

# Record of Proceedings, Including Reasons for Decision

In the Matter of

Applicant Cameco Corporation

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Subject Application to Renew the Operating Licence for  
the Key Lake Uranium Mill

Hearing Dates June 11, 2008 and September 17, 2008

**RECORD OF PROCEEDINGS**

Applicant: Cameco Corporation

Address/Location: 2121-11<sup>th</sup> Street West, Saskatoon, Saskatchewan S7M 1J3

Purpose: Application to renew the operating licence for the Key Lake Uranium Mill

Application received: December 10, 2007

Date(s) of hearing: June 11, 2008 and September 17, 2008

Location: Canadian Nuclear Safety Commission (CNSC) Public Hearing Room, 280 Slater St., 14th. Floor, Ottawa, Ontario (Hearing Day One)  
Delta Bessborough, 601 Spadina Crescent East, Saskatoon, Saskatchewan (Hearing Day Two)

Members present: M. Binder, President A. Harvey  
C. Barnes M. J. McDill  
A.R. Graham D. Tolgyesi

General Counsel: J. Lavoie (Hearing Day One) and L. Thiele (Hearing Day Two)

Secretary: M.A. Leblanc

Recording Secretary: P. Bourassa

| <b>Applicant Represented By</b>  | <b>Document Number</b>  |
|--|---|
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| <b>Others</b>  |   |
| <ul style="list-style-type: none"> <li>• Saskatchewan Government, represented by G. Alderman and V. Bourhis</li> <li>• Ministry of Environment, represented by R. Kidd</li> </ul>  |   |
| <b>Intervenors</b>   | <b>Document Number</b>  |
| See appendix A   |   |

**Licence:** Renewed  
**Date of Release of Decision:** October 23, 2008

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## **Introduction**

1. Cameco Corporation (Cameco) has applied to the Canadian Nuclear Safety Commission<sup>1</sup> (CNSC) for the renewal of its operating licence for the Key Lake uranium mill located in northern Saskatchewan, approximately 570 kilometers north of Saskatoon, Saskatchewan. The current operating licence expires on October 31, 2008.
2. Cameco is currently authorized to operate a uranium mill at Key Lake and to maintain the facilities necessary to support this operation, including waste management facilities. The current licence also authorizes Cameco to possess, store, transfer, import, use, and dispose of nuclear substances and radiation devices. Cameco is seeking to renew its licence to continue carrying out the authorized activities for another five years.
3. Cameco is authorized to receive and mill ore slurry from the Key Lake and McArthur River Operations and to produce 7.2 million kilograms of uranium annually under the current licence.

## Issues

4. In considering the application, the Commission was required to decide, pursuant to subsection 24(4) of the *Nuclear Safety and Control Act*:<sup>2</sup>
  - a) if Cameco is qualified to carry on the activity that the licence would authorize; and
  - b) if, in carrying on that activity, Cameco would make adequate provision for the protection of the environment, the health and safety of persons and the maintenance of national security and measures required to implement international obligations to which Canada has agreed.

## Public Hearing

5. The Commission, in making its decision, considered information presented for a public hearing held on June 11, 2008 in Ottawa, Ontario and September 17, 2008 in Saskatoon, Saskatchewan. The public hearing was conducted in accordance with the *Canadian Nuclear Safety Commission Rules of Procedure*.<sup>3</sup> During the public hearing, the Commission received written submissions and heard oral presentations from CNSC staff (CMD 08-H12, CMD 08-H12.A, CMD 08-H12.B) and Cameco (CMD 08-H12.1, CMD 08-H12.1A, CMD 08-H12.1B). The Commission also considered oral presentations and written submissions from 12 intervenors (see Appendix A for a detailed list of interventions).

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<sup>1</sup> The *Canadian Nuclear Safety Commission* is referred to as the “CNSC” when referring to the organization and its staff in general, and as the “Commission” when referring to the tribunal component.

<sup>2</sup> S.C. 1997, c. 9.

<sup>3</sup> S.O.R./2000-211.

6. The Commission also held public hearings on June 11, 2008 and September 17 and 18, 2008 to consider Cameco's applications to renew the operating licences for the McArthur River uranium mine and the Rabbit Lake operation. Considering that certain issues and corporate-wide programs at Cameco apply to all three facilities, and recognizing the interest that some intervenors have in more than one of Cameco's facilities, the Commission decided to consider any relevant information presented on the record for any one matter, for all three hearings.

### **Decision**

7. Based on its consideration of the matter, as described in more detail in the following sections of this *Record of Proceedings*, the Commission concluded that Cameco is qualified to carry on the activity that the licence will authorize. The Commission also determined that Cameco, in carrying on that activity, will make adequate provision for the protection of the environment, the health and safety of persons and the maintenance of national security and measures required to implement international obligations to which Canada has agreed. Therefore,

the Commission, pursuant to section 24 of the *Nuclear Safety and Control Act*, renews the Uranium Mill Operating Licence issued to Cameco Corporation for its Key Lake Operation located in northern Saskatchewan. The licence, UMLOL-MILL-KEY.00/2013, is valid from November 1, 2008 to October 31, 2013.

