

## Attendees

- **SRC:** Chris Reid (Gunnar), Mark Calette (Senior Advisor), Alexey Klyashtorin (Gunnar), Ian Wilson (Remediation Manager), Eric Thiessen (Communications), Vanessa Crawford (Administrative Officer)
- **Canadian Nuclear Safety Commission (CNSC):** Karina Lange, Adam Levine
- **Prince Albert Grand Council (PAGC):** Joseph Tsannie (Vice-Chief), Jim Tsannie, Leonard Hardlotte
- **Fond du Lac First Nation:** Louis Mecredi, Willie John Laurent, Chief Earl Lidguerre
- **Black Lake First Nation:** Ambrose Sandypoint
- **Hatchet Lake First Nation:** Paul Denechezhe
- **University of Alberta:** Brent Swallow (Consultant for PAGC), Yichuan Wang
- **Athabasca Chipewyan First Nation:** Jack Flett, Lloyd Gould (Consultant)
- **Metis Nation Saskatchewan:** Allen Augier (Uranium City), Earl Cook (Director, Northern Region 1)
- **Saskatchewan Environmental Society:** Ann Coxworth, Peter Prebble
- **Saskatchewan Environment:** George Bihun (Environmental Project Officer), Jana Lung (Environmental Protection Officer)
- **O’Kane Consultants Inc.:** Bonnie Dobchuk (Senior Engineer)
- **SRK:** Trevor Podaima (Senior Consultant), Mark Liskowich (Principal Consultant)
- **Senes/Arcadis:** Harriet Phillips (Senior Risk Assessment Consultant)

## Agenda

1. Morning Session
  - Opening Prayer
  - Introductions, objectives and agenda
  - Presentation by SRC (all site aspects)
    - Questions and Roundtable Discussion
2. Lunch Break
3. Afternoon Session
  - Presentation by Consultants (O’Kane, SRK) (all site aspects)
    - Questions and Roundtable Discussion
4. Dinner Break
5. Evening Session (if required)
  - Follow-up on any items discussed during the earlier sessions
  - Meeting wrap-up and next steps (CNSC and SE regulatory processes)
  - Closing prayer

### Discussions regarding the Institutional Control Program (ICP)

- Once the site enters the Institutional Control Program (ICP), funding will be set aside to provide long term care and management
- Phase I includes studies, Phase II allows the work to be done, Phase III is the ICP; each phase undergoes a rigorous review
- CNSC and Sask Environment review everything before SRC can put Gunnar into ICP
- Recommend Keith Cunningham (Senior Analyst with SK Ministry of Economy) to come and explain their processes to the group as that would provide a better understanding of the processes and procedures
- Standards need to be put into place by First Nation's representatives; First Nation's people need to be involved in the process
  - Initiate the involvement of First Nations when meeting next with SK Ministry of Economy

### General discussion regarding SRC presentation

Q. What is the memorandum of understanding regarding the cost sharing between the federal and provincial governments?

A. Cost sharing still has to be worked out and agreed upon. The Ministry of Economy will work with the federal funding agency to determine cost sharing for the Gunnar Project.

Q. Will part of the \$200 million keep going into the fund?

A. We'll look into this.

Q. Is the \$200 million for the whole site?

A. Yes.

Q. Is \$200 million enough to finish the project?

A. The cost estimate was built quite conservatively, but without the benefit of a remediation design. If the cost does go up, the Ministry of Economy may have to go back to the provincial treasury to cover any increases.

Q. Regarding the unforeseen events fund, what could be an unforeseen event that could drive costs up?

A. Examples of unforeseen events may be severe flooding, forest fires, the lake level going up or down drastically, etc. There is a calculation for how they determine the unforeseen events fund. The government won't accept Gunnar into ICP if the funding is not in place. There hasn't been a dollar amount to put forward to the ICP fund yet. It will be a long time before they even go into ICP. At least 10 years of monitoring after the work is complete needs to happen before it will go into ICP.

Q. Monitoring and maintenance of local people would be good. Could CanNorth do this type of monitoring?

A. A program is going to be developed to allow young people to get training and have a better understanding of what the job would entail. Local individuals will be trained to do the monitoring when ICP takes over.

