



Saskatchewan Environmental Society

Prepared for submission to the Canadian Nuclear Safety Commission

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COMMENTS FROM THE SASKATCHEWAN ENVIRONMENTAL SOCIETY ON THE LICENSING OF THE GUNNAR REMEDIATION PROJECT

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Submission to CNSC from the Saskatchewan Environmental Society on Licensing of the Gunnar Remediation Project

Gunnar Licensing submission

In commenting on the proposed licensing of continued work aimed at partial remediation of the Gunnar site, the Saskatchewan Environmental Society (SES) faces several difficulties.

We recognize that this is a legacy site that was abandoned at a time when environmental legislation was virtually non-existent. The resulting contamination of this region on the shore of a major northern lake is such that complete remediation will not be possible. Yet much can be done to reduce the risks. We support the five broad purposes for the Gunnar Remediation project that the Saskatchewan Research Council (SRC) spells out in section 1.3 of its September 2014 submission to CNSC.

The broad goal of this remediation project is basically to improve the situation on the site, but with some real uncertainty about what the standard of completeness of the remediation work will be. An infinite amount of money could theoretically be spent without totally removing the ecological and human health risks. The degree of improvement of the site will be largely dependent on the funding available. The original budget is already seriously overspent. Future expenditure relies on a statement of provincial liability that could be amended by any future government. Apparently and strangely the federal government has denied any further responsibility beyond their originally committed contribution.

The Environmental Impact Assessment, already approved by the Government of Saskatchewan, leaves so many questions unanswered that the Licensing process is being launched before background studies are complete and before most decisions on remediation activities can be made. It appears that the real licensing decisions will be made later by an individual CNSC representative without provision for public review.

Much worthwhile work has been done by SRC to analyze the state of contamination and the risks associated with the Gunnar site, and to identify remediation options and their likely effects. However, at this point, we are basically being asked to comment on SRC's proposal to continue studies and to hire a consultant. In that context, we submit the following observations.

1. LACK OF PROVISION IN DRAFT LICENCE CONDITIONS HANDBOOK FOR PUBLIC REVIEW OF KEY FUTURE REMEDIATION DECISIONS

Because of the many unknown factors concerning the site and the need for many further studies prior to decisions on selection of remediation options, the proposed licence sensibly allows for a series of major future decisions to be made as research progresses. Throughout the approval process for this remediation project, from environmental assessment to licensing to permitting to transfer to Institutional Control, issues are being referred forward to the next stage without resolution. Saskatchewan's Environment Minister, in announcing provincial approval for the Environmental Assessment, noted, "I am confident that potential treatment plans that have not yet been identified in the decision tree...that may become apparent...can be further developed... during the licensing and permitting phase." This confidence allows him to conclude that "the benefit of the development will be enhanced and the negative impacts of the project can be minimized to the extent possible". The licensing stage is where it is assumed that these unknowns would be resolved.

However, given the nature of this project, the current licence does not, and cannot, address specific issues about remediation plans. According to the current licence proposal, decisions allowing SRC to proceed with specific Phase 2 activities will be made from time to time by a designated CNSC individual. Thus, there is no provision for public review before actual decisions are made about SRC's proposed remediation plan.

The current licence, from the perspective of the public, is therefore, inevitably, rather a pig in a poke. We are being invited to comment on a process that will allow major, future remediation activities to take place without an opportunity to examine them. Although we have confidence in the ability of the Saskatchewan Research Council to successfully undertake complex remediation tasks, the process that is being used here to request a long term licence is not acceptable, and sets an undesirable precedent.

We suggest that a simple solution would be to build into the licence a requirement for a public review process once SRC has identified its preferred remediation plans within the decision tree approach. This would allow for much more responsible public involvement in the remediation of this legacy site. Logically, this public review would take place at the end of Phase 1 of the licence,

as described in the draft Gunnar Legacy Uranium Mine Site Licence Conditions Handbook, and before phase 2 gets underway.

The timeline laid out in the EIS suggests that a more detailed remediation plan will be ready by 2016. (Please refer to 'Anticipated Schedule for Gunnar Site Remediation in 2014-2021' in the September 2014 SRC Submission to CNSC). That seems a natural time to schedule a public review of the remediation plan.

