2011 Report of the NWMO Independent Technical Review Group

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October 2011

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Chairman, Alan Hooper (Alan Hooper Consulting Limited, UK)

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Summary

The impressive development of the NWMO Technical Programme has continued over the past year with a clear focus of activities on the prospective selection of a preferred site in 2018. A timely initiative is underway to evaluate options for recovering stored used fuel and transporting it to a repository site; when completed in conjunction with complementary repository design studies this will enable NWMO to present a coherent system for the long-term management of Canada's used fuel. The plans for work on adapting repository design to possible site conditions are still being developed; as in its 2010 Report, the ITRG considers that these plans are very important and has made a number of recommendations in this area of the programme. Recommendations made previously by the ITRG have either been implemented or their implementation is underway, although in some cases the ITRG has emphasised where more work may be required.

1. Introduction

The Independent Technical Review Group (ITRG) met at NWMO Offices on 26-27 September 2011. Brief biographies of the ITRG members are given in Annex 1.The meeting was conducted according to the agenda proposed by NWMO (Annex 2). ITRG members had received the briefing material listed in Annex 3 in good time before the meeting.

This is the report of the ITRG on its findings from the review of the NWMO Technical Programme that it was able to undertake on this basis. Whereas the review did not involve detailed technical evaluations the ITRG wishes to confirm that the information provided in the briefing documents, presentations and oral responses to questions was sufficient to enable it to form a view on the Technical Programme in the context of NWMO's overall planning. Furthermore the ITRG wishes to confirm that it was able to conduct its business with the required level of independence. It would also like to thank the NWMO team for their clear and comprehensive answers to the many questions posed by its members, including the provision of copies of reports and other documents that responded to specific points raised in the review meeting.

NWMO staff members have checked the final report for factual accuracy but, subject only to a small number of resulting factual corrections, the report presents the independent findings of the ITRG.

2. Terms of Reference

The ITRG agreed that the revised Terms of Reference distributed in February 2009 continue to provide a sound basis for it to give the NWMO Board the advice that it requires on the Technical Programme.

The ITRG reaffirmed that its current membership covers the range of knowledge and skills necessary to comment meaningfully on all aspects of the current Technical Programme. The ITRG noted in its 2010 Report that the Programme was entering a new phase in respect of implementation of Adaptive Phased Management (APM), where site investigations and associated site-specific designs and safety assessments would be undertaken. It recommended that NWMO should consider enhancing the membership of the ITRG at the appropriate time, or possibly establishing a review group specifically to review, and advise on, the site investigations. Therefore it welcomed the information that NWMO will establish a Geoscience Review Group for this purpose.

3. Review Findings on the Technical Programme

The ITRG presents its findings in this report on the basis of the evaluation factors that are derived from the Terms of Reference. The ITRG was asked to comment specifically on two questions raised by NWMO; these questions are identified and commented upon under the relevant evaluation factor.

3.1 Based on appropriate scientific and technical approaches and methodologies:

a) The Technical Programme Objectives remain clear and comprehensive in defining what should be achieved. The objective to develop and demonstrate the full range of components for transferring used fuel from reactor site storage into the deep geological repository by 2018 appears ambitious but nonetheless represents a logical objective in the context of the current illustrative implementation schedule.

b) The ITRG previously welcomed the information that NWMO was developing a comprehensive technical research, development and demonstration programme report that would document the status of research and provide the rationale for conducting research in each area of study. The ITRG had recommended that the report should make clear where research is conducted in direct response to a requirement of the developing engineering design or safety case and where it is conducted to build confidence in an important aspect of the underpinning science. The NWMO has now published the relevant report, “RD&D Program 2011 – NWMO’s Program for Research, Development and Demonstration for Long-Term Management of Used Nuclear Fuel, NWMO TR-2011-01 (April 2011). This report represents an impressive achievement and, reflecting the basis for the relevant ITRG recommendations, provides interested parties with valuable insights into the significance and prioritisation of activities conducted in the Technical Programme. It is clear that the development of the report has also served a valuable purpose of integrating the multi-disciplinary streams of work conducted by NWMO technical staff and contractors. The RD&D Report assigns work programme elements principally to two main work areas, namely: “Design Development and Safety Case” and “Confidence Building and Understanding”. This is in line with the ITRG’s earlier recommendation and the rationale for further work, which is provided for each work element, makes clear why the assignment has been made in each case. The ITRG recommends that in future, when the next version of the RD&D Report is published, a brief explanation of what is meant by confidence building and process understanding should be added to the relevant introductory section of the report. The ITRG further recommends that, if the ITRG or its equivalent exists at the time the

next RD&D Report is developed, NWMO should consider requesting it to review the report prior to publication. Interested parties could then have confidence that such an important publication in relation to the Technical Programme has been subject to independent scrutiny, and in particular that it aligns with ITRG findings and recommendations.

c) In general, the ITRG continues to be impressed with the scientific and technical approaches and methodologies that NWMO is using in its Technical Programme. There were rare exceptions to this overall finding, which will be covered in the relevant sections below.

