

**Canadian Nuclear
Safety Commission**

**Commission canadienne de
sûreté nucléaire**

Public Hearings

Audiences publiques

October 23, 2006

Le 23 octobre 2006

Davidson Centre
Kincardine Hall
601 Durham Street
Kincardine, Ontario

Davidson Centre
Kincardine Hall
601, rue Durham
Kincardine (Ontario)

Commission Members present

Commissaires présents

Ms. Linda J. Keen
Dr. Christopher Barnes
Mr. André Harvey

Mme Linda J. Keen
Dr. Christopher Barnes
M. André Harvey

Secretary: Mr. Marc A. Leblanc

Secrétaire: M. Marc A. Leblanc

General Counsel : Jacques Lavoie

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1 Ottawa, Ontario

2
3 --- Upon commencing on Monday, October 23, 2006
4 at 9:32 a.m.

5
6 **Opening Remarks**

7 **THE CHAIRPERSON:** Good morning, ladies and
8 gentlemen. My name is Linda Keen and I'm the President of
9 the Canadian Nuclear Safety Commission.

10 Before we start the formal procedures and
11 formal hearing today, we are very honoured -- we are very
12 honoured indeed that the Saugeen First Nation has asked us
13 to participate with them in a welcoming ceremony and this
14 is to welcome us as the Commission and you as participants
15 today. So we are -- the Commission will be leaving the
16 podium for the first part of today and participating on
17 the welcoming ceremony to the traditional lands of the
18 Saugeen First Nation.

19 We are very proud that two chiefs of the
20 First Nation have come to be with us today and they will
21 be also participating later in the formal hearing, and
22 this is Chief Nadjiwan, the Chief of the Chippewas of
23 Nawash Unceded First Nation and Chief Kahgee, the Chief of
24 the Saugeen First Nation as well. So thank you very much,

1 gentlemen, for being here.

2 So we will be leaving the podium at this
3 moment and we will be participating -- we will come back
4 for the formal hearing start. Thank you.

5 **(WELCOMING CEREMONY)**

6 **M. LEBLANC:** Bonjour, mesdames et
7 messieurs. We will now proceed with the public hearing.

8 During today's business we have
9 simultaneous translation. If you do need some assistance,
10 you could go at the technical booth at the back.

11 I would ask you to please keep the pace of
12 speech relatively slow so that the translators have a
13 chance of keeping up.

14 The hearing is going to be transcribed.
15 The transcripts are going to be available on the website
16 of the Commission late this week or early next week.

17 To make the transcript as meaningful as
18 possible, we would ask everyone to identify themselves
19 clearly before speaking.

20 As a courtesy to others in the room, please
21 silence your cell phones.

22 Madame Keen, présidente et première
23 dirigeante de la Commission, va présider l'audience
24 d'aujourd'hui.

25 Madame Keen.

1 **THE CHAIRPERSON:** Good morning and may I
2 again welcome you to the hearing of the Canadian Nuclear
3 Safety Commission today. It's a great pleasure for the
4 Commission to be back in the Kincardine community. It's
5 been a number of years -- about five years ago we came.
6 So it's very much a pleasure for us to be back here.

7 As many of you know, listening to
8 communities is a very important part of the role of the
9 Canadian Nuclear Safety Commission and, in fact, is
10 crucial. It's absolutely crucial to the work of the
11 Commission in our effort to be Canada's nuclear watchdog
12 and to behave in a way that is commensurate with our
13 values of transparency and openness.

14 I would like to thank very much those
15 people that have made it possible for us to be here today.
16 We certainly had great cooperation from the community and
17 we are deeply honoured, again, to have the opportunity to
18 welcome the Saugeen Ojibway First Nation with us today.

19 First, I would like to begin by introducing
20 the members of the Commission that are with us today. On
21 my far left is Dr. Christopher Barnes. On my immediate
22 left is Mr. André Harvey. As well as the Secretary of the
23 Commission, Marc Leblanc, we also have the General Counsel
24 to the Commission, Jacques Lavoie, with us today on the
25 podium.

1 I would like to note that the Commission is
2 on enhanced security status, as are many of the facilities
3 that we regulate and, as such, if I feel that matters of
4 an enhanced security nature are being discussed, I will
5 ask for an in camera session which means that the
6 Commission will go into the boardroom separately from the
7 open session and talk to the people about the issues in
8 front of us.

9 Before adopting the agenda, I would like to
10 note that there was seven supplementary Commission Member
11 Documents and throughout the day today I'm going to be
12 referring to Commission Member Documents as CMDs, and
13 these seven supplementary ones were added to the agenda
14 after its initial publication on September 28th, 2006, and
15 these are listed in the updated agenda.

16 **06-H21**

17 **Adoption of Agenda**

18 **THE CHAIRPERSON:** With this information, I
19 now call on the adoption of the agenda by the Commission
20 members. The agenda is noted in Commission Member
21 Document 06-H21.E.

22 Do I have the concurrence of the members?
23 I do note for the record that there is concurrence.

24 On the agenda today is the One-Day Hearing
25 in the matter of the Scoping Document (the Environmental

1 Assessment Guidelines) regarding Ontario Power Generation
2 Inc.'s proposal to construct and operate a Deep Geologic
3 Repository within the Bruce Nuclear Site in Kincardine,
4 Ontario.

5 **MR. LEBLANC:** This is a one-day public
6 hearing. The Notice of Public Hearing 2006-H12 was
7 published on July 31st, 2006. The public was invited to
8 participate either by oral presentation or written
9 submission. September 22nd, 2006 was the deadline set for
10 filing by intervenors. The Commission received 57
11 requests for intervention. Some submissions were received
12 after the deadline. Based on its consideration of these
13 matters, a panel of the Commission accepted the
14 interventions that had been filed formally.

15 The Commission strongly urges all parties
16 to file their submissions within the deadlines set in the
17 Public Notice of Hearings in compliance with the CNSC
18 Rules of Procedure.

19 October 16th was the deadline for filing of
20 supplementary information. I note that supplementary
21 information has been filed by Ontario Power Generation,
22 CNSC staff and one intervenor.

23 **THE CHAIRPERSON:** I would now like to start
24 the hearing by calling on a presentation by Ontario Power
25 Generation Inc. This presentation is outlined in CMDs 06-

1 H22.1, 06-H22.1A, 06-H22.1B, and I will turn the floor
2 over to Mr. Ken Nash, Senior Vice-President of Nuclear
3 Waste Management Division of OPG.

4 Good morning, sir. The floor is yours.

5
6 **Ontario Power Generation Inc.:**
7 **Scoping Document (Environmental**
8 **Assessment Guidelines) regarding**
9 **Ontario Power Generation Inc.'s**
10 **proposal to construct and operate**
11 **a Deep Geological Repository within**
12 **the Bruce Nuclear Site in**
13 **Kincardine, Ontario**

14
15 **06-H22.1 / 06-H22.1A / 06-H22.1B**

16 **Oral presentation by**
17 **Ontario Power Generation Inc.**

18
19 **MR. NASH:** Good morning, Madam Chair,
20 Members of the Commission. Thank you for this opportunity
21 to make a presentation. My name is Ken Nash of Ontario
22 Power Generation.

23 With me today to help answer questions are
24 Frank King, OPG Director, Repository Development and
25 Safety; Mark Jensen, OPG Manager of Geoscience; Terry

1 Squire, OPG Director of Public Affairs; Dr. Duncan
2 Moffatt, Principal with Golder Associates, who carried out
3 the assessment leading to the selection of the repository
4 by Kincardine; Ken Raven, President of INTERA, who carry
5 out the detailed investigation of the site geology and Dr.
6 Derek Martin of the University of Alberta and a member of
7 our Geoscience Review Group.

8 This presentation will provide an outline
9 of the existing low and intermediate waste storage
10 operation on the Bruce site, the independent assessments
11 of long term options carried out by Golder Associates on
12 behalf of Kincardine and OPG, the community decision to
13 select the Deep Geologic Repository and why OPG supported
14 that decision and, finally, an overview of the proposed
15 repository and the planned geological site investigation.

16 The Western Waste Management facility is
17 located on the Bruce site and is owned by OPG. The
18 facility has stored low- and intermediate-level waste from
19 Pickering, Bruce and Darlington for more than 30 years.
20 The current capacity of the storage structure is 82,000
21 cubic metres. Some time ago, OPG obtained EA approval for
22 up to a further 80,000 cubic metres of storage. With this
23 capacity OPG could continue to accept all low- and
24 intermediate-level waste arising from its 22 reactors for
25 many more years to come.

1 OPG is very proud of the safety and
2 environmental record of the facility. Emissions have
3 always been less than .1 per cent of the regulatory limit.
4 We've operated for 11 years without a single lost time
5 accident. The facility has ISO 14001 registration. We
6 have achieved a level 8 on the International Safety Rating
7 system and this is considered upper quartile.

8 We transported radioactive materials,
9 shipments for 30 years. We have no releases to the
10 environment and no injuries, and this includes all of the
11 shipments of low and intermediate waste from Pickering and
12 Darlington.

13 OPG's mission is to operate safely and to
14 do so in harmony with the communities in which we do
15 operate. OPG considers itself part of the Bruce
16 community. We have 160 staff who live here. We keep the
17 community informed and provide regular briefings. We
18 participate in and support community events. Public
19 attitude research carried out in 2003 indicated more than
20 90 per cent acceptance of our operations.

21 OPG has pursued cooperative initiatives
22 with the Saugeen Ojibway nations since the late 1980s.
23 Some of them are listed here: the bridging programs, a
24 jointly-initiated archaeological assessment; protocols for
25 access to the burial grounds and the white fish and the

1 diet survey. We have also hosted visits to the west
2 facility.

3 In the early 1990s, the then Ontario Hydro
4 established a strategy to manage nuclear waste in a safe,
5 environmentally and socially and financially-responsible
6 way. OPG's 1999 reference plan assumed that a permanent
7 repository for low- and intermediate-level waste would be
8 available in 2015 or later. This plan was primarily for
9 financial planning purposes and no particular technology
10 and certainly no site was defined. The financial plan was
11 aimed at ensuring that future generations would not bear
12 the costs of long term management. In the case of low and
13 intermediate waste, long term management would be financed
14 from the Waste and Decommissioning Fund which is now fully
15 funded at \$4.2 billion.

16 In 2001 the municipality of Kincardine
17 approached OPG regarding the long term plans for low- and
18 intermediate-level waste and this resulted in a memorandum
19 of understanding of this committee to both parties to
20 jointly review options with respect to technical
21 feasibility, social, economic and environmental impacts
22 and potential community hosting agreements.

23 We subsequently jointly selected Golder
24 Associates to carryout an independent assessment of
25 available options.

1 The options studied in detail were enhanced
2 processing, surface vaults and a deep geologic repository.
3 These options were chosen because they were already in
4 operation in different parts of the world. Kincardine
5 counsellors toured facilities in Europe and the United
6 States and spoke with elected officials in the host
7 communities.

8 Public consultation included open houses
9 and news lectures in Kincardine and the four surrounding
10 communities; interviews with community leaders, public
11 attitude research and a dedicated website.

12 The Golder Associates' Independent
13 Assessment Study concluded that all three options were
14 technically feasible, there would be no adverse social,
15 economic or environmental impacts and that the Bruce site
16 geology was ideally suited for deep repository.

17 In April 2004 by resolution of Kincardine
18 Council, OPG was requested to pursue the Deep Geological
19 Repository option. Four months later, the OPG Board of
20 Directors approved the DGR proposal because it's based on
21 proven technology and is consistent with international
22 best practice. It will provide the highest level of
23 safety in the long term. It is a permanent solution and
24 avoids passing undue burdens to future generations.
25 External experts advised that the Bruce geology was

1 ideally suited for this kind of facility and, of critical
2 importance it was requested and supported by the
3 community. OPG fully recognizes that a project of this
4 nature cannot succeed without the support of the host
5 community.

6 In October 2004 OPG and Kincardine entered
7 into a hosting agreement based on several precedents
8 including an agreement between the federal government and
9 the community of Port Hope. Another example is, for
10 instance, in Spain, Switzerland and the United States.

11 The agreement provides for OPG to seek
12 regulatory approval for a Deep Geologic Repository that
13 would take only the existing low- and intermediate-waste
14 streams from OPG on the facilities. This specifically
15 does not allow used fuel to be placed in the repository.
16 It provides for Kincardine and the surrounding communities
17 to receive \$24 million in net present value paid over a
18 30-year period. It requires confirmation and support from
19 Kincardine residents.

20 To meet that requirement, Kincardine and
21 OPG carried out an extensive community consultation
22 followed by a telephone poll aimed at seeking the views of
23 every resident in Kincardine 18 years and older. During
24 the three years leading to the poll, the information
25 provided included opening a community consultation centre

1 on the main street in Kincardine, 200 media articles, 150
2 presentations to local groups and 20,000 pamphlets
3 delivered to local residents.

4 The questions raised included the value of
5 the hosting agreement, would used fuel be placed in the
6 repository, the impact of an earthquake and will
7 groundwater quality be affected? A telephone poll
8 conducted by an independent company appointed by
9 Kincardine endorsed the proposal.

10 In parallel with the consultation with
11 Kincardine and the surrounding communities, OPG has also
12 been communicating with the Saugeen Ojibway nations on the
13 DGR since 2003. More than 25 meetings have been held
14 including open houses and a workshop. OPG has also
15 provided funding for first nations to have their own
16 expert review the Golder Assessment Report, for a
17 communications advisor and to start an environmental
18 office to facilitate review of the DGR and their projects.

19 OPG is committed to working with First
20 Nations in providing funding for further reviews of the
21 DGR.

22 I will now briefly describe the proposed
23 DGR concept. The repository will be located 660 metres
24 below the Bruce site adjacent to the existing low and
25 intermediate storage facility. It would have capacity for

1 approximately 160,000 cubic metres of waste from OPG-owned
2 generating stations and the low- and intermediate-level
3 waste currently stored at the surface will be transferred
4 to the DGR.

5 This overhead which is vertically
6 exaggerated illustrates the geology in the vicinity of the
7 Bruce site with the Niagara Escarpment situated 100
8 kilometres to the east and Lake Huron to the west.

9 The regional geology is part of the
10 Michigan Basin. This is a well-understood sedimentary
11 geologic structure defined in part by bedrock outcroppings
12 and many deep boreholes. This sedimentary sequence is
13 approximately 830 metres thick and comprises horizontal
14 layers which include shells, limestone and other
15 formations that range in age from 350 to 540 million
16 years.

17 A significant source of understanding is
18 derived from the Texaco well situated three kilometres to
19 the east of the site. This borehole was drilled through
20 the sedimentary layers down into the granitic bedrock.

21 The repository is purposely positioned at a
22 depth of 660 metres within a 200-metre thick layer of low
23 permeability limestone. Above the limestone is a 200-
24 metre thick layer of low permeability shale. The
25 groundwater at the repository depth is expected to be

1 highly saline; many times that of seawater.

2 As illustrated on this overhead, the
3 repository is situated more than 500 metres below any
4 source of drinking water.

5 The long term safety case is based on
6 multiple lines of reasoning. The repository is located in
7 low permeability limestone, beneath the protective cap of
8 low permeability shale. Significant radioactive decay
9 would occur prior to the movement away from the
10 repository. Any radionuclides that did move away would
11 move less than one millimetre per year in the limestone
12 and the shale. These rock formations have remained stable
13 through hundreds of millions of years despite seismic
14 activity and major climate change, including multiple
15 periods of glaciation.

16 Water is highly salient at the repository
17 depth; this indicating that it has been trapped for
18 millions of years. The estimated dose to humans peaks
19 after many thousands of years and is orders of magnitude
20 below the international standards.

21 Other countries have successfully licensed,
22 built and are now operating geologic repositories for low-
23 and intermediate-level waste. These include Sweden,
24 Finland and the United States. The two facilities shown
25 here in Sweden and New Mexico were visited by Kincardine

1 Council and OPG, including discussions with local
2 community officials.

3 Notwithstanding the high level of
4 confidence provided by the existing understanding of the
5 site geology, OPG intends to carry out an extensive
6 investigation to verify the geology. A geoscientific site
7 characterization plan has been developed by INTERA
8 Engineering and reviewed by an independent geoscience
9 review group. This group comprised of geoscientists from
10 four countries and has over 80 years of collective
11 experience in the geoscience of radioactive waste
12 management.

13 The function of the group is to assess the
14 adequacy of the plan and the investigations. The
15 investigations will be conducted in a stepped-wise manner
16 over a period of five years and will include, amongst
17 other activities, deep boreholes and seismic surveys. The
18 site investigations have purposely designed to test the
19 current understanding as it relates to repository safety.
20 The geosynthesis work will provide an integrated picture
21 of the site.

22 This next overhead provides an outline of
23 the overall milestone and decision points prior to the
24 start of operation of the repository. The pre-project
25 work has taken five years. The licensing and construction

1 work is expected to take a further 12 years. This is
2 largely influenced by the time to complete a thorough site
3 investigation.

4 This final slide provides a summary. OPG
5 has been safely storing low- and intermediate-level waste
6 at the Bruce site for more than 30 years and has the
7 capacity to do so for many more years to come.

8 Kincardine approached OPG to consider long
9 term options. An independent study concluded that there
10 will be no adverse environmental, social or economic
11 effects resulting from any of the three options studied,
12 including the proposed DGR. The community subsequently
13 requested OPG to proceed with a DGR for existing low- and
14 intermediate-level waste streams stored at the Bruce site.
15 OPG agreed. The proposal uses proven technology and is
16 consistent with best international practice. It would
17 result in increased margins of safety, orders of magnitude
18 better than the existing facility and regulatory limits.
19 It would move existing waste streams from a safe to a
20 safer place in the long term.

21 The geology at the Bruce site is ideally
22 suited for this purpose. Finally, the repository will
23 provide a long term solution. Notwithstanding this high
24 level of confidence, OPG plans an extensive technical
25 evaluation and studies to verify safety.

1 Thank you.

2 **THE CHAIRPERSON:** Thank you, Mr. Nash.

3 Before opening the floor for questions,
4 we're going to move to the presentation by the CNSC staff.
5 This presentation is outlined in CMDs 06-H22, 06-H22A.
6 I'm going to turn the floor over to Mr. Barclay Howden,
7 the Director General responsible.

8 Before I do so, I wish to note that Mr.
9 Howden is accompanied by Dr. Patsy Thompson who has
10 recently been appointed as the Director General, the first
11 Director General of the new Directorate of Environmental
12 Assessment and Protection.

13 I wish to note for the record that the CNSC
14 becomes the first nuclear regulator in the world to have a
15 separate senior executive dedicated to environmental
16 assessment and protection.

17 As such, Mr. Howden, you have the floor.

18

19 **06-H22 / 06-H22.A**

20 **Oral Presentation by**

21 **CNSC staff**

22

23 **MR. HOWDEN:** Thank you.

24 Good morning, Madame Chair and Members of
25 the Commission. For the record, my name is Barclay

1 Howden. As you stated, I am the Director General of the
2 Directorate of Nuclear Cycle and Facilities Regulation.

3 With me today at the front table are Dr.
4 Patsy Thompson, Director General of the Directorate of
5 Environmental Assessment and Protection, and Mr. Michael
6 Rinker, Environmental Assessment Specialist within the
7 directorate.

8 In addition, we have staff from the CNSC's
9 licensing and environmental specialist divisions under the
10 leadership of Mr. Robert Lojk, Director of Wastes and
11 Decommissioning Division, and Mr. Christopher Taylor,
12 Director of Geosciences and Environmental Compliance
13 Division.

14 Ontario Power Generation indicated its
15 intent to prepare a site, construct and operate a Deep
16 Geologic Repository for the purposes of managing low- and
17 intermediate-level radioactive waste. The *Canadian*
18 *Environmental Assessment Act* requires that an
19 environmental assessment be conducted prior to making a
20 licensing decision on the proposal. Therefore, an
21 Environmental Assessment Track Report for that
22 environmental assessment has been prepared for the
23 consideration of the Members of the Commission.

24 I would now like to pass the floor to Dr.
25 Thompson, who will say a few words about the environmental

1 assessment process, in which CNSC is engaged on this
2 proposal.

3 Mr. Rinker will then provide a more
4 detailed presentation including CNSC staff's
5 recommendations for the Commission's consideration.

6 **DR. THOMPSON:** Thank you, Mr. Howden,
7 Members of the Commission. For the record my name is
8 Patsy Thompson.

9 As set out in the *Canadian Environmental*
10 *Assessment Act*, there are two possible assessment
11 processes, or as we will refer to the them today, tracks.
12 These are the screening track and the comprehensive study
13 track. Both of these environmental assessment tracks may
14 be referred to a mediator or review panel.

15 Projects that are described in the
16 comprehensive study list regulations of which the proposed
17 Deep Geologic Repository is one, must follow the
18 comprehensive study track, at least initially.

19 For any track, there are three main steps:
20 scoping of the assessments; secondly, conduct of the
21 technical studies and consultations and finally a decision
22 on the likelihood and significance of the project's
23 environmental effects. However, the way in which these
24 steps are completed and the involvement of different
25 stakeholders differs.

1 Normally in the past, the Commission has
2 been involved largely in screenings where the scoping
3 involves only the establishment of the bounds of the
4 studies to be carried out and the preliminary
5 consideration of public concerns for the purpose of
6 deciding whether to refer their project to a review panel
7 at that initial stage.

8 A recommendation for referral to a review
9 panel is entirely at the Commission's discretion in the
10 screening and that can be exercised at any time during the
11 course of, or following the completion of the screening
12 study report.

13 When a project starts down the
14 comprehensive study track such as is the case for the Deep
15 Geologic Repository, the process and types of information
16 that must be considered by the Commission at the initial
17 scoping stage is different. For comprehensive studies,
18 the responsible authority and the Minister of the
19 Environment must follow a process that ensures that there
20 is an explicit consideration of the need for a review
21 panel or a change in the EA track, the environmental
22 assessment track, early in the scoping and assessment
23 stages.

24 More specifically, the Commission, at this
25 stage, is not only presented with a draft assessment

1 guidelines document and a summary of any related public
2 concerns for consideration but also with a preliminary
3 assessment of the likely adverse environmental effects of
4 the project.

5 The Commission must consider both the
6 preliminary assessment and any public concerns when making
7 what is now an obligatory recommendation to the Minister
8 on whether the environmental assessment track should
9 remain a comprehensive study or proceed as a review panel.

10 The Commission may not proceed with the
11 environmental assessment as a comprehensive study until
12 and unless the Minister of Environment decides that a
13 comprehensive study is the appropriate environmental
14 assessment track.

15 If the Minister refers the project back to
16 the Commission to continue the comprehensive study, no
17 further opportunity to change the environmental assessment
18 track to a review panel would remain.

19 However, if the Minister establishes a
20 review panel, the panel, after completing its work in
21 accordance with the terms of reference established by the
22 minister, would make recommendations on the project back
23 to the Minister. The Minister, in turn, must issue a
24 decision statement with respect to whether the project is
25 likely to cause significant environmental effects taking

1 describe the OPG proposal, indicate how staff determined
2 that the *Canadian Environmental Assessment Act* would be
3 applied, staff's understanding of the duties of the
4 Commission at this stage of the EA process, describe and
5 explain the purpose of the Environmental Assessment Track
6 Report that is before the Commission today, including an
7 overview of its proposed content and; finally, staff will
8 make recommendations on the Environmental Assessment Track
9 Report for the Commission's consideration.

10 Ontario Power Generation has proposed to
11 prepare a site, construct and operate a Deep Geologic
12 Repository on the Bruce Nuclear site. The purpose of the
13 repository is to manage low- and intermediate-level waste
14 that was and will be generated from OPG's nuclear
15 generating stations at Bruce, Pickering and Darlington.
16 Refurbishment waste from OPG's current nuclear generating
17 stations would also be placed into the repository.

18 All waste that is proposed to be managed in
19 the DGR is currently approved for management in the
20 Western Waste Management Facility located on the same
21 Bruce site. Indeed, a large amount of the waste that
22 would be destined for the Deep Geologic Repository is
23 currently stored at the Western Waste Management Facility.

24 The physical works associated with the
25 project include above and belowground facilities. Surface

1 facilities would include physical works for underground
2 access, ventilation buildings and related infrastructure.
3 Belowground facilities would include shafts or ramps in
4 emplacement rooms and service areas.

5 The undertakings in relation to these
6 physical works would include preparation of the site,
7 construction of the facility, retrieval of waste from the
8 Western Waste Management Facility, placement of waste into
9 the repository and, finally, the long-term operation of
10 the facilities.

11 Under the Class 1 Nuclear Facilities
12 Regulations, the Deep Geologic Repository is identified as
13 a Class 1B nuclear facility. CNSC authorization of this
14 project would require the issuance of a site preparation
15 and construction licence followed by the issuance of an
16 operating licence.

17 The consideration of licence applications
18 for the Deep Geologic Repository by the Commission would
19 be made using the public hearing process. Public hearings
20 on licensing would give affected parties and members of
21 the public an opportunity to be heard before the
22 Commission.

23 For the Deep Geologic Repository, an
24 environmental assessment must be completed. If there is a
25 decision that the project would not likely cause

1 significant adverse effects on the environment, then the
2 CNSC may consider Ontario Power Generation's licensing
3 applications.

4 This slide provides a very generalized view
5 of the process that OPG would enter in order to receive
6 approval for the proposed Deep Geological Repository.

7 The first step in this process indicated by
8 the numeric digit "1" is the initiation of an
9 environmental assessment. The second step indicated in
10 this slide by the red star is our current step in the
11 process; that is, consideration of an Environmental
12 Assessment Track Report and a recommendation to the
13 Minister of Environment. The third step in the process
14 would be the Minister of Environment's decision on whether
15 to refer the project back to the CNSC as a comprehensive
16 study or to a review panel. In either case, the
17 environmental assessment would need to be completed with a
18 decision as to whether the project would be developed and
19 operated in a way that would provide protection to people
20 and to the environment.

21 If the environmental assessment is complete
22 and indicates that both the environment and the health of
23 people would be protected, the CNSC could consider OPG's
24 application for a licence.

25 The CNSC requires a phased licensing

1 approach whereby separate licences would be considered at
2 different stages of the project, such as consideration of
3 a site preparation and construction licence followed by
4 the consideration of an operating licence. The project
5 would be assessed at each phase of licensing.

6 Environmental assessment is emphasized on
7 this slide because this is the current process we have
8 entered into. However, the licensing process, should we
9 enter into that phase, would require a rigorous assessment
10 and include transparent decision-making by way of public
11 hearings.

12 OPG's proposal involves the project as
13 defined in section 2 of the *Canadian Environmental*
14 *Assessment Act*. CNSC's authorization of the projects
15 would require the issuance of a licence and therefore
16 there is a trigger for an environmental assessment under
17 the *Canadian Environmental Assessment Act*.

18 The proposal would involve a new Class 1B
19 facility on a site that is not within the boundaries of an
20 existing licenced nuclear facility and that would be used
21 for the disposal of radioactive nuclear substances. As
22 such, under the Comprehensive Study Regulations of the
23 *Canadian Environmental Assessment Act* and pursuant to
24 section 21 of that Act, the CNSC must ensure that a
25 comprehensive study is initiated and that an Environmental

1 Assessment Track Report is provided to the federal
2 environmental -- federal Minister of the Environment.

3 The CNSC will be the only responsible
4 authority for the assessment. Through the application of
5 federal coordination regs, the CNSC have determined that
6 Health Canada, Environment Canada and Natural Resources
7 Canada are federal authorities for the purpose of the
8 assessment. There are no provincial requirements for an
9 environmental assessment under provincial legislation.

10 The Canadian Environmental Assessment
11 Agency is the federal environmental assessment coordinator
12 for this assessment.

13 As the responsible authority, the CNSC has
14 certain obligations under the *Canadian Environmental*
15 *Assessment Act*. These obligations would be the same for
16 all comprehensive studies brought before the Commission at
17 this stage of the process. The responsibilities include
18 establishment of the scope of project, the factors and the
19 scope of the factors that are collectively called the
20 "Scope of the Assessment"; consult the public on the Scope
21 of the Assessment and on the ability of the Comprehensive
22 Study to address issues relating to the project; provision
23 of a report to the Minister of the Environment. This
24 report is the subject of today's hearing and contains the
25 Scope of the Assessment and other required information.

1 Finally, the responsible authority must
2 make a recommendation to the Minister of Environment on
3 either to continue with the environmental assessment by
4 means of a Comprehensive Study or to refer the project to
5 mediation or a review panel.

6 Pursuant to section 21(2) of the *Canadian*
7 *Environmental Assessment Act*, the Commission is required
8 to provide this report. The report referred to today as
9 the EA Track Report is provided in CMD 06-822. The
10 content of the report satisfies the requirements of the
11 *Canadian Environmental Assessment Act* and includes the
12 Scope of the Assessment, public concerns in relation to
13 the project, the potential for the project to cause
14 adverse environmental effects and the ability of the
15 Comprehensive Study to address issues relating to the
16 project. I will discuss this information in more detail
17 in the following slides.

18 The Commission must also recommend to the
19 Minister of Environment to continue the EA of the
20 Comprehensive Study or to refer the project to a mediator
21 or a review panel. I will present staff's recommendations
22 to you later in this presentation.

23 CNSC staff have developed an Environmental
24 Assessment Scoping Document for this assessment. The
25 Scoping Document contains a detailed description of the

1 Scope of the Assessment much like environmental assessment
2 guidelines they are developed for screening environmental
3 assessments.

4 The scope of the project refers to those
5 components of the proposal that are considered part of the
6 project for the purposes of an environmental assessment.

7 I would emphasize that all components of
8 OPG's proposed project were scoped into this assessment.
9 The factors to be considered in the assessment are based
10 on legislative requirements in paragraph 16(1) and 16(2)
11 of the *Canadian Environmental Assessment Act*.

12 In addition, with the discretion allowed
13 for in paragraphs 16(1)(e) of the *Canadian Environmental*
14 *Assessment Act*, the EA would also require the purpose of
15 the project from OPG's perspective and consideration of
16 traditional and local knowledge.

17 The scope of the factors for the assessment
18 identifies the specific information requirements and
19 methodologies that will be used in the conduct of this
20 assessment. The draft Scoping Document was circulated to
21 federal departments for review. Natural Resources Canada
22 and Health Canada found the Scoping Document to be
23 acceptable. Environment Canada provided some comments,
24 all of which were incorporated into the document.

25 The Scoping Document provides particular

1 emphasis on aspects of the technical assessment and on the
2 plan for consultation. Alternative means of carrying out
3 the project were of particular concern to some members of
4 the public. This section was altered to specifically
5 require the assessment of several alternatives such as
6 deep, shallow and surface facilities, engineered barriers
7 versus natural surround and to provide a comparison of the
8 status quo; that is, continued management of the Western
9 Waste Management Facility.

10 There is also an emphasis on assessing the
11 project over the long term. Although the proposal is for
12 site preparation, construction and operation of the
13 facility, the scope of the assessment requires a detailed
14 assessment of the long term safety of that facility.

15 Staff are proposing that the CNSC retain
16 much of the requirement to consult. For example, the CNSC
17 would consult the public on valued ecosystem components
18 and on scenarios that would be developed to assess
19 abnormal operations, malfunctions and accidents and on
20 alternative means.

21 OPG would be delegated consultation on
22 their proposed project and consultation on the results of
23 technical assessments. However, CNSC staff would retain
24 the responsibility to consult the public on CNSC
25 interpretation of the technical studies and then

1 conclusions and recommendations outlined in the draft
2 Comprehensive Study.

3 To facilitate public awareness of the
4 environmental assessment, the project was identified in
5 the Canadian Environmental Assessment Registry and on the
6 CNSC website. A public registry is maintained of all
7 documents pertaining to this review. The public was
8 invited to review and comment on the Scoping Document as
9 well as the ability of the Comprehensive Study to address
10 issues. The consultation period was from June 5th to July
11 17th, 2006.

12 The Scoping Document was posted on the
13 CNSC's and the CEA agency's website in both official
14 languages. The document was made available in public
15 libraries throughout the region and mailed directly to
16 more than 60 groups and individuals that had expressed an
17 interest in this current assessment or in Bruce Power and
18 OPG projects in the past.

19 An open house was held in the region in the
20 early part of the consultation period. The purpose of the
21 open house was to assist members of the public participate
22 in the process. The open house was advertised by radio
23 broadcast, newspaper advertisements, direct mailing and
24 the provision of posters throughout the region.

25 By the end of the consultation period, 44

1 written submissions were received by CNSC staff. Separate
2 meetings and discussions were held with First Nations.
3 The result of these discussions will be discussed later in
4 the presentation.

5 The Environmental Assessment Track Report
6 contains a summary of public concerns in relation to the
7 project. This section of the report represents the
8 concerns expressed to CNSC staff prior to today's hearing.
9 The submissions represented a varied response; some
10 members of the public expressed support for the project
11 while others expressed concern for the project.

12 The following concerns were specifically
13 expressed in relation to OPG's proposed Deep Geologic
14 Repository: There was some concern that the proposed
15 location is too close to Lake Huron. There is some
16 concern that the project is of a precedent-setting nature
17 for waste disposal in Canada and should be assessed with
18 additional rigour. There is concern with the long-lived
19 nature of nuclear substances associated with this project.
20 There is concern that the sedimentary rock is either not
21 suitable or not proven to be suitable for this type of
22 project. There is concern that groundwater movement is
23 not predictable and that the environmental effects would
24 therefore not be predictable with certainty. There is
25 concern that the facility would leak and therefore not

1 perform as anticipated and there is concern that the
2 project would put further stress on the Great Lakes which
3 are already under considerable stress.

4 The Environmental Assessment Track Report
5 contains a brief analysis of the potential for the project
6 to cause adverse effects. The assessment was based on the
7 following: OPG's project description and CNSC staff's
8 knowledge of the scenarios and analytical techniques used
9 to develop the project description; staff experience with
10 existing waste management practices at the Western Waste
11 Management Facility and other facilities in Canada that
12 are designed to manage nuclear substances indefinitely;
13 and finally, staff knowledge of international practice and
14 experience with geologic repositories.

15 I would emphasize that this section of the
16 Environmental Assessment Track Report does not prejudice
17 the outcome of the environmental assessment. This
18 analysis is based on how the Deep Geologic Repository
19 would be expected to form and does not consider abnormal
20 events such as malfunctions or accidents or unexpected
21 findings that would result from a more rigorous assessment
22 of geologic and hydrogeologic conditions at the site.

23 Potential project environment interactions
24 are provided in a table in the EA Track Report. These are
25 located in Appendix 4 of that report. Effects that may

1 occur during site preparation and construction would be
2 related to the management of excavated rock, clearing of
3 terrestrial vegetation and dewatering of the facility.
4 These effects would be typical of large scale construction
5 projects and are understood and could be mitigated.

6 Hydrodynamic containment would be
7 maintained during the operation period of the facility.
8 Therefore, the risks associated with this project during
9 the operational period would be related to the handling of
10 the material and ventilation of the Deep Geologic
11 Repository. These effects would be similar to those of
12 the currently authorized Western Waste Management
13 Facility, of which there is more than 30 years of
14 monitoring and experience. The facility would be
15 isolated from surface after operation. Therefore, effects
16 would be restricted to those that would result from the
17 potential leakage of nuclear substances into the
18 groundwater and transport of these nuclear substances to
19 surface water or well water.

20 Based on preliminary information of geology
21 and hydrogeology, it is expected that the transport of
22 radio nuclides would be slow and would be diffusion
23 dominated and would not result in a measurable change to
24 either surface water or well water.

25 The environmental assessment track report

1 provides a discussion of the ability of the comprehensive
2 study to address issues. CNSC staff, together with
3 federal authorities, have the experience and skills to
4 provide a technical assessment of this project in its
5 entirety. A technical review of this project can
6 therefore be entirely managed within the context of a
7 comprehensive study.

8 Members of the public had requested that
9 the scope of the assessment be changed to include specific
10 elements such as additional scenarios, including an
11 assessment of transport and decommissioning waste in the
12 assessment. The request also included alternatives to
13 incineration and included nuclear phase out as an
14 alternative, and including federal policy on the
15 management of low- and intermediate-level waste.

16 Some of these suggestions were accepted by
17 CNSC staff and some were not. Because environmental
18 assessment is a planning tool used by the federal
19 government to assess proposed projects it was staff's
20 opinion that the scope should not include those activities
21 currently authorized under the *Nuclear Safety and Control*
22 *Act*. Because much of the waste is already stored at the
23 Western Waste Management Facility the need for the project
24 would remain regardless of provincial energy policy.

25 It was, therefore, the opinion of staff

1 that policy decisions, such as nuclear phase out, would be
2 beyond the scope of an environmental assessment for this
3 specific project. Similarly, federal policy on the
4 management of low- and intermediate-level waste would be
5 beyond the scope of an environmental assessment for a
6 specific project. The project represents one licensee's
7 proposal to manage waste and does not represent a federal
8 initiative on waste management in general.

9 Although a review panel would have the
10 flexibility to broaden the scope of an environmental
11 assessment beyond the mandate of the CNSC, it is unlikely
12 that a review panel would include these scoping issues
13 because they are not directly related to the project being
14 proposed.

15 It is, therefore, the opinion of CNSC staff
16 that a comprehensive study could address the technical
17 issues of the project and could also address the relevant
18 scoping issues that were raised during the consultation
19 period.

20 The Chippewa's of Saugeen First Nation and
21 the Chippewa's of Nawash Unceded First Nation,
22 collectively referred to as the Saugeen Ojibway Nation,
23 reside near the proposed site for the Deep Geologic
24 Repository. CNSC staff's preliminary analysis indicates
25 that the Saugeen Ojibway Nation have potential and

1 established aboriginal and treaty rights that may be
2 impacted by the proposed project which could trigger the
3 Crown's duty to consult with the potentially affected
4 First Nations.

5 CNSC staff are of the opinion that the
6 environmental assessment consultation process would need
7 to be tailored in order to ensure that the Saugeen Ojibway
8 Nation are adequately engaged to provide meaningful
9 consultation. The purpose of consultation at the
10 environmental assessment stage would be to identify First
11 Nation concerns with the project that may need to be
12 accommodated should the project proceed to licensing.

13 Discussions to date have been constructive
14 and informative but constrained by the environmental
15 assessment process schedule. Staff proposed a separate
16 environmental assessment consultation process for the
17 Saugeen Ojibway Nation that could be managed within the
18 context of a comprehensive study. However, the period of
19 time available was insufficient to allow CNSC staff and
20 the Saugeen Ojibway Nation to fully develop an appropriate
21 consultation plan. The consultation plan put forward by
22 staff and attached to CMD 06-H22.A would only be feasible
23 if both parties agree to engage in such a process.

24 The Saugeen Ojibway Nation did not provide
25 comments to date on this proposed approach but did contend

1 that a panel review would meet their needs for an exchange
2 of information between the Crown and the Saugeen Ojibway
3 Nation.

4 The approval being sought from the
5 Commission today is for the environmental assessment track
6 report. The acceptability of the proposed project would
7 be the subject of later decisions.

8 CNSC staff recommends that the Commission
9 approve the environmental assessment track report for
10 Ontario Power Generation's proposal to prepare a site,
11 construct and operate a Deep Geologic Repository for low-
12 and intermediate-level radioactive waste as presented in
13 Appendix A at CMD 06-H22.

14 By approving the environmental assessment
15 track report, the Commission would also be approving the
16 scoping document, acceptance of the adequacy of the
17 information that would be provided to the Minister of
18 Environment, providing a recommendation to the Minister of
19 Environment to refer the assessment back to the CNSC as a
20 comprehensive study, delegation of technical studies to
21 Ontario Power Generation and delegation of certain public
22 consultation activities and retention by CNSC of a large
23 portion of the required public consultation for this EA.

24 Thank you.

25 **MR. HOWDEN:** Madam Chair, that concludes

1 staff's presentation. We are prepared to respond to
2 questions.

3 Thank you.

4 **THE CHAIRPERSON:** Thank you.

5 Before we go into the question period I
6 would just like to clarify a number of things,
7 particularly because we're in the community and it's
8 important that certain things be clear.

9 First of all, the role of the Commission
10 today is to not licence the facility. It is the very
11 beginning of a process that is required by Canadian law to
12 ensure that we understand what the impact of this project
13 would be before we would be allowed to go into the next
14 stage of licensing. So we're at a very preliminary stage.
15 So the decisions that the Commission will make coming out
16 of the proceedings today will not be to go ahead with the
17 project per say, it's to start the environmental
18 assessment project.

19 Secondly, the Commission -- when people
20 refer to the CNSC there is actually two parts of the CNSC.
21 One part of the CNSC, which is generally referred to as
22 the Commission, are the people that are sitting with me
23 today. I and my colleagues are members of the Commission.
24 The Commission is a quasi-judicial independent tribunal of
25 the Canadian government. Its independence is because it

1 was created to be independent from the government. The
2 government does not, nor the officials of the government,
3 have anything to do with the decisions that we make. We
4 make them in independent spirit and we put out what those
5 decisions are with reasons for decision.

6 We are operating today under the *Canadian*
7 *Environmental Assessment Act*. The majority of our
8 activities take place under the *Nuclear Safety and Control*
9 *Act*. In either way, the Commission is responsible totally
10 for its decision and the deliberations it makes today.

11 We are appointed by what is called a
12 Governor in Council. That means that we are appointed for
13 a term, which is independent because we serve at good
14 behaviour, which means that we cannot be removed before
15 our term is up unless there is a significant legal issue.
16 So we are independent.

17 The CNSC staff works for the Commission.
18 They are the employees of the Commission, and they do, by
19 far, most of the work that takes place that brings them
20 here today. However, they make recommendations to the
21 Commission and again, the Commission is independent in how
22 it makes its decision.

23 So I hope that clarifies what can be
24 sometimes confusing, is that there is a Commission and
25 there is CNSC staff, and clearly there is a technical

1 basis. The members of the Commission are not or never
2 have been members of the nuclear industry. We are experts
3 in our own fields and the government is very grateful for
4 the Commission members agreeing.

5 Just to give you a sense of the eminence,
6 we have two Orders of Canada, a member of the Order of
7 Quebec and a member of the Order of Saskatchewan as
8 members of this Commission. So we are very lucky to have
9 eminent Canadians to take part in this and two of those
10 honoured Canadians are with me today.

11 What we are going to do now is just take a
12 15-minute break. I would like you to be quite diligent in
13 your time, watching your time because we will come back
14 and start questioning after that 15-minute break.

15 Thank you for attending so far.

16 --- Upon recessing at 10:25 a.m.

17 --- Upon resuming at 10:41 a.m.

18 **THE CHAIRPERSON:** Ladies and gentlemen, if
19 I could ask you to take your seats, please. We're ready
20 to start.

21 The Commission will proceed with questions
22 that will be addressed to either the licensee or to the
23 staff and we will go in rounds, so we'll start at one end
24 -- the Commission will proceed and we'll proceed with
25 rounds of questions until we've satisfied ourselves and

1 then after this question period we will start with the
2 interventions. So we will start now with questions to OPG
3 as the licensee and to CNSC staff and we will start with
4 Dr. Christopher Barnes.

5 **MEMBER BARNES:** Thank you, Madam Chair.

6 Maybe if you'd allow me, Madam Chair, I'd
7 just like to make a couple of comments and partly to
8 phrase, really, some of my initial questioning.

