining properties on 1 September 1982. The regulatory agencies stipulated a number of requirements and/or objectives on the close-out of the properties, which were reflected in the Eldorado philosophy and objectives for decommissioning and reclamation. The environmental endpoint criteria used to evaluate potential remedial options were:

1. That annual loadings of radioactive and non-radioactive contaminants released to the environment after close-out shall not be greater than those which occurred during operations.
2. That the Saskatchewan Surface Water Quality Guidelines shall apply as objectives for four specified sample locations. These sample locations were located at the outlet of the two major satellite mines (Hab and Dubyna), as well as the outlet of the TMA and where the Ace Creek discharges to Beaverlodge Lake.

Various reclamation scenarios were assessed with regards to contaminant loading to the environment. Substantial loading reductions were observed at shutdown with further reductions in loadings predicted to occur very gradually over a period of hundreds of years. Only very small improvements were predicted between the maximum reclamation and the vegetation scenarios.

Three principal contaminants were of concern (uranium, radium-226, and total dissolved solids) when assessing contaminant concentrations in water. Water quality objectives did not exist for uranium or total dissolved solids in 1982 when the mine and mill closed; rather these close-out criteria were established through negotiation with the regulatory agencies.

Close-out criteria were met at the time the operation shut down adjacent to the mill site where Ace Creek flows into Beaverlodge Lake. At the outlet of the TMA, it was predicted that uranium concentrations would meet the close-out objectives only in the long term, while radium and total dissolved solids were not expected to meet the close-out objectives in the long-term. During the original assessment no significant improvement in the concentrations of these parameters was predicted with any of the reclamation options considered. It was also predicted at the time of decommissioning that changes in Beaverlodge Lake water quality would occur very slowly as a result of the long retention time of the lake (~200 years).

## **2.2 Decommissioning activities**

Shutdown activities involved the orderly closure of the mine and mill from January to August 1982, and the relocation of approximately 700 workers and their families. Salvage work in the mine began in July 1982, and was completed in 1983. All access to the underground workings was restricted after the salvage work was completed. The mine shafts and vent raises were used for disposal of various materials throughout the decommissioning period. When no longer required, the surface openings were capped with reinforced concrete.

The majority of the equipment from the Beaverlodge facility was salvaged and sold to other uranium mining and milling companies within Canada. Chemicals used in the milling and water treatment process were returned to suppliers where appropriate, with the remaining chemicals being disposed of within the vertical mine openings.

Eldorado field staff proposed a number of scenarios for decommissioning the infrastructure. It was decided to partly demolish the structures, fill the voids with waste rock, and cover and contour the area to suit the existing topography. To decommission satellite mine facilities, unsalvageable material was dumped into the open pits, covered with waste rock and contoured to the extent possible to match the surrounding topography.

In keeping with the Eldorado philosophy to remove man-made structures, the control structures used to maintain water levels in the TMA were removed allowing water levels to return to within one metre of their natural outlet level, while exposed tailings deposited in the reservoir were moved to deepest part of the waterbodies to ensure a one-metre water cover. Surface-deposited tailings in the TMA were covered with

600 mm of waste rock to reduce gamma radiation levels to an acceptable level. The preceding information describing the planning and activities required to decommission the Beaverlodge mine and mill was obtained from Eldorado Nuclear Limited (1982) and Eldorado Resources Limited (1983).

### 2.3 Transition phase monitoring

Transition phase monitoring has been occurring since decommissioning was completed, which consists of regular inspections of the decommissioned Beaverlodge properties by Cameco and the regulatory agencies responsible for the site. In addition to the inspections a comprehensive water-sampling program is in place to monitor long-term recovery and identify any unusual trends that may require additional study.

In general the decommissioned Beaverlodge site is behaving as predicted; however some unexpected events and trends requiring additional study and/or remediation have been identified. At the main tailings disposal area, tailings were migrating through the waste rock cover as a result of increased porewater pressure. A sand cover was applied and acts as a filter, allowing pressure to be released while preventing the tailings from becoming aerially exposed.

Also, radium concentrations downstream of the TMA have increased since the mid 1990s. This has been attributed to several factors, including the increase in the solubility of barium-radium-sulphate co-precipitate which settled downstream of the TMA water treatment facility. It is postulated that by decreasing levels of total dissolved solids, including sulphate, disequilibrium conditions are generated with precipitate re-dissolution occurring. Biological reductive dissolution may also be a contributing factor.

These events occurred within the expected timelines of a reasonable transition phase monitoring period and have resulted in additional study to understand the issues, with remediation completed where required.

