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SUBMARINE DISMANTLING PROJECT

Proposed Site Criteria & Screening Paper

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Amendment History

Issue	Date	Details of Amendment	DCCF
0.1	12th Oct 2010	Draft circulation for comment from Virtual Team, Site focal points, CLS and AG Sub-Group	
0.2	3rd Nov 2010	Responding to comments received from circulation at 0.1	
0.3	19th Nov 2010	Implementing comments received from OGDs	
0.4	26th Nov 2010	Implementing advice from Advisory Group Sub Group Meeting 22nd November 2010.	
1.0	6th Dec 2010	Public domain release alongside the SDP SEA Statutory Consultation Scoping Report dated 6th Dec 2010	

Distribution

SDP OGD Meeting Members
SDP Virtual Team Members
Statutory Consultees

Executive Summary

The aim of the Submarine Dismantling Project (SDP) is to develop a solution for the dismantling and disposal of 27 of the UK's nuclear submarines after they have left service with the Royal Navy and been defueled. To do this, the project must ultimately arrive at strategic decisions on sites for undertaking the initial dismantling of the submarines and for interim storage of Intermediate Level Waste (ILW) arising, whilst awaiting disposal in the UK's proposed Geological Disposal Facility (GDF).

The process leading towards these decisions includes a Strategic Environmental Assessment (SEA) to identify and consider the potential environmental effects associated with the project [1]and a public consultation on the project's strategic options. Ahead of this, however, the project must first develop and apply appropriate criteria so that potential candidate sites that might be suitable for these activities can be identified. This is being undertaken in parallel with the Statutory Consultation stage of the SEA.

The first step has been to determine, using a structured set of criteria, whether the high level or generic categories of undeveloped 'Greenfield', previously-developed 'Brownfield' or 'Existing' Nuclear Licensed or Authorised sites would all be credible alternatives and whether any of these categories offer particular advantages (Section 2 below).

Two sets of criteria, for dismantling and interim storage respectively (Section 3), have been proposed for purposes of identifying potential candidate sites. The decision about where the non-nuclear remainder of the submarines would be dismantled (the 'ship-breaking' activity) is not within the scope of this part of the process.

The main purpose of this current paper is to publish, in provisional form, these structured sets of criteria and, for dismantling sites, the way they would be applied. Section 4 therefore also includes the short list of dismantling sites that would follow from the application of the proposed criteria. These are interim conclusions, subject to change if arguments are made which lead to changes to the criteria or methodology.

Further, more detailed, analysis (Section 5) would then be required to reduce the short lists to a small number of technical options / site combinations which could be put to consultation as described in Section 6.

Of the generic high level site options, including 'Greenfield', 'Brownfield', and 'Existing Nuclear Licensed or Authorised' sites, MOD considers that it is reasonable to develop, through the application of the appropriate criteria, a list of named credible sites from within the generic category of 'Existing Licensed or Authorised sites' in the UK. Within this category, there are three types of site: Those are those owned by MOD, those owned by the Nuclear Decommissioning Authority (NDA) and those owned by private commercial organisations.

[1] In accordance with the Environmental Assessment of Plans and Programmes Regulations 2004 (SI 2004 / 1633) ("the 2004 Regulations")

To screen the potential candidate sites, MOD has proposed the following universal criteria: physical capacity, legal or contractual commitments, UK organisational control, security of tenure, topography, compatibility with site operations, operational safety and licensing conditions. Additionally, criteria associated with coastal location and port access are proposed for screening initial dismantling sites, and store construction and existing store capability for screening ILW storage sites. It is acknowledged that additional criteria may be introduced later to assess the relative merits of credible sites. In particular, the final decision as to location(s) will be informed by the outcome of the forthcoming consultation that will be carried out on the project's options analysis and environmental report that describes the likely significant effects on the environment of implementing the project. Such a decision would be subject to further planning and regulatory approvals.

MOD's initial assessment against these proposed criteria indicates Devonport Royal Dockyard and Rosyth Royal Dockyard as potential candidate sites for radiological dismantling of submarines. It should be noted that this implies three initial dismantling site options involving either of the above sites or a combination of both sites.

It has not been possible, at this stage, to screen the potential candidate sites for interim storage of ILW due to the developing nature of the national strategies for interim ILW storage, and the subsequent effect this has on the MOD's approach. Within the high level option of 'existing' nuclear licensed or authorised sites, however, the generic options can be expressed as those owned by MOD, those owned by NDA and those owned by private commercial organisations.

At this stage, this is an indicative screening assessment which will not be finalised until MOD has concluded the SEA Statutory Consultation stage and engaged with key local site stakeholders.

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1. Introduction

1.1.1. The aim of the Submarine Dismantling Project (SDP) is to develop a solution for the dismantling and disposal of 27 of the UK's nuclear submarines after they have left service with the Royal Navy and been defueled. To do this, the project must ultimately arrive at strategic decisions on sites for undertaking the initial dismantling of the submarines and for interim storage of Intermediate Level Waste (ILW) arising.

1.1.2. Initial Dismantling is the process whereby the Reactor Compartment is dismantled, leaving the rest of the submarine free to be dismantled via conventional ship-breaking. Interim storage is the process of safely storing the ILW arising from the SDP until such time as the proposed UK Geological Disposal Facility (GDF) becomes available to the SDP, at some point after 2040.

