

1 **Hearing Day 2**

2 **COGEMA Resources Inc: Application for Licence to**
3 **Operate Cluff Lake Mining Facility**

4 The first day of the public
5 hearing on this application was October 4, 2001.
6 The public was invited to participate either by
7 oral presentation or written submission on Hearing
8 Day 2.

9 November 13th was the deadline set
10 for filing by intervenors as specified in the
11 notice of public hearing 2001-H13 published on
12 July 25, 2001. Two written submissions were filed
13 by intervenors.

14 The Commission members present for
15 Day 1 of the hearing included Mr. Graham,
16 Dr. Giroux, Dr. Barnes, Ms MacLachlan and myself.
17 Presentations were made on Day 1 by both the
18 applicant, COGEMA Resources under CMDs 01-H26.1,
19 01-H26.1A and by the Commission staff under CMD
20 01-H26. I note that both the applicant, COGEMA
21 Resources, and CNSC staff will present
22 supplementary information today.

23 With that background I would like
24 to begin with the oral presentation by COGEMA
25 Resources as outlined in document CMD 01-H26.1B

1 and I understand that Mr. Pollock, the Vice
2 President of Environment, Health and Safety for
3 COGEMA Resources will be making that presentation.

4 Mr. Pollock.

5

6 **01-H26.1B**

7 **Oral presentation by COGEMA Resources Inc.**

8 MR. POLLOCK: Thank you.

9 Good morning, Madam Chairman and
10 members of the Commission. For the transcript
11 record, I am Bob Pollock, Vice President of
12 Environment, Health and Safety of COGEMA Resources
13 Inc. Also present today on behalf of COGEMA
14 Resources are Steve Grinius, General Manager of
15 Cluff Lake Project to my left, and Gerry Acott,
16 Director of Environmental Programs to my right.

17 As noted in our presentation in
18 October, Mr. Grinius is located at the Cluff Lake
19 site and is responsible for all operations there.
20 Mr. Acott and myself are located at the corporate
21 office in Saskatoon.

22 We are here in support of our
23 application for renewal of the CNSC operating
24 licence for Cluff Lake Project, for which Day 1 of
25 the hearing was held on October 4th. There were

1 no specific requirements for additional data
2 identified in the transcript of Day 1, however,
3 after reviewing the intervenor submissions, we
4 felt that we should make a brief oral presentation
5 to provide more detail to Commission members on
6 certain aspects of environmental protection than
7 were contained in our Day 1 presentation.

8 We are also including one item of
9 recent information that we did not have at the
10 time of the Day 1 hearing.

11 I will start with what we believe
12 are three key aspects of environmental protection.
13 These are listed in the slide, with two of them
14 being operational considerations. These are:
15 treatment and release of process water;
16 prevention, control and mitigation of spills and
17 other unplanned events. The third key aspect is
18 long-term protection of the environment, which is
19 a major consideration during environmental
20 assessment and licensing of proposed
21 decommissioning plans for the Cluff Lake Project.

22 This environmental assessment is
23 currently in progress, and we anticipate that both
24 it and our subsequent application for a
25 decommissioning licence will be the subject of

1 future hearings by the Commission. I will thus
2 not be discussing them further in this
3 presentation, except to note that we concur with
4 the analysis put forward in the CNSC staff CMD on
5 development of the decommissioning environmental
6 baseline data as part of the environmental
7 assessment and licensing process for
8 decommissioning.

9 A follow-up program, of which this
10 will be one aspect, is a normal part of a
11 Comprehensive Study Report developed in accordance
12 with the Canadian Environmental Assessment Act.
13 We are currently revising the draft Comprehensive
14 Study Report in response to comments by CNSC staff
15 and other federal and provincial authorities.

16 I will begin with some further
17 information on the quality of treated water. We
18 noted in our previous presentation that our
19 effluent water quality has consistently met the
20 action levels and regulatory limits contained
21 within our licence.

22 This is acknowledged in one of the
23 intervenor submissions. Nevertheless, there is a
24 consistent suggestion in the submission that
25 radium-226 releases are significant with respect

1 to environmental impacts. We do not believe that
2 this suggestion is supported by an examination of
3 the data.

4 This overhead shows the Island
5 Lake and Cluff Lake surface water systems. Mining
6 operations take place in the area just to the
7 north and east of Cluff Lake. There is no
8 discharge of potentially contaminated minewater
9 since all water collected from dewatering of open
10 pits and underground mines is pumped to the water
11 treatment system at the TMA, Tailings Management
12 Area, either directly or after use in the mill.

13 In fact, the dewatering operations
14 provide a form of hydraulic containment for these
15 facilities. This lack of impacts on the surface
16 water system at, and downstream of, the mining
17 area is substantiated by the environmental
18 monitoring data for the four small streams
19 entering Cluff Lake from the mining area, and for
20 Cluff Lake and the downstream lakes.

21 The Island Lake watershed is also
22 shown in the figure. It includes the Tailings
23 Management Area, or TMA as I shall refer to it
24 further, and the Water Treatment System with the
25 point of treated water release being into Snake

1 Creek, which is located between Snake Lake and
2 Island Lake. As shown in the figure, both the
3 Island Lake and Cluff Lake surface water systems
4 converge at Sandy Lake.

5 Water requiring treatment includes
6 that pumped from the mining area, water used in
7 the mill, and water collected from the tailings as
8 they drain and consolidate. This slide shows the
9 radium-226 inventory at several stages in the
10 milling and water treatment processes.

11 The annual radium-226 inventory in
12 the ore being processed can readily be calculated
13 on the basis of the amount of uranium processed.
14 This is shown in the slide. It should be noted
15 that all units for radium-226 inventory are in
16 MegaBecquerels to facilitate comparisons.

17 Most of the initial radium-226
18 inventory in the ore remains in the tailings
19 solids. The amount contained in the inflow for
20 water treatment, including the contribution from
21 the mining area, ranged from about 1 to 1.5 per
22 cent in 1999 and 2000, averaging 1.3 per cent.

23 A large reduction in radium-226
24 concentration occurs in the primary and secondary
25 treatment plants, with the overall treatment

1 efficiency exceeding 99.98 per cent. It can be
2 seen that the radium-226 inventory in the treated
3 water has averaged about 0.0002 per cent of the
4 original inventory in the ore processed over the
5 past two years.

