

EXECUTIVE SUMMARY

1.1 INTRODUCTION

The Cameco Corporation Millennium Project is a proposed greenfield underground uranium mine located in northern Saskatchewan. To support the underground mine, a 21 kilometre site access road and surface infrastructure will be required to support the underground operations, as well as ore transport, and freshwater intake and treated mine water discharge structures. The Millennium Project will use existing licensed mill and waste management facilities in northern Saskatchewan, the construction and operation of which have previously been assessed.

1.2 REGULATORY APPROVALS AND AUTHORIZATIONS REQUIRED FOR THE PROJECT

The Canadian Nuclear Safety Commission determined that the Millennium Project is an undertaking in relation to a physical work. As set out in Section 5 of the *Canadian Environmental Assessment Act*, an environmental assessment is required before the CNSC issues a Licence to Prepare Site and Construct or a Licence to Operate under subsection 24(2) of the *Nuclear Safety and Control Act*. Based on the Millennium Project Description (Cameco Corporation 2009), the Canadian Nuclear Safety Commission determined that a comprehensive study environmental assessment is required under subsection 19(a) of the *Comprehensive Study List Regulations* of the *Canadian Environmental Assessment Act*.

Further, the Millennium Project satisfied one or more of *The Saskatchewan Environmental Assessment Act* definitions of a “development”. Therefore, in accordance with Section 2(d) of this legislation, Cameco, as the proponent, must submit an Environmental Impact Statement to the provincial Minister of Environment. Should the Environmental Impact Statement sufficiently show that the Millennium Project is environmentally acceptable; the proponent’s applications will be considered for the necessary provincial approvals, permits, and licences that regulate construction and operation.

The scope of the environmental assessment to be completed was outlined in the Project-Specific Guidelines Scoping Document for the Preparation of an Environmental Impact Statement. This document reflects the requirements identified by federal and provincial regulatory agencies specific to the Project. To demonstrate compliance with the Guidelines and facilitate access to information within the Environmental Impact Statement, a concordance table, (or cross-referencing table) is provided that lists the requirements and the location of the corresponding information provided within the Environmental Impact Statement.

1.3 PROJECT DESCRIPTION

The Millennium Project is located within the Moon Lake drainage area, 36 kilometres north of Cameco’s Key Lake operation. The mineral claim containing the Millennium

Project is approximately 600 kilometres north of Saskatoon, Saskatchewan. The proposed surface lease area for the Millennium Project is approximately 6 to 15 square kilometres and is located to the west of the upper basin of Moon Lake and southeast of the main basin of Slush Lake. The assessed Millennium Project's physical footprint is approximately 512 hectares in size.

The Millennium Project will be a mine-only development, as there are no plans to build a mill or associated long-term waste management facilities on-site. Ore and waste products will be transported to a licensed facility for processing and long-term management. For planning purposes, all the resource requirements have been secured at the Key Lake operation. In the future, other regulatory approvals and processes may be completed to evaluate transport of ore and special waste to other licensed facilities. Off-site activities associated with milling of ore and waste management have and will be encompassed within the scope of separate regulatory approvals for existing licensed uranium facilities within the region. Further, power transmission to the site will be assessed under a separate regulatory approval that is being sought by SaskPower.

The Millennium Project includes underground and surface infrastructure for extracting and handling ore, and the construction of an all-season access road connecting to the existing Key Lake-McArthur River haul road. The Millennium Project is expected to produce approximately 150,000 to 200,000 tonnes of ore each year over a projected five-year operations period, based on current indicated resource estimates. It is expected that additional ore will be discovered during mine development, extending the life and production of the mine. Accordingly, a ten-year life of mine was assessed in the environmental assessment.

The scope of the Millennium Project includes the activities and components associated with the construction, operation, and decommissioning of the Millennium Project. Construction activities include shaft and underground mine development, building of surface infrastructure and support facilities, as well as construction of the access road and stream crossing structures. Operation activities include mining of the ore deposit and operation of the surface infrastructure and support facilities, site water management, ore and mine rock management, temporary storage of industrial, domestic, hazardous, and contaminated waste, and transportation of ore and mine waste.