1.1.3. The process leading towards these decisions includes (1) the completion of a Strategic Environmental Assessment (SEA) to identify the likely significant effects on the environment of implementing the project and (2) a public consultation on the project's strategic options. Ahead of this, however, the project must firstly identify the potential candidate sites that might be suitable for these activities and this is being done in parallel with the first stage of the consultation requirements of the SEA process[2]. Once confirmed, a detailed assessment of the merits of the candidate sites will be prepared. This will be consulted upon alongside the SEA in the forthcoming SDP public consultation, before specific recommendations (including those relating to site selection) can be made.

1.1.4. This paper summarises the MOD's proposed site screening criteria and, for dismantling sites, its initial identification of the potential candidate sites that satisfy these criteria. It accompanies the release of MOD's SEA Scoping Report (version A2)[3] and associated Non Technical Summary which provides further background information on MOD's approach to the project including the three technical options for submarine dismantling and a description of the end-to-end SDP process. Frequently Asked Questions and wider background information may also be found at www.submarinedismantling.co.uk.

1.1.5. The key difference between the three technical options is the form in which intermediate level waste (ILW) is placed into interim storage pending the availability of a final disposal facility. The three technical options under consideration are:

- Reactor Compartment (RC) storage – This involves cutting out the complete RC, separating it from the rest of the submarine. The RC is then stored intact and further processing and packaging of ILW will be required prior to disposal.

- Reactor Pressure Vessel (RPV) storage – This involves cutting out the RPV

[2] See footnote 2 above
[3] Submarine Dismantling Project, Strategic Environmental Assessment (SEA) – Stage 'A' Scoping Report – Update dated 6th December 2010. This is also accompanied by a Non Technical Summary document. Both documents can be found at www.submarinedismantling.co.uk

and removing it from the submarine. The RPV is then stored intact in specialist shielded packaging. Further processing and packaging of ILW will be required prior to disposal.

- Packaged waste storage – This involves fully dismantling the Reactor Compartment, so that the radioactive materials can be cut up and packaged in appropriate containers for transport, interim storage and disposal in the proposed GDF.

1.1.6. At this stage, this screening assessment of potential candidate sites for initial dismantling has been undertaken on an indicative basis to enable the MOD to engage with key local site stakeholders before the screening criteria are finalised and the potential candidate sites confirmed as a list of credible sites to be taken forward. In addition, a number of assumptions have been made in developing the proposed criteria (as stated in this paper) that may be subject to further work. After engaging key local site stakeholders and other relevant government departments, MOD will prepare and release an updated paper setting out the updated criteria and its final screening assessment of candidate sites for initial dismantling.

1.1.7. It should also be noted that MOD has identified a number of other criteria which are not proposed for screening of potential candidate sites but for subsequent assessment of candidate sites. These are introduced in outline in Section 5 of this paper.

2. High Level Site Options

2.1.1. As set out in the SEA Scoping Report, the following high level, generic site options for initial submarine dismantling and for interim ILW storage have been considered:

Undeveloped, 'Greenfield' land	This is land that has not previously been subject to industrial development, such as farmland or parkland, or which has been abandoned after historic use and has reverted to a 'natural' state - such as a disused quarry or mine workings. At a site on such land, there would be no existing dock, or ship handling facility, nuclear licence or expertise to undertake the required work; most or all the required infrastructure would need to be developed from scratch.
Previously-developed, 'Brownfield' land	This is land that is or has been developed and occupied by buildings or infrastructure. Ideally, there should be sufficient existing infrastructure in place (such as a dock to accommodate the submarines), but there would be no nuclear facilities or qualified personnel available. Commercial ship-breaking facilities without a nuclear licence or authorisation would fall into this category.
Existing nuclear licensed or authorised Sites	This comprises developed sites which currently have a licence under the Nuclear Installations Act or an authorisation by the Defence Nuclear Safety Regulator, and where suitable nuclear expertise exists. Ideally, there should be sufficient existing infrastructure in place, such as a dock to accommodate the submarines. These are sites that are in current use for nuclear activities.

2.1.2. Overseas dismantling or storage is not acceptable on security grounds, and may also contravene international agreements on the export and import of nuclear material. The options of Greenfield, Brownfield and Existing Licensed or Authorised sites have been considered, in relation to the following key factors:

- Government policy and regulation
- Licensing requirements
- Environmental issues arising from the SEA
- Planning permission, including consideration of political and perception issues
- Level of infrastructure required, including for transportation to and from the site
- Local availability of Suitably Qualified and Experienced Personnel (SQEP) who have the skills and experience to work with radiological materials.