9 I really do think this is a rather
10 momentous point. The issue of nuclear waste has been with
11 us for some decades now. There have been many studies and
12 there are really the two categories; the ones that we're
13 here today which is the low level and intermediate level
14 and then separately and really quite separately are the
15 nuclear fuel issues. But to my knowledge most of the
16 considerations of where to bury waste, if it is to be
17 buried, in Canada have been focused on crystalline
18 basement rocks in the Canadian Shield, for the most part
19 looking at high-level nuclear waste, but as I recall,
20 these two issues were never really separated in earlier
21 discussions.

22 And so I do make the observation that I
23 think much of the research that went on in Canada in the
24 issue of where to bury nuclear waste from a -- I'll call
25 it a geological perspective, the investment of research

1 has been in crystalline basement rocks, not in sedimentary
2 rocks. And so part of this document is to convince us
3 that this is an appropriate place to put them and it
4 cannot really refer back too much to research in Canada
5 and so it addresses examples internationally where waste
6 repositories have been established over the last decade or
7 so. And I'd like to come back to that or I'm sure the
8 panel will in due course.

9 But because we're at the front end of a --
10 or the back end in a sense of a nuclear cycle, having had
11 reactors for 30 years and accumulated a lot of waste, all
12 of the low-level and intermediate-level waste for the last
13 30 years in Ontario now being essentially stored at a
14 surface on site and with potentially another 30 years to
15 go more or less of about the same volume of waste, this is
16 what we're looking at and to dispose of it in the
17 subsurface of the Bruce site.

18 So this to me is one of two major decisions
19 that essentially the country is going to make in terms of
20 long term storage of waste; one dealing with low-level and
21 intermediate waste and one eventually to look at high-
22 level waste. So we're here just to look at the beginning
23 of an EA process of looking at a Scoping Document to bury,
24 let's say, half of the -- well, the accumulated waste and
25 equivalent amount yet to come.

1 And so the facility that is being planned
2 here has to essentially be regarded as capturing something
3 like 60 years of accumulated waste, right, the past and
4 the present, at which point, after all that has been
5 stored and various tests, it will be then sealed and that
6 will be sort of hopefully the end of it. So it's very
7 important that we get this right because if we don't get
8 it right we could pay significantly in public concern as
9 well as costs in the future. And so I ask initially two
10 questions before going into some more detailed comments.

11 Because we've been given details by OPG of
12 the technical design, the anticipated technical design,
13 where it will be located in the subsurface, a facility
14 covering the order of 30 hectares at a depth of 600 metres
15 below the surface in a complex series of emplacement
16 rooms, chambers, it seems to me that this is going to be
17 the -- if it's approved and et cetera, that this is going
18 to be the low-level and intermediate-level waste for all
19 of Ontario.

20 So I ask the question -- two questions why;
21 why is it that we're not really considering
22 decommissioning waste? Because we know at the moment all
23 of this is coming from the nuclear plants at Bruce here
24 and Pickering and Darlington. We know not only are they
25 generating waste but those plants eventually will be

1 decommissioned and there will be a considerable amount of
2 decommissioning material that has to be disposed of and
3 presumably it would -- the idea would be to dispose of
4 this in the subsurface. This was alluded to in OPG's
5 documents, and in, I think, the initial CMD by staff they
6 seem to say that's really not part of what we're looking
7 at and then in some of the later documents because I think
8 some of the intervenors argued that it should be. As I
9 read it, staff thought, well, maybe it should be within
10 the sort of the scoping issue. So I shall ask a question
11 for both OPG and staff.

12 My second point is that it's now in the
13 public media, over the last year or so there has been
14 proposals to add new nuclear plants, some here at Bruce,
15 possibly four units and some potentially at Darlington,
16 perhaps a similar number. And so again this -- if you
17 stand back and look at where Ontario is to dispose of its
18 low-level and intermediate waste, we seem to be starting
19 in a sense at the threshold of a new set of nuclear
20 reactors in the province and it seems to me we should also
21 be asking the question, is the waste from the new reactors
22 logically to be located in this facility.

23 If it is, in the design of the facility and
24 its location and its scoping, that kind of thing, is it
25 something which is suitable for future expansion to

1 accommodate these sorts of additional reactors over the
2 kind of timeframes? Because part of what we're -- we've
3 been looking at in these documents is given some timeframe
4 for emplacement of waste and then sealing, et cetera. But
5 if in fact we're going to add a whole set of new reactors
6 that would last for another 30 years beyond that, then it
7 seems to me this facility would remain open for a
8 considerable period of time, right, for some decades if
9 that waste from the new reactors were to be included
10 within it.

11 So it seems to me, because this isn't just
12 a small sort of one-off issue, it really is making a
13 fundamental decision on where we put low-level and
14 intermediate waste for most of Canada's reactors. I don't
15 see why those two issues aren't being addressed within
16 this Scoping Document.

17 So if I could ask, first, OPG and then
18 staff to respond to those two key points.

19 **MR. NASH:** Thank you, Dr. Barnes. It's Ken
20 Nash. This is not about the future of nuclear power.

21 This process started in 2001. In 2001 the
22 prospects for future nuclear power were quite different
23 than they are today. This started because the community
24 of Kincardine, the leadership of Kincardine and OPG wanted
25 to work together to deal with the existing waste streams

1 that have been created and were potentially being created
2 by the existing generating stations. So it was very much
3 a contained issue that we were dealing with.

4 So there are no approved nuclear power
5 plants beyond the 20 in Ontario that we have now. So when
6 we started, we made the project description, it was
7 consistent with the original intent, to deal with the
8 existing waste streams because we have the responsibility
9 to do so. And the plan that was put forward, in the
10 opinion of the leaders of Kincardine and OPG, was a good
11 plan to deal with those existing waste streams. So it's
12 not about the future of nuclear power.

13 With regard to decommissioning waste, OPG
14 does have preliminary plans for decommissioning nuclear
15 power plants and those say that when the plants reach the
16 end of their life, they would be placed in safe storage
17 for a period of 30 years.

18 In terms of nuclear generating stations, we
19 have five in Ontario; Bruce A, Bruce B, Pickering A,
20 Pickering B and Darlington. None of those stations have
21 yet reached the end of their life. It will be a number of
22 years before any of them would do so. So we're looking at
23 a minimum, a minimum 40 years before there would be any
24 waste arising from decommissioning. That is a long way
25 down the line.

1 The other point is that it is by no means
2 certain that the best approach would be to centralize that
3 decommissioning waste.

4 For instance, in Finland, the plan is they
5 have two sites for nuclear power plants and the
6 decommissioning waste will be managed at those individual
7 sites. So it's 40 years away before we need to cross that
8 bridge and we decided that we really wanted to contain
9 this project to the existing waste streams.

10 **MEMBER BARNES:** If I could just interject
11 before we go to staff. Forty (40) years though, what
12 you're saying, let's not worry about that because it's 40
13 years away, but we are looking at waste that has
14 accumulated over 30 years, to repeat what I said before,
15 and this facility is to accommodate during the time life
16 of those reactors you just referred to. Then that
17 facility is to remain, in a sense, viable for some decades
18 until it's eventually sealed. So we are talking about a
19 facility that is going to be with us, functioning,
20 operating for 40 years or more.

21 **MR. NASH:** Ken Nash.

22 The end of the life of the generating
23 stations -- at the moment, we have Bruce A which could
24 operate until I think it's 2030ish and when that station
25 is shut down it would then be in safe storage, according

1 to the preliminary plan, for another 30 year. So after
2 the stations have operated and we're taking operational
3 waste here, there will be another period of 30 years
4 before the reactors would be decommissioned.

5 **MR. HOWDEN:** Barclay Howden speaking, for
6 the record.

7 There are two points. From the first point
8 of the new reactor builds, from CNSC staff's perspective,
9 the proposal is as Mr. Nash has stated for the existing
10 reactors, with the waste from them as they generate the
11 waste over the next 30 years. For the handling of the
12 decommissioning waste within the environmental assessment,
13 I'm going to ask Mr. Rinker to explain how that was
14 considered.

15 **MR. RINKER:** Mike Rinker, for the record.

16 In staff's determination of the scope of
17 project, that is based entirely on what OPG has proposed
18 in their project. They have proposed to manage low- and
19 intermediate-level waste from the existing nuclear
20 generating stations that they have in Ontario.

21 However, under the CEAA, there is a
22 requirement for a cumulative effects assessment and a
23 cumulative effects requires the consideration of any
24 potential future projects. Clearly there is an indication
25 that decommissioning waste is a potential future project.

1 There is evidence for that in their Memorandum of
2 Understanding with the Town of Kincardine, for example.
3 However, it is not a part of their proposed project.

4 Certainly in the scope of cumulative
5 effects, which would in part form the decision on -- the
6 significance of cumulative effects would in part form our
7 decision on the CEAA, decommissioning waste would be
8 required.

9 In addition, the issue you raised about
10 new-built reactors; if, for example, the management of
11 low- and intermediate-level waste from any proposed new-
12 built reactors had the potential to be managed in this DGR
13 that is also a potential future project that could fall
14 under a cumulative effects assessment.

15 What would happen, therefore, is that this
16 current project that is under assessment, there would be a
17 decision that would include assessment of these cumulative
18 effects. However, if OPG did require to come to us to
19 manage low- and intermediate-level waste from new builds
20 or to manage decommissioning waste in the DGR, a new
21 environmental assessment would be initiated for those
22 separate applications.

23 **MEMBER BARNES:** Thank you.

24 I can imagine the process. It's just I
25 still find it -- I question the logic knowing what is

1 likely to come, that we're here to look at -- just because
2 Mr. Nash says, "We started this process in 2001 and this
3 is the amount of waste we have; we know the amount of
4 waste that's going to be generated, so let's design a
5 facility for it". Right. As though nothing else is going
6 to happen, like a decommissioning waste or new-builds and
7 so on.

8 Because this is such a, in a sense, unique
9 facility being built in Canada and certainly as we can
10 compare it later, one of the larger ones that will be
11 built in the world and if you were to accommodate this
12 decommissioning waste, a certain portion of it, the low
13 and intermediate part of that waste and any future waste
14 from the new-builds, then you would presumably be building
15 a facility that had a capacity for expansion. The size of
16 ramps, the size of hoists and so on, might be larger. The
17 footprint might be different. You make a point in here
18 that the footprint is entirely within Bruce. If it was
19 double that would it still be entirely within Bruce. A
20 whole lot of other questions arise which are, seems to me,
21 a part of the scope that -- we were looking at Scoping
22 Document that fits a particular concept of what this
23 facility is, but I guess I'm challenging that these two
24 issues of decommissioning waste and new-builds, which
25 would logically be put into this -- I would have thought

1 logically, from an OPG management perspective, are not
2 being considered as part of the document.

3 So I'll leave it at that, unless staff want
4 a further comment?

5 **DR. THOMPSON:** Patsy Thompson, for the
6 record.

7 Essentially, as a responsible authority
8 under the *Canadian Environmental Assessment Act*, the CNSC
9 is constrained in terms of the proponent's application, as
10 well as their project description and so the assessment
11 was scoped within those constraints but we have used,
12 essentially, the requirements in the *Canadian*
13 *Environmental Assessment Act* to consider future-planned
14 projects as well as foreseeable projects to include them
15 in cumulative effects assessment. So we have used the
16 authority of the *Canadian Environmental Assessment Act* to
17 properly scope the assessment but within the constraint of
18 the project description and OPG's application to the CNSC.

19 **MEMBER BARNES:** In this first round I'd
20 like to follow up on some things in which I have to get a
21 little specific, so some of the audience members might
22 need to bear with me here. Because one of the concerns I
23 have in the documents that have been provided by OPG is
24 what I would call a rather simplistic portrayal of
25 conditions. And it's not that this is just a matter, I

1 think, of communication of, say, complex issues to the
2 public or the Commission and so on. If this is what is
3 being portrayed, then it's also being portrayed at times
4 in community meetings and part of what we're looking at is
5 community support for the project, and if the community --
6 communities are being given a rather simplistic picture,
7 then perhaps the acceptance might be based on some
8 incomplete information or perhaps even false assumptions.
9 And so I'm going to look at this, if I may, in terms of
10 issues of stratigraphy and groundwater first and perhaps
11 engineering, excavation.

12 We're told that the -- and I'll just make a
13 couple of points from documents here, is that we are
14 looking at the end of the day at a very site-specific
15 repository, right? I mean, it's a 30-hectare thing. It's
16 roughly 600 metres below the Bruce plant. Although we may
17 be drawing comparisons with rock types in Niagara or
18 Darlington, they may vary by the time you get underneath
19 Bruce here. And it's simply a fact, quoting from the
20 Golder 203 study on page 46 in the information gaps that
21 "no subsurface information on the Bruce site in a sense
22 exists below 100 metres." And separate to that, we have
23 heard Mr. Nash indicate that we have a little bit of
24 information from the oil wells like Texaco number 6 well
25 that was drilled a few miles away.

1 But in truth, we have very little actual
2 subsurface information below the Bruce site, and so when
3 it comes down to talking about the impermeability or
4 fractures, groundwater flow rates, we don't have that
5 information. We just do not have it and some of the
6 arguments that are being made is that we shouldn't worry
7 about that because we know that these units are basically
8 nearly horizontal -- of course they're not horizontal
9 because that's why we have an the Niagara Escarpment and
10 the beds are dipping into the Michigan Basin, albeit
11 gently -- and that the statements are that the units are
12 basically similar over hundreds of kilometres and those
13 stratigraphic sections where you have the so-called layer-
14 cake stratigraphy are there.

15 If I could ask a few questions to OPG,
16 which I would like to give some examples that things might
17 be potentially a little bit more complex than that.

18 Could someone in OPG tell me what happens
19 to the Queenston formation, which you refer to having
20 particularly in Golder's work having geotechnical work
21 who've done this in the Niagara Falls area and you show a
22 picture of that, what happens to that formation if you
23 traced it along the Niagara Escarpment towards Manitoulin
24 Island?

25 **MR. JENSEN:** Madam Chair, Board Members,

1 Mark Jensen, OPG.

2 The Niagara -- the Queenston shale unit
3 peters out as you move north along the escarpment towards
4 Owen Sound and that's where it subcrops. It subcrops east
5 of the escarpment and dips in a southwest direction to the
6 centre of the basin near Saginaw Bay in Michigan.

7 **MEMBER BARNES:** And on Manitoulin Island?

8 **MR. JENSEN:** I don't know in Manitoulin
9 Island.

10 **MEMBER BARNES:** Well -- and where is this
11 Queenston formation being generated basically, the rocks
12 that are -- make up that unit?

13 **MR. JENSEN:** Where is it being generated?

14 **MEMBER BARNES:** Yes, where -- those are
15 siliciclastic red fine grain shales, siltstones, where are
16 those being derived from?

17 **MR. JENSEN:** They were being derived during
18 the building of the Appalachian mountain chain and were
19 deposited at -- in the Ordovician.

20 **MEMBER BARNES:** Being derived from, where
21 were they eroded from?

22 **MR. JENSEN:** From the -- the time it would
23 be from the -- well, the building of the Appalachian
24 mountain chain.

25 **MEMBER BARNES:** Right, from the east.

1 **MR. JENSEN:** Yes, from the east.

2 **MEMBER BARNES:** But the point is that these
3 are represented by red shales in, for example, Niagara but
4 by the time you get to Manitoulin, they're entirely
5 carbonates, all right? As you said, by the time you get
6 up to Wiarton, you're having an interfingering
7 relationship. So we have the limited information that we
8 have from the Texaco number 6 well that gives you a
9 thickness. Could I ask if those -- that well provided
10 cuttings or cores through the Queenston and Lindsay units?

11 **MR. JENSEN:** Mark Jensen. That well would
12 have provided cuttings to identify the various formations,
13 their thicknesses and depths and there was also
14 geophysical logs that allowed verification of those
15 thicknesses and depths.

16 **MEMBER BARNES:** Right. But on the Golder
17 Report which is Figure 3.3, which gives a map showing
18 basically the generation of many of these siliciclastic
19 from the Appalachians spreading eastward or north --
20 sorry, spreading west but it's north westwards, there is a
21 facies change, right? There's a -- or most of these
22 units. So the Queenston could be expected in this area to
23 include potentially some siltstone, potentially some
24 carbonates, all right. It need not be viewed as a
25 complete shale unit. Would you agree with that?

1 **MR. JENSEN:** There are beds within the
2 Queenston shale that could be carbonaceous, that's
3 correct.

4 **MEMBER BARNES:** No, under the site here,
5 which is what we're talking about, not elsewhere, would
6 you agree that since it's passing into carbonates as you
7 go north, going this general direction away from the
8 source, there is as good chance that the Queenston shale
9 has a significant amount of carbonate within it, limestone
10 beds?

11 **MR. JENSEN:** There are carbonate member
12 beds, carbonaceous member beds in the Queenston formation,
13 that's correct. And they're seen elsewhere in the
14 province as well. They're not just seen at distant points
15 to Bruce. They're seen at the Niagara Escarpment, for
16 example, at some of the quarries there that have been
17 drilled by the Ontario Geological Survey.

18 **MEMBER BARNES:** Right. The point I'm
19 making though is not -- I sense you're perhaps being a
20 touch defensive that there are -- it's not a question of
21 is there a limestone bed or some limestone beds. The
22 point I'm making is that the facies changes from a
23 dominantly shale-dominated siliciclastic further to the
24 east where the source is to a dominant carbonate one,
25 certainly on Manitoulin, and I would guess under Lake

1 Huron somewhere probably the Queenston passes into a
2 carbonate facies, and the fact is we don't have much in
3 the way of subsurface information in this region to know
4 under this site what the nature of the Queeston Shale will
5 be. Would you agree with that?

6 **MR. JENSEN:** That is the purpose of the
7 site characterization plan that we're mounting right now,
8 yes.

9 **MEMBER BARNES:** Okay.

10 So then the second unit, the unit
11 underneath that is the Georgian Bay formation; correct?

12 **MR. JENSEN:** That's correct.

13 **MEMBER BARNES:** And again this is referred
14 to as dominant shales, but again it has significant
15 numbers of limestone beds, siltstone beds, which certainly
16 are well seen. Again, it has the same relationship in
17 this basin. Basically, we have a period of mountain
18 building here; we have a fallen basin here providing
19 clastics, and as you come to the west and northwest, there
20 are more and more carbonates in this unit. In other
21 words, there's a facies change as you go westwards through
22 Ontario. So if you go to, for example, East Meaford Creek
23 near Wiarton, you see quite a number -- this is not a --
24 I'll say a totally shale unit. This is a shale, mixed
25 shale, siltstones carbonate unit. Would you agree with

1 that, at the north end of the escarpment, around Wiarton?

2 **MR. JENSEN:** It could be.

3 **MEMBER BARNES:** So the picture that we're
4 given in the documents is that above the location of the
5 proposed site, in the limestones that occur below that,
6 which is in the Lindsay Formation, we have "a blanket" of
7 200 metres of shale. A blanket, all right? Low
8 permeability shale. Again, I would say this is a
9 simplistic characterization. The impression is given of a
10 blanket of 200 metres of impermeable shale. I would
11 challenge that we know whether we have a blanket of 200
12 metres of low permeability shale. The likelihood is that
13 we have 200 metres of a mixed shale carbonate
14 siliciclastic component, which might have different
15 hydrogeologic properties than "a blanket of total shale".
16 Would you agree with that?

17 **MR. JENSEN:** I would believe that the --
18 that it does blanket and I clearly believe that the
19 understanding of the geology and the stratigraphy is that
20 this unit does extend for tens of kilometres and is
21 horizontally layered above the Lindsay limestones on which
22 the repository is to be excavated. I would suggest to you
23 that the hydrogeologic conditions in the Queenston shale
24 are understood from sampling elsewhere within the Michigan
25 Basin and clearly the fact that we have extremely saline

1 brines would be an indicator of extremely low
2 permeabilities existing in these rocks. So there are
3 indications that the permeabilities of these rocks, the
4 shales, the member beds as an aggregate are very low and
5 have been over periods of geologic time.

6 **MEMBER BARNES:** I will come to that in a
7 while but the issue is -- I think what I'm trying to get
8 at is the blanket is fine. I mean, there is clearly --
9 the wells show that there is a significant stratigraphic
10 unit. I'm just trying to say that the wording that is
11 portrayed here in the OPG documents is to give the
12 impression there is 200 kilometres of shale. I don't
13 believe there is 200 kilometres of shale which have that
14 sort of uniform hydrogeologic properties. I think there
15 is a good likelihood, and for the reasons I have given, of
16 there being interbedded carbonites, interbedded
17 siliciclastics in this which might give it a somewhat
18 different hydrogeologic property. I'm not trying to here
19 today argue what is down there because, as I started off
20 by saying, we have so little information that I don't know
21 and I don't believe OPG knows what's there and, as you
22 say, the purpose of the site characterization is to know
23 that.

24 What I'm trying to say is that the wording
25 that has been portrayed in these documents is simplistic

1 to give the impression, right, that we don't in a sense
2 need to worry about that because there is a cap of 200
3 metres of shale which provides an impermeable barrier.
4 I'm just saying that that's too -- for me, that's too
5 simplistic a portrayal of what is likely to be the real
6 geologic conditions there.

7 **MR. JENSEN:** I think our approach -- Mark
8 Jensen, OPG -- I think our approach has been to look at
9 multiple lines of reasoning in terms of coming up with the
10 messages that we have been sending about this particular
11 site. They've been based on geology and stratigraphy
12 which is well defined over decades of research in this
13 basin. They are based on an understanding of
14 hydrogeochemistry which is well understood and clearly
15 shows distinct signatures in the Queenston formations. We
16 certainly base it on work done in the Niagara frontier in
17 terms of hydraulic conductivity testing and boreholes
18 where its very precise work was undertaken. We look at
19 underground openings elsewhere in southern Ontario within
20 these same formations and what sorts of inflows they
21 experienced.

22 We have also looked at issues such as
23 glaciation and what sorts of effect glaciation may have
24 had on these sediments at these depths, these Ordovician
25 sediments that you speak of, and it's clear from the

1 picture we have with that information together that there
2 has been little effect and that the systems have remained
3 stable and stagnant over periods of geologic time.

4 **MEMBER BARNES:** I have a number of other
5 issues that I'll -- Madam Chair, you can tell me when my
6 time is up or if you would like to move on, I'll come back
7 in the second round.

8 But could I just turn to staff, and do you
9 have any comment on whether the portrayal of the so-called
10 blanket on top of the Lindsay should be characterized as
11 200 metres of shale in a sense of a uniform impermeable
12 layer versus the likelihood that I tried to portray that
13 this is a rather more complex internal stratigraphy to
14 that unit and different methodologies there that might
15 give it a different hydrogeologic properties?

16 **MR. HOWDEN:** Barclay Howden speaking. I'm
17 going to ask one of our geoscientists, Dr. Ben Belfadhel,
18 to respond to that question.

19 **DR. BELFADHEL:** Mahrez Ben Balfadhel, CNSC.
20 At this early -- at this very early stage
21 of the project, CNSC staff considers that OPG's
22 representation of the stratigraphy and geology is
23 conceptual and it is subject -- it will be subject to a
24 very detailed and comprehensive site characterization
25 program.

1 So having said that, CNSC staff looked at
2 the published information on the geology of southern
3 Ontario and our review did not identify any evidence or
4 issue that would suggest that the conceptual model is very
5 far from what one would expect. But as I said in the
6 beginning, this has to be confirmed through site-specific
7 studies.

8 **MEMBER BARNES:** Okay. I would like to turn
9 to the issue of the groundwater. Again, the impression is
10 given quite firmly that the groundwater in the areas below
11 the Queenston or including the Queenston and below, these
12 are very tight units, impermeable; that the groundwater
13 flow into the containment areas is essentially negligible
14 and is not an issue.

15 And the impression given, albeit as a so-
16 called conceptual document, but again a concern to me, is
17 that it's portrayed in rather simplistic terms; actually,
18 somewhat variable depending on which document you read but
19 the impression is that these groundwaters have been down
20 there for as long as the rocks were there, 500 years.
21 They are saline brines and therefore very old. Elsewhere,
22 they are referred to as at least a million years old and
23 so on. I'm not sure that it's easy to be precise there
24 but at least the impression is given that all that is
25 sealed and et cetera.

1 But I would like to ask when do you think
2 these -- from an OPG viewpoint, how old do you think these
3 brines are then? I'm talking about in the Ordovician
4 units.

5 **MR. JENSEN:** Mark Jensen, OPG.

6 There is considerable debate on the age of
7 those fluids. I think the one thing that you would find
8 agreement on is that they are of geologic age and they are
9 old. One group would suggest that they are seawater and
10 in fact were there at the time that these sediments were
11 deposited onto the ancient seafloor from which the shales
12 were deposited and others might suggest that they are
13 younger but we are dealing with periods of hundreds of
14 millions of years.

15 **MEMBER BARNES:** I think it is an issue of
16 how groundwaters are formed and how they are developed and
17 how they migrate and we are dealing with a sedimentary
18 basin in which it has experienced a number of not just the
19 one tectonic event, the tectonic we referred to before.
20 You're aware of the concept of tectonic pumping of
21 groundwaters?

22 **MR. JENSEN:** My understanding would be that
23 basically stresses in the crust would actually be a
24 mechanism to move the waters.

25 **MEMBER BARNES:** Well, it's also when there

1 are major layers building on the margins of a basin that
2 sufficient topography is generated in those areas that
3 there is essentially a hydrologic head developed and
4 therefore there is a pumping, a migration of fluids into
5 the subsurface basin pumping through that basin. So this
6 Appalachian Basin that we have already referred to goes
7 through three major organic events; right, one in the
8 Ordovician, one in the -- which is the tectonic, one in
9 Devonian, which is the rocks that we are sort of sitting
10 on here; another in the Pennsylvania and there is evidence
11 really of pumping. Grant Garvin has written about this
12 for at least a decade and so on, sufficient that these
13 drive large amounts of fluids, including hydrocarbons and
14 even the precipitation of lead zinc deposits far inland so
15 a lot of the lead zinc deposits that occur in the
16 Mississippi Valley. The Athabasca Tar Sands are an
17 example of this sort of migration.

18 So these are the kinds of situations that
19 appear likely in geologic processes -- not that one should
20 think of these because they are brines that are in these
21 so-called impermeable rocks, that things have not
22 migrated, all right? And since then there is also, during
23 their Cretaceous time, probably hotspot developments that
24 occurred in Ontario which, again, lifted the topography
25 significantly and it might have been another period of

1 changing groundwater influx into these -- into these
2 rocks. And then, as you indicated, the whole area has
3 been covered by glaciers and tremendous amounts of melt
4 waters that might in fact have generated the rather fresh
5 conditions in the Devonian to give it the contrast with
6 the more saline deposits at depth.

7 Now, in the documents that have been
8 provided and referenced, there's a paper reference by
9 Sherwood Lollar and Frappe, July 1989, and there is a note
10 by McNaught and others, so it's the same group. This was
11 actually a contract report on hydro chemical and isotopic
12 investigations of Ontario Hydro UN2 and OHDP1 boreholes.

13 Are you familiar with this report?

14 **MR. JENSEN:** Mark Jensen.

15 I am.

16 **MEMBER BARNES:** And what were the
17 conclusions in that report?

18 **MR. JENSEN:** The drilling of those two
19 boreholes, OHD1 at Lakeview and UN2 at Darlington. was
20 part of the sedimentary sequence study. In the case of
21 the studies at those wells were multidisciplinary. The
22 purpose was to drill the wells and obtain drill core to
23 understand the lithology and petrology certainly that
24 existed beneath those parts of Southern Ontario. There
25 was also some detailed hydraulic connectivity testing that

1 went on in that borehole and is reported by INTERA
2 Technologies.

3 Subsequent to that work, we installed some
4 instrumentation in these boreholes that, after a certain
5 period of time, the University of Waterloo went in and
6 actually sampled. This instrumentation we put into the
7 boreholes allowed the single borehole to be divided into
8 20 or 30 different intervals so that we could sample from
9 individual units.

10 The results of the chemical sampling
11 indicated that there was extreme brines in most cases.
12 What we saw was the waters with total dissolved solids in
13 excess of 250 grams per litre.

14 The report also indicated that there was
15 the likelihood of drill fluid contamination certainly of
16 some of the samples that had been collected, as indicated
17 by the fact that they had tritium in them and that an
18 interpretation of those data was not -- would have only
19 been preliminary or conceptual in nature.

20 **MEMBER BARNES:** I asked the conclusions.
21 Let me read the conclusions. These are on page 15 of that
22 report. It's a paragraph, Madame Chair, half a page.

23 "Geochemical and isotopic
24 investigations of these two sites..."

25 Remember this is in the same Ordovician

1 package that has been characterized as being impermeable
2 and where the repository will be located approximately.

3 "... geochemical and isotopic
4 investigations of these two sites
5 provide clear evidence of significant
6 migration, a mixing of subsurface
7 fluids in Palaeozoic sedimentary
8 sequences. Incursions of Cambrian
9 type brine..."

10 That's the rocks that lie below the
11 Ordovician ---

12 "... into Ordovician strata at these two
13 sites are significant and readily
14 identifiable via geochemical and
15 isotopic signatures. Furthermore,
16 these geochemical signatures clearly
17 indicate the fluid migration is
18 strongly influenced by stratigraphic
19 controls. This conclusion is
20 substantiated by the excellent
21 correlation between geochemical and
22 isotopic indications of fluid
23 migration by the mid-Ordovician
24 limestones. And the information on
25 the hydro geologic heterogeneities

1 within these formations determined by
2 the hydraulic testing by Ontario
3 Hydro. Ontario Hydro report H-89-039.

4 As I read this document, in rocks that have
5 been characterized by OPG where they would put their
6 repository as having impermeable with minuscule migration
7 rates, one of your own reports indicates that they're --
8 well, I just read it out. I don't need to repeat it.
9 This seems to be totally conflicting with the portrayal of
10 hydrogeologic conditions in the rocks in which you plan a
11 repository.

12 Would you like to respond to the apparent
13 dichotomy of opinions here?

14 **MR. JENSEN:** Mark Jensen, OPG.

15 The results of that testing program clearly
16 indicated, as I mentioned, the hydraulic packer testing
17 work that was done, and I'll ask Ken Raven to address that
18 in a moment. The results clearly indicated that the rocks
19 are of a very low permeability, on the order of 10^{-19}
20 metres squared or less.

21 The results of the hydro geochemical
22 sampling did provide some preliminary interpretation of
23 the hydro geochemistry in water movement and it certainly
24 conveyed an image that there was hydrostratigraphic
25 control by the bedrock formations and that vertical

1 migration was an unlikely outcome.

2 The results, as I mentioned, were taken in
3 terms of borehole sampling. There is belief in the
4 report. There are six mentions in that report, in that
5 12-page report where drill water contamination was
6 discussed and brought up as an issue that would affect the
7 interpretations. And there are clear guidelines and
8 processes that we are taking in the now site
9 characterization program at Bruce site that would prevent
10 these issues from occurring again and confounding the
11 interpretation of the results.

12 Ken, would you like to speak to the
13 hydraulic connectivity testing at both those holes, UN2
14 OHD1 please?

15 **MR. RAVEN:** Ken Raven, INTERA Engineering.

16 Yes, as Mark has indicated, I was involved
17 in hydraulic testing of those boreholes in the mid to late
18 1980s prior to this work on groundwater sampling being
19 reported on.

20 Hydraulic testing in those boreholes
21 indicated that for the most part, and this was a fairly
22 detailed testing program, indicated that the bulk of the
23 rocks in these shales and limestone formations had very,
24 very low hydraulic connectivities; typically less than
25 10^{-11} metres per second, frequently less than 10^{-12} metres

1 per second. When you have boreholes that are that tight,
2 it really is a challenge to get representative groundwater
3 samples out of those kinds of formations.

4 And I think that the conclusions in this
5 report that we are discussing, I would judge those
6 conclusions as being somewhat premature because to make
7 those kinds of statements, you have to have some assurance
8 that the samples that you are collecting are truly
9 representative of the formation fluids and, given the very
10 tight nature of these boreholes and the observation that
11 there is obviously drill water contamination in a lot of
12 the samples, I think that we could conclude or at least I
13 would conclude that these samples are for the most part
14 influenced by drill water contamination and I wouldn't
15 consider them to be totally representative of what the
16 formation fluids actually are.

17 **MEMBER BARNES:** I suppose, as you say, it
18 certainly comments on the potential for drill water
19 contamination, but I think if you read on the balance of
20 their comments and the scale of isotopic difference there,
21 I will still repeat that their interpretation is that
22 there is significant mixing and that mixing must come
23 about.

24 I'm not trying to challenge that many of
25 these limestones have very low permeability. The point

1 I'm trying to make, when people used to go on the Canadian
2 shield to show that you could take a granite and it will
3 likewise have that, that point was that it's not necessary
4 that but fracture flow, which is allowing migration of
5 fluids. The natural rock type might be very tight, but if
6 there are sufficient fractures that will allow fluid
7 migration, that it may cause then this mixing.

8 What I heard from OPG earlier is that you
9 said, "Well, you try to characterize this site in its
10 early days based on information you know elsewhere". I'm
11 simply quoting back a study that was your study that you
12 did which gives results which contradict the picture that
13 you are giving in your documents that these are entirely
14 tight, impermeable limestones in which there's no
15 groundwater flow or mixing. And this study using isotopic
16 signatures is perhaps not completely -- still has some
17 questions as do most scientific studies, let's face it,
18 but the bulk of the evidence here is that there is
19 significant mixing from Cambrian units at the bottom well
20 up into the middle Ordovician limestones and the only way
21 to get that, according to these authors, which I think
22 you'd agree are reputable authors, is by mixing it
23 presumably through fracture flow. That's all I'm trying
24 to say here, is that the picture need not be as simple as
25 the one you are portraying in the documents.

1 Could I ask staff if you have a comment on
2 this point?

3 **MR. HOWDEN:** Barclay Howden speaking. I'm
4 going to ask Dr. Ben Belfadhel to reply to that.

5 Thank you.

6 **DR. BELFADHEL:** Mahrez Ben Belfadhel, CNSC.
7 CNSC staff did review that report and the
8 main conclusion we retained is that there is a potential
9 for a hydraulic connection between the Cambrian and the
10 other formations, and this is something that we will keep
11 in our mind during the EA and during the Site
12 Characterization Program from a regulatory oversight.

13 But having said that, CNSC staff were not
14 very surprised by the conclusions because if I recall, the
15 report reported that some of the pull holes intersected
16 some discrete fractures and this is consistent with the
17 understanding of the fractures network of Southern Ontario
18 and there are some studies that separated the faulting in
19 Southern Ontario in two blocks: the Bruce megablock,
20 which is north and which includes the Bruce site, and the
21 Niagara megablock which is south. The Niagara megablock
22 is more complex in terms of fault distribution and things
23 like that. So it is a little bit consistent and we
24 suspect that the connection is caused by more complex
25 fracturing.

1 **MEMBER BARNES:** Let me just turn to that.
2 This, I guess, is portrayed on this diagram which is the
3 one by Sanford et al, and it's in the Golder Report. It's
4 Figure D-2 on page 135 which shows a regional pattern of
5 faults and fractures in Southern Ontario and shows the
6 faults here, more complex there and to the south, as it
7 would be, but it also shows, if I read this correctly, a
8 series of more or less east-west fractures that are in
9 this region.

10 So you would agree that the subsurface in
11 this region, certainly one might well expect to see
12 fractures that would go through the stratigraphy.

13 **DR. BELFADHEL:** Ben Belfadhel, CNSC.

14 That is correct, Dr. Barnes, and that
15 figure shows that there is fracture networks close to the
16 Bruce area. We looked at that and we paid attention to
17 the scale of the fractures and this fracture seems to be
18 spaced by several kilometres. So we expect that the site
19 characterization program will demonstrate -- will clearly
20 demonstrate that the proposed site is not in the proximity
21 of one of the faults.

22 **MEMBER BARNES:** But would you also agree,
23 given the scale of those studies, that that's perhaps a
24 generalization in the original studies?

25 **DR. BELFADHEL:** That is correct.

1 **MEMBER BARNES:** Right. Okay.

2 And if I could then turn to OPG staff, you
3 showed us a diagram in the presentation this morning and
4 it's in your documents, and that's the Bruce site geology,
5 the one where you refer to Texaco.

6 And if I could ask you to explain this so-
7 called fault zone that's actually referred to in the text
8 immediately in the Bruce site? You show a kind of
9 synclinal structure of beds and it's in the area of Texaco
10 Well No. 6, Bruce site.

11 **MR. JENSEN:** There is in the Celina
12 formation an escarpment which cuts out just north of the
13 Bruce site out into Lake Huron and it's there where the
14 geology in that structure you are focusing on exist.

15 **MEMBER BARNES:** It's also, I think,
16 referred to in another report that you quoted in your
17 studies, another Ontario Hydro Report, and this is one by,
18 if I pronounce the name correctly, Lucogic, Aziz and
19 Menson, 1986, "Seepage Control During Tunnel Driving Under
20 Lake Huron". So in this case this is the intake valve
21 that was driven out there, a 9-kilometre tunnel from the
22 Bruce B Nuclear Generating Station, at that time owned and
23 operated by Ontario Hydro.

24 In that report it indicates that the tunnel
25 passed through a -- encountered three sets, very distinct

1 sets of vertical joints and also encountered a so-called
2 fold zone and brachiation in which there was considerable
3 influx of water into the tunnel which eventually was
4 grouted and so on. This is called Zone 2 or Fold area.
5 This is on -- it doesn't have a page number, I don't
6 believe -- a brachiated fold zone, approximately 230
7 metres long was encountered in the mid portion of the
8 tunnel (Figure 2).

9 So what is the generation in Devonian rocks
10 of this fold zone?

11 **MR. JENSEN:** Mark Jensen, OPG.

12 The Devonian sediments lie above the
13 Silurian and certainly there were some salt units that in
14 geologic time have been dissolved out from beneath, and
15 part of the belief is that some of the features that we
16 see in the Devonian above are responsible for that
17 dissolution of the salt underlying it are responsible for
18 those features.

19 **MEMBER BARNES:** One more point, Madam
20 Chair, if I may and then I'll pause.

21 One of the concerns in engineering projects
22 in Southern Ontario, as I understand it, is the high
23 lateral stress fields, which is certainly encountered in
24 many quarries with pop-up features of up to a metre or two
25 metres on quarry floors and so on.

1 This was not mentioned in many of the
2 documents until right at the end of the project
3 description on page 142, and it's on the Golder 203 Study,
4 Appendix "D". I wonder if OPG would like to comment on
5 the significance of this high stress field in developing
6 subsurface excavations of the scale that you're talking
7 about, recognizing that the Appendix "D" pointed out that
8 the stress fields would be expected to increase with
9 depth, the significance of these -- so you're creating
10 basically holes in the subsurface, substantial holes which
11 over time might be affected presumably by this high
12 lateral stress field that would potentially weaken the
13 walls of the roofs, and so on and so on.

14 **MR. JENSEN:** Mark Jensen, OPG.

15 I would like to ask Derek Martin to
16 respond, please.

17 **MR. MARTIN:** Yes, Derek Martin.

18 The stresses have been considered. We've
19 compiled the stresses in Southern Ontario and, as you
20 rightly point out, they are elevated stresses compared to
21 the weight of the overburden.

22 We have also looked at the stresses in a
23 limestone mine at a depth of just around 600 metres, I
24 believe it is. So we have an approximate gradient with
25 depth. This is certainly more than you have at many

1 engineering projects with regard to stress magnitudes. We
2 understand how the stress magnitudes interact with the
3 underground openings and, of course, during the site
4 characterization plan, efforts will be made to
5 characterize the stress gradients with depth to ensure
6 that they're within our realm of experience with Southern
7 Ontario.

8 **MEMBER BARNES:** What was the mine at 600
9 metres that you looked at limestone?

10 **MR. JENSEN:** The Barbotin Mine. The
11 Barbotin Mine is just south of Cleveland, 40 kilometres
12 south of Cleveland at a depth of about 2,100 feet.

13 **MEMBER BARNES:** That's the one in Columbus,
14 limestone, that you referred to elsewhere or not? I'm not
15 sure.

16 **MR. JENSEN:** I'm not sure of the formation.

17 **MEMBER BARNES:** I guess what I was
18 concerned about -- again, I'm trying to distinguish
19 between the specifics here and what we're given as
20 information, and what I was concerned about here, knowing
21 that this was a significant engineering issue and that it
22 wasn't mentioned it's mentioned sort of in the back of
23 these technical reports. Nowhere, as far as I know, in
24 the main OPG document, nowhere in the staff document is
25 this issue raised. I personally don't know if it is an

1 issue and if it is, how it would be accommodated. We are
2 looking at a repository that is going to remain for
3 decades, for which we certainly don't want collapse
4 features, I think, in here.

5 So it speaks to the integrity of these
6 engineering and placement rooms that you are putting in,
7 which again we are given very little information on to
8 what extent these are going to be grouted; whether the
9 roofs are going to be concreted in some way or just left
10 bare. I have a sense that the floors, from what you tell
11 me, are going to be concreted or perhaps left -- the walls
12 and the ceilings largely left open, and so this could be a
13 significant thing.

14 Clearly, we will get more information when
15 you do more drilling, but the picture I am trying to
16 communicate here is that when you say that you have
17 comparisons with excavations at Niagara Falls -- they give
18 a picture there of the Queenston Shale or one at
19 Darlington -- I would contend that these are rather
20 different engineering situations than when you are
21 drilling something at 600 metres depth, with a high stress
22 field.

23 And so what I have tried to show in my
24 introductory comments, Madam Chair, is that I don't
25 believe, just to summarize, that the characterization of a

1 uniform 200 metre shale blanket is quite correct.

2 I don't believe in the information I quoted
3 from Sherwood Loller and Shawn Frappe's publication that
4 one can simply expect the groundwater condition to be
5 totally impermeable limestones in the Lindsay Formation;
6 that there may well be fractures down there that cut all
7 through this stratigraphy, and if they cut through this
8 stratigraphy and if there are leakages from the
9 repository, the groundwater flow patterns that you have
10 also given here, once it gets above the Queenston Shale,
11 it moves into the Silurian rocks and the groundwater flow
12 patterns that you show flow into the bottom of Lake Huron
13 at rates up to 10 metres a year.

14 So in terms of the timeframe, and we are
15 just a kilometre below Lake Huron -- that's vertically --
16 presumably those beds intersect Lake Huron further out,
17 but given the timeframe, the potential for transport of
18 contaminants if it reaches this so-called Queenston
19 Blanket and gets into the Silurian rocks which are rather
20 porous, fractured dolostone, it could move from above the
21 site into Lake Huron waters within sort of human
22 lifetimes, a relatively short period of time. We are not
23 talking about a repository that remains sealed for
24 hundreds of thousands of years.

25 Would you agree with that?

1 **MR. NASH:** Could I perhaps respond on
2 behalf of OPG?

3 **MEMBER BARNES:** Yes, please.

4 **MR. NASH:** The reason we moved ahead with
5 this was based largely on the Golder Report. The Golder
6 Report was prepared on behalf of OPG in Kincardine.

7 The conclusion of the Golder Report was
8 that for deep geologic depository it was technically
9 feasible and we would have high levels of safety based on
10 the information available. That information said it was
11 highly probable that the movement of radionuclides through
12 the limestone layer and the shale layer -- maybe that's an
13 oversimplification of the description of them -- but
14 through those two layers would be diffusion dominated, and
15 that was the conclusion of the Golder geologist.