3.2 Addresses range of technical issues and challenges associated with design and development of used fuel storage, transportation and placement in a deep geological repository in either crystalline rock or sedimentary rock:

a) With nine communities having expressed an interest in the preliminary stage of the siting process, NWMO is clearly entering the site identification and site selection phase of implementing APM. The ITRG remains of the view expressed in its previous reports that NWMO has identified all the relevant issues and challenges and proposes a comprehensive programme of work to address these. There is a good balance in the programme to cover the possible outcomes from the siting process while taking account of the existing knowledge that has been obtained in Canada and other countries. NWMO clearly recognises that it will need to review its programme in the light of the likely geological characteristics in areas of participating communities. For example, at present all the areas of the interested communities are understood to be underlain by crystalline bedrock; if this situation remains unchanged, a decision will be required at an appropriate stage whether to maintain a significant programme in relation to potential siting in sedimentary formations. The findings in the remainder of this section represent recommendations on how work might be planned in key areas identified by the ITRG.

b) One of the specific questions on which the ITRG was asked to comment was: *Is the approach and funding for developing a used fuel transfer system appropriate for the site selection phase of the repository program?* The ITRG received some detailed presentational material concerning work that is underway or planned on the recovery of used fuel at reactor sites and the transport system for its transfer to the repository. Currently different storage arrangements at various reactor sites and alternative designs for transport containers imply a wide range of possible handling plant and container designs and associated processes. The ITRG sees the merit of looking to achieve some standardisation, particularly of transport containers, and optimisation of fuel handling operations and container design. Potentially such work could reduce the number of handling operations required, and therefore the radiological doses to workers involved in each of those operations, as well as potentially leading to a cost-effective solution and overall efficiency.

Currently the work is at a scoping stage in exploring possible options for designs, weights, dimensions and waste capacities of containers. The ITRG recommends that future work should be conducted with reference to a hierarchy of relevant requirements and that this hierarchy needs to be established and documented; possible examples proposed by the ITRG included requirements for radiation

shielding, for handling features on containers, or for retrievability of used fuel containers following emplacement in the repository. The ITRG was impressed that possible improvements on existing, reference container designs and fabrication methods are being considered as part of this programme of work. Innovative work to explore the possibility of applying a copper coating to a steel container is particularly impressive, and the ITRG is reassured that NWMO recognises the demands for quality assurance that will have to be met in the area of container fabrication. Work in this area impinges strongly on repository design studies and highlighted to the ITRG certain areas that require consideration, which will be picked up in separate points below.

To respond to the question posed by NWMO, the ITRG believes that the approach and funding in this area are appropriate to the stage of the programme, subject to its comments on establishing a hierarchy of requirements and ensuring compatibility with repository design and operations. Significant benefits may accrue from part of NWMO's approach in considering new developments and techniques, which may in turn lead to improved design concepts. It is timely for NWMO to explore the options for optimising this aspect of implementing APM for Canada's used fuel. There is likely to be the greatest flexibility with respect to choosing among various options for engineered barrier systems in the time leading up to a licence application. After a licence is issued, flexibility in this area is likely to be diminished. If such work were not initiated now, there would be a risk that the implementation programme could get tied into sub-optimal arrangements inherited from perfectly reasonable decisions that have been made to date to establish a reference case as a basis for planning.