8. The Commission includes in the licence the conditions recommended by CNSC staff as set out in the draft licence attached to CMD 08-H12.B.
9. With this decision, the Commission requests that Cameco prepare a status report on the safety performance of its facility following the midpoint of the five-year licence term. CNSC staff shall also prepare a report on the results of compliance activities carried out during the first half of the licence term and on the licensee's performance during that period. Cameco and CNSC staff shall present their reports at a public proceeding of the Commission, in approximately June 2011.
10. The Commission expresses its concern with Cameco's delays in addressing certain aspects of its operations. With the intent to enhance its oversight of the facility during the next licence period, the Commission requests that Cameco present progress reports on specific initiatives. In this regard, Cameco shall report to the Commission in April 2009 on the molybdenum and selenium removal measures it has taken pursuant to its *Key Lake Operation – Action Plan for Selenium and Molybdenum* and as referenced in licence condition 5.4. Furthermore, Cameco shall report to the Commission in September 2009 on the following items: its action plan for the management of waste rock, referenced in licence condition 2.3; its action plan for the timely installation of long-term pit wall stability measures in the Deilmann Tailings Management Facility, referenced in licence condition 2.4; and on its fire protection program, referenced in Appendix E of the licence.

The Commission expects to see significant progress and evidence of improvements in these areas at the time of reporting. These reports will be presented at public proceedings of the Commission.

### **Issues and Commission Findings**

11. In making its licensing decision under section 24 of the NSCA, the Commission considered a number of matters relating to Cameco's qualifications to carry out the proposed activities, and the adequacy of the proposed measures for protecting the environment, the health and safety of persons, national security and international obligations to which Canada has agreed. The Commission's findings on these issues are summarized in this section.
12. The Commission notes that many of the issues examined are interdependent. As such, the findings of the Commission presented below are based on the Commission's consideration of all of the information and submissions available for reference on the record for the hearing.

### **Radiation Protection**

13. Cameco reported on the improvements it has made to its radiation protection program during the current licence period, which included additional radiation protection staff, and the introduction of new technology and new or improved processes. Cameco also implemented a formal job hazard analysis and an enhanced respirator program to ensure workers remained well protected while carrying out work in areas of potentially elevated airborne uranium concentrations. Cameco reported that the average full-time equivalent dose for Key Lake employees and contractors was reduced to 1.7 millisieverts (mSv) from 2.1 mSv during the previous period.
14. CNSC staff reported that Cameco's radiation protection program and its implementation at the Key Lake Operation meet CNSC requirements. CNSC staff noted that the Key Lake Operation has an effective Radiation Protection program that is based on keeping the doses as low as reasonably achievable (ALARA). CNSC staff also reported that the radiation doses to the workers during the current licence period were consistently below the regulatory limits.
15. CNSC staff noted that action levels<sup>4</sup> were exceeded during the licence period on a few occasions as a result of maintenance and upgrades to two areas. CNSC staff was satisfied with Cameco's investigations following these occurrences and with the changes made as a result to minimize inhalation of radioactive uranium dust. Changes and improvements that were made during the licence period include the application of Job Hazard Analysis for

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<sup>4</sup> Under the *Uranium Mines and Mills Regulations*, "action level" means a specific dose of radiation or other parameter that, if reached, may indicate a loss of control of part of a licensee's radiation protection program or environmental protection program, and triggers a requirement for specific action to be taken.

non-routine work, the replacement of dosimeters, the improvement to procedures regarding the control of intakes of uranium dust, the adoption of radiation protection training for the Cameco Mining Division, and the use of HAZMAT suits during routine cleaning.

16. In their interventions, J. Penna and E. Knight expressed their view that radiation protection standards are outdated and should be reviewed to account for new scientific findings.
17. Based on the above information and considerations, the Commission concludes that Cameco has made, and will continue to make, adequate provision for radiation protection of persons at the Key Lake facility.
18. With respect to the intervenors' concerns, the Commission notes that CNSC staff reviews the work and recommendations of the International Commission on Radiological Protection (ICRP) and other relevant technical committees to carry out its regulatory activities. The Commission is of the opinion that the regulatory dose limits are based on the best available relevant scientific information and international recommendations.

### **Conventional Health and Safety**

19. CNSC staff explained that the regulation of non-radiological health and safety in uranium mines and mills involves three regulatory agencies: Saskatchewan Ministry of Advanced Education, Employment and Labour (Saskatchewan Labour), Human Resources and Social Development Canada (HRSDC) and the CNSC. CNSC staff reported that Saskatchewan Labour conducted regular compliance inspections under its agreements with HRSDC and the CNSC, and has indicated that the level of compliance observed at the Key Lake Operation during the review met requirements.
20. CNSC staff noted that there were several issues during the licence period that warranted further discussion with Cameco executive management. CNSC staff noted that Cameco had responded satisfactorily to these issues by implementing additional safety measures for workers and developing a contractor management program and standard.
21. Cameco reported that the number, frequency and severity of accidents at the Key Lake Operation were all low during the current licence period, for both its employees and contractors working on site.
22. The Commission sought further information on the outcome of Cameco's improvement initiatives with respect to the safety of contractors on site. CNSC staff confirmed that Cameco had implemented acceptable corrective actions to address this corporate-wide issue. Cameco provided further details of the improvements made that include worker orientation, walk-downs and management involvement.
23. Saskatchewan Labour noted its view that Cameco responds well and quickly to issues and stated that Cameco's health and safety program at the Key Lake Operation was acceptable.

24. The Canadian Nuclear Workers Council and United Steel Workers Union submitted that positive health and safety measures were in place at Key Lake and that the work environment was such that, in the event of a potentially unsafe situation, workers were not afraid to stop work. The intervenor also noted that the existing Health and Safety Committees ensure a safe workplace at the facility.
25. Based on this information, the Commission is satisfied that Cameco has made, and will continue to make, adequate provision for the protection of persons from conventional (non-radiological) hazards at the Key Lake Operation.