Decommissioning and post-decommissioning activities were considered throughout the design of the Millennium Project. Lands disturbed by the Millennium Project activities will be returned to a condition that is physically stable, safe, and environmentally-sustaining in keeping with the land use and landscape of the day. All infrastructures will be removed from surface, with only the recontoured and revegetated clean mine rock pile remaining at mine closure. Post-closure monitoring also will be completed following cessation of operations.

1.4 PROJECT ALTERNATIVES

The Millennium Project represents a feasible uranium mining opportunity that currently is available to sustain future production schedules at existing mills in the Athabasca Basin, specifically at the Key Lake mill, and potentially, the Rabbit Lake mill.

This assessment assumes that the ore will be transported to the Key Lake operation for milling. The proximity to the Key Lake mill reduces ore transport costs. Other potential small, low-grade deposits comparable to the Millennium deposit have been identified; however, they are not within a reasonable proximity to a milling facility. Costs of extracting the ore are reasonable, as the low nominal grade of the orebody facilitates the use of bulk extraction mining methods. The success of this mining method has been demonstrated at the Eagle Point mine at the Rabbit Lake operation.

Currently, no economically feasible alternatives to the Millennium Project exist. Although, Cameco's ongoing exploration efforts in northern Saskatchewan may result in other mining operations that complement the Millennium Project, none have been identified as a viable alternative at this time.

Alternative means of carrying out the Millennium Project were considered early in the planning as part of the environmental assessment process, providing a comparison of economic, environmental, and social benefits. For the Millennium Project, alternative means that were evaluated included the primary mining method, milling location, alternative transportation methods (i.e., location of access roads, stream crossing locations, and structures), long-term ore storage, skip and hoist location, site waste and water management (including mine water treatment and discharge), and camp facilities.

1.5 ENVIRONMENTAL ASSESSMENT

A number of analyses were completed to evaluate the potential effects during the construction, operation, and decommissioning of the Millennium Project on valued components. The overall environmental assessment approach progresses through the following steps:

- description of existing conditions for environmental components so that changes from the Millennium Project can be measured;
- identification of valued components, including valued ecosystem components and valued socio-economic components, and associated assessment endpoints and measurement endpoints;
- establishment of environmental assessment boundaries (i.e., spatial and temporal boundaries);
- identification of potential project-environment interactions, environmental effects pathways, and environmental design features and mitigation practices (i.e., pathways analysis);
- residual effects analysis (i.e., project-specific effects and cumulative effects);
- determination of significance;
- consideration of uncertainty; and
- development of monitoring and follow-up programs to address the uncertainties and to verify the residual effect predictions.

Through community engagement, a list of valued ecological and socio-economic components was developed for the Millennium Project. A valued component is a component that is considered to be ecologically, culturally, socially, or economically important. The valued components were selected to focus the environmental assessment

because of their ecological, social, cultural, or economic value, and their potential vulnerability to effects from the Millennium Project. The overall determination of significance of effects from the Millennium Project on valued components will be predicted by linking residual effects on measurement endpoints to the associated assessment endpoint.

A screening approach was used to identify and assess the linkages (interactions) between the Millennium Project components or activities, and the corresponding potential effects to valued components (e.g., surface water quality, aquatic biota, vegetation, wildlife, and socio-economics). Pathways were determined to be primary, secondary, or as having no linkage using scientific and traditional knowledge, logic, and experience with similar developments and environmental design features. Pathways identified as being secondary or no linkage were not evaluated for significance because these pathways are not expected to result in a residual effects to a valued component. Primary pathways underwent further effects analysis and residual effects classification to determine the environmental significance of the Millennium Project on the valued component. The following pathways were identified as primary for residual effects:

- changes to surface water quality from the discharge of treated mine water from the water treatment plant may affect fish and wildlife health;
- changes in traffic volume may increase the potential for collisions and rollovers and potential spillage of ore and mine waste, which may affect fish and wildlife health;
- direct loss and fragmentation of plant communities and wildlife habitat from the Millennium Project footprint;
- sensory effects (e.g., presence of buildings, people, lights, smells, and vehicles) may change the quality of wildlife habitat and alter wildlife movement and behaviour (distribution);
- workforce requirements for the Millennium Project will increase employment and related income in northern Saskatchewan;
- project contract, service, equipment, and supply requirements may increase the level of business activity in northern Saskatchewan;
- transportation of ore, mine waste, and workers may affect local transportation and increase maintenance requirements;
- public exposure to radioactive and non-radioactive constituents of potential concern construction, operation, and decommissioning of the Millennium Project;
- worker exposure to radioactive and non-radioactive constituents of potential concern from the construction, operation, and decommissioning of the Millennium Project; and
- changes in traffic volume may increase the potential for collisions and rollovers and thereby increasing the risk of injury or mortality.

1.6 PUBLIC, FIRST NATIONS, MÉTIS, AND REGULATORY ENGAGEMENT

Cameco Corporation has developed and implemented a public participation plan, in addition to documents submitted for public and regulatory review and comment. Public participation is a key component of an environmental assessment, as well as a reflection of the corporate social responsibility of the proponent. This plan ensures the distribution of project-related information broadly throughout northern Saskatchewan and provides a

means to systematically address concerns raised by interested or potentially-interested parties. There have been specific benefits of this process to the Millennium Project and meaningful, transparent, and constructive discussions with interested parties have been provided for throughout the environmental assessment process. These discussions have led to recommendations being considered and integrated into the design plans on an ongoing basis. Cameco Corporation's public participation plan has promoted a broader understanding of the nature of the Millennium Project and its potential effects on the environment.

Cameco Corporation will continue to engage northerners throughout the remaining phases of the environmental assessment and licensing processes for the Millennium Project. Cameco Corporation also will continue to build and maintain strong relationships in the north through its public participation efforts. Engagement opportunities will continue to provide an opportunity for interested parties to gain information regarding issues identified following the submission of the draft Environmental Impact Statement.

1.7 RESIDUAL EFFECTS ANALYSIS AND DETERMINATION OF SIGNIFICANCE

The environmental pathways model, IMPACT™, was used to predict concentrations in environmental media, transport through the environment, and potential risks to ecological receptors from the discharge of treated mine water. Results of modelling indicate that there are no predicted exceedences of benchmarks for aquatic and terrestrial valued components exposed to constituents of potential concern in the Moon Creek and Wheeler River drainages. Predicted radiation doses to valued components also did not exceed the dose benchmark in the Moon Creek and Wheeler River drainages. After mining operations cease, predicted water and sediment concentrations decrease and return to background conditions in the receiving environment.

The results of the modelling indicate that the discharge of treated mine water should not result in significant effects to the maintenance of self-sustaining fish and wildlife populations and protection of fish habitat. Changes from the Millennium Project are measurable at the local scale, and effects may be strong enough to be detectable at the regional scale, but are not likely to alter the state of the environment from baseline conditions, nor increase the risk to the fish and wildlife populations. Changes to surface water and sediment quality are spatially limited to the Moon Creek drainage and are not expected to extend to the Wheeler River. As such, changes to fish and wildlife populations from the discharge of treated mine water are not expected to overlap with the effects associated with the Key Lake operation.

The probability of a spill of ore to a waterbody is very small, because the affect area is small and localized; risks identified for aquatic biota are based on the immediate and short-term concentrations of constituents of potential concern in the sediment, which are anticipated to decrease naturally overtime. For wildlife, exposure is well below the no effects screening index value. Therefore, no risks of adverse effects are expected even for aquatic-based wildlife that might obtain all of their diet from the area downstream of the Wheeler River bridge crossing following a spill of ore.