Another option would be for CNSC to issue SRC a two or three year licence, and delay the issuance of a longer term licence until such time as SRC is ready to present its more detailed remediation plan for the Gunnar site to CNSC and to the public.

2. BUDGETING AND PAYING THE BILLS

The financial history of this project is disturbing. Clearly, choices of remediation approaches have to depend on funding available. The 2006 cost-sharing agreement between the Government of Saskatchewan and the Government of Canada, based on a total budget of \$24.6 million, made no provision for coverage of any cost over-runs. Saskatchewan has already spent \$37 million on a project for which its share was defined as \$12.3 million – all before any actual remediation of waste rock, uranium mill tailings or the Gunnar open pit has taken place.

In our comments on the Environmental Assessment report we pointed to the need to address the future funding uncertainty. We suggested that a statement of commitment should be provided by the federal government to cover all the un-budgeted remediation costs related to tailings and waste reclamation that exceed the Memorandum of Agreement budgeted amount, in order to ensure that the tailings and waste reclamation work is successfully completed. Clearly, the current provision in the Memorandum of Agreement between the Government of Saskatchewan and the Government of Canada that there be “no cost overruns” from the original budget is unrealistic, given the complexity of the task ahead. The response from both levels of government was that this issue is outside the scope of the Environmental Assessment. So perhaps it belongs at the licensing level.

On page 33 of the CNSC staff report (e-Doc 4440021) it is stated that “current plans for the Gunnar site will be a \$208.5 million liability on the Provincial ledger

which will include money for future monitoring and maintenance as part of the Institutional Control Program...Since this project has been officially accepted as a liability of a Provincial Government, and funds have been set aside by the Saskatchewan Provincial Treasury to safely manage this site during and after the anticipated remediation activities, CNSC staff recommend that no further financial assurance be required under this licence.”

This surprising statement begs answers to two questions.

First, what is the rationale for placing responsibility for this entire, huge cost overrun on the taxpayers of Saskatchewan?

Secondly, how was this figure of \$208.5 million arrived at? It suggests that somewhere there is a budget calculation for a series of as yet unknown remediation activities, as well as for long-term monitoring and maintenance of a site with many unknown future characteristics. Does this number imply a limit to what remediation and long-term care activities may be carried out, or does it mean that if the costs go beyond this, Saskatchewan will assume an even larger liability?

We suggest that it is inappropriate for the federal government to refuse all responsibility for these extended costs, and we recommend that CNSC ask that a statement of commitment should be provided by the government of Canada to cover remediation costs associated with tailings and waste reclamation that exceed the originally budgeted amount.

To back up the case for the Government of Canada to be asked to make such a commitment, it should be remembered that it was the federal government that set the stage for the development of the Gunnar site by negotiating a uranium supply agreement with the United States Atomic Energy Commission (USAEC). Moreover, it was the Government of Canada that arranged for the transfer of uranium produced at the Gunnar mine to be sent to the USAEC for atomic weapons production, via the federal crown corporation Eldorado Nuclear. The Government of Canada therefore has a clear obligation to address the environmental pollution legacy it helped leave behind at Lake Athabasca in a much more substantial way than it currently plans to do. (For further details of the Government of Canada’s agreements with the owners of the Gunnar site and with the United States Atomic Energy Commission refer to *Eldorado: Canada’s*

National Uranium Company by Robert Boswell, Chapter 9, pages 326-8 and pages 329-33.)

3. PROVINCIAL COMMITMENT TO INSTITUTIONAL CONTROL

In the SRC submission for licence, it is claimed (page 22) that “the Province has also committed to entering this site into their Institutional Control program”. Indeed, throughout the environmental assessment and licensing documents, and in response to issues raised by interveners, it is suggested by CNSC and the proponent that various long-term management issues will be the responsibility of the IC program and are outside the mandate of the present approval processes.

Our understanding is that there is as yet no commitment by the Province of Saskatchewan to accept this site into the IC program. Presumably it will depend on the state of the site when remediation is deemed to have been completed, the perceived maintenance requirements, and the capacity of the Province to take on this responsibility.

We recommend that CNSC recognize the possibility that it may be several decades before the site is in a condition acceptable to the IC program, if ever, and there should be provision for federal responsibility for continuing site management for an indefinite duration, should that be necessary.