### **Environmental Protection**

26. Cameco stated that its environmental management program (EMP) provides the framework for the Key Lake environmental management system (EMS) which includes a component for the identification of environmental improvement initiatives. As a result, Cameco noted that a number of improvements have been made during the current licence period, including the installation of primary containment around the counter-current decantation (CCD) thickeners, repair and sealing of floors in the crystallization, solvent extraction and precipitation areas, and installation of a groundwater recovery system for the mill.
27. Cameco reported on the steps that it had taken to reduce that number of reportable incidents over the current licence period. Cameco explained that the frequency of incidents was due in part to an ageing infrastructure. Cameco added that its revitalization plan for the facility would assist in reducing the number of incidents further since several projects within the plan would have direct positive impacts on the environment. Cameco also added that all of the spills reported did not represent a significant risk to the environment and that treated mill effluent releases were within effluent limits and met toxicity test requirements.
28. CNSC staff reported that Cameco's Environmental Protection program meets requirements but the implementation of the program is rated below requirements since Cameco has yet to be successful in reducing the selenium and molybdenum levels in the mill effluent and David Creek drainage. CNSC staff was of the view that past and ongoing selenium and molybdenum loadings to the David Creek drainage pose an unreasonable environmental risk.
29. CNSC staff reported on several aspects regarding Cameco's environmental performance during the licence period, noting that deficiencies and action notices had been adequately addressed by Cameco and were now considered closed. Some of these issues related to the sulphuric acid spill, as reported to the Commission in 2006, low pH releases, and stack emissions. CNSC staff reported that the treated mine effluent releases were within the limits set out in the current licence.

30. With respect to the reportable spills that occurred during the licence period, CNSC staff stated that the releases to the environment were localized and largely recovered, so the effects were minor. CNSC staff added that most of these spills were related to an ageing groundwater dewatering pipeline infrastructure, which is currently being upgraded by Cameco in consultation with CNSC staff and Saskatchewan Ministry of Environment.
31. The Commission sought the views of the provincial government with respect to Cameco's environmental protection performance. The Saskatchewan Ministry of the Environment responded that Cameco was operating within the terms of its current provincial operating approval and that it was adequately protecting the environment.
32. E. Knight, in her intervention, expressed concern with Cameco's delays to reduce the molybdenum and selenium releases and that the proposed system may not sufficiently reduce the selenium concentration. The intervenor was also concerned that CNSC does not anticipate a measurable increase of potential long-term chronic effect of selenium.
33. The Commission also expressed its concern with Cameco's performance to date with respect to the reduction of selenium and molybdenum loadings to the environment. Considering that Cameco had previously committed to achieving greater success in reducing these loadings, as discussed during a related licence amendment hearing<sup>5</sup> held on January 25, 2007, the Commission sought further information from Cameco on its plans going forward and from CNSC staff with respect to the risk to the environment pending further reductions.
34. CNSC staff explained that the risk associated with selenium releases is the long-term chronic effect. CNSC staff considers that the short-term impact from the delay in further reducing the loadings will not result in a measurable effect on the environment. CNSC staff expressed the view that the concern at this stage was Cameco's inability to deliver on its commitment. In this regard, further discussion on Cameco's operational performance can be found in the relevant section of this Record of Proceedings.
35. Cameco was of the view that it had made significant progress to achieve reduction of molybdenum and selenium loadings but explained that commissioning issues had delayed the successful implementation of its mitigation plan. Cameco further noted that it expected to have the measures in place by March 2009.
36. CNSC staff recommended that Cameco update the Commission at the April 2009 Commission meeting on its progress in rectifying their operating problems and meeting their targeted molybdenum and selenium removal objectives. In response to the Commission's request for clarification on the deliverables, Cameco stated that it would be in a position to report on the completion of the construction and initial results.

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<sup>5</sup> Refer to the *Record of Proceedings, Including Reasons for Decision*, in the matter of Cameco Corporation's Application to Amend the Key Lake Operation Uranium Mill Operating Licence Facility for the Public Hearing held on January 25, 2007.

37. The Saskatchewan Environmental Society made several recommendations for the protection of the environment that included aspects of long-term monitoring and an independent analysis of the tailings management for the reduction of the long-term radiological risk to the environment. CNSC staff explained that long-term monitoring is included in the preliminary decommissioning plans and in the decommissioning licences issued by the CNSC.
38. In response to the Commission's enquiry on the need for independent analysis, Cameco responded that it employs geoenvironmental engineers and hydrogeologists and also calls on external experts to review its work and carry out more specialized work as well. CNSC staff explained that it has the in-house expertise in hydrogeology and geoscience and that it is also involved in external research with Carleton University.
39. E. Knight expressed the view that the operating licence should include release limits for radionuclides and that the newly planted trees on the site should also be monitored for radionuclides.
40. The Commission notes in this respect that, as reported by CNSC staff, the final treated mill effluent must meet the effluent discharge limits stipulated in Appendix D of the operating licence, which includes limits for the release of radium, and that the treated groundwater must meet discharge limits specified in the *Metal Mining Effluent Regulations*<sup>6</sup> (MMER). Both discharges are also subject to regular MMER mandated fish toxicity testing and to more stringent Action Levels specified in the Key Lake Operation's Environmental Code of Practice. The Commission also notes that CNSC staff assembles and evaluates the environmental effects monitoring (EEM) information along with any other routine or special investigations to develop a comprehensive understanding of the receiving environment.
41. The Northern Saskatchewan Environmental Quality Committee (NSEQC) submitted that Cameco's revitalization project should also include upgrades to its environmental practices.
42. In this regard, the Commission sought more information on whether Cameco's revitalization plans were to include environmental performance improvements. Cameco responded that its revitalization plans did include such improvements and provided examples such as the construction of new acid and oxygen plants that will result in significant decrease of sulphur dioxide emissions and an enhanced heat recovery system to reduce the use of propane.
43. The Saskatchewan Chamber of Commerce expressed its view that Cameco has good environmental standards in place and made reference to Cameco's certification to the ISO 14001 environmental quality management standard.