### 2.4 Changing expectations

One of the key issues with the Beaverlodge mine decommissioning project has been the length of time between active reclamation work and final site closure, which still has an uncertain end date. With the passage of time, institutional memory has been reduced. Those involved with site management and regulation have changed. Environmental criteria used to judge the work has been modified and expanded, and decommissioning expectations for uranium mines have increased.

Over the past 10 to 15 years, target levels for uranium in the aquatic environment have been examined both under the *Canadian Environmental Protection Act* Priority Substance List process and through the re-evaluation of the Canadian Council of the Ministers of Environment Water Quality Guidelines process. The impact of this guideline work on the ability to complete decommissioning of the Beaverlodge properties has not yet played out. Perhaps more significant has been evolving expectations on acceptable levels of selenium in the aquatic environment. When the original close-out objectives were established selenium was not a formal consideration, while today it is arguably the dominant concern. Table 1 shows how criteria for key contaminants have changed. Essentially, water quality criteria for selenium and uranium have dropped by an order of magnitude while radium has stayed the same.

**Table 1 Comparison of close-out objectives with current criteria**

	Original Close-Out Concentration Criteria	Current SSWQO**
Selenium (mg/L)	0.01*	0.001
Uranium (mg/L)	0.25	0.015
Radium-226 (Bq/L)	0.11	0.11

\* Selenium value provided is from Environment Saskatchewan (1975).

\*\* Surface Water Quality Objective s (SSWQO); Saskatchewan Environment (2006).

In the original decommissioning plan it was acknowledged that the Beaverlodge area was impacted and was not going to be returned to a pre-mining condition. Although the current regulatory agencies of the

Beaverlodge properties or their predecessors all approved the implementation of the original decommissioning plan, the expectations of some regulators have changed since 1985.

Expectations have evolved to increase the focus on the downstream environment. Comparisons to non-impacted reference areas are now a routine part of study design. Environmental studies, completed between 2005 and 2008 in response to concerns expressed by the CNSC, focus mainly on downstream impacts to determine if there was any measurable recovery occurring in Beaverlodge Lake.

In 2009, the CNSC stated it did not support the conclusion that Beaverlodge Lake is showing expected and acceptable rates of natural recovery, despite the original prediction that it would take many hundreds of years for some areas to recover from the historical mining practices. The CNSC concluded that a feasibility investigation should be conducted to determine which additional source controls or remedial actions could be effectively implemented to promote natural recovery to an acceptable rate. This conclusion clearly demonstrates the changing regulatory expectation and has changed the course of the Beaverlodge work plan.

With the passage of time and new developments, the overall Beaverlodge work plan has required additional modification. Specifically, work is underway to determine if there are any reasonable remedial options that could be implemented that would speed up the process of natural recovery, as well as assessing the associated costs and benefits of such activity; however, the lack of infrastructure in the Beaverlodge area makes the ability to affect changes to site conditions both difficult and costly.

Another complicating factor in bringing closure to the Beaverlodge decommissioning project is the presence of other non-Cameco decommissioning initiatives in the area. The federal and provincial governments have sponsored studies at both the former Lorado mill site and Gunnar mine and mill site to prepare them for decommissioning activities.

These parallel projects bring into focus the variable licensing situations and ownership of former uranium properties in the Uranium City area, as well as the balance between modern decommissioning expectations and the legacy aspects of these properties. The Beaverlodge site is unique in the Uranium City area in that it is currently the only legacy impacted facility that was formally decommissioned and also that it holds a CNSC licence. The extent to which current licensing of a legacy site will drive the selection of standards to be applied for remediation relative to the other properties in the area remains to be seen.

### **3 Development of institutional control**

In 2005, the Government of Saskatchewan was faced with the challenge of defining the circumstances and conditions under which it would accept responsibility for former mine and mill properties located on Crown lands once the operator had fulfilled their closure obligations, demonstrated compliance, and requested release from further financial bonding to cover the costs of closure. The situation was further complicated when such properties included former uranium mill and tailings operations as international conventions and the national nuclear regulatory frameworks play an overriding and often defining role. As a result, the provincial institutional control framework would be required to meet international, national and provincial obligations, while ensuring that future generations would not be burdened with that responsibility.

In 2007, after significant consultation with various stakeholders, including the CNSC, the mining industry, aboriginal organisations and communities in the major mining regions of the province, the Government of Saskatchewan proclaimed The *Reclaimed Industrial Sites Act* and The Reclaimed Industrial Sites Regulations to establish and enforce the IC Program.