4. PREVENTING ACCESS TO HAZARDOUS AREAS

It seems to be broadly accepted that after basic remediation work has been done, human exposure to contaminants, whether directly or by consuming contaminated local foods, can be satisfactorily limited by the use of signage and fencing. This approach is used to justify a remediation approach that still leaves a level of potential harm to local area residents and visitors who may ignore or not notice warnings. We have not seen any description of the nature of the fencing that will keep people away from hazardous areas after remediation work is complete. Will it create an actual physical barrier to access, or be simply a wire fence? Over how long a time period is it assumed that signage and fencing will be actively repaired and replaced?

5. ACCEPTABLE GAMMA DOSE

We need to draw attention to the apparent mis-reading by provincial and federal agencies of an SES comment on the Environmental Assessment report. In Table A2 of the CNSC staff submission to the current hearings (p.237/306), responses to SES comments are listed.

One comment from SES actually stated as follows:

“In Vol. 1 of the EIS, Executive Summary p. iv, it is stated that only areas with gamma dose greater than 1 microsievert/hr above background will be remediated, and that this is consistent with the CNSC and Sask. Environment allowable cumulative dose threshold of 1 mSv/yr. But 1 microSv/hr. = 8,760 microSv./yr. = 8.76 mSv/yr., well above the standard limit. Perhaps the assumption is that no one would be on the site for more than 42 days a year (which would give them a cumulative dose of 1mSv), but we cannot assume that this will be the case for the indefinite future. Especially as climate change tends to drive habitation northwards, year-round occupation of the area is a distinct possibility. We therefore suggest that a lower hourly gamma dose rate guideline be used, and as a result that the range of remediation activity be extended over a larger area.”

In Table A2 of the CNSC submission it is suggested that SES claimed that the cumulative annual exposure from 1 microSv/hr would be 8,760 mSv/yr. *No, this is not what we said.* We had clearly indicated that the figure was 8,760 microSv or 8.76 mSv. This figure is nearly 9 times higher than the recommended exposure limit. The proposed remediation approach would leave un-treated areas with this potential level of exposure for any people who spend much of the year there. Prevention of residence in the site area is one of those responsibilities that is passed forward to future provincial control, although it is unclear how this can be assured over the long time-frame necessary.

Our recommendation is still that remediation work should be carried out over a larger area, so that areas with lower hourly exposure rates would also be dealt with. The licence that is granted should address the need for this to be done.

6. FISH IN THE PIT

We had earlier raised the issue of the discrepancy in the documentation about the presence of fish in the Gunnar Pit. We noted that:

“EIS Vol. 1, Sec. 5.3.3, p.5-16 says that Canada’s Department of Fisheries and Oceans considers that the water in the Pit does not warrant treatment as it is non-fish-bearing. This is apparently accepted by SRC. The EIS, in Vol. 1, table on p. 5-27, notes in the decision tree for the Gunnar Pit that the pit contains no fish (but that rodents, birds and amphibians do inhabit the pit). This is contradicted in the Saskatchewan Ministry of Environment Technical Review comments p. 15, which state that the Pit contains fish with elevated levels of COPCs. This difference needs to be clarified.”

CNSC staff response to our concern was that DFO didn’t really mean that there were no fish in the pit, but rather that the Department is not administratively responsible for that water body. Nevertheless on page 5-27 of the EIS it is stated that consideration of human health risk (non-gamma) from the water in the pit is not applicable because DFO has indicated that the pit does not constitute fish habitat. The kind of sloppy communication around this issue leads to a lack of public confidence in the conclusions that are drawn from the EIS. We see similar confusion in the response to our concern that the EIS reports that there is “no feasible option” for dealing with seepage from the Main Tailings. The federal response is that “it is premature to indicate that there are no feasible options.” We realize that the issues involved here are very complex, but this requires that clarity of language be a high priority.

7. FUTURE USE OF THE SITE

We are getting mixed messages about the future usage of the Gunnar site. On the one hand, the level of proposed remediation is based on the assumption that there will be little human use of the site. In the long term, it is intended that people will be kept away by fencing and signage, and will not be allowed to build permanent homes. On the other hand, the benefits of the project as identified by Saskatchewan’s Minister of Environment in the province’s EA decision statement (p.7/12) include “improved visual appearance of the site, which may lead to increased usage of the site for traditional activities/pursuits and tourism, and

removal of lingering fears of the site”. The degree of remediation that will be deemed acceptable in the future will depend on presently unknown land-use factors.