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<sup>6</sup> S.O.R./2002-222.

### *Conclusion on Environmental Protection*

44. The Commission is of the opinion that, pursuant to paragraph 12(1)(f) of the *General Nuclear Safety and Control Regulations*<sup>7</sup> (GNSCR), Cameco will take all reasonable precautions to protect the environment and to control the releases of radioactive nuclear substances within the site of the licensed activity and into the environment.
45. The Commission is satisfied with CNSC staff's assessment that Cameco's delay in reducing the molybdenum and selenium loadings will not have a measurable impact on the environment in the short term.
46. However, the Commission is expecting progress to be made in the months ahead with respect to the implementation of Phase I of Cameco's *Key Lake Operation – Action Plan for Selenium and Molybdenum*, referenced in proposed licence condition 5.4. As recommended by CNSC staff, the Commission requests Cameco to report on this matter at a public proceeding in April 2009. The Commission also notes that Cameco should proceed expeditiously to implement other measures, such as those of Phase II and/or Phase III of its mitigation plan, in the event that Phase I is found to be insufficient to meet the target releases of molybdenum and selenium to the environment.
47. Based on this information, the Commission is satisfied overall that Cameco has made, and will continue to make, adequate provisions for the protection of the environment during the proposed licence period.

### **Operational Performance**

48. The Commission considered the operating performance at the Key Lake Operation as further indication of Cameco's qualifications to continue operating the uranium mill and, in doing so, to provide adequate protection for the environment, and the health and safety of persons. The areas of operating performance that the Commission examined are described in the following sections.

#### *Mill Operations*

49. CNSC staff reported that Cameco's Mill Operations subprogram and its implementation meet requirements. CNSC staff carried out 15 compliance inspections during the current review period and issued action notices that mostly related to housekeeping, signage and containment issues. CNSC staff reported that 32 situations pursuant to Section 29 of the *General Nuclear Safety and Control Regulations* were reported but considered minor, except the acid spill previously reported to the Commission in 2006 as a Significant Development Report (SDR)<sup>8</sup>. CNSC staff noted that many situations were related to an ageing infrastructure, and that Cameco was in the process of upgrading its infrastructure through the implementation of its revitalization plan.

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<sup>7</sup> S.O.R./2000-202.

<sup>8</sup> Refer to the Minutes of the Canadian Nuclear Safety Commission (CNSC) Meeting held Thursday, February 16, 2006.

50. The Commission sought more information on Cameco's approach to ageing management, referring specifically to containment issues that Cameco has faced recently at several of its licensed facilities. Cameco responded that it has begun a review of all its sites with respect to containment structures and sump replacements, using a risk-based approach. Cameco confirmed that it is confronted with ageing issues at many of its facilities and that it is committed, at a corporate-wide, senior level, to provide oversight of ageing management.
51. Considering that Cameco has not been able to meet its commitments on a number of initiatives, including the implementation of an adequate system for the reduction of molybdenum and selenium loadings and a mitigation plan for the sloughing issues at the site, the Commission questioned whether Cameco has the capability or commitment to achieve operational excellence. The Commission was of the view that Cameco should be demonstrating that it takes initiatives to address the issues as they arise, as opposed to being imposed action by the regulator and, furthermore, it should deliver on its commitments.
52. With respect to the annual production limit, Cameco submitted on Day Two of the hearing that, if it could meet all of its effluent discharge requirements and limits, the Commission could consider authorizing a three-year rolling average on production to replace the current annual production limit.

#### *Waste Management Operations*

53. In its submission, Cameco provided an overview of the operational performance and improvement initiatives in the following areas: the Deilmann Tailings Management Facility (DTMF), waste rock management, and the Above-Ground Tailings Management Facility (AGTMF).
54. CNSC staff reported that Cameco's Waste Management subprogram meets requirements. CNSC staff conducted 11 compliance inspections and noted that all action notices were closed except for one currently under review. However, CNSC staff rated the implementation of the program as below requirements. CNSC staff reported that Cameco has been slow to react to emerging issues and has not met all its scheduling commitments. Specifically, Cameco has had difficulty in meeting its commitments on the expansion of the Reverse Osmosis plant, the molybdenum and selenium treatment circuit, the groundwater contamination recovery system, and some aspects of the waste-rock management schedule.
55. CNSC staff submitted that the delay to have a long-term waste-rock management option in place was acceptable, given that the Deilmann North waste-rock pile is within the cone of groundwater depression and that seepage from the pile is contained and collected via the pump and treat system currently in place.