2.1.3. Consideration of the high level options against the above factors is summarised in

the table below:

Factor	Greenfield	Brownfield	Existing Nuclear Licensed or Authorised
Government policy and regulation	Theoretically possible to meet all policy and regulatory requirements. However, a new Environmental Permit will be required.	Theoretically possible to meet all policy and regulatory requirements. However, a new Environmental Permit will be required.	Theoretically possible to meet all policy and regulatory requirements. A significant variation to an existing Environmental Permit will be required.
Licensing	A new nuclear site licence will be required which will be a significant undertaking. The ongoing requirements to meet the licence conditions will be substantial and will need to be met entirely by the SDP.	A new nuclear site licence will be required which will be a significant undertaking. The ongoing requirements to meet the licence conditions will be substantial and will need to be met entirely by the SDP.	A significant modification will be required to existing nuclear site licence or the existing authorisation will need to be replaced by a site licence. Ongoing requirements to meet licence conditions can be shared between the different activities on the site.
Environ-mental	Likely to have the highest environmental impact (but subject to further assessment in the SEA).	Likely to have a lower environmental impact than a Greenfield site (but subject to further assessment in the SEA).	Likely to have the lowest environmental impact (but subject to further assessment in the SEA).
Planning	Gaining planning permission for a new build on a Greenfield site will be a significant challenge and potentially more controversial than the other high level options.	Gaining planning permission for a new build on a Brownfield site is generally more straightforward than a Greenfield site but nuclear issues will need to be considered.	Gaining planning permission for a new build on an Existing Licensed or Authorised site, or for change of use of existing facilities is likely to be more straightforward than it would be for either Greenfield or Brownfield land. Previous public consultations have concluded a preference for this option.

Factor	Greenfield	Brownfield	Existing Nuclear Licensed or Authorised
Infrastructure	Full new build of the dismantling and storage facilities will be required, along with full provision of security facilities and access (for movement of the submarines and/or waste boxes). Overall, this will have the highest infrastructure requirements.	Full or partial new build of the dismantling and storage facilities will be required (dock facility assumed), together with full or partial provision of access. Full provision of security facilities will be required.	Modification of existing facilities will be required for dismantling. Modification or provision of a new facility will be required for storage. Most security facilities should be in place. Overall, this will have the lowest infrastructure requirements.
SQEP resource	Unlikely to have SQEP resource in the locality. No potential conflict with existing operations.	Unlikely to have a nuclear resource in the locality. No potential conflict with existing operations.	SQEP workforce will be available in the locality. Potential for conflict with existing operations.

2.1.4. Taking account of the implications for cost, schedule and risk, the overall conclusion is that use of an existing nuclear licensed or authorised site has significant cost and performance advantages over the development of new facilities, be they on Greenfield or Brownfield sites.

2.1.5. The Greenfield and Brownfield generic site options are not discounted from further consideration and will be assessed within the SEA as generic options. However, as there are an almost unlimited number of undeveloped and previously-developed sites in the UK, and it is considered disproportionate in relation to the scale of the SDP to attempt to consider each one individually unless the possibilities for using an existing nuclear licensed or authorised site are exhausted. This conclusion is supported by the findings of the earlier public consultations[4] and in comments received from the Environment Agency during the first part of Statutory Consultation.

2.1.6. The names and locations of Existing Nuclear Licensed sites in the UK may be found on the HSE website[5] and a summary list of nuclear licensed and authorised sites in the UK is at Annex A. Since the radiological dismantling is an activity unique to SDP

[4] Project ISOLUS, Front End Consultation, Final Report, September 2001 and Project ISOLUS, Consultation on Outline Proposals, Final Report, September 2001. Both reports can be viewed at www.submarinedismantling.co.uk

[5] http://www.hse.gov.uk/nuclear/licensees/pubregister.pdf

it is possible to consider named sites, for Existing Licensed or Authorised sites, at this stage. By contrast, the availability of Existing Nuclear Licensed or Authorised sites for interim storage of ILW is constrained by the developing nature of the national strategies for radioactive waste management and hence a generic approach has been adopted at this stage. This is explained further at section 4 of this paper.

3. Proposed Site Screening Criteria

3.1.1. MOD's proposed criteria for screening potential candidate sites for their suitability for SDP activity are summarised in the Table below. The criteria have been derived from the project requirements for dismantling 27 defuelled submarines and storing the ILW arising until a disposal solution (the proposed GDF) becomes available.

3.1.2. It should be noted that the proposed criteria for interim ILW storage relate to the development of a bespoke SDP ILW storage solution using either new build store(s) or adapting existing store(s) specifically for SDP. The applicability of these criteria would need to be reviewed and revised if a national waste consolidation strategy were to develop (see section 4.2).

3.1.3. There are two types of screening criteria. The primary screening criteria are key fundamental requirements; unless a site meets these conditions, it will not be considered suitable for undertaking SDP activities and no further consideration is given. The secondary screening criteria consider the requirements at a more detailed level, and are applicable to those sites which meet the primary screening criteria. These are also pass / fail criteria; any site failing any of these will not be considered suitable for SDP activities.

Initial Dismantling		Interim ILW Storage	
Primary Screening Criteria			
1A	**Coastal site location** *(Site must be accessible by sea)* **Dismantling must be conducted on a coastal site.** This is essential to enable access to the dismantling site for the submarine. A coastal site is defined by the 1949 Coastal Protection Act, as amended. Essentially this means that the site must be located adjacent to a body of tidal water (sea, bay, estuary or river as far as the tidal flow) to enable the submarine to be removed from the sea for dismantling. Additional dredging requirements should be avoided.	2A	**New store construction** *(Can a new store be built?)* **New build will only be considered on sites that are owned or operated on behalf of the MOD.** The risk of developing capital facilities on sites not owned or controlled by the MOD would be too great. For example, if the use or the ownership of the site were to change then the MOD may no longer be able to use the facility for its intended purpose.
1B	**Physical capacity** *(Is there enough space and / or facilities?)* **The dismantling site must have sufficient physical capacity to enable secure dismantling activities**	2B	**Existing store capability** *(Can store accept SDP ILW?)* **Existing storage facilities must be compatible with the proposed technical option for dismantling.** The risk of investing in major

