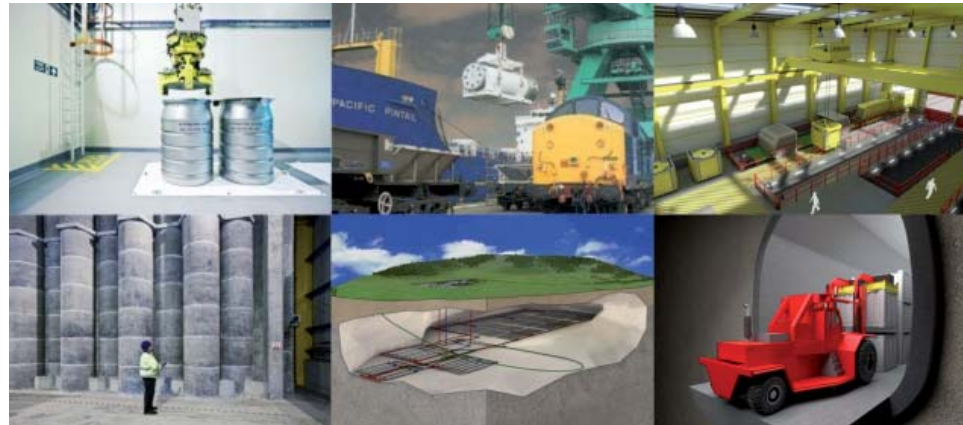


Geological Disposal

Manpower and skills requirements



May 2011

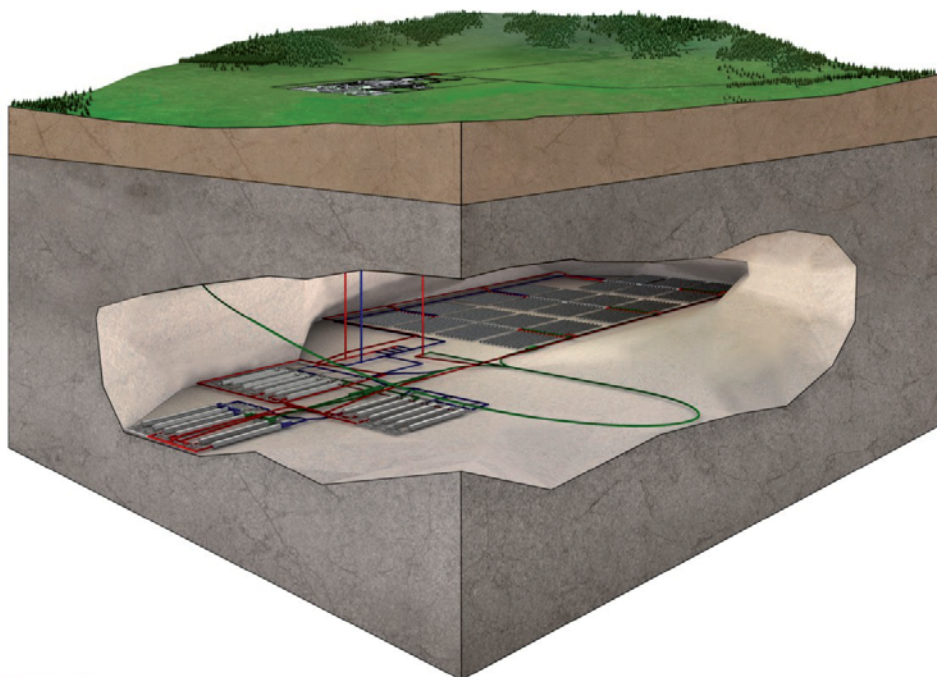


1. Introduction

We have undertaken a study to consider the number of jobs and skills that could be needed to implement a geological disposal facility for higher activity radioactive waste in the UK.

At present no site has been selected and the inventory for the amount and type of waste to be disposed of may change. Our study is therefore based on knowledge we currently have and factors we have assumed for planning purposes.