Q. Can you give an estimate of how much monitoring there will be?

A. At this point, the monitoring program is happening monthly, because the monitors are active at Gunnar. When the site moves forward, monitoring will be quite intensive. Once active remediation is complete, less monitoring will be needed as the monitors will have a better handle on what is happening at the site. To start, it may be once a month, then once every few months depending on what is required. When it shifts into ICP, it may be three or four days per year.

Q. Do you have numbers for the monitoring process and can we have access to the numbers?

A. The information is available in the EIS.

Q. Why do you not have more indigenous areas? You just talk about the indigenous areas around Gunnar.

A. We have been working, in partnership with Cameco, to develop a regional monitoring program for all of the mine sites in proximity to the Uranium City area.

Q. There is rock sliding into the channel, and cracks and slumps in the ground. What is being done?

A. SRK has a plan to make the slopes safer. It is in their conceptual design plan and presentation.

Q. Does this mean there are no standards for the remediation of Gunnar?

A. There are objectives developed specifically for the site called Site Specific Remediation Objectives (SSROs). These objectives come from the EIS, commission hearings, public meetings, region representatives, regulators, consultants, Sask Environmental Society, etc.

#### *General Comments*

- Recommend more detail in presentations versus high level.
- Logistically it would be cheaper to have local people monitoring the site, so people don't need to be flown in to complete the work.
- It is going to be important to do a good job today and clean it up properly. Then we don't have to worry about future issues or unforeseen events.
- More information is available on [www.saskcleans.ca](http://www.saskcleans.ca)

#### *Discussion regarding O'Kane presentation (tailings cover design)*

Q. Is there seepage into the cover?

A. Yes, although the cover is designed to be a surface water shedding landform, there may be some moisture seeping into the cover system. The cover system and modelling takes this into consideration.

Q. What is the till cover? Is it soil or more sedative material? Have lab tests been done?

A. Testing and research was completed on the local till material they will be using. The majority of the materials are very fine; their performance will only improve the radon gas over time.

Q. There is very little that can stop radiation. Is this enough fill material to stop the radiation?

A. Yes. The term "Halving layer" (HLV) is used for describing the penetrating ability of radiation through different materials. It is the thickness of material penetrated by one half of the radiation. In our case, the soil thickness that will cut down half of the radiation is 10-12 cm. The next 10-12 cm layer will cut down one half of the rest of the radiation. In fact, 30-40 cm is enough to shield the radiation at the Gunnar tailings to safe values. We will place a minimum 60 cm, which is twice as thick, to cut down the radiation to the natural background level.

Q. Do the radiation levels align with the approved Canadian Standards levels?

A. They are considered safe levels according to the EIS (Environmental Impact Statement), when site specific remedial designs were developed. This concentration is safe to 90 percent of the species that may be present in Langley Bay. Ten percent of the invertebrates could be at risk.

Q. Do the levels meet the Saskatchewan Water Quality levels?

A. The levels will meet the Saskatchewan Water Quality Standards. Once the remediation is complete, the levels will be lower than what Saskatchewan Water Quality requires.

Q. Will the till cover stand up over the centuries? This was not an objective in the initial report (wind erosion, water erosion, burrowing animals).

A. The key is creating a land form that is similar to the surrounding area and similar to the current environment. The till cover will minimize erosion and enhance vegetation growth; it is thick enough that animals won't erode the cover. There is a design life set and it will be shown in the final report.

Q. How can you be confident in your design if this is the only area in this world that this has happened too? The terrain is totally unique to this area. The waste rock you are planning on using has different sizes of rocks - how are you going to manage this? How do you transport it without disturbing the area? Is the problem being hidden?

A. We are reducing and mitigating the risks to human health and the environment. We are never going to get the site back to a pristine state. What we are doing through this is identifying the risks and mitigating or managing the risks.

We are capping the site, which is a common, effective and widely accepted remedial practice.

Q. If this current working group from the Athabasca region says the design is not acceptable, what will your plans be then?

A. The majority of the communities are in favor of the remediation of the Gunnar site and approve it. We have to come up with the best options that are reasonable and manageable in the long term.

Q. SRC doesn't have a site specific objective for radium. The current condition is 01 ug/L. Why wasn't a site specific objective made?

A. Site specific remedial objectives (SSROs) were calculated from available research data on toxicity for each Contaminates of Potential Concern (COPC). Research data on environmental toxicity of Ra-226 at current (very low) concentrations are limited, therefore we use a conservative value indicated in the Saskatchewan Water Quality Objectives (0.11 Bq/l).