6 That is for approximately each
7 500,000 atoms of radium-226 in the ore processed,
8 the release to the local surface water environment
9 is one atom.

10 An inventory of about 32 MBq per
11 year in the treated water is small compared to the
12 amounts of radium-226 in the natural environment.
13 For example, the top one meter of soil in a
14 residential lot of dimensions 20 m by 30 m also
15 contains about 32 MBq of radium-226, assuming a
16 dry density of 1800 kg per cubic meter of soil,
17 and a typical background radium concentration of
18 30 Bq per kilogram.

19 This slide shows radium-226
20 concentrations in the top two centimetres of the
21 sediments at seven locations in Island Lake,
22 compared to the data for three background control
23 lakes. Island Lake, shown in an earlier slide, is
24 the first lake downstream of the treated water
25 discharge location and these data collected in

1 1998 show little, if any, radium-226 accumulation
2 after almost 20 years of operation.

3 This is consistent with the amount
4 of radium-226 in the treated water being
5 insignificant relative to the amounts already
6 present in the natural environment.

7 The other key aspect of
8 environmental protection during the operational
9 period relates to potential impacts from spills or
10 other unplanned events.

11 Ms. Shiell has previously and
12 separately commented that our draft Comprehensive
13 Study Report did not adequately include discussion
14 of the 1981 and 1983 spills described in her
15 intervenor submission to this hearing. We
16 appreciate her comments, and are making revisions
17 to the Comprehensive Study Report.

18 We wish to note, however, that the
19 lack of discussion in the draft Comprehensive
20 Study Report does not mean that cleanups were not
21 carried out at the time. The areas are also still
22 easily identified by old aerial photographs, or
23 other records.

24 For example, this slide shows the
25 location of the storage area for the concrete

1 vaults used to store the leach tails, from
2 processing the higher grade "D" ore, until they
3 were subsequently reprocessed. The vaults are
4 under the yellow tarpaulin shown in the middle
5 right portion of the picture, at the top of the
6 developed area.

7 This slide shows previous clean-up
8 of contaminated soil in the vault storage area.
9 Ms Shiell notes in her submission that the records
10 which she has reviewed indicate that regulatory
11 agency staff considered the clean-ups adequate
12 based on gamma radiation surveys.

13 Gamma radiation surveys are a
14 sound method for assessing the extent, if any, to
15 which residual concentrations of radium-226 above
16 normal background are present. The presence of
17 radium-226 above normal background amounts is then
18 also a reliable indicator for other metals or
19 radionuclides contained in the spilled material.

20 A recent walkover survey of this
21 area, which is now overgrown with vegetation
22 native to the site, showed normal background
23 radiation with a few areas with minor elevations,
24 but well within the cleanup criterion that we have
25 proposed in the Comprehensive Study.

1 We emphasize that a final
2 verification survey of this area, and all others
3 potentially affected by our operations, will be
4 part of the decommissioning program. The detailed
5 protocol will be developed for regulatory approval
6 during decommissioning licensing.

7 This slide provides an update to
8 the data for radium-226 in water at the Snake Lake
9 monitoring location, that is the water at the
10 outlet of Snake Lake. There is now only a small
11 residual effect from the unplanned release of
12 contaminated water which occurred in 1997 and
13 1998. Previous assessments by COGEMA Resources,
14 and by CNSC staff, have concluded that the
15 likelihood of significant impacts from this
16 release was low and actions to prevent a
17 recurrence were taken. Current data are
18 consistent with the earlier conclusion.

19 In addition to providing
20 comprehensive data for specified parameters on an
21 ongoing basis, environmental monitoring is adapted
22 as may be necessary to respond to new
23 requirements. The next slides describe recent
24 information which was not available at the Day 1
25 hearing.

1 In May of this year, the West Side
2 Environmental Quality Committee, or EQC,
3 recommended that samples be collected from a small
4 number of ducks and geese which appeared to be
5 resident at a small pond within the TMA. The pond
6 overlays tailings within the Lower Decant Area and
7 is used to collect porewater which drains from the
8 tailings, for treatment at the water treatment
9 plant.

10 Results have recently been
11 received and we have had a follow-up meeting on
12 November 29 with the EQC, since the results show
13 elevated levels of several metals and
14 radionuclides, particularly polonium-210. At the
15 meeting, attended also by CNSC and SERM
16 representatives, we discussed both the results and
17 our plans to prevent access of ducks and geese to
18 this area when they return in the spring.

19 The EQC indicated that they were
20 satisfied with the actions taken and proposed. We
21 have also presented the results and future plans
22 to workers at the Cluff Lake site. Many workers
23 are residents of West Side communities and had
24 expressed interest in the results when they became
25 available.

1 As part of the discussion of
2 results, we have provided information on the
3 potential risk to human health, taking into
4 account the factors listed in this slide. We
5 believe the risk to be low and much less than the
6 risk from receiving an exposure of 1 mSv/a each
7 year.

8 We have provided the sample data
9 and our analyses to CNSC and other federal and
10 provincial agency staff for their further review.

11 Even though the results are
12 preliminary, and the risk to members of the public
13 well below that associated with regulatory limits,
14 it is both our policy and a regulatory requirement
15 to take all reasonable precautions to protect the
16 environment. We believe we can largely eliminate
17 future access of waterfowl to the suspect
18 potential sources.

19 These sources are entirely at the
20 TMA. This slide show's data for polonium-210 in
21 sediments in six lakes downstream of the TMA,
22 compared to three background control lakes. All
23 of the downstream lakes, including Snake Lake and
24 Island Lake, the first two shown, show only normal
25 background concentrations.

1 We also looked at lead-210
2 sediment data, since the longer half-life of
3 22 years for lead-210 provides a longer term
4 source for polonium-210. Again, all of the
5 downstream lakes show only normal background
6 concentrations in sediment.

7 We will discuss further actions
8 with the EQC, with our employees and other area
9 residents, and with regulatory agencies. We will
10 also look for their input next year when we carry
11 out a follow-up program to confirm that we have
12 eliminated the cause for these elevated
13 concentrations.