16 As an executive responsible for this,
17 embarking on an endeavour here to commit the company to
18 make an application for a geologic repository, I
19 personally checked that out several times with the
20 geologist. In fact, I have a letter on file from the
21 geologist assuring me that he had a high level of
22 confidence that when we actually did the detailed
23 investigation, we would find the rocks down there would
24 provide a diffusion-dominated environment.

25 Obviously, we have commissioned a five-year

1 study to where we would sink many boreholes, several
2 boreholes on that site that would go into the shale and
3 limestone formations to confirm that any release there
4 would be diffusion dominated. So we respect the fact that
5 there are a significant number of questions to be
6 answered, but the information we received was that there
7 is a high level of confidence that when we do that
8 confirmation it will indeed confirm and verify the
9 characteristics of the rock.

10 I don't think we are here today to pretend
11 that we have the answers to every single question. We are
12 here to advise you of the information we do have and the
13 reasons why we do believe this project will not cause any
14 significant environmental impacts, but as we move forward,
15 we do intend to make that confirmation. I can assure you
16 we didn't -- I personally did not want to go into this
17 process to find that we didn't have the drop down there.

18 **MEMBER BARNES:** I agree, or I'll comment,
19 and I understand that the process, I understand, is very
20 difficult and that is why I started off with that quote
21 that we have almost no information below 100 metres here,
22 and all I am doing is, I think, challenging what I view --
23 and forgive the word if it is inappropriate -- somewhat
24 simplistic portrayal of some of these conditions I find in
25 the Golder Report and in the OPG document for this process

1 that we are engaged in today, and I won't repeat them, but
2 -- well, I will repeat them.

3 The stratigraphy, I think, is simplistic.
4 The hydrogeological is simplistic, particularly if you
5 have any faith that some of that information I'm sure
6 would lower -- and the portrayal that these rocks are
7 entirely tight, that there could not be fractures in this
8 region when you have a map showing fractures in this
9 region -- most of these are sub-vertical fractures, i.e.
10 cutting through the stratigraphy -- should be of concern,
11 right?

12 Now, when I read what OPG is going to do in
13 terms of site characterization, you are going to do --
14 which, again, is not very much information, right, for me
15 to have an assurance that the work planned will, in fact,
16 improve the knowledge which I think is incomplete.

17 For example, you are doing 2-D seismic. I
18 might ask why you wouldn't do 3-D seismic for this level
19 thing. You mention several boreholes, but it doesn't say,
20 "several boreholes", it says, "two boreholes, one at 400
21 metres and one at 800 metres." It doesn't tell me what
22 kind of boreholes, et cetera, but the 400-metre borehole
23 is not going to get you down into the stratigraphic unit
24 where you are proposing to emplace it, which is at 600 and
25 650 metres.

1 So what I read in your document is you are
2 going to have one borehole available and then you go on on
3 page 24 of the OPG document to say this site
4 characterization work that you plan will, "Provide 3-D
5 spatial distribution of all important geological
6 formations" and goes on, "...and structural features."

7 I don't think you can do that from one
8 borehole that will take you down into the stratigraphic
9 interval.

10 **MR. NASH:** Perhaps if we could respond to
11 that.

12 OPG decided to move forward with the
13 geologic repository, then we hired INTERA Engineering to
14 develop the geoscience site characterization plan which
15 spans over five years, and then we went one step further.
16 We recruited the panel of geoscientists to overview this.

17 I will make one last comment before passing
18 it back to Mark and to Ken. The work that you are
19 referring to there, is that work that we would expect to
20 deliver as part of the environmental assessment, but to
21 complete the analysis, that is not the five-year program.
22 The five-year program is much more detailed than that. So
23 perhaps I will pass that back to Mark to comment.

24 **MR. JENSEN:** Starting in July of 2005, we
25 put together a team with INTERA to develop a geoscientific

1 site characterization plan for this project. That plan
2 was finished in April of this year. As part of that
3 process, INTERA assembled a group of 14 specialists in
4 areas of geology, geomechanics, hydrogeology, hydro
5 geochemistry, geophysics and the like, that essentially
6 took a look at the information, in terms of the
7 geotechnical feasibility studies that we had performed on
8 the site. The intent was to develop a descriptive
9 conceptual model of the site. That model essentially says
10 that the site and its bedrock stratigraphy and its
11 hydrogeochemistry, its hydrogeology, has been stable for
12 geologic periods of time.

13 So what the geoscientific site
14 characterization plan does is it puts forward methods to
15 test that understanding of the site and these methods are
16 to be implemented in a step-wise fashion over five years.
17 The first phase of these -- of this plan, which is
18 available on the OPG website, will be implemented in the
19 next two years. As part of the plan we had the
20 geoscientific review group review this plan and got their
21 concurrence in March of this year, that the plan was
22 acceptable.

23 I'd like, perhaps to talk to Ken about the
24 development of the plan and its implementation over the
25 next two years.

1 **MR. RAVEN:** Ken Raven, INTERA Engineering.

2 The plan that we are implementing is
3 documented, it's called the Geoscientific Site
4 Characterization Plan. It's available on the OPG website.
5 It's a three-phase program and the initial phase is
6 intended to collect information in a number of key areas
7 that are deemed to be important with respect to assessing
8 safety at the site. A lot of the things that you've
9 mentioned, Dr. Barnes, about stratigraphy and structure;
10 we recognize these as data needs to characterize the site.
11 The investigations have been designed to collect that kind
12 of information. The investigations have also been
13 designed to collect information on the geomechanical
14 properties including in-situ stresses.

15 Another set of data needs that are going to
16 be addressed in this plan relate to the hydraulic
17 properties of the rock mass, the diffusive, absorptive
18 properties of the rock mass. And then there's a
19 significant program intended to try to avoid what I
20 consider to be some of the difficulties associated with
21 the Sherwood Loller Report and that is, a program looking
22 at characterizing groundwater at the site, not only from
23 conventional monitoring wells, which is what the Sherwood
24 Loller Report had focussed on, but also to extract water
25 from the pores of the intact rock. And in my opinion,

1 that's going to be the best kind of data that we're going
2 to get on the geochemical signatures of the water in these
3 formations at depth.

4 **MR. NASH:** Perhaps we could ask Dr. Martin,
5 who is a member of the International Geoscience Review
6 Group, to just outline the function of their group in
7 reviewing that plan and the data we'd expect to get from
8 there. That perhaps would be helpful as well.

9 **DR. MARTIN:** Yes, Derek Martin.

10 As you rightly point out, Canada's research
11 efforts at the beginning of your discussion was -- has
12 been in granitic rocks and that was recognized by OPG.
13 There has been a lot of effort, of course, internationally
14 in the more mudrocks, if you like, the weaker side of the
15 equation, in Switzerland and in France and on the
16 extremely weak side, in the site in Belgium.

17 So OPG put together or assembled four
18 members of the Geoscience Review Group that looked at the
19 various aspects; one from Switzerland, one from the U.S.
20 and one from France and myself. We reviewed -- well, we
21 actually got together with OPG in August of 2005 and we
22 had a two-day workshop whereby we went through the
23 international experience of having to deal with these
24 extremely tight formations and the difficulty of site
25 characterization, these formations.

1 We reviewed or outlined, if you like, what
2 we thought would be an ideal strategy for characterizing
3 the site. And then over the period of about -- well, up
4 until January of this year, we had three iterations of
5 reviewing the site characterization program and providing
6 feedback to the site characterization team to incorporate
7 the experience, if you like, that's been gained elsewhere
8 over the last 10 to 12 years.

9 **MEMBER BARNES:** I wonder if staff have any
10 comments?

11 The point I'd make before staff answers is
12 that it may be on the website, but in the information we
13 have been given for this process by OPG, it's simply a
14 very brief series of statements on page 24/25. Right?
15 And it's quite firm; I'll just repeat again:

16 "The geologic site model will describe
17 ..."

18 On page 25:

19 "... the three dimensional spatial
20 distribution of all important geologic
21 formations and the occurrence of all
22 important geologic structural features
23 within the bedrock units. A
24 descriptive model will provide a basis
25 for geoscientific understanding of the

1 current conditions at Bruce site, its
2 past evolution and likely natural
3 evolution over the period of
4 interest." (As read)

5 But we're given no information on that
6 except phase one, which is what I said, just two
7 boreholes, or even the timeframe for that.

8 So, I just bring you back again to my
9 central points, is that we're being told that there's not
10 much of a problem here, but on the other hand, to me there
11 could be some problems and I'm anxious that we understand
12 those to see -- I think the process should understand
13 those problems before, you know we get down the track.
14 And here we're at the front end of an EA process which
15 needs some information to make some rational decisions. I
16 mean, questioning whether the data being brought forward
17 today are fairly portrayed and essentially adequate for
18 the purpose at hand.

19 Do staff have any comment on the last few
20 points we've been making?

21 **DR. THOMPSON:** Patsy Thompson, for the
22 record.

23 In terms of the site characterization plan
24 we have been discussing and the -- to put it in context of
25 the environmental assessment; staff has not yet reviewed

1 and accepted OPG's site characterization plan.

2 In addition, the site characterization plan
3 has been described by OPG, a few minutes ago, as something
4 that would span a five-year period. In terms of the
5 environmental assessment, the extent of site
6 characterization that is expected is site characterization
7 that would be sufficient to support the environmental
8 assessment and it would not be possible right now, to
9 determine the amount of information that is needed. But
10 the expectation is that OPG will do the extent and amount
11 of site characterization work that is required to support
12 the environmental assessment.

13 The environmental assessment will deal with
14 site preparation, construction, as well as operation and
15 the long-term safety of the proposed project. And so the
16 information needs to be able to support the feasibility as
17 well as the safety assessment in terms of determining the
18 long term safety.

19 There is a requirement in the environmental
20 assessment to be able to conclude as to the likely
21 significant effects of the proposed project. That is the
22 purpose of the environmental assessment.

23 As staff have indicated a few minutes ago,
24 we do share the concerns you have been raising, have
25 reviewed the information and will be considering and

1 reviewing OPG's technical studies with those concerns in
2 mind.

3 **THE CHAIRPERSON:** If I could though, just
4 to follow up with staff, what the Commission is being
5 asked to consider today is, as Dr. Barnes said, whether
6 the information that we have is sufficient for us to go
7 ahead with the recommendation that you've made, which is
8 embodied in the proposed environmental assessment tracking
9 report which is a comprehensive study.

10 So, what we're trying to struggle here with
11 is based on the amount of information we've been given by
12 the proponent, the analysis by the staff. What is the
13 expected answers to come out of the tracking report and
14 the research that's been done, such that we feel that we
15 could launch on one avenue versus another?

16 So I guess my question for staff is a
17 supplementary to Dr. Barnes is; hearing what you've heard
18 now in terms of the questions from Dr. Barnes, the OPG
19 comments and the comments from the staff which is far more
20 detailed than what is available in the documentation. Are
21 you still confident that the proposed Environmental
22 Assessment Track Report which recommends the comprehensive
23 avenue for this is still the right avenue at this moment?
24 I will be asking this question throughout the proceedings
25 today in order that we get an understanding of what are

1 the choices before us and what is that element.

2 So is there still the confidence from the
3 CNSC staff in your recommendation with regards to the
4 questions that Dr. Barnes put forward?

5 **DR. THOMPSON:** Patsy Thompson for the
6 record.

7 The sorts of questions that are being posed
8 are really going quite far into the technical aspects and
9 the work that will be done as part of the technical
10 studies to support the environmental assessment. In
11 staff's view, the extent and seriousness and rigour of the
12 technical studies that will be required for the
13 environmental assessment would be the same for either
14 track. The comprehensive study track and the review panel
15 track would not change the level of technical information
16 that is required and the level of review of the technical
17 information that would be done.

18 **THE CHAIRPERSON:** Thank you.

19 This is really one of the questions that
20 the Commission will struggle with, is this is the chicken
21 and the egg really. You know, you have a certain amount
22 of information to start the EA process and you're going
23 forward into the more detailed studies. Is there
24 information that as such would lead one to one track
25 versus the other, realizing that the CEAA requires a

1 vigorous analysis of all these elements? It's what would
2 be the advantages of one over the other, not questioning
3 the fact that the studies would have to be done or the
4 integrity of those studies.

5 I'll go on, then, to Mr. Harvey for his
6 questions in round one.

7 **MEMBER HARVEY:** Merci, Madame la
8 Présidente.

9 In your documents you refer to the
10 experience of other countries with operating facilities in
11 those countries, to support your conclusion. My question
12 is are the criteria used to class the waste either in low
13 level waste or intermediate level waste, are they the same
14 in these other countries? What are they?

15 Furthermore, are those criteria recognized
16 on an international basis?

17 **MR. KING:** This is Frank King for the
18 record for OPG.

19 There are various types of classification
20 systems used around the world. There is no one uniform
21 system. I'll speak to the one that we use right now and
22 make a comment on some of the others.

23 We classify it as -- in OPG as low-level
24 waste, intermediate-level waste or used fuel. What we are
25 talking about is the first two of them.

1 And the difference between low and
2 intermediate is basically derived from an occupational
3 dose consideration, what is the external dose from those
4 wastes would lead to one type of storage versus another
5 type of storage. So in fact, the criteria is that if it
6 is less than 10 milliSieverts an hour, that's one ram an
7 hour at 30 centimetres and that's low-level waste and it
8 typically can be stored in aboveground storage buildings.
9 If it's higher than that dose limit we have some shielding
10 required and typically it's stored underground and
11 shielded in engineered containers.

12 Now, there are certain types of waste which
13 kind of automatically fall into the ILW category and these
14 would be any waste coming from in-core components that are
15 no longer required; resins that are used to clean up your
16 primary or your moderator systems, water systems in the
17 reactor, filters and exchange columns that are self-
18 contained. And what we're talking about in this facility
19 is that summation of the non-used fuel waste, the low and
20 intermediate.

21 In the international scheme, IAEA has a
22 system where they also refer to the heat generating
23 capability of the waste as well as the life of the
24 different radionuclides and they come into a
25 classification of -- it's a matrix involving the life of

1 radionuclides and heat generation capability and because
2 some other countries have more complex waste streams,
3 countries that involve fuel reprocessing and they
4 sometimes requires a more complex system to characterize
5 their wastes.

6 Perhaps I will stop there and maybe if you
7 have some supplementary questions I can answer them as
8 well.

9 **MEMBER HARVEY:** Well, just about those
10 three facilities that you are -- when you visited those
11 facilities and you are using those facilities to -- well,
12 to talk about the experience of such facilities. I would
13 like to know if those facilities, if the waste of those
14 facilities compare with what you have here.

15 **MR. KING:** Frank King again.

16 Yes, we've had a lot of contact with
17 international facilities; the ones that Mr. Nash talked
18 about, other ones from Finland and Sweden and the U.S.

19 The Finnish and the Swedish facilities have
20 low-level waste and they have silos in the Swedish
21 facility, a silo which puts in some types of ILW. They
22 have different engineered structures around those silos
23 because of the various types of radionuclides. As well,
24 they have in the -- if you go into the Finnish facility at
25 Olkiluoto they have two silos, one which is for ILW. It's

1 more shielding involved in that silo and right next to it
2 is the low-level waste. The Swedes they are -- they have
3 on their books and they have a process going forward in
4 the near future to put another extension of their
5 geological repository in the Forsmark site which will
6 handle longer-lived ILWs.

7 Generally, the ILW which is shorter-lived
8 you can put higher up in the strata in that it will decay
9 before an assumed loss of institutional control on the
10 site. If you have very long-lived radionuclides, the
11 international practice is put those deeper to protect them
12 from inadvertent human intrusion over very long
13 timeframes.

14 **MR. NASH:** Perhaps just to add to that, the
15 one in the United States, the WIC facility there, that's
16 sort of approximately the same depth and that has a large
17 number of very, very long-lived radionuclides in it.

18 **MR. KING:** Yes, that facility at Carlsbad
19 it's in a salt formation about 655 metres down and it is
20 for transuranic wastes coming out of the U.S. military
21 program which are contaminated with elements above uranium
22 in the periodic table.

23 **MEMBER HARVEY:** So it's difficult to say
24 that what you are planning to do has been done as far as
25 not exactly the same?

1 **MR. NASH:** Well, no, the types of wastes,
2 low-level wastes that we are dealing with are very typical
3 internationally. They are -- it's just the clothes
4 workers wear, the tools, low-level activity and any
5 international program that has a reactor program generates
6 these types of wastes and so our low-level waste streams
7 are very similar to other low-level waste streams. When
8 you get to some of the intermediate level waste streams
9 because of the CANDU reactor concepts some of the
10 radionuclide inventories are a little different than in
11 some of the international ones. They may have more of one
12 and we'll have more of another, but the nature of the
13 waste, whether there are ion exchange resins, they have
14 ion exchange resins; we have ion exchange resins. They
15 have core components; we have core components, but the
16 percentage of each type or the radionuclide
17 characteristics will differ from country to country.

18 **MEMBER HARVEY:** When you're talking of
19 percentage, if I just go to page, I think, 2 of your
20 document one, you gave there some percentage like stating
21 for low waste. That's okay. But for intermediate-level
22 waste, you say that 80 per cent would be lower than 200
23 milliSieverts. Do you have it? And that -- the first
24 page. That's H22.1A.

25 **THE CHAIRPERSON:** It's "11" under Western

1 Waste Management Facility, the paragraph we're on.

2 **MEMBER HARVEY:** My point is just you're
3 saying that with an average dose rate less than 200
4 milliSieverts for more than 80 per cent of the waste
5 containers and more than 40,000 for the remaining
6 containers. Then you say 99 per cent has a dose rate less
7 than 1,000.

8 But my question would be what is the
9 average of all that?

10 **MR. KING:** What is the average dose rate
11 from ---

12 **MEMBER HARVEY:** Well, the average of the
13 3,200 cubic metres that would come to the site each year.

14 **MR. KING:** Frank King.

15 I don't have that average number with me.

16 **MEMBER HARVEY:** You don't have the average.
17 Because we see that 47,000, it's a lot more
18 than 200. So even if there is a small amount of that type
19 of waste, it must influence the average of the total
20 waste.

21 **MR. KING:** I'm afraid I just don't have
22 that information available.

23 **MEMBER HARVEY:** Okay. I don't mind.

24 Incidentally, in the Golder Study even in
25 the title you are just -- that's Low-Level Waste

1 Geotechnical Feasibility Study. Why are you using just
2 that term here instead of low-level and intermediate?

3 **MR. KING:** Frank King.

4 In the very early days of our review of
5 options following the signing of the memorandum with the
6 Municipality of Kincardine it was a study looking at low-
7 level waste and then there was a change a little bit later
8 on where we looked at intermediate-level waste. That's
9 why you will note that in some of the work, in particular
10 the Quintessa Safety Assessment Study, it is primarily the
11 numerical calculations that are on the low-level waste but
12 there is the qualitative statement in those on Aisle W in
13 the Quintessa studies.

14 When it was all brought together in the
15 Golder Independent Assessment Report, it has low- and
16 intermediate-level waste in the title.

17 **MEMBER HARVEY:** In the document you're
18 saying that the maximum dose will occur in thousands of
19 years. I mean, there is a process that the -- the maximum
20 problem, if there was a problem, would appear in thousands
21 of years.

22 What is the process which ---

23 **MR. NASH:** Ken Nash.

24 Perhaps I'll answer that question and ask
25 one of my colleagues to add to it.

1 The maximum -- our assessment is that the
2 maximum dose from the facility in the long term will
3 actually occur in many thousands of years. That is based
4 on the assumption that the transport of radionuclides will
5 be diffusion-dominated, and that is the process. The
6 assumption that through the limestone rock and the shale
7 layer it will be diffusion-dominated and the main
8 radionuclide there is a long-lived radionuclide that have
9 mobility, and this will be from Iodine-129. We estimate
10 in the facility there will be somewhere in the order of
11 100 grams of Iodine-129 and that will be the dominant
12 radionuclide that does find its way out of the limestone
13 and the shale layer after many thousands of years, and
14 that's based on the assumption of a diffusion-dominated
15 release mechanism.

16 Do you want to add to that, Frank?

17 **MR. KING:** No, not really. I think the
18 answer is as Ken Nash said. It's when you -- with respect
19 to our conceptual model of the geosphere and if it's
20 diffusion-dominated, then it automatically drives the dose
21 into many thousands of years.

22 **MEMBER HARVEY:** It's just because the
23 diffusion, there's no other reason, but if it's a
24 diffusion problem, we don't know where it could happen. I
25 mean, there will be a migration of the radionuclide.

1 Well, I've got difficulty to -- it's just a question of
2 migration, that's all, but you don't know where will be
3 the problem or what will be the maximum dose -- the
4 location of the maximum dose?

5 **MR. NASH:** Ken Nash again.

6 The hypothesis is that we have a limestone
7 layer and a shale layer, through which the only mechanism
8 for release will be diffusion through the solid rock. To
9 make the calculation of the dose we have to make certain
10 bounding assumptions. One of those would be that someone
11 drilled a well down to the top of the shale layer, some
12 300-400 metres, and they take water from that well, and
13 once they take water from that well that will be the dose
14 uptake mechanism.

15 And I do believe the bounding calculation
16 that was done to arrive at those conclusions is based on
17 certain bounding assumptions like that.

18 Perhaps you want to comment on that, Frank.

19 **MR. KING:** Yes. In the analysis that Mr.
20 Nash was referring to, and just to preface my remarks,
21 you're indicating that the migration away could go
22 anywhere. Well, it could go in any direction. It can go
23 down, to the left, to the right, up. What we assume in
24 our conservative analysis is that it can only go in two
25 directions, up or down, and 50 per cent goes up, which is

1 a conservative way of looking at it.

2 If we make a conservative assumption that a
3 well was put down to the shale layer, if you go below the
4 shale layer, you will not yield water into the well. So
5 there's no reason why anybody would expect to have a well,
6 but in these conservative safety analysis scenarios we
7 perform we make conservative assumptions.

8 And then if somebody drank the
9 concentration of water coming out of that top of the shale
10 layer, you would get a very small dose and it would be a
11 very long time.

12 It would be well over 100,000 years in the
13 future and it would be dominated by Iodine 29 because most
14 of the other radio nuclides have decayed mostly away.

15 **MEMBER HARVEY:** Yes, I understand that, but
16 if somebody just dig a well the problem would not be in
17 thousands of years, it would be an immediate problem I
18 suppose. When you dig a well the problem is there is no
19 migration if it's near the deposit.

20 **MR. KING:** The well, if again our model of
21 the geology is correct, that geology will not yield water.
22 There is no -- and if it did yield any water it would be
23 very salty that nobody would want. That location -- and
24 maybe Mark Jensen can comment further -- is that the first
25 100 meters at the site yields substantial quantities of

1 good water and there's no need, in fact, you would not be
2 successful if you went lower than that to get potable
3 water.

4 Mark, if you want to comment any further.

5 **MR. JENSEN:** Mark Jensen, for the record.

6 Regional studies in Bruce and Grey Counties
7 indicate that groundwater resources are obtained from the
8 upper 100 metres and as you go down they become more
9 mineralized and sulphurous, and as you even go down
10 further the permeabilities just won't sustain any yield,
11 so there's good natural markers that would prevent people
12 from drilling deep wells.

13 **MEMBER HARVEY:** I'll just ask the staff if
14 there is any comment on the subject.

15 **MR. HOWDEN:** Barclay Howden speaking.

16 Mr. Harvey, I would like to -- you've
17 touched on quite a few points in your questioning and I'd
18 like to -- I'm going to ask someone to describe what we
19 did with our preliminary assessment. We did six specific
20 activities and we applied four criteria to determine where
21 things stood from health and safety. One of the things
22 touches upon international benchmarking, which I think was
23 one of your earlier questions about the other facilities,
24 and another criteria we'll talk about what we did with
25 regard to containment and isolation, which is dealing with

1 this transport phenomena issue of diffusion.

2 So if you could indulge me, I'd like to ask
3 Dr. Ben Belfadhel to describe broadly what we did, but it
4 will touch on the questions that you're talking about, as
5 well as the final issue of the groundwater.

6 **MR. BELFADHEL:** Ben Belfadhel, CNSC.

7 In forming our opinion on potential
8 environmental effects associated with the facility, we
9 took a global approach and we considered three criteria
10 that when put together will control the long-term
11 performance of a disposal facility.

12 And these criteria's are first, the
13 suitability of sedimentary rock as a potential candidate
14 for containing and isolating radioactive waste. The
15 second criteria is the maturity of the safety assessment
16 tools and techniques that are used today to evaluate the
17 safety of these type of facilities. And the third
18 criteria is the feasibility of the proposed concept in
19 terms of construction, the operation and safe closure.

20 And we looked at these criteria under the
21 light of international experience and also using our own
22 expertise with the long-term management of radioactive
23 waste in Canada and within the CNSC, and also we looked at
24 it in the context of the Canadian regulatory framework
25 which allows for a stepwise approach for decision-making

1 and which allows for multiple or successive reassessment
2 of the safety of these facilities.

3 In terms of the specific activities that we
4 did, first we reviewed the published information related
5 to the geology of Southern Ontario. We reviewed OPG's
6 studies, the feasibility study and the preliminary safety
7 assessment that they did, and also we conducted our own
8 limited calculations just to provide ourselves with a
9 sufficient level of confidence that what OPG was
10 describing in terms of migration of contaminant and
11 loadings to the environment is within reason.

12 We also reviewed the first phase of the
13 site characterization program that OPG is planning to
14 perform at the site and, of course, we reviewed
15 international experience.

16 Now, to go back to your question about the
17 migration of contaminant, the preliminary safety
18 assessment that OPG conducted is based on the three main
19 scenarios. Basically one type of scenario is the natural
20 evolution of the site and the other scenario is intrusion.

21 So with regards to the natural evolution of
22 the site, they considered two pathways. One pathway is a
23 release to the lake, and the other pathway is a release
24 through the shaft to the lake.

25 In terms of the release to the lake, the

1 pathway that was considered is, as you said, diffusion in
2 all directions, and they took 50 per cent of the
3 contaminant and they put them upward through the limestone
4 and through the shale into the more permeable layer and
5 from there the contaminants were taken to the lake, and it
6 is expected that the breakthrough of contaminant will be
7 from 10 to 20 kilometres from the lake.

8 And in terms of the -- sorry, from the
9 shore. And in terms of the intrusion scenario and the
10 well drillings, the scenario that was considered is the
11 future drilling for any reasons, resources or something
12 like that, and the scenario that was considered did not
13 involve drinking water because we are too deep and we
14 assumed that the groundwater there is not drinkable. So
15 the scenario that was considered, if somebody goes in,
16 drills a well -- a bore hole, and takes some waste to the
17 surface for analysis purposes and get exposed to the
18 waste, and in all cases the predicted doses were well
19 below the regulatory limits.

20 **THE CHAIRPERSON:** At this point we're going
21 to take a break. We're going to take an hour break for
22 lunch and we'd like you to be here very promptly at 1:30.

23 My first set of questioning will start with
24 the issues of cumulative affects which continues on from
25 some of the comments that were just made and I'll be

1 questioning OPG and staff on that particular matter.

2 So if I could ask you to be back by 1:30
3 promptly.

4 Thank you.

5 --- Upon recessing at 12:27 p.m.

6 --- Upon resuming at 1:32 p.m.

7 **(AUDIO DIFFICULTIES)**

8 **MR. MOFFETT** --- an example might help in
9 terms of some new-build activity at the Bruce site, for
10 example, where that might intersect in terms of the
11 timeframe for construction. So we might expect an
12 intersection of effects in terms of air quality. We might
13 an intersection of effects in terms of socioeconomic
14 issues.

15 So we first identified the direct effects
16 of the DGR Project and then looked to our other projects
17 and characterized the effects of those other projects
18 where there might be an intersection.

19 **THE CHAIRPERSON:** Thank you.

20 Because I believe that this is one of the
21 issues that the community should be very interested in
22 because, you know, handling growth in communities is very
23 much an important part of how communities grow in a
24 sustainable way. So I think it's very -- I imagine would
25 be very important.

1 Would the CNSC staff like to comment on
2 that, on the comments by OPG?

3 **MR. RINKER:** Mike Rinker for the record.

4 Only that we concur with the description of
5 requirement for a cumulative effects and the methodologies
6 that Golder put forward. CNSC staff are in agreement with
7 the comments that were made.

8 **THE CHAIRPERSON:** My second question is I
9 understand there is a representative of CEAA with us
10 today. Would you care to approach a microphone, please?
11 Would you please introduce yourself?

12 **MR. ADVOKAAT:** Eric Advokaat with the
13 Canadian Environmental Assessment Agency.

14 **THE CHAIRPERSON:** Thank you for coming
15 today.

16 My question is that the staff have
17 described in their CMD contrasting the comprehensive study
18 with the panel. Do you concur with what the staff have
19 written in this case?

20 **MR. ADVOKAAT:** Yes. I don't have it before
21 me, but I did review it at the time it was released for
22 public comment and I do concur with the comparison that
23 they provided.

24 **THE CHAIRPERSON:** Thank you very much. I
25 just wanted the concurrence.

1 Is there anything you would like to add at
2 this time while you have the microphone?

3 **MR. ADVOKAAT:** I don't feel that I have
4 anything in particular that I need to add, but I'm
5 certainly willing to answer any of the questions that you
6 might have about it.

7 **THE CHAIRPERSON:** My third question is to
8 staff, and it's with regards to the adherence of the staff
9 in this project to the Canadian Nuclear Safety Commission
10 regulatory policy in managing radioactive waste, P-290. I
11 am assuming the staff have a copy handy? Well, perhaps
12 you have memorized it.

13 I think it's incredibly important that the
14 Commission gets a sense from the staff of the policy
15 approach that you've taken to this particular project and
16 its adherence with the policy statement of P-290.

17 The issues that really -- I mean, there's a
18 series of issues here on the policy description, and the
19 one that kind of interests me the most right now is the
20 trans-border effects on the health and safety of persons
21 and the environment that could result from the management
22 of radioactive waste in Canada are not greater than the
23 effects experienced in Canada.

24 There's a commitment here for the CNSC in
25 terms of the evaluation of the project. Would you care to

1 comment on this since this seems to be one of the issues
2 under concern here?

3 **MR. HOWDEN:** Barclay Howden speaking.

4 Yes, I would like to ask Dr. Ben Belfadhel
5 to reply to that because we have looked at that particular
6 issue in the context of P-290.

7 **DR. BELFADHEL:** Thank you, Officer Howden.

8 Ben Belfadhel, CNSC.

9 One of the principles in CNSC policy P-290
10 on managing radioactive waste is that radioactive waste
11 should be managed in a manner that protects human health
12 and the environment of current and future generations.
13 This is achieved by ensuring that the future impact
14 associated with radioactive waste management is not
15 greater than the one that is accepted by our generation,
16 and this is why policy P-290 requires that in terms of
17 timeframes of the assessment, that the assessment should
18 be carried out until the maximum impact is predicted, and
19 then the criteria that are used to assess or judge that
20 maximum impact is not greater -- are the same as the one
21 we are using for ourselves today.

22 **THE CHAIRPERSON:** Thank you for that
23 because that was going to be another point.

24 But the one that I specifically addressed
25 was the trans-border effects which would be the trans-

1 border effects on health and safety, meaning for people in
2 this region, are not greater than the effects experienced
3 in Canada.

4 I think, to me, it goes to the point with
5 regards to the scoping of the document in terms of the
6 area. So perhaps you could try again.

7 **MR. HOWDEN:** Barclay Howden speaking.
8 Robert Lojk, our Director of Waste and Decommissioning
9 Division will respond to that.

10 **MR. LOJK:** Good afternoon. Bob Lojk for
11 the record.

12 As Dr. Belfadhel mentioned, we don't want
13 to put anything forward to the future generation.
14 Likewise, we don't want to put anything to our neighbours
15 to the south, or to the north, to the east or anywhere
16 else.

17 Consequently, what you're trying to do is
18 ensure that the effects that you have in any system to
19 retain the waste are not -- don't provide a mechanism for
20 it to be transferred elsewhere where we have no control
21 over it.

22 And from the information provided under the
23 submission at this level of EA study, that doesn't seem to
24 be the case.

25 **THE CHAIRPERSON:** Thank you.

1 Dr. Barnes, would you like to start Round
2 2, please?

3 **MEMBER BARNES:** Thank you, Madam Chair.

4 Again, I have several aspects I would like
5 to enquire about, the first one being some aspects of
6 excavating the large repository that is the basis of this
7 application.

8 Again, I'm conscious that OPG are proposing
9 a facility in which their basic assumption is that there
10 would be virtually no groundwater ingress into the
11 facility.

12 I raised certain comments this morning that
13 might suggest that under certain circumstances and with
14 more information that may not be the case, but perhaps
15 it's fair to say that given that assumption on OPG's part,
16 it's understandable that there has been no discussion on
17 the potential problems, if there was ingress, on corrosion
18 of the various containers that you plan to put in there,
19 some of which being steel, some concrete and so forth.

20 Given that, as you say, the groundwater
21 solutions at this depth are highly saline, concentrated
22 brines and so forth, do you think there should be more
23 consideration of that as well as the type of canisters in
24 this sort of document?

25 **MR. NASH:** Ken Nash, OPG.

1 As we go through the detailed design of the
2 repository and more detailed engineering, those things
3 will be considered, but I really do come back to the basic
4 assumption that we've got that -- and really I'm quoting
5 here from the Golder Report which everything that -- we
6 have come so far based on the information compiled by
7 Golder, which says that the deep bedrock groundwater zone
8 comprising out of the shales and limestones, which
9 underlie the site below a depth of about 400 metres and
10 which are characterized by extremely low permeability with
11 solute transport being dominated by chemical diffusion and
12 no direct discharge to Lake Huron. That characterization
13 plan if it does not confirm that assertion by Golder, then
14 we would have to revisit the need for the whole project.
15 Whether that solution will be to provide corrosion-
16 resistant containers or to abandon the project altogether,
17 it's very difficult for me to say at this time because it
18 is hypothetical. But if this program does not confirm
19 that assertion, we would certainly have to re-look at the
20 whole concept.

21 **MEMBER BARNES:** You did give in your
22 documents some general indication of what you anticipated,
23 or hoped, anticipated, would be the timeframe under which
24 an EA process would take place. Correct?

25 **MR. NASH:** Could you just repeat the

1 question?

2 **MEMBER BARNES:** You gave a table in your
3 documents as to the expected milestones or timeframes
4 under which the EA process would take place?

5 **MR. NASH:** That's correct.

6 **MEMBER BARNES:** And could you comment how
7 you would expect that would correlate with your phases 1,
8 2 and 3 of the site characterization work?

9 **MR. NASH:** Perhaps I'll defer that question
10 to Mark Jensen.

11 **MR. JENSEN:** Mark Jensen for the record.

12 Phases 1, 2 and 3: Phase 1, which we've
13 just begun, is intended to end in 2008, the end of 2008,
14 and that will give us the results of the one and a half
15 boreholes plus the seismic surveys, which will put us in a
16 better position to have site-specific information to test
17 or verify the model that was put forward by Golder. That
18 information will support the EA and then the information
19 that would be collected in phases 2 and 3, if we were
20 allowed to proceed with this proposal, would support the
21 licensing submissions for the site preparation and
22 construction licence.

23 **MEMBER BARNES:** Thank you.

24 Just coming back to an area which I, again,
25 saw a little discussion of -- it was raised a little bit

1 this morning, I think, by OPG, should there have been more
2 discussion in your documents on the effects of heat from
3 the amount of waste and the types of waste that you're
4 putting in here in terms of its potential interaction with
5 the host bedrock in which you're emplacing it.

6 **MR. KING:** Frank King for the record. I'll
7 make some initial comments and if Mark Jensen wants to add
8 anything, by all means.

9 The low-level waste is not heat generating
10 in any significant way. Some of the intermediate-level
11 waste, in particular, retubing waste, can generate heat.
12 We make these predictions of heat generation when we come
13 up with the designs for packaging of those retubing wastes
14 and they will be taken into consideration in the design of
15 the underground works. We don't expect at this point in
16 time that this will be a design setting issue for the
17 repository.

18 **MEMBER BARNES:** Thank you.

19 On a separate topic, and this is the host
20 community agreement, on a number of communities but
21 particularly with Kincardine, I wonder if you could, OPG,
22 advise me of the purpose of contributing \$35 million over
23 10 years to the host communities?

24 **MR. NASH:** Ken Nash, OPG.

25 Perhaps I'll just explain the broader

1 context. When we signed the memorandum of understanding
2 with the community, in addition to evaluating the
3 different technologies and the potential impacts of those
4 technologies we undertook jointly to review host community
5 agreements that existed in different parts of the world
6 and we did that -- as we examined that, one thing came
7 out. It was, you know, some communities did have hosting
8 agreements; others didn't. Those that did have hosting
9 agreements were at various levels of financial
10 remuneration for hosting the facilities but in no case did
11 we find that those were in any way linked to potential
12 impacts. They were basically the cost of doing business
13 and when we came to negotiate a hosting agreement, that
14 was the basis of it. It was very similar to the hosting
15 agreement between the Federal Government and the community
16 of Port Hope and Welcome in Southern Ontario. Some
17 community agreements have more payments and some community
18 agreements have less.

19 Perhaps I could ask my colleague, Terry, to
20 add a word to that?

21 **MR. SQUIRE:** Terry Squire, OPG, for the
22 record.

23 Dr. Barnes, one of the things that we
24 looked at specifically was the agreement with Port Hope,
25 Port Hope Township and the Municipality of Clarington,

1 where they are looking at storing low-level waste -- I
2 believe over a million cubic metres of low-level waste.
3 That agreement was bounded by \$30 million, \$10 million
4 trust funds paid to each of the municipalities. They were
5 allowed to take the interest off of the trust funds and
6 when the facility goes into service, they then assume the
7 trust funds for their own purposes.

8 So we looked at, you know, bounding by
9 international agreements and also by agreements right here
10 in Ontario and Canada as well.

11 **MEMBER BARNES:** I have read the agreements
12 that you had and I haven't, at least lately, read the one
13 with Port Hope, but knowing a little bit about Port Hope.
14 Obviously, the distribution of low-level waste and so on
15 is scattered throughout that community.

16 In the case that we're looking at here, the
17 siting of this facility is entirely within Bruce plant and
18 I wasn't sure; again, why there was a potential -- well,
19 an agreed transfer of funds in the said case of Kincardine
20 of \$22 million over 10 years. And when I look for what
21 that would be used for, there really was no specification
22 as I recall in the document of what it would be used for.
23 So it was simply a transfer to the community and I
24 couldn't see what costs totalling roughly \$22 million
25 might be incurred by the community in this particular

1 facility.

2 **MR. SQUIRE:** Terry Squire, OPG again, for
3 the record.

4 Dr. Barnes, one of the things that we
5 looked at as Ken Nash referenced is there is a certain
6 cost of doing business and, you know, for Kincardine to
7 step forward and not only store wastes from the Bruce area
8 but also wastes from the Darlington and the Pickering
9 area, I believe that they felt that their community had to
10 benefit from that and that benefit were those dollars. The
11 dollars are actually paid over 30 years.

12 And that was a topic of discussion, whether
13 they were paid more upfront, such as the Port Hope
14 Agreement, or whether they were paid over time. Many of
15 the politicians felt that they wanted future councils to
16 make some of the decisions about how that money would be
17 made, so they preferred that the money was received over a
18 longer period of time.

19 **MEMBER BARNES:** A separate topic, and I
20 wanted to follow up some of the questions that Mr. Harvey
21 raised on international repositories.

22 In the documents from OPG as was stated --
23 you gave examples on page 22-23 of Sweden, Finland; two in
24 Finland and one in the U.S. You happened to mention but
25 gave no details at all on others in Switzerland and Spain,

1 for instance, and Germany and likewise staff had a small
2 component on there and both parties, OPG and staff, claim
3 that they could make in a sense judgments or assessments
4 of the subsurface repository here based on their
5 "international experience" or looking at international
6 repositories.

7 But what, again, troubles me slightly is
8 that to me, again, based on -- based on the information
9 I'm given, all right, as opposed to other information you
10 might have in other reports and files and so on, but based
11 on the information I'm given; first of all, I'm given very
12 little and, secondly, I'm not persuaded that the
13 comparatives you're making here are particularly close.
14 There is significant differences in the depth of burial.
15 Most of the ones that you quote in Finland and in the U.S.
16 and Sweden and so on are 50 to 110 metres rather than 600
17 metres. They're in crystalline bedrock. They're not in
18 sedimentary sequences. They are often, I suspect, again
19 there's no information, but they're often tied to a
20 reactor. So the volume of waste, I assume, is
21 significantly less. Mr. Harvey asked whether it was the
22 same type, low and intermediate was the same
23 classification, and I'll leave that because I think it has
24 been answered somewhat. And the size of the repository
25 given the volume I think is significantly different. So

1 what I see here is something that's being proposed at very
2 extensive -- again, I say 30 hectares at 600 metre depth
3 in limestone -- and I don't see that being compared to
4 another repository. The only one in sedimentary rocks
5 that we had any information on was the one in Carlsbad,
6 which is in permeant salt deposits at about the same
7 depth, 600. But again, those in salt fractures and so on
8 are somewhat self-healing, the salt again has some
9 capacity to flow, et cetera. There again, the type of
10 waste being deposited is different because it is military
11 waste and so on.

12 Most of these repositories appear to have
13 essentially just started, about 1999 on, again from the
14 limited information that's here. So again I'm troubled by
15 what appears to be a simplistic statement in here as I
16 started this, this morning. It's that to the casual
17 reader on both staff and OPG, there is not a problem
18 because (a) we have experience and (b) we visited these
19 sites. And I don't see that these are at all comparable
20 to the issues that you will be facing in here. Am I
21 correct?

22 **MR. NASH:** Ken Nash, OPG.

23 I don't think we ever tried to portray that
24 any situation is exactly like that in Canada. To my
25 knowledge, there are very few countries that you can

1 directly compare situations with.

2 The portrayal of Deep Geologic Repositories
3 was that, yes, they do exist. We do recognize that in
4 terms of the lifetime the repositories must manage the
5 waste, they have been in operation for a relatively short
6 period of time. The intent there was to demonstrate that
7 other countries have taken the decision to store similar,
8 not identical, but similar kinds of waste in the long-term
9 in repositories. Yes, some of these -- for instance, none
10 of these are exactly the same geology, but here the point
11 that we do make somewhere in the text I think, of the
12 information we put forward and it is part of our assertion
13 that we are in proposing this repository within the
14 international mainstream here and that is that several
15 other countries have specifically investigated sedimentary
16 sequences for, in fact, high-level waste. And that is
17 part of the confidence building there.

18 Perhaps Frank King could add to that.

19 **MR. KING:** Frank King for the record.

20 Maybe I'll just speak in general a little
21 bit about how we bring international experience in all
22 aspects not just necessarily in the geology but in the
23 engineering design of repositories to this project.

