NUCLEAR WASTE MANAGEMENT ORGANIZATION
SOCIÉTÉ DE GESTION DES DÉCHETS NUCLÉAIRES

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NWMO BACKGROUND PAPERS
6. TECHNICAL METHODS

6-3 STATUS OF GEOLOGICAL REPOSITORIES FOR USED NUCLEAR FUEL

EXECUTIVE SUMMARY

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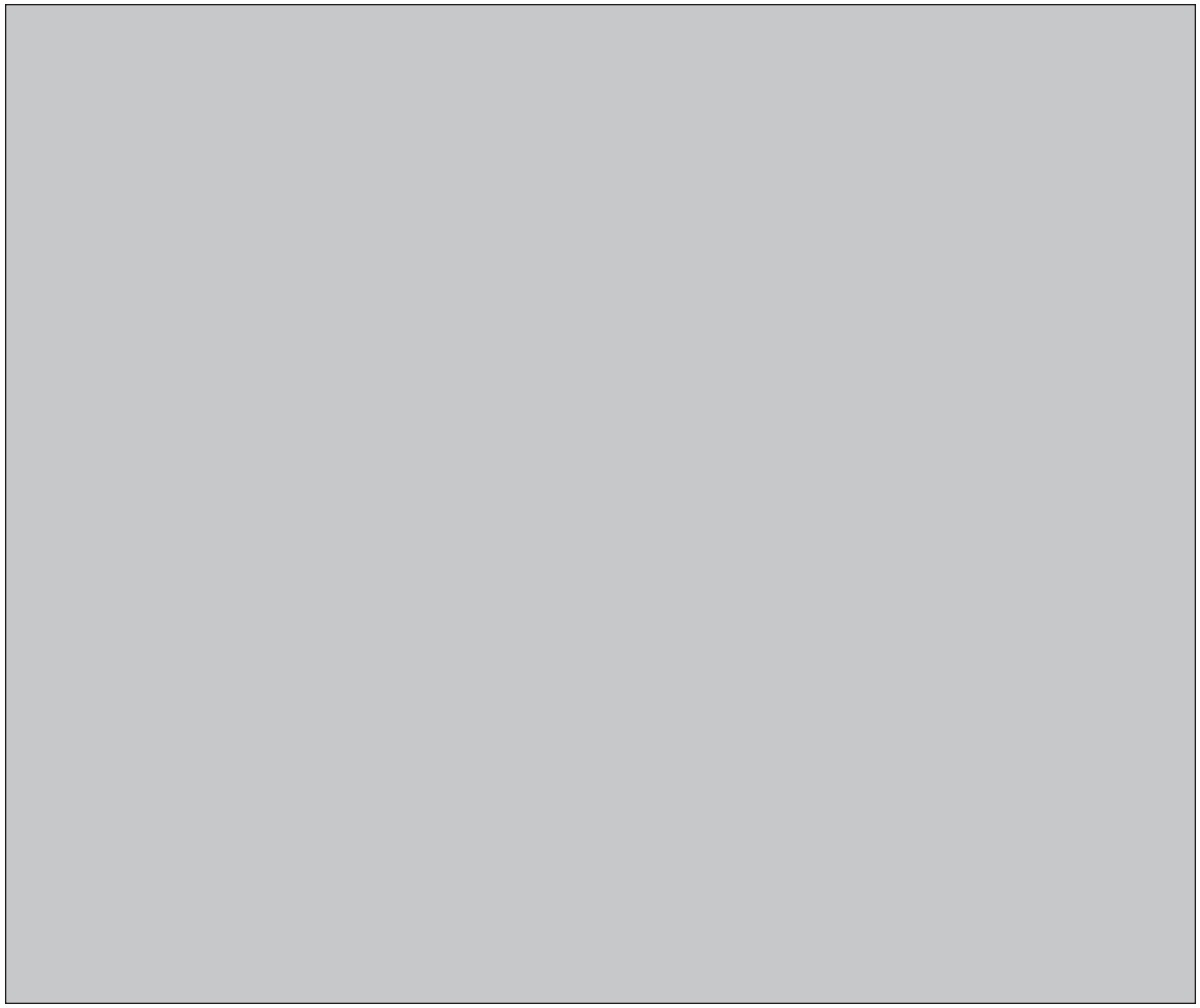

1 Summary

The aim of this report is to give an objective appraisal of the development of the concept of geological disposal of radioactive wastes and of its status today. It is an overview document that has been prepared for a general readership. It addresses the key issues associated with geological disposal of used nuclear fuel and other high-level radioactive wastes. The depth of the treatment varies for two reasons. Firstly, some aspects are examined in more detail because they are of fundamental importance in geological disposal. A particular example concerns the issue of the siting of deep repositories. The second reason for treating some issues in more detail is that these are topical issues that reflect a raised level of interest in a general public. Some of the most topical issues are addressed in more detail in appendices A to D.

In an abbreviated form, the main text addresses the following issues:

- the need to protect humans and the environment from the hazards and the risks presented by radioactive wastes in general, and by used nuclear fuel in particular
- the strategies for minimising long term risks and the reason why this goal has led to the development of the geological repository concept
- the different technical, societal and economic challenges faced by a geological disposal programme.
- the description of the multiple safety barriers in a geological repository and of how they function
- the series of activities performed throughout the several decades for which a repository programme must run
- the status of geological disposal programmes in various nations around the world.
- the key challenges and outlook for further developments in the implementation of geological repositories.

The appendices are on:

- the nuclear fuel cycle and the hazards associated with its wastes
- the ethical basis underlying geological disposal
- the procedures for assessing long-term safety of repositories
- the diversity of views held by different societal groups on the feasibility of safe geological disposal

- the topical debate on retrievability of wastes from geological repositories.

Sufficient references are given throughout the report to allow specific issues of interest to be followed up further. In addition, the following overview books or reports are listed as a guide to the entire field of geological disposal: Chapman and McKinley 1987, Savage 1995, NEA 1999b, Witherspoon and Bodvarsson 2001; NRC 2001, Chapman and McCombie 2003.