PAPE SALTER TEILLET
BARRISTERS & SOLICITORS
546 Euclid Avenue, Toronto, Ontario M6G 2T2
T 416.916.2989 F 416.916.3726 www.pstlaw.ca

Debra Myles
Panel Co-Manager
Deep Geologic Repository Project
Canadian Environmental Assessment Agency
160 Elgin Street, Place Bell Canada
Ottawa ON K1A 0H3

By Email: DGR.Review@ceaa-acee.gc.ca

May 31, 2012

Dear Ms Myles,

RE: Saugeen Ojibway Nations Information Requests (Part 1) - Joint Panel Review of the Deep Geologic Repository for Low and Intermediate Level Radioactive Waste Project

Please find attached a first set of information requests sent on behalf of the Saugeen Ojibway Nations in regard to the above captioned matter. We anticipate that we will submit subsequent sets in the next weeks.

Thank you for your attention.

Yours truly,

<original signed by>

Alex Monem
/sc

Deep Geological Repository for Low and Intermediate Level Radioactive Wastes Project – Joint Panel Review
REGISTRY REFERENCE - 06-05-17520

Saugeen Ojibway Nation Information Request Package (Part 1)

June 15, 2012

IR#	EIS Guidelines Section	EIS Section or other technical document	Information Request	Context
SON 1.1	EIS Guidelines, Section 10: Existing Environment; Section 11: Effects Prediction, Mitigation Measures, and significance of Residual Effects; Section 13: Long-Term Safety of the DGR	Section 10.1.1: Geology and Geomorphology; Section 11.4.1: Geology and Geomorphology; Geoscientific Verification Plan, March 2011 Prepared by Nuclear Waste Management Organization NWMO DGR-TR-2011-38	Provide more and detailed information in the Geoscientific Verification Plan on the specific timing, amounts and locations of various testing and geological observations that will be made during the construction phase of the Project.	The Geoscientific Verification Plan as currently written is significantly inadequate in addressing confirmatory issues during the construction phase. The plan as currently written is extremely limited in defining the specific timing, amounts, and location of various testing and geologic observations that will be made during the construction phase of the project. Experience at other nuclear facilities worldwide has shown that this scientific component of construction phase monitoring is critical in providing the most important information necessary to confirm or reject, in situ, the observations and assumptions made in earlier phases of the project. There are significant omissions in the plan as stated. The proposed geologic mapping program does not mention the need for mapping of the glacial overburden excavation. In addition, there is no proposed detailed geologic and features mapping of the shaft and repository. A shaft photography plan is proposed but this is usually used as a supplement to expert geologist visual mapping.
SON 1.2	EIS Guidelines,	Geosynthesis, March	Provide further information and analysis to	There are non-conservative inconsistencies in

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	Section 13: Long-Term Safety of the DGR; Section 10: Existing Environment; Section 11: Effects Prediction, Mitigation Measures, and significance of Residual Effects;	2011, Prepared by: Nuclear Waste Management Organization NWMO DGR-TR-2011-11	explain inconsistencies regarding the presence of faulting in the repository vicinity. Provide data and analysis aimed at resolving these inconsistencies derived from other seismic reflection technology, additional core borings, or other procedures. Provide additional seismic surveys to verify the presence of faulting observed in the 2 D Seismic Survey.	observations regarding the presence of faulting in the repository vicinity. The 2 D Seismic Survey conducted showed the presence of faulting. The drilling program did not reveal the presence of faulting. It is not clear whether or not the borings were oriented correctly to intercept the faulting observed in the seismic survey. The potential presence of faulting in the repository vicinity is critical to all of the assumptions made regarding tectonics of the region, possible neotectonic activity, fracture analysis, and groundwater flow modeling. Failure to reconcile differences in the 2-d seismic profiling observations and the drill core results leaves open the issue of faulting being present in the repository vicinity..
SON 1.3	EIS Guidelines, Section 10 Section 10: Existing Environment; Section 11: Effects Prediction, Mitigation Measures, and significance of Residual Effects; Section 13: Long-Term Safety of the DGR	Geosynthesis, March 2011, Prepared by: Nuclear Waste Management Organization NWMO DGR-TR-2011-11	Provide further information, studies, demonstrations and analysis of the impact of future glacial isostatic adjustment on the current and future behavior of fractures and joint sets in the repository vicinity.	There is inadequate consideration of the impact of future glacial isostatic adjustment on the current and future behavior of fractures and joint sets in the repository vicinity. The continuing stress release due to the removal of glacial compression forces since the last glaciation period will continue to cause upward movement on existing fracture and joint sets, as well as create the possibility of new fractures and joint sets during the construction and operational life of the proposed repository. Current studies indicate that glacial compression impacted rock stress to a depth of