Initial Dismantling		Interim ILW Storage	
	to be undertaken. The threshold for a site to be considered as a dismantling facility is the requirement for an existing permanent ship handling capability for the submarines within the scope of the project and sufficient area to provide a lay apart area. The MOD has assumed that it would not be cost effective to build a new dock or ship handling facility, where these facilities are already available in some locations.		modifications to facilities on sites not owned or controlled by the MOD would be too great, as the site owner could choose to change the purpose of the site and/or storage facility. Therefore only stores which are compatible with the MOD waste could be considered. There are no existing stores that can accommodate RPV or RC storage. In respect of storage of packaged waste, MOD has assumed that ILW will be packaged in GDF compatible boxes.
		2C	**Physical capacity** *(Is there enough space and facilities?)* **For a new build facility, at an MOD owned or operated site, there must be sufficient available footprint for the construction of the store**. This minimum footprint represents the smallest area which must be available to accommodate the new store. If there is insufficient available space on the site, then the facility cannot be constructed. This minimum threshold assumes security and road infrastructure are already in place. Minimum area required varies across the technical options with RC storage requiring more space than RPV storage or packaged waste. **For the use of an existing store there must be sufficient unallocated capacity in the store.** This criteria reflects the fact that, although the store may not be full at this time, the owner / operator may have already allocated the capacity to other future waste streams.
Secondary Screening Criteria			
1C	**Port access** *(Access is required to port facilities)* **There must be suitable port access**		

Initial Dismantling		Interim ILW Storage	
	for submarines. The method for transporting the submarine to the dismantling facility is yet to be determined. However, it will certainly be some form of sea transportation (e.g. towing or heavy lift vessel) and therefore the dismantling site must have suitable port access. Factors determining suitable port access will include the physical space required for manoeuvring the towed or transported submarine, the depth of the required channel and the strength of the tidal flow (which will determine how readily the submarine can enter the port).		
1D	**Legal or contractual commitments** *(Are there barriers to use of site?)* **There must be no existing contractual or legal commitments impeding use of land**. The MOD would not want to challenge the existing long-term contractual or legal status of the proposed site(s).	2D	**Legal or contractual commitments** *(Are there barriers to use of site?)* **There must be no existing contractual or legal commitments impeding use of land**. The MOD would not want to challenge the existing long-term contractual or legal status of the proposed site(s).
1E	**UK organisational control** *(Site must remain under UK control)* **The site shall remain under UK organisational control and shall not be under risk of transfer from UK control**. The MOD requires that the dismantling operation remains under UK control at all times because of security considerations. There must be a mechanism in place to ensure that the site remains under UK organisational control for the required duration of tenure (at least 30 years). This threshold is particularly relevant to commercial sites where the owner organisations could potentially be sold to foreign buyers. However, a site would still pass the threshold if arrangements were already in place to prevent a sale that was not in the	2E	**UK organisational control** *(Site must remain under UK control)* **The site shall remain under UK organisational control and shall not be under risk of transfer from UK control**. The MOD requires that the waste being stored remains under UK control at all times because of security considerations There must be a mechanism in place to ensure that the site remains under UK organisational control for the required duration of tenure (100 years). This threshold is particularly relevant to commercial sites where the owner organisations could potentially be sold to foreign buyers. However, a site would still pass the threshold if arrangements were already in place to prevent a sale that was not in the interests of national security. NB: This criterion assumes

Initial Dismantling		Interim ILW Storage	
	interests of national security.		physical characteristics of the ILW arising from SDP will remain classified.
1F	**Security of tenure** *(Site needed for 30 years)* **Location must be available and have security of tenure for at least 30 years** (the estimated duration of dismantling activities based on a throughput of approximately 1 submarine per year). Once a dismantling site(s) has been selected the MOD would not want to have to change location purely because the tenure of the site is too short and the site becomes unavailable. This would be expensive and time-consuming.	2F	**Security of tenure** *(Site needed for up to 100 years)* **Location must be available and have security of tenure for at least 100 years** (the maximum estimated duration before a Geological Disposal Facility is assumed to be available to receive SDP waste). Once a storage site(s) has been selected the MOD would not want to have to change location purely because the tenure of the site is too short and the site becomes unavailable. This would be expensive and time-consuming.
1G	**Topography** *(Must be suitable for dismantling)* **Topography must not prevent use of site for dismantling.** The topography of the site covers all of the physical characteristics of the area. Sites will be excluded from consideration if topography means that dismantling is not physically practicable. Local knowledge and professional judgement will be required to assess this. Relevant factors are likely to include sea cliffs, unstable land and steep slopes.	2G	**Topography** *(Must be suitable for storage facility)* **Topography must not prevent use of site for storage.** The topography of the site covers all of the physical characteristics of the area. Sites will be excluded from consideration if topography means that storage is not physically practical. Local knowledge and professional judgement will be required to assess this. Relevant factors are likely to include sea cliffs, unstable land and steep slopes.
1H	**Compatibility with site operations** *(Existing or planned operations)* **The planned dismantling activities must be compatible with the operations, both current and planned, on the site**. Examples of incompatibility would include activities competing for physical space and facilities; it could also include the dismantling being incompatible with the main purpose and mission of the site. Where potential conflicts exist it will be	2H	**Compatibility with site operations** *(Existing or planned operations)* **The planned ILW storage activities must be compatible with the operations, both current and planned, on the site**. Examples of incompatibility would include activities competing for physical space and facilities; it could also include storage being incompatible with the main purpose or mission of the site. Where potential conflicts exist it will be the