We recommend that future remediation plans that CNSC approves make the assumption that the site will support traditional land uses, that it will be visited from time to time by tourists, and that as time passes the chances will increase that the site could be frequented on a more regular basis or permanently occupied.

8. PACKAGING AND TRANSPORTATION

The CNSC staff submission discusses Licensing Conditions. In Section 3.1.14 (p.27/306) they state that “None of the nuclear substances being managed will require transportation outside of the licensed areas. There are no packaging and transportation requirements.” However, we note that earlier in their report (p.13/306) they state that “Radioactive materials consolidated during both implementation of the (2010) order and through general site management of interim risks were shipped to the United States for disposal.”

We suggest that, given all the uncertainties about the future of the site, it is unreasonable to rule out the possibility that further transportation of radioactive materials for off-site management may be considered. We suggest that the Licence be amended to cover such a situation, along with relevant packaging protocols.

9. TRAINING OF WORKERS

In discussing Licensing Conditions CNSC staff (p.22/306) notes that “training will be provided to new workers and contractors with particular focus on conventional health and safety. More detailed environmental awareness and radiation protection training will be provided for medium to long-term workers”. SES recommends that all workers on the site receive basic environmental awareness and radiation protection training.

10. IMPACTS TO LAKE ATHABASCA

In discussing impacts to the aquatic environment, CNSC staff comment (p.23/306) that “uranium and associated radionuclides are the most likely cause of impacts to biota in upper Zeemel Bay and Back Bay/Langley Bay areas.” They also note that “contamination tends to be localized and in close proximity to contaminant sources, with impacts to the aquatic environment being reduced as a result of the site’s close association with Lake Athabasca, which provides substantial dilution of contaminants.” While dilution may be providing short-term prevention of identifiable impacts on aquatic life, there needs to be consideration of the potential re-concentration of pollutants as they move up the aquatic food chain.

11. TAILINGS COVER

In their September 5, 2014 submission to CNSC (p. 12) the Saskatchewan Research Council proposes that a tailings cover of between 0.5 metre and 1 metre be placed over the three main tailings areas. (Also refer to EIS section 4.3.1). SRC’s plan to cover the Gunnar Main, Gunnar Central and ‘dry’ portion of the Langley Bay tailings is one of the better defined parts of the remediation plan.

The Saskatchewan Environmental Society strongly supports the principle of covering the tailings. We are pleased with the differentiated approach that SRC is planning to take with each tailings deposit, including the care being taken in planning a vegetative cover, engineering features to help handle extreme weather events, and the plans to redirect surface water flows in the tailings areas.

However, we are concerned that the thickness of cover being proposed by SRC will be insufficient to withstand the physical pressures and biological and chemical processes that will act on the cover system over time. If the tailings become exposed again, but then no further remediation is done, they will pose a risk to site visitors, wildlife and local surface waters for thousands of years into the future. This is because thorium-230, the parent of the radium in the tailings, has a half life of approximately 80,000 years. In turn radium has a half life of 1620 years.

The long term risk posed by the radium in the tailings therefore needs to be kept in mind when decisions about a site cover are being made. We recommend a cover that is 1.2 to 1.5 metres in thickness. We also recommend examination of

the potential of applying permeable reactive membrane technology to the cover system.

We thus propose that one additional condition of the licence be that CNSC ask SRC to examine options for a more effective cover system that is designed to withstand frost action, burrowing animals, and erosion from heavy rainfall, strong winds and severe weather events over a period of several thousand years. An added benefit of a thicker cover system will be a further reduction in gamma radiation exposure.

12. PRIORITIZING USE OF THE GUNNAR PIT

SES has previously suggested a need to review and prioritize potential uses of the Gunnar Pit space. This space could potentially be used to simply continue holding contaminated water; it could be used to hold waste rock; or it could become a repository for some of the more problematic tailings. Possibly a combination of functions would be most appropriate. Some approaches would require creating a water treatment facility on site, as pit water would need to be removed to make space for waste rock or tailings. At present the space possibly available for hazardous waste storage in the underground workings is unknown, and this could presumably only be determined after completely emptying the pit. While recognizing the difficulty of doing this, we suggest that the unique value of the pit and underground capacity is such that it deserves further consideration.