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				500m and that there has been approximately 60m of rebound in the site vicinity since glacial removal. There is no adequate reason provided to conclude that there will not be additional rebound movement sufficient to cause opening of fractures and joints. There is also concern that assumptions made regarding future glaciation and reloading of the site could lead to differential movement along existing fractures and joints.
SON 1.4	EIS Guidelines: Section 13, Long-Term Safety of the DGR	Postclosure Safety Assessment, March 2011 Prepared by: Quintessa Ltd., Geofirma Engineering Ltd. and SENES Consultants Ltd. NWMO DGR-TR-2011-25	Provide additional studies and lessons learned analyses of previous experiences sealing major underground projects. Provide analysis of combined seal failure and faulting scenarios.	OPG appears to underestimate the difficulty of sealing the DGR adequately. Key examples of previous poor performance in related projects are not acknowledged. Poor performance at the Asse mined geologic repository is not acknowledged; failure of cement seals at the Deep Horizon disaster are not recognized; combined effects from faulting and seal failure are not considered; recognition that natural phenomena challenges can exceed design criteria based on Fukushima Daiichi nuclear disaster are not accounted for.
SON 1.5	EIS Guidelines: Section 13, Long-Term Safety of the DGR	Postclosure Safety Assessment, March 2011 Prepared by: Quintessa Ltd., Geofirma Engineering Ltd. and	Provide more information regarding the sources of C-14, Cl-36, Ni-59, Zr-93, Nb-94 and I-129. Identify specifically which waste components contribute significantly to this source term.	A full understanding of the impact of ILW and other long lived radionuclides is necessary to fully consider the environmental impacts on the DGR.

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		SENES Consultants Ltd. NWMO DGR-TR-2011-25		
SON 1.6	Section 7.3: Alternative Means	Section 3.2.5: Decision by OPG Section 3.4.2: Choice of Site	Provide further information on the location, salient features, evaluation criteria used, and a summary presentation of the comparison and selection process for alternative locations considered for the DGR. How does the site selection process compare with efforts to site other deep geologic repositories? Explain whether international recommendations using an adaptive staged management approach to siting a DGR were followed. If not, provide justification for the decision.	The EIS Guidelines directs the proponent to consider the siting of the DGR in a location outside the existing site. No supporting information is provided as to what off-site locations were considered. No alternate DGR sites appear to have been considered by OPG.
SON 1.7	Section 7.3: Alternative Means	Section 3.2.5: Decision by OPG	Provide a discussion, with supporting information, on whether OPG consider developing a long-term management project for LILW concurrently with the ongoing project for the long-term management of high level nuclear wastes. Provide a comparative analysis of this approach to others considered, including the preferred approach.	OPG has stated that the WWMF currently manages LILW safely and could continue to do so for many decades. OPG should explain its preference to move ahead with the DGR project prior to the completion of NWMO's current site selection phase to find a location and develop an appropriate methodology for long term management of HLW in a geological repository. Many factors suggest that constructing the LILW at the time when a suitable location and plan for HL would be a preferable option. This

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				option does not appear to have been considered by OPG.
SON 1.8	7.1 Purpose and Need for the Project 7.2 Alternatives to the Project	EIS 3.2.2 Long Term Planning by OPG	Provide data, background information and documentation, analysis and discussion respecting OPG's early management concepts relating to the long-term management of long-lived intermediate level wastes. Explain when OPG changed its planning approach from managing long-lived intermediate level wastes by co-location with used fuel in a deep geological repository. Provide background information, data, analysis and justification for change to current model of co-location of long lived intermediate level wastes with low and short lived intermediate level wastes.	OPG states on p 3-6 of the EIS that in the early 1990's, it was assumed that low and short-lived intermediate level radioactive waste would be emplaced in a low level waste repository and that management of selected long-lived intermediate level waste was assumed to be co-located with used fuel in a separate deep geological repository.
SON 1.9	7.1 Purpose and Need for the Project 7.2 Alternatives to the Project 6.2 Government Agencies	1.2.2 DGR Project Background 2.4.1 Briefings with Local Municipalities	Provide further information concerning the discussions between the Municipality of Kincardine and OPG in the period leading to Kincardine approaching OPG in 2001 to enter into an agreement to study long term management options of L&ILW at the WWMF. Information should include description of all meetings, briefings or communications between OPG and Kincardine in the period	1.2.2 of EIS indicates that the Municipality of Kincardine approached OPG seeking to enter into an agreement to study long-term management of L&ILW at the WWMF. It appears this initial contact resulted in only one potential site for the DGR being considered. This has also been use by OPG as the fundamental basis for its Justification of the Project, and Need for project (Section 3 of EIS). It is critical to understand why OPG did not consider other potential sites for the project in