Certain dose limits are accepted internationally. It is very difficult to back out a single radionuclide, as they are a group. We look at the concentrations of all the radionuclides and calculate from there.

Q. Once the ground cover is in place, will all of the radon gas that escaped into the atmosphere be trapped under ground and decay?

A. Once radon has decayed, it is no longer dangerous to humans.

Q. What about rocks washing out in this area with heavy rains? Is the fill thick enough? There are high concentrations of radon, but Gunnar is getting less fill than other areas like Lorado. Why hasn't the government shown this table to the locals?

Constituent	SSRO	Langley Bay Current Conditions	With Cover System
<b>Sulphate (SO4)–mg/L</b>	-	7.1	3.7
<b>Arsenic (As)–µg/L</b>	100	0.2	0.2
<b>Cadmium(Cd)–µg/L</b>	0.3	0.1	0.1
<b>Lead (Pb)–µg/L</b>	13	2.8	2.8
<b>Uranium (U)–µg/L</b>	90	1.2	0.8
<b>Radium-226 (Ra226) Bq/L</b>	-	0.1	0.1

A. The roads are on a high slope; this is the reason for rocks falling out. The tailings cover will have a lesser slope, so no rocks will be falling out.

The channel is sloped to go at a 1 % gradient. The hill slopes are at a minimum 0.5 % gradient, enough that we wouldn't have any ponding water. All slopes are at a same maximum grade. The long-term maintenance and minor repairs are to keep surface water from pooling.

Q. Why don't you want ponding or standing water?

A. The intent of the covers is to shed water off them, so they don't come into contact with the tailings. This would stop the pooling; pooling would get into the tailings and increase contamination. We don't want any beaver damming, and the gradual slope isn't as appealing to beavers. Long-term maintenance would also watch for beaver damming.

Q. Are the concentrations per litre? Every litre coming into the lake has this concentration. Over the years, how much has accumulated?

A. Loadings (accumulation over time). There is only so much that will go into Langley Bay. It won't be this concentration forever; it will actually decrease over time. A lot of this information is made available through the EIS. Part of the risk reduction strategy is to slow down the flow of water, thus loading. Right now, quite a bit is flowing through occurs, but over time, it will slow down with the cover design.

The Canadian drinking water standards for arsenic is 10µg/L. The lake level is 0.2µg/L

*Canadian Drinking Water Standards*

Arsenic: 10µg/L

Cadmium: 5µg/L

Lead: 10µg/L

Uranium: 20µg/L

We are managing a legacy site. Current working mines can control what is going into the environment. We can only manage what was left. If we dredged the tailing up from Langley Bay, it will stir it up and more will go into the environment. It is better to keep it stable, stirring it up will cause bigger problems.

Q. We harvest moose that go into the bays. What will happen when the moose drink the water and eat in these bays?

A. Once we have completed remediation, the levels will not be high enough to effect wildlife or transfer to human health

Q. What would be the actual cost for remediation of the site and what would you do differently if you could?

A. Even with the technology we have, we aren't even sure we could remediate the area enough to make it pristine again. We only put a dollar figure on the project after we made a plan on how to remediate. We have not just set a budget and tried to work within it. More project funding may not provide better remediation results.

There isn't enough data to use man made products; there is no guarantee they will still be around. There is greater comfort in using the natural material that is found in the area. It is already there and it works. Maybe a more complex idea won't work. Clay and other material could be trucked in, but the longevity is unknown.

Q. What would we do if we had an infinite amount of money? Maybe planting algae that would absorb some of the contaminants, as well as a permeable reactive barrier? These things would require maintenance. It would help with removing some of the contaminants. This could be a supplement into the current plan.

A. These are ideas that have been considered and one of the challenges would be sequestering these contaminants into another form and putting them in a vessel. What would we do with the vessels? We look to what the best solutions for this site would be, then build our budget.

We have looked into the concept of phytoremediation. It may not be the best remedial technique to use in this case as it is very slow and not as efficient as other means, and there is the worry of disposal of contaminates concentrated in the plants. There is also the issue of failing to maintain the plants for a season and the contaminates being reintroduced back into the local food chain.

CNSC has finished its preliminary assessment of the design cover. They have also asked a group of engineers, biologists and scientists to review. CNSC also has the same concerns as the community members; they feel confident the design can go into the next generations, but not decades.