56. The Saskatchewan Environmental Society, the Northern Saskatchewan Environmental Quality Committee and E. Knight, in their interventions, expressed concern with the current tailings management and sloughing issues at the DTMF. The Saskatchewan Environmental Society submitted that waste disposal should be subject to a formal public review every two years.
57. Considering that sloughing has been an on-going issue discussed at length in past proceedings, including during the previous licence renewal hearing and in the subsequent mid-term report, the Commission expressed its view that insufficient progress has been made to date to address this issue in the long term. The Commission expressed its concern that the lack of a remediation plan would affect the viability of the facility by compromising the capacity to safely store the tailings at the site.
58. Cameco provided further details on the site characteristics and noted its long-term plan could include the possibility of building an additional facility to manage the tailings. Cameco noted that it had begun a scoping study to look at slope stabilization options but that additional field and laboratory work was needed. Cameco also noted that the slope mitigation decision was dependent on which tailings option would be selected.
59. With respect to the current short-term solution, Cameco noted that sloughing has now stopped as a result of maintaining the water level stable and that, with the increased water treatment capacity now in place, it can begin to lower the water level in the pit to further stabilize the slope. Cameco also noted that it would have sufficient tailings capacity for the next 10 years under the current short-term measures.
60. CNSC staff stated its view that Cameco was making adequate provisions for the safety of its workers and the protection of the environment by managing the short-term risks. CNSC staff proposed a new licence condition to have Cameco submit an Action Plan by June 30, 2009 and report to the Commission in September 2009 at a public proceeding.
61. CNSC staff also noted that it had concerns with the impact the sloughed sand might have on contaminant leaching from the tailings. To address these concerns, Cameco has completed a two-year field program and found that the revised model predictions were consistent with the earlier predictions of no significant environmental effects. However, a joint geochemical investigation between Cameco and the University of Saskatchewan is in progress on the geochemical controls on contaminant concentrations in the tailings pore waters. This study is expected to be completed in 2009.

*Packaging and Transport*

62. CNSC staff stated that it had conducted nine compliance inspections during the current review period, one of which was conducted jointly with Transport Canada. All resulting action notices have been closed except those from a recent inspection that Cameco was currently addressing. CNSC staff also reported that there were successful simulations of accident scenarios conducted with Transport Canada. CNSC staff reported that Cameco's Packaging and Transport sub-program and its implementation meet expectations.
63. CNSC staff noted that there were six dangerous occurrences pursuant to section 19 of *Packaging and Transport of Nuclear Substances Regulation*<sup>9</sup>. In three cases, the contamination was contained within trucks and clean-up operations recovered and repackaged any errant material. Two occurrences involved ore slurry trucks with small amounts of residual contamination. One occurrence involved a contractor's vacuum truck that left the site with a small amount of contamination and that was later returned to the site for decontamination.
64. Cameco reported that the occurrence involving a contractor's vacuum truck prompted a review of its monitoring and release protocols. A new corporate standard was subsequently produced and has been implemented successfully at Key Lake.

*Conclusions on Operating Performance*

65. The Commission is satisfied that Cameco's programs, processes and controls in place for operation are sufficient to ensure that the continued operational activities are carried out safely.
66. Considering that Cameco has not been able to meet certain commitments during the current licence period, the Commission agrees with CNSC staff's recommendation that Cameco provide a progress report in September 2009 on the following items: its action plan for the management of waste rock, as referenced in licence condition 2.3 and its action plan for the timely installation of long-term pit wall stability measures in the Deilmann Tailings Management Facility, as referenced in licence condition 2.4.
67. With respect to the production limit, the Commission notes that the safety programs currently in place have been assessed based on Cameco's application and current annual limit. Considering the potential impact that a change in the production limit may have on the safety programs, the Commission notes that the annual production limit from the facility shall remain at 7.2 million kilograms of uranium, as recommended by CNSC staff in the proposed licence. If the licensee requires increased operational flexibility, the Commission would consider a different approach to setting the production limit upon receipt of a licence application with supporting documentation.

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<sup>9</sup> S.O.R./2000-208.

## **Quality Management and Training**

68. As a further indication of the adequacy of Cameco's qualifications and protection measures, the Commission examined performance assurance elements that include quality management, personnel training and safety culture.
69. Cameco stated that it was moving toward operational excellence through consistent application of formal management systems and, as such, has adopted an integrated safety, health, environment and quality (SHEQ) policy as the foundation for Cameco's management systems. The policy is implemented through an integrated set of SHEQ programs whose implementation began in 2006. Cameco provided an overview of the continuous improvement initiatives it has undertaken and completed in the past years and summarized the four key areas that it was currently targeting: training, corrective actions, procurement and contractor management.
70. With respect to safety culture, Cameco stated its safety and health management program includes a requirement that safety culture be systematically assessed at all operations. Cameco noted that it has planned to conduct a safety culture assessment at Key Lake early in the proposed licence period.
71. CNSC staff reported that it had conducted a comprehensive document review, an Environmental Management System (EMS) audit and two Quality Management System (QMS) on-site reviews over the current licence period. CNSC staff stated that there has been significant advancement of the corporate QMS Manual and oversight of the Key Lake Operation and that Cameco's Quality Management program now meets expectations. CNSC staff also reported on other corporate and site-based advancements made, which includes increased corporate involvement, the implementation of Incident Reporting System, the adoption of TapRoot as a universal Cameco root cause technique, and the development of a corporate-wide Systematic Approach to Training (SAT) based program and a Systems Application Products (SAP) database to centralize procurement, equipment records and maintenance.
72. CNSC staff noted that the implementation of the Quality Management program has been rated as below expectations as it is only partially complete and other deficiencies still remain.
73. E. Knight, in her intervention, questioned whether Cameco is committed to safety and the protection of the environment, considering the time it has taken to implement a SAT program and an adequate Quality Assurance program.
74. The Commission also expressed its concern that Cameco has several program implementations that are below requirements and that there are significant improvements yet to be achieved. The Commission sought assurances that Cameco was indeed striving to address the issues in a timely manner. In response, Cameco explained that it had to prioritize its work but that it also has some plans in place and developing others to address these deficiencies. Cameco noted that significant progress had been made in the past few years and that some delays were due to the need to carry out further studies to ensure a thorough understanding of an issue that would lead to the appropriate solutions.