14 We hope that this information
15 provides a useful additional perspective on the
16 environmental protection program and monitoring
17 results at the Cluff Lake Project. We
18 believe it is a sound and effective program in
19 terms of both the results routinely collected and
20 its adaptability to incorporate improvements. The
21 valuable role that the EQC performs in identifying
22 ways to improve our monitoring program and
23 environmental management system has been
24 illustrated by the recent waterfowl sampling
25 program.

1 We will also be pleased to answer
2 any questions which Commission Members may have on
3 this presentation or anything which may still
4 arise from the earlier Day 1 presentation.

5 Thank you.

6 THE CHAIRPERSON: Thank you very
7 much.

8 With the permission of the
9 Commission Members I would like to turn to the
10 CNSC staff for their presentation before I open
11 the floor.

12 Mr. Pereira.

13

14 **01-H26.A**

15 **Oral presentation by CNSC staff**

16 MR. PEREIRA: Thank you,
17 Madam Chair.

18 For the record, my name is Ken
19 Pereira. I am the Director General of the CNSC
20 Directorate of Fuel Cycle and Materials
21 Regulation.

22 COGEMA Resources Incorporated has
23 applied for a uranium mine operating licence for
24 the Cluff Lake project. Under this licence the
25 proponent proposes to complete their final

1 operating phase. The underground mining operation
2 is expected to conclude around May of 2000 and
3 milling of the remaining stockpiled uranium ore is
4 expected to be completed by the end of 2002.

5 At the Day 1 hearing held on
6 October 4, 2001, CNSC staff presented CMD 01-H26.
7 CNSC identified the scope of activities to be
8 covered under the licence, as well as CNSC staff's
9 evaluation of the company's policies, programs and
10 performance.

11 CNSC staff also provided a status
12 report on the Canadian Environmental Assessment
13 Act comprehensive study under way for the next
14 licensing phase for Cluff Lake, which is
15 decommissioning.

16 One of the follow up issues CNSC
17 staff identified in the comprehensive study raised
18 a question from the Commission. CNSC staff were
19 asked by the Commission whether a licence
20 condition was required to ensure additional
21 environmental monitoring information would be
22 provided by the licensee during the licensing
23 period now before us.

24 In response, CNSC staff has
25 prepared and tabled CMD 01-H26.A.

1 The CNSC staff position is that a
2 condition in the proposed licence is not required
3 because additional environmental information,
4 arising from the environmental assessment that is
5 currently under way, can be obtained prior to or
6 during the decommissioning licence process.

7 Another issue discussed at the
8 Day 1 hearing concerned the timing for COGEMA to
9 address the new licence condition requirement on
10 quality assurance.

11 COGEMA's response was provided in
12 a letter dated November 20, 2001. They outline
13 how they will further develop and implement the
14 revised quality assurance program, and they
15 confirm that they will be able to meet the
16 April 30, 2002 deadline prescribed in the licence
17 condition.

18 CNSC staff and COGEMA will be
19 meeting tomorrow to discuss the current status in
20 more detail.

21 CNSC staff has received and
22 reviewed two intervenor Commission Member
23 documents that were submitted for this hearing.
24 One is from Ms Shiell and the other from Mr. Lau.

25 One issue that was raised in these

1 submissions was the question of possible residual
2 contamination arising from the storage of leach
3 tailings residues and their reprocessing in 1987
4 and 1988.

5 This concern will be addressed in
6 due course, because the licensee will have to meet
7 the final site closeout criterion that confirms
8 that any residual contamination on site is
9 acceptable before the site abandonment is
10 permitted.

11 The confirmation monitoring around
12 the old leach tailings storage part has not taken
13 place yet as the criteria for closeout and
14 monitoring have not as yet been finalized.

15 As all of this relates directly to
16 the eventual decommissioning plan and process, it
17 will be addressed as part of the considerations
18 for issuance of a decommissioning licence for the
19 site.

20 Evidence of contamination in
21 waterfowl resident in the Cluff tailings
22 management area came to light at the end of
23 November. CNSC staff is still assessing the
24 preliminary results from tests, information
25 obtained at consultation meetings in northwest

1 Saskatchewan in late November, and COGEMA's
2 proposed remedial action.

3 Overall, CNSC staff concurs with
4 COGEMA's approach to address the concerns raised
5 by the local Environmental Quality Committee, or
6 EQC.

7 CNSC staff will remain an active
8 participant in the proposed follow up program and
9 will communicate our expectations of findings to
10 the West Side EQC also.

11 Some key facts to keep in mind are
12 that the upper portion of the tailings area is now
13 covered by one meter of till and that COGEMA is
14 planning to deter waterfowl from the contaminated
15 waters or sediments in other parts of the tailings
16 management area during its final year of
17 operation. Subsequently those areas will be
18 drained and also covered.

19 Therefore, CNSC staff does not
20 recommend adding a licence condition related to
21 this new topic, as COGEMA's commitment and actions
22 on this issue satisfy CNSC staff.

23 CNSC staff commit to keeping the
24 Commission informed of the results from additional
25 studies scheduled for later in 2002 after the

1 waterfowl migrate back to the Cluff Lake area.

2 With regards to security, the
3 Cluff Lake operation was subject to assessment
4 under Phase 2 of the CNSC's security review of
5 licensed facilities and activities.

6 Under this review COGEMA was
7 requested, under subsection 12(2) of the General
8 Nuclear Safety and Control Regulations, to carry
9 out certain actions and to provide a report of the
10 prescribed information back to the Director
11 General, Directorate of Fuel Cycle and Materials
12 Regulation, by December 15, 2001. We anticipate
13 receiving that report shortly.

14 In conclusion, CNSC staff
15 recommends that an operating licence for the Cluff
16 Lake project be issued for a 28-month term.

17 CNSC staff is available to respond
18 to any questions that the commission members may
19 have at this time.

20 THE CHAIRPERSON: Thank you,
21 Mr. Pereira.

22 I will now open the floor for
23 questions from the Commission Members with regard
24 to both the presentation by the application and
25 the presentation by staff.

1 Are there any questions or
2 comments from the Commission Members at this time?

3 Dr. Giroux.

4 MEMBER GIROUX: Yes. I would have
5 one question for staff.

6 Mr. Pollock just mentioned -- and
7 you will find this on page 4 of his
8 presentation -- that the residual radium-226 is
9 less than what can be found in a normal house in
10 the background radiation.