24 I'll perhaps be a little longer but I think
25 it's worthwhile to bring out. I am going to first talk

1 about the Geoscience Review Group. It was alluded to
2 earlier and Derek Martin mentioned its composition, but I
3 would just like to go to a little more detail on that.
4 The member from Switzerland, Dr. Andreas Gautschi, is the
5 head of the Nagra, which is the Swiss waste management
6 organization. He is the head of the geoscience program in
7 that organization. He is on our Geoscience Review Group.
8 They have submitted over the last number of years a
9 feasibility case for a high-level waste repository in
10 opalinus clay in Switzerland and that feasibility study
11 has got its necessary approvals in Switzerland for moving
12 ahead to the next step there. We also have Mr. Jacques
13 Delay. He is from Andra. Andra is the French waste
14 management organization. They have built an underground
15 laboratory in shale at Bure. He is the deputy head of the
16 whole program at Bure. He is the head geoscientist at
17 Bure. He is on our Geoscience Review Group. The French
18 Government recently have passed a law in June moving
19 forward with a high-level waste repository in sedimentary
20 rock in the Bure area.

21 With respect to some recent activities we
22 have taken, myself, the head of my engineering manager, my
23 safety assessment manager, and representatives of the
24 engineering company Hatch Associates who we have
25 contracted with to further the conceptual design of this

1 facility, the group of us over the last two months have
2 visited POSIVA, the Finnish waste management organization,
3 discussions with their staff on design aspects. We have
4 gone underground at their repository. We have gone to
5 Germany. We have gone underground at Gorleben salt mine
6 facility, which up until their recent political
7 difficulties in Germany was the destined place for their
8 high-level waste. We have gone underground at Konrad,
9 which is a licensed low- and intermediate-level waste
10 repository, in an old, previous iron mine near Hanover.

11 We have talked to their staff about various
12 design aspects of how you -- the number of shafts, the
13 types of shafts, what you move up and down shafts, design
14 of ventilation systems, the design of underground
15 openings, all of these things, which are important to
16 Hatch Associates, which is a mine development company here
17 in Canada to further our conceptual design.

18 I mentioned earlier the WIPP facility, that
19 same group of people just earlier on this month, we
20 visited the WIPP facility, had discussions with their
21 designers, their geoscientists, even though it's in salt,
22 there is a lot of common design aspects that you can learn
23 from, and we are taking every advantage. So we have
24 visited essentially all the deep repositories in the world
25 right now to bring this experience to bear on this

1 program.

2 I have referred to the Konrad repository in
3 Germany. While that is licensed, I should have mentioned
4 that it is still under challenge in the courts in Germany,
5 but it does have a license from their regulator to operate
6 but it is not operating right now.

7 Anyway, I just thought I'd just put all
8 that perspective on how we are bringing international
9 experience to bear.

10 **MEMBER BARNES:** I wonder if staff had a
11 comment?

12 **MR. HOWDEN:** Yes, Barclay Howden speaking.
13 I'm going to pass it to Chris Taylor shortly to talk about
14 what value we get out of the international experience;
15 what we've seen OPG has been getting out of it as well as
16 how we consider it in the broader context of our
17 assessment.

18 **MR. TAYLOR:** Yes, Chris Taylor.
19 Geosciences and Environmental Compliance.

20 The staff's earlier comments were not to
21 suggest that we were looking for a directly analogous
22 situation to the proposal we have here at the Bruce.
23 However, it's really only one of a multiple lines of
24 reasoning that we would expect OPG to bring to their
25 safety assessment, and we are looking to the -- and we

1 have in fact looked at the international experience and we
2 are aware that -- looking for common approaches to doing a
3 safety assessment regardless of the particular type of
4 rock and depth and media that exist at those sites.

5 So it is part of one of many lines of
6 reasoning that we would be bringing into our assessment of
7 that and I can ask Dr. Belfadhel to elaborate, if you
8 wish, on the specifics of our knowledge of those
9 locations.

10 **MR. BELFADHEL:** Ben Belfadhel, CNSC.

11 Yes, as Mr. Taylor mentioned, we didn't do
12 a site to site comparison because it's difficult. I mean
13 it's very difficult to find two sites that have the same
14 sedimentary rock sequence on hydrogeology.

15 So what we were interested in more from a
16 global perspective is really the performance; what are the
17 factors that control the performance of a geological
18 disposal facility? We looked at the international
19 experience. We have currently about maybe a little bit
20 over 20 programs around the world, including high-level
21 and intermediate-level waste and low-level and about half
22 of these programs are actively considering sedimentary
23 rock. So from those programs that are concentrated on
24 sedimentary rock, there is a large body of information on
25 the characteristics of sedimentary rock.

1 There is a consensus right now within the
2 international community that ---

3 **THE CHAIRPERSON:** Just a moment. Could we
4 please ask that the cell phones be silenced?

5 **DR. BELFADHEL:** So there is a consensus
6 amongst the international community that sedimentary rock
7 formations are adequate for containing and isolating the
8 waste, provided the government mechanisms of transport is
9 diffusion.

10 As a matter of fact, as Mr. Frank King
11 mentioned, they are currently a licensed facility in
12 sedimentary rock and all the safety assessments that have
13 been done using sedimentary rock are predicting doses that
14 are well, well below the regulatory limits.

15 As part of the multiple lines of reasoning,
16 we didn't just focus on the hydrogeology and geology. We
17 also looked at, as I mentioned earlier, the tools that we
18 are using, that people are using to assess the geological
19 disposal facilities. And current experience is very rich,
20 and again there is a consensus that with the tools we have
21 and the multiple lines of evidence we have right now, with
22 the natural analogs that people are using, we can conclude
23 with a reasonable degree -- I say reasonable degree of
24 assurance that the future impact from these facilities
25 will be -- should be acceptable.

1 Thank you.

2 **MEMBER BARNES:** Madame Chair, I wanted as
3 my final sort of package of questions to address the
4 Scoping Document. Is that appropriate? Because I think
5 obviously it's the key document for us today in a lot of
6 -- certainly the questions I've been posing are to look at
7 some of the supporting documents, but all of it
8 essentially ends up focussing on the Scoping Document
9 itself, which has an assumption really that these are to
10 be looked at in the format of a comprehensive study.

11 So I have to go into a little bit of
12 detail, so I just would like to ask staff, I guess
13 primarily here, why the -- whether it would be an
14 advantage to add the following comments? All right?

15 And so I turn to page 8, which is 3.0,
16 "Factors to be considered in the comprehensive study".
17 And you have a set of bullets there, and I wondered if I
18 would suggest two additional bullets to that list. Are
19 you with me? This is the Appendix 2, which is the
20 Proposed Comprehensive Study Scoping Document, August 2006
21 and I'm on page 8, "Factors to be considered in the
22 comprehensive study".

23 I would have thought a first one there,
24 before getting into some of the specifics, would have
25 included an evaluation of the technical assumptions in the

1 project, in those that affected environmental situations,
2 some of the ones I was trying to get at this morning.
3 There are some assumptions made which, if you accept the
4 assumptions and there's probably little environmental
5 concern if the assumptions are incorrect and they're a
6 significant environmental concern, because I think there
7 is some -- could be some debate on the technical aspects
8 and some evaluation of those would be appropriate.

9 Again, tell me if this is inappropriate in
10 this sort of procedure, but there is very little
11 documentation and I realize this is an EA process and
12 eventually there will be a licensing process and, you
13 know, there have been many, many things that we look at in
14 more detail as we proceed down this path, but nevertheless
15 we are given the specs on this facility and we are given
16 its sort of history of development. We are told in
17 general terms what kind of material is going into it and
18 then we're told how it will be sealed and essentially left
19 in perpetuity.

20 What we're not told in this process is the
21 details of the monitoring program that again would give
22 assurance to the public that this facility -- that we
23 understood the ongoing dynamics of this facility, and I
24 would say both in its operating stage when it's filling
25 up, which will take some many years to go through that

1 process, and when it's sealed, as I understand the
2 documentation here, it won't be fully sealed. The
3 chambers will be sealed. You'll still be able to get down
4 the shafts and so on. They're to be left that way for
5 some considerable time to make sure there's no problem.
6 And then eventually the whole shaft system will be sealed
7 up.

8 So one assumes at the time of this sort of
9 decommissioning licence there will be a lot more focus on
10 the environmental monitoring, but I would have thought
11 since this is one of the critical issues to ensure that
12 there is absolutely no leakage that's going to get through
13 this blanket of sediment, the shale, the Queenston shale
14 and so on, that we need to understand what monitoring
15 facilities and systems are going to be put in place to
16 demonstrate that there is no contamination leakage during
17 the filling phase and during the interim closure and the
18 final closure.

19 **THE CHAIRPERSON:** Just to clarify for
20 staff; if you believe that this is covered by one of the
21 factors, you should say that.

22 **MR. RINKER:** Mike Rinker, for the record.
23 I'd like to just point out initially that
24 section 3 describes the legislated factors considered in
25 the comprehensive study. So these are -- these bullets

1 are taken almost verbatim from the Act.

2 But what you're getting at is a critical
3 point about evaluation of technical assumptions, follow-up
4 program to verify those assumptions. I think those are
5 captured in part by the second-last bullet, the need for
6 and requirements of a follow-up program in respect of the
7 project.

8 But what you're asking for, I think, may be
9 more appropriate to elaborate upon in section 4.2.11 of
10 the same document. That's on page 24.

11 **MEMBER BARNES:** I'm coming to 4.2.

12 **MR. RINKER:** Within, for example, the final
13 paragraph of that section as it exists, it talks about the
14 follow-up program should include the description of what
15 is being monitored and why. In this case, what would be,
16 for example, the technical assumptions and why is to
17 verify said assumptions and also to include things like
18 threshold triggers for implementing contingency plans. So
19 how would we respond if, for example, those assumptions
20 proved to be inaccurate?

21 **MEMBER BARNES:** I had it on there, on the
22 bottom paragraph on 4.2.11, the follow-up program, you had
23 "What is being monitored?" and then "Why?" And I had
24 inserted in between, "How it's being monitored?" Right?

25 **MR. RINKER:** Mike Rinker, for the record.

1 It's difficult at this point to know, since
2 we do not know what part of the assessment is going to be
3 based on data and which part of the assessment is going to
4 be based on assumptions, to start describing exactly how
5 those assumptions would be monitored.

6 So there is a requirement to develop the
7 program but to develop it now is premature.

8 **MEMBER BARNES:** I'm not asking for a whole
9 detail of specifics. Right. I'm just saying that there
10 is very little in here about the monitoring program, in
11 truth, and yet it's absolutely critical. All right. And
12 it seems to me it should be reflected in this document,
13 given the nature of it. There's nothing, basically on --
14 also on the potential to re-enter this, if there was a
15 problem after it's sealed. Right. After it's sealed,
16 could you in fact take the stuff out, if there was a
17 problem?

18 **THE CHAIRPERSON:** That's probably a
19 question better addressed to OPG.

20 **MR. NASH:** Ken Nash.

21 I'll provide a brief answer and then ask
22 perhaps Frank King to elaborate. We do believe that, in
23 short, that the material can be recovered. Initially it
24 will be relatively simple to recover it whilst all the
25 mine shafts are open and at that stage it will be

1 relatively easy to recover it. After the mine shaft is
2 closed off, it will become more difficult to recover.

3 I must say that the decision to shut -- to
4 close off the mine shaft and kind of, take the steps
5 towards decommissioning the facility is a very long way in
6 the future and we would expect there would be a regulatory
7 process and quite a lot of public discussion regarding how
8 and when and what monitoring will be required in the
9 longer term, but perhaps I'll pass that now, to Frank
10 King.

11 **MR. KING:** Frank King, for the record.

12 Monitoring; we kind of split it down into
13 two phases, the operational phase monitoring that would go
14 on, and Mark Jenson certainly can provide more information
15 on that, and the post-closure monitoring. As it has been
16 noted, on the post-closure monitoring -- well, first of
17 all, that's to decide exactly what happens there, what
18 would happen, is a long ways away.

19 Whatever requirements in the scoping
20 document for us to address -- post-closure monitoring or
21 operational monitoring, that is documented in the scoping
22 document, of course, we would respond to that in the
23 submission of our EA and follow up report. Now, the
24 subject of monitoring of course is a big subject, which
25 has to be addressed in all of the international geologic

1 repository programs. In Canada, in the high-level
2 program, that's been a subject of study for a long period
3 of time and the question of how is addressed. There are
4 reports out of the Canadian program and international
5 programs of the various possible ways you can do it. But
6 actually what should be done or what would be done can
7 really only be addressed at the time when we have more
8 knowledge and that is, when we have to go through a phase
9 of decommission license application and EA and approval.
10 At that point in time, I guess, there will be a narrowing
11 in on what -- based on the level of confidence that we
12 would have in the decades of activity, decades of learning
13 that would have passed between now and then, in order to
14 come up and conclude what should be done in the post-
15 closure monitoring.

16 **MEMBER BARNES:** If I could just go on to
17 page -- this is 4.2.3, which is page 12. Second paragraph
18 is:

19 "The project description should
20 include the following information
21 provided in summary form with
22 references to more detailed
23 information where applicable."

24 Then the rest of the page is a series of
25 bullets. I wondered if one of those early bullets should

1 be stratigraphic options and justifications.

2 Most of this is focussed on essentially a
3 site within one particular formation based on certain
4 assumptions and with the testing that's planned, they may
5 well look at other options.

6 **MR. RINKER:** Mike Rinker, for the record.

7 In the section on alternative means, we are
8 requiring the -- OPG to look at a Deep Geological
9 Repository, shallow and a surface repository. Would that
10 address the concern you have or are you looking for
11 something else?

12 **MEMBER BARNES:** No, those were very
13 different kinds of facilities. This is -- and I don't
14 know to what extent this document is essentially focussing
15 -- all of the documentation is focussing on one site and
16 one formation basically; right; the Lindsay Formation?
17 There could be other locations within the Ordovician
18 limestone sequence that might be appropriate.

19 Almost certainly, there are going to be
20 little local variations under that site and so it seems to
21 me that you want to be able to look at some other options.

22 **THE CHAIRPERSON:** Perhaps OPG could answer
23 that.

24 **MEMBER BARNES:** Okay.

25 **MR. KING:** Frank King, for the record.

1 I referred to earlier, that we have
2 contracted with Hatch Associates and, in particular, their
3 mine development group, to progress our conceptual design.
4 One of the things that we have been doing right now, is to
5 look at this ramp versus shaft access. Right now, our
6 reference design is to have a double shaft access, but
7 we're aware that other places in the world, they have
8 chosen to go ramp access. We want to make sure we have
9 the right, the optimum solution. So that piece of work
10 will be done over the next six months or so.

11 On your specific question of where would
12 you locate the repository in the various layers? Of
13 course, that will be something we'll address as part of
14 the engineering development. The initial decision, which
15 is the reference design right now, to put it in the
16 limestone, was based on ease of construction; that it's
17 easier to construct in that limestone formation rather
18 than the shale and also to maintain that shale layer in
19 its entirety as a cap for the facility. But that will
20 certainly be looked at once we get the information from
21 the first deep borehole.

22 **MEMBER BARNES:** And then under, on page 12
23 and 13, which are essentially all a set of bullets; some
24 dealing in the -- on the topics I just mentioned and then
25 later on page 13, malfunctions and accidents. I wasn't

1 I think, the additional scenarios that Dr.
2 Barnes is raising, could be added to this list.

3 **MEMBER BARNES:** Likewise, in the study
4 areas of 4.2.9, page 17/18, I see you mention Lake Huron
5 at the bottom of page 17, site study area. And so you'd
6 accept that investigations into potentially Lake Huron is
7 captured. You'd agree on that, I presume?

8 Because otherwise, under local study areas
9 -- everything is virtually terrestrial.

10 **MR. RINKER:** Mike Rinker, for the record.

11 Yes, we agree with you, sir, what you're
12 saying.

13 **MEMBER BARNES:** I understand the procedure
14 that you have a format to follow, and it's partly tied to
15 CEAA and so on.

16 This is best illustrated on page 16, where
17 we have the traditional list of bullets there, which ask
18 you to look at meteorology and climate, all the way down
19 to terrestrial ecology and then another set of bullets
20 below that.

21 But in truth here, we're looking at a
22 project that is a sub-surface project, 600 metres below,
23 in which most of those bullets are, to some extent, of
24 minor concern and there are other of those bullets,
25 perhaps just two or three of those, which include geology

1 and engineering and things like that, which are hugely
2 important, right, compared to most of the other bullets.
3 This is what's, I think unfortunate to some degree, to get
4 trapped into a suit preparing a scoping document.

5 Go ahead.

6 **MR. RINKER:** Mike Rinker, for the record.

7 Because the -- I understand that one of the
8 more important parts of this project is the long-term
9 performance; however, part of this environmental
10 assessment would include the site preparation phase. It
11 would include the construction phase, and it would include
12 the operation, whether it's dewatering. And then it would
13 also include the long-term performance.

14 So many of these issues, such as air
15 quality and noise are critical to the initial stages of
16 the assessment, just as bedrock in geology would be
17 critical to the end part of the assessment.

18 **MEMBER BARNES:** On page 19, which is
19 4.2.9.1; this is the assessment of effects caused by the
20 project on the environment during operations. Okay? And
21 you identify three -- four factors, one across the page
22 there, which are -- the first two are looking at valued
23 ecosystem components, what you see.

24 But do you think there should be a boldface
25 component there that actually looks -- again, it's a

1 repetition, but it's under this particular component of
2 environmental monitoring systems, because how can you
3 assess the effects if you haven't -- if it's not clear
4 what the appropriate methods by which you can assess some
5 of the concerns that we've been expressing here this
6 morning?

7 **MR. RINKER:** Mike Rinker, for the record.

8 I'm not certain that I completely
9 understand your requirement. In general, the
10 environmental monitoring systems that we wish to put in
11 place are those that would capture information at the end
12 of the assessment, some things that are left to ensure
13 that our predictions were indeed accurate.

14 So I'm not sure how environmental
15 monitoring systems would aid us in evaluating an
16 environmental effect, assuming that prediction is based on
17 either data or assumption.

18 I can understand that an environmental
19 monitoring system could be in place to verify that the
20 data or assumptions are indeed correct.

21 **MEMBER BARNES:** Yes, and it may be implicit
22 in here, for example, under 2, the last paragraph,
23 quantitative as well as qualitative methods. It just
24 seemed to me that the assessment of the effects caused by
25 the project on the environment during operations, and the

1 operations here are not only construction but the filling
2 of the repositories. So it goes on for a considerable
3 period of time and these potential radiological effects
4 and so forth and all the engineering and groundwater, et
5 cetera, et cetera.

6 But you can only assess those effects if
7 you have baseline information. And what I tried to point
8 out right at the beginning this morning, it's admitted
9 that we have almost no "baseline information" below 100
10 metres in this site. We will gradually gather some, but
11 if you're trying to show that there's no -- if you're
12 trying to assess the effects caused by the project, you
13 have to have some means by which you're measuring the
14 effects from the beginning which require you to have a
15 strategy of appropriate -- I'll call them monitoring
16 systems in place, various kinds. It just seemed to me
17 that the areas in bold were kind of, to some extent,
18 inappropriate for this kind of project and weren't
19 emphasising the need to have those systems in place early
20 rather than at the end, by which case you wouldn't be able
21 to show whether there is much of an effect.

22 **THE CHAIRPERSON:** If the staff believes
23 that it's covered, please, you can state that and you can
24 state that and the Commission will decide what it cares to
25 add to the area.

1 **DR. THOMPSON:** Patsy Thompson for the
2 record.

3 In terms of trying to address your concerns
4 and maybe clarify expectations of what would be done,
5 essentially, to answer the questions that are bolded in
6 elements 1, 2, 3 and 4 that you've been speaking about, I
7 think what could be done is to more explicitly identify
8 the requirement for the baseline -- the existing
9 environmental monitoring data and site characterization
10 information to be included in the assessment, as well as
11 the need for the site characterization program information
12 to be tightly linked to the environmental assessment. I
13 think this is what you're getting at.

14 **MEMBER BARNES:** Exactly. Thank you very
15 much.

16 That's all, Madam Chair.

17 **DR. THOMPSON:** Perhaps to go back to one of
18 the issues Dr. Barnes had as well in terms of -- on page
19 24, element 4.2.11 for the follow-up program. I think
20 your concern was that it wasn't very explicit, the process
21 that would be followed, to develop the follow-up program.

22 So I think it would be appropriate perhaps
23 to expand the section to provide more details on the
24 process that needs to be followed to identify the elements
25 of the follow-up program, what they are linked to.

1 **THE CHAIRPERSON:** Mr. Harvey.

2 **MEMBER HARVEY:** Merci, madame la
3 présidente.

4 My question is addressed to staff. Coming
5 back to factors to be considered in the comprehensive
6 study, when we compare the list in the documents with the
7 list in the Act, there is a slight difference. You just
8 push away the paragraph which is paragraph (e). This is
9 in page 8 of the comprehensive study, Scoping Document.
10 So you pushed at the end of the list the paragraph (e) of
11 16.1, which concerned the need for the project and
12 alternatives to the project, and I see that you pushed it
13 at the end and you retained the need for the project, but
14 you left away the alternatives of the project at the
15 specific place.

16 Do you follow me?

17 **MR. RINKER:** Mike Rinker, for the record.

18 Not entirely. We have -- we've put in the
19 mandatory requirements outlined in 16.1 and 16.2.
20 16.1.(e) provides the CNSC some discretion to add
21 additional factors, and so those additional factors were
22 listed at the end.

23 The need for the project, for example, is
24 not necessarily required but we've added that because its
25 consideration of traditional and local knowledge is not a

1 legislated requirement for a comprehensive study but we've
2 added that. So the additional factors we've put at the
3 end to those that were indeed legislative requirements.

4 **MEMBER HARVEY:** It's not obligatory; it's
5 discretionary?

6 **MR. RINKER:** Mike Rinker, for the record.

7 Yes, 16.1(e) of the *Canadian Environmental*
8 *Assessment Act* says any of the matter of the screening or
9 comprehensive study, such as the need for the project,
10 alternatives to the project, that our responsible
11 authority may require or can be considered, but those are
12 examples.

13 The ones that CNSC staff are putting
14 forward are the need and traditional and local knowledge.

15 **MEMBER HARVEY:** In fact, when you're
16 talking about the need, in page 3 of the -- at the end,
17 disposition of comment, you say that according to the
18 guidance -- this is on page 3, the last document,
19 disposition of comments, it's -- this is bottom of page 3:

20 "According to CEAA guidance, the need
21 should be established from the
22 perspective of the project proponent."

23 So I'm just trying to ---

24 **MR. RINKER:** Mike Rinker, for the record.

25 I see your point. The first sentence in

1 the disposition of comments that says, "The need for a
2 project is required for every comprehensive study" is not
3 correct. The need of the project is an optional
4 requirement that in this case the CNSC has required OPG to
5 provide.

6 **THE CHAIRPERSON:** I would like to address
7 one of the issues that is of concern in a number of the
8 areas, a number of the documents, which is the closeness
9 of the project to Lake Huron and the distance from Lake
10 Huron.

11 So I would like to start with OPG in terms
12 of the considerations that the risks of having this
13 project, a Deep Geologic Deposit as close as one kilometer
14 from Lake Huron.

15 **MR. NASH:** Ken Nash.

16 Perhaps I'll start with that. I quoted
17 earlier from the Golder Report that did assess all the
18 available information about the regional geology and I
19 quoted from that report that there would be no direct
20 discharge to Lake Ontario. That's the advice that --
21 sorry, Lake Huron. That was the advice we obtained from
22 Golder.

23 I would perhaps ask either Mark Jensen or
24 Dr. Moffett to add to that and further explain that point.

25 **THE CHAIRPERSON:** And if you also could

1 discuss what makes you -- the assessment of that. I think
2 this is an extremely important point and what will be done
3 during the environmental assessment that will seek to
4 investigate this thoroughly.

5 **MR. MOFFETT:** Duncan Moffett for the
6 record.

7 On a matter of principle, first of all,
8 remoteness in itself is a very bad criterion for waste
9 management. A waste management facility, as a matter of
10 principle and fundamental design should rely upon the
11 inherent properties of the rock to contain and isolate the
12 wastes.

13 So strictly speaking, proximity to a lake
14 is not in itself something that would be exclusionary. It
15 is not acceptable to contaminate 100 metres of rock or 100
16 kilometres of rock further away from a lake is what I am
17 saying.

18 When Golder did the independent assessment
19 report and the geological feasibility study, we started
20 with basically three questions: Is the geology under the
21 site predictable? And our answer was based upon the
22 information in Southern Ontario, based on various
23 boreholes was, from a study point of view, yes.

24 Then our second question was, was the
25 geology of the site capable of allowing, from an

1 engineering point of view, the facility to be constructed.
2 And our answer for that again was, based on information we
3 had, yes.

4 And then our third goal in the feasibility
5 in the independent assessment study we did is given the
6 assumed rock properties, would the rock be capable of
7 providing the degree of isolation that is necessary. We
8 answered "yes" to obviously all of those questions and
9 ended up with a rock, which we believe, based on our
10 professional judgment, that that rock is capable of
11 providing the degree of isolation such that there would be
12 no contamination leaching the lake or getting close to the
13 lake now or 10 or 1,000 years in the future. And the
14 confirmation of that was in Quintessa's safety assessment,
15 which used the geological and hydrogeological model that
16 we had developed to predict the future contamination or
17 the movement of contamination.

18 I believe, Mr. Nash has said several times
19 if it is found in the drilling program that the geology or
20 the hydrogeology is not as we expect -- and again I
21 emphasize there's a lot of evidence to lead us to our
22 prediction, but if the monitoring program Dr. Barnes, I
23 think, sees it in terms of the characterization program
24 and the extensive amount of work that is to be done in
25 this five-year program, if that does not lead to confirm

1 -- to show that the initial assumptions were generally
2 correct, that the location -- that the containment is
3 provided by diffusion control, then this would not be an
4 acceptable site. The analysis will find it not to be
5 acceptable.

6 **MR. NASH:** Sorry, Ken Nash.

7 You did also ask regarding what steps we
8 will take to actually verify that. If you would like, I
9 could ask Ken Raven to describe the site characterization
10 plan that's aimed at testing and verifying the earlier
11 assertions made by Golder.

12 **THE CHAIRPERSON:** And if I could, one of
13 the questions that comes up, and this goes back to Dr.
14 Barnes' question about your timetable versus five years,
15 is I guess why does it take five years to do this? Could
16 this be done earlier so that there could be more
17 information available earlier that would allow more
18 decision making. So since you're on that subject, if you
19 could answer the two things together?

20 **KEN RAVEN:** Ken Raven, INTERA Engineering,
21 for the record.

22 In terms of the work that will be done in
23 Phase 1 for the geoscientific site characterization
24 program, we will be completing 20 kilometres of seismic
25 reflection survey that's intended to try and identify the

1 presence of any structure and the layering that's present
2 in the sediments at the site. That provides sort of
3 qualitative information, but what we will be relying on
4 principally will be a very detailed hydraulic testing
5 program of these formations, and if the hydraulic
6 connectivities of these formations are low enough, then we
7 can have some confidence that transport will be dominated
8 by diffusion.

9 In addition to that hydraulic testing
10 program, we will get information on the chemistry of the
11 pore fluids and of the groundwater that will also lend to
12 support judgments about whether or not there is any sort
13 of active groundwater migration occurring at the site
14 today.

15 **THE CHAIRPERSON:** Just back to Mr.
16 Moffett's comment, I mean, of course the Commission
17 expects that OPG won't accept environmental damage of any
18 kind. We expect that on all their sites. It is just that
19 I think one can understand that when you are next to a
20 large body of water that people depend on for a lot of
21 reasons, including their livelihoods, that just the
22 proximity itself would, not from the viewpoint necessarily
23 of scientific studies or whatever, but just inherently be
24 for people at risk. I think that that seems to me an
25 obvious concern that people have put forward, and I think

1 it is up to OPG to address the people's concern before
2 even the environmental assessment gets started, that this
3 is, you know -- and I don't expect a comment exactly. I
4 just don't think that it is right for us as scientists,
5 and I'm one too, to disregard concerns that are there.

6 I think we are finished the first rounds of
7 questioning. I think it has taken quite a while, but
8 there's some interesting areas.

9 We are now going to move to the
10 interventions. We do have a number of interventions
11 today, oral and written.

12 The first thing I would like to say to
13 everybody who put in their oral or written intervention,
14 that the Commission has had an opportunity to read these
15 and we do read these very carefully and use them in our
16 decision making. So whether it is oral or written, we pay
17 attention to what is said. We find them very interesting
18 and rewarding and we will ask questions as we see fit on
19 either the oral or written interventions. That's what we
20 do.

21 That is why we have an order to take into
22 account. The number of people who have been interested in
23 talking to us today, we have asked people to use their
24 written text but to -- we've allocated about 10 minutes
25 for each oral presentation. So we will be asking for your

1 help to meet that.

2 We have an opportunity now to go to our
3 first oral presentation, and we are pleased to welcome
4 again the Saugeen Ojibway Nations, CMD 06-H22.57. We have
5 chiefs with us again this afternoon.

6 Thank you for coming and for staying with
7 us. So I don't know who is going to do the presentation,
8 but we will leave it to you and we listen with all
9 interest. Thank you very much for coming.

10

11 **06-H22.57**

12 **Oral presentation by**
13 **the Saugeen Ojibway Nations**

14

15 **CHIEF KAHGEE:** I'll just make sure this
16 works first. All right.

17 Madam President, Members of the Commission,
18 I'm Chief Randal Kahgee. I am Chief of the Saugeen First
19 Nation. I am going to be speaking on behalf of the
20 Saugeen Ojibway Nations today.

21 I would like to thank you for the
22 opportunity to be heard on this very critical issue. We
23 have our detailed written submissions, which I am sure you
24 will review or have reviewed. I am going to highlight our
25 positions and respond to what Commission staff said in

1 their supplementary information they filed last week.

2 Saugeen Ojibway Nations are asking you to
3 recommend to the Minister of the Environment to refer the
4 DGR Proposal to a review panel and that you consult the
5 Saugeen Ojibway Nations respecting the membership and the
6 Terms of Reference for that panel.

7 We say that for two reasons. First, a
8 panel review is appropriate for the assessment requirement
9 in the *Canadian Environmental Assessment Act* because this
10 project may cause significant adverse environmental
11 effects over the very long term and that this danger has
12 raised widespread concern among members of the Saugeen
13 Ojibway Nation.

14 This project will not be publicly
15 acceptable, from the First Nations' perspective, until we
16 have a high degree of certainty that harm to the
17 environment would be avoided over many hundreds of years.

18 Who we are as a people, as a community and
19 as a nation is defined according to our relationship to
20 the land. Our responsibility and commitment is to
21 maintain this relationship and protect the land for future
22 generations. This is a role and responsibility that we do
23 not take lightly.

24 As First Nations we do not have the luxury
25 of dealing in "what ifs". We need to deal in the

1 absolutes.

2 As such, we will not believe that this is
3 safe for our future generations unless that is the
4 conclusion reached by a credible, independent and thorough
5 investigation that addresses all the big issues and is
6 conducted in public with our full participation.

7 It is our understanding that panel reviews
8 under CEAA are intended to operate that way but that
9 comprehensive studies are not used when that degree of
10 independence, participation or public process is
11 appropriate. That is why we have not agreed with the
12 Commission staff's recommendation to conduct a
13 comprehensive study.

14 Second, the federal government has a legal
15 duty to consult with the Saugeen Ojibway Nation and try to
16 reach agreement with us on effective ways to accommodate
17 our rights and interests that would be put at risk by the
18 DGR proposal being considered. That duty must be
19 fulfilled before the project could be authorized by this
20 Commission. The Commission staff has failed to get the
21 law right on this particular issue. The duty cannot be
22 met just by the conduct of an environmental assessment,
23 but if we could agree on how to conduct that assessment,
24 it would lead to thorough and trustworthy answers on all
25 the substantive issues that need to be considered. It

1 and deep concerns regarding the project, if we cannot be
2 sure that the EA process will be one that is credible,
3 independent, thorough and addresses all the substantive
4 issues, then I think we have a very serious problem on our
5 hands.

6 The DGR is a huge project. It is a project
7 that we think has been seriously underestimated in both
8 its size and scope. It is imperative that we get this
9 right.

10 Although we've had useful discussions with
11 Commission staff, we have not been able to achieve that
12 critical first step in terms of the collaborative design
13 of an appropriate consultation and EA process. We welcome
14 further discussions towards such a collaborative design.

15 In closing, I would like to emphasize that
16 this is our home. This has been our home for hundreds of
17 years and we're not going anywhere. We cannot be treated
18 as simply a people on the outside looking in or just
19 another public interest group. It is much, much deeper.
20 This is what the Constitution tells us.

21 As a guide, if substantial public concern
22 warrants the panel, then my challenge to you, why doesn't
23 our concerns, the First Nations' public concern also
24 warrant a panel?

25 **THE CHAIRPERSON:** Thank you very much.

1 Questions from the Members of the
2 Commission? Dr. Barnes has a question.

3 **MEMBER BARNES:** I just had two comments
4 that are slightly minor compared, I think, to the main
5 points you're making. One is there have been some points
6 I have made and which President Keen has made regarding
7 the issue of Lake Huron and I think it's worth stressing
8 that the First Nations here depend very much on the
9 fishery there. So the potential contamination of the
10 lake, that is one of the key issues that one needs to be
11 concerned about. Obviously, there would be -- I'm sure
12 OPG would say if that happened and they don't anticipate
13 it to happen, then there would be a significant dilution
14 factor, but one might want these environmental assessments
15 to look at the circulation patterns and potential
16 stratigraphic contacts with the sea bed, et cetera, et
17 cetera, in relation to where you're fishing.

18 The second is a small point, again relative
19 to what you've said, but it didn't come up this morning.
20 It's in the OPG document where they mention that they
21 would have a specialist in anthropology that would do a
22 survey prior to their activities of roughly 15 hectares
23 that would be cleared.

24 I would ask OPG, because obviously much of
25 that is forest and it's perhaps difficult to find such

1 activities, but would you anticipate having such a
2 specialist available during the clearing and during the
3 excavations, at which time you're much more likely to find
4 activities or remains prior to those activities? Question
5 to OPG.

6 **MR. NASH:** Ken Nash, OPG.

7 I'll just provide a general answer and
8 perhaps one of my colleagues could add to that. For
9 instance, when we did the Bruce Storage Project there was
10 a need to clear some land there and we did surveys and we
11 kind of generally agreed with the First Nations, the scope
12 of those surveys, and they were carried out by a
13 specialist. I don't know if anybody wants to -- and so we
14 would intend to follow a similar process there.

15 Perhaps Duncan Moffett could add to that in
16 any way.

17 **DR. MOFFETT:** Yes, Duncan Moffett.

18 As part of the environmental assessments
19 that we do routinely, we do a phased approach to
20 archeological assessment based upon the written record of
21 what is on the site or what sites are recorded, and that
22 directs our field investigation.

23 In addition, at this site we would expect
24 to continue to hear from the Saugeen Ojibway Nations in
25 terms of their concerns for the site and their known

1 burial areas on the site.

2 So I think in terms of environmental
3 assessment methodology, it's a very cautious and stepwise
4 approach, and if there is any indication that an artefact
5 or a sacred area might be in any way impacted, then our
6 follow-up program that we would recommend in the
7 environmental assessment would indeed include that
8 archeologists be present during excavations.

9 **MEMBER BARNES:** Again, just a comment for
10 clarification. Actually, that area that you mentioned
11 here really was, I felt, well covered and well illustrated
12 in the OPG document compared to some of the other things I
13 raised this morning.

14 But I'm just trying to distinguish between
15 the survey, again, before in a forested area, which may
16 not find that and the First Nations may not be aware of
17 those versus being able to locate them during the
18 excavation. It's a very different situation and I think
19 it's just a question of two groups agreeing whether that
20 should be done, not today, but ---

21 **DR. MOFFETT:** To respond, in terms of the
22 carrying out the studies, most certainly and absolutely
23 we're interested in respecting and reflecting the concerns
24 that aboriginals have with respect to sacred sites and
25 archeological value on that site.

1 **THE CHAIRPERSON:** I believe that Chief
2 Nadjiwan wants to comment on that.

3 **CHIEF NADJIWAN:** Madam President, I'd like
4 to say good afternoon to you and to your colleagues this
5 afternoon. I know we extended a good morning to each
6 other this morning and I would like to add perhaps a few
7 comments and I hope I'm not falling out of synch with the
8 process here this afternoon because I know we have entered
9 into a question period.

10 I guess many of you can see the map up on
11 the board there and we've got several of them there for
12 your viewing and, as you can see, if you look from the
13 light green area right up to the top of the Bruce
14 Peninsula in the Tobin Murray area you can see in that
15 illustration the amount of land that our territory has --
16 you know, what it's based on, the comprehensiveness of it.

17 And through the succession of treaties it
18 was never the position of the Saugeen Ojibway Nations to
19 surrender any of their traditional occupational
20 activities.

21 This morning was also an example of the
22 maintenance of our inherent values and we performed a
23 ceremony which was -- included our songs and our language
24 and our traditions, customs and heritage and those
25 traditions stem from a longstanding relationship with

1 understanding the environmental health of the lands that
2 we've lived on for a long, long period of time.

3 The environment, to some of our elders, is
4 like a hardware store, a grocery store, the bank or the
5 pharmacy and they've drawn their sustenance off of these
6 territories from time immemorial.

7 We've had eight community meetings on the
8 DGR and visitations by the OPG and the gist of those
9 meetings can be summarized fairly quickly, and I'll do so
10 with the following words. As good as their science and
11 engineering appears to be, as reasonable as their
12 explanations have been, our people have still had
13 questions and they say, "Yes, but what guarantees can you
14 give us that you will not harm the land?" And in response
15 to that they could give no guarantees. No one can.

16 And that's why we are asking you to
17 recommend the full environmental assessment, a full panel.
18 By doing so, the process places all parties on the same
19 page. The members of the Sagueen Ojibway Nation
20 territories have been here for a long time and hopefully
21 will remain here for a long time. There are also peoples
22 who have come to enjoy and live and thrive within our
23 territorial homelands and we recognize individuals, many
24 of them whom are here today.

25 We have heard of that as the "public

1 domain" and we anticipate that as it was mentioned earlier
2 by Dr. Barnes, some of the explanations and the
3 descriptions can be seen as somewhat simplistic or perhaps
4 understated. There are a variety of ways of assessing
5 those various presentations and descriptions. All in all,
6 we end up with the same questions and some of these
7 questions relate to, I would say, the three pillars of
8 this development; the first one being preparation, the
9 second one construction, the third one operations.

10 In order to facilitate all of those things
11 in their fullest capacities and extents, we believe that
12 the panel is the only way to achieve those means in the
13 fullest way. So we emphasize consideration for that.

14 I also have had an opportunity to review
15 the members of the panel here today and their level of
16 expertise and I see that not everyone there is a nuclear
17 physicist or someone in that spectrum, and I'm glad of
18 that but I'm also glad to see that many of the members of
19 the CNSC are also highly skilled and highly gifted and
20 very committed people in a variety of fronts. Certainly,
21 I can recognize that and respect that.

22 We would ask you all to consider, you know,
23 for that one extra moment that it takes to realize that
24 this is one example that sets the tone for the future of
25 the Canadian nuclear industry in our country and it's

1 happening right here in this beautiful part of the country
2 that we consider our traditional homelands.

3 So I thank you for hearing these few words
4 that I've shared in adding to Chief Kahgee's presentation
5 and am happy to be here to do this presentation today.

6 Thank you.

7 **THE CHAIRPERSON:** Thank you very much.

8 Mr. Harvey, any questions?

9 I have a question for you because I
10 mentioned earlier that one of the things that strikes me
11 -- and I come from Alberta so I know about lots of
12 development happening really fast and what this means. I
13 talked about the fact that so much is happening here and
14 so much is going on at once.

15 One of the questions I'll be asking some of
16 the mayors as well is the effect that this is having on
17 the community.

18 I suppose from our point of view it's not
19 just for this project or for CEAA. It's really that the
20 CNSC spends a great deal of time with the licensees --
21 with many of the same licensees on many projects again and
22 again.

23 One of the issues with that of course is
24 that their brownfield -- what they call brownfield sites
25 -- but the other is that in fact you are not in and out as

1 others are.

2 You know, one of the considerations that
3 strikes me is I have been involved in panels on the other
4 side of it and panels come in and look at projects through
5 eyes and then they leave, you know. And one of the things
6 that's unique about the CNSC compared to any other nuclear
7 regulator in the world is the fact that we are in at the
8 environmental assessment, go through the whole process
9 right down to decommissioning of the projects. And so
10 it's a different position. So although CEAA says its
11 environmental assessment is to plan, you know, you're
12 planning so you can monitor this so that you don't plan
13 and then adios. You plan because you're going to make
14 sure -- Dr. Barnes' comments about these factors -- are
15 monitored; you set the baseline and you measure it and you
16 take action when things go wrong. You don't come in and
17 leave.

18 So I guess I just have two questions.
19 That's two parts then. The whole issue of this amount of
20 activity in coping with many projects at once, I think the
21 only project that's probably not the CNSC is the windfarms
22 concept and what that means, I suppose, for you and for
23 your people, and the second is have you thought about the
24 pros and cons of this? Has the staff explained to you
25 what panels are like as well as there is pros and cons to

1 this concept as well?

2 **CHIEF KAHGEE:** Thank you, Madam President,
3 for your comments and your questions. I'll try and answer
4 them the best I can.

5 With regard to the first question, and
6 that's more of a general statement and kind of curiosity
7 in terms of how we deal with these types of projects and
8 the ongoing demand, I can tell you from experience, having
9 been doing this work for several years, prior to my life
10 as a chief I was an aboriginal rights lawyer with my
11 colleague here, Mr. Pape, and I've had the opportunity
12 with working with many wonderful communities across this
13 country, and particularly in northern Ontario and that's
14 where I'm going to draw my experience in relation to what
15 my people have been saying in Saugeen and perhaps Chief
16 Nadjiwan can speak for the people in Nawash.

17 The long and short of it, it's incredibly
18 overwhelming. It's incredibly draining and requires a lot
19 of time, a lot of commitment a lot of resources and a lot
20 of technical savvy; all of those things we just don't
21 have. And I'm reminded of a comment that an Elder made to
22 me once and this is in the context of mining and I think
23 it's also applicable here in the context of the comment
24 you've asked me to address.

25 And that is, so often these companies come

1 into our territory and we have so many other things going
2 on, and I'm sure you read about all the social context and
3 all the social issues that are going on in our community.
4 With all those things going on we are expected at a
5 moment's notice to drop everything and focus our
6 attentions on that and it is extremely difficult.

7 It was even much more difficult three years
8 ago, prior to the new case law and the issue of
9 consultation which has given us some flexibility, as well
10 as the Crown some flexibility and proponents flexibility
11 in terms of looking at these issues, sitting down and
12 hashing out a process that makes sense to all the parties.

13 From where we come from, what we look for,
14 really, is a process that's going to do just that; really
15 take a hard look at the particular project in question,
16 assess it fully in terms of what its impacts are going to
17 be on our rights and interests.

18 Now, that's something that we as First
19 Nations have to play a very critical role in. It's not
20 something we can be on the outside looking in and I think
21 the new law in this area is a breath of fresh air. I know
22 everyone hears the word "consultation" they throw up the
23 warning flags. But what does that mean?

24 I appreciate and understand it is a new
25 development law but it is something that I've seen work,

1 in terms of sitting down at the table, agreeing on a
2 process that makes sense to all the parties and
3 identifying those potential risks and working towards a
4 way to mitigate or minimize those risks.