12. REQUEST FOR REASSESSMENT OF SITE SPECIFIC REMEDIATION OBJECTIVES

The Saskatchewan Environmental Society has reviewed the site specific objectives proposed for St. Mary's Channel/Langley Bay and proposed for Zeemel Bay. (Refer to: Feb 2013, SRC Revised EIS, Volume 1, pages iv and v submitted to the Saskatchewan Ministry of the Environment). In general, we would like to see SRC setting more ambitious objectives than those proposed to CNSC, but further study may be needed to determine if this is feasible, given cumulative baseline site loadings in these bays. (Refer to table 8.2 in the August 2014 EIS)

At this point, we wish to point out to CNSC that the proposed objective for uranium in Zeemel Bay surface waters (after remediation) is 13 times higher than Saskatchewan Surface Water Quality Objectives, and the proposed objective for lead in Zeemel Bay of 35 ug/L is also high.

If the SRC objective for arsenic were achieved, arsenic levels in Langley Bay surface water would still be as much as 20 times higher than Saskatchewan Surface Water Quality Objectives. Moreover, arsenic levels in Zeemel Bay would be as much as 78 times higher than Saskatchewan Surface Water Quality Objectives.

We hope that a condition of the licence issued by CNSC will be to ask SRC to examine what steps can be taken to achieve a more ambitious set of surface water objectives for Langley Bay, St. Mary's Channel and Zeemel Bay. A revised set of objectives should be formally submitted to CNSC.

13. CONCLUSION

In closing, we support the five project purposes proposed for the site by the Saskatchewan Research Council in its September 2014 submission to CNSC and we agree with CNSC staff that SRC is qualified to carry on the activities authorized by the licence.

We also agree with the assessment by CNSC staff that the SRC remediation project is expected to have long term positive effects on humans and the environment, and we agree with the CNSC staff assessment that the remediation work can be carried out safely and with minimal impact on the environment. However, we recommend that additional conditions need to be attached to the licence, as follows:

a) the scheduling of a formal public review period after a specific site remediation plan, tailings remediation plan, waste rock remediation plan and pit remediation plan for the Gunnar site have been prepared (i.e.: at a point when phase 1 of the licence period is nearing completion).

That review, if integrated into the licence as a condition, would allow for the issuance of a 10 year licence. (Alternatively, a short 2 year licence should be

issued now, followed by public review of a much more specific set of remediation plans for the Gunnar site, once those plans have been submitted to CNSC.)

b) a requirement that SRC bring forward a medium and long term plan for fencing and signage on the site, and more specifically a long term plan for how public access will be restricted to those areas of the Gunnar site which are still not deemed safe after remediation work has been completed

c) that all workers involved in remediation work on the site receive basic environmental awareness and radiation protection training

d) that a lower hourly gamma dose rate guideline be used to determine the area in which remediation activity is required on the site. On the assumption that an important outcome of remediation will be to achieve the allowable cumulative dose threshold of 1mSV/yr, remediation work should be carried out over a larger area than is currently planned.

e) that in preparing detailed plans for tailings remediation, waste rock remediation, treatment of pit water, and overall site remediation, SRC should bear in mind the need for the site to be safe and stable for thousands of years into the future. SRC should also be asked by CNSC to assume that the Gunnar site will be used for traditional land use purposes and tourist visits in the near term (once remediation work is complete). In the longer term, SRC should be asked to assume the site could be even more intensively used, including the possibility of permanent residency.

f) In this context, specific measures should be reported on by SRC as a condition of the licence, including the benefits that would come with a well designed thicker cover over tailings areas, the potential benefits of applying permeable reactive barrier technology on the site, and the potential for achieving more ambitious site specific surface water quality objectives for Langley Bay, Zeemel Bay and St. Mary's Channel.

Finally, while not specifically related to the conditions of the licence, it is obvious that the success of remediation work on the site would be greatly enhanced by a greater level of financial support from the Government of Canada. We therefore recommend that CNSC formally request a greater level of financial participation in the Gunnar Remediation Project by the Canadian government.