The approach adopted for this area of the technical programme will meet both the important need to provide the community in the area of a selected site with information on the transport of used fuel and the important need to establish with the nuclear site operators a coherent, safe and cost-effective system for the recovery, transport and emplacement of the used fuel. All the elements of the work programme, which were explained to the ITRG in this area, are necessary to achieve these objectives in our view, and such comparisons as are possible, using the experience of ITRG members of equivalent work programmes in other countries, indicate that the funding allocated represents a cost-effective approach to delivering such objectives.

c) NWMO has recently completed a major design study to update the reference repository designs, timetables and cost information that provide the basis for the planning of the APM Implementation Programme. It is now turning attention to planning work on options for adapting repository design to site conditions, in line with the recommendations made by the ITRG in its 2010 Report. Particularly in the light of the work now underway on the used fuel transfer system, the ITRG has a number of further recommendations:

- The reference repository designs for crystalline and sedimentary rocks envisage the use of vertical shafts for transferring used fuel to the repository horizon. A potentially favourable arrangement of used fuel bundles within a container would result in a payload of 75 metric tons that would require to be lowered down the shaft. There is no precedent for handling a payload of this magnitude in a vertical shaft although the technology is considered by NWMO's specialist mining contractors to be available. Whereas

arrangements could probably be made to ensure that radiological safety was not compromised in the event of a dropped container, the programme risk is considerable given the likely requirements for clean-up of dispersed materials and retrieval of a damaged container and its contents. Therefore very high reliability of handling of order 10,000 heavy payloads in a vertical shaft would have to be ensured, which may be beyond conventional mining practice. Therefore, the ITRG recommends that NWMO should obtain convincing evidence of the capability to hoist repeated payloads of order 75 metric tons with an appropriate level of reliability. The ITRG further recommends that NWMO should give careful consideration to the option of using an inclined ramp to transfer used fuel to the repository horizon, noting that, in addition to avoiding a dropped load accident, a ramp gives greater flexibility both in recovering from a handling incident and in transferring various sizes of machinery underground. These recommendations are in line with the analyses conducted by SKB, where an inclined ramp is the favoured design for used fuel transfer underground.

- The ITRG notes that the reference repository design for a sedimentary host rock is derived from the reference design of Nagra (Switzerland) and agrees that this is an appropriate choice. However, it also notes that, in contrast to the reference design for crystalline rock, there is not the equivalent level of demonstration of the viability of the design on an industrial scale. If a community in an area underlain by sedimentary rock comes into the site selection process, NWMO will very soon have to develop demonstrations that it can implement the relevant repository design. Therefore the ITRG recommends that NWMO should start planning the work that will be required to achieve this objective, taking account of relevant work in this area that is underway or planned in other countries, and in particular by Nagra.

- The ITRG questioned the basis for NWMO cost information respectively for repositories in crystalline and sedimentary rock, where, unusually for world-wide experience, the calculated cost of a repository in sedimentary rock is less than that for crystalline rock. The difference can be traced principally to the smaller excavated volume associated with the sedimentary rock design, thereby reducing excavation and backfilling costs. In similar comparisons in other countries this cost advantage is typically more than offset by the requirement for engineered support for mechanically less-competent sedimentary rocks. NWMO has used the mechanical properties of the highly competent sedimentary rock characterised at the site for the Deep Geological Repository for L/ILW as the basis for its design work in this area. Also it has not considered the alternatives for waste emplacement in crystalline rock that have the potential to reduce the volume of excavations, such as the horizontal emplacement alternative to the SKB reference design, known as KBS-3H. The ITRG recommends that these assumptions need to be made clear when presenting cost information and that NWMO should assemble the necessary technical information to be able to understand the dependence of costs on design responses to possible site conditions.

- In its 2010 Report the ITRG noted that, given its importance to APM, the designs need to show how account is to be taken of retrievability. It noted that

this might, for example, require linings for container placement tunnels particularly in rock formations where excavations could be unstable if left open for extended periods. Therefore the ITRG welcomed the information that retrievability is discussed in the reports on the reference designs that are soon to be published. However, it recommends that NWMO should prepare more specific information on the topic so that it can provide information to support the relevant discussions with communities that have expressed an interest in the siting process.

d) As noted in the 2010 ITRG Report, NWMO continues to make impressive progress in addressing the issues raised by the possibility of locating a repository in a sedimentary formation with highly saline groundwater. It recognises the need for a thermodynamic database for radionuclide behaviour in highly saline, chemically reducing conditions. Following the identification of problems in adapting the Yucca Mountain Project (USA) database, the ITRG supports NWMO's proposed approach of developing its own database, starting from a potentially suitable database published in the USA, as the best option of those carefully explored.

e) The ITRG believes that NWMO is correctly identifying the main technical challenges and prioritising its work programme accordingly. Good examples falling in areas of expertise of some of the ITRG members include work on used fuel processes where NWMO is looking to build confidence, through mechanistic understanding, in relation to processes that will control releases of radionuclides from used fuel contacted by groundwater (fuel dissolution and instantaneous release of mobile, segregated radionuclides within the fuel pins).