5 So I think it's a very positive process but
6 it's also very time consuming and as first nations, I'll
7 be honest with you, we don't have the capacity, we don't
8 have complete access to the technical people to bring them
9 in and take a full independent look at these types of
10 projects and I think that's where the environmental
11 assessment is very critical.

12 We appreciate that it is not meant to be
13 the where-all and end-all of consultation, but it is very
14 much a critical part of that process and if it's fashioned
15 properly and it does just what we have said it should do;
16 take a very hard look, independent and thorough look at
17 all the substantive issues and address them going forward,
18 then you've come a long way to establishing a very
19 critical part of that process.

20 But I referenced it in my comments earlier,
21 if the EA process is not fashioned properly, regardless of
22 what it looks like in terms of being a panel or a
23 comprehensive study, the bottom line is the overall
24 process is just going to fail.

25 Now, the second question -- I got off the

1 second question.

2 Oh, your second question was in the context
3 of CNSC staff in terms of pros and cons. Yes, we've had
4 some very, what I think, positive initial discussions with
5 CNSC staff and we certainly have welcomed those
6 discussions. Certainly, in my experience there was a
7 degree of openness that, you know, you probably don't see
8 in other realms.

9 But I think we've started something and we
10 would welcome continuing discussions on looking at what
11 that process may be, regardless if it is a panel or if
12 it's a comp. Obviously our experience is that panels
13 generally do provide that degree of independence and
14 public assurance of the process but we are certainly
15 committed to -- for us the emphasis has to be in the
16 process and we have to play a critical role in that.

17 **THE CHAIRPERSON:** Thank you very much for
18 that. Thank you very much for coming, we really do
19 appreciate that.

20 We're going to just take a short break.
21 We're just going to take a 10-minute break and then we'll
22 start with the next intervenors.

23 Thank you.

24 --- Upon recessing at 3:11 p.m.

25 --- Upon resuming at 3:25 p.m.

1 **THE CHAIRPERSON:** Ladies and gentlemen, the
2 Chiefs of the Saugeen Ojibway Nations have graciously
3 offered to perform a song for us as an ending for their
4 presentation and the Commission has agreed. So we will
5 now turn our attention to my right.

6 --- Song by Saugeen Ojibway Nations

7 **THE CHAIRPERSON:** Thank you, ladies and
8 gentlemen.

9 We'll now proceed further with our
10 interventions. And we are now pleased to turn to the oral
11 intervention by the mayor of the town of Saugeen Shores.
12 This is a mayor that we've had an opportunity to meet
13 several times, Mayor Kraemer. So it's very nice that
14 you've taken the time again to be with us and we look
15 forward to your comments, sir.

16
17 **06-H22.2**

18 **Oral presentation by the**
19 **Town of Saugeen Shores**

20
21 **MR. KRAEMER:** Madame President, Commission
22 members, Commission staff, OPG staff, fellow deputators,
23 members of the public and press. It is indeed a pleasure
24 to be back here again, Madame Chair and it is somewhat
25 with a heavy heart that I tell you this will be the last

1 time I appear before you because I have decided to retire
2 from political life, so it is with a bit of sadness that I
3 sit here before you today.

4 It's my pleasure though, to introduce to
5 you, on my right, Mayor Ron Oswald from the Municipality
6 of Arran-Elderslie. Mr. Oswald is also our Bruce County
7 Warden and he will be speaking to you separately,
8 following my presentation this afternoon.

9 We were also to have with us, Mayor Charlie
10 Bagnato from the Municipality of Brockton and also we were
11 to have Mayor Mitch Twolan with us from the Municipality
12 of Huron-Kinloss. Unfortunately they both had to leave
13 for prior engagements; one was family-oriented and the
14 other was a distraction called a council meeting so they
15 bring their best and they send their regrets for not being
16 able to stay.

17 So we actually represent the four
18 municipalities that are adjacent to the Municipality of
19 Kincardine and along with Kincardine, we make up the
20 traditional impact zone that surrounds the Bruce Nuclear
21 site.

22 It goes without saying that the nuclear
23 industry plays an important role in our municipalities.
24 And after 45 years, we believe that they have actually and
25 indeed earned our trust and our support. Our residents

1 have a good understanding of the industry and we play host
2 to the industry's employees; we understand the challenges
3 that the industry faces and sometimes we share those
4 challenges along with the industry. And of course, they
5 refer specifically to managing our wastes. That happens
6 to be one of our biggest challenges and I'm sure you've
7 noted in the newspapers, other municipalities fighting the
8 same challenge of waste management.

9 We have been allowed to be part of the
10 consultation process with the proposed DGR, both for low-
11 and intermediate-level waste that OPG is proposing to
12 construct. And they have been kind enough to include
13 ourselves and our CAOs from our municipalities in
14 quarterly meetings to keep us abreast of what's happening
15 with the proposal, where they are in the application
16 process with yourselves, but more importantly I think, to
17 glean feedback in terms of what they should do and how
18 they should present additional information if they have
19 been ommissive in keeping our people up to speed.

20 We believe that OPG has done an excellent
21 job of communicating the DGR proposal to our residents
22 over the last four years. In fact, they have used many
23 various methods, including open houses, radio talk shows,
24 advertising, direct mail-outs. They have willingly
25 participated in multiple speaking engagements and media

1 stories and the one that I think most of us are the most
2 impressed with is a mobile exhibit they put together that
3 they willingly bring to virtually every major function in
4 Bruce and near Grey County.

5 We are actually pleased contrary to some of
6 the comments made earlier and the questions asked, that
7 OPG continues to consult with the international community
8 and to other countries that have actually now established
9 and are hosts for a DGR concept.

10 We appreciate the comments made by the
11 Commission members this morning and this afternoon as to
12 the differences. But at the end of the day, they both, I
13 believe had to walk the same path in trying to establish
14 and receive approval to operate a DGR and we believe that
15 the science is probably one of the most important and
16 critical functions. And that's where we bow to the
17 experts. We bow to the scientists and we bow to your
18 expertise also because we believe that at the end of the
19 day, it does have to be a considerable partnership between
20 the three parties involved.

21 We believe that the CNSC staff will bring
22 to the table the expertise to ensure that the questions we
23 all have around protecting our environment and around
24 protecting our natural resources will be sufficient enough
25 to allow you as Commission members to make the decision to

1 allow OPG to provide that long-term management of
2 intermediate- and low-level waste; the solution that we've
3 been looking for and waiting for for some time.

4 We have, as you know been in a temporary
5 storage basis since day one, right back from the day that
6 Douglas Point was first dreamed of. And I would hearken
7 back to your comments this morning, Dr. Barnes, where you
8 mentioned that we really are at a precedent setting and
9 historical point in time and I think those comments are
10 bang on. And I think to a large extent, where we sit
11 today is not a whole lot different than where they sat in
12 the fifties when they first dreamed of a thing called
13 Douglas Point and the resistance and the challenges that
14 the people faced to actually launch nuclear power in our
15 country, I think are no different than the challenges we
16 face today in how to manage the waste product that is now
17 our responsibility in this generation to take care of.

18 As I said before, I have a considerable
19 amount of faith in our technical expertise, in our
20 scientists. I think they bring to the table understanding
21 and knowledge that we simply did not have even one
22 generation ago. I think that through their collective
23 input, we will find a way that is the best way to do the
24 long-term storage of this product.

25 We have heard from our communities. We

1 have had some resistance from some of our people and there
2 will continue to be those that will step forward and I'm
3 sure following me today, there will be several that will
4 step up and tell you why a Deep Geological Repository is
5 not the proper thing to do.

6 But I would suggest to you that the bulk of
7 our people, the great majority of the residents in the
8 four communities surrounding Kincardine have actually
9 voiced their support for this project. They too believe
10 in the ability of the people involved to manage this issue
11 for the safety of not just the human factor but the
12 environmental factor and we put our faith and our trust in
13 you people and we put our faith and our trust in the
14 scientists as I said before.

15 Waste management facilities are not an easy
16 issue to tackle. Finding a site, creating understanding
17 and building support for a facility is even more
18 difficult. But I applaud OPG for accepting the
19 responsibility and we too, as communities, share in that
20 responsibility to move forward to a responsible solution
21 to the longest term storage, question and challenges
22 around low- and intermediate-level waste.

23 We believe OPG is proposing to build a
24 world class facility. Are there challenges along that
25 path? Absolutely. Will it require a lot of consulting?

1 Absolutely.

2 But at the end of the day, the storage of
3 the low- and intermediate-level waste is a must. It's a
4 must not just because it's in existence now and it already
5 sits in temporary storage but it's a must if we are
6 looking at the sustainability of the nuclear industry and
7 the go forward position of continuing to power this
8 province.

9 We simply can't ignore this issue any
10 longer and I believe that the fact that OPG has accepted
11 the lead role in resolving this issue is something that
12 they should be applauded for, not denigrated.

13 We do support this proposal and we do ask
14 you as the CNSC to continue your oversight and regulatory
15 role, but we do believe that a viable long-term solution
16 is indeed there, and I'd refer back to a comment made by
17 CNSC staff this morning where they did say that they do
18 believe that the difference between a comprehensive review
19 and a review panel is not materially different in terms of
20 the due diligence that they will perform.

21 And I think at the end of the day we need
22 to understand that there is an element of time sensitivity
23 in this product. It is there now. We as a community are
24 looking for a long term solution to it as opposed to a
25 temporary storage situation and we believe that the

1 proposal that is there is manageable. We simply have to
2 find a way collectively to agree on what the DGR actually
3 looks like at the end of the day.

4 To all of you, I appreciate the opportunity
5 of speaking to you once more. I really believe that --
6 again, I refer back to Dr. Barnes' comments. I think that
7 the issue before us has been presented in somewhat of a
8 simplistic manner so that all of us can understand it, but
9 I also believe that the simplistic nature of the
10 presentation allows us to do the due diligence and the
11 exploratory that we need to, to ensure that the DGR at the
12 end of the day is indeed safe for humans and for the
13 environment.

14 I thank you for the opportunity of
15 presenting, and I look forward to your decision to allow
16 this process to move forward.

17 **THE CHAIRPERSON:** Well, thank you very
18 much. Are there questions? Dr. Barnes.

19 **MEMBER BARNES:** I just have a couple of
20 what I call mundane questions just in terms of the
21 procedures.

22 In your first paragraph you refer to
23 quarterly meetings with OPG. How long would those
24 meetings usually last and who sets the agendas?

25 **MR. KRAEMER:** It's a cooperative agenda. it

1 is -- we are allowed to put input into it, Dr. Barnes, and
2 those meetings have run anywhere from as short as an hour
3 to as long as three and a half hours depending on where we
4 are in the process and what questions we're bringing
5 forward from our community.

6 **MEMBER BARNES:** Okay. And the minutes are
7 available to your council?

8 **MR. KRAEMER:** I would defer to my
9 colleagues to the left.

10 **MEMBER BARNES:** Are they open meetings or
11 is it council to management meetings?

12 **MR. KRAEMER:** Sorry.

13 It's generally done with the mayors, the
14 CEOs and representatives of OPG.

15 **THE CHAIRPERSON:** Mr. Harvey.

16 **MEMBER HARVEY:** A small question, when you
17 say that you got the support of most of your residents, is
18 that true as well for the non-residents or the seasonal
19 residents and permanent people from your municipality?

20 **MR. KRAEMER:** We included that, or I
21 included that in the presentation I did to you in writing,
22 simply because in our marketplace we are very much in tune
23 with two types of residents. We have the year-round
24 resident that is obvious -- it's clearly defined by its
25 comment, but we also have what we refer to as our summer

1 or part-time residents.

2 We're blessed with a tremendous tourism
3 industry on the shoreline of Lake Huron and, as such, we
4 have a tremendous influx of people that simply stay with
5 us from roughly May 24 until Thanksgiving. Sometimes we
6 are challenged to ensure that they are as up to speed as
7 our year-round residents in terms of dispersing
8 information throughout our community. The reason that
9 that paragraph was included in our written submission to
10 you is to indicate that OPG also recognizes that. They
11 understand the mix and the demographics of our community
12 and have indeed gone out of their way to repeat and redo
13 open houses and presentations to ensure that those -- that
14 information flow was available to our year-round resident
15 but, more importantly and equally as important to our
16 summer residents.

17 **THE CHAIRPERSON:** Thank you very much,
18 Mayor, and we have thoroughly welcomed your interventions
19 over the years. So thank you and your future career, I'm
20 sure it will be to have a public involvement as well. So
21 thank you very much.

22 We'd like then to move to the next
23 presentation which is the oral presentation by the County
24 of Bruce, CMD 06-H22.3, and the Warden, Mr. Ron Oswald, is
25 with us today.

1 Sir, the floor is yours.

2

3 **06-H22.3**

4 **Oral presentation by the**

5 **County of Bruce**

6

7 **MR. OSWALD:** Thank you, Madam President.

8 My name is Ron Oswald and I am the Warden
9 of the County of Bruce and also the Mayor of Arran-
10 Elderslie.

11 Thank you for the opportunity to appear
12 before you today to personally express Bruce County's
13 support for the Ontario Power Generation's Deep Geologic
14 Repository. This is a good project. Waste issues are
15 always controversial for politicians and nuclear waste
16 issues are no less so. But in this case you are dealing
17 with a county that has dealt with the nuclear industry for
18 over 40 years.

19 Also, in this case, Ontario Power
20 Generation has done such an excellent job at
21 communications over the last four years that this project
22 enjoys the support of the majority of our residents. In
23 fact, this is not even an issue that the public confronts
24 me on regularly and if they do mention it is usually in
25 support of the project.

1 The county has been included in the Deep
2 Geologic Repository process in a number of ways, including
3 presentations to the county, the warden's participation on
4 the Impact Advisory Committee and through a consultation
5 committee that OPG setup to seek the advice of the warden
6 and the five local mayors on communications and
7 consultation.

8 The committee has been an excellent way for
9 us to receive regular updates on the process of the
10 project, to ask any questions that we may have and to
11 suggest ways that our residents be consulted. The Deep
12 Geologic Repository proposal to isolate the low- and
13 intermediate-level wastes deep below the Bruce site
14 appears to be a viable way to protect the environment and
15 the residents of Bruce County over the long term.

16 Let's face it, the waste is here today. It
17 either needs to be moved or put in a safe place for the
18 long term. We are comfortable that OPG can safely manage
19 the waste in the near future and believe the Deep Geologic
20 Repository is the ideal long term solution.

21 The Deep Geologic Repository proposal
22 enjoys public support as we do not hear significant public
23 concerns. We would like to see the project proceed and
24 become a reality under the appropriate review by the
25 Commission.

1 Again, thank you for allowing me the
2 opportunity to participate in this important hearing
3 today. Thank you very much.

4 **THE CHAIRPERSON:** Thank you very much, sir.

5 Are there any comments or questions?

6 Thank you very much for coming today.

7 We're then going to move to the next
8 submission which is an oral presentation by the
9 Municipality of Kincardine, as outlined in CMD document
10 06-H22.4.

11 And Mayor Sutton is with us today. Your
12 Honour, you're -- the floor is yours.

13
14 **06-H22.4**

15 **Oral presentation by the**
16 **Municipality of Kincardine**

17 **MR. SUTTON:** Thank you, Chair Keen.

18 I'm Mayor Glen Sutton, Municipality of
19 Kincardine, the host municipality for the Bruce Nuclear
20 site. I take this opportunity to formally welcome the
21 Commission to Kincardine.

22 We have a long history of working with the
23 nuclear industry from the time the site was first
24 purchased in 1959 to today, over a 45-year period. I
25 believe we are one of the most knowledgeable communities

1 around nuclear power and the issues that surround the
2 industry.

3 I wanted to appear before you today to talk
4 about OPG's DGR project which this municipality has been
5 involved in since its inception. It was the Municipality
6 of Kincardine who approached OPG to see if they wanted to
7 explore in partnership with the municipality if there were
8 safe and viable options for the long-term storage of low-
9 and intermediate-level waste on the Bruce site. We
10 believe OPG has been doing a good job of managing the
11 waste to date but want to know the long-term plans for the
12 waste and we want to ensure the health and safety of our
13 residents.

14 We also believe in taking responsibility
15 for this matter and with a forward-looking perspective we
16 started to discuss the issue. During this term of council
17 we proceeded in an open and transparent manner and we are
18 part of the solution for long-term storage of low- and
19 intermediate-level nuclear waste. We subsequently signed
20 an MOU with OPG to explore the options and the parties
21 obtaining Golder Associates to conduct an independent
22 assessment study, or IAS, of the options available to
23 store the waste.

24 While the study proceeded we visited Europe
25 and the United States of America to see firsthand some of

1 the facilities and service around the world. We talked to
2 the host communities about the process they used to
3 consult their residents and how they felt about the
4 existence of facilities in their communities. We visited
5 facilities Switzerland, France, Sweden and U.S. in 2003
6 and 2004 respectively.

7 Golder Associates came back in the IES and
8 told us that the geology of the Bruce site could support
9 three options; namely, enhanced processing storage;
10 aboveground concrete vaults and deep underground
11 repositories. Because of what we had seen in Sweden and
12 Whip facility in New Mexico and the projected safety
13 margins of the underground vaults, the Kincardine Waste
14 Steering Committee recommended to the rest of Council that
15 they endorse the DGR concept as a preferred option for
16 further study. Council agreed and a bylaw was passed to
17 confirm Council's decision.

18 OPG accepted the decision and sat down to
19 work with Council on a hosting agreement to set out the
20 terms and conditions under which the municipality would
21 host the facility. This was an important step because the
22 municipality felt that if we were going to take on the
23 role of host for all the low- and intermediate-level waste
24 from OPG's 20 reactors, including those leased to Bruce
25 Power, that our residents should benefit for taking on

1 this responsibility and doing this for the public good and
2 the Province of Ontario.

3 We reached a hosting agreement with OPG and
4 Council decided that a telephone poll of all residents 18
5 years old would be carried out by an independent polling
6 firm to see if our residents wanted to continue to explore
7 the DGR option.

8 Before the poll was conducted, OPG and
9 Council opened a storefront office and conducted an
10 information campaign to provide the public with
11 information to make an informed decision.

12 I would like to compliment and thank OPG
13 for their communications effort that has been made over
14 the last four years. They have done everything that we
15 have asked of them and more. The results of the poll was
16 positive. Sixty (60) per cent said yes; 22 per cent no,
17 and the remainder are saying they either did not know or
18 did not want to participate. Seventy-two (72) per cent of
19 the eligible voters took part in the poll, a much higher
20 percentage than the last two municipal elections.

21 With this mandate from our residents, we
22 now move forward with OPG to the regulatory stage. We
23 believe in OPG's plan to construct, license and operate a
24 world-class facility. They have contracted with some of
25 the most experienced people in industry to conduct the

1 site characterization and with the Geoscience Review
2 Panel, they have obtained some of the world's best
3 scientists to provide advice and guidance. This and the
4 ongoing communications builds understanding, support and
5 trust.

6 Now, in your CMD 06-H22 document it states:

7 "CNSC staff have confirmed with the
8 Ontario Ministry of Environment that
9 there are no provincial EA
10 requirements under the *Ontario*
11 *Environmental Assessment Act* that are
12 applicable to this proposal."

13 Kincardine concurs that there are no
14 provincial EA requirements under the *Ontario Environmental*
15 *Assessment Act*.

16 As per the disposition comment section in
17 the document CMD 06-H22, note CNSC staff have revised the
18 text of the document based on public comments to date.
19 The CNSC staff, on page 13 of the CMD 06-H22 document
20 state:

21 "It is therefore the opinion of CNSC
22 staff that public concerns do not
23 warrant referral to a panel review."

24 Kincardine accepts this opinion. The
25 Municipality of Kincardine supports the DGR project and we

1 hope that the CNSC will accept their staff's
2 recommendation to proceed with a comprehensive EA for the
3 project.

4 Like you, we will first and foremost always
5 look to preserve our environment and ensure the safety of
6 our residents, and I want to personally assure you about
7 that.

8 The low-level waste and intermediate-level
9 waste is here today in our community. We have taken the
10 responsibility to move forward with the industry in a
11 cooperative manner to resolve the long-term storage of
12 this material. We believe we have made a knowledgeable
13 and a reasonable, responsible decision.

14 We hope the Commission will support this
15 opportunity and ensure that the project proceeds in a
16 safe, responsible and timely manner as a comprehensive EA
17 for the project. This is in keeping with your CNSC
18 staff's recommendation at page 13 of the CMD 06-H22
19 document.

20 In conclusion, the Municipality of
21 Kincardine always places the safety as the most important
22 element of the DGR's project and we only support projects
23 that are safe for the public, the workers and the
24 environment.

25 I provided to Louise this morning of your

1 staff a few additional comments. I think you have a copy.
2 The first one is I submit, along with OPG, a brief summary
3 of the DGR community consultation and hosting agreement
4 from the Municipality of Kincardine to the IAEA contact
5 expert group workshop in Olkiluoto, Finland, held June
6 28th to 30th, 2006. The workshop was entitled "National
7 Experience re: Radioactive Disposal Facilities".

8 On August 24th, 2006, I assisted as Mayor
9 to host a Bulgarian delegation visit to the Bruce site.
10 The delegation consisted of the mayors of Belin and
11 Kosluti, a counsellor from Kosluti, a nuclear regulatory
12 agency engineer and a state enterprise radioactive waste
13 department engineer. This was hosted by two IEAE reps
14 from Vienna who organized the tour. Their objective was
15 to tour a Bruce site reactor and the OPG western waste
16 management facility. The specific item I updated them on
17 was our successful DGR community consultation overall and
18 the hosting agreement. They, in Bulgaria, are looking at
19 consolidating their low-level waste into one site.

20 On September 18th, the DGR Community
21 Consultation Advisory Committee group meeting was held in
22 the Kincardine Council Chambers. This quarterly meeting
23 is held with the mayors and CEOs of the five
24 municipalities around the Bruce site, home of the WWMF and
25 OPG officials. We are kept up to date on the activities

1 and the progress to date of the DGR. Any questions or
2 concerns are answered. Typically, the progress reported
3 is on technical, regulatory and communications matters.

4 For example, the 2-D seismic survey and
5 borehole drilling was explained at this meeting. As well,
6 the geoscientific site characterization plan was discussed
7 and also the establishment of existing instrumental
8 monitoring wells to collect additional data.

9 On October the 7th I attended the Port
10 Elgin Pumpkinfest. OPG had their DGR van and trailer on
11 site for two days of the event to provide information and
12 answer questions.

13 On October 15th I was asked to bring
14 greetings and remarks to the 13th Annual Convention in
15 Owen Sound at the CNWC, which is the Canadian Nuclear
16 Workers Council.

17 During the afternoon sessions, I heard a
18 presentation on the Team CANDU Organization and more
19 germane to today's discussions and hearing, a presentation
20 by OPG on the DGR project in Kincardine.

21 Last week, on October 18th, I attended our
22 monthly Liaison Committee meeting with Bruce Power and
23 OPG. The DGR status was reported as it is every month.
24 We were informed that the 2-D seismic survey was started
25 October the 10th, 2006 and the site preparation for the

1 borehole drilling was also proceeding in parallel.

2 Finally, point seven, October 19th, last
3 Thursday night, I attended at monthly IAC Impact Advisory
4 Committee meeting in Underwood where a similar update on
5 the DGR as provided at the Liaison Committee Meeting above
6 was given.

7 Now, why am I presenting this information?
8 I just want to illustrate and show that OPG has kept us
9 all very well informed on the DGR project. Newsletters
10 have been mailed to our homes. I received mine in our
11 home in Kincardine on a regular basis and also we, here,
12 keep other jurisdictions of the world informed to share
13 common knowledge.

14 Those finish my formal remarks. Thank you.

15 **THE CHAIRPERSON:** Thank you, Mr. Sutton.

16 Are there any questions from Commission
17 Members?

18 Mr. Harvey?

19 **MEMBER HARVEY:** Merci, Madame la
20 présidente.

21 The Council decided that a telephone poll
22 would be done to get the position of the residents. Why
23 have you chosen a telephone poll instead of other means?

24 **MR. SUTTON:** Good question. Thank you for
25 that.

1 Basically, we felt that we could contact
2 more people that way. There's a large portion of our
3 population that are seasonal in cottages and they live in
4 Kitchener, London and other parts of the province. So we
5 contracted a company from Toronto and they phone each of
6 the people, permanent residents in Kincardine or seasonal
7 residents as per the tax rules where they live and ask
8 them the question were they in favour, yes or no.

9 **THE CHAIRPERSON:** Dr. Barnes.

10 **MEMBER BARNES:** I asked the question of OPG
11 this morning and I probably heard the answer regarding the
12 hosting agreement. I think it's \$22 million between OPG
13 and Kincardine.

14 I wonder if I could ask you what do you
15 anticipate that funding being used for?

16 **MR. SUTTON:** Thank you for your question.
17 It's a very important question.

18 Our Council, two years ago, after we signed
19 the bylaw, we just got over roughly about a million
20 dollars per year. It's inflated over -- for inflation,
21 over 25 years. Sixty-five (65) per cent goes to
22 Kincardine and there's 25 per cent Saugeen Shores and 74
23 per cent to the four municipalities around here.

24 But basically our proportion or share in
25 Kincardine, we've placed it into two reserve funds. One

1 is called a tax mitigation reserve fund to keep taxes
2 lower in the future for the Council of the day and the
3 second one was for Health Sciences Reserve Fund. The
4 Health Sciences Reserve Fund is an interesting one. It is
5 basically to have money available for, for example,
6 capital expansion -- they plan addition to the Kincardine
7 Hospital and also for retention and recruitment of
8 doctors.

9 I got here at a quarter to nine this
10 morning because I presented a cheque for \$90,000 to the
11 local Community Health Care Foundation for the Kincardine
12 Hospital at 8:30 this morning.

13 So we take the money each year and put it
14 in these two reserve funds for use by the council.

15 **MEMBER BARNES:** And I notice that the
16 future receipt of such funds is conditional on you
17 continuing to provide support for this project. Given
18 that the money goes into those funds, do you think you
19 might be compromised in your continuing support in any way
20 by the need to sustain these two reserves once you
21 establish them?

22 **MR. SUTTON:** Not at all. Thank you for
23 your question. It's a good question that came up during
24 the community consultation where we had an office in
25 downtown Kincardine, staffed at all times by a member of

1 our council and a person from a OPG, a staff person.

2 Basically, when we did our trips across the
3 world in our due diligence, we found evidence of other
4 hosting community agreements across the world and this
5 Agreement is consistent with that and I don't think we're
6 compromising ourselves at all. We are just treating it as
7 basically a source of revenue. We had received no
8 compensation for approximately 35 years in the previous
9 history when the former Ontario Hydro had been at the
10 site.

11 So, no, I don't think we are compromising
12 ourselves and if evidence comes to light that the geology
13 down there is not what we think it is or supposed to be,
14 then of course we'll have a rethink about that. But I am
15 quite confident on that.

16 And just on what's being done at the site
17 right now, interesting, there's two-D seismic surveys.
18 It's a truck at the site that has a large hydraulic ramp
19 or whatever at the front of the truck. It just bangs the
20 ground several times and we are told by OPG's staff
21 reports that there are some detectors, geophones farther
22 down the transmission lines and they pick up the reflected
23 waves and from that technique, they can tell how thick the
24 geology is below here and at what level.

25 And then by the borehole testing they can

1 drill down, there several holes right below where the
2 proposed site is; extract the boreholes up to the top and
3 keep it for historical records and check it and make sure
4 and prove that what is down there is what we think is down
5 there.

6 We will be following the results of those
7 tests closely and like I mentioned in my formal report
8 earlier today that public safety, employee safety is
9 number one. That will not be compromised, I want to
10 assure you of that fact.

11 **THE CHAIRPERSON:** Thank you very much, sir.

12 **MR. SUTTON:** Thank you.

13

14 **06-H22.5**

15 **Oral presentation by**

16 **Liz and Frank Barningham**

17

18 **THE CHAIRPERSON:** We are now going to move
19 to oral presentation by Liz and Frank Barningham 06-H22.5.
20 I believe Mr. Barningham is with us today.

21 Welcome, sir, I think it's your first time
22 before the Commission?

23 **MR. BARNINGHAM:** Yes, it certainly is.

24 **THE CHAIRPERSON:** The floor is yours, sir.

25 **MR. BARNINGHAM:** Thank you.

1 The name is Barningham. Madam President,
2 Members of the Commission, we, my wife and I, would like
3 to respectfully point out that decisions being made as a
4 result of today's hearing are not really yours to make.
5 Decisions which are going to affect the quality of life
6 and possibly even the survival of our children,
7 grandchildren in generations to come should be made by us
8 all. Neither you nor I own the planet. We are here as
9 stewards to use the earth's resources wisely and not to
10 leave a legacy of toxic pollution.

11 If the amount of money which is budgeted
12 for nuclear projects and their cleanup was to be spent on
13 safe, proven energy sources such as solar, wind and hydro
14 combined with a meaningful program of education for
15 conservation, then money would not need to be wasted on
16 nuclear projects and hearings such as this. Our legacy
17 would be clean rather than toxic.

18 We don't need experts to tell us about
19 this. In a true democracy the decision of the majority
20 does not require justification. In the words of someone
21 we respect and admire, "we just don't want it".

22 Thank you for this opportunity.

23 **THE CHAIRPERSON:** Thank you, sir. You will
24 be presenting the next one as well. But on your specific
25 CMD are there any questions from Commission Members?

1 Thank you very much.

2

3 **06-H22.6**

4 **Citizens for Renewable Energy**

5

6 **THE CHAIRPERSON:** Then we will again turn
7 the floor over to you, sir, for the oral presentation that
8 you are making on behalf of the Citizens For Renewable
9 Energy, 06-H22.6.

10 The floor is yours again, sir.

11 **MR. BARNINGHAM:** Thank you.

12 At the risk of being labelled a windbag, I
13 will continue.

14 Madam President, Members of the Commission,
15 this submission is made on behalf of Citizens For
16 Renewable Energy, a non-profit organization with over
17 1,000 members incorporated in Ontario in 1996 and on
18 behalf of the International Coalition of Great Lakes
19 United; comprised of over 120 organizations representing
20 tens of thousands of citizens in the Great Lakes and St.
21 Lawrence River ecosystem.

22 We are calling on the Commission to refer
23 this proposal to bury low and intermediate-level nuclear
24 waste never before attempted in this country and never
25 before in a rock formation like sedimentary limestone in

1 any place in the world to the Minister of the Environment
2 for an environmental assessment conducted by an
3 independent review panel.

4 We have reviewed the staff track EA Report
5 and OPG's submission on the scoping document. We also
6 studied OPG's DGR project description, November '05, and
7 have taken part in a special information meeting called by
8 OPG at the Bruce site in February, as well as open houses
9 by the CNSC and OPG.

10 We have also submitted comments on the
11 draft CCSD to the EA specialist in July of this year.

12 Our request is based on the following
13 facts:

14 One, in CMD 06-H22.1, under section 1.4, we
15 find the statement;

16 "These facilities, Western Waste
17 Management facility, can continue to
18 provide safe storage of the waste for
19 many decades into the future."

20 There is obviously not any need for this
21 ingress into a questionable geological formation.

22 Two, the location for this DGR is totally
23 absurd. To attempt to bury this radiated waste a little
24 more than 1,000 metres from the shoreline of a lake, part
25 of the largest freshwater ecosystem of the world, evades

1 any sane consideration. The fact that this whole nuclear
2 facility is located on a spit, jutting into Lake Huron
3 surrounded on three sides by water is in no way addressed
4 in these documents relating to construction and operation
5 of this DGR.

6 Three, the identity of the waste and its
7 properties have been poorly described and consistently
8 understated. There needs to be a frank and detailed
9 assessment of the radiation levels and half-lives,
10 especially regarding the intermediate level waste.

11 Four, there has to be a thorough
12 investigation into the validity of the International
13 Commission on Radiation Protection dose limits. A
14 considerable number of recent studies and reports have
15 rejected the models used in establishing the exposure
16 limits, like the European Commission on Radiation Risk in
17 '03; the Committee Examining Radiation Risks of Internal
18 Emitters in '04; the Biological Effects of Ionisation
19 Radiation Report of '05 and others.

20 Ethical reasons demand a close scrutiny of
21 the assumptions used in these models supposed to protect
22 workers, the public, and the environment.

23 Five, repeatedly the independence of
24 research and of the local polling has been pointed out in
25 the documents. There is no true independence and

1 objectivity when the studies and the polling have been
2 financed by the project proponent with the obvious goal
3 showing feasibility and public acceptance.

4 How can public trust be established in that
5 way? Researchers have to be called upon who are truly
6 independent, not in any way connected to or paid by the
7 industry or the CNSC.

8 Predetermination of feasibility and local
9 effects only show the scope of this comprehensive EA is
10 being arbitrarily limited when we read,

11 "The stakeholder consultation and
12 communication program focused on the
13 local municipalities based on
14 feasibility studies. No effects
15 outside of Bruce County were
16 anticipated."

17 We find numerous problems with the CNSC EA
18 track report. We are questioning the ability of this
19 process to address many issues relating to the proposed
20 project. There is no ground for CNSC staff's opinion or
21 the review panel would not address any of the scoping
22 concerns that would not be considered in this
23 comprehensive study. The comparison between two different
24 models in Table 1, Page 14 is misleading and downright
25 deceptive. Since Terms of Reference have to be given to a

1 review panel, there can be no determination if the factors
2 considered will be the same as in a comprehensive EA.

3 The Minister is bound by the CEAA to
4 appoint persons unbiased and free from any conflict of
5 interest relative to the project, which would exclude
6 anyone from the industry or CNSC staff. The panel has the
7 power to call independent experts as witnesses and to
8 issue summonses for documents.

9 To omit listing the powers of enforcement
10 of a panel like a court of record listed in the *Canadian*
11 *Environmental Assessment Act* under subsection 35(2), is a
12 serious attempt to mislead the public.

13 In our submission on the draft Scoping
14 Document, we requested that transportation of waste coming
15 from Darlington and Pickering stations be part of the EA.
16 However, that was rejected, arguing that that activity is
17 already licensed. We have no record of a public hearing
18 for licensing of that activity.

19 With increased numbers of cargoes of
20 intermediate-level waste from the proposed refurbishment
21 of Pickering B reactors, there must be an extensive
22 examination of the dangers of that activity connected with
23 that proposed project. Other comments filed by us on the
24 draft were not dealt with and no comments from Environment
25 Canada and Health Canada were listed, even though they had

1 to be consulted.

2 The support for continuation of the EA as a
3 comprehensive study by local MPs and MPPs, as listed on
4 page 8, carries absolutely no weight as both represent not
5 even 50 per cent of the constituents; in the MP's case,
6 hardly more than one-third.

7 Reviewing CNSC staff's assessing potential
8 adverse effects, both from construction and operation, the
9 consensus is that:

10 "Effects would be limited to the Bruce
11 site and would have little effect on
12 land uses or cultural activities."

13 Is this project's location not proposed to
14 be very close to the lake? Do they mean there is no
15 effect on water? There are currents, the same as in air,
16 that can carry emissions, leaks and discharges well beyond
17 the site and into the Great Lakes drainage basin. That is
18 why the GLU constituency is so alarmed and opposed to this
19 unprecedented project.

20 Under 6.0, Potential of the Project to
21 Cause Adverse Environmental Effects, we find the
22 interesting statement:

23 "A preliminary assessment of OPG's
24 project was completed by CNSC staff.
25 This assessment is based on CNSC staff

1 experience. A detailed and rigorous
2 assessment of effects was not
3 conducted."

4 We need to know how a regulatory authority
5 can come up with all these effects addressed as
6 immitigable and having effects that are acceptable to the
7 CNSC. The answer is on Page 13:

8 "The CNSC possess the experience and
9 expertise in the environmental effects
10 that would competently manage the
11 comprehensive study process for the
12 DGR project."

13 The CNSC staff and consortium of agencies
14 are the experts and nobody from outside the industry and
15 regulator knows anything about all the issues involved.

16 With all the evidence listed in our
17 submission, how can the public trust these bodies?

18 Excluding topics like transportation and
19 the inadequacy of the 30 year-old never-amended *Nuclear*
20 *Liability Act*, there is even more reason to call for a
21 rigorous, wide-ranging EA by an independent review panel.

22 With statements like "The accuracy of
23 predictions made in long-term assessments cannot be
24 checked," and "The long-term predictions made by
25 assessment models cannot be confirmed," in CNSC draft

1 Regulatory Guide G320, it proves the fallacy of predicting
2 the safe, long-term containment of these lethal wastes.

3 To address the unprecedented huge level of
4 concern by these tens of thousands of citizens on both
5 sides of the border as expressed in the resolution, it
6 must obligatory for the Commission to submit this project
7 and environmental assessment to the Minister at this
8 stage, with a recommendation for a full EA, to be
9 conducted by an independent review panel.

10 We request the courtesy of obtaining a copy
11 of the Commissioner's Report to the Minister on this stage
12 of the environmental assessment for the Deep Geological
13 Repository.

14 Thank you. And I would like to just add
15 the GLU that was mentioned in that submission, there was a
16 resolution adopted at the 24th Annual Meeting of Great
17 Lakes United on June 11, 2006 which reads:

18 "WHEREAS Ontario Power Generation is
19 planning to construct two 660-metre
20 deep caverns in so-called low
21 permeable limestone rock at the Bruce
22 Power site near Kincardine on the
23 shore of Lake Huron, and,
24 WHEREAS, OPG is planning to store low
25 and intermediate-level nuclear waste

1 in these caverns from all of Ontario's
2 18 nuclear reactors and has requested
3 a licence to begin construction from
4 the Canadian Nuclear Safety
5 Commission, and
6 WHEREAS, this deep geological
7 repository will be located just 1300
8 metres from the Lake Huron shoreline
9 on a spit surrounded by water on three
10 sides and is supposed to house a
11 radiated waste dangerous for tens of
12 thousands of years, and
13 WHEREAS this huge project could
14 endanger all people living within the
15 Great Lakes ecosystem, and
16 WHEREAS there is no truly independent
17 scientific study being planned for
18 this never-before tried undertaking
19 and no precautionary principle
20 applied,
21 THEREFORE, be it Resolved, that Great
22 Lakes United call on the federal
23 Minister of the Environment to realize
24 the overwhelming public concern about
25 a project that can inflict

1 unmentionable harm on our children and
2 future generations,
3 AND be if Further Resolved, that Great
4 Lakes United opposes the planned
5 construction of this Deep Geological
6 Repository and demands that the
7 federal Minister of the Environment
8 have this first-of-its-kind project
9 brought before an independent panel
10 for an in-depth review with full
11 public participation under the
12 provisions of the *Canadian*
13 *Environmental Assessment Act*. Signed
14 Molly M. Flanagan, Secretary, GLU."

15 Thank you for the opportunity.

16 **THE CHAIRPERSON:** Thank you.

17 I let you go on a little long because you
18 were reading the resolution.

19 Any questions? Yes, Dr. Barnes.

20 **MEMBER BARNES:** I would just like to pick
21 up two of your points and, in a sense, re-direct them to
22 CNSC staff.

23 The first is -- I'll read them both out
24 because they may be linked. The first is at the end of
25 the first paragraph on Page 3. They are unnumbered but

1 the third page. The last paragraph there says:

2 "There is no ground for CNSC staff
3 opinion that a review panel would not
4 address any of the scoping concerns
5 that would not be considered in this
6 comprehensive study."

7 And I invite a comment from staff on the
8 fourth page, the second last page, which is in the upper
9 part in bold, that staff commented that:

10 "A detailed and rigorous assessment of
11 effects was not conducted by staff."

12 **MR. RINKER:** Mike Rinker, for the record.

13 During the consultation process for the
14 Scoping Document, there were several written submissions
15 requesting a broadening of the scope for the environmental
16 assessment, some of which were accepted. Some of them
17 that were not accepted include those that involved, for
18 example, federal policy or provincial policy, and others
19 involved activities that are currently authorized under
20 the *Nuclear Safety and Control Act*.

21 Those particular issues were not scoped in.
22 They were not part of the project and it was staff's
23 opinion that a panel would not likely consider those as
24 part of an assessment as well.

25 In the second part of your question, a

1 detailed and rigorous assessment was not conducted. We
2 provided a preliminary assessment to describe what would
3 be, based on the limited knowledge we have at this time,
4 adverse effects related to this project. This is a
5 requirement of the *Canadian Environmental Assessment Act*
6 for comprehensive studies at this time, but it certainly
7 does not preclude a detailed and rigorous assessment that
8 would be required as we move forward in either track for
9 an environmental assessment.

10 **MEMBER BARNES:** In fact, I would assume
11 that you would be doing it, not precluding it?

12 **MR. RINKER:** Right.

13 The results of our preliminary assessment
14 or preliminary analysis now do not mean that we would not
15 do a rigorous assessment in the future. We intend to.

16 **THE CHAIRPERSON:** Mr. Harvey?

17 **MEMBER HARVEY:** Merci, madame la
18 présidente.

19 On Page 2, point 4:

20 "Considerable number of recent studies
21 and reports have rejected the models
22 used in establishing the exposure
23 limits."

24 I would like to have the opinion of the
25 staff on that point.

1 **MR. HOWDEN:** Barclay Howden speaking.

2 I'm going to ask Dr. Steve Mihok, our
3 environmental risk assessment specialist, to reply to
4 that.

5 **MR. MIHOK:** For the record I'm Steve Mihok,
6 again, environmental risk assessment specialist.

7 We have quite a number of staff who are
8 familiar with many of the reports that have been written
9 in discussing radiation protection principles in general
10 and we review these documents on a regular basis. We
11 respect their opinions. We look at the consensus that is
12 reached on an international basis on some of these topics
13 and essentially with the recent reports that have been
14 quoted, other information that is being promulgated by
15 ICRP for example, the International Commission on
16 Radiation Protection, the overall view, I think and staff
17 think in general, is that the current regulatory limit of
18 about one milliSievert per year for members of the public
19 is still reasonable and still based on good science.

20 There are differences of opinion but it's
21 unlikely that these differences will result in, let's say,
22 a major change in that sort of philosophy, in the near
23 term at least.

24 **THE CHAIRPERSON:** My question to you, sir,
25 is I'm trying to really understand the policy of

1 Citizen's for Renewable Energy because my understanding
2 from page 1 is that -- and please correct me if I'm wrong
3 here -- is that you would like the waste -- that you don't
4 believe this facility is necessary because the western
5 waste management facility is there and yet the staff have
6 talked about looking at alternative means under 424,
7 alternative means which includes the status quo.

8 So is the position of your organization
9 that you would prefer to see the waste stay where it is
10 and not be put in a Deep Geologic Repository?

11 **MR. BARNINGHAM:** I think that we would
12 prefer to have it as it's being stored now until there's
13 something better than what -- than the DGR that we're
14 talking about here today.

15 Yes, it's aboveground. It's obvious. It's
16 a bit like PST and GST; every time you pay a bill, you see
17 it there. You don't forget it. It doesn't go away. One
18 of the feelings here is, apart from leakage and other
19 aspects that have been discussed today is the fact that
20 it's being monitored and it can be contained as it is.

21 **THE CHAIRPERSON:** My second is more of a
22 comment than a question. I realize that on page 3 you
23 mention about a court of record and what I failed to
24 mention this morning is the Canadian Nuclear Safety
25 Commission is a court of record. So just to note for it

1 is that not only are we independent, separate from nuclear
2 industry, but we are a court of record, just to clarify
3 that for your organization.

4 **MR. BARNINGHAM:** Thank you.