11 Would staff agree with that
12 statement?

13 MR. PEREIRA: I will ask
14 Mr. McCabe to respond.

15 MR. McCABE: I'm sorry, I didn't
16 hear your question and we were just --

17 We haven't personally done that
18 type of calculation to confirm that. We certainly
19 look at the aspect of the impact on the
20 environment. So I am not in a position to say
21 that that 30 Bq per kilogram is a representative
22 number at this time. We just haven't that type of
23 calculation.

24 MEMBER GIROUX: Okay. But without
25 going into the detailed calculation, do you agree

1 that residual radiation is quite low all together
2 and not of concern?

3 MR. PEREIRA: Perhaps Dr. Thompson
4 can comment on the issue.

5 DR. THOMPSON: Staff have
6 conducted assessments using effluent quality data
7 as well as environmental monitoring data on radium
8 and other radionuclide concentrations and various
9 environmental compartments. Our assessment shows
10 that the radium levels are not having an adverse
11 effect on the environment.

12 So from that point of view the
13 residual radium, and once the treatment is
14 conducted, does not seem, after years and years of
15 operation, to have accumulated to levels that
16 would be of concern.

17 THE CHAIRPERSON: Further
18 questions from the Commission?

19 Dr. Barnes.

20 MEMBER BARNES: I want to follow
21 up on the problem with the waterfowl in the TMA
22 pond.

23 I may not be reading this
24 correctly, but the results that you have "recently
25 received", were they included on those charts that

1 you showed from that actual pond? You showed data
2 from various lakes downstream from it.

3 MR. POLLOCK: No, there are no --
4 the data are from the downstream lakes to show
5 that the elevated concentrations are strictly
6 associated with the TMA, that the downstream lakes
7 are no different than the background.

8 The tailings areas are obviously
9 substantially higher than natural concentrations.
10 They are not shown here. They are in the order
11 of -- I'm sorry.

12 MEMBER BARNES: I wonder why they
13 weren't shown. I mean, you have a hot area,
14 relatively speaking, you show all the downstream
15 information, but in fact you don't give us any
16 information that you have found here.

17 MR. POLLOCK: I wanted to make the
18 point clearly that this is strictly associated
19 with the TMA.

20 MEMBER BARNES: It would still be
21 useful to know what those results were.

22 MR. POLLOCK: Yes. We have
23 submitted all of the samples and our analysis to
24 the staff. I guess in retrospect I could have put
25 some of it in.

1 MEMBER BARNES: Could you give an
2 indication of the levels there compared to the
3 downstream ones?

4 MR. POLLOCK: The levels of
5 polonium and lead-210 in the tailings are in the
6 order of about 90 or 200 Bqs per gram, which is,
7 if I look at the background results that are here,
8 this is up by -- we are showing results,
9 background results in the order of .4-.5 Bqs per
10 gram in the graph here, so tailings are in the
11 order of 200 times background in terms of
12 concentration.

13 Waterfowl either grazing on the
14 grass or diving for food right in the pond are
15 clearly going to ingest some amount of sediment
16 along with the food intake, and the food intake
17 would also have some uptake.

18 So there is a substantial
19 difference between the potential source term right
20 at the tailings compared to outside of the
21 tailings area.

22 MEMBER BARNES: Two more
23 questions, if I may, in follow up.

24 You refer to this as a small,
25 unique population of waterfowl at TMA. How do you

1 define that?

2 MR. POLLOCK: We have carried out
3 observations routinely and recorded those
4 observations over the course of the summer.

5 The EQC raised this issue back in
6 May at their annual meeting at the site, so we
7 have recorded observations by the site staff in
8 terms of the numbers of ducks or geese that appear
9 to be routinely using that particular area.

10 MEMBER BARNES: These disappear in
11 the winter and come back in the summer?

12 MR. POLLOCK: Yes. They are
13 now -- our weather is not as pleasant as it is
14 here in Ottawa at the moment. All the ducks and
15 geese have left for the winter.

16 MEMBER BARNES: Do you know if
17 they are the same ducks and geese that come back
18 to that particular pond the next year?

19 MR. POLLOCK: There has been no
20 banding or anything of that nature that would
21 positively confirm that.

22 My understanding is that these
23 waterfowl tend to come back to the same general
24 area, or perhaps even the same lake. I can't
25 speak from any field of expertise.

1 Do you have a comment on that,
2 Gerry?

3 MR. ACOTT: Gerry Acott, Human
4 Resources.

5 I believe that is correct, they do
6 tend to come back to the same nesting area year
7 after year.

8 We believe it is a relatively
9 small population. Early in the summer we were
10 recording three to five ducks on an average
11 sighting. Later in the fall when the migration
12 had begun, that number rose to about 20. So those
13 are the kind of numbers we were looking at.

14 MEMBER BARNES: Okay.

15 THE CHAIRPERSON: Mr. Graham.

16 MEMBER GRAHAM: Yes. Just as a
17 follow up to Dr. Barnes' questions, the testing of
18 the waterfowl and the question I would have is:
19 If those waterfowl were, say, shot on their
20 migration route or something and humans consumed
21 them, would they have any health hazard to human
22 beings?

23 Perhaps to CNSC staff.

24 MR. PEREIRA: I will invite
25 Mr. Thériault to respond to the question.

1 MR. THÉRIAULT: Thank you.

2 We have looked at the sampling
3 results submitted to us by the licensee. The
4 doses were estimated for the ingestion of each
5 individual. Doses generally were below one
6 miliSievert, namely 0.96 miliSieverts, 0.85 and
7 0.15 miliSieverts, except for one sample which, if
8 it had been ingested, would have resulted in a
9 dose of 6 miliSieverts.

10 I should note that these doses are
11 for ingestion of the flesh, kidney, as well as the
12 liver. In the latter case, consuming flesh only
13 would have resulted in a dose of 1.7 miliSieverts.

14 There were, in total, six animals
15 sampled. Two of them were collected at a location
16 that I understand to be a few hundred kilometres
17 from the actual mine site, and doses for the
18 ingestion of these background waterfowl samples
19 was estimated to be about 0.002 miliSieverts.