75. With respect to training, Cameco stated that it has developed a SAT program to manage and track the training requirements and that it was currently working on its implementation, scheduled to be complete by 2011. Cameco also noted that its job hazard analyses for high-priority positions would be in place by end 2009.
76. CNSC staff rated Cameco's Training sub-program as meeting requirements. CNSC staff noted that the current training program has been subject to many improvements and will improve as SAT processes are implemented. However, considering the deficiencies identified during an inspection and the remaining level of activity required to fully implement the SAT program, CNSC staff rated the implementation of the program as below requirements.
77. The Canadian Nuclear Workers Council and United Steel Workers Union, in its intervention, stated that workers have received the upgraded radiological safety training. The intervenor noted that the SAT program is a positive initiative that will take time to implement and agrees with CNSC staff conclusion in this regard.

#### *Conclusions on Quality Management and Training*

78. The Commission is of the view that the outstanding issues pose a low risk to the achievement of regulatory performance requirements and expectations. However, the Commission expresses its view that Cameco has yet to demonstrate operational excellence at Key Lake and expects Cameco to address the outstanding issues during the proposed licence period.
79. Based on the above information and considerations, the Commission concludes that Cameco has in place the necessary programs to assure continued acceptable performance.

#### **Emergency Preparedness and Fire Protection**

80. The CNSC requires that licensees, as part of their provisions for protection of persons in the conduct of their operations, be prepared to deal effectively with emergencies that may arise. In this regard, Cameco noted that the Key Lake Operation has a well-trained and effective emergency response team (ERT). The ERT participates in training activities delivered by the site safety staff as well as specialized training such as "first responder" and "rapid intervention team". Cameco further noted that it continues to carry out emergency response exercises to ensure readiness for emergencies.
81. Based on the level of risk, the existing program, the training provided and the availability of emergency response personnel and equipment, CNSC staff stated that the Emergency Preparedness program and its implementation at the Key Lake Operation meet requirements. CNSC staff also noted that Cameco has a fully-trained and equipped firefighting and emergency response team, and conducts regular drills of their emergency response plans.

82. Cameco noted that, during the licence period, it has commissioned a third-party review of fire protection requirements at the site which was followed up with site inspections. Cameco developed a plan to address the identified deficiencies, including the development and adoption of a National Fire Code compliant maintenance and testing logbook. Cameco will incorporate the logbook into Key Lake's maintenance management system.
83. CNSC staff rated Cameco's Fire Protection program and its implementation as below requirements. Non-compliances and weaknesses were identified by a third-party review with the National Fire Code and during Type II inspections. Cameco has a plan in place to address the non-compliances raised by the third-party review, but its plan to address the weaknesses of the Type II inspection has yet to be finalized. CNSC staff noted that Cameco is addressing the deficiencies on a priority basis and communicating with CNSC staff to resolve the issues.
84. CNSC staff also submitted that Cameco has extensive fire detection and suppression systems in place and all new projects with fire protection implications are now being reviewed by a third-party. Furthermore, the Key Lake Operation has added personnel to carry out the inspection and testing requirements as well as fire prevention and awareness activities.
85. The Commission is of the opinion that the current deficiencies in the fire protection program and implementation do not pose an unreasonable risk to the public, considering the measures and controls currently in place. The Commission is also satisfied that adequate design provisions are being made to ensure fire protection at the Key Lake Operation.
86. However, the Commission remains concerned that Cameco has not yet demonstrated full compliance with the CNSC requirements for fire protection and expects that the outstanding issues will be addressed as soon as possible. In this regard, the Commission requests that Cameco provide an update to the Commission on the status of its fire protection program at a public proceeding in September 2009.
87. The Commission concludes that emergency preparedness and fire protection measures at the Key Lake Operation are adequate for the proposed licence renewal.

### **Security**

88. The Commission does not discuss security matters in detail in a public document, such as this *Record of Proceedings*, but notes that it is satisfied that Cameco's performance with respect to maintaining security at the facility has been acceptable.
89. The Commission concludes that Cameco has made, and will continue to make, adequate provisions for ensuring the physical security of the Key Lake Operation.

## **Safeguards**

90. CNSC staff reported that Cameco's program for the safeguarding of material and non-proliferation and its implementation meet CNSC requirements. CNSC staff noted that Cameco has provided all relevant reports and requested information on a timely basis. CNSC staff submitted that Cameco has satisfactory procedures in place.
91. CNSC staff explained that the CNSC's regulatory mandate includes ensuring conformity with measures required to implement Canada's international obligations under the Treaty on the Non-Proliferation of Nuclear Weapons. Pursuant to the Treaty, Canada has entered into safeguards agreements with the International Atomic Energy Agency (IAEA). The objective of these agreements is for the IAEA to provide credible assurance on an annual basis to Canada and to the international community that all declared nuclear material is in peaceful, non-explosive uses and that there are no undeclared nuclear material or activities in this country.
92. The Saskatchewan Environmental Society, in its intervention, stated its view that uranium from Key Lake should not to be exported to nuclear weapons states nor should depleted uranium be used for military purposes.
93. With respect to the export of uranium, the Commission notes that all export licences must respect the Canadian non-proliferation policy as well as Canada's international commitments. As required by the *Nuclear Non-Proliferation Import and Export Control Regulations*<sup>10</sup>, for each export licence application, detailed information on the end use and end user of each export must be provided. This information is verified through a rigorous process that CNSC staff conducts to evaluate the end use and end user.
94. Based on this information, the Commission is satisfied that Cameco has made, and will continue to make, adequate provisions in the areas of safeguards and non-proliferation at the Key Lake Operation that are necessary for maintaining national security and measures necessary for implementing international agreements to which Canada has agreed.

