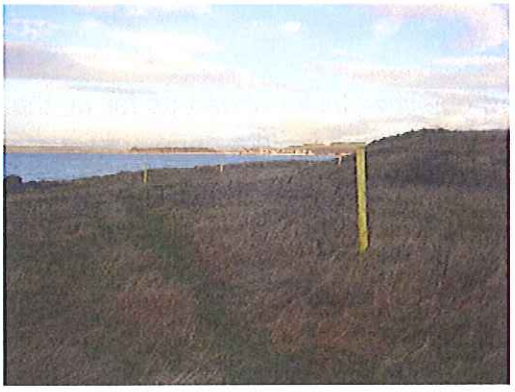
Magnox North

Hunterston A Site

Appraisal of Options for Long-Term Management of the Solid Waste Disposal Area

Non-Technical Summary

September 2008



BACKGROUND

The land owned by the Nuclear Decommissioning Authority at Hunterston A includes an area reclaimed from the foreshore of the Firth of Clyde using mainly soil and rock excavated during the construction of the Hunterston A and B power stations. This Foreshore Reclaimed Area lies outside the Nuclear Licensed Site.

In the late 1970s and early 1980s, the Scottish Development Department authorised the South of Scotland Electricity Board to dispose of Very Low Level (radioactive) Waste (VLLW) within five pits excavated in the southern part of the Foreshore Reclaimed Area. At around the same time, an adjoining area was allocated for disposal of surplus construction material arising from the construction of Hunterston B station.

Magnox North maintains a Land Quality Strategy for the whole NDA land-holding at Hunterston A, which is divided into a series of zones. The VLLW Disposal Area and Construction Waste Disposal Area together make up "Zone G" - the "Solid Waste Disposal Area". The various zones are illustrated in the attached drawing (HAD.HDO.8300.000089).

The Land Quality Strategy will be developed and refined over the coming years, starting with zones like Zone G that are around the periphery of the site. A key step in strategy development for a given zone is a strategic options appraisal.

OBJECTIVE OF OPTIONS APPRAISAL FOR ZONE G

The stated objective for the strategic options appraisal for Zone G was to **"Identify a preferred strategic option for the condition of land quality Zone G during Care & Maintenance".**

A strategic option is an option about what to do about the matter in hand – it is not about how to do it. The how question needs to be addressed once the preferred strategic option has been identified.

The stated objective looks ahead as far as the planned period of several decades during which the site as a whole will be in a period of Care & Maintenance, with minimal staff to look after the site. Current plans envisage that this period will start around 2020.

HOW THE OPTIONS APPRAISAL WAS DONE

The options appraisal for Zone G was undertaken by Magnox North using in-house experts based at Hunterston A and at the central Engineering, Waste, Technical & Strategy function in Gloucestershire. The process was very like giving product ratings for comparable consumer products such as cars or domestic appliances. Box 1 highlights the options short-listed for Zone G.

Box 1: Short-listed Options for Zone G

Option 1: STOP MONITORING: There is currently regular monitoring of radiation levels and levels of radioactivity in groundwater within Zone G. There is no regulatory requirement to undertake such monitoring. Option 1 would involve stopping this monitoring and taking no further action to monitor or maintain the area. The work done by Golder Associates and others shows that this option would not result in unacceptable risks to members of the public using the area for recreational purposes.

Option 2: MONITOR AND MAINTAIN: This option would involve continuing the current monitoring arrangements, and also the removal or localised capping of any patches of slight radioactive contamination that might arise in future as a result of disturbance of the ground (as has happened in two instances in the past).

Option 3: IMPROVE CONTAINMENT: This option would involve improving physical capping of the VLLW Disposal Area to prevent further contamination appearing at the ground surface. After implementing the option, a one-off survey would take place to confirm absence of radioactive contamination at or near the ground surface, then reassurance monitoring of groundwater would continue until there is general agreement that it is no longer required.

Option 4: REMOVE HAZARD: This option would involve excavation of contaminated waste and subsequent disposal at a suitable off-site facility.

The steps in the process for the Zone G options appraisal were as follows:

- Agree the objective and any key constraints and assumptions that needed to be stated at the outset – for example what assumptions to make about what would happen to any waste that might be generated by implementing some of the options being considered.
- Agree the attributes to be used in comparing the options. These are various different factors covering safety, transport, environment, technical performance and cost. The chosen attributes are set out in Table 1.
- Develop a long-list of potential options that could be considered.
- Reduce the long-list to an agreed short-list, by ruling out some options that would be against Government policy or very unlikely to be effective, and by combining some long-listed options that were very similar to each other.
- For each attribute, list the pros and cons of each option, then agree an order of preference score for that attribute (see Table 1). This was done in a workshop session on 25 July 2008, involving six people with a range of relevant expertise and experience.
- Identify a preferred option, based on the orders of preference for all the attributes. In practice, this was done in two stages:
    - Firstly Option 4 (REMOVE HAZARD) was clearly identifiable as the worst option (see Table 1) and was rejected from further consideration.
    - Then the focus moved to look at the attributes that gave different order of preference scores. Some of these attributes were considered relatively unimportant for identifying a preferred option. The important attributes separating Options 1, 2 and 3 were identified as Environmental Impact, Technical Performance and Cost, and on that basis, Option 3 emerged as the preferred option.