20 In terms of risk, what this
21 represents, if we look at the risk of fatal cancer
22 from ingesting this particular waterfowl that
23 would have resulted in a dose of 6 miliSieverts,
24 it would represent an increase of fatal cancer of
25 approximately 0.03 per cent.

1 MEMBER GRAHAM: So what you are
2 saying is that it would increase the risk.

3 MR. THÉRIAULT: By that amount.
4 That is absolutely correct.

5 MEMBER GRAHAM: The second
6 question is: The waterfowl that were sampled,
7 were they caught, killed and sampled, or was there
8 another method of sampling liver and tissue and so
9 on?

10 THE CHAIRPERSON: That is a
11 question for COGEMA.

12 MR. POLLOCK: I will ask Gerry to
13 speak to it. It is hard to sample something's
14 liver or kidney without collecting the whole bird.

15 MEMBER GRAHAM: That is what I was
16 wondering. You are saying that those were killed
17 and then sampled. But you have no idea how many
18 birds could have had that same contamination.

19 I guess that would be my question.

20 MR. POLLOCK: We have looked quite
21 closely at the question of not just the number of
22 birds at the TMA but also the number of waterfowl
23 in northern Saskatchewan. There are actually very
24 good statistics available from surveys carried out
25 annually by U.S. Fish and Wildlife.

1 Based on our observations, we are
2 of the view that 20 is a conservative number for
3 ducks and a similar number for waterfowl. The
4 U.S. Fish and Wildlife survey data show in excess
5 of 100,000 mallards alone, 400,000 total ducks in
6 the northwest corner of Saskatchewan; and about a
7 third of that number of Canada geese.

8 So if one factors in both
9 likelihood of encountering one of these and dose
10 consequence, then the overall risk factor is
11 obviously very low.

12 MEMBER GRAHAM: I have another
13 question for COGEMA staff.

14 In Ms Shiell's intervention, at
15 page 2, she states:

16 "I am not satisfied regarding
17 the internal, long-lived,
18 alpha-emitting..."

19 And she goes on with that. Then
20 she says:

21 "No tests of the vegetation
22 have been undertaken in these
23 areas."

24 Could you comment on that, COGEMA.

25 MR. POLLOCK: Our programs tend to

1 look right in the lakes and rivers themselves.

2 I will ask Gerry to speak further
3 to it.

4 MR. ACOTT: I think the specific
5 comment about sampling vegetation referred to the
6 leach storage area. We have not sampled the
7 vegetation as yet in that area, but we intend to
8 do so as part of the decommissioning planning.

9 MEMBER GRAHAM: So that would only
10 be done at the time of decommissioning.

11 MR. ACOTT: That is correct.

12 MEMBER GRAHAM: Would CNSC staff
13 like to comment any further on the testing?

14 MR. PEREIRA: I will invite
15 Dr. Thompson to comment.

16 DR. THOMPSON: There was never any
17 requirement on COGEMA to sample vegetation. At
18 the time that the clean-up was conducted, the
19 clean-up was done to our satisfaction, and the
20 levels were not anticipated to be such that you
21 would have significant output in vegetation.

22 So there was never a requirement
23 of the routine monitoring program to conduct that
24 sampling.

25 THE CHAIRPERSON: I believe that

1 COGEMA wishes to comment.

2 MR. POLLOCK: I would just add the
3 comment as noted in our presentation. We have
4 done a recent walkover survey to confirm that the
5 gamma radiation levels in that particular area
6 don't give any rise to concern that we should be
7 going out to do something immediately. In our
8 view, this is something that we will finish the
9 documentation of as part of the final verification
10 surveys for decommissioning.

11 THE CHAIRPERSON: Are there any
12 questions?

13 My question is to COGEMA Resources
14 with regard to the EQC.

15 Who is part of this group? Do
16 they represent citizens from other parts of
17 Saskatchewan, or is it restricted to the north?

18 Exactly what are the terms of
19 reference?

20 MR. POLLOCK: The West Side EQC
21 includes representatives from all of the
22 communities that are in the northwestern portion
23 of the province that represents the area from
24 which our lease agreements stipulate that we would
25 draw employees from.

1 I will ask Gerry to speak in more
2 detail as to the composition.

3 MR. ACOTT: The EQC was developed
4 as a result of a panel recommendation back in 1993
5 by the province. They developed a Northern
6 Monitoring Secretariat, which handles three
7 different EQCs. The one we deal with at Cluff is
8 the West Side. And as Bob correctly said, those
9 involve all the northwestern communities that are
10 in our impact zone, according to the lease
11 agreement.

12 THE CHAIRPERSON: And the terms of
13 reference...?

14 MR. ACOTT: Their mandate is
15 largely to oversee the environmental monitoring
16 programs that are done at the mine sites, but they
17 also get intimately involved in some of the social
18 issues and some of the other things that happen at
19 the mine.

20 They make at least one trip to
21 each mine every year to review the provincial
22 licence renewal and look through the monitoring
23 program and provide any comment they may have.

24 During these visits, which we had
25 in May of this year, was when they brought up the

1 issue of waterfowl.

2 THE CHAIRPERSON: As you will note
3 from past appearances before the Commission, I
4 have indicated my concerns about public
5 information programs that don't offer perhaps
6 intervenors in other parts of the province who may
7 have interests and concerns to voice those.

8 Are there any plans by COGEMA to
9 broaden either involvement in either specifics,
10 such as the EQC, or other public information plans
11 to involve people in other parts of the province
12 to put that open?

13 What is the way that interested
14 parties or the interested public can get involved
15 overall and continuously?

16 MR. POLLOCK: We have recently,
17 since the Day One hearing day on this application,
18 written to a number of individuals, consisting of
19 basically those who have submitted submissions
20 pertaining to hearings.

21 Also, we were able to identify
22 five local environmental organizations.

23 We have written to the head of
24 each of those organizations as well, including a
25 fairly thick package of all of the public

1 information materials that are available from us,
2 and also including a document called Opportunity
3 North, which is a quarterly magazine covering both
4 renewable and non-renewable resource issues in
5 northern Saskatchewan. It is primarily targeted
6 at the northern part of the province, but there is
7 no reason why anyone who is interested obviously
8 can't get on the distribution list by contacting
9 the publisher.