## **Public Information Program**

95. Cameco outlined the various aspects of its public information program that features public presentations, tours, and meetings. Cameco noted that its consultation activities are intended to provide information to all stakeholders, but are focused primarily on those residents who live in the vicinity of the operation. These communities are referred to as impact communities.

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<sup>10</sup> S.O.R. 2000/210.

96. CNSC staff noted that Cameco's Key Lake Public Information program is extensive and varied. CNSC staff was of the view that Cameco's Public Information program meets the criteria for an acceptable public information program set out in Regulatory Guide G-217 and meets the requirements of the *Uranium Mines and Mills Regulations*<sup>11</sup>. CNSC staff also noted that Cameco defines its target audience to be the Northern Environment Quality Committees (NEQC), the Northern Mines Monitoring Secretariat (NMMS) and the Mudjatik Co-Management Board.
97. The Saskatchewan Environmental Society was of the view that Cameco should provide information regarding its releases of radioactive and toxic materials. The intervenor was also concerned about the adequacy of Cameco's public information program to warn the public of potential contamination of the site in the future, when the site has been decommissioned. J. Penna, in his intervention, submitted that Cameco's public record should include the history of incidents, accidents and contamination, as well as clear information on Cameco's safety culture and compliance reports.
98. The Northern Village of Pinehouse expressed the need for Cameco to provide meaningful information and seek the opinions and advice from elders and community leaders.
99. Some intervenors, including the Saskatchewan Chamber of Commerce and the St. Paul's Hospital (Grey Nuns) of Saskatoon, expressed their view that Cameco has an adequate public consultation and communication program. Several other intervenors attested to Cameco's involvement in and commitment to the community.
100. The Commission expresses the view that a licensee's public information program should provide meaningful information in a clear and understandable manner to the public. In this respect, the Commission suggests that Cameco consider the intervenors' comments and explore other methods of presenting information in a clear and simple manner to a wider public.
101. Based on this information, the Commission is satisfied that Cameco's information program meets requirements for the proposed licence period.

### **Decommissioning Plan and Financial Guarantee**

102. In order to ensure that adequate resources will be available to meet the same regulatory requirements for safety, environmental protection and security during the future decommissioning of the Key Lake Operation, the Commission requires that adequate plans and financial guarantees for decommissioning and long-term management of waste be put in place and maintained in a form acceptable to the Commission.

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<sup>11</sup> S.O.R./2000-206.

103. CNSC staff reported that the decommissioning plan for the Above-Ground Tailings Management Facility (AGTMF) has been submitted. CNSC staff has reviewed the revised preliminary decommissioning plan (PDP) and associated cost estimates and has found them acceptable. CNSC staff recommended that the financial guarantee currently in place for the decommissioning of the Key Lake Operation be increased to \$120.7 million, to be provided in irrevocable letters of credit.
104. The Saskatchewan Environmental Society recommended that the financial guarantee be increased to \$200 million to account for the uncertainties associated with the tailings management and the risk of groundwater contamination after the site has been abandoned. In response to this concern, CNSC staff explained that the proposed financial guarantee was derived using an evaluation process that takes these uncertainties into account, as prescribed in Regulatory Guides G-219, *Decommissioning Planning for Licensed Activities* and G-206, *Financial Guarantees for the Decommissioning of Licensed Activities*.
105. The intervenor further expressed concern that a period of monitoring of the site after decommissioning should be imposed. E. Knight also expressed concern with decommissioning at the site.
106. In response to these concerns, and as requested by the Commission, CNSC staff explained the decommissioning process and the roles of the licensee, the CNSC and the Province of Saskatchewan. CNSC staff noted that licensees are required to provide preliminary decommissioning plans and financial guarantees that are updated throughout the life cycle of the facilities, including during their operating period. At the end of operation of the facility, a detailed decommissioning plan is then provided to describe the decommissioning work and the end state objectives and, if applicable, the institutional controls to be in place for a certain number of years.
107. The Saskatchewan Ministry of the Environment explained that it has an institutional control framework under the *Reclaimed Industrial Sites Act*<sup>12</sup>. Institutional control requires that the site is stable and that funds are available for unexpected events and for monitoring maintenance. The Province will be responsible for institutional control in the long term, but only after the site has shown that it has been stable and meets the applicable requirements.
108. The Northern Saskatchewan Environmental Quality Committee expressed the view that decommissioning activities can occur at the same time as operation continues and thus Cameco should consider the decommissioning of the AGTMF.
109. In this regard, Cameco noted that it was currently investigating decommissioning options for the facility which include in-situ decommissioning and the relocation of tailings from the AGTMF either by direct relocation or through reprocessing.

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<sup>12</sup> S.S. 2006, c. R-4.21.

110. The Commission notes that decommissioning and abandonment of nuclear facilities are licensed activities under the NSCA and that such licences can only be issued if the requirements of the NSCA and associated regulations including the *Uranium Mines and Mills Regulations* are met. Factors that are considered at the decommissioning stage include the expected levels of activation and contamination within the facility following the end of operation and the long-term management of the nuclear materials on site.
111. The Commission concludes that the proposed financial guarantee for decommissioning the Key Lake Operation is acceptable for the purpose of the licence renewal.

### **Cost Recovery**

112. CNSC staff reported that Cameco is in good standing with the *Canadian Nuclear Safety Commission Cost Recovery Fees Regulations*<sup>13</sup>, with respect to the payment of licensing fees for its Key Lake Operation.