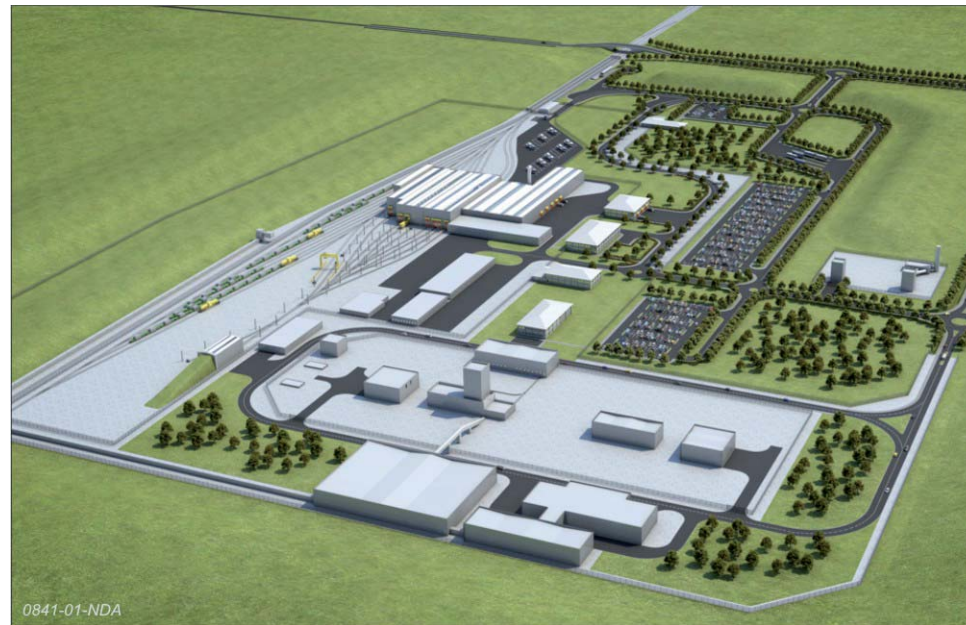
The full report can be found at <http://www.nda.gov.uk/documents/upload/Geological-Disposal-Development-of-manpower-and-skills-data.pdf> and its main findings are summarised in this document.



0810-02-NDA

Illustration of a geological disposal facility

2. Implementing Geological Disposal



Aerial view of surface facilities at a geological disposal site

In the Geological Disposal: Steps towards implementation report published in 2010, (see <http://www.nda.gov.uk/documents/upload/Geological-Disposal-Steps-Towards-Implementation-March-2010.pdf>) we set out what we call our “reference case” which we use for planning purposes. This was used as the basis of this study of skills and manpower likely to be required to implement geological disposal.

Government has set out a staged **Managing Radioactive Waste Safely (MRWS)** process for the implementation of geological disposal with clear decision points that allow design and development, safety, cost, affordability, value for money and environmental sustainability impacts to be reviewed at the end of each stage before a decision to continue is made by the local community and Government.

This study examines the skills and manpower which are likely to be required from the beginning of more detailed geological work, from initial surface investigations, through the construction, operation and eventual closure of a geological disposal facility.

The study only considers employment as part of the geological disposal programme. It does not consider any indirect employment in the local community which would be supported by the presence of those employed in the programme.

3. Manpower and skills

3.1 Methodology of the study

Three methods were used to develop the estimate of the manpower numbers to ensure there is a sound basis for the estimates produced. These were:

- **Benchmarking** – against other similar programmes around the world
- **Task allocation** – applied typically for underground construction activities such as sinking shafts and tunnelling
- **Labour factors** – such as construction reference tables which are commonly used for pricing surface building construction and contain an element of labour costs, which can then be used to determine manpower numbers. This method has also been used to estimate manpower numbers associated with project management.



Manpower numbers have been estimated

3.2 Manpower and skills required

The average employment on the project over the period of around 140 years considered in the study would be 555 although average employment varies significantly between different stages of the programme as shown below.

Description		Indicative Timescale	Average Annual Manpower
Surface-based investigation		Around 10 years	437
Underground Operations	Construction to first waste emplacement	Around 15 years	838
	Operations and on-going construction	Around 100 years	565
	Closure	Around 10 years	188

The highest employment would be during the initial construction of the facility prior to first waste emplacement when it is estimated there would be over 1,000 staff with around 800 working on the geological disposal facility site.

Some employment has to take place at the geological disposal facility site (e.g. construction staff) while others roles could in principle be undertaken away from the site (e.g. some scientific, technical or business support roles). Over the whole programme around 75% of the manpower would have to be based on the geological disposal facility site.

The skill level of jobs required as well as the level of employment is important. The study showed that the jobs created in implementing geological disposal would be of high quality. Half of the required manpower throughout the programme was categorised as skilled with a further quarter categorised as management and professional.

The total estimated manpower can be shown over time in the bar chart in Figure 1 below.