3.3 Able to initiate technical site evaluation and characterisation at potential candidate sites:

a) In its 2010 Report, the ITRG concluded that NWMO has made remarkable progress in this area such that it is in a good state of readiness for the forthcoming site identification and site selection phases of its implementation programme. A further positive development in the past year has been the increased transfer of in-house geoscience staff and expertise from the DGR Project to the APM project. What is particularly impressive is the strategy of maintaining historical relationships with academic institutions, specialists and consultants from the DGR Project. This should ensure the successful transfer of knowledge and experience, particularly when it comes to integrating multidisciplinary field data as required to develop a safety case. Furthermore, this is likely to represent a highly cost-effective strategy since there will not be an initial "learning-curve" period.

3.4 Able to develop illustrative safety assessments:

a) As noted in previous ITRG reports, NWMO is building on well-established capabilities in the area of safety assessments and is currently preparing a "4th Case Study" for a used fuel repository in crystalline rock for submission to the CNSC as part of the pre-project review material. The ITRG questioned an aspect of the approach used, which appears important given that the implementation programme is moving towards identification of possible candidate sites and it recommends that this should be considered carefully before finalising the case study report. The issue is the

selection of geosphere parameters to represent the large-scale permeability of the crystalline rock surrounding the repository. The interim geosphere parameters chosen are sufficiently low that any solute transport in the groundwater system within tens of metres of the repository excavations would be controlled by diffusion. The ITRG recognises that such permeabilities within large domains of rock have been inferred from studies in crystalline bedrock at generic sites previously investigated in Canada; nonetheless it recommends that the values selected for the case study should be placed in an appropriate geoscientific context by reference to knowledge of the likely range of hydrogeological characteristics of Canada's crystalline bedrock. Further, it recommends that the 4th Case Study should consider including fractures with advective flow in the host rock which may intersect the plane of the repository. Particularly in the context of having interested communities in areas underlain by crystalline rock, it would be prudent to show that long-term management of used fuel in a deep geological repository can be safely achieved in crystalline rocks containing fractures that carry advective flow, as has been done in SKB's recently published licence application for a used fuel repository in Sweden.

b) NWMO will increasingly turn attention in this work area to the "5th Case Study" for a repository in sedimentary rock. The ITRG has commented previously on the issues concerning gas generation and migration in a tight sedimentary formation. It recommends that gas migration should not be treated as a process directly within the overall radionuclide transport model to be developed for the 5th Case Study. Rather, the 5th Case Study should treat this issue through an analysis structured to represent the uncertainties in the description of the evolution of a discrete gas phase, with the purpose of communicating with regulators and interested communities at the level of the gas transport-relevant features (such as backfills, seals and the excavation disturbed zone in the rock) and processes (such as supply of groundwater or metallic corrosion).

3.5 Consistent with international practice:

a) The ITRG repeats the conclusions drawn in its 2010 Report. NWMO continues to have an appropriate level of involvement with relevant international activities to ensure a good awareness of the latest developments in repository science and technology. It is actively involved in highly relevant projects at the Äspö Rock Laboratory in Sweden (crystalline rock) and at the Mont Terri Underground Rock Laboratory in Switzerland (sedimentary rock). Its involvement with SKB and Posiva Oy in the Greenland Analogue Project will help ensure that it is at the forefront of the science concerning the effects of glacial cycles on deep rock-water systems and repository engineered barrier systems. The ITRG now welcomes the commitments that NWMO has given to making technical contributions to a number of the experiments planned or underway at Mont Terri since the processes studied in these experiments are highly relevant to issues identified in NWMO's programme of work in support of a repository in sedimentary rock. In line with previous ITRG recommendations, this level of participation should ensure that NWMO will be able to fully utilise the understanding gained in its own programme.