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			before 2001 respecting study long term management options of L&ILW at the WWMF, including meeting minutes. Information should be summarized in included in table format	order to satisfy the conditions of the EIS Guidelines. Table 2.4.1-1 does not include a description of activities and meetings with Kincardine prior to April 16, 2002, although the history of meetings with Aboriginal parties extends back to "prior to late 1980's (Table 2.3.4-1).
SON 1.10	7.1 Purpose and Need for the Project	3.1 Purpose of the Project 3.2 Need for the Project	Provide a more complete description of the capacity of the WWMF to continue its operations into the future. Provide explanation and discussion of sentence "[WWMF] structures could, with proper maintenance, continue to safely store the waste much longer than 50 years" (pg. 3-5) Provide predictions of how long WWMF could continue to operate, including description of maintenance work required and associated costs.	A full understanding of the capacity of the WWMF to continue to safely manage LILW in necessary to assess the current need for the Project, as well as to assess the preferred option and assess alternative means. The EIS currently provides very little information on the WWMF, its ongoing capacity to manage wastes and associated costs.
SON 1.11	7.2 Alternatives to the Project	3.3 Alternatives to the Project 3.3.5 Comparison of Feasible Alternatives to the Project	Clarify when OPG first concluded that the geology below the Bruce nuclear site was "likely ideally suited to a deep geological repository" (pg 3-11 of EIS). Provide reference to earliest data, studies,	The EIS is not clear on when OPG first learned of the potential suitability of the Bruce nuclear site for a geological repository. There is indication in the EIS that locations other than the Bruce nuclear site may have appropriate geology, but there was insufficient data to confirm [Table

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			reports and analysis suggesting that the geology below the Bruce nuclear site might be suitable for a deep geological repository, including any such analysis regarding other experience or investigation relating to the Cobourg formation.	3.4.2-1] It is necessary to have a complete understanding of the early investigation carried out by OPG to assess its decision regarding the preferred option.
SON 1.12	Section 2.6, Study Strategy and Methodology Section 8.1, "General Information and Design Description"	Environmental Impact Statement, March 2011 (Report 00216-REP-07701-00001 R000) Section 4.5 Reference Low and Intermediate Level Waste Inventory for the Deep Geologic Repository (00216-REP-03902-00003-R003)	Provide information regarding what constitutes a "recognizable fuel fragment". Describe the past and existing waste packaging procedures that support the waste acceptance criterion that "recognizable fuel fragments" are excluded waste. Identify the threshold sum of actinides in a package that initiates further inspection for failed fuel fragments. If there is no such threshold, provide justification.	The EIS, Section 4.5 "WASTE TO BE PLACED IN THE DGR" states: "The DGR will not accept used nuclear fuel or recognizable fuel fragments." Table 4.5.1-3: Summary of Waste Acceptance Criteria states that recognizable fuel fragments are excluded wastes but also includes a criterion that the package amount of uranium-235, uranium-238, plutonium-239, plutonium-240, and plutonium-241 must be reported. The Reference Low and Intermediate Level Waste Inventory for the Deep Geologic Repository (00216-REP-03902-00003-R003), Table 3.3: Estimated Reactor Refurbishment Radionuclide Inventory at 2062 lists uranium and transuranic radionuclides (not listed in Rev. 1) and on waste streams where they had not been identified in the earlier revision. If there can be uranium and plutonium but there cannot be recognizable fuel fragments, the process for differentiating between a package that documents the presence of uranium and plutonium and a package containing a recognizable fuel fragment must be clarified.
SON 1.13	Section 2.6, Study Strategy and Methodology	Reference Low and Intermediate Level Waste Inventory for the Deep	Provide information that justifies the significant decrease in the expected radioactive material content reported for	Reference Low and Intermediate Level Waste Inventory for the Deep Geologic Repository, Table B-1 in Rev. 3 combined 2 waste streams