10 We have written to all of these
11 organizations, providing quite a comprehensive
12 package, including things such as some of the
13 information materials we had prepared for Cluff
14 decommissioning consultation program, indicating
15 that if they wished to be on the mailing list in
16 the future just let us know; and also pointing out
17 that, certainly in terms of all of our
18 publications, that one could readily find these on
19 our web page.

20 I guess my response would be we
21 will see what interest and feedback this draws.
22 Certainly, there is no reason whatsoever that
23 anyone who is interested should not be on the
24 distribution list. Or if they were not aware of
25 our web page, it is to access virtually all of

1 this information off the web page.

2 We have made a positive step to
3 respond to the concern, and we will see where it
4 goes from there.

5 THE CHAIRPERSON: Thank you.

6 Ms MacLachlan.

7 MS MacLACHLAN: Thank you.

8 I would like to go back to the
9 issue of the contaminated waterfowl. I do
10 understand that your long-range measures for
11 alleviating the problem are to cover the area with
12 fill, and I believe you mentioned that there was
13 some form of deterrence as a mitigative measure in
14 the short term for the waterfowl for this area.

15 What measures are those?

16 MR. POLLOCK: I will ask Steve
17 Grinius to speak to it in more detail.

18 The short answer is we had already
19 started to cover what is called the Upper Solids
20 Pond, which is a substantial portion of the TMA
21 which is no longer in service, to put an initial
22 levelling course on. That is now complete, and we
23 have asked the site staff to consider means by
24 which they might further restrict access, for
25 example, to the pond itself that is right within

1 the tailings decant area.

2 MR. GRINIUS: Steve Grinius.

3 Like Bob said, we have completed
4 covering the Upper Solids, which was a grassy area
5 that the geese were in.

6 The area that the ducks were
7 actually seen in, which is the Lower Solids decant
8 area -- there is some ponded water -- what we plan
9 to do is put a floatable mesh material that is an
10 orange colour that will sit on that pond. They
11 will come in and see the material and wouldn't
12 like to land on it, and that will keep them from
13 landing on that area.

14 That, plus part of our liquids
15 pond, will be covered with that material.

16 We are also looking at doing a
17 winter sampling on the sediments on the edge of
18 the liquids pond. Depending on the results of
19 those samples, we may put some till or rock
20 material on the ice, and when it melts in the
21 spring it will drop down and cover those sediments
22 if it is necessary.

23 MS MacLACHLAN: Thank you. I just
24 have one other question, and this is to staff.

25 In 01H-26, under Emergency

1 Response, there is a statement that no formal
2 assessment has been carried out on a facilities
3 emergency response program. Has that changed?

4 If no formal assessment has been
5 carried out, is there an intention to do one; and
6 if not, why not?

7 MR. PEREIRA: I will invite
8 Mr. Scissons to provide the information requested.

9 MR. SCISSONS: Good morning.
10 Kevin Scissons, project officer from Saskatoon.

11 We are planning and will be doing
12 an on-site evaluation of the emergency response
13 program. It is in the works to do the on-site
14 evaluation. The paperwork is in place. Now we
15 are going to do the confirmation on site.

16 MS MacLACHLAN: Thank you.

17 THE CHAIRPERSON: Mr. Graham.

18 MEMBER GRAHAM: I have a question
19 that may be more relevant to decommissioning, but
20 I will ask it anyway. And this again comes back
21 to Ms Shiell's intervention with regard to the
22 slimes problem in which she expressed about the
23 leaching and how that was overcome by, as she
24 understood was corrected by covering the
25 containers.

1 Is that a normal practice, and has
2 that worked out well?

3 I will ask CNSC staff. Has that
4 situation been handled correctly or
5 satisfactorily?

6 MR. PEREIRA: I will ask
7 Mr. McCabe to provide the information.

8 MR. McCABE: Thank you.

9 I think there are two issues that
10 are being addressed there. One is the disposition
11 of the leach tail vaults. There are concrete
12 vaults in which the high grade leach tails were
13 placed. They leaked. It was decided to run that
14 material through the mill for uranium and gold
15 recovery and then take all of these vaults, place
16 them in the extreme upper edge of the tailings
17 management area and then cover them with tailings.

18 The purpose is to make a longer
19 path for the migration of the contaminants down in
20 the tailings management area. This has worked
21 quite well. This has been quite effective over
22 this period of time.

23 It is not directly related to the
24 slimes. Slimes are going to be generated, no
25 matter how you place the tailings in above-ground

1 TMA of that nature. So they are not two issues
2 tied together.

3 MEMBER GRAHAM: You are saying
4 that after the concrete containers were emptied
5 the empty containers were placed there.

6 MR. McCABE: That's right.

7 MEMBER GRAHAM: The material that
8 had spilled, that was all cleaned up and put
9 through --

10 MR. McCABE: And placed in the
11 tailings management area and covered.

12 MEMBER GRAHAM: Has there been
13 testing downstream from that to see --

14 MR. McCABE: Regular monitoring of
15 the tailings management area would indicate if
16 there were any problems related to that.

17 MEMBER GRAHAM: And there hasn't
18 been any?

19 MR. McCABE: There have not been
20 any.

21 MEMBER GRAHAM: Thank you.

22 THE CHAIRPERSON: Thank you very
23 much.

24 On that basis, we will now move to
25 the interventions.

1 The first written intervention is
2 from Mr. Victor Lau, as outlined in CMD Document
3 01-H26.2.

4

5 **01-H26.2**

6 **Written submission from Victor Lau**

7 THE CHAIRPERSON: Are there any
8 questions or comments from the Commission Members
9 with regards to this written submission?

10 There are none; thank you very
11 much.

12 Now we will move to the written
13 intervention by Mrs. Shiell, as outlined in
14 Document 01-H26.3.

15 You will note that this is a
16 written submission, but Mrs. Shiell is with us
17 today.

18

19 **01-H26.3**

20 **Written submission from Maisie Shiell**

21 THE CHAIRPERSON: Mrs. Shiell, I
22 know that you have asked to make a few comments.
23 In order that I follow the rules of procedure,
24 however, I would first like to ask you if there is
25 any particular reason why you put in a written

1 submission and would like to now do an oral
2 submission.

3 MRS. SHIELL: I don't think I did
4 particularly ask to intervene today. But I am
5 very pleased to be here, and I wouldn't mind
6 explaining my position.