3.6 Broaden and advance NWMO's technical knowledge to adequately support implementation of APM:

a) The reporting of NWMO's involvement with Canadian universities in the 2010 Annual Report represents a sustained response to the ITRG's previous recommendations in this respect. As noted in Section 3.3 above, NWMO has further enhanced the involvement in the APM Technical Programme of universities in Canada and other countries by transferring in many of the successful partnerships forged in the DGR Programme. The second specific question on which the ITRG was requested to comment is best dealt with in this section of the report. The question was: *Is the planned scope of the program for building confidence in the safety case through research in collaboration with universities and international partners appropriately structured and funded at an appropriate level given the status of implementation of APM?* The ITRG considers that the work areas of the technical programme defined as building confidence in the safety case should generally be focussed on addressing remaining uncertainties and ensuring that the scientific basis for the safety case can be demonstrated to be sound and up-to-date with recent developments. The work programme identified as falling in this category clearly satisfies our criteria: a successful outcome to the relevant studies should lead to a safety case that would be considered more reliable and soundly based than could be achieved with existing information. The NWMO strategy for involving universities and international partners in this part of the programme is highly beneficial since it enables NWMO to retain a well-informed scientific community and gives NWMO access to scientific expertise in all key areas. The current level of funding is considered appropriate on the basis that the scope of the programme is tightly focussed on the most significant remaining uncertainties and associated areas of science and that, by comparison with similar programmes in other countries, the planned outputs will be obtained in a most cost-effective manner. This latter finding almost certainly reflects the strong involvement of university researchers in delivering a significant proportion of this programme. The ITRG noted that a high proportion of the programme assigned to the building of confidence concerns geoscientific research. Much of this research will eventually be applied to the interpretation of information obtained from site investigations, in the same way as earlier geoscientific research came to be applied in the DGR Project. In our view this is a highly successful model which emphasises the utility of a carefully focussed work programme.

3.7 Has sufficient technical resources:

a) Since the ITRG made a number of comments on technical resources in its 2008 report there has been a controlled build up of in-house capability in terms both of numbers, and of qualifications and experience. Given the current scope of the Technical Programme the in-house technical staff numbers are such that the staff will have to work efficiently if they are to continue to control and manage the programme to sustain the quality of outputs achieved to date. The ITRG was reassured to learn that further recruitment is progressing. The planned additions to the in-house staff in future years look to be the bare minimum that will be adequate for the delivery of the planned scope of the Technical Programme. However, the ITRG recognises that the resources required will be strongly dependent upon the number and nature of potential sites undergoing evaluation and investigation and that NWMO will necessarily review its resource plans when the position is known in this regard. The 2010 Annual Report

on the Technical Programme shows that NWMO is continuing to build commercial relationships with highly competent research companies, consultants and university departments that offer the combined capabilities required to deliver the programme. In its 2010 Report, and again in the current review, the ITRG gave a great deal of attention to the repository design area within the Technical Programme. It welcomes the strengthening of the in-house repository design team and its planned further expansion which reflects the encouraging movement of the APM programme towards engineered implementation.

Annex 1

Brief Biographies of the ITRG Members

Alan Hooper is the Chair of the ITRG. Since 2007 he has been an independent consultant who specializes in the safe, long-term management of radioactive waste for the UK and other national programmes. In 2008 he was appointed Visiting Professor of Repository Science and Engineering in the Department of Earth Science and Engineering at Imperial College London.

On joining the electricity supply industry, Alan Hooper researched the operational safety of advanced reactor designs before transferring into early research on decommissioning nuclear power stations and radioactive waste management. He joined Nirex, the UK radioactive waste management agency in 1988, holding a number of senior management positions including Director for Science. Professor Hooper holds a Bachelor of Science and Ph.D. in Chemistry from Nottingham University, UK.

Kaj Ahlbom has 30 years of experience in the Swedish radioactive waste programme concerning site selection, site characterisation and interaction with stakeholders. Since 2002, he has been the Site Manager for SKB's (Swedish Nuclear Fuel and Waste Management Company) site investigation for a repository for spent nuclear fuel at Forsmark, Sweden. He has been involved in all aspects of site selection from formulating site selection criteria to participating in the site selection process and investigating candidate municipalities and sites. All phases of this process have involved interactions with stakeholders such as government agencies, municipal officers, the geoscientific community, nearby residents, landowners, general public and media.

Mr. Ahlbom received his bachelor's degree in Precambrian Geology from the University of Gothenburg, Sweden, and master's degree in Applied Geophysics from Imperial College, UK.

Lawrence Johnson is a senior scientist and research and development coordinator at Nagra (Swiss National Cooperative for the Disposal of Radioactive Waste), where he has worked since 1999 on various aspects of engineered barriers performance.

Mr. Johnson received a bachelor's degree in Chemistry with Great Distinction from the University of Lethbridge, Alberta, in 1977. He joined Atomic Energy of Canada Limited (AECL) at Whiteshell Laboratories in 1978, where he studied the dissolution of spent fuel and vitrified high-level waste for several years before becoming Manager of Engineered Barrier Studies in the Canadian Nuclear Fuel Waste Management Program. He also managed the technical studies of durability of spent fuel in interim wet and dry storage.