Initial Dismantling		Interim ILW Storage	
	the decision of the site owner to prioritise activities and decide whether dismantling is a compatible activity.		decision of the site owner to prioritise activities and decide whether storage is a compatible activity.
1I	**Operational safety issues** *(Must be able to manage safety risks)* **There must be no unacceptable operational safety issues arising from existing activities on or off site.** In common with any activity, there will be safety issues arising in the dismantling process. However, unacceptable operational safety issues are defined as safety risks that cannot be mitigated (or managed) effectively. Examples might include proximity to flying operations or firing or bombing ranges.	2I	**Operational safety issues** *(Must be able to manage safety risks)* **There must be no unacceptable operational safety issues arising from existing activities on or off site.** In common with any activity, there will be safety issues arising in the dismantling process. However, unacceptable operational safety issues are defined as safety risks that cannot be mitigated (or managed) effectively. Examples might include proximity to flying operations or firing or bombing ranges.
1J	**Licensing conditions** *(Obtain and maintain licence for 30 years)* **The site must be capable of radiological dismantling under licensing conditions**. The dismantling activities will need to be undertaken under a nuclear site licence (as issued and regulated by the Health and Safety Executive). It must be possible to demonstrate to the regulatory authorities that the dismantling activities can be carried out safely. There must be no factors which would prevent the extension of an existing licence to cover dismantling activities, or would prevent the obtaining of a licence on an existing authorised site. Environmental Permitting will also be required and there should be no factors which would prevent this.	2J	**Licensing conditions** *(Obtain and maintain licence for 100 years)* **The site must be capable of ILW storage under licensing conditions**. The storage will need to be undertaken under a nuclear site licence (as issued and regulated by the Health and Safety Executive). This means that it must be possible to demonstrate to the regulatory authorities that the storage can be carried out safely. There must be no factors which would prevent the extension of an existing licence to cover ILW storage activities, or would prevent the obtaining of a licence on an existing authorised site, as it is assumed that a nuclear site licence would be required for the long-term storage of ILW. A licence would need to be maintained for up to 100 years and no known factors should be present to prevent this (licence will be subject to regular review). Environmental Permitting will also be required and there should be no

Initial Dismantling		Interim ILW Storage	
			factors which would prevent this.
		2K	**Receipt of ILW** *(Access for import of waste is required)* **The location must provide a means to receive ILW.** Unless the same site is selected for both initial dismantling and interim storage, then it is assumed that the waste will need to be transported between the two sites. If ILW is to be stored as a Reactor Pressure Vessel (RPV) or a Reactor Compartment (RC) the requirements for receipt will be very different. Due to the size and weight of the RC, sea transportation will be required and hence only coastal sites can be considered. The current project assumption is that RPVs, similarly, can only be transported by sea but this remains under review.

4. Initial Screening Assessment

4.1. Potential Candidate Sites for Initial Dismantling

4.1.1. The table below shows MOD's initial assessment of existing Licensed or Authorised sites as potential candidate sites for initial dismantling of submarines in any of the three technical methodologies.

Key:

Y	Assessed as passing criterion
N	Assessed as failing criterion
	Not assessed due to failing primary criteria

ID	Site	Owner / Operator	Coastal site	Physical Capacity	Port Access	Legal or contractual commitments	UK organisation control	Security of tenure	Topography	Compatibility with site operations	Operational safety issues	Licensing conditions
			1A	1B	1C	1D	1E	1F	1G	1H	1I	1J
1	HMNB Devonport	MOD	Y	N								
2	Devonport Royal Dockyard	Babcock International Group Plc	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
3	HMNB (Clyde) Faslane	MOD	Y	Y	Y	Y	Y	Y	Y	N	N	Y
4	HMNB (Clyde) Coulport	MOD	Y	N								

ID	Site	Owner / Operator	Coastal site	Physical Capacity	Port Access	Legal or contractual commitments	UK organisation control	Security of tenure	Topography	Compatibility with site operations	Operational safety issues	Licensing conditions
5	Rosyth Royal Dockyard	Babcock International Group Plc	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
6	Aldermaston	AWE, UK Government	N	N								
7	Burghfield	AWE, UK Government	N	N								
8	Barrow-in-Furness (Devonshire Dock Complex)	BAE SYSTEMS Marine Limited	Y	Y	N	Y	Y	Y	Y	N	Y	Y
9	Neptune Reactor, Fuel Production Plant, Derby	Rolls Royce Marine Power Operations	N	N								
10	Dounreay	DRSL, NDA, UK Government	Y	N								
11	Harwell	RSRL, NDA, UK Government	N	N								
12	Winfrith (Research Sites Restoration Limited)	NDA, UK Government	N	N								