7 I am in town for a different
8 meeting, and it happens that my other meeting
9 doesn't start until 11:00. That is why I came.

10 THE CHAIRPERSON: The Commission
11 always endeavours to be flexible for members of
12 the public to ensure that there is transparency.
13 Mrs. Shiell, the rules of procedure do allow for
14 ten minutes for intervenors. So I would turn it
15 over to you for that time limit.

16 Then we will open the floor to
17 further questions on your submission.

18 Thank you.

19 MRS. SHIELL: Thank you very much.

20 My concern is about the long-lived
21 alpha-emitting radionuclides. Therefore, my
22 concern is about our children in the future.

23 Radium has a 1,600-year half life.
24 It produces far more alpha emitters. There are
25 six alpha emitters. And it is alpha radiation

1 that no studies have been done on.

2 I am not criticizing the company,
3 because the company is keeping the rules, as I
4 mentioned. But I am drawing this to the
5 Commission's attention that we haven't done any
6 studies on alpha, on the genetic and somatic
7 effects of alpha radiation, and yet we are
8 allowing a 21 per cent concentration -- never
9 heard of anywhere in the world -- to go ahead.

10 I just would like you to get my
11 position.

12 I am very pleased with the PSL-2
13 situation, where at least they are calling for a
14 40, at least 40 RBE. That is not being used at
15 present, and I don't think it is being used as we
16 are looking at decommissioning.

17 I have also been in correspondence
18 with Dr. Ward Wicker. This is the point he is
19 making: that on alpha radiation there have been no
20 studies.

21 And IAEA in July 1999, I think,
22 brought out a report, Tech Doc 1091. That has not
23 been picked up by CNSC. I have even been to an
24 international meeting in Vienna about it, where it
25 really was never discussed.

1 That document is saying these
2 things: that we have to be more careful than what
3 we are doing.

4 I was very pleased to hear that my
5 report -- I tried through the comprehensive study.
6 The Environmental Assessment Act does not give a
7 person a right to say anything at this time. But
8 I put in my piece to them, and they do tell me
9 that they are changing. Well, I am very glad to
10 hear that.

11 On the gamma radiation surveys, I
12 think that what I am trying to say at least is
13 that the alpha is very different than the gamma.
14 Now we do gamma rays to see whether there is any
15 alpha in there.

16 I think what we definitely need to
17 do, and again this has been said today, that they
18 do intend but they haven't yet measured the
19 vegetation and actually in the reports that I have
20 of those two really serious spills in 1980 and
21 1981 there was more than even that patch where
22 they stored the oils. Tractors ran through the
23 spills and spread it all around and we need to do
24 more for vegetation.

25 I think I probably ran out of my

1 ten minutes.

2 THE CHAIRPERSON: Thank you very
3 much, Ms Shiell.

4 MS SHIELL: Thank you.

5 THE CHAIRPERSON: Questions from
6 the Commission members.

7 Ms MacLachlan.

8 MEMBER MacLACHLAN: Thank you very
9 much for your submission.

10 This is a question to staff.
11 Based on the oral presentation we heard today and
12 the information or the statements made in
13 01-H26.3, could you please comment on Ms Shiell's
14 statements that firstly there are no scientific
15 tests for contaminated biota to support the limit
16 set as being acceptable.

17 Secondly, the need to have
18 measured effects from internal alpha radiation
19 effects that Ms Shiell refers to as sub-lethal,
20 and lastly the 1981 comments from Friedlander
21 about the difficulty with measuring genetic or
22 somatic effects.

23 MR. PEREIRA: I will invite
24 Dr. Thompson to start off with a response.

25 MEMBER MacLACHLAN: Thank you.

1 DR. THOMPSON: Good morning. For
2 the record my name is Patsy Thompson. I'm head of
3 the Environmental Protection Section of the CNSC.

4 Maybe to put the information
5 presented in the intervention in context, there
6 are several statements made about the fact that
7 there are no studies or data available on the
8 effects of alpha emitters. That's not quite
9 factual. The fact is there are many studies
10 looking at the effects of alpha emitters on
11 genetic endpoints such as DNA damage and damage to
12 tissues.

13 One of the areas of uncertainty is
14 that most of those studies have been done in cell
15 cultures with the alpha emitter essentially on the
16 surface of a plate and the tissue on top of it.
17 So the experiments are well controlled and those
18 studies have shown that if you compare the effects
19 of alpha emitters on genetic damage, for example,
20 to the effects of gamma meters there is about an
21 RB factor, the alpha emitters will cause about ten
22 times more damage than a similar dose of gamma
23 meter.

24 So there is lots of information on
25 what we are calling in vitro studies, studies done

1 on cell cultures, but not in living organisms.
2 That is where the deficiency is. There are few
3 studies that have been done over long periods with
4 alpha emitters injected in animals, for example,
5 and plants to look at the long-term over a
6 significant proportion of the lifetime of animals
7 exposed to internally deposited alpha emitters.
8 There are some studies, however, that have been
9 done, although there aren't very many.

10 There are a number of studies that
11 were done on small mammals over an extended period
12 of time. Those studies have shown that when alpha
13 emitters are in tissues of small mammals like rats
14 and mice the effects of the alpha emitters are
15 about, if you look at an endpoint like life
16 shortening which includes death from all kinds of
17 diseases, not just cancer and, for example, if
18 there is immune deficiency and higher
19 susceptibility to disease, the life shortening
20 endpoint will consider all causes of death.

21 The alpha emitters tend to be 40
22 to 50 times more effective in causing life
23 shortening than would be similar doses to gamma
24 meters. So that information is available.

25 There is also some information

1 from experiments conducted in the late '90s where
2 people have looked at reproductive endpoints.
3 There are some studies also in the '60s looking at
4 reproductive endpoints. But most of the work was
5 done in the late '90s.

6 So those studies have shown that
7 alpha emitters tend to be anywhere between 100 to
8 300 times more effective than gamma rays, similar
9 does of gamma rays in causing those types of
10 damages.

11 So essentially what CNSC staff
12 have done is take all that information together
13 and recommended, for example, that we use an RB
14 factor of 40 to take into consideration the
15 increased biological effectiveness of the alpha
16 internally deposited.