Mr. Johnson is the author of over 110 reports and journal papers covering many areas related to materials performance aspects of engineered barrier systems, as well as a number of studies dealing with long-term safety assessment. He is a member of the International Scientific Advisory Board of the CEA PRECCI Programme and has

acted as advisor and reviewer for nuclear waste management programs in Finland, Sweden, Japan and the U.S.

Derek Martin is a professor in the Department of Civil and Environmental Engineering at the University of Alberta, Edmonton, since 2000. Prior to joining the University of Alberta, Dr. Martin served as Senior Advisor to the Director of the Canadian Nuclear Fuel Waste Management Program, as well as head of the Geotechnical Research Section of AECL's Whiteshell Underground Research Laboratory.

Professor Martin holds a BSc in Geology from Memorial University, a Masters of Engineering from the University of Alberta and a PhD from the University of Manitoba in Civil/Geotechnical Engineering. He has reviewed nuclear waste programs for various countries. He is a scientific advisor to the Swedish nuclear fuel and waste management program, as well as member of the Geoscience Review Group for Ontario Power Generation's Deep Geologic Repository project for Low and Intermediate Level Waste. Professor Martin has published over 150 articles related to geotechnical engineering and deep geological repositories and underground excavations.

Annex 2

Agenda for the September 2011 Meeting of the Independent Technical Review Group

Independent Technical Review Group **September 2011 Meeting** **AGENDA**	
Date:	September 26-27, 2011
Location:	NWMO Board Room, 22 St. Clair Avenue East, 6th Floor, Toronto CANADA
Attendees:	**ITRG:** Alan Hooper, Kaj Ahlbom, Derek Martin and Lawrence Johnson **NWMO:** Ken Nash[1], Ben Belfadhel, Paul Gierszewski, Chris Hatton, Mark Jensen, Atika Khan and Sean Russell
Contact:	Sean Russell → Ph: 647-259-3022. Cell: 647-272-6442. E-mail: srussell@nwmo.ca

DAY 1 – Monday September 26, 2011		
Time	**Item**	**Lead**
08:30	Refreshments [NWMO office]	
09:00	Welcome & Introductions	All
09:15	Overview of APM Technical Program & Status of Progress in 2011 - objectives, assumptions, schedule - budget, staffing	S. Russell
09:30	APM Designs, Costs & Safety Cases - reference repository design & cost estimate - postclosure safety assessment - CNSC pre-project review	S. Russell / P. Gierszewski / A. Khan
10:15	Break	
10:30	Developing a Used Fuel Transfer System - logistics - container coating technology - container size	C. Hatton
12:00	Lunch [NWMO office]	All
12:30	L&ILW DGR Project Update (*lunch time presentation*)	F. King
13:00	Confidence Building & Process Understanding - models & data, corrosion studies, sealing materials - international projects (Äspö, Mont Terri) - seismic monitoring - mass transport, geochemistry, sampling methods, EDZ, etc.	P. Gierszewski / M. Jensen / S. Russell

[1] Part time.

DAY 1 – Monday September 26, 2011		
Time	**Item**	**Lead**
14:30	Break	
14:45	Site Characterization & Evaluation - status of site evaluations - planned activities for 2012	M. Ben Belfadhel
16:00	ITRG Discussion of APM Technical Program (*in camera*)	ITRG
17:00	Adjourn	
19:00	Dinner [TBD]	All

DAY 2 – Tuesday September 27, 2011		
Time	**Item**	**Lead**
08:30	Refreshments [NWMO office]	
09:00	ITRG Discussion of APM Technical Program (*in camera*) (NWMO staff available for discussion, as required)	ITRG
10:00	Break	
10:15	ITRG Discussion of APM Technical Program (*in camera*) (NWMO staff available for discussion, as required)	ITRG
12:00	Lunch [NWMO office]	
13:00	ITRG Feedback on APM Technical Program	A. Hooper
	- Comments, Questions & Discussion of Issues	ITRG
13:45	Closing Comments	K. Nash
14:00	Next Steps - Preparation of ITRG Report to NWMO Board - Presentation to Advisory Council on November 30, 2011 - Presentation to NWMO Board on December 1, 2011	S. Russell
14:30	Adjourn	S. Russell

Annex 3
Documents Sent for Review by the Independent Technical Review Group

No.	Item
1	Draft Agenda for September 2011 Meeting
2	APM Technical Program Activities for the Period 2012 to 2018, Revision 0. June 2011