ID	Site	Owner / Operator	Coastal site	Physical Capacity	Port Access	Legal or contractual commitments	UK organisation control	Security of tenure	Topography	Compatibility with site operations	Operational safety issues	Licensing conditions
13	Sellafield (including Windscale licensed site)	Sellafield Limited, NDA, UK Government	Y	N								
14	LLWR, Drigg	NDA, UK Government	N	N								
15	Oldbury Power Station	Magnox, NDA, UK Government	Y	N								
16	Wylfa Power Station	Magnox, NDA, UK Government	Y	N								
17	Trawsfynydd Power Station	Magnox, NDA, UK Government	N	N								
18	Chapelcross Power Station	Magnox, NDA, UK Government	Y	N								
19	Hunterston A Power Station	Magnox, NDA, UK Government	Y	N								
20	Berkeley Technology Centre	Magnox, NDA, UK Government	Y	N								
21	Bradwell Power Station	Magnox, NDA, UK Government	Y	N								

ID	Site	Owner / Operator	Coastal site	Physical Capacity	Port Access	Legal or contractual commitments	UK organisation control	Security of tenure	Topography	Compatibility with site operations	Operational safety issues	Licensing conditions
22	Hinkley Point A Power Station	Magnox, NDA, UK Government	Y	N								
23	Sizewell A Power Station	Magnox, NDA, UK Government	Y	N								
24	Capenhurst	Sellafield Limited, NDA, UK Government	N	N								
25	Springfields	Springfields Fuels Limited, NDA, UK Government	N	N								
26	British Energy reactor sites (7 sites)	British Energy Ltd	Y (some sites)	N								
27	Other Commercial Sites	Various	N	N								

4.2. Interim Storage of ILW

4.2.1. Within the generic option of Existing Licensed or Authorised sites, potential candidate sites for storage of ILW fall into three possible categories:

- Sites owned by Ministry of Defence
- Sites owned by the Nuclear Decommissioning Authority (NDA)
- Sites owned by industry

4.2.2. As described for criteria 2A above, the significance of ownership is that MOD could only consider a new build store on land that it owns or land where it has some other long term controlling interest. In any event, given the estimated volume of ILW to be produced[6], the development of a new build and bespoke MOD store for SDP ILW is unlikely to deliver value for money compared to the shared use of an existing suitable store, most or all of which are on sites owned by the NDA.

4.2.3. The current practise in the civil sector is that ILW is stored at the point of generation until a disposal solution becomes available and there is, therefore, no established precedent for transfer of ILW between NDA stores. NDA have challenged this position in their latest draft strategy[7] and are exploring opportunities to share current and planned storage assets to improve value for money and reduce the environmental impact of new store build. The development of such a national waste consolidation strategy represents a significant opportunity for MOD to realise better value for money in conjunction with wider Government liabilities but it is not sufficiently mature to support the screening of potential candidate sites.

4.2.4. Similarly, the MOD has published its policy for Nuclear Decommissioning[8] but has yet to publish a strategy to take this forward.

[6] It is estimated that SDP, for all 27 submarines, will generate a containerised volume of approximately 485 m^3 This is less than 0.2% by volume of the UK ILW inventory.
[7] Nuclear Decommissioning Authority, Draft Strategy Published September 2010 for Consultation
[8] MOD Policy for Decommissioning and the Disposal of Radioactive Waste and Residual Nuclear Material arising from the Nuclear Programme. See http://www.mod.uk/NR/rdonlyres/4CB2F1B9-48AC-4ECC-87BE-15B4C78425AD/0/20070918_disposal_policy_paper_issue_5_2_.pdf

5. Proposed Site Assessment Criteria

5.1.1. MOD has considered a number of other criteria that are not proposed for purposes of screening potential candidate sites but are expected to be relevant to the downstream assessment of candidate sites (in addition to further assessment using the proposed screening criteria where appropriate). These are outlined in the table below.

Initial Dismantling		Interim ILW Storage	
Site Assessment Criteria			
1K	**Dispatch of ILW** **Ideally, the proposed site will provide a cost effective and low risk option for dispatch of ILW.** Clearly, the risks and the costs will vary depending on the transportation options and the form of ILW being transported (whether packaged waste, RC or RPV).		
1L	**Natural environment issues** **Ideally, the proposed site carries no significant flooding or environmental safety risks that would be likely to impede planning approval.** This includes flooding risk which will be considered further with the SEA.	2L	**Natural environment issues** **Ideally, the proposed site carries no significant flooding or environmental safety risks that would be likely to impede planning approval.** This includes flooding risk which will be considered further with the SEA.
1M	**National Parks, environmental, historical or conservational designations.** **Ideally the proposed site will not be in a national park or carry environmental, historical or conservational designations** that are likely to impede planning approval or SDP operational capability. This criterion will be considered as part of the SEA.	2M	**National Parks, environmental, historical or conservational designations.** **Ideally the proposed site will not be in a national park or carry environmental, historical or conservational designations** that are likely to impede planning approval or SDP operational capability. This criterion will be considered as part of the SEA.
1N	**Security** **Ideally, the site should have no impediment to cost-effective compliance with security regulations**. All named sites under	2N	**Security** **Ideally, the site should have no impediment to cost-effective compliance with security regulations**. All named sites under