17 Essentially that decision is based
18 on the fact that if you look at life shortening,
19 essentially a sort of collective endpoint, it sort
20 of corresponds with observations over long-term
21 experiments in small mammals. So that's what is
22 available in terms of experimental data from the
23 literature.

24 In terms of actual data of
25 operating uranium mine sites such as Cluff Lake,

1 there is extensive biological monitoring
2 information that has been collected
3 pre-operationally at the sites and during the long
4 years of operation.

5 That information was assessed by
6 CNSC staff looking at effluent releases
7 radionuclides and other contaminants as well as
8 environmental media information on the effects on
9 populations of benthic invertebrates, the
10 invertebrates that live on populations of fish.

11 All that information together
12 shows that there are at some operating mine sites,
13 Cluff Lake is an example, impacts occurring, but
14 those impacts tend to be very limited spatially
15 and close to the source of release. The impacts
16 have not been very extensive in terms of spatial
17 extent.

18 From that information we have
19 essentially concluded that the programs that Cluff
20 Lake has in place to control emissions have been
21 effective in terms of controlling environmental
22 impacts of their facilities. We don't have tools
23 that can be used in the field to do biomonitoring
24 for genetic damage from alpha emitters. There are
25 tools available to do that kind of work, but it's

1 not something that can be done on a routine basis
2 in Northern Saskatchewan and out where the
3 facilities don't exist.

4 There are tests that are not
5 available in many, many labs. There are a few
6 researchers working on these, but they are not yet
7 developed to the point where they can be done
8 routinely. However, the information we do have on
9 community level impacts shows that if -- the
10 information from the literature shows that if
11 there is enough genetic damage, either the
12 organisms will die or they will fail to reproduce.
13 Those types of endpoints are being monitored in
14 the environment. So if genetic damage was
15 sufficient then you would be seeing those kinds of
16 impacts.

17 The information over a long period
18 of operation have not revealed extensive impacts
19 of that nature.

20 So we feel that there is enough
21 information on which to base decisions on the
22 appropriateness of environmental protection
23 programs that licensees have put in place.

24 MEMBER MacLACHLAN: Thank you.

25 Just to follow up on the tests

1 that you were speaking of. What is the period of
2 time over which the alpha emitters are monitored
3 for their effects? What period of time elapses
4 before an effect begins to be noticeable, and is
5 there an increase over time in the magnitude of
6 the effect?

7 DR. THOMPSON: The rate at which
8 the effects will develop is dependent on dose
9 rates and generally the higher the dose rate or
10 the total dose then the more significant the
11 impacts are and the more quickly they will be
12 observed.

13 The doses at Cluff Lake in the
14 near field from our estimates are on a very, very
15 limited spatial extent, may be high enough to be
16 borderline on dose rates that could have
17 environmental effects, but the biological
18 information doesn't show extensive impacts and the
19 impacts that are observed are more likely due to
20 metals and other contaminants released by the
21 facility because they tend to be more toxic.

22 In terms of genetic damage at low
23 levels, if the genetic damage isn't such that it
24 would cause immediate death or reproductive
25 failure, you tend to have what is called a genetic

1 load. Essentially the genetic damage can be
2 transferred from generation to generation. But at
3 some point the damage will be severe enough that
4 it will cause somatic damage.

5 The organisms that are most
6 exposed are those that live in sediment because
7 the radionuclides tend to accumulate in sediment.
8 Those organisms are short lived. So they have
9 essentially been exposed to radionuclides for
10 several generations and despite that exposure over
11 several generations we haven't seen adverse
12 environmental effects.

13 MEMBER MacLACHLAN: Thank you very
14 much.

15 THE CHAIRPERSON: Are there any
16 further questions?

17 Dr. Giroux.

18 MEMBER GIROUX: Yes, along the
19 same lines. One of the strong arguments that --
20 well, one of the arguments that Ms Shiell makes is
21 about the long-term effects and I was wondering
22 about the scale of time that you have been
23 referring to. You did mention some long-term
24 experiments or tests or observations on mammals, I
25 believe, but we may be talking about decades or

1 centuries.

2 The question is: Do you have any
3 indication that if there is a strong or high
4 initial dose then no more, that effects might show
5 up after only years or do you always have
6 immediate effects and nothing that sort of
7 germinates and shows up later? I am just
8 wondering about the possibility that damage would
9 show up much later than the initial dose that
10 started it.

11 DR. THOMPSON: I guess there are
12 two elements to answer your question. One is
13 there have been experimental data done on small
14 mammals, for example, in a laboratory setting
15 where exposure has happened over a few
16 generations, but not decades or centuries.

17 There are sites in the U.S. that
18 are known to have been contaminated in the '40s
19 and '50s that have been studied during that period
20 and also more recently in the mid-90s where they
21 looked at DNA damage in turtles, for example, that
22 are long-lived reptiles. Those studies have shown
23 that the turtles that are resident of those
24 contaminated ponds, if you compare DNA damage to
25 reference turtles, the level of DNA damage is

1 marginally above reference, but those animals are
2 long lived. They seem to be reproducing
3 successfully.

4 So even after 40 or 50 years of
5 exposure, there doesn't seem to be an accumulation
6 of genetic damage and in those ponds the
7 contamination levels are a lot higher than what we
8 see at uranium mining facilities.

9 The second element of the response
10 is during the operational phase the biological
11 environmental monitoring has been conducted, and
12 we would expect that the monitoring would also
13 continue post-decommissioning. So if at some
14 point we observed effects that were not
15 anticipated, then actions can be taken at that
16 time to do more cleanup, for example.

17 So it's not once we give it
18 decommissioning licence then nothing else happens.
19 There is still an option to go back and revisit
20 decommission options and there will be continued
21 monitoring.

22 THE CHAIRPERSON: Thank you very
23 much.

24 This completes the record for the
25 public hearing in the matter of the application by

1 COGEMA Resources Inc. for a licence to operate
2 Cluff Lake Mining Facility.

3 The Commission will deliberate and
4 will publish its decision in due course. The
5 decision will be posted on the CNSC website as
6 well as distributed to participants. Thank you
7 very much.

8 We will be moving to the next
9 agenda item. We will take a five-minute break in
10 which we will change rounds. So therefore in five
11 minutes we expect people to be back in their
12 seats.

13 Thank you.

14 --- Upon recessing at 9:47 a.m.