The IC Program establishes a process for transferring decommissioned mining and milling properties to provincial responsibility, once remediation has been completed and a period of monitoring has shown the properties to be stable. The two primary components of the program are the IC Registry and two IC funding mechanisms: the “monitoring and maintenance fund” and the “unforeseen events fund” (Saskatchewan Ministry of Energy and Resources, 2009). The funds required for the monitoring and maintenance fund are negotiated between the Government of Saskatchewan and the operator, who provides funding for the province to perform long-term monitoring of the site to ensure the site continues to perform as expected. The operator also contributes to an unforeseen events fund as part of a general pool of funds, which is built up as sites are added to the IC Registry and will be available for the province to apply at their discretion to any site not performing as expected.

The IC Registry maintains a formal record of closed sites, manages the funds, and schedules any required monitoring and maintenance work. As such, the IC Program addresses all applicable articles of the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management administered by the International Atomic Energy Agency (IAEA), the requirements of the federal Nuclear Safety and Control Act, the expectations of the CNSC, and all relevant provincial Acts and regulations.

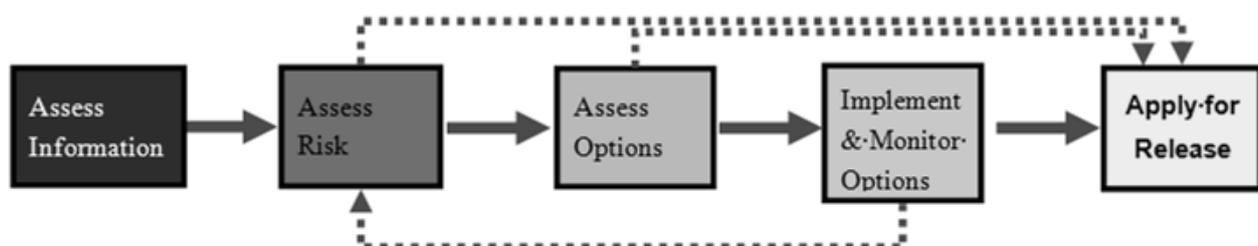
The institutional control monitoring program is an innovative approach to assure the long-term care and maintenance of decommissioned and reclaimed industrial sites. The program has provided a goal and focus to decommissioning efforts. Without such a process to transfer properties to Crown control, the incentive to perform additional remediation is difficult to justify. Proponents would likely continue to monitor the current condition in perpetuity. However, with the incentive of returning properties to Crown control, industry will ensure their remediation activities will meet the province's requirement that properties are chemically and physically stable and that unreasonable risks have been mitigated.

## 4 Management framework

### 4.1 Development of the Beaverlodge management framework

Following the development of the IC Program and the transfer of five relatively benign properties into institutional control, attention turned to the remaining licensed properties and what can reasonably be done, if anything, to reduce the residual risk. The JRG, consisting of CNSC, SkMOE, EC and EFO, and Cameco generally agreed that the ultimate goal of the management of the Beaverlodge properties was to eventually return them to the provincial IC Program. Cameco and the JRG met over the course of 2009 to develop the Beaverlodge Management Framework.

The Management Framework recognises that the Beaverlodge area has been impacted by historical mining operations. It describes the management philosophy, identifies physical boundaries to which the management framework applies, and identifies the minimum requirements for the province to accept properties into the IC Program. The framework references a decision-making process that will guide assessments through to the final endpoint, a critical piece in the management of the Beaverlodge properties. The decision-making process was developed in collaboration with the JRG to ensure there was “buy-in” to the step-wise plan for gathering information, assessing risk and making decisions regarding potential remedial options for the properties. A simplified version of the decision making process is provided in Figure 2.



**Figure 2** Simplified Beaverlodge management framework flowchart

The Management Framework commits us to maintaining a public outreach program that features proactive stakeholder involvement, including consultation with local communities and aboriginal groups. To meet that commitment there is an opportunity for engagement with stakeholders between each phase of the Management Framework flowchart described in Figure 2.

### 4.2 Implementing the management framework

In June 2009, prior to the development of the management framework, Cameco hosted a “Remedial Options Workshop”. The workshop included participants from Cameco, the JRG and various stakeholders including youth and elders from Uranium City. The workshop generated many potential remedial options to be

assessed; however, it became apparent during the workshop that we did not have enough information to make an informed decision on the expected benefit of potential remedial options.