Initial Dismantling		Interim ILW Storage	
	consideration are existing licensed or authorised sites and hence will have some form of security already in place (although it is recognised it may need modification for dismantling activities).		consideration are existing licensed or authorised sites and hence will have some form of security already in place (although it is recognised it may need modification for ILW storage activities).
1O	**Compliance with other regulations** **Ideally, the site should have no impediment for cost-effective compliance with the other regulations** Other relevant regulations will include those in force under legislation such as the Health and Safety at Work Act and the Environmental Protection Act and the Water Resources Act. Also any legislation specific to Scotland.	2O	**Compliance with other regulations** **Ideally, the site should have no impediment for cost-effective compliance with the other regulations** Other relevant regulations will include those in force under legislation such as the Health and Safety at Work Act and the Environmental Protection Act and the Water Resources Act. Also any legislation specific to Scotland.
1P	**SQEP workforce** **Ideally, a SQEP workforce and skills set will be readily available to meet planned throughput.** As all sites under consideration are Existing Licensed or Authorised sites there is likely to be a considerable nuclear skill set already in place although shortfalls may arise due to overall workload at the site.	2P	**SQEP workforce** **Ideally, a SQEP workforce and skills set will be readily available to meet planned throughput.** As all sites under consideration are Existing Licensed or Authorised sites there is likely to be a considerable nuclear skill set already in place although shortfalls may arise due to overall workload at the site.
1Q	**Planning** **Ideally, the proposed site will have no impediment to cost effective planning consent being obtained.** Planning consent will be required wherever the dismantling facility is located. Although it is recognised that there may be differences in the level of difficulty in obtaining planning permission.	2Q	**Planning** **Ideally, the proposed site will have no impediment to cost effective planning consent being obtained.** Planning consent will be required wherever the ILW storage facility is located. Although it is recognised that there may be differences in the level of difficulty in obtaining planning permission.

5.1.2. It is acknowledged that in addition to the above criteria, other assessment criteria (particularly those which may only be assessed through public consultation) may yet be identified as MOD engages with statutory bodies and project stakeholders,

including key local site stakeholders.

5.1.3. Moreover, as explained in the next section, a wider set of criteria (including but not limited to those described in this paper) will be derived from the overall project requirement and used to assess combined site(s) and technical options for SDP. As such, the proposals to be put forward in public consultation and ultimately recommended to decision makers will be in the form of credible scenarios (i.e. “initial dismantling site X” with “ILW storage solution Y”, using “technical option Z”).

6. Conclusions and Next Steps

6.1.1. Of the high level options the overall conclusion is that use of an Existing Nuclear Licensed or Authorised site has significant cost and performance advantages over the development of new facilities, be they on Greenfield or Brownfield sites. The Greenfield and Brownfield generic site options are not discounted from further consideration and will be assessed within the SEA as generic options. MOD considers that it is reasonable, however, to develop the list of named credible sites from within the generic option of 'Existing Licensed or Authorised Sites' in the UK

6.1.2. The potential candidate sites identified, on an indicative basis, as suitable for initial dismantling are:

Site	**Location**	**Owner**
Devonport Royal Dockyard	Plymouth, Devon	Babcock International Group
Rosyth Royal Dockyard	Fife, Scotland	Babcock International Group

6.1.3. It should be noted that this implies three initial dismantling site options involving either Devonport Royal Dockyard or Rosyth Royal Dockyard, or some combination of both sites.

6.1.4. It has not been possible, at this stage, to screen the potential candidate sites for interim storage of ILW due to the developing nature of the national strategies for interim storage of ILW. Within the high level option of 'Existing' Nuclear Licensed or Authorised sites, however, generic options may be expressed as those sites owned by MOD, those owned by the NDA and those owned by private commercial organisations.

6.1.5. The proposed criteria and their associated screening thresholds (the numerical or judgemental distinction between passing and failing a criterion) will now be further developed in conjunction with the SEA Statutory Consultation and through engagement with key stakeholders for the above named sites. MOD then intends to publish an updated paper in early 2011 to confirm the site screening criteria and the candidate sites for initial dismantling to be taken forwards into detailed assessment. This paper will also take into account relevant feedback received during the Statutory Consultation process and engagement with key site stakeholders.

6.1.6. Once candidate sites are confirmed, they will be combined with the technical dismantling options to define the credible scenarios for SDP (i.e. scenarios in the form of "initial dismantling site X" with "ILW storage solution Y" using "technical option Z"). These credible scenarios will then be further assessed through formal option analysis and investment appraisal, in conjunction with the SEA, to identify MOD's proposed (or most preferred) scenario. These credible scenarios and MOD's proposed scenario will then be presented for local and national public