STAKEHOLDER INVOLVEMENT AND PEER REVIEW

The newly-convened Land Quality Sub-Group of the Site Stakeholder Group (SSG) met for the first time on 15 July 2008. The Sub-Group received a presentation on land quality management work at Hunterston A, and there was a Question and Answer session which focused mainly on Zone G. The meeting took place during the Zone G options appraisal process, shortly before the workshop session, so that feedback from the Sub-Group could be taken into account in the later stages of the process. The short-listed options had already been identified before the Sub-Group meeting, and as it was thought that Option 3 was likely to emerge as a preferred option, the views of the Sub-Group were sought concerning this option. As recorded by the Sub-Group meeting minutes, the Sub-Group was understood to be supportive in principle.

Magnox North have recently appointed Enviros Consulting Ltd to undertake an independent peer review of the land quality management work at Hunterston A. This has included a formal peer review of a near-final draft of the technical report on the options appraisal. The headline of their review stated, "In general the document presents a comprehensive appraisal assessing the options for remediation at a strategic level and follows current best practice and guidance." Other comments were suggestions for improved clarity, which have been addressed in finalising the report and in preparing this non-technical summary.

OUTCOME

The options appraisal for Zone G has identified Option 3 (IMPROVE CONTAINMENT) as Magnox North's preferred strategic option for the management of this zone (including the VLLW Disposal Area) for the foreseeable future (at least into the period of Care & Maintenance. Implementation of this option will involve improving the capping over the VLLW Disposal Area, followed by a one-off survey to confirm absence of radioactive contamination at or near the ground surface and continuing reassurance monitoring of groundwater until there is general agreement that it is no longer required.

Box 2: Radioactivity Levels in the Very Low Level Waste at Hunterston A

The Very Low Level Waste (VLLW) in the VLLW Disposal Area was limited to waste with radioactivity levels at least 600 times lower than the upper limit for general Low Level Waste (LLW). The levels of radioactivity remaining in the waste (based on several hundred sub-surface measurements) are lower still, more than 10,000 times lower than the LLW limit.

Consultants Golder Associates have calculated that the additional radiological dose that someone would receive if they used the VLLW Disposal Area regularly as a recreational area would be more than 1,000 times lower than the dose that person would receive from natural sources.