Following the Remedial Options Workshop and the development of the Beaverlodge Management Framework, Cameco developed a work plan to gather the necessary information required to adequately assess the risk on all of the Beaverlodge properties. The Management Framework and work plan were accepted by the CNSC Commission in 2009.

Most of the properties are currently in the first stage of the Management Framework. Much of the required information for this stage has been gathered during the original decommissioning and transition phase monitoring. Information gaps were identified based on the Remedial Options Workshop and subsequent risk assessments. The necessary studies required to fill these information gaps are well underway.

While gathering this additional information Cameco is working with a third-party to develop a quantitative site model (QSM) of the properties. The QSM assesses the interaction of the decommissioned Beaverlodge mining and milling facilities and related properties on the receiving environment. It incorporates past monitoring information and contaminant transport and pathways modelling to predict environmental recovery of the Beaverlodge area. Once developed, the model will assist in the assessment of the technical feasibility of potential options and their expected benefit. For those remedial options considered worth pursuing, the QSM will help establish site specific performance objectives and a monitoring program to track the progress of environmental recovery to ensure that the expected benefits are achieved.

As an environmental management tool, the QSM will facilitate investigation of the effect of various remedial measures. This “what if” feature of the model will allow an easy and quick prediction of expected contaminant flux reduction by implementation of various remedial options, such as:

- Covering the sediments in affected lakes with clay, sand or other cover material.
- Dredging lake sediments for disposal in a secure location.
- Removing waste rock from the shoreline of lake or stream sections.
- Applying a cover on waste rock.
- Isolating or covering exposed tailings spill areas.
- Treating contaminated water.
- Diverting clean flow around a contaminant source.

Once the information has been gathered and Cameco is in a position to assess the feasibility of potential remedial options, the performance objectives and basic costs will be established for those options considered technically feasible. Cameco, through its aboriginal and stakeholder consultation and outreach program, will engage the various stakeholders in this process to receive their input regarding the options, their predicted benefits and their costs. The stakeholder engagement process also involves ongoing discussions with regulatory agencies as they are critical to the process and must support the decisions being made, particularly the Province of Saskatchewan as the eventual landlords of the properties. Following the engagement process one of two outcomes is anticipated:

1. If the expected environmental benefit is commensurate with cost, the option would be implemented. The success of the implemented option would be assessed against the performance objective established during the feasibility assessment. Once monitoring has shown that performance objectives are being achieved and the property is stable, an application would be made to release the property and transfer it to the IC Program.
2. It may be determined that there are no justifiable remedial options for a particular area based on environmental benefit versus cost. Alternative risk management actions would be implemented to reduce the risk as low as reasonably achievable. These risk management actions could include fish and drinking water consumption advisories, posting warning signs on former mining properties describing the risks associated with the properties, or establishing long-term land-use restrictions to control how humans utilise the resources on the properties in the future. Once the alternative risk

management actions have been implemented an application would be made to release the property and transfer it to the IC Program.

## 5 Summary

The Beaverlodge site was remediated under an approved decommissioning plan developed using the best available technology and industry standards of the day. The plan was approved and monitored by the regulatory agencies at the time, and the site is generally performing as predicted. While in transition phase monitoring, the decommissioned Beaverlodge properties were subject to changing expectations resulting from the lack of a formal process for determining when decommissioning and reclamation activities are considered acceptable and complete.

The Beaverlodge Management Framework is a step-wise approach to assessing risk and risk mitigation on the licensed properties. It ensures that all reasonable actions are taken to manage risk prior to proposing transfer to the IC Program. By following the accepted framework, the risk of changing expectations will be reduced as risk assessments will determine the appropriateness of additional remediation. If additional remediation is warranted, site specific performance objectives would be monitored and once achieved, the properties would be proposed for transfer to IC Program.

The recent implementation of the IC Program by the Province of Saskatchewan and the development of the Beaverlodge Management Framework have brought focus to the efforts at Beaverlodge. There is clear understanding of what is required to prepare the properties for transfer to the IC Program. It provides ongoing assurance to both licensing authorities and the local community that funding is in place for the government to perform monitoring and maintenance activities and to deal with unforeseen events.

Prior to the development of the IC Program, proponents performed the expected decommissioning and then monitored the condition in perpetuity, with no expectation that they do any more than meet regulatory requirements for on-site safety. The Province of Saskatchewan's IC Program was the missing piece of the puzzle when the Beaverlodge mine and mill was decommissioned in the 1980s. Having a documented process for relinquishment of decommissioned mining properties is a necessary step to ensure mining properties are adequately remediated and that the burden of long-term monitoring and maintenance of the site will not fall to future generations.

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