The Millennium Project development is expected to cause habitat fragmentation. Direct effects related to the loss or alterations of plant communities from the Millennium Project are local in geographic extent. The magnitude of effects on plant communities and wildlife is predicted to be negligible to low. Reclamation of the site is anticipated to occur at decommissioning, therefore, effects on plant communities and wildlife populations are predicted to be reversible.

The Millennium Project, not taking into consideration reclamation activities, is anticipated to result in a less than 1 percent direct loss of key habitat in the terrestrial regional study area for each wildlife value component. For each wildlife value component, the Millennium Project is anticipated to reduce good-quality habitat by less than 1.5 percent. It is expected that all disturbed areas will be reclaimed following closure, including the clean mine rock pile. The direct loss of plant communities and wildlife habitat from the Millennium Project footprint are local in spatial extent and effects are predicted to be negligible to low. Individuals from wildlife populations may interact with other developments and activities so the cumulative effects from direct habitat loss and fragmentation on wildlife population size and distribution are expected to be regional in geographic extent. However, cumulative effects are anticipated to be negligible to low.

Habitat quality is predicted to decrease within five kilometers of the Millennium Project and other developments in the area. These changes are expected to result from the combination of noise and other sensory disturbances from the Millennium Project. Effects on the abundance and distribution of wildlife populations from indirect changes to habitat quality from Millennium Project activities are expected to be local to regional in geographic extent and reversible following closure.

Changes in transportation needs in northern Saskatchewan will affect traffic volumes along the public roads north and south of the Millennium Project, which may increase the potential for vehicle collisions with wildlife. Although the increase in traffic volume related to the Millennium Project is considered to be moderate in magnitude and the possibility of a fatality is not anticipated to significantly increase. The construction and operation of the Millennium Project, the Slurry Haul Project, and the Key Lake Extension Project also should not result in significant cumulative effects to the maintenance of self-sustaining wildlife populations.

Effects to the economy would be a result of the construction, operation, and decommissioning of the Millennium Project and its associated employment and business opportunities. Residents of Saskatchewan's north, including residents of the priority recruitment communities, would benefit from increased and continued employment and business opportunities during the construction, operation, and decommissioning of the Millennium Project. Employment from Millennium Project would provide increased income opportunities for residents of Saskatchewan's north and other individuals. Additional positive benefits would accrue from Cameco Corporation's efforts to provide additional training and development to increase participation in the Millennium Project workforce by residents of Saskatchewan's north. These effects on the northern

Saskatchewan economy are considered positive, moderate in magnitude, medium to long-term in duration, and regional in extent.

Changes in transportation needs in northern Saskatchewan will affect traffic volumes along the public roads north and south of the Millennium Project, and may increase maintenance requirements. Effects to road infrastructure and services would be both positive and negative as the creation of new road will add to the road network in northern Saskatchewan, while the implications of increased traffic could have a small but discernible effect to the quality of road infrastructure. Effects would be regional in geographic extent, of medium duration, and would not persist upon decommissioning of the Project. Although there would be cumulative increases in traffic volumes on selected routes, Cameco Corporation's commitments to the overall maintenance of roadways means that effects to infrastructure and services would be limited. As such, effects to transportation infrastructure from the Millennium Project, as well as cumulative effects are determined to not be significant because the costs and upgrades associated are captured in a heavy haul agreement with the province.

Activities at site have the potential to present working hazards to nuclear energy workers and non-nuclear energy workers. Nuclear energy workers are persons who are required, in the course of the person's business or occupation in connection with a nuclear substance or nuclear facility, to perform duties in such circumstances that there is a reasonable probability that the person may receive a dose of radiation that is greater than the prescribed limit for the general public. Project activities will be conducted in accordance with Cameco Corporation's Safety and Health Management Program and Radiation Protection Program. Radiation doses to workers are predicted to be below regulatory dose limits. The Millennium Project is not anticipated to result in significant residual adverse effects on the maintenance of self-sustaining fish populations, plant communities, and wildlife populations. In addition, no exceedences of benchmarks for the general public and non-nuclear energy workers are predicted. The potential for adverse health effects from Project-related exposures for the fisher/trapper is considered negligible.