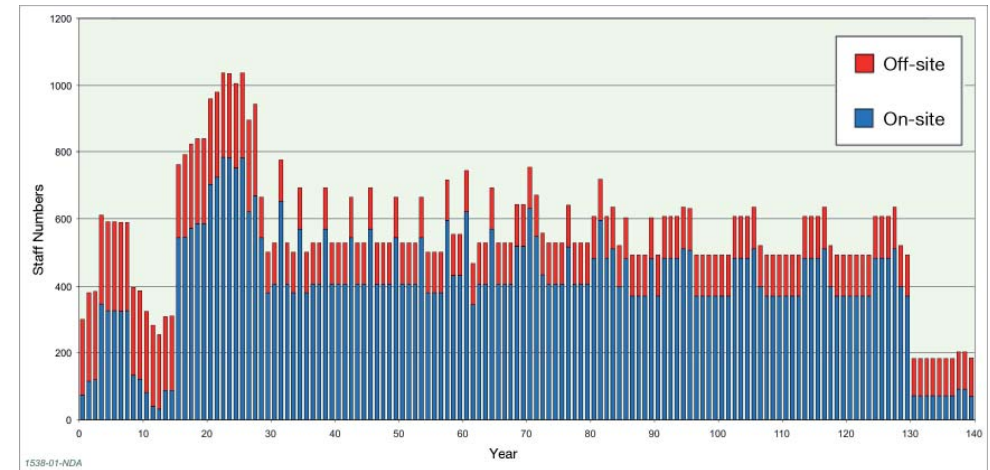


Figure 1 - The total manpower requirements by time



A large nuclear construction project

4. Ensuring the right skills are available

Ensuring we have the manpower and skills resources to fulfil our mission is one of our objectives as set out in our strategy which was published in April 2011.

Cogent – the UK’s industry skills body covering the nuclear sector – reported in 2009 that some 44,000 people were employed in the nuclear sector with approximately 6% of these (excluding contractors) working in the waste and repository (geological disposal facility) sector.

Their findings also indicated that a significant portion of this workforce is older than the UK’s general workforce and this needs to be considered in the planning for geological disposal given the long timescales involved in the programme.

A common classification system for skills was developed by Cogent in conjunction with the NDA’s skills and resources task group. This is used widely in the UK nuclear sector and was adopted for this study to allow comparison with other work on nuclear skills.

5. Impact of different design assumptions



Surface waste receipt and transfer facility

All of the previous information is based on our reference case. We have also considered the impact of changes to the design assumptions in qualitative terms, where there are differences in the geology, the inventory or with throughput rates. These are described below:

- **Different geological environments:** The reference case design is assumed to be constructed in a higher strength rock; however, the facility could also be constructed in a lower strength sedimentary or evaporite rock. The surface infrastructure for each geological environment would remain largely unchanged, but the underground layout would increase significantly in size and different excavation techniques and design features would be required. As a consequence there would be an increased manpower requirement during the construction, operation and closure of the facility.
- **Different inventories:** An increase in the volume of the inventory for disposal would increase the required size of the facility. This would result in additional construction work and assuming the same throughput rates would extend the operational life of the facility. It is expected that the same level of construction and operational personnel would be required for longer.
- **Different throughput rates:** If there were increases in the required throughput rates then additional personnel would be needed to bring forward the construction work, that is, the number of teams working concurrently on excavations. It would also be expected that there would be an increase in manpower required for waste handling during the operational phase. However, if throughput was increased with no change to the inventory the operational period of the facility would be expected to reduce.

6. Socio-economic benefits

The Managing Radioactive Waste Safely (MRWS) White Paper makes it clear that construction and operation of a geological disposal facility will be a multi-billion pound project that will provide skilled employment for hundreds of people over many decades. The conclusions of this report provide more detail on the levels and types of employment required involved in the siting, construction and operation of a geological disposal facility.

Hosting a geological disposal facility is likely to bring significant economic benefits to a community in terms of employment. Any community that ultimately hosts a geological disposal facility will be keen to understand the nature of these benefits, and will expect Government and the NDA to ensure that the project contributes to its development and well-being.

The MRWS White Paper outlines that without wishing to pre-judge potential benefits for communities these could in principle include local training, skills development, and educational investment to ensure that local people have the skills needed for the jobs created by the project.

As well as providing arrangements that encourage the employment of local people, there is also potential scope to locate some of the employment which in principle does not need to take place at the geological disposal facility, at or near to the site.



A geological disposal facility is likely to bring significant benefits to the local community



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