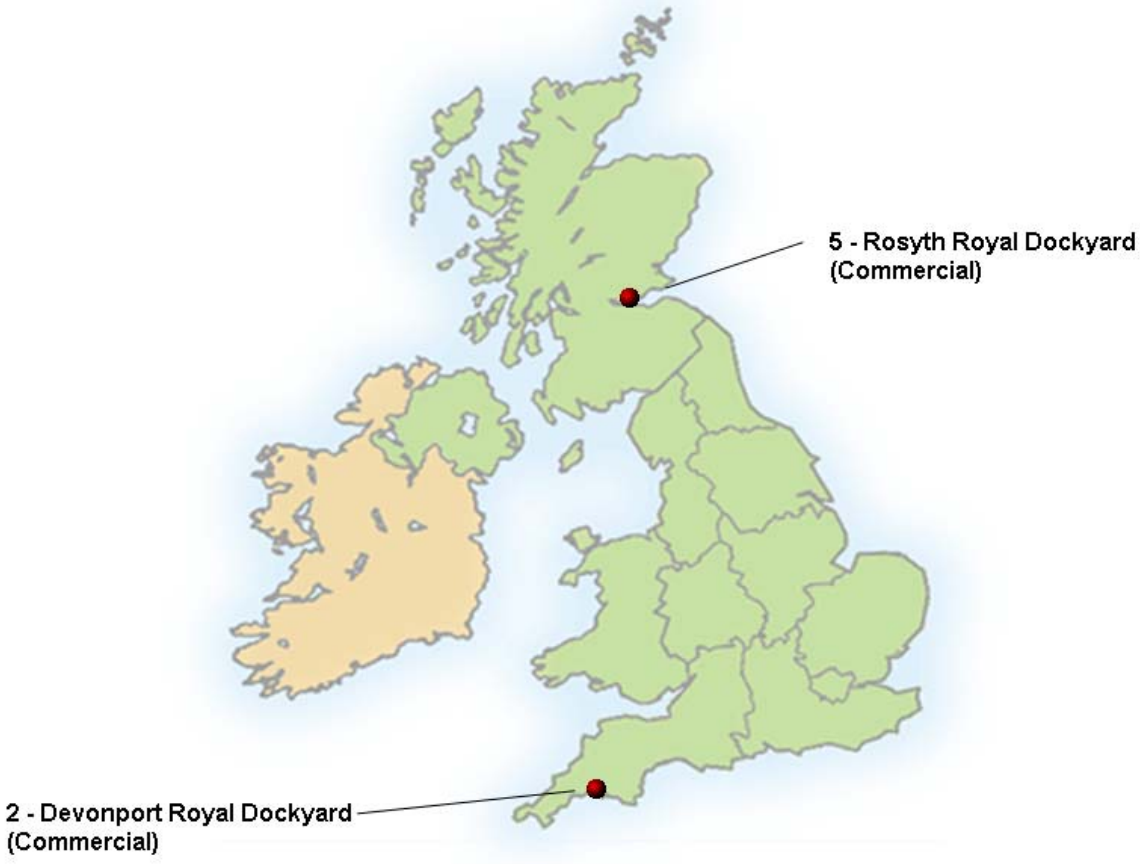
consultation planned to take place in the second half of 2011. MOD will then re-work its analysis to take into account the findings of the public consultation before making decisions and seeking local planning and regulatory approvals.

Annex A – UK Licensed and Authorised Sites

No.	Site	Land owner	Licensed or Authorised
1	HMNB Devonport	MOD	DNSR authorised
2	Devonport Royal Dockyard	Babcock International Group	Licensed with additional DNSR authorised activities
3	HMNB (Clyde) Faslane	MOD	DNSR authorised
4	HMNB (Clyde) Coulport	MOD	DNSR authorised
5	Rosyth Royal Dockyard	Babcock International Group	Licensed
6	AWE Aldermaston	MOD	Licensed
7	AWE Burghfield	MOD	Licensed
8	Barrow-in-Furness (Devonshire Dock Complex)	BAE SYSTEMS Marine Limited	Licensed
9	Neptune Reactor, Fuel Production Plant, Derby	Rolls Royce Marine Power Operations	Licensed
10	Dounreay	NDA, UK Government	Licensed
11	Harwell	NDA, UK Government	Licensed
12	Winfrith (Research Sites Restoration Limited)	NDA, UK Government	Licensed
13	Sellafield (including Windscale licensed site)	NDA, UK Government	Licensed
14	LLWR, Drigg	NDA, UK Government	Licensed
15	Oldbury Power Station	NDA, UK Government	Licensed
16	Wylfa Power Station	NDA, UK Government	Licensed
17	Trawsfynydd Power Station	NDA, UK Government	Licensed
18	Chapelcross Power Station	NDA, UK Government	Licensed
19	Hunterston A Power Station	NDA, UK Government	Licensed

No.	Site	Land owner	Licensed or Authorised
20	Berkeley Technology Centre	NDA, UK Government	Licensed
21	Bradwell Power Station	NDA, UK Government	Licensed
22	Hinkley Point A Power Station	NDA, UK Government	Licensed
23	Sizewell A Power Station	NDA, UK Government	Licensed
24	Capenhurst	NDA, UK Government	Licensed
25	Springfields	NDA, UK Government	Licensed
26	British Energy reactor sites (7 sites)	British Energy Ltd	Licensed
27	Other Commercial sites	Various	Licensed

Annex B – Map showing locations of Potential Candidate Sites for Initial Dismantling of Submarines



GLOSSARY

Abbreviation	Meaning
AWE	Atomic Weapons Establishment; sites owned by MOD but operated by AWE Plc.
DE&S	Defence Equipment & Support; the organisation within MOD responsible for defence equipment including the SDP.
DNSR	Defence Nuclear Safety Regulator
FEC	Front End Consultation – the first stage of consultation on Project ISOLUS
HMNB	Her Majesty's Naval Base
ILW	Intermediate Level Waste
ISOLUS	Interim Storage of Laid-Up Submarines, the forerunner to SDP.
MOD	UK Ministry of Defence
NDA	Nuclear Decommissioning Authority
RC	Reactor Compartment
RPV	Reactor Pressure Vessel
SDP	Submarine Dismantling Project
SEA	Strategic Environmental Assessment
SQEP	Suitably Qualified and Experienced Personnel
UK	United Kingdom