5 **THE CHAIRPERSON:** I just wanted to ask a
6 question to staff. This CMD raises the point that there
7 were no comments from Environment Canada or Health Canada
8 looked at in the disposition of comments. Could you
9 inform the Commission why that -- was there no comments or
10 what was the issue?

11 **MR. RINKER:** Mike Rinker for the record.

12 We did not receive comments from Natural
13 Resources Canada and Health Canada. We received a letter
14 explaining that the Scoping Document was acceptable as is.

15 We did receive comments from Environment
16 Canada. Because the nature of this CMD is an
17 environmental assessment track report that would go to the
18 Minister of Environment, there isn't the obligation to
19 have these sort of comments supplied in such a report. So
20 we do have these comments. They just weren't incorporated
21 into the CMD.

22 **THE CHAIRPERSON:** So if the organization
23 wished to have those comments, that could be made
24 available to them?

25 **MR. RINKER:** Absolutely. They are part of

1 the public registry for this environmental assessment and
2 any document is a public document on that registry.

3 **THE CHAIRPERSON:** Acknowledging, sir, that
4 on the resolution you say "Whereas there is no truly
5 independent scientific study being planned for this," I
6 would just like the comments of OPG and CNSC staff with
7 regards to what they feel will be the next steps in this
8 and if that would look at -- would that be qualified as a
9 truly independent scientific study or not? OPG.

10 **MR. NASH:** Ken Nash for the record.

11 Our intention is to, and we have indeed
12 contracted in four major areas to move the DGR forward.
13 One is with INTERA to do the site characterization, the
14 site investigation. We rely on their professional
15 judgment to provide a good scientific investigation.

16 We have, as Frank King mentioned,
17 contracted with Hatch Associates to do the engineering.
18 They're a world-renowned company in the mining area.
19 We've contracted with Quintessa who are safety assessment
20 experts to carry out the detailed safety assessment for
21 the post-closure and we've contracted with Golder
22 Associates to do the environmental assessment.

23 Yes, it is true that we pay them but we
24 rely on their professional judgment to provide us with
25 solid scientific evidence to compile, to present to the

1 CNSC for our own judgment regarding whether this facility
2 will be safe in the long term.

3 As I mentioned before, we have the
4 materials stored there, above-ground now. It has
5 community acceptance. We do have capacity to expand. It
6 is our belief, based on the information that we have, that
7 it will be safer in the long term and it is socially
8 acceptable to do that. We support this process in moving
9 forward to determine if indeed we can verify that.

10 **THE CHAIRPERSON:** Thank you.

11 CNSC staff?

12 **DR. THOMPSON:** Patsy Thompson, for the
13 record.

14 In terms of the independence of the
15 scientific and technical work that will be undertaken, the
16 environmental assessment process is intended to provide a
17 level of technical review that is required for the level
18 of risk of a project.

19 Certainly the staff from the CNSC, as well
20 as experts from other federal departments will conduct the
21 required level of technical reviews and investigations to
22 ensure that the work conducted by the proponent is
23 appropriate and can validate the conclusions.

24 There are no links between CNSC staff and
25 staff of other federal departments and the proponents. So

1 it is a technical independent review of studies that will
2 be done by the proponent.

3 **THE CHAIRPERSON:** My final question is with
4 regards to the comment that perhaps we could clarify, the
5 licensing of the activity that is mentioned on page 3,
6 which is with regards to the transportation of waste.
7 Perhaps the staff could just comment on how transportation
8 is licensed in terms of these products?

9 **MR. HOWDEN:** Yes, Barclay Howden speaking
10 for the record.

11 Yes, for the transportation of nuclear
12 substances and radioactive materials such as radioactive
13 waste, they're governed by two regulations. One is the
14 Transport and Packaging Regulations which are under the
15 *Nuclear Safety and Control Act*. As well, Transport Canada
16 has the *Transportation of Dangerous Goods Act*.

17 The two of these together form the
18 regulatory regime for the transportation of these
19 particular substances; which includes certification of
20 packages that the material goes in and under
21 Transportation of Dangerous Goods, the inspections that
22 can be taken to ensure that the carriers are following the
23 rules that they should be and that the people who are
24 responsible for the products, in this particular case OPG,
25 are following all the regulations.

1 So there is a regulatory regime that's in
2 place, has been in place for a very, very long time and is
3 actually based on international best practices.

4 **THE CHAIRPERSON:** So there aren't public
5 hearings for transport of goods, but I just -- I think if
6 you have any questions with regards to that, please take
7 the opportunity to talk to the staff about how it is
8 transport is regulated. I think it's very important that
9 citizens do know about their regulatory regime in that
10 case.

11 Thank you very much, sir.

12 **MR. BARNINGHAM:** Thank you for the
13 opportunity.

14 I think the concern there with the
15 transportation is that we've heard a lot today about the
16 community and the size of the community; it seems to be
17 very local. I live in Durham which is an hour's drive
18 away and we are downwind from this facility and the
19 transportation is going to come is going to come across
20 the province from several directions and I'm sure that a
21 lot of municipalities and towns are concerned about
22 transporting of this waste through their areas. So that's
23 why this point was raised.

24 Thank you.

25 **THE CHAIRPERSON:** Thank you. Thank you

1 very much. Thank you very much for coming.

2 We'll now move to the next submission which
3 is an oral presentation by Mr. Keith Battler, outlined in
4 CMD 06-H22.7.

5 Sir, the floor is yours.

6

7 **06-H22.7**

8 **Oral Presentation by**

9 **Mr. Keith Battler**

10

11 **MR. BATTLER:** Thank you. Madam Chair and
12 Committee Members, I'd like to thank you for this
13 opportunity for presenting.

14 I'm Keith Battler, a resident of
15 Kincardine, with a young family. As both a realtor and
16 residential developer in the Municipality of Kincardine
17 for over 15 years, I believe that the Ontario Power
18 Generation proposed Deep Geological Repository for the
19 long-term storage of low and intermediate radioactive
20 waste is a positive step forward for the nuclear industry
21 within this community.

22 I am aware that the DGR will provide long-
23 term storage for low and intermediate waste which is
24 currently safely stored on an interim basis at the Western
25 Waste Management Facility at the Bruce site. Given the

1 fact that the Western Waste Management Facility has been
2 safely managing waste for some 30 to 40 years on an
3 interim basis, moving to a long-term facility makes sense.
4 It also makes sense that it should continue at the Western
5 Waste Management Facility where you have the presence of
6 people with the experience and expertise required to
7 safely manage these materials.

8 It is my understanding that the five-year
9 geological site characterization program which will
10 examine all aspects of the safety case for the DGR, in
11 terms of this geological, its ability to protect the
12 ground and surface water, while isolating the waste for an
13 extended period of time, will ensure the stability of the
14 site for the DGR.

15 I am also confident that the comprehensive
16 environmental assessment, as is currently recommended,
17 will ensure the DGR is without significant impact. A
18 comprehensive environmental assessment will also provide
19 lots of opportunity for public input in addition to the
20 public consultation activities hosted by OPG, which have
21 been ongoing for a number of years already.

22 I would also like to state that I do not
23 expect either the presence of the current nuclear facility
24 or the WWMF included, or the proposed DGR, will have any
25 negative effect on my ability to either sell homes or

1 develop properties. I have been a leading real estate
2 salesman in the area for a number of years and I've also
3 developed several multi-dwelling residential properties
4 including a block of 11 condominiums which are currently
5 in the process of being completed. I do not anticipate
6 any problem in selling these homes and I can say with
7 certainty from my perspective as a developer that the
8 proposed DGR does not affect in any manner my business or
9 bottom line.

10 The nuclear business as a whole obviously
11 adds to the economic development within this municipality.

12 In conclusion, it is my opinion that the
13 comprehensive environmental assessment for the DGR should
14 proceed.

15 Thank you.

16 **THE CHAIRPERSON:** Well, thank you very
17 much. It's always nice to hear a view from someone new to
18 the Commission. So thank you very much for taking this
19 time to do this presentation.

20 Are there any questions from Commission
21 Members?

22 So thank you very much, sir.

23 We're going to be making a switch for the
24 next presentation. Mr. Larry Kraemer, who was scheduled
25 to speak now, has unfortunately been pulled away and won't

1 be back until later on. So the Commission has taken its
2 discretion and made a change here. So therefore we're
3 going to have CMD 06-H22.18, which is Mr. David Martin
4 from Greenpeace Canada.

5 Mr. Martin, you have the floor, sir, and
6 welcome back before the Commission.

7
8 **06-H22.18**

9 **Oral Presentation by**
10 **Greenpeace Canada**

11
12 **MR. MARTIN:** Thank you very much, Madam
13 President, Commission Members.

14 My name is Dave Martin. I'm Energy
15 Coordinator for Greenpeace Canada, which was founded in
16 Canada in 1971. We have about 100,000 supporters across
17 the country and about 2.8 million supporters around the
18 world. We have had a longstanding interest in nuclear
19 fuel chain issues.

20 Our participation today should not be
21 interpreted as endorsement for the rules of procedure in
22 this hearing. There are real problems with it, in our
23 view; the restriction to a 10 minute presentation, the
24 lack of opportunity to test evidence through cross-
25 examination and the lack of funding for expert testimony

1 and other intervention expenses all render this proceeding
2 unfair to public interest intervenors.

3 We have a fundamental issue with this
4 proceeding. We believe that it should be delayed because
5 the federal government has not established a transparent
6 and socially acceptable framework for the management of
7 long-lived, non-fuel, radioactive waste. The federal
8 government has this responsibility under the 1996
9 radioactive waste policy framework and I'll just read the
10 relevant section. It reads:

11 "The federal government has the
12 responsibility to develop policy to
13 regulate and to oversee producers and
14 owners to ensure that they comply with
15 legal requirements and meet their
16 funding and operational
17 responsibilities in accordance with
18 approved waste disposal plans."

19 The CNSC, in our view, has failed to
20 address this issue and we've had no response from other
21 departments of the federal government. Greenpeace
22 submitted this matter as a petition to the Auditor General
23 last June. We expect a reply -- we were told by the
24 Auditor's office, within the next week, to that petition.

25 Ancillary to this issue is the failure of

1 the federal government to even classify and define what is
2 meant by low- and intermediate-level waste. I talked to a
3 representative of the International Atomic Energy Agency
4 who described the Canadian approach as informal.

5 This failure on the part of the CNSC and
6 the federal government has allowed OPG to misrepresent the
7 nature of the hazard. It's suggested for instance, that
8 radionuclides in low- and intermediate-level waste have
9 "half-lives generally equal to or less than 30 years". In
10 fact, the low- and intermediate-level waste currently in
11 the Western Waste Management Facility at the Bruce site
12 include many, many long-lived radioisotopes, including for
13 example, plutonium-239 with a half-life of 24,000 years.
14 That means that any given amount of that plutonium will
15 remain hazardous for about 240,000 years.

16 This also raises the question of
17 decommissioning waste. I would suggest that's part of the
18 problem that we're facing and of course we've suggested
19 that those decommissioning wastes should be included in
20 this proposal. I'm not satisfied that the response given
21 by the staff will adequately deal with that issue.

22 Next, I would urge that this environmental
23 assessment does proceed. We'd strongly recommend that it
24 be bumped up to a panel review and we've suggested three
25 reasons for that. First, that it's the only way to

1 achieve fair hearing. Secondly, that it's warranted
2 because of the importance and precedent-setting nature of
3 the undertaking, and finally because there is indeed
4 significant public concern.

5 This process must be fair. It must be seen
6 to be fair. We believe that the Canadian Nuclear Safety
7 Commission has failed to proactively acknowledge and
8 address gaps in Canada's current legislation, regulations
9 and policies governing nuclear power. That is, in fact,
10 part of the substance of our complaint and petition to the
11 Auditor General.

12 The aspect also of this petition that is
13 relevant to the proceeding is, as I mentioned earlier, the
14 CNSC's failure to address the absence of policy on low-
15 and intermediate-level radioactive waste and its long-term
16 management.

17 On the second point, this is obviously a
18 very important proposal that will set a precedent, not
19 only for low- and intermediate-level waste, but I would
20 argue as well, for high-level waste. The impacts will be
21 local. They will be regional and they will be
22 international in scope. Obviously, they will also be
23 multi-generational.

24 Finally, I would argue that there is
25 significant public concern. Greenpeace Canada polling has

1 shown this conclusively that the overwhelming concern from
2 the public on nuclear issues relates to radioactive waste.

3 I can provide details on that polling if
4 you would like. Submissions from concerned individuals in
5 Canada and USA show this. Nor do I believe that broad
6 community acceptance, contrary to earlier testimony, has
7 indeed been demonstrated by OPG. Less than half of the
8 population of Kincardine was polled in a survey. I don't
9 consider that to be -- a telephone survey to be an
10 accurate or meaningful poll. The other surrounding
11 municipalities' citizens were not surveyed. Nor were
12 members of the First Nations' communities surveyed.

13 And I would also just as evidence of public
14 concerns cite the International Joint Commission -- that's
15 the International Joint Commission on Great Lakes Water
16 Quality which stated, and I quote:

17 "The management of radionuclides
18 including the temporary and long term
19 storage of nuclear waste is a matter
20 of public concern."

21 That was part of the Ninth Biennial Report
22 on Great Lakes Water Quality in 1998.

23 As a matter of alternatives, the CNSC has
24 indeed expanded alternatives from simply explaining why
25 the deep underground dump should be selected. However,

1 these alternatives should still include storage at
2 existing sites. The federal government has mandated site
3 storage as one of the three options for high-level waste.
4 The CNSC staff response was that the Western Waste
5 Management Facility is:

6 "...currently authorized, therefore
7 site storage will not be considered."

8 I don't think that's a sufficient response.

9 They have also suggested that reduction at
10 source would be included but only in the sense of volume
11 reduction. We believe that reduction through nuclear
12 phase out should be considered. Again, the argument
13 provided was that nuclear power is "currently authorized".
14 I'd also like to point out that shutting down nuclear
15 power plants is currently authorized and, I guess, the
16 rhetorical question is you wonder why we want an
17 independent panel review.

18 And the question of study areas, and I know
19 I'm approaching my time here within a couple of minutes
20 but I'm close to the end -- the study areas should be
21 expanded to include downstream communities on Lake Huron
22 in both Canada and the United States. I would suggest
23 there is significant interest and concern. You've heard
24 from approximately 20 groups, Michigan-based environmental
25 groups. Recently, Congressman Bart Stupak has written to

1 the CNSC. I copied his letters to the Minister of
2 Environment and in case it hasn't been given to the
3 Members, I'd just like to provide you with copies of
4 Congressman Stupak's letter.

5 **THE CHAIRPERSON:** We have to supply it to
6 everybody. If you table anything with us it has to be to
7 everybody.

8 **MR. MARTIN:** In terms of the assessment
9 timeframe, Greenpeace submitted that the impact should be
10 considered over a one million year timeframe. I'm a
11 little uncertain about the CNSC response, whether that
12 acceded to our request or not and seeing as CNSC staff
13 responded:

14 "The period of time required for
15 assessment as described in the Scoping
16 Document is dependent on the period of
17 time that effects would occur rather
18 than the rate of decay."

19 I mean, I'd suggest that that's the whole
20 issue. I mean, what is the period of time over which
21 effects will occur? So I guess my proposal still stands.

22 In terms of malfunctions and accidents, I
23 would suggest that it should be -- there should be an
24 explicit reference to water flow in the model, facilities
25 that are being put forward, the finished facilities at

1 Kyoto and Levisa as well as Forsmark and it's not --
2 again, it's sort of the same question. I don't know
3 whether the change that was inserted into the scope will
4 deal with our request that the worst case kind of accident
5 should be considered.

6 On the question of transportation, CNSC
7 staff are refusing to consider transportation in the
8 environmental assessment and, again, currently approved.
9 But I would suggest with a centralized facility such as is
10 being proposed that exclusion of transportation really is
11 a transparent attempt to avoid what is a controversial but
12 nevertheless fundamentally important aspect of this
13 proposal. It should be considered.

14 Similarly, radioactive waste incineration:
15 There should be detailed environmental evaluation of
16 incineration. Again, why is it excluded? Well, current
17 practice currently approved and I don't accept that there
18 are not alternatives. Compaction is clearly a valid
19 alternative.

20 And I'm really winding up here.

21 Cost evaluation: in the real world the
22 cost of alternatives is an obviously important factor.
23 There should be detailed cost evaluations and estimates
24 for not only the preferred alternative but also all the
25 alternatives being considered so that we can see what

1 that's all about and what the tradeoffs are.

2 In terms of public participation Greenpeace
3 requested that CNSC should consult with municipalities on
4 the transportation route from the Darlington and Pickering
5 nuclear power plants to Bruce. The CNSC staff response,
6 "currently approved".

7 I would ask you, can you seriously ask us
8 why we want an independent panel review when the kind of
9 response we get on these fundamental concerns about
10 environmental impacts of this process are simply ignored
11 with the bad excuse that these practices are currently
12 approved. They are part of this proposal. They deserve
13 to be considered and if we need a panel review to re-
14 evaluate the scope then that's what should be done.

15 Thank you.

16 **THE CHAIRPERSON:** Thank you very much, and
17 we appreciate that your submission was 17 pages, so that
18 there is quite a bit of information in there.

19 So we'll open for questions. Mr. Harvey,
20 would you like to start?

21 **MEMBER HARVEY:** With regard to the public
22 concerns on page 8 of your submission, the fourth
23 paragraph, finally there is particularly strong concern
24 about radioactive waste disposal among the public.
25 Polling the Commission by Greenpeace on the topic of high-

1 level radioactive waste indicates that 88 per cent of
2 respondents opposed to the siting of radioactive waste
3 facility in their community and 60 per cent opposed even
4 the transportation. This what is written here, "high-
5 level radioactive" how can you apply or adapt this polling
6 to the actual project and compare it with the poll that
7 has been done here for the residents in the area?

8 **MR. MARTIN:** Yes, I acknowledge and admit
9 that the polling was specifically addressing fuel waste.
10 However, I think it probably will extend to so-called low-
11 and intermediate-level waste as well, given the fact that
12 many of the radioisotopes in the so-called low- and
13 intermediate-level waste have extremely long half-lives.
14 So I think they are comparable issues and I think they
15 will certainly be perceived as comparable issues in the
16 mind of the public.

17 **MEMBER HARVEY:** Page 13, it's not -- the
18 result of some studies at the International Joint
19 Commission on Great Lakes Water Quality and I just read
20 that they contradict the CNSC staff position and make it
21 clear that operation of Canadian nuclear facility of the
22 Great Lakes has had immeasurable transborder effects. So
23 I'm just asking you if you have more comments about that
24 and I will ask after that the staff to give the opinion.

25 **MR. MARTIN:** Well, the IJC did do some

1 fairly extensive studies at that time in the late '90s
2 and, granted, those were looking at primarily the impacts
3 of nuclear power plants and effluent from uranium mines in
4 Elliott Lake, but nevertheless they recognized that there
5 have been measurable impacts on levels of radioisotopes in
6 the lakes due to the operation of these nuclear facilities
7 and they specifically noted that radioactive waste
8 facilities are a particular issue.

9 So I think it's relevant and it has
10 certainly contradicted the position that was taken by the
11 CNSC staff. So I'll leave it at that.

12 **MR. HOWDEN:** Barclay Howden speaking.

13 I'm going to ask Dr. Steve Mihok, our
14 environmental risk assessment specialist, to reply.

15 **DR. MIHOK:** I agree with basically what has
16 been said that, yes, in the past we have a lot of
17 information not just from the International Joint
18 Commission on effects in terms of radionuclides being
19 present in the Great Lakes ecosystem. Obviously, the
20 radionuclides would be present in easily-detected
21 concentrations close to a point of release or a point of
22 operation of a nuclear facility, but once we start to get
23 into the issue of true trends, boundary effects at long
24 distances and so on, it becomes progressively more and
25 more difficult to actually demonstrate an effect in terms

1 of a change in the level of a radionuclide that may be
2 present in background concentrations and have some
3 additional increment from an actual operation of the
4 nuclear facility or a waste disposal facility.

5 And in reality, in present times the only
6 radionuclide that is easily detectable in the long term is
7 the tritium and, again, it's because of the operations of
8 power reactors on the Great Lakes and there has been a
9 small elevation a few times, background, in terms of
10 tritium at long distances throughout the Great Lakes.

11 In terms of why we take a position on no
12 logical effect, no easily measured effect occurring, it's
13 based on the preliminary safety assessments that have been
14 done that have looked at the concentrations of
15 radionuclides that will hit the lake somewhere deep in the
16 sediments, perhaps some far from the shoreline, perhaps
17 close to the shoreline. These numbers are so small and so
18 difficult to detect that we really cannot see these
19 effects occurring more than on a very localized scale, and
20 even when we try to define what an effect might be, at the
21 moment these preliminary assessments are really just
22 dealing with dose as a consequence of changes in levels.

23 These doses are on the order of millions,
24 if not billions or millions of millions of levels lower
25 than numbers that are of concern to humans and for effects

1 on ecosystems and so on. They're essentially numbers that
2 would never be measurable.

3 **MEMBER HARVEY:** Thank you.

4 **MR. MARTIN:** May I make an additional
5 comment?

6 **THE CHAIRPERSON:** Certainly, which belies
7 your comment about being able to ask questions, Mr.
8 Martin. Please, you can ask questions to the Chair.

9 **MR. MARTIN:** Touché.

10 Yes, I mean, I guess in the spirit of some
11 of the comments earlier in the hearing I was simply
12 responding to what I considered to be a rather sweeping
13 and simplistic claim that -- and I quote the CNSC
14 Disposition of Comments document -- "adverse effects occur
15 only locally". That's patently untrue that effects of
16 nuclear facilities in the Great Lakes have been shown to
17 have trans-boundary, large scale, non local effects.

18 **THE CHAIRPERSON:** Well, at the risk of
19 stopping a scientific debate back and forth between the
20 staff, I think we'll move on to Dr. Barnes.

21 **MEMBER BARNES:** Well, let's just pick up on
22 that. What do you mean by large scale? Is that a
23 geographic or is it a quantity issue of contaminants?

24 **MR. MARTIN:** Well, as alluded to earlier,
25 I'm thinking -- and it wasn't -- I should say that the IJC

1 did not just track tritium. They were tracking other
2 radioisotopes as well, but tritium obviously is the
3 notable one, and I do mean primarily -- when I say large
4 scale, I mean geographically. But certainly these are
5 levels that increased.

6 What happened with tritium was that there
7 was large levels from atmospheric bomb testing. Following
8 the cessation of atmospheric testing, tritium levels in
9 the Great Lakes declined. Following the start-up of
10 nuclear reactors in the '70s and into the '80s, tritium
11 levels in Lake Ontario, for instance, increased once again
12 at obviously detectable levels.

13 **MEMBER BARNES:** Okay. I have four other
14 questions, Madam Chair.

15 To staff first; the intervenors raise the
16 issue of basically the government not developing a policy
17 for low-level and intermediate-level waste. I think this
18 goes back to a recommendation in 1996. That was basically
19 in a decade when it was recommended.

20 Would you like to comment on this, that we
21 basically are here today at this sort of momentous stage
22 and yet it's without having an overall federal policy
23 framework, it appears.

24 **MR. HOWDEN:** Barclay Howden speaking.

25 In fact, the federal government does have a

1 federal policy. I think the issue of the policy -- the
2 basic gist of the policy is that for radioactive waste
3 that the producer is responsible for managing the waste
4 that they produce.

5 I think what Mr. Martin might be alluding
6 to is there is not an integrated national strategy for
7 dealing with it as there is with high level waste spent
8 fuel, the government created the Nuclear Waste Management
9 Organization.

10 But right now the policy is the producer is
11 to manage the waste, and within that context, the CNSC,
12 under the NSCA, is required to regulate that.

13 **MEMBER BARNES:** And a second point which I
14 think needs clarification by Mr. Martin is the failure of
15 the federal government to define what is really meant by
16 low-level and intermediate-level waste and refer to this
17 as being sort of a more informal definition. Would you
18 agree?

19 **MR. HOWDEN:** Barclay Howden speaking.

20 I'm going to pass this question back to Don
21 Howard on the issue of classification of waste in Canada
22 and because there isn't a formal system, how we address
23 the risk.

24 **MR. HOWARD:** For the record, Don Howard.
25 I'm a project officer with the Waste and Decommissioning

1 Division.

2 Essentially in Canada, I tend to agree with
3 Mr. Martin, there is an informal waste classification
4 system. Essentially it was designed that the federal
5 government wanted to identify spent fuel, wanted to
6 identify tailings, and then essentially all other
7 radioactive waste fell into another category called low-
8 level radioactive waste.

9 Now, this has been identified by the Low-
10 Level Radioactive Waste Management Office in their
11 reporting of radioactive waste in Canada.

12 However, the Canadian Nuclear Safety
13 Commission does not regulate by this informal system. We
14 essentially regulate by the characteristics of the waste.
15 We look at the chemical, biological, radiological
16 properties of those waste and how they can best be managed
17 and stored safely.

18 **MEMBER BARNES:** So if I could come back to
19 what you just said in terms of the high level versus
20 intermediate level, where you can have a cut-off of high
21 level being spent fuel, a fuel-related issue as opposed to
22 a radiological level, which is implied, I think, in the
23 term; is there a cut-off in terms of level, radiological
24 hazard, when we refer to intermediate-level waste that
25 would apply to this facility?

1 **MR. HOWARD:** For the record, Don Howard.
2 Essentially, the system that is used in
3 Canada identifies spent fuel as high-level waste and
4 basically everything else, low and intermediate-level
5 waste are then classified into the third category which is
6 defined as low-level radioactive waste.

7 Now, in the Joint Convention on the Safety
8 of Spent Fuel Management and Radioactive Waste Management,
9 Canada has stated this position internationally. We have
10 committed to reviewing the situation in Canada with
11 respect to the classification of waste and we are
12 investigating the possibility of introducing a
13 classification system in Canada but we are only reviewing
14 that at this time.

15 **MEMBER BARNES:** So since the OPG has stated
16 that there will be no spent fuel placed in this facility,
17 how high can -- from a radiological viewpoint -- can
18 intermediate-level waste go? Is there a defined upper
19 limit on that or in practice what would this be?

20 **MR. HOWARD:** For the record Don Howard.
21 Essentially, no, there is no upper limit.
22 What OPG has to demonstrate is that the design of the
23 facility can adequately manage the waste, which they
24 intend to emplace in that particular facility. So they
25 have to design a waste acceptance criteria for the

1 facility and within that bounding envelope the waste --
2 basically, they'll be characterizing the waste and
3 essentially they have to design a facility that can and
4 will safely manage that waste.

5 **THE CHAIRPERSON:** I believe, Dr. Barnes,
6 OPG would like to comment on that.

7 **MR. NASH:** Ken Nash, OPG.

8 I will just make a couple of remarks and
9 then pass it to Frank King.

10 Our project description does provide a
11 description of the types of waste that will be in the
12 Track 1, Track 2, Track 3; the sources of those waste,
13 where they will come from, and we have a quite detailed
14 characterization of that waste and all the different
15 radioisotopes.

16 So it's well defined in the project
17 description and, as we move forward, we'll be
18 demonstrating that for each of those radionuclides what is
19 a safety case and how can we demonstrate that those
20 radionuclides will not be transported to the environment
21 in any significant quantity.

22 So I'll pass that to Frank King to further
23 elaborate.

24 **MR. KING:** Yes, we, for all of our waste
25 streams, we recognize them individually and we break them

1 down into about 15 different categories of where the
2 wastes are coming from in the nuclear stations, form of
3 waste. Ash from our incinerator would be a waste stream.

4 Then, for the last many years, 10 years or
5 more, we've had a waste characterization program. Every
6 year, we go and take samples from various waste streams
7 and over years, we have built up a database of
8 information. We take the samples. We send them to the
9 lab. We get detailed lab analysis of what radionuclides
10 are in each of the waste streams. Over the years, we have
11 built up a big database and that is that our radioactive
12 waste characterization database is used as input to safety
13 assessment.

14 So when our safety assessment people --
15 they don't simply just look at two categories. They look
16 at all the waste streams. Those are all input into a
17 scoping safety analysis to identify the more important
18 radionuclides. Those are carried through to a detailed
19 safety analysis and, hence, this issue of having a
20 definition really is not used in detailed safety
21 assessment.

22 Madam Chair, since I have the microphone at
23 the time, Mr. Harvey asked me a question this morning
24 which I did not have the answer to, which I have it now.
25 Would you like to hear it?

1 Okay. Mr. Harvey, you asked me a question
2 about the average field that comes from an intermediate-
3 level waste. I managed -- I didn't have the information
4 before, but over the lunch hour I managed to get that
5 information.

6 What we have done -- I'll talk about this
7 database. For every waste container we have, when it
8 comes to the site it has a gamma scan done. So we get the
9 radioactive field coming from that container. What
10 reactor that container came from, the date it came; its
11 radioactive field and some other information are put into
12 a database. We know exactly where that container is in
13 one of our buildings, which row, which height, which
14 column, which in-ground container. We made a detailed
15 database of tracking where all the waste is and what's in
16 that container and what the field was.

17 What we have done recently is we have
18 looked at all those field measurements of all of those
19 containers, and there's tens of thousands of these
20 containers, and done a kind of probabilistic distribution
21 of where the dose rates are on the containers. And if I
22 could just refer to my notes here, the average for the ILW
23 that we have in storage right now is 20 millisieverts per
24 hour.

25 A couple of other points on that

1 probabilistic distribution would be that 99 per cent of
2 the waste packages are under 1,000 milliSieverts per hour;
3 99.6 per cent of the waste packages are under 5,000
4 milliSieverts per hour.

5 This information shows a lower dose rate
6 than would be implied by that information in our project
7 description right now. In fact, these dose rate
8 informations are not decay corrected, so these are the
9 dose rates when the package went into storage. Over time,
10 they would really be much less than the numbers I've just
11 given you.

12 **MR. HARVEY:** Thank you very much.

13 **MEMBER BARNES:** If I could just back up
14 before you made that comment, and just ask a further
15 question when we were talking about the levels of
16 intermediate waste and so on.

17 And another question that came from Mr.
18 Martin was the issue of how long this repository should
19 be, in essence, proven to be in a safe, non-hazardous
20 condition, and Mr. Martin suggested a million years might
21 be appropriate. Given that you've got this documentation
22 that you've just stated, which is the last 30 years, and
23 given the expectation of the next 30 years is not going to
24 be significantly different, which is what you state in
25 your documents, could you say if you bury that amount of

1 waste in this facility, as you've described, what is the
2 timeframe that you would say is valid compared to Mr.
3 Martin's one million years that relates really to the
4 half-lives of the radionuclides and the proportion of
5 those, et cetera?

6 **MR. KING:** Frank King, for the record.

7 In the proposed scoping document the CNSC
8 staff have put together, I believe there is a requirement
9 in there that we -- or certainly in the draft G320, which
10 is the Safety Assessment Requirements document, that we
11 continue our safety assessment calculations until the dose
12 peaks, whatever the pathway that we are considering until
13 the dose peaks and that would be for several hundreds of
14 thousands of years because of the assumed diffusion of
15 control. It takes a long time before it would peak. So
16 we would continue out our safety assessment calculations
17 for a very long period of time until the dose curve turned
18 over. That's quite common in international practice in
19 this area.

20 **MEMBER BARNES:** Right, and that number is
21 based on the assumption that those radionuclides go from
22 the repository to the top of the Queenston red shale only
23 by diffusion. And should there be fractures or faults by
24 which they can migrate upwards, that number would be
25 significantly changed. Correct?

1 **MR. KING:** Frank King, for the record
2 again.

3 It is immaterial what the detailed
4 assumptions are. We do the calculation until the dose
5 peaks whatever that number is.

6 **MEMBER BARNES:** If I can ask one more
7 comment, again referring to information that Mr. Martin
8 provided on -- I'm not sure if it's information or just a
9 comment provided on page 14, under 6.3, "Malfunctions and
10 Accidents", where he noted that the:

11 "Environmental Assessment Report
12 should include detailed discussion of
13 expected water flow".

14 We have certainly discussed that this
15 morning. And there should be detailed reporting on the
16 water flow at those foreign repositories, specifically
17 mentioning Sweden, Finland and the U.S.

18 Could I ask OPG and staff if they have any
19 disagreement with OPG's answer? Since you have now
20 thorough knowledge of repositories, has there been
21 significant water flows into those repositories?

22 **MR. KING:** Frank King, for the record.

23 We have, as I've indicated, visited many
24 repositories just on our last trip, just going through
25 them of course, that the WIPP facility with salt, there is

1 almost nothing. They had some small brine inflow, which
2 is no longer present.

3 Conrad in Germany, there's essentially
4 none. At ISOFAR in Sweden there are inflows of water, I
5 don't have the rates right now, we can get that
6 information, but I've been underground at the ISOFAR
7 facility and there is some water inflow that requires pump
8 out.

9 **MEMBER BARNES:** Any comment from the staff?

10 **MR. BELFADHEL:** Ben Belfadhel, CNSC. Yes,
11 in general we agree with what Mr. Frank King mentioned and
12 our agreement is based on our knowledge of -- our review
13 of the published information.

14 **MEMBER BARNES:** Madam Chair.

15 **THE CHAIRPERSON:** I would like to ask a
16 question with regards to Mr. Martin's numbers, page 16,
17 number 7, which is to do with the cost evaluation of the
18 various issues.

19 I would like to have a sense from CNSC
20 staff with regards to their view of this amendment and the
21 application of "environmental technical social factors"
22 versus or including, if it includes or not, the economic
23 analysis and full cost disclosure. So could you reconcile
24 the comments please?

25 **MR. RINKER:** Mike Rinker for the record.

1 The criteria put forward in section 4.2.4 suggesting
2 economic, technical, social, environmental factors may be
3 used for the selection are guidance provided from the
4 *Canadian Environmental Assessment Act*.

5 There would be a requirement for OPG to put
6 forward what their criteria are and then those would be
7 reviewed by CNSC staff to see if it's appropriate.

8 In terms of economic, we would not be
9 expecting a full disclosure of their costs but certainly a
10 relative comparison, if indeed economic became a
11 criterion, which we would be assessing alternatives.

12 **THE CHAIRPERSON:** But would the CNSC do
13 economic criteria as a measurement?

14 **MR. RINKER:** Mike Rinker, for the record.
15 The *Canadian Environmental Assessment Act* would allow us
16 to use the weighing of several factors, including
17 economic. The absolute value is not something we'd be
18 necessarily interested in, but it would be one of the
19 criterion we could use to see whether if one advantage
20 over -- if one option, for example, had similar means to
21 protect the environment as another, then OPG may prefer
22 another one and we could accept that.

23 **THE CHAIRPERSON:** Thank you very much, Mr.
24 Martin, and thank you for agreeing to switch with another.
25 Thank you very much.

1 **MR. MARTIN:** Thank you.

2 **THE CHAIRPERSON:** We would now like to take
3 a 15-minute break and we'll be back after that.

4 --- Upon recessing at 5:11 p.m.

5 --- Upon resuming at 5:27 p.m.

6 **THE CHAIRPERSON:** Thank you for your
7 patience, ladies and gentlemen; if you could take your
8 seats please. Could you please take your seats?

9

10 **06-H22.9**

11 **Oral Presentation by**

12 **South Bruce Impact Advisory Committee**

13

14 Well we'd like to thank Mr. Ribey for his
15 patience, he has certainly been before the Commission
16 before and we're very delighted to see you again, sir.

17 Representing the South Bruce Impact
18 Advisory Committee, CMD 06-H22.9. The floor is yours sir.

19 **MR. RIBEY:** Good afternoon. And first I'll
20 say this is probably the last time I'll be here.

21 Madam Chair, Members of the CNSC Board, I
22 am Howard Ribey. As chair of the South Bruce Impact
23 Advisory Committee, please consider our comments in
24 regards to the proposal for long-term storage of low- and
25 intermediate-level radioactive waste from OPG's reactors,

1 including those leased to Bruce Power.

2 The IAC is a committee of elected
3 representatives from the municipalities of Arran-
4 Elderslie, Brockton, Huron-Kinloss, Kincardin, and Saugeen
5 Shores. Bruce County is also represented by the sitting
6 warden. Bruce Power and Ontario Power Generation, Western
7 Waste Management are also represented on our committee.

8 The mandate of our committee is to provide
9 proactive liaison by enhancing communications and
10 providing perspective from the Bruce Nuclear Power
11 Development Impact Municipalities, Bruce County, Ontario
12 Power Generation and Bruce Power with the purpose of
13 identifying issues and addressing impacts that may affect
14 the health, safety, environment, and economic well-being
15 of South Bruce area.

16 The committee has received regular
17 briefings by OPG regarding the current waste storage
18 operations and the DGR proposal.

19 The IAC is satisfied with the manner in
20 which OPG has managed the low- and intermediate-level
21 nuclear waste to date and the DGR proposal provides a
22 viable long-term approach to isolate the waste into the
23 future.

24 The IAC received presentations by Golder
25 Associates on the geological conditions below the Bruce

1 site during the independent assessment study and if OPG
2 confirms these conditions through the site
3 characterization program, isolating the waste in the
4 limestone with the overlying shell layer appears to be the
5 best approach to manage the waste over the long-term.

6 During the assessment of the proposal OPG
7 had been very diligent with communications to the public.

8 We have lived with low- and intermediate-
9 level nuclear waste for over 30 years; we know what it is
10 and we know how it is stored. Considering that the waste
11 is here, we would like to see the Deep Geological
12 Repository project move forward to provide the long-term
13 solution to this management.

14 We support your staff's recommendation to
15 move forward with a comprehensive environmental assessment
16 for this project. We do not see any significant
17 environmental issues with the proposal. OPG has done
18 extensive communications over the last four years and the
19 majority of people in this area are supportive of the
20 project.

21 In closing, we believe this is the right
22 solution, in the right place, for the right reasons and
23 the time is right to address the problem of long-term
24 management of low and medium waste. Respectfully
25 submitted. Thank you.

1 **THE CHAIRPERSON:** Thank you, sir, for
2 bringing forward the views of the committee.

3 Are there any questions from Commission
4 members?

5 Well thank you very much sir.

6

7 **06-H22.11**

8 **Oral Presentation by**

9 **Patti Chmelyk**

10

11 **THE CHAIRPERSON:** We're now moving to CMD
12 06-H22.11, and Ms. Chmelyk is with us, Ma'am, and the
13 floor is yours.

14 **MS. CHMELYK:** Thank you, Madam Chair,
15 Commission Members, ladies and gentlemen.

16 My name is Patti Chmelyk; I'm a mother, a
17 wife, and an administrative assistant who possesses a keen
18 interest in the processes that make this great country of
19 Canada work.

20 Unfortunately, over the past few years,
21 I've had many experiences and been involved in many
22 situations that have caused me to stop trusting our great
23 Canadian system.

24 I do not think that everything has gone to
25 hell in hand basket yet, but I do believe that we are

1 rapidly heading in that downward spiral, unless people
2 like me intervene. I'm here today to intervene.

3 In 2001, my husband, a professional
4 engineer working for a plastics firm was diagnosed with a
5 fatal bone marrow failure disease; a disease for which the
6 Canadian Institute of Health Information (CIHI) does not
7 gather statistics.

8 At that time, this disease had no treatment
9 and no cure. A bone marrow transplantation was my
10 husband's only hope of surviving beyond a few months.

11 When we questioned the haematologist as to
12 what may have caused this illness, the doctor said and I
13 quote: "If I were a betting man, I would bet on chemical
14 exposure."

15 My husband was only 45 years old at the
16 time; at the height of a career and a profession in which
17 he took great pride.

18 During his illness I learned an awful lot
19 about how our great Canadian processes work. Some of
20 these processes were admirable and worked exactly as they
21 were supposed to, but many of the processes that I really
22 believed were in place to protect me, a taxpayer in every
23 sense of the word, many of these processes were not and
24 still are not working, but I will not go into that today.

25 My husband and I were able to determine

1 what industrial contaminants he had worked with that may
2 have caused this catastrophe and realised that his
3 exposure occurred in the late 1980s and early 1990s. We
4 just didn't know at that time that these types of
5 industrial contaminants could contribute to bone marrow
6 failure diseases. Workers, including professional
7 engineers, were not being advised of these dangers or, at
8 the very least, the dangers were being greatly minimized
9 and even today, the clause on MSDS sheets regarding bone
10 marrow failure diseases is treated by many industry
11 experts as just being a motherhood clause. Bone marrow
12 failure is just not considered to be a real threat to
13 workers' health and safety.

14 We trusted that our great Canadian
15 processes would not allow unsafe chemicals to be
16 mishandled by workers, but it's happening in this country
17 every single day and it's not just happening with
18 chemicals. Every single day, in every single part of this
19 country, workers are being placed in very unsafe working
20 conditions.

21 More recently, I've been involved with
22 People Against Radioactive Contamination (PARC), a
23 grassroots group of concerned citizens in my home city of
24 Brampton. PARC was very concerned with a proposal to
25 install an incinerator to burn low-level radioactive waste

1 within the city limits. PARC's history is very
2 interesting, but I won't go into that today.

3 What I learned in that process truly
4 frightened me. I learned that a company was allowed to
5 apply to the CNSC for a laboratory licence to handle
6 radioactive waste. I learned that this company was
7 allowed, through the auspices of the CNSC, to keep adding
8 addendums onto their lab licence, enabling them to
9 increase the levels of radioactive materials and
10 processing on their work site, which was dangerously close
11 to people's homes and schools.

12 In a subsequent meeting between CNSC and
13 PARC officials in which ---

14 **THE CHAIRPERSON:** I'm sorry, Ma'am, this
15 hearing is about the proposal that's before us today.

16 **MS. CHMELYK:** And it's coming.

17 **THE CHAIRPERSON:** Please do so.

18 **MS. CHMELYK:** Yes.

19 In which I was in attendance, one CNSC
20 official, when asked what processes worked in this
21 particular case, indicated that the legislation worked.
22 Assuming I took the leap of faith and trusted that there's
23 nothing wrong with the legislation and taking that leap of
24 faith a step further and did as the CNSC official was
25 asking, which was to trust him personally, the only

1 conclusion I could reach was that the internal processes
2 of the CNSC had some massive flaws to have allowed a lab
3 licence to go as far as it had.

4 This conclusion led me to ask how many more
5 cases have there been and how many more cases will there
6 be for which the internal CNSC processes do not work?

7 Certainly the internal CNSC process worked
8 last December when they stopped the company in question
9 from processing any more radioactive waste, but I have to
10 ask if maybe the CNSC was politically forced to act
11 because the political pressure on the issue was mounting.

12 Ordinary people were asking questions that
13 required the CNSC's communications specialist to be called
14 in to respond.

15 That being said, how can I, a tax-paying
16 citizen of this country, trust that the CNSC has
17 sufficient knowledge about the biological effects of
18 radionuclides that may leak from the repository over the
19 next several centuries?

20 Bone marrow damage is a very real, living
21 example of biological damage. Does the CNSC have
22 expertise in this field?

23 Certainly KIHI, the agency responsible for
24 gathering such data, doesn't even collect the data on bone
25 marrow failure diseases for the research to even be

1 conducted. What other ill effects could come from this
2 project? Does the CNSC have a health department? Does
3 the CNSC have the necessary health professionals, data
4 analysts and researchers on staff who can conduct a proper
5 environmental assessment of the facility in the proposed
6 timeframe? I think the answer is a resounding no.