### **Application of the *Canadian Environmental Assessment Act***

113. Before making a licensing decision, the Commission must be satisfied that all applicable requirements of the *Canadian Environmental Assessment Act*<sup>14</sup> (CEAA) have been fulfilled.
114. CNSC staff indicated that the application to renew the operating licence under subsection 24(2) of the NSCA is not prescribed for the purposes of paragraph 5(1)(d) of the CEAA in the *Law List Regulations*<sup>15</sup>. Since there are no other CEAA triggers for this project that involve the CNSC, CNSC staff submitted that an EA under CEAA is not required.
115. The Commission accepts CNSC staff's interpretation of the CEAA and thus is satisfied that an environmental assessment is not required before the Commission may consider and make a decision on this licence renewal application for the Key Lake facility under the NSCA.
116. The Commission notes that further EA determinations would be done separately, as appropriate, for future projects such as those that may be initiated under Cameco's revitalization plans.

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<sup>13</sup> S.O.R./2003-212.

<sup>14</sup> S.C. 1992, c. 37.

<sup>15</sup> S.O.R./94-636.

### **Licence Length and Interim Reporting**

117. Cameco has applied to the CNSC for a five-year renewal of its licence. With reference to the CNSC staff criteria for recommending licence duration (as described in CMD 02-M12, *New Staff Approach to Recommending Licence Periods*), CNSC staff recommended that the Commission accept and grant the proposed five-year term based on its view that, overall, there is enough strength in the programs and their implementation, and the licensee has demonstrated a long operating history of competence.
118. With respect to interim reporting, CNSC staff proposed to submit a status report covering the relevant information on the operating performance of the facility at approximately the mid-point of the licence period.
119. Several intervenors representing community members, local organizations and the workers' union supported Cameco's request and CNSC staff's recommendation for a five-year licence.
120. Other intervenors did not support the licence renewal application or submitted that the licence should be limited to a shorter term, considering Cameco's delays in implementing certain improvement initiatives and uncertainties associated with the tailings management capacity.
121. The Commission is of the view that a five-year licence allows a more effective oversight of the facility by the CNSC staff and allows Cameco to progress on its improvement initiatives and tailings management study while concentrating on operating safely in an environmentally responsible manner.
122. The Commission is also of the view that deficiencies that remain in certain program areas do not constitute an unreasonable risk to the maintenance of health, safety, security, environmental protection, or conformance with international obligations to which Canada has agreed.
123. Based on the above information and considerations, the Commission accepts the proposed five-year licence term. With respect to interim reporting, the Commission requests that Cameco and CNSC staff present to the Commission mid-term reports on the safety performance at the Key Lake Operation at a public proceeding of the Commission.
124. In addition to the mid-term report, the Commission also requests that Cameco submit progress reports on specific matters in April and September 2009 (refer to paragraphs 10 and 128 of this *Record of Proceedings*).

**Conclusion**

125. The Commission has considered the information and submissions of the applicant, CNSC staff and intervenors as presented in the material available for reference on the record.
126. The Commission is satisfied that the applicant meets the requirements of subsection 24(4) of the *Nuclear Safety and Control Act*.
127. The Commission therefore renews, pursuant to section 24 of the *Nuclear Safety and Control Act*, the Uranium Mill Operating Licence issued to Cameco Corporation for the Key Lake Operation. The licence UMLOL-MILL-KEY.00/2013 is valid from November 1, 2008 to October 31, 2013.
128. The Commission includes in the licence the conditions recommended by CNSC staff in the draft licence attached to CMD 08-H12.B.
129. With this decision, the Commission requests that Cameco prepare a status report on the safety performance of its facility following the midpoint of the five-year licence term. CNSC staff shall also prepare a report on the results of compliance activities carried out during the first half of the licence term and on the licensee's performance during that period. Cameco and CNSC staff shall present their reports at a public proceeding of the Commission, in approximately June 2011.
130. The Commission expresses its concern with Cameco's delays in addressing certain aspects of its operations. With the intent to enhance its oversight of the facility during the next licence period, the Commission requests that Cameco present progress reports on specific initiatives as follows: 1) report on the implementation of the molybdenum and selenium removal measures in April 2009 and 2) report on the development of the waste-rock management plan, on the long-term action plan for Deilmann sloughing mitigation, and on the fire protection program in September 2009. The Commission expects to see significant progress and evidence of improvements in these areas at the time of reporting. These reports will be presented at public proceedings of the Commission.



OCT 23 2008

Michael Binder  
President,  
Canadian Nuclear Safety Commission

Date

## Appendix A – Intervenors

| <b>Intervenors</b>  | <b>Document Number</b>        |
|---|-------------------------------|
| Saskatchewan Environmental Society, represented by A. Coxworth                        | CMD 08-H12.2                  |
| Northern Saskatchewan Environmental Quality Committee, represented by N. Wolverine    | CMD 08-H12.3                  |
| James V. Penna  | CMD 08-H12.4                  |
| Northern Village of Pinehouse, represented by M. Natomagan                            | CMD 08-H12.5<br>CMD 08-H12.5A |
| Northern Lights School Division No. 113   | CMD 08-H12.6                  |
| Canadian Nuclear Workers' Council and the United Steel Workers Union (USW) local 8914 | CMD 08-H12.7                  |
| Eleanor Knight  | CMD 08-H12.8                  |
| Northern Saskatchewan Women's Network Incorporated                                    | CMD 08-H12.9<br>CMD 08-H12.9A |
| Saskatchewan Chamber of Commerce  | CMD 08-H12.10                 |
| Board of Directors of St. Paul's Hospital (Grey Nuns) of Saskatoon                    | CMD 08-H12.11                 |
| Saskatoon Regional Economic Development Authority                                     | CMD 08-H12.12                 |
| Edwards School of Business, University of Saskatchewan                                | CMD 08-H12.13                 |