Increased traffic volumes to transport resources and personnel to site on public accessed roadways have the potential to increase vehicle rollovers and collisions. The Millennium Project activities will be conducted in accordance with Cameco Corporation's Safety and Health Management Program, which includes driving procedures. The community of Pinehouse would experience an increase in truck traffic, although this traffic would not travel directly through the community or use any community maintained roads. Although the increase in traffic volume related to the Millennium Project is considered to be moderate in magnitude and the possibility of a collision not discernibly increased, it is acknowledged that in the event of a traffic accident occurring that results in a human injury or fatality, the effect would be considered high magnitude. Any vehicle collision resulting in the death of an individual would result in a significant effect on the immediate family and community.

1.8 MONITORING PROGRAMS

Monitoring programs are proposed to deal with the uncertainties associated with the effect predictions and environmental design features. Monitoring verifies effect predictions and determines the effectiveness of environmental design features. Monitoring is also used to identify unanticipated effects and implement adaptive management. Monitoring can include compliance inspection, environmental monitoring, and follow-up programs. If monitoring or follow-up detects effects that are different from predicted effects, or the need for improved or modified design features is identified, then adaptive management will be implemented. This may include increased monitoring, changes in monitoring plans, or additional mitigation.

An Environmental Monitoring Program, as part of an environmental management program developed for the Millennium Project, will be used to test and verify effects predicted, to determine the effectiveness of mitigation and environmental design features, and to identify unanticipated changes and implement adaptive management. The Environmental Monitoring Program will be designed to be consistent, where relevant, with the Environmental Effects Monitoring Program of the *Metal Mining Effluent Regulations*.

Fish, benthic invertebrates, and sediment quality in the receiving environment will be monitored as part of a cyclical monitoring program, which will be designed to evaluate the potential effects of treated mine water release into the environment on aquatic biota. Monitoring stations will be strategically located to capture any potential effects in receiving waters, as well as in reference waters. These stations would be identified under guidance of Saskatchewan Ministry of Environment and the Canadian Nuclear Safety Commission within the licensing process.

Six permanent sampling plots for monitoring metal and radionuclide chemistry will be established as part of the air monitoring program. All of these locations are within two kilometres of the Millennium Project footprint. These plots will be monitored as part of the Environmental Monitoring Program to identify potential changes to the levels metals and radionuclides in plants during and following the Millennium Project. Monitoring of revegetation success will be completed following decommissioning and reclamation of the Millennium Project.

Cameco Corporation will monitor traffic and will track the number of accidents involving Millennium Project related vehicles on the access road and on Highway 914. Should travel safety issues be identified (e.g., in relation to deteriorating infrastructure conditions), the necessary steps to improve road safety or infrastructure condition will be undertaken in a timely fashion and in consultation with the province.

Radiation exposure on-site will be directly monitored to verify the effects predictions and determine the effectiveness of mitigation and environmental design features that will be implemented.

Effects to the resource user/trapper will be monitored through an annual meeting between Cameco and the resource user/trapper.

Compliance inspections and environmental monitoring data reporting will be undertaken as part of a site comprehensive environmental protection plan. The plan will provide flexibility for the Millennium Project proponent and the Saskatchewan Ministry of Environment to effectively identify and respond to unanticipated changes to the environment communities, to adapt to new regulatory frameworks (e.g., *Saskatchewan Environmental Code*), and to provide appropriate feedback required to improve future environmental assessments. It is anticipated that data reporting will occur annually, with detailed comparative data analysis being undertaken every five years and communicated in the form of State of the Environment reports.

1.9 CONCLUSIONS

On the basis of the detailed Millennium Project information and assessment of effects provided in this Environmental Impact Statement, Cameco Corporation believes that the Millennium Project can be operated in a manner that, taking into account environmental design features and mitigation, is not likely to cause significant adverse effects to the biophysical or socio-economic environments.