7 What happens when 200 years down the road
8 some government is elected who believes that no harm can
9 come from relaxing some ancient laws from 2006 regarding
10 the safety of this long-abandoned piece of land and
11 decides to build a school on the property?

12 Goodness knows we've had governments who
13 figured Walkerton's water was safe. We didn't need
14 environmentalists on the public payroll to tell us that,
15 did we?

16 We've got laws to protect us in Canada. We
17 don't need publicly paid environmentalists who consider
18 the broader determinants of the health of a community.

19 Something else that frightened me is the
20 fact that the Brampton company was, according to one CNSC
21 official, a virtual licence to make money. I don't have
22 the exact quote, but it was something like the company was
23 making money on the product coming in and on the product
24 going out. He really seemed to think it was a great
25 business, but that's precisely what worried me. A person

1 who was being paid to represent and protect me was more
2 impressed with what a money-making venture this business
3 was, wasn't concerned about my safety, my family's safety
4 or the safety of my community.

5 Another thing I learned in this process is
6 that not a single level of the great Canadian process took
7 ownership of this foul-up, not the administrative,
8 protective or political branches of the city, the region,
9 the province or federally, including the CNSC, took
10 responsibility for the foul-up.

11 Each level of government and agency ---

12 **THE CHAIRPERSON:** I'm sorry, Ma'am, I'm
13 really going to have to ask you if you have comments with
14 regards to the Deep Geologic Deposit. We are almost eight
15 minutes through your presentation.

16 **MS. CHMELYK:** I'm just about done with the
17 comments.

18 With all of that, you still want me to
19 trust you. You want me to trust you personally. You want
20 me to trust the process. You want me to trust the
21 legislation and you want me to trust that all the
22 uncontrollable factors that come up in life won't happen.
23 You expect me to trust that all of these unknowns -- you
24 expect me to trust all of these unknowns with
25 radionuclides.

1 Because of my mistrust, I would like to see
2 an independent panel review the potential environmental
3 impacts of this project, not just an in-house review by
4 the CNSC.

5 More importantly, if the CNSC does not
6 recommend a thorough review of the possible health
7 implications of the possible failure of this proposed
8 repository, then the CNSC is not living up to its mandate
9 to use all due diligence to ensure that the public health
10 and safety is protected. If the health issues are not
11 properly understood or analyzed in the first place, how
12 can the health and safety of Canadians and our precious
13 environment be adequately protected?

14 Thank you.

15 **THE CHAIRPERSON:** Thank you.

16 Are there any questions from Commission
17 Members?

18 Thank you very much, Ma'am, for coming and
19 we certainly will consider your comments and your written
20 remarks as well. So thank you.

21 We're going to make a bit of a switch in
22 terms of availability right now. We're going to CMD 06-
23 H22.20, which is an oral presentation from Mr. Chris
24 Peabody, who is a counsellor, I think, with Walkerton.

25 The floor is yours, sir.

1 **06-H22.20**
2 **Oral Presentation by**
3 **Chris Peabody**

4
5 **MR. PEABODY:** Thank you very much, Madam
6 President, and thank you for the substitution. I would
7 also like to thank the Council Members for coming to Bruce
8 County to hold the presentation here, making it easy for
9 the residents of the county to come and testify.

10 I'm a resident of Walkerton. I've lived
11 there for 20 years. Currently I teach geography at the
12 high school in Walkerton and I serve on the Town Council.

13 My intervention to the Nuclear Safety
14 Commission, I would like to cite three specific areas of
15 concern: the transportation of nuclear waste through the
16 Town of Walkerton; the hosting agreement between Ontario
17 Power Generation and the Municipality of Kincardine and
18 the hydrogeological studies on the project.

19 As a resident of Walkerton I would like to
20 encourage the Nuclear Safety Commission to evaluate the
21 impact of the transportation of low and intermediate-level
22 waste through the numerous towns located between
23 Darlington, Pickering and Bruce. Twenty-seven (27) trucks
24 a week pass through our town. They head up Highway 9 in a
25 northerly direction and in Walkerton they turn west

1 towards Lake Huron, and at that corner there are --
2 there's an elementary school at the corner and a high
3 school.

4 I know that transportation has already been
5 covered before but I just wanted to mention that the
6 safety of the people in Walkerton, with regard to the
7 transportation, should be considered at some regulatory
8 level but since you've covered that, we'll move on.

9 The Hosting Agreement that was signed
10 between Kincardine and OPG, I believe should be subject to
11 some scrutiny. The municipality of Brockton of which
12 Walkerton is a part of, where I'm a counsellor, is a party
13 to the Agreement and we will receive \$40,000 a year under
14 the terms of the Agreement.

15 On our Council, at the initial meeting
16 between OPG and our Council, the meeting, the issue was
17 discussed at an in camera meeting. A public meeting was
18 later held when the contents of the meeting were leaked to
19 the media. Our Council then voted to accept the payments
20 despite the fact that we were not given at that time or
21 nobody questioned or looked into what the contract was.

22 I do have a copy of the contract as I'm
23 sure the Commission does and I find section 4(c) very
24 disconcerting. Section 4(c) of the contract states that
25 notwithstanding anything to the contrary in the section 4;

1 "...if, at any time, OPG determines that
2 the adjacent municipalities are not in
3 good faith, exercising best efforts to
4 achieve any of these milestones, OPG
5 may, in turn, in its sole discretion,
6 acting reasonably, decline to make
7 further annual payments or any further
8 one-time lump sum payments set out in
9 Schedule A for any or all of the
10 aforementioned municipalities as the
11 case may be, which OPG has determined
12 is failing to exercise best efforts in
13 which case the affected municipality
14 will not have any right to receive or
15 cover that payment. OPG shall pay
16 half the annual or one-time lump sum
17 payment not paid to the affected
18 municipality, to local community
19 projects and or local charities
20 agreeable to both OPG and Kincardine."

21 I find that clause there rather binding and
22 it doesn't allow municipalities that would have a concern
23 about that to express that through any type of formal
24 motion and of course they would lose the money.

25 In my municipality, to lose \$40,000 a year

1 would be a -- that would be a one per cent tax hike, and
2 that would be quite significant to the taxpayers in my
3 community to have to build that into our budget to raise
4 the taxes by one per cent.

5 Thirdly, I believe that the hydrogeology
6 should be subject to an independent review. In the town
7 of Walkerton, I've served on the Environmental Assessment
8 Long-Term Water Study after our tragedy. I was elected
9 after the tragedy, and we've had three different
10 hydrogeologists offer very differing opinions on what is
11 underneath our current wells where we are getting our
12 water.

13 One was arguing that the hole formation was
14 a Karst formation and very susceptible to E-coli from the
15 top leaking down and the other was saying "no, absolutely
16 not, it's not" and then there was another hydrogeologist
17 in the middle. So given all the money we've spent in
18 Walkerton on our hydrogeology and having three different
19 opinions, if we switch to the topic of below-ground
20 storage of nuclear waste, I think it would be important to
21 have an independent peer review of any of these scientific
22 studies.

23 In summary, I feel that given the permanent
24 nature of this proposal to dispose of nuclear waste on the
25 shoreline of Lake Huron and given the uncertain nature of

1 the science of hydrogeology that the Commission should
2 recommend to the Minister that DGR proposal be subject to
3 a panel review.

4 **THE CHAIRPERSON:** Thank you very much, sir.
5 Question from the Commission Members?

6 My question is actually about this Hosting
7 Agreement. It was discussed by Dr. Barnes and whatever.

8 I guess I want to be clear that this isn't
9 really the purview of the Commission. The Commission
10 didn't suggest a Hosting Agreement nor is it subject to
11 the scrutiny of the Commission.

12 So I wish -- I think that's probably quite
13 clear to you, but I just wanted to make that clear that
14 that wouldn't be under the purview of the Commission and
15 certainly one of the jobs of elected officials is to
16 review and sign agreements but I didn't want the questions
17 that we asked about the Hosting
18 Agreement to give any sense that we were the people that
19 monitor these or required these or got involved. It was
20 strictly an arrangement between the parties involved but
21 we do appreciate that issue.

22 Dr. Barnes?

23 **MEMBER BARNES:** I am just going to follow
24 up on your transportation issue and just ask OPG. You
25 said, Mr. Peabody, the 27 trucks a week go through

1 Walkerton to OPG, what proportion would that be of the
2 waste traffic coming in from Darlington and Pickering?
3 Does another set go through another routine?

4 **MR. NASH:** Ken Nash.

5 We have various routes from Bruce to
6 Darlington, Pickering. Some of the material is coming
7 from Pickering and Darlington, low and intermediate-level
8 waste and in fact, some of the radioactivity is actually
9 going in the opposite direction to Darlington for instance
10 for tritiated heavy water for detritiation, so exactly
11 what percentage is low and intermediate-level waste, I
12 can't really say.

13 We do have a routine where the routes can
14 be varied so they won't always go through Walkerton but
15 Mr. Peabody is correct, that by routine they would do, but
16 I can't really exactly say what percentage is low and
17 intermediate-level waste.

18 **THE CHAIRPERSON:** Thank you very much, Mr.
19 Peabody, and a safe trip home.

20
21 **06-H22.13**

22 **Oral presentation by**

23 **Paul Steckle, M.P., Huron-Bruce**
24

25 **THE CHAIRPERSON:** We will then next move to

1 the submission CMD 06-H22.13, which has been submitted by
2 the Member of Parliament from Huron-Bruce who can't be
3 with us today I gather and so he has asked his
4 constituency assistant to represent him. The floor is
5 yours, Ma'am.

6 **MS. HENKENHAF:** Thank you. Madam Chair,
7 Members of the Commission, my name is Dianne Henkenhaf. I
8 am assistant to Paul Steckle. I would like to present the
9 submission to the Canadian Nuclear Safety Commission, re
10 the Deep Geologic Repository.

11 Good afternoon. My name is Paul Steckle
12 and for the past 13 years it has been my privilege and
13 honour to be a Liberal MP for the federal riding of Huron-
14 Bruce.

15 Before I begin, I would like to personally
16 welcome you to the Huron-Bruce and on behalf of the
17 residents of this area, I would encourage you to partake
18 in the scenery, hospitality and warmth that Bruce County
19 has to offer. I know that if you take a moment to explore
20 the region and meet the people, you will most certainly
21 enjoy the picturesque uniqueness that is the County of
22 Bruce.

23 By way of background, I would like to take
24 a moment to outline my credentials so as to provide you
25 with the basis from which I address you today.

1 Firstly, I am currently serving my fifth
2 consecutive term as a Member of the Canadian House of
3 Commons. In that role, since 1993, I have served on
4 numerous formal legislative bodies such as the Standing
5 Committee on Environment; the Standing Committee on
6 Fisheries and Oceans; and the Standing Committee on
7 Agriculture and Agri-Food, which I chaired between
8 February 2003 and January 2006.

9 Prior to '93, I served as an elected
10 municipal counsellor for a decade, from 1970 to 1980 as
11 the Reeve of that council between 1980 and '85 and as the
12 Warden of Huron County in 1985. Simply put, today as I
13 offer my remarks, I postulate them as a Public Servant
14 with 30 years of elected and community experience.

15 The nuclear industry plays a pivotal role
16 in the overall economy of Huron-Bruce, and I unreservedly
17 support the industry. Moreover, during my tenure in
18 office, I have come to understand that the vast majority
19 of area residents share this viewpoint. Simply put, Bruce
20 Power and OPG have become responsible and welcome
21 community fixtures on the landscape of this constituency.

22 In addition to the above and as part of the
23 outreach efforts made by Bruce Power and OPG, I have
24 become well acquainted with the workings of the Bruce
25 Power site and have participated in several events at the

1 site and in the surrounding community. I receive regular
2 briefings by Bruce Power pertaining to the operation and
3 rehabilitation of the Bruce reactors and from OPG
4 regarding the current waste storage operations and the
5 Deep Geologic Repository or DGR proposal. As a
6 politician, I appreciate the efforts that both companies
7 have made to keep me informed and to listen when I have
8 concerns. But even more importantly, I appreciate the
9 efforts that they have made to communicate with my
10 constituents in the community where they operate. Having
11 an ongoing dialogue with the public is the way trust and
12 understanding is built and I believe that is the reason
13 that the industry enjoys the support it does in my riding.

14 I have been briefed many times by OPG on
15 the Deep Geologic Repository, DGR project, for the long-
16 term storage of the low and intermediate-level waste.
17 Frankly, while I believe that OPG has been doing an
18 exceptional job of managing the waste on an interim basis,
19 as a responsible legislator, I believe that something must
20 be done to establish a long-term solution to isolate this
21 material from the public and from the environment.

22 Based upon the information available to me,
23 the DGR proposal of isolating the waste, deep underground,
24 in ancient limestone, is a viable and practical solution.
25 Similar facilities are currently in operation throughout

1 the world and I know that OPG has been securing solid
2 advice derived from the lessons learned during the process
3 of establishing and the consequent operations of the said
4 facilities from the Canadian and international experts
5 alike.

6 As you know, OPG has been responsible for
7 an aggressive and ongoing public outreach campaign on the
8 subject. They have undertaken an extensive and open
9 communications effort on the DGR proposal over the last
10 four years and, in my opinion, the people are aware of the
11 project and it is frankly not an issue of significance in
12 my riding.

13 I believe the majority of my constituents
14 agree with the proposal and would readily endorse the
15 concept of moving forward with the proposal without delay.
16 In the interests of absolute clarity, please note that I
17 support your staff's recommendation to move forward with a
18 comprehensive environmental assessment for this project.
19 I do not see any environmental issues that cannot be
20 mitigated at this point and I believe there is substantial
21 public support in this area.

22 In closing, I would like to once again
23 underscore my unreserved support for the DGR project as a
24 solution to the long-term management of low and
25 intermediate-level nuclear waste.

1 Thank you for the opportunity to speak
2 today. Paul Steckle, MP for Huron-Bruce. Thank you.

3 **THE CHAIRPERSON:** Thank you very much.
4 Are there any questions from Commission
5 Members?

6 So we'd like to have you extend our thank
7 you to Mr. Steckle for his presentation. Thank you.

8 **MS. HENKENHAF:** I will do that. Thank you
9 very much.

10 **THE CHAIRPERSON:** Thank you.

11 The next presentation, I believe, is by
12 telephone and it's an oral presentation by the Coalition
13 for a Nuclear Free Great Lakes, outlined in CMD 06-H22.14.

14 Mr. Michael Keegan is with us, I believe,
15 by phone.

16 **MR. KEEGAN:** Yes.

17 **THE CHAIRPERSON:** Mr. Keegan, the floor is
18 yours, sir, for a maximum of 10 minutes. Thank you.

19

20 **06-H22.14**

21 **Oral presentation by the**

22 **Coalition for a Nuclear**

23 **Free Great Lakes**

24

25 **MR. KEEGAN:** Madam Chair, thank you very

1 much. Commissioners, thank you very much.

2 I am the Chairperson of the Coalition for a
3 Nuclear Free Great Lakes. We are an organization that
4 developed in 1986 in the wake of the Chernobyl accident.
5 We have member groups in eight states and three provinces.

6 Also today, I have been asked to speak on
7 behalf of the Citizens for Alternatives to Chemical
8 Contamination which was founded in 1978. This is a
9 Michigan coalition which has individual numbers up and
10 down the shorelines of Lake Huron.

11 Undoubtedly, the Great Lakes are the most
12 precious resource on this planet, 20 per cent of the
13 world's fresh water and, yet, this Deep Geologic
14 Repository is a major threat to the three lower lakes.
15 There is no -- on the U.S. side there is no low-level
16 waste or high-level waste facility that has not been
17 leaking. The Department of Energy on the U.S. side has an
18 abysmal record on this.

19 I am asking today, and I'll be brief -- I'm
20 asking today that the assessment study must be expanded to
21 the downstream communities on both sides of the lake.
22 After five years of study, the Committee on Biological
23 Effects of Ionized Radiation concluded in a report this
24 last June that even low doses of radiation pose a risk of
25 cancer and that there is no threshold below which exposure

1 can be viewed as harmful.

2 The road to Hell is paved with good
3 intentions but there is no low-level waste site on the
4 U.S. side which is not leaking, not leaching, not
5 migrating. While you may have good intentions, it's going
6 to leach and migrate where you're at.

7 The International Joint Commission have
8 called for virtual elimination of radionuclides from the
9 Great Lakes basin, virtual elimination of persistent
10 toxins. Radionuclides are among the most persistent
11 toxins of any.

12 The most prudent course of action is the
13 best possible review possible. An independent panel
14 review is called for.

15 Now, it comes to my attention that money
16 has been spent and spread around in municipalities in the
17 Kincardine area. One might view this as bribery and,
18 thus, one might surmise that these communities are
19 operating under duress.

20 In the United States there is an Act called
21 RECO, Racketeering and Conspiracy. What seems to me, on
22 the face of it, is that the Canadian Nuclear Safety
23 Commission is in collusion with OPG to divert the
24 interests of the public. I urge you not to travel down
25 this draconian road which will drain the capital from the

1 economy, opportunity costs and lack all the people and the
2 citizens of Ontario into economic ruin.

3 Not to conduct a full independent panel
4 review constitutes criminal negligence. The Coalition for
5 a Nuclear-Free Great Lakes and the Citizens for
6 Alternatives to Chemical Contamination today rise and
7 stand in opposition to this proposed project.

8 That is my testimony.

9 **THE CHAIRPERSON:** Thank you very much.

10 You made some quite serious -- well, some
11 very serious allegations about the CNSC. Do you have
12 proof of this arrangement that you say exists between the
13 CNSC and OPG?

14 **MR. KEEGAN:** No, but I am looking for it.
15 It certainly smells that way and from my read of the
16 documents it's pointing in that direction.

17 **THE CHAIRPERSON:** Well, sir, you know, in
18 this country making allegations about anyone, companies,
19 private individuals, organizations is looked at very
20 seriously.

21 **MR. KEEGAN:** Okay.

22 **THE CHAIRPERSON:** Making allegations about
23 organizations, in this case it's the CNSC, but I said this
24 to people who made allegations about companies -- this is
25 all recorded as transcripts in Canada. Those remarks are

1 now on transcript in this country.

2 So I suggest that if you have proof of that
3 serious allegation that you wish to make about collusion,
4 then you should take the necessary action to bring that to
5 the authorities in Canada.

6 If you do not have ---

7 **MR. KEEGAN:** Would that be the Inspector
8 General?

9 **THE CHAIRPERSON:** No, that could be
10 Parliament, Parliament. We don't report to an inspector
11 general. We report to Parliament.

12 **MR. KEEGAN:** Okay.

13 **THE CHAIRPERSON:** So I think it's extremely
14 serious to make allegations if you do not have proof. In
15 this country that is a very serious matter.

16 So with that statement I'll turn to my
17 colleagues with regards to questions on some of the other
18 issues that you have.

19 Dr. Barnes.

20 **MEMBER BARNES:** Well, I would echo the same
21 sentiments, with your last comment on criminal negligence.
22 To me, criminal means something far more specific than
23 perhaps collusion and, again, I would echo the Chair's
24 comments that in a public forum I would say that it's
25 irresponsible of an intervenor to use such terms unless

1 they have some evidence. We are here today to hear
2 evidence and information on the issue at hand.

3 **MR. KEEGAN:** I'm asking for the prudent
4 course of action. This is irreversible. Once this is
5 done it can't be undone. I'm asking you for the most
6 intense, independent panel review. That's what I'm
7 driving at.

8 **MEMBER BARNES:** You may be asking for that,
9 but you're couching it in words which I would say are
10 inflammatory at least and also irresponsible and putting
11 yourself in some legal jeopardy, I would suggest. You may
12 wish to retract comments such as collusion or criminal
13 negligence.

14 **MR. KEEGAN:** I am raising the question.

15 **MEMBER BARNES:** I beg your pardon?

16 **MR. KEEGAN:** I am raising the question.

17 **MEMBER BARNES:** Well, I didn't think you
18 were raising a question. Those seem to me to be
19 accusations.

20 **MR. KEEGAN:** I am raising the question. If
21 it does not apply, then it does not apply, but from what
22 I've seen, I believe you're doing the bidding of OPG and
23 not doing the representation of the people of Canada, and
24 that is my opinion. I will state it as an opinion.

25 **THE CHAIRPERSON:** Well, sir, you know, to

1 be taken seriously in front of the Canadian Nuclear Safety
2 Commission, we base our testimony here whether people are
3 for a project or against a project based on Rules of
4 Procedure of the Canadian Nuclear Safety Commission which
5 are based on values of transparency and respect.

6 If people do not agree with the results of
7 the Canadian Nuclear Safety Commission, their avenue is
8 the federal courts in Canada, but other than that, whether
9 it is, as I said, accusations about the CNSC, about OPG or
10 others, in fact, that is not language that is welcomed at
11 the CNSC.

12 Further questions? Thank you.

13 **MR. KEEGAN:** Thank you for the opportunity
14 to testify today.

15 **THE CHAIRPERSON:** We will next move to the
16 next submission which is the oral presentation by the
17 Power Workers' Union. This is outlined in CMDs 06-H22.15,
18 06-H22.15A, and we're pleased to welcome representatives
19 of the Workers with us again. I believe that Mr. Peter
20 Falconer is going to do the presentation but we welcome
21 Mr. David Shier as well who comes before us often.

22 Welcome, sir. The floor is yours.

23
24 **06-H22.15 / 06-H22.15A**

25 **Oral Presentation by**

1 **Power Workers' Union**

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MR. FALCONER: Thank you and good afternoon, Madam Chair and Members of the Commission. My name is Peter Falconer. I am the Vice-President of the Power Workers' Union from the nuclear sector. Assisting me today is David Shier and he is a PW staff officer for Nuclear and next to Dave is Mr. Terry Brian. Terry is a past chief steward from the OPG nuclear waste site. Currently Terry is in the position of being retired, but he still lives in the area of the site.

My remarks will be brief and will update the Commission on some of the issues that we have covered in our written submission. I will talk about the following issues: the PW overview; PW views on the environment; public consultation; union involvement; summary and conclusions.

The PWU has been the bargaining agent for a majority of the workers at the employer's OPG western waste management facility since its inception. Currently we have over 100 workers at this site. We also represent the majority of the workers at the adjacent Bruce Power facility. The vast majority of these members reside with their families in their surrounding community.

The PWU places worker safety at the top of

1 their agenda. Our members have been safely handling this
2 waste for over 30 years and are absolutely confident that
3 moving this material into a permanent storage facility is
4 a very safe method for long-term storage.

5 Our elected representatives and health and
6 safety representatives at this site are always diligent in
7 regards to health and safety issues. The workers at this
8 site have an excellent health and safety record. The
9 public can be assured that any health and safety issues at
10 this site will be addressed promptly. The majority of the
11 workers live with their families in the immediate vicinity
12 and they are naturally very concerned with the
13 environment.

14 Therefore, any issues relating to the
15 environment will be immediately addressed since any risk
16 to the environment is also a direct risk to workers'
17 health and safety.

18 Many of our members attended the OPG
19 consultation sessions with the community. We believe that
20 the results of a telephone poll conducted on this project
21 should help assure the CNSC that the local residents are
22 very supportive.

23 Many of our members visited the storefront
24 operation that OPG operated in Kincardine and found it
25 very informative. We also believe that the website

1 provided and will continue to supply valuable information
2 to the community on the Deep Geological Repository.

3 OPG has kept the PW fully informed of this
4 proposal since its inception. The Bruce Power PW
5 representatives have also been kept informed on the
6 progress and issues surrounding this project.

7 Last week, the annual convention of the
8 Canadian Nuclear Worker Council was conducted in the local
9 community. Nuclear workers representing 15 different
10 unions attended this conference. An OPG representative
11 made a presentation to the convention delegates explaining
12 in detail the project. The delegates were also provided
13 with a tour of the current waste site. The CNWC council
14 members are in full support of moving ahead with this
15 project through a comprehensive review.

16 The PWU and the members at the waste
17 facility will continue to monitor this project. The CNSC
18 and the public can be assured that any environmental or
19 safety concerns that we or our members have will be
20 readily addressed with OPG and, if necessary, with the
21 CNSC.

22 In summary, the PWU supports the
23 environmental assessment track report dated August 23rd,
24 2006 and the PWU submits that a referral to a mediator or
25 review panel is not warranted.

1 We are naturally prepared to answer any
2 questions that you may have in regards to our written
3 submission or our verbal presentation of today. Thank
4 you.

5 **THE CHAIRPERSON:** Thank you very much.

6 Any questions from the Members?

7 Well, thank you very much and thank you for
8 your patience in waiting for today's opportunity. Thank
9 you.

10 We're going to move to the next
11 presentation which is an oral presentation by
12 teleconference and it's by Dr. Gordon Edwards. This is
13 outlined in CMD Document 06-H22.17.

14 Dr. Edwards, the floor is yours, sir, if
15 you're on the phone.

16
17 **06-H22.17**

18 **Oral presentation by**

19 **Gordon Edwards**

20
21 **DR. EDWARDS:** Well, thank you very much.

22 I would like to thank the Commission for
23 providing me with an opportunity to make my views known
24 through teleconferencing. Because I'm a full-time teacher
25 at Vanier College here in Montreal, it's not always

1 possible for me to attend the CNSC public hearings in
2 person.

3 I have five points which I would like to
4 make. First, the proposed underground repository for low-
5 level and medium-level radioactive waste at Bruce is the
6 first of its kind. In my opinion, it's a facility of a
7 totally different nature than other nuclear facilities
8 routinely licensed by the CNSC. The proposed facility has
9 no foreseeable time horizon. The facility itself and the
10 threats that it may pose to human health and to the
11 environment will almost certainly outlast both the
12 licensee and the regulatory agency, both of which may very
13 well not exist a few hundred years from now.

14 For this reason alone, it is highly
15 desirable that a more penetrating and far-reaching
16 environmental assessment be undertaken than that
17 traditionally given to nuclear facilities with a
18 predetermined lifespan. Only a full panel review, in my
19 opinion, is capable of providing the level of independent
20 scrutiny that would be appropriate for such a facility,
21 which is intended, after all, to outlast the Egyptian
22 pyramids in longevity.

23 Point number two, the striking parallels
24 between this proposed facility at Bruce and the
25 controversial Atomic Energy of Canada proposal for

1 geological storage of irradiated nuclear fuel is yet
2 another reason why the environmental assessment must, in
3 my view, be subjected to a full panel review.

4 In Canada, as you well know, a number of
5 competent bodies, completely independent of the nuclear
6 industry and the nuclear regulatory agency have already
7 identified a host of unresolved problems. Problems of
8 ethics; of stewardship; of governance; of long-term
9 environmental forecasting; of the reliability of
10 mathematical models; of the integrity of engineered
11 containment structures; of the nature of the geologic
12 medium itself; of pathways back to the environment of
13 living things; of alternative storage strategies, and so
14 on. All of these, to be sure, in the context of
15 geological storage of high-level radioactive waste, but
16 these same issues apply albeit in a different way to the
17 currently proposed underground repository for low- and
18 medium-level radioactive waste proposed at Bruce.

19 To proceed without a full panel review of
20 this project would be seen by many as a pre-emptive
21 rejection of all those precautionary warnings from bodies
22 such as The Ontario Royal Commission on Electric Power
23 Planning, The Select Committee on Ontario Hydro Affairs,
24 The House of Commons Committee on Environment and
25 Forestry, and the Seaborn Environmental Assessment Panel,

1 all of course in the context of the long-term geologic
2 storage of irradiated nuclear fuel.

3 Indeed, in my view, to proceed with this
4 project without a full panel review would even make a
5 mockery of the spirit of openness and independent review
6 advocated by the Nuclear Waste Management Organization in
7 its final report, a report, which I do not fully agree
8 with but I certainly agree with its call for openness and
9 independence.

10 Third point, although the radioactive waste
11 to be stored in the proposed facility are somewhat
12 superficially described as low- level and medium-level
13 radioactive waste, this terminology is completely
14 inadequate, in my opinion, to describe the extraordinarily
15 complex mix of radionuclides of all sorts; fission
16 products; activation products; corrosion products; beta-
17 and gammaemitters; alphaemitters; neutron emitters; with
18 half-lives ranging from years to millennia. Moreover, the
19 physical and chemical forms of the waste destined to be
20 stored in the proposed underground facility are very
21 diverse and complicated, comprising everything, as far as
22 I am aware, from radio-actively contaminated filters, mops
23 and rags to barrels of radioactive debris; to contaminated
24 and irradiated structural elements, such as highly
25 radioactive pressure tubes and the mammoth steam

1 generators with their thousands of internally corroded
2 radioactive pipes.

3 In many ways then problems of containment,
4 integrity, radioactive leakage, chemical interactions and
5 pathways to the environment are as complicated, and
6 perhaps even more complicated, than in the case of the
7 underground storage of irradiated nuclear fuel.

8 Point Number 4. The Canadian nuclear
9 establishment built -- well, Atomic Energy of Canada
10 Limited mainly -- built and operated an underground
11 research laboratory in Manitoba for many years in order to
12 learn about the geological characteristics of the plutonic
13 rock of the Canadian Shield. A total of \$700,000,000 was
14 spent on research over a period of 10 to 15 years, which
15 did not involve the actual emplacement of radioactive
16 waste in the repository.

17 To the best of my knowledge, no such
18 preliminary research has been carried out on the
19 particular type of rock formations being contemplated for
20 the underground repository at Bruce. In the absence of
21 such baseline data, it will be difficult if not impossible
22 to carry out a realistic environmental assessment of the
23 project. Moreover, one of the primary criteria of Atomic
24 Energy of Canada Limited was the absence of water, and yet
25 this repository is intended to be sited very close to the

1 largest body of fresh water -- I am referring here to the
2 Great Lakes as one body -- in North America.

3 I believe that an independent panel will be
4 in a much better position to assess, with full
5 credibility, the importance of such factors and to draw
6 the appropriate conclusions.

7 Point Number 5, and this is my last point,
8 and with all due respect to the Commissioners and to
9 yourself, Madam Chairperson, in my considered opinion, the
10 CNSC is not seen by the Canadian public as a champion of
11 the environment or of human health, but rather as a
12 necessary administrative adjunct of the nuclear industry.
13 For decades, the CNSC and its predecessor, The Atomic
14 Energy Control Board, have been seen as overly permissive
15 of industry transgressions, allowing warnings and
16 directives to go unheeded, sometimes for years, and
17 allowing safety related problems to multiply by the
18 hundreds and to go unresolved sometimes for a decade or
19 more, without seemingly ever refusing to grant a licence
20 renewal. So CNSC is not seen as possessing a strong and
21 vibrant capability, either in the health department or in
22 the environmental department, to really critique the
23 industry's often, what we feel is, superficial statements
24 about anticipated environmental impacts which are
25 invariably reassuring.

1 In short, while CNSC is very busy dealing
2 with multiple licensing matters and trying to keep up with
3 the complex challenges posed by the routine operations of
4 nuclear facilities, CNSC is not seen by the public in my
5 view as a body adequately resourced or staffed to be able
6 to do a top-notch, highly focussed environmental
7 assessment, which puts the public interests in the long,
8 distant future first and foremost. The fact that CNSC
9 reports to the same Minister who is responsible for
10 promoting the nuclear industry may have something to do
11 with this public perception, I don't know. Whether that
12 perception is justified or not, I believe it's important
13 to take it into account and to acknowledge that justice
14 must not only done, it must also appear to be done.

15 In my view, only a full and independent
16 panel review can provide the necessary sense of
17 objectivity. In fact, it may take a lot of pressure off
18 the CNSC and allow it to devote itself to its primary
19 responsibility as a licensing agency.

20 That concludes my comments, Madam
21 Chairperson and Members of the Commission.

22 **THE CHAIRPERSON:** Thank you, Dr. Edwards.
23 Any questions from my colleagues?

24 There are no questions for you, sir, but
25 thank you very much for taking the time and we have read

1 your written submission as well.

2 Thank you.

3 **DR. EDWARDS:** Thank you.

4

5 **06-H22.19**

6 **Oral presentation by**

7 **Nuclear Information and Resource Service,**

8 **other organizations and individuals**

9

10 **THE CHAIRPERSON:** We will now move to the
11 next submission, which is an oral presentation by the
12 Nuclear Information and Resource Service, other
13 organizations and individuals, as outlined in CMD document
14 06-H22.19.

15 Is Mr. Kevin Kamps with us today, sir?

16 **MR. KAMPS:** Yes, yes, I am.

17 **THE CHAIRPERSON:** Oh, hello, Mr. Kamps ---

18 **MR. KAMPS:** Hello.

19 **THE CHAIRPERSON:** --- and the floor is
20 yours, sir, for the Commission.

21 **MR. KAMPS:** Chairwoman Keen and CNSC
22 Commissioners.

23 I am thankful for this opportunity to
24 intervene in the proceedings regarding Ontario Power
25 Generation's proposal to permanently bury all of Ontario's

1 so-called low- and intermediate-level radioactive wastes
2 just one kilometre from the waters of Lake Huron.

3 My name is Kevin Kamps. I am nuclear waste
4 specialist at Nuclear Information and Resource Service in
5 Washington, D.C. We have members in Ontario and Quebec,
6 as well as in each U.S. State that borders the Great
7 Lakes. I am also on the Board of Directors of "Don't
8 Waste Michigan", a state-wide coalition. I represent the
9 Kalamazoo, Michigan Chapter, my hometown, located not far
10 from Lake Michigan.

11 I am testifying on behalf of 22 additional
12 groups in Michigan, as well as 10 groups in the remainder
13 of the Great Lake States, Indiana, Illinois, Wisconsin,
14 Minnesota, Ohio, Pennsylvania and New York. Just one of
15 those groups, The Michigan Environmental Council, is
16 itself a coalition of 72 grassroots groups in Michigan,
17 representing over 200,000 Michigan residents. Thus, our
18 coalition of nearly three dozen U.S. environmental
19 organizations represents citizens across Michigan as well
20 as throughout each Great Lake state in the basin.

21 I would like to mention that two United
22 States congressmen have also expressed concerns about the
23 proposed radioactive waste dump at Bruce. United States
24 Congressman Bart Stupak, who represents Michigan's First
25 Congressional District has written to you and the Canadian

1 Environment Minister with his concerns. His first
2 congressional district is Michigan's largest, with half
3 the State's landmass and nearly 2,600 kilometres of Great
4 Lakes shoreline. Stupak is recognized as a national
5 leader in protecting the Great Lakes. Stupak was the
6 author of legislation that banned underwater oil and gas
7 drilling in the Great Lakes. He also took a lead role in
8 opposing a Canadian company's plans to sell water from the
9 Great Lakes to China.

10 United States Representative, John Conyers,
11 also spoke out today expressing his concerns about this
12 proposed dump, upstream of his district in Detroit,
13 Michigan, the largest city in the state. He said:

14 "My constituents depend upon the Great
15 Lakes as a source for drinking water.
16 I am very concerned about this dump
17 leaking radioactive contamination into
18 Lake Huron and the potential
19 downstream impacts this leak could
20 have on our supply of clean drinking
21 water."

22 Representative Conyers of Michigan's 14th
23 District represents parts of Detroit and the downriver
24 area. Conyers is the ranking member of The House
25 Judiciary Committee. He is among the longest serving

1 members of the U.S. House of Representatives with over 40
2 years of service. Among his countless accomplishments was
3 the establishment of the federal Martin Luther King Jr.
4 holiday, he is regarded as a national civil rights
5 champion.

6 Radioactive contamination of Detroit's
7 drinking water supply is an environmental justice issue
8 for Detroit has a large African-American population, as
9 well as other people of colour and low-income communities.

10 Congressman Stupak has also requested that
11 the U.S. Environmental Protection Agency and the
12 U.S./Canadian International Joint Commission investigate
13 the trans-boundary impacts of the proposed dump at Bruce.

14 The U.S. Great Lakes Task Force has also
15 begun investigating this proposal. It is a bi-partisan
16 and bi-cameral organization that works to enhance the
17 economic and environmental health of the Great Lakes.

18 Founded in the 1980s the Great Lakes Task
19 Forces and the U.S. House of Representatives and the U.S.
20 Senate work together to advocate for policies and programs
21 that enhance this unique natural resource, the Great
22 Lakes.

23 The Great Lakes comprised 20 per cent of
24 the surface freshwater on the planet and are a source of
25 drinking water, fisheries, tourism, recreation, and water

1 for industry and agriculture for 35 million people in the
2 United States and Canada.

3 The House and Senate Great Lakes Task
4 Forces are concerned with preserving the environmental
5 quality of the Great Lakes Basin.

6 As expressed in our previous written
7 submissions at each stage of this proceeding, we wish to
8 say "no" to a low-level environmental assessment and OPG's
9 proposed radioactive waste dump, less than a kilometre
10 from the shore of Lake Huron.

11 It is unprecedented to permanently dump
12 radioactive wastes on the Great Lakes' shoreline. This
13 dump risks turning the Bruce region and points downstream
14 into a permanent nuclear sacrifice area that would affect
15 future generations in Canada and the United States for
16 hundreds of thousands of years.

17 For that reason we call on an independent
18 panel review to consider impacts for a million years into
19 the future. Certain radioactive poisons in the waste will
20 be hazardous for far longer than that.

21 The U.S. ETA has proposed a million year
22 regulatory enforcement period for radioactive waste burial
23 in the U.S. under the proposed Yucca Mountain, Nevada
24 high-level radioactive waste dump proposal.

25 Low and intermediate-level nuclear waste

1 contains many, even most of the same deadly ingredients as
2 high-level radioactive waste, just in lesser
3 concentrations, but the U.S. National Academy of Sciences
4 reaffirmed just last year that any dose of radiation, no
5 matter how small, carries with it a cumulative risk to
6 human health.

7 Because of the bad precedent that would be
8 set by dumping radioactive wastes on the Great Lake
9 shorelines, environmental groups from each U.S. state on
10 the Great Lakes, even those upstream, are today expressing
11 concern and opposition to this proposal.

12 Any proposal for these radioactive wastes
13 demands the highest level of scrutiny and independence,
14 not the low-level environmental assessment proposed by the
15 CNSC.

16 Of special concern is the risk of
17 radioactive waste contamination of Lake Huron and points
18 downstream. This risks the drinking water supply for many
19 Michigan towns and cities, such as Bay City, Port Huron,
20 Detroit, and Munro, to name but a few. They draw their
21 drinking water from Lake Huron and points downstream,
22 including the St. Clair River, Lake St. Clair, the Detroit
23 River and Lake Erie.

24 Drinking water impacts could even impact
25 downstream communities in Ohio, Pennsylvania, and New

1 York. For this reason, the scope of the area of concern
2 must be greatly expanded to include all these communities
3 downstream in the United States.

4 For these many reasons our coalition calls
5 on the CNSC for the proposed low-level environmental
6 assessment to be upgraded to an independent panel review,
7 the highest level environmental review under Canadian
8 federal law.

9 We are calling on the CNSC to delay this
10 assessment process, since it would, in effect, allow the
11 Canadian nuclear industry to pre-emptively decide Canada's
12 policy for the long-term management of all radioactive
13 wastes, other than a radiated nuclear fuel.

14 This contradicts the Canadian federal
15 government's 1996 radioactive waste policy framework which
16 stipulates that this responsibility lies with the Canadian
17 federal government.

18 We support Greenpeace Canada's complaint
19 filed with Canada's Environment Commissioner regarding
20 OPG's radioactive waste dump proposal which was submitted
21 in June of this year.

22 We are also concerned that a so-called low
23 and intermediate-level radioactive waste dump at Bruce
24 would pave the way for high-level radioactive wastes from
25 all of Ontario and even all of Canada to also be

1 transported to, stored at, and even dumped at the Bruce
2 site. This would represent a Yucca Mountain dump in the
3 heart of the Great Lakes.

4 We also join with the Canadian
5 Environmental Coalition in calling on the CNSC to include
6 decommissioning wastes in planning for the Bruce facility;
7 to expand the study area to include downstream communities
8 on the Great Lakes in Canada and the U.S.; to extend the
9 assessment timeframe to one million years because of the
10 long lifetime of radioactive elements in the waste; to
11 include a worst-case accident scenario, involving leaking
12 of radioisotopes from this underground dump and even the
13 surface operations associated with it.

14 To examine the safety of radioactive waste
15 transport from the Pickering and Darlington sites to the
16 Bruce site and to consider alternatives to radioactive
17 waste incineration at Bruce which very likely is having
18 downwind impacts on public health in Michigan and other
19 U.S. states.

20 Here are some questions and issues we would
21 like addressed in the independent panel review. What will
22 be the legally acceptable leak rate for this dump?

23 What will be the legally acceptable dose
24 rate to persons downwind and downstream, both in the U.S.
25 and Canada? How will that be verified and by whom?

1 What human health impacts will that have on
2 downwind and downstream communities, including in the
3 U.S.?

4 Would it meet the U.S. Nuclear Regulatory
5 Commission's burial regulations for radioactive waste,
6 found in Chapter 10 of the U.S. Code of Federal
7 Regulations at part 61?

8 What are the Canadian regulations and how
9 do they compare? I ask this because the Bruce dump could
10 very well impact communities in the United States,
11 especially over time.

12 Not a single new low-level radioactive
13 waste dump has been licensed in the United States since
14 the *Low-Level Radioactive Waste Policy Act* of 1980 was
15 passed. This is because every targeted site has not been
16 protective enough to isolate the waste for as long as it
17 is hazardous.

18 Will the proposed Bruce dump be able to
19 isolate the radioactivity from the biosphere for as long
20 as the waste remains hazardous?

21 The State of Michigan originally searched
22 but then stopped looking for a nuclear dump site in its
23 own state because of the threat to the water from the
24 radioactivity.

25 In the 1980s and 1990s Don't Waste

1 Michigan, one of the signatories to our statement today,
2 played an instrumental role in stopping this scheme by
3 eight U.S. states to dump their radioactive wastes in
4 Michigan.

5 Our coalition of groups will not sit idly
6 by as the Canadian nuclear establishment attempts to
7 create a nuclear sacrifice zone in the heart of the Great
8 Lakes, upstream from Michigan communities.

9 Does Canada think that they can make a safe
10 enough dump for wastes, hazardous longer than any
11 reasonable institutional control period?

12 The International Joint Commission has a
13 goal of virtual elimination of toxic pollutants, including
14 radioactivity into the Great Lakes. How does this
15 proposed dump comport with that IJC goal?

16 Every low-level radioactive waste dump in
17 the United States has leaked into groundwater. Other low-
18 level radioactive waste dumps at Bruce have also already
19 leaked into groundwater. Groundwater near Bruce, of
20 course, flows into Lake Huron and points downstream in the
21 Great Lakes.

22 Can OPG, CNSC, and the City of Kincardine
23 guarantee that this Bruce underground dump will not leak
24 into Lake Huron over time?

25 In summary, it is neither moral nor legal

1 for a single company, along with local governments, in a
2 single small area to endanger the entire Great Lakes
3 Basin. That is why we are intervening in this proceeding.

4 Thank you for considering our intervention
5 and including all of the concerns raised in our
6 submissions and testimony in your independent panel review
7 of this dump proposal.

8 A revised written submission with a
9 complete updated listing of the 30 groups in the U.S.
10 concerned about and opposed to this dump will be sent to
11 CNSC. The full contact information for each of these
12 groups will be included.

13 In the interests of openness, transparency,
14 and public participation, we request that all
15 documentation associated with these proceedings be sent to
16 each of our 30 organizations on an ongoing basis.