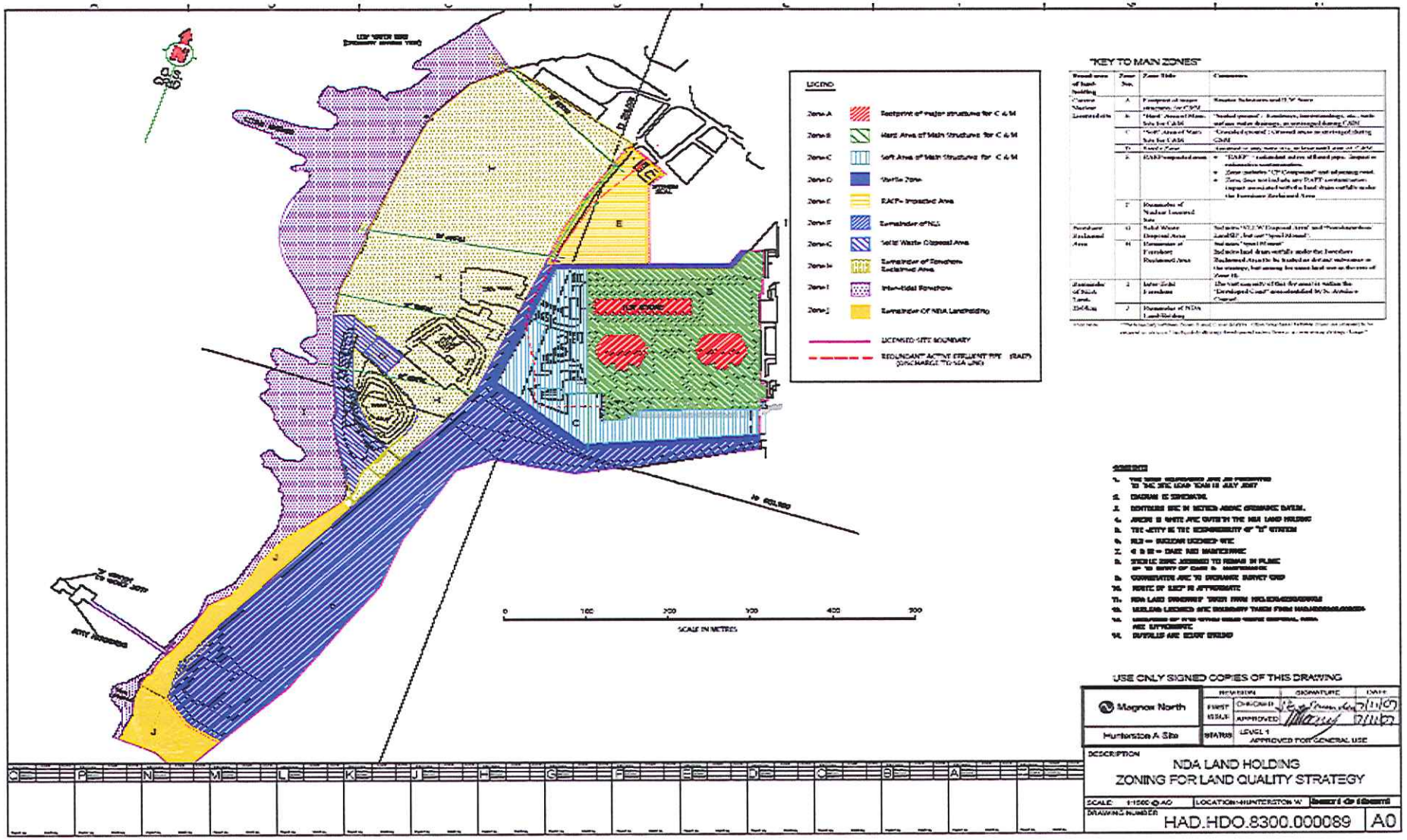

LEGEND
Zone A
Zone B
Zone C
Zone D
Zone E
Zone F
Zone G
Zone H
Zone I
Zone J
LICENSED SITE BOUNDARY
REDUNDANT ACTIVE EFFLUENT PIPE (RAEP) DISCHARGE TO SEA LINE
"KEY TO MAIN ZONES"
0 100 200 300 400 500
SCALE IN METRES
USE ONLY SIGNED COPIES OF THIS DRAWING
Magnox North
Hunterston A Site
DESCRIPTION
NDA LAND HOLDING
ZONING FOR LAND QUALITY STRATEGY
SCALE 1:1500 @ A0
LOCATION HUNTERSTON 'A'
DRAWING NUMBER
HAD.HDO.8300.000089
A0

Table 1: Assessment of Short-Listed Options against Attributes

Attribute	Pros/cons & order of preference	Option 1: Stop monitoring	Option 2: Monitor & Maintain	Option 3: Improve containment	Option 4: Remove hazard
Public Safety (conventional safety during intervention works)	Pros	No additional risk.	No additional risk.	Risks associated with intervention largely contained on site.	
	Cons			Negligible risk associated with vehicle movements to/from site. Need to prevent public access during works.	Larger risks due to off-site transport of wastes. Need to prevent public access during works.
	Order of preference	1	1	1	4
Worker Safety (Conventional)	Pros	No additional risk.	No additional risk.		
	Cons			Some risk associated with works.	Larger risks associated with more extensive works.
	Order of preference	1	1	3	4
Additional Waste Volume	Pros	No additional waste.		No additional waste.	
	Cons		Potential for additional waste arisings should further contamination be detected.		Creates 100s-1000s cubic metres of waste for re-disposal.
	Order of preference	1	3	1	4

Table 1 (continued): Assessment of Short-Listed Options against Attributes

Attribute	Pros/cons & order of preference	Option 1: Stop monitoring	Option 2: Monitor & Maintain	Option 3: Improve containment	Option 4: Remove hazard
Transport (excluding safety aspects)	Pros	No additional transport impact.	No additional transport impact.	Negligible additional transport impact (plant going to/from site at start/end of works).	
	Cons				Additional transport mainly associated with off-site waste disposal.
	Rank score	1	1	1	4
Environmental Impact	Pros	No disturbance of fauna and flora.	No disturbance of fauna and flora.	Area landscaped.	Area landscaped.
	Cons	Visual appearance of area remains poor.	Visual appearance of area remains poor.	Short-duration disturbance of fauna and flora (weeks).	Longer-duration disturbance of fauna and flora (months).
	Order of preference	3	3	1	2
Technical Performance	Pros			Hazard isolated from receptors.	Hazard removed.
	Cons	Public and possibly regulator concern of future undetected exposure of contamination.	Potential for further contamination to become exposed and need to be managed.		
	Order of preference	4	3	1	1
Cost	Pros	Cost saving	No up-front cost	Minimal continuing cost (groundwater monitoring)	No continuing cost
	Cons		Ongoing cost of monitoring and management of any surface contamination found (should it occur).	Modest up-front cost (low £100,000s)	Very large up-front cost (£1,000,000s)
	Order of preference	1	2	2	4
Total of order of preference scores		**12**	**14**	**10**	**23**