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		Geologic Repository (00216-REP-03902-00003-R003)	the operational LL/ALW Resin waste stream on Table B.1 of Reference Low and Intermediate Level Waste Inventory for the Deep Geologic Repository (00216-REP-03902-00003-R003) as compared to Rev. 1 of the same document.	(LL Resins and ALW Resins) that had been separate in Rev. 1. Rev. 3 shows specific activity of the combined waste streams of 2.2E+08 Bq/m3 where Rev. 1 of this document showed the specific activity of radioactive material with t½ > 1 yr. of 5.0E+11 Bq/m3 for the LL resins alone and 2.1E+08 Bq/m3 for the ALW resin waste stream. There is no explanation for the dramatic decrease in specific activity from the combined waste streams.
SON 1.14	Section 2.6, Study Strategy and Methodology	Reference Low and Intermediate Level Waste Inventory for the Deep Geologic Repository (00216-REP-03902-00003-R003)	Provide information to justify that the Non-processible drummed waste stream is accurately and adequately characterized for radioactive material content. Describe the methods of characterization, the number of samples/characterizations analyzed, and the variation in the results. Discuss specifically the bituminized low-level wastes quantity and the process waste streams that were input to the bituminization process.	Table 2.1 of Reference Low and Intermediate Level Waste Inventory for the Deep Geologic Repository shows that the non-processible drummed waste stream is the third largest contributor by net volume and the second largest contributor by emplaced volume in the DGR. The specific activity information presented in Table B.1 shows nearly all of the activity in Non-pro Drummed waste is attributed to H-3 but that radionuclide is not measured but scaled based on the C-14/H-3 ratio from incinerable wastes with no basis presented. Drum Racks and Drum Bins (pp. 88 & 90 of 136) information presents 9 different dose rate classes from <0.01 mSv/hr to >10 (4 orders of magnitude), all with the same average waste density and specific activity. The wide range in dose rates from these packages appears inconsistent with packages filled primarily with H-3.

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SON 1.15	Section 2.6, Study Strategy and Methodology	Reference Low and Intermediate Level Waste Inventory for the Deep Geologic Repository (00216-REP-03902-00003-R003)	Provide copies of the studies that resulted in the "…new specific activity information" referred to in the Revision Summary of revised Reference Low and Intermediate Level Waste Inventory for the Deep Geologic Repository. Clarify whether this information was applied to the characterization of already packaged wastes. If not, provide a justification. Explain how this information was applied to future waste projections.	Comparison of the 2010 revision of Reference Low and Intermediate Level Waste Inventory for the Deep Geologic Repository to the 2008 revision generates questions. The Revision Summary in Rev. 003 of 2010 refers to "…new specific activity information…" but does not present any context regarding this new information. It is unclear if new information was utilized only going forward or if it used to adjust historical data, Some of this new information is inconsistent with the information presented in the 2008 Rev. 1 of the same document. For example, by comparing Table 3.3: Estimated Reactor Refurbishment Radionuclide Inventory at 2062 between Rev. 1 and Rev. 3 one finds that Rev. 3 lists uranium and transuranic radionuclides not listed in Rev. 1 and on waste streams where they had not been identified in the earlier revision. The only change found in the text mentioned recent gamma scans of the steam generator in storage at Bruce.
SON 1.16	Section 2.6, Study Strategy and Methodology	Reference Low and Intermediate Level Waste Inventory for the Deep Geologic Repository (00216-REP-03902-00003-R003)	Provide the following additional information regarding the determination of waste stream radionuclide content: Provide the bases for scaling factors used; Provide an error analysis that addresses the uncertainty introduced by the use of scaling factors: Provide an analysis of the uncertainty in	Table B.1 suggests incomplete assessments. For example, there are nine radionuclides measured in only one waste stream and their presence is not considered in the other waste streams, yet several radionuclides have not been measured in any waste stream so they are scaled or inferred based on their presence in used fuel into every waste stream. The logic of this approach is not obvious.