Q. Is the traditional knowledge of the elders considered?

A. SRC does look at using the traditional knowledge and consultation of the community members. It is very important.

Q. What is happening with the Langley Bay tailings? The algae is lifting from the bottom and moving out. Could there be a berm around the tailings of Langley Bay? There is a study about algae neutralizing uranium.

A. We are currently developing a Gunnar site management system that would include an environmental monitoring plan, for use during project operations. This environmental monitoring plan is important in measuring and mitigating any actions that may damage the environment during remediation activities. Once we start operations, we are working to develop a management system for environmental monitoring. Measures such as a floating-sinking silt curtain may be used to protect Langley Bay from sediments generated during remediation activities.

Q. Will we screen the waste rock? How do we keep the more radioactive material from being used?

A. We have a good idea where these areas are and will not be using them. It isn't actually part of the cover, it is part of the fill. The average of the waste rock is five times less radioactive than the tailings. It will work as a shield for the tailings. Then the clean cover will be put over the waste rock. It will act as a shield.

Q. Is there any room for an increase in funding for the communities to attend these information meetings? How are we to be a valid participant when we only have so much funding?

A. We don't have unlimited funds, but we do provide funding for the hearing process, EIS follow-up process, follow-up document, continued monitoring and meetings like today. We are flexible and will look into more funding for communities. Feedback about presentations to the communities is really important so that everyone understands what we're talking about.

Q. Are you looking at lessons learned from previous meetings? If so, make it known that lessons learned were taken into account.

A. Yes, we do this and integrate it in future meetings. We have updated these presentations from previous community meetings, and have taken the lessons learned into account and made the necessary changes.

Q. Regarding the use of waste rock, what was the ore concentration during mining? What will we do if we find high levels when starting the tailings cover?

A. Historic U concentration is the Gunnar ore was less than 0.02%. We are still working the details out with O'Kane and SRK. All options are being considered and worked out. We want to be prepared if we run into this problem.

Q. When you add a meter of cover, will the level be elevated above the landscape and will this affect the landscape?

A. This won't change the current localized flow of water and will be integrated into the surrounding slope of the landscape.

Q. What are the issues from Back Bay to Langley Bay?

A. There is a flow of run off from Back Bay, and it could overflow into Langley Bay. The design has been set up so Back Bay can flow into Langley Bay even with the new tailings cover.

Q. In regards to the remediation impacts to Langley Bay, has there been an estimated time it would take for the objectives to be achieved, for the concentrations to lower?

A. O'Kane will provide the final concentrations and loading over time in their final report.

Q. What are the affects to fish in Langley Bay?

A. The final concentrations will decrease gradually with time, while the current tailings at the bottom of Langley Bay will be covered with natural accumulating sediment – mainly organic matter.

#### *General Comments*

- Recommend reconsideration of water quality levels and consult with Saskatchewan Water Quality levels.
- Concern that the end result of this design looks like it is only going to reduce uranium levels and make the area look good.

- It is very important everyone understands this is the home of many indigenous people. The standards and guidelines should be different in the Athabasca than other regions. Other regions are more polluted.
- It is very important to have a representative from each community, someone that works alongside CNSC when they are developing their plans. Recommend community members get involved before the plans go to the public so that everyone is on the same page.

Discussion regarding SRK Presentation of Gunnar and other site aspects (preliminary design stage)

Q. Are you going to provide the safety and hazards of monitoring? What risks do the people monitoring face?

A. SRC is in a preliminary design stage. Safety precautions will be put into place and approved by CNSC once identified.

Q. Why is the garbage going to be buried and kept on site? Why can't you take it off site? Can you melt the metal down?

A. All hazardous material has been removed from site, with the exception of asbestos, which will be managed in-place. The main issue is safety; cutting steel and putting it into containers for transfer and transporting it off site could represent a hazard to works. This is done not just from a cost standpoint, but a health and safety standpoint. This is the best option.

There is steel, wood and concrete debris; 95% of this material is not contaminated. There are no health risks. If it is possible to recycle, we will.