17 We will also submit a written transcript of
18 this oral testimony to be included in the official record
19 of these proceedings.

20 Thank you very much.

21 **THE CHAIRPERSON:** Thank you.

22 Well, I did let you go on longer than the
23 10 minutes, but just two things I wanted to comment on.

24 Number one, it is not possible in the
25 proceedings, rules or proceedings of the CNSC to offer

1 documents later. So if you sent a document to us it would
2 not be included in the proceedings because it has to be
3 sent in advance and in record.

4 So thank you for the offer but that would
5 not be part of it.

6 In terms of putting your document on the
7 official proceedings, all our proceedings in Canada are
8 transcribed; so every word that you said is now on the
9 transcript, as well as everybody else who has given
10 information today is available in the transcript, and so
11 it's available to all people who wish to read the
12 proceedings. So that won't be necessary at all. You'll
13 be quoted verbatim.

14 **MR. KAMPS:** How can I communicate the names
15 of the organizations that have joined this coalition?

16 **THE CHAIRPERSON:** There is an information
17 -- at the CNSC website; there is a note there as to how to
18 send information directly to the CNSC. You've
19 participated in these hearings before, so it has obviously
20 worked.

21 I'm just going to check with my Commission
22 Members if there's any questions. Dr. Barnes.

23 **MEMBER BARNES:** Well, because Mr. Kamps is
24 on the phone and may only have joined us fairly recently,
25 I would make the comment that many of the points that he's

1 making have been discussed through the day and raised by
2 other intervenors or earlier in the day.

3 I would ask staff just to clarify one
4 issue, and that is the extent to which the study area
5 might be enlarged to include areas to the south, both
6 obviously towards Windsor on the Canadian side and
7 potentially on the Michigan side. What is your current
8 thinking on that?

9 **MR. RINKER:** Mike Rinker, for the record.

10 The study area itself and the timeframes
11 are flexible to ensure that the geographic extent of all
12 effects and the timeframes in which those effects would
13 occur is captured within the environmental assessment.

14 So through the assessment, if for example
15 downstream communities were impacted, they certainly would
16 be included as part of the assessment. There is no
17 exclusion of any communities.

18 **THE CHAIRPERSON:** Just to extend Dr.
19 Barnes' comment, as well as you being included in the
20 transcript, you will have the opportunity to read the
21 transcript and see many of the answers to many of the
22 questions that you have raised today were put on the
23 record today. So I will leave it at that.

24 So thank you very much for joining us by
25 phone today, sir.

1 **MR. KAMPS:** Thanks for making it possible.

2 **THE CHAIRPERSON:** Thank you.

3 We would like to then move to the next
4 presentation which is the oral presentation by the Society
5 of Energy Professionals. This is CMD 06-H22.55 and Dr.
6 Canosa is with us today to present the submission.

7 Welcome, sir. The floor is yours.

8

9 **06-H22.55**

10 **Oral Presentation by**

11 **The Society of Energy Professionals**

12

13 **DR. CANOSA:** We are pleased to be here
14 today representing 6,000 strong members of the Society of
15 Energy Professionals, Local 160 of the International
16 Federation of Professional and Technical Engineers to give
17 our support to the next phase of the Deep Geological
18 Repository for low-level waste and intermediate-level
19 waste.

20 The Society has a long history, over 80
21 years, representing the engineers and professionals that
22 built our electricity system. They are well known to all
23 of you for their great works in the power industry and in
24 keeping the lights on. When you flick the light switch,
25 the electricity that lights our homes is generated in a

1 number of ways. One of them is nuclear power.

2 Ontario Power Generation and Bruce Power
3 run a number of nuclear reactors to produce this energy
4 that lights our homes and powers our industry.

5 In producing this energy, some wastes are
6 generated which contain radioactivity. In the particular
7 case at hand we are dealing with here today, we are
8 referring to low-level waste that is mainly rags, paper
9 towels, discarded components, et cetera. They have some
10 radioactivity for the maintenance of the systems that run
11 our nuclear power stations.

12 There are also intermediate-level waste
13 from ion exchange resins primarily used to maintain, clean
14 the water pools where they used fuel is stored and the
15 heat transport system. These wastes need to have a final
16 resting place to provide assurance that safety will be
17 maintained for decades to come.

18 Against this background, the Society, in
19 supporting this project to its next phase of a
20 comprehensive environmental assessment, has taken into
21 consideration 1) the excellence of the people involved in
22 the project; 2) the community spirit of the proponent and;
23 3) the technical viability of the proposal.

24 Excellence is reflected in the safety
25 record of the proponent, Ontario Power Generation and in

1 its technical capability, the level of support of the
2 community and the geological setting chosen.

3 A sample of the enviable record of safety
4 and protection of the environment in the Canadian nuclear
5 sector is right here at the Bruce site in the western
6 waste management facility. Waste from the Ontario nuclear
7 reactors have been stored here since the beginning of
8 nuclear power in Ontario in the early '70s.

9 Since then storage and transportation of
10 these wastes have been done routinely in a manner that
11 exceeds federal and provincial regulations.

12 It must be emphasized that during this
13 time, over 30 years, there has not been any incidents of
14 significance.

15 The safety record here at Kincardine speaks
16 well of the people we represent and it is clear evidence
17 of responsible stewardship that can be trusted.

18 Further, our members are committed to their
19 communities through many social and service organizations.
20 This loyalty and citizenship to the community is further
21 evidence that we should lend our support to them in the
22 task of building a safe repository which is to benefit all
23 Ontarians.

24 The third consideration has to do with the
25 technical content of the proposal. It is noted that the

1 repository will be built in a geological setting known to
2 be tectonically stable and has been in place for hundreds
3 of millions of years.

4 Further, primary information suggests that
5 the rock mass itself is highly impermeable and, therefore,
6 we these considerations in mind, we are favourable to a
7 successful Deep Geological Repository that is being
8 proposed.

9 Hence, there is a great need to proceed to
10 characterize the site and the Society awaits with
11 heightened expectations the results. On this basis, the
12 Society also supports proceeding with a comprehensive
13 environmental assessment.

14 In moving forward with the proposal, the
15 Society is conscious of the great resource value of the
16 Great Lakes to the communities that live on their shores
17 and beyond. Indeed, the Great Lakes are the largest body
18 of drinking water in the world. They sustain a vast and
19 diverse ecosystem that brings wealth to our communities in
20 many ways: tourism; hunting; fishing; agriculture and the
21 transportation of goods.

22 In view of these great responsibilities to
23 the Great Lakes communities and indeed to the global
24 village, the Society recommends that a thorough,
25 comprehensive environmental assessment be approved. We

1 envisage a process which allows for community input and
2 transparency by allowing easy public access to data and
3 documents.

4 In considering what other jurisdictions
5 have done in this area, the Society realizes that there
6 are variations on the same theme and, therefore, it
7 encourages the experience from other jurisdictions to
8 consider and integrate it in the development of the Deep
9 Geological Repository. We view this as a way to
10 excellence in the design.

11 In bounding the thematic variation, the
12 Society submits that the environmental assessment should
13 pay close attention to the following generic technical
14 aspects which are common to proposals in other
15 jurisdictions:

16 First, a detailed isotopic composition of
17 the wastes; in particular, contamination by long-lived
18 fission products and actinides;

19 Second, impact of the damage excavation
20 zone on rock permeability;

21 Third, groundwater drawdown and its impact
22 on groundwater levels;

23 Fourth, condition of the granitic basement
24 interface;

25 Fifth, chemical evolution of the wastes,

1 vault and gas generation;

2 Sixth, microbial growth and its impact on
3 waste behaviour;

4 Seventh, temperature evolution of the Deep
5 Geological Repository; and

6 Eighth, the risk of a Deep Geological
7 Repository pressurization and its impact on groundwater
8 flow and rock stability.

9 We are confident that our people can
10 provide us with a technical purification of the repository
11 in due time. We also trust that the proposal will become
12 a viable solution to move forward, to responsibly manage
13 the waste. It is in this spirit that we fully support
14 moving forward to the stage of characterization of the
15 site and developing a comprehensive environmental
16 assessment for the proposed Deep Geological Repository at
17 the Bruce site.

18 Thank you for your attention.

19 **THE CHAIRPERSON:** Thank you very much, sir,
20 it's always a pleasure to hear from the energy
21 professionals.

22 **DR. CANOSA:** Thank you.

23 **THE CHAIRPERSON:** Are there any questions
24 from the Commission member?

25 Yes, Dr. Barnes.

1 **MEMBER BARNES:** Yes, I appreciated the
2 detail that you put in your document, particularly the
3 last eight numbered points, some of which had been I
4 think, covered today, others, I think less so or perhaps
5 implied. And I think to cut to the chase, given the time,
6 I would just like to ask OPG and staff if they weren't
7 happy with OPG's response, whether they're in agreement
8 that the items listed one to eight here, should be
9 considered in the environmental assessment?

10 **MR. KING:** Frank King for the record.

11 I'm just busily trying to -- I copied the
12 eight numbers, I didn't quite get them all. I have
13 certainly looked at them before but I just wanted to
14 refresh my memory on them before I spoke in summary. So
15 if somebody could ---

16 Well certainly item number one; that will
17 certainly be included.

18 Item number two on the damaged excavation
19 disturbed zone; considerations of that will be included in
20 our safety assessment and hence our EA activities.

21 Number three on ground water drawdown; yes,
22 and Mark Jensen can certainly comment on that one after
23 I'm finished here.

24 On point number four, I'll ask Mark to
25 comment on that one as well, but we will be looking at

1 that interface.

2 And the other, number five on chemical
3 evolution of the vault, what's in the vault and the waste,
4 both microbial or other forms of corrosion that might lead
5 to gas generation, that's an important part of our
6 assessment and will be included. So I guess I've covered
7 number six as well.

8 Temperature evolution, I spoke to that
9 earlier, Dr. Barnes, in response to one of your questions.
10 We will look at heat generation. We don't think it's an
11 important factor right now but we will look at that in
12 detail.

13 And yes on point number eight, the risk of
14 pressurization; certainly that's an important part of this
15 assessment because there are gases which are created by
16 corrosion and microbial activity.

17 Mark, did you want to comment on those
18 other two I missed?

19 **MR. JENSEN:** Mark Jensen for the record.

20 On item three the extent of groundwater
21 draw down while the facility is excavated; at that point
22 in the program the three phases of the site
23 characterization program would have been completed and
24 monitoring devices would be in place to measure the dry
25 down and to compare that dry down against numerical models

1 that were done to predict the effects.

2 In terms of the granitic basement that's at
3 a depth of around 830 metres beneath the Bruce site. At
4 the time of the safety assessments that will be performed
5 three-dimensional models will be used and they will
6 incorporate all the stratigraphy and the permeability's,
7 hydraulic gradiance and they will be able to determine
8 pathways in the subsurface, through the Precambrian
9 basement for radionuclide transport.

10 **MEMBER BARNES:** Let me just make two
11 comments and then the staff may comment.

12 Yes, just on that last one, it's not just a
13 Precambrian basement; it's a potential Cambrian sands
14 which are typically a pathway. I'm not sure I would
15 necessarily have agreed but, Mr. King, earlier on talked
16 about radionuclides going up and down and so if they're
17 going down it's a potential to get into that Cambrian
18 sandstone and to be much more regionally distributed.

19 The second, in item six, microbial growth;
20 I didn't pursue this earlier because I felt I was going on
21 too long but one of the -- the base of the shale unit, the
22 so-called shale blanket is the Collingwood or Whitby,
23 which is a black organic rich shale, you can literally
24 burn it in certain places. Again, I'm not quite sure what
25 its characteristics are when you get underneath the Bruce

1 site. But historically in other parts of southern Ontario
2 it has problems when exposed in excavation of developing
3 microbial growth and having expansion, sulphur-rich
4 bacteria and so on.

5 Bob Quigley, at the University of Western
6 Ontario wrote many papers, I think, on this topic. It was
7 a plague in many buildings in Ottawa, as I recall, and
8 things of this type. So should the repository get high in
9 the Lindsay and come up against that unit then there's
10 some potential there, I think.

11 Would the staff have any comment on these
12 eight?

13 **MR. HOWDEN:** Barclay Howden speaking. I'm
14 going to ask Dr. Ben Belfadhel to comment whether we have
15 any differences of opinion from what we've heard.

16 **DR. BELFADHEL:** I'm Ben Belfadhel, CNSC.
17 We agree with what we heard.

18 **THE CHAIRPERSON:** Any further questions?

19 Thank you very much, you've obviously
20 sparked a lot of interest today.

21
22 **06-H22.27**

23 **Oral presentation by the**
24 **Bruce Power Retirees Association**

25

1 We'll now move to the next submission which
2 is the oral presentation by Bruce Hydro Retirees
3 Association. As outlined is CMD 06-H22.27 and I believe
4 Mr. Frank Baker is with us today.

5 Sir, the floor is yours. Thank you for
6 coming.

7 **MR. BAKER:** Thank you for allowing us to
8 have this input.

9 My name is Frank Baker and I've been
10 retired from Ontario Hydro for 14 years. I'm the founder
11 and the President of the Bruce Hydro Retirees Association;
12 we have existed since 1993 and I feel confident that I
13 share the feelings of the greater portion of the
14 membership of approximately 1,000 retirees.

15 On behalf of the Bruce Hydro Retirees
16 Association we offer our positive support to the Deep
17 Geological Repository for low- and medium-level
18 radioactive waste.

19 Many of us worked for Ontario Hydro during
20 the early days of the construction of Douglas Point
21 Nuclear Generating Station. We knew from the start that
22 the work being done was to a high standard. From the days
23 of blasting the rock to ensure every footing of the
24 buildings were down to bedrock, we knew everything had to
25 be done to nuclear grade.

1 Every concrete wall in the reactor building
2 had be bag rubbed to ensure a smooth surface. We came to
3 realize later that a smooth surface wall is much easier to
4 decontaminate. That same strive for perfection continues
5 in the nuclear program today.

6 After reviewing the project description and
7 armed with the knowledge of safety practices of past
8 projects, we feel confident this project is a safe and
9 economic way of dealing with low- and intermediate-level
10 rad waste.

11 One of the other components leading to a
12 feeling of confidence is knowing the whole project will be
13 operated by Ontario Power Generations for whom I have the
14 deepest respect.

15 My last 20 years with Ontario Hydro were
16 enjoyed as the management supervisor at the radioactive
17 waste storage site. During that time, myself and the
18 other employees became aware of the importance of ensuring
19 the rules set down by the then, Atomic Energy Control
20 Board, were followed to the letter. Surprise visits
21 sometimes caused some excitement but because we knew and
22 worked to the rules, the visits were always positive.

23 I'm also confident that since the CNSC will
24 hold the license the project will be operated to the
25 highest standards.

1 Thank you.

2 **THE CHAIRPERSON:** Thank you very much.

3 It's very interesting to hear about a
4 different perspective on the projects as well.

5 Any questions from members?

6 Yes, Dr. Barnes.

7 **MEMBER BARNES:** I wonder if I could just
8 pick up on some aspects that you're pointing out here and
9 the nature of blasting and just ask a question of OPG,
10 since this is -- the repository is going to cover a very
11 large area of 30 hectares and so on.

12 And I presume, as I read it, you're going
13 to use predominantly a method of drill and blast to take
14 out all the waste rock.

15 Do you anticipate any fracturing,
16 significant fracturing that you wouldn't seal up and any
17 grouting away of all the surrounding rocks, the pillars,
18 the walls, ceilings of the cavities that are being
19 developed?

20 **MR. KING:** Frank King for the record.

21 Perhaps Mark Jensen or Dr. Martin might
22 want to comment after my remarks.

23 The blasting -- and we've all, as you say,
24 it's drill and blast for the shaft and for the underground
25 openings. There will be no tunnel-boring machines in our

1 current reference. The extent of the damage zone, where
2 you can induce fractures into the rock will be measured
3 and determined as we do the excavation. It becomes
4 important later in the sealing of the repository that --
5 in the shaft sealing of the repository, that there are no
6 bypasses around the shaft seal, so that would have to be
7 looked at to make sure that any damage there was either
8 excavated before we put in the shaft seal or somehow
9 grouted.

10 Perhaps I will pass either to Mark or to
11 Dr. Martin to see if they have any other comments.

12 **DR. MARTIN:** Derek Martin, for the record.

13 There's been an extensive program
14 internationally and both carried out also by AECL at the
15 Underground Research Lab on careful blasting techniques.
16 Those are now well-established practices. So the
17 techniques, we believe are in place to minimize the
18 damage. There will always be some damage but the amount
19 now is -- we typically see less than a few centimetres of
20 blast-induced damage.

21 **MEMBER BARNES:** Which underground facility
22 is this where the testing is?

23 **DR. MARTIN:** Well, AECL did its own
24 testing. That was first sponsored by Andra, then a whole
25 240 level was done under careful blasting control. The

1 SKB in Sweden has carried out extensive blasting programs
2 to minimize the amount of damage.

3 **MEMBER BARNES:** Oh, these are on granitic
4 basements, the solitudes, right?

5 **DR. MARTIN:** They are. Nagra in
6 Switzerland has looked at it, most of their excavations
7 are carried out with road headers and of course, that's
8 always an option. If the rock -- once we get the test
9 results and the site investigation approves that.

10 **MEMBER BARNES:** Any comment from the staff?

11 **MR. HOWDEN:** Barclay Howden speaking.

12 I'd like Dr. Son Nguyen to respond to that.

13 **DR. SON NGUYEN:** I'm Son Nguyen, for the
14 record.

15 I agree with Dr. Martin, about the current
16 knowledge of the blast-induced effect in granitic rock and
17 the experiments they were referring to are actually in
18 granitic rock. Experimental sites -- a beautiful example
19 in France are in the type of clay material which is
20 similar to the OPG proposed site. And the situation is
21 very similar. The extent of the damage zone is restricted
22 a zone of about one metre around the opening.

23 **MEMBER BARNES:** So in the case of this
24 myriad of emplacement chambers and I'll pass around those
25 as well as the shafts -- maybe it's a question to OPG;

1 would you be lining the walls and roof? I mentioned this
2 before, but I didn't get an answer -- I didn't pose the
3 question, but I'll pose it now. In this document you
4 refer to, concreting the floors of these emplacement
5 rooms, but I think there was no mention of what you would
6 do to the walls or the ceiling of the underground
7 repository.

8 **MR. KING:** Frank King, for the record.

9 The shafts will be fully lined, concrete
10 lined. The degree of support in the room excavations,
11 rock bolting, shotcreting will be determined ultimately
12 when we get the characteristics of the formations down
13 there. In the reference design right now, we have some
14 degree of rock bolting, but as I said, we will make a
15 final decision on that from a design point of view a
16 little bit later.

17 With respect to sealing the shaft, the
18 reference is to remove the concrete shaft liner over the
19 extent which we would emplace the - over the hundreds of
20 metres over which we would emplace the seal.

21 **MEMBER BARNES:** Which would in fact prevent
22 any removal of material afterwards, if you wished to?

23 **MR. KING:** Frank King again.

24 I didn't quite -- the removal of material -
25 - of the waste?

1 **MEMBER BARNES:** Should that become an issue
2 after sealing.

3 **MR. KING:** Well, as Mr. Nash said earlier,
4 from a retrievability point of view, it becomes -- it's
5 not a question of can you, you can. It's just a matter of
6 difficulty. If you talk prior to doing the final shaft
7 sealing, we would go through an environmental assessment
8 on the decommissioning, the license for decommissioning
9 and at that point of course, the whole process would have
10 to be open on what we're going to do and there would have
11 to be acceptability on that plan, at that time. And any
12 need for post-closure retrievability would be addressed at
13 that time.

14 **THE CHAIRPERSON:** Thank you very much. You
15 provoked a good discussion about some important aspects.

16 We're going to go now, by teleconference to
17 Mr. Peter Tabuns, who is an MPP. This CMD 06-H22.12.

18 Thank you very much for your patience, sir
19 and the floor is yours.

20 Okay, what we're going to do then is try to
21 find -- try to reconnect to the MPP, then we're going to
22 go to Mr. Larry Kraemer, who is also been before the
23 Commission before. And we're going to go to -- sorry.
24 Sorry, Mr. Kraemer, we're going to go to Mr. Tabuns.

25

1 **06-H22.12**
2 **Oral Presentation**
3 **By Teleconference by**
4 **Mr. Peter Tabuns**

5
6 **MR. TABUNS:** Hello there.

7 **THE CHAIRPERSON:** Hello sir. Sorry for the
8 delay. The Commission is awaiting your testimony.

9 **MR. TABUNS:** Okay, thank you for that.
10 Thanks for the opportunity. I needed to say, before I
11 started, that your schedule and my schedule are converging
12 and I have to leave very shortly for a meeting. So I will
13 be speaking much less than the time that you've allotted.

14 As you've probably said, my name is Peter
15 Tabuns. I'm the Member of Provincial Parliament for
16 Toronto-Danforth riding and I'm the provincial NDP's
17 Environment critic. There are just a few things I wanted
18 to say and they are focussed around key points.

19 First, the need for the Canadian Nuclear
20 Safety Association to delay moving forward with this
21 proposal until the much needed federal policy around the
22 management of non-fuel, radioactive waste is developed.

23 Secondly, the need to subject this proposal
24 to a far greater level of scrutiny, to address the
25 substantial potential implications it has on public health

1 and source waters. Our comprehensive review that's
2 proposed is simply inadequate to investigate and evaluate
3 the multiple concerns and potential negative implications
4 associated with such an unprecedented proposal to store
5 radioactive waste deep underground, in such close
6 proximity to the Great Lakes, the source of drinking water
7 for millions of Ontarians and Americans.

8 Now, first of all, in terms of the
9 postponement; before this environmental assessment
10 proceeds, the Canadian Nuclear Safety Commission and the
11 federal government need to acknowledge that to date the
12 environmental assessment process is taking place in a
13 policy vacuum. It needs to move to devise a policy before
14 proceeding further.

15 The federal government has not established
16 a transparent and socially acceptable framework for
17 managing long-lived, non-fuel, radioactive waste in
18 Canada, despite a legal obligation to do so under the 1996
19 Radioactive Waste Policy framework. Until this obligation
20 has been met, the environmental assessment should be put
21 on hold.

22 However, if the federal government
23 continues to ignore its legal responsibility in this
24 matter and the CNSC chooses to proceed with the
25 environmental assessment process, in the absence of such a

1 directive, then the need for a higher and more independent
2 level of review of this proposal becomes even greater.

3 The comprehensive study environmental
4 assessment proposed by the CNSC under the *Canadian and*
5 *Environmental Assessment Act* is, in my opinion, an
6 inadequate tool to assess this proposal for the deep
7 underground dump for low and intermediate-level
8 radioactive waste. I know that Howard Hampton, the leader
9 of the Ontario NDP has sent a letter to the attention of
10 the Minister of the Environment and the Canadian Nuclear
11 Safety Commission urging the bump-up of the comprehensive
12 study to an independent panel review, so a more thorough
13 and objective review of such an unprecedented proposal can
14 occur.

15 Now, I have raised this issue in the
16 legislature with the Minister of the Environment and asked
17 her to proceed with an independent environmental
18 assessment under the Ontario *Environmental Assessment Act*.

19 To date, she has not accepted that call,
20 but I urge all of you who are involved in this process
21 that you support the call for a bump up of this assessment
22 to an independent review panel.

23 And I apologize to all of you, but your
24 schedule moved late and my schedule has come up, and I
25 have to leave for a community meeting.

1 clarify a couple of points that I didn't make clear or I
2 guess not adequately clear in my submission.

3 One, I'm not currently the mayor of the
4 municipality of Kincardine. I was mayor from 2000 to
5 2003. However, at the moment, I am currently official
6 candidate for mayor again. So, if you hear my oral
7 submission, just bear that in mind. And I will do my best
8 to squeeze three years of work into 10 minutes.

9 It has been several years since I've
10 appeared before you, and I would just like to thank you
11 for holding this important meeting once again in
12 Kincardine.

13 As the Mayor of Kincardine, I was the one
14 who signed the Memorandum of Understanding in your
15 presence, in Ottawa, April 16, 2002. The Memorandum of
16 Understanding set out several tasks to be accomplished to
17 bring us to the point that we have now arrived. I, more
18 than anyone else led us to this point and I've never had a
19 chance to inform you of the results of some of the
20 findings that were laid out in the Memorandum of
21 Understanding.

22 As Mayor, I organized and recommended the
23 choice of sites that were visited based on the Memorandum.
24 The criteria that was used was that they must represent
25 the best technology, most modern and safest facilities in

1 the world.

2 It was agreed by Ontario Power Generation
3 and the Kincardine Council that nothing less than the best
4 was of any interest to us. At every site that we visited
5 as part of the study process, it was jointly agreed that
6 we would talk to community leaders, mayors and councillors
7 at each stop. The purpose was to understand the community
8 impact and acceptance as well as to understand the
9 technical side, which were the operators were the most
10 qualified to give.

11 The visits took us to Switzerland, France
12 and Sweden. In each visit, we were given very complete
13 access to the finest repositories in Europe and then in
14 conversation with each region's community leaders, we had
15 very frank discussions regarding community impacts and the
16 pass to acceptance. Each visit with community leaders was
17 ended with the question; "Based on your experience, would
18 you recommend that we continue with our plans to host a
19 permanent facility in Kincardine?"

20 Although each community's experience was
21 different, each response was an unequivocal "yes."

22 Our next group of visits was to the U.S.
23 Again as Mayor, site selection recommendation was up to
24 me. Although these visits were led by our Deputy Mayor at
25 the time, Sharon Mooser, the question as the same and the

1 results were the same; the answer to the question, an
2 unequivocal "yes."

3 Also as Mayor, I was invited to participate
4 in a series of international conferences studying possible
5 solutions and nuclear waste issues. This resulted in an
6 opportunity to visit three other pertinent sites. These
7 visits were arranged by the Nuclear Energy Agency, which
8 is a division of the organization of economic cooperation
9 development or development cooperation.

10 These visits, OPG was not involved in a
11 significant way in these organizations. The first visit
12 was to Port Hope, Ontario, where I had the opportunity to
13 understand their historical sites and the processes
14 leading to their home-grown solution. The conference then
15 moved to Ottawa where I had a chance to have very detailed
16 discussions with international experts about what was
17 learned.

18 My next visit was to Spain where I had an
19 opportunity to visit the world's first decommissioning,
20 one of the world's first decommissioning and dismantling
21 projects of a nuclear power station, Vandellós, on the
22 outskirts of Tarragona, Spain. Then the trip concluded
23 with a visit to El Cabril, near Seville. El Cabril is
24 Spain's low-level repository.

25 Now, for some observations. First, the

1 residents and leaders that we met everywhere that these
2 facilities were cited reported excellent safety records.
3 Next, everywhere that I have visited, the majority of the
4 local people supported their facility even though some did
5 not initially welcome its establishment.

6 With tight controls, it is possible to
7 safely decommission and dismantle nuclear generating
8 stations so long as suitable safe repositories exist. And
9 although the stories in the past of the communities were
10 different, the recommendation was the same; go forward
11 with the project.

12 Everywhere in the world there are people
13 who will reject any lessons learned in order to oppose
14 finding a solution to this problem.

15 And now, to Kincardine; and I would just
16 like to make sure they understand that I don't pretend to
17 be a geologist. However, I would like to put in layman's
18 terms what I have understood for many of the detailed
19 discussions that I have had with them. And I am sure that
20 you will have people question the suitability of limestone
21 as a rock for a repository and to my understanding this is
22 based on the fact that most of the limestone in North
23 America is fractured due to geological activity. And this
24 is not the case here.

25 At depth, the limestone under Kincardine is

1 unfractured due to very long term geological stability of
2 the region; in the neighbourhood of five hundred million
3 years.

4 Also, I have heard the statement that
5 limestone has no absorbed properties. Under Kincardine,
6 however, it is my understanding that the layer of
7 limestone is covered by approximately 600 feet of
8 unfractured shale and this does have absorbed properties.

9 Next, there is the issue of water. At this
10 depth any moisture that has been down there has been down
11 there for somewhere around five hundred million years. It
12 has been there since before dinosaurs walked the earth.
13 Also, there is almost no moisture. In fact, it is much
14 drier than the Sahara desert due to the incredible
15 pressures of weight of stone above. Any moisture was
16 squeezed out hundreds of millions of years ago.

17 Lastly, low-level nuclear waste returns
18 basically the same level as background in about 500 years.
19 And it has been geologically, to my understanding, it has
20 been geologically stable approximately a million times
21 that long.

22 Finally, I know that if Larry Kraemer
23 leaves a long-term legacy in his life; this repository
24 will be it. As a leader and as a person I have
25 endeavoured to see that this project is conformed to the

1 highest standards possible in every category that I have
2 been party to.

3 I have insisted that the same be true of
4 OPG and I believe that it has. I have uncovered in my
5 research no other communities in the world that have gone
6 to such lengths and consulted with the best in the world
7 so widely. I am very proud of the work that I have been
8 part of, as well as the community that I have led.

9 I would just like to add to this that I am
10 also proud of the people at OPG. In my experience, they
11 have done their job above the call of duty, knowing that
12 this will also be their legacy.

13 Myself and those who have worked on this
14 project have done our best to see to it that this project
15 can stand up to the toughest scrutiny possible. However,
16 there will be those who will fight for rules so tough that
17 it is impossible to achieve them. This is in no one's
18 best interest and is a tactic to kill the project. Please
19 don't let that happen.

20 I would like to close with the prediction
21 that this will be the best and safest nuclear waste
22 repository ever built in the world. That in the future,
23 when it is complete, people from around the world will
24 come to Kincardine to study our repository and study our
25 solution to the daunting task that we have faced.

1 And either as Mayor or in private life,
2 Kincardine's Deep Geological Repository has my full
3 support. Thank you.

4 **THE CHAIRPERSON:** Thank you very much. Are
5 there any questions from Commission Members?

6 That finishes the oral presentations of the
7 hearing today, and I suggest we take a 10-minute break and
8 then come back and we will finish with the written
9 submissions. Thank you.

10 --- Upon recessing at 7:13 p.m.

11 --- Upon resuming at 7:23 p.m.

12
13 **06-H22.10**

14 **Written Submission from**

15 **Northwatch**

16
17 **THE CHAIRPERSON:** Well, thank you, ladies
18 and gentlemen, we are now going to move to the next
19 submission, which is a written submission. It was
20 originally submitted as an oral presentation, but it's a
21 written submission from Northwatch CMD 06-H22.10.

22 Are there any questions or comments from
23 Commission Members with regards to this submission?

24 Thank you very much.

25

1 **06-H22.16**
2 **Written Submission from**
3 **Sierra Club of Canada**

4

5 **THE CHAIRPERSON:** We will now then move to
6 the next submission, which is a written submission by
7 Sierra Club of Canada, CMD 06-H22.16.

8 Are there any questions or comments with
9 regards to this submission? No?

10 Thank you.

11

12 **06-H22.21**
13 **Written Submission from the**
14 **Corporation of the Municipality of Arran-Elderslie**

15

16 **THE CHAIRPERSON:** Then we will move to the
17 next submission, which is the written submission by the
18 Corporation of the Municipality of Arran-Elderslie, CMD
19 06-H22.21.

20 Are there any questions or comments with
21 regards to this written submission?

22 Thank you.

23

24 **06-H22.22**
25 **Written Submission from**

1 **Mariah Branch**

2

3

4

5

THE CHAIRPERSON: The next one is the
written submission by Ms. Mariah Branch as outlined in CMD
document 06-H22.22.

6

7

 Are there any questions or comments with
regards to this written submission?

8

 Thank you.

9

10 **06-H22.23**

11 **Written Submission from**

12 **George Macdonald**

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15

16

THE CHAIRPERSON: Then I'll turn to the
next one, which is a written submission by Mr. George
Macdonald outlined in CMD document 06-H22.23.

17

18

19

 Are there any questions or comments with
regards to this submission?

20

 Thank you.

21

22 **06-H22.24**

23 **Written Submission from**

24 **Dr. Hazel Lynn**

25

1 **THE CHAIRPERSON:** Then we'll turn to the
2 next, which is a written submission by Dr. Hazel Lynn, CMD
3 06-H22.24.

4 Are there any questions or comments with
5 regards to this issue?

6 I would just like to note that I think it's
7 very interesting to get comments from the Medical Officer
8 of Health in the community, and I would like it to be on
9 record that I thank Dr. Lynn for her comments.

10

11 **06-H22.25**

12 **Written Submission from**

13 **Murray E. Miller**

14

15 **THE CHAIRPERSON:** The next one is a written
16 submission by Mr. Murray E. Miller, CMD 06-H22.25.

17 Are there any questions or comments with
18 regards to this submission?

19 Thank you.

20 **06-H22.26**

21 **Written Submission from**

22 **Saugeen Shores Chamber of Commerce**

23

24 **THE CHAIRPERSON:** Then the next submission
25 is the written submission by the Saugeen Shores Chamber of

1 Commerce, CMD 06-H22.26.

2 Are there any questions or comments with
3 regards to this submission?

4 Thank you.

5

6 **06-H22.28**

7 **Written Submission from**

8 **Canadian Nuclear Association**

9

10 **THE CHAIRPERSON:** Then we will turn to the
11 next submission, which is the written submission by the
12 Canadian Nuclear Association outlined in CMD 06-H22.28.

13 Are there any questions or comments with
14 regards to this submission? No?

15 Thank you.

16

17 **06-H22.29**

18 **Written Submission from**

19 **Southampton Rotary Club**

20

21 **THE CHAIRPERSON:** The next submission is
22 the written submission by the Southampton Rotary Club, CMD
23 06-H22.29.

24 Are there any questions or comments with
25 regards to this submission?

1 Thank you.

2

3 **06-H22.30**

4 **Written Submission from**

5 **Municipality of South Bruce**

6

7 **THE CHAIRPERSON:** The next submission is
8 the written submission by the Municipality of South Bruce,
9 as outlined in CMD document 06-H22.30.

10 Are there any questions or comments with
11 regard to this submission? No?

12

13 **06-H22.31**

14 **Written Submission from**

15 **Great Lakes United**

16

17 **THE CHAIRPERSON:** The next submission is
18 the written submission by Great Lakes United, outlined in
19 CMD document 06-H22.31.

20 Are there any questions or comments with
21 regards to this?

22 Thank you.

23

24 **06-H22.32**

25 **Written Submission from**

1 **Frank E. Caiger-Watson**

2

3 **THE CHAIRPERSON:** The next submission is a
4 written submission by Mr. Frank E. Caiger-Watson, CMD 06-
5 H22.32.

6 Are there any questions or comments with
7 regard to this submission?

8 Thank you.

9

10 **06-H22.33**

11 **Written Submission from**

12 **Energy Solutions Expo**

13

14 **THE CHAIRPERSON:** We will now move to the
15 next submission, which is the written submission by Energy
16 Solutions Expo outlined in CMD document 06-H22.33.

17 Are there any questions or comments from
18 Commission members with regard to this written submission?

19 Thank you.

20

21 **06-H22.34**

22 **Written Submission from**

23 **Algoma-Manitoulin Nuclear Awareness.**

24

25 **THE CHAIRPERSON:** Then we will now turn to

1 the next one, which is a written submission by the Algoma-
2 Manitoulin Nuclear Awareness, CMD 06-H22.34.

3 Are there any questions or comments with
4 regards to this submission?

5

6 **06-H22.35**

7 **Written Submission from**

8 **Bill Henderson**

9

10 **THE CHAIRPERSON:** We will move to the next
11 submission, which is a written submission by Mr. Bill
12 Henderson outlined in CMD document 06-H22.35.

13 Are there any questions or comments with
14 regards to this submission?

15 Thank you.

16

17 **06-H22.36**

18 **Written Submission from**

19 **Friends of the Earth Canada**

20

21 **THE CHAIRPERSON:** We will move to the next,
22 which is the written submission by The Friends of the
23 Earth Canada as outlined in CMD 06-H22.36.

24 Are there any questions or comments with
25 regards to this submission?

1 Thank you.

2

3 **06-H22.37**

4 **Written Submission from**

5 **Jeff Harti**

6

7 **THE CHAIRPERSON:** We will move to the next
8 submission, which is the written submission by Mr. Jeff
9 Harti as outlined in CMD 06-H22.37.

10 Are there any questions or comments with
11 regards to this submission?

12 Dr. Barnes?

13 **MEMBER BARNES:** I think it should noted
14 that there is an error in the paragraph that says:

15 "This proposed project is to be sited
16 within 100 metres of Lake Huron."

17 Just for the record. I think he means 1000
18 metres.

19 **THE CHAIRPERSON:** That's confirmed by OPG
20 that there is no intention to put it within 100 metres.

21 **MR. NASH:** Ken Nash.

22 Yes, that's correct.

23 **THE CHAIRPERSON:** Thank you, and thank you,
24 Dr. Barnes, for pointing that out.

25

1 **06-H22.38**

2 **Written Submission from**

3 **Bruce Power**

4

5 **THE CHAIRPERSON:** We will now move to the
6 next submission, which is the written submission by Bruce
7 Power as outlined in CMD 06-H22.38.

8

9 Are there any questions or comments with
10 regards to this submission?

11 Thank you.

12

13 **06-H22.39**

14 **Written Submission from**

15 **PROBUS Club of Kincardine**

16

17 **THE CHAIRPERSON:** We will now move to the
18 next submission, which is the written submission by PROBUS
19 Club of Kincardine outlined in CMD 06-H22.39.

20 Are there any questions or comments from
21 Commission Members with regard to this submission? No?

22 Thank you.

23

24 **06-H22.40**

25 **Written Submission from**

1 **Douglas R. Cornett**

2

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4

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THE CHAIRPERSON: We will move to the next
submission, which is the written submission by Mr. Douglas
R. Cornett as outlined in CMD 06-H22.40.

6

7

 Are there any questions or comments with
regards to this submission?

8

9

06-H22.41

10

Written Submission from

11

Women's House Serving

12

Bruce and Grey

13

14

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16

THE CHAIRPERSON: We will move to the next
which is a written submission by Women's House Serving
Bruce and Grey as outlined in CMD 06-H22.41.

17

18

 Are there any questions or comments with
regards to this submission?

19

 Thank you.

20

21

06-H22.42

22

Written Submission from

23

Jim Cameron

24

25

THE CHAIRPERSON: We will move to the next
submission, which is a written submission by Mr. Jim

1 Cameron as outlined in CMD 06-H22.42.

2 Are there any questions or comments with
3 regards to this submission?

4 Thank you.

5

6 **06-H22.43**

7 **Written Submission from**

8 **Doug Freiburger**

9

10 **THE CHAIRPERSON:** Then we'll move to the
11 next submission, which is the written submission by Mr.
12 Doug Freiburger as outlined in CMD 06-H22.43.

13 Are there any questions or comments with
14 regard to this submission?

15 Thank you.

16

17 **06-H22.44**

18 **Written Submission from**

19 **Lynn Ehrle**

20

21 **THE CHAIRPERSON:** The next submission is a
22 written submission by Ms. Lynn Ehrle as outlined in CMD
23 06-H22.44.

24 Are there any questions or comments with
25 regards to this submission?

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06-H22.45

**Written Submission from
Rosemarie Morris**

THE CHAIRPERSON: We will move to the next submission which is a written submission by Ms. Rosemarie Morris as outlined in CMD 06-H22.45.

Any questions or comments with regards to this submission?

No.

06-H22.46

**Written Submission from
Canadian Environmental
Law Association**

THE CHAIRPERSON: We will next move to the next submission, a written submission by The Canadian Environmental Law Association. This is outlined in CMD 06-H22.46.

Are there any questions or comments with regards to this submission?

No? Thank you.

1 **06-H22.47**

2 **Written Submission from**

3 **Anna Przychodski**

4

5 **THE CHAIRPERSON:** Then we will move to the
6 next submission which is a written submission by Ms. Anna
7 Przychodski as outlined in CMD 06-H22.47.

8 Are there any questions or comments with
9 regards to this submission?

10 Thank you.

11

12 **06-H22.48**

13 **Written Submission from**

14 **Gary A. Karch**

15

16 **THE CHAIRPERSON:** We will move to the next
17 submission, which is a written submission by Mr. Gary A.
18 Karch, CMD 06-H22.48.

19 Are there any questions or comments with
20 regards to this submission?

21 No?

22

23 **06-H22.49**

24 **Written Submission from**

25 **Fred Fuller**

1 **THE CHAIRPERSON:** We will move to the next
2 submission, which is a written submission by Mr. Fred
3 Fuller, CMD 06-H22.49.

4 Are there any questions or comments with
5 regards to this submission?

6 Thank you.

7

8 **06-H22.50**

9 **Written Submission from**

10 **Phyllis Creighton**

11

12 **THE CHAIRPERSON:** Then we will move to the
13 next submission, which is a written submission by Ms.
14 Phyllis Creighton as outlined in CMD 06-H22.50. Are there
15 any questions or comments with regards to this submission?

16 Thank you.

17 **06-H22.51**

18 **Written Submission from**

19 **Art Hanson**

20

21 **THE CHAIRPERSON:** Then we will move to the
22 next submission, written submission by Mr. Art Hanson CMD
23 06-H22.51. Any questions or comments from Commission
24 members? No.

25

1 **06-H22.52**

2 **Written Submission from**

3 **Natalie Hanson**

4

5 **THE CHAIRPERSON:** The next submission is a

6 written submission by Ms. Natalie Hanson, CMD 06-H22.52.

7 Any comments or questions?

8 **06-H22.53**

9 **Written Submission from**

10 **Vitold Kreutzer**

11

12 **THE CHAIRPERSON:** Then next submission is

13 CMD 06-H22.53, Mr. Vitold Kreutzer. Are there any

14 questions or comments with regards to this submission?

15

16 **06-H22.54**

17 **Written Submission from**

18 **Energy Probe Research Foundation**

19

20 **THE CHAIRPERSON:** The next submission is a

21 written submission by Energy Probe Research Foundation,

22 CMD 06-H22.54. Are there any questions or comments with

23 regards to this submission?

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25 **06-H22.56**

1 **Written Submission from**
2 **The International Institute of**
3 **Concern for Public Health, Toronto**

4

5 **THE CHAIRPERSON:** The next submission is a
6 written submission by the International Institute of
7 Concern for Public Health, Toronto, CMD 06-H22.56. Are
8 there any questions or comments with regards to this
9 submission?

10 Thank you.

11 **06-H22.58**

12 **Written Submission from**
13 **National Council of Women**
14 **of Canada**

15 **THE CHAIRPERSON:** We'll move to the next
16 submission which is a written submission by the National
17 Council of Women of Canada, CMD 06-H22.58. Are there any
18 questions or comments with regards to this written
19 submission?

20 Thank you.

21 This brings -- this completes the record
22 for the public hearing on the matter of the Ontario Power
23 Generation's proposal to construct and operate a Deep
24 Geologic Repository within the nuclear Bruce site in
25 Kincardine.

1 I propose that the Commission confers with
2 regards to the information we have considered today and
3 then determine if further information is needed or if the
4 Commission is ready to proceed with the decision and we
5 will advise accordingly.

6 Well, thank you very much, to all of you;
7 this brings to an end the public hearing of the Canadian
8 Nuclear Safety Commission. I would like to thank all of
9 you for your patience, for your attendance, and I'd also
10 like to thank all of you, who have given us such a warm
11 welcome to Kincardine.

12 Thank you very much.

13 --- Upon adjourning at 7:34 p.m.

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