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			data as presented in Appendix D and explain how the inventory was adjusted for the assessment to assure that the assessment is bounding considering these uncertainties; *See below*	Table B.1 presents data that suggests C-14/H-3 ratios from 2.2 to 2.4E-5, with no explanation but all H-3 values are scaled, presumably from C-14. The analysis presented in Appendix D identifies numerous uncertainties and inadequacies in the data and discusses the application of scaling factors. For example, D.2.0 identifies use of C-14/H-3 ratios that have not been validated; use of limited data for resins and sludge; as well as for I-129, Cl-36 and Tc-99 (key radionuclides for evaluating DGR performance and potential doses). Table D.1 of the inventory report presents uncertainty information differentiated by the log dispersion that seems to represent wide variations in the limited data (e.g., LD values of 45 for Co-60 and 87 for Cs-137 for Miscellaneous IX Resins). Such a wide dispersion on such easily measured isotopes begs that question whether this waste stream can be reasonable characterized as a single stream.
SON 1.17	Section 2.6, Study Strategy and Methodology	Environmental Impact Statement, March 2011 (Report 00216-REP-07701-00001 R000) Section 5.5 Reference Low and Intermediate Level Waste Inventory for the Deep	Provide justification that the proposed waste acceptance criteria adequately differentiate acceptable wastes accurately. Describe in detail the measures that will be taken to provide adequate characterization prior to disposal and how this will be used for determining acceptability for disposal.	The waste acceptance criteria do not require identification of Ra-226, Np-237, Pb-210, and P0-210, radionuclides identified in the EIS Table 8-1 as having acceptance criteria for protection of non-human biota from potential radiological impacts. There is no restriction in the waste acceptance criteria on radioactive material concentrations.

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		Geologic Repository (00216-REP-03902-00003-R003)		The human intrusion scenario assessment considers the average concentration in Panel 1 but there is no criterion limiting the concentration to some range around the average used in the assessment.
SON 1.18	7 - Project Justification 2.5 – Precautionary Approach	3.2.6 – Hosting Agreement 3.2.7 – Community Poll	Provide rationale and justification for the construction of the question used in the telephone poll to demonstrate public support by Kincardine residents. Provide alternative formulations of the question considered and rationale for their exclusion. Provide discussion of alternative means considered for demonstrating support, including multiple polls or a referendum. If these other options were not considered, provide justification for decision.	2.1.4 affirms that OPG held out that it would only construct the DGR Project with community support. This was demonstrated by the results of a community telephone poll. The question was "do you support the establishment of a facility for the long-term management of low and intermediate level waste as the Western Waste Management Facility" This should be compared with the more descriptive language of the Kincardine Council resolution #2004-232, set out in 1.2.2 of the EIS "…that Council endorse the opinion of the [Kincardine] Nuclear Waste Steering Committee and select the "Deep Rock Vault" option as the preferred course of study in regards to the management of low and intermediate level radioactive waste". The language of the public survey question is ambiguous and leaves out reference to nuclear waste, a deep geological repository concept, gives no indication of location of project or that is permanent. Explanation is required to show that this is a questions capable of meaningfully demonstrating public support for the project.

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				EIS does not reference any alternative approaches to more accurately demonstrate local support, including multiple surveys or referendums.
SON 1.19	6.2 - Government Agencies	2.4.2 – Briefings and Consultation with Federal and Provincial Politicians and Agency Staff	Provide minutes for meetings identified in Table 2.4.2-1 occurring on: August 6, 2009 with Huron-Bruce MP July 6, 2010 with Huron-Bruce MP July 9, 2010 with Ministry of Energy Provide copies of any response materials or briefings from OPG or NWMO relating to these meetings or issues raised in those meetings.	Table 2.4.2-1 of EIS indicates that various government officials and representatives expressed interest in understanding the relationship between the Project and a potential high level waste long-term management project. It is important to understand the nature of the inquiries and the responses given to understand public perception, support and contribution to the Project.
SON 1.20	6.3 – Stakeholders	2.5.1 – Briefings with Property Owner's and Ratepayers Associations	Provide minutes for meetings identified in Table 2.5.1-1 occurring on: August 30, 2008 with IDRA July 17, 2010 with Point Clark Beach Association July 31, 2010 with Bruce Beach Association September 4, 2010 with IDRA Provide copies of any response materials or briefings from OPG or NWMO relating to these meetings or issues raised in those	Table 2.5.1-1 of EIS indicates that various stakeholders expressed interest in understanding the relationship between the Project and a potential high level waste long-term management project. It is important to understand the nature of the inquiries and the responses given to understand public perception, support and contribution to the Project.

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			meetings.	