Q. What are the current regulations for operating mines?

A. Burying on site is a current regulation. Mines like Cluff Lake and Key Lake all bury on site.

Q. Is SRK's design similar to other mine designs?

A. If a community were to design a landfill, they would receive the same type of design.

Q. Are these examples of successfully remediated mine sites?

A. Yes. The most successful is Butchart Gardens on Vancouver Island (which was an old limestone mine).

Q. Will there be drainage lines?

A. The till cover on top would not be susceptible to erosion. The landform isn't big enough to include a drainage line.

Q. What percentage of waste rock will be used in the tailings cover?

A. Forty percent of the waste rock will be used for the tailings.

Q. Does the flow coming from catchment 3 have radium and uranium?

A. Yes, catchment 3 water that, currently comes in contact with the waste rock, will have lower contaminate loading before exiting Zeemel Bay.. There will be clean fill, rip rap and coconut matting will be used, so any run off coming to those piles will be clean. Afterwards, the concentrations going into Zeemel Bay will be greatly reduced. The concentration will be below the Sask Water Quality objectives.

Q. Would it be possible to screen out rocks that have high levels of uranium?



A. They would be put in the tailings and also contained (no longer an immediate source of contamination)?

Q. Why are you only putting half a meter and not a meter of cover?

A. This design is based on the reduction of gamma. To meet the criteria, only half a meter is required. There will also be channels, which will carry water away as soon as it hits the cover.

Q. How high will the mounds for the waste rock piles be?

A. It will be approximately 15 meters high. The height is almost consistent with the surrounding areas.

Q. Does the pit sometimes overflow into the lake?

A. It may seep. There is a culvert, so it will go through the culvert and discharge first. There is also a plug going from the pit into the lake. It is a very solid plug, but if needed, we could enhance the stability of it.

Q. Are there more options for covering the waste rock besides just grading it down?

A. During the EIS process, a decision tree was used to go through the potential options for each, with input from the communities. SRK and O'Kane took their designs from these options. In the end, they came up with the best potential options, which were provided in the EIS. SRK and O'Kane can go back now and review their options and make sure they are the best options possible. That is what today's process was all about.

Q. How bad are the airborne contaminants from the Gunnar main tailings?

A. There were very low readings. It is very limited in where it spreads and goes too.

Q. What will happen to the water from Mudford Lake?

A. The current thought is it is going to be pumped out before they start construction. It will either be treated or go to the pit. Once that water has been drained, they will start installing the waste rock cover.

It wouldn't be cost effective to treat the water because the uranium concentrations are lower than the pit water. It would actually help to dilute the pit water. It may raise the water level of the pit, so possibly removing the beaver dam at the end of Mudford Lake first will help with the water level of the pit.

Q. How will you handle the icing up of the drainage channels? What will happen when you get snow melt and freezing?

A. Drainage channels shouldn't have any water in them to freeze; they are run-off channels. The channels are wide enough and the slopes low enough that you don't get a huge amount of accumulation and there's no chance of glaciation erosion. The slopes are steep enough.

Q. Would it be possible to go through the pros and cons of moving the waste rock into the pit and capping it there?

A. There are few pros. Committing to full-time water treatment is very costly. If we didn't get the expected outcomes, we cannot turn back.

#### *General Comments*

- SRC is looking at adding value added items, which are not covered within the remediation designs, in house. Some of these potential value added items may include introducing a precipitating agent into the pit water to allow contaminants to come out of the solution and

drop to the bottom of the pit. It is important to differentiate SRC's potential value added work from the remediation design scope.

- There are a lot of unknowns and uncertainties with leaving the piles in place. The community feels it is a test case by trial and error. How do we make sure what we are doing is going to work? It could cost triple down the road if it isn't done correctly in the first place. They would like their own independent person to review all these options on behalf of the First Nations people. However, they don't have the appropriate funding to do this.
- One community member would like to see the waste rock piles brought down and a monument placed at the Gunnar site (e.g., Steam Shovel).
  - SRC and consultants are trying to return the site its natural state as much as possible. Revegetation will also be completed.

#### Discussions regarding CNSC presentation

Q. Could the Saskatchewan Environmental Society submit a supplementary submission too?

A. Yes, the commission will have to review it first.

Q. When does monitoring start?

A. Monitoring started in the assessment stage and will continue long after remediation has been completed. It could continue indefinitely.

#### *General Comments*

- CNSC plans to go up to Gunnar the beginning of September for a site inspection.
- Part of SRC's program was to provide the Athabasca regions and the interveners a copy of the EIS to review. The EIS is also available on the Saskatchewan Government's archival site.
- Before the final phase is completed, the communities would like to address the trigger points once the site goes into ICP, so they don't get left out.