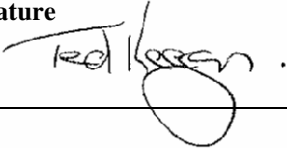




LLW FACILITIES STAGE 2
ENVIRONMENTAL STATEMENT ADDENDUM
NON-TECHNICAL SUMMARY
MARCH 2008

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Signature 	Signature 	Signature 
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This report has been prepared by Jacobs Babtie for UKAEA.

Publication Details

This document is a Non-Technical Summary (NTS) of the contents of the Environmental Statement (ES) and subsequent Addendum (ESA) for the New Low Level Waste (LLW) disposal Facilities at Dounreay. Printed copies of the complete ES and ESA can be viewed at the following locations:

The Highland Council
Planning and Development
Service
Council Headquarters
Glenurquhart Road
Inverness
IV3 5NX

The Highland Council
Council Offices
Market Square
Wick
Caithness
KW1 4AB

Thurso Service Point
Council Offices
Rotterdam Street
Thurso
Caithness
KW14 8AB

Thurso Library
Davidson's Lane
Thurso
Caithness
KW14 7AF

Wick Library
Sinclair Terrace
Wick
Caithness
KW1 5AB

Dounreay Post Office
Buldoe
Dounreay
Caithness
KW14 7YB

dounreay.com
Public Information Centre
7 Traill Street
Thurso
Caithness
KW14 7BJ

This NTS and the ES and ESA will be available on the Dounreay Site Restoration Limited (DSRL) website at www.dounreay.com

Additional copies of the NTS, ES, and the ESA are available from:

Marie Mackay
Dounreay Communications Department
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Copies of the NTS are available free upon request. Paper copies of the ES and ESA are available at a cost of £100. A CD version is available free upon request. Alternative formats of this publication, including large format and audio cassette are also available on request.

The submission of the amendments to the Planning Application and associated ESA for the proposed New LLW Facilities will be followed by a 4-week period, during which any person wishing to make representation regarding the Planning Application and/or the ES and ESA should lodge it in writing to the following address:

David Mudie
Acting Head of Development and Building Standards
The Highland Council
Planning & Development Service
Glenurquhart Road
Inverness
IV3 5NX

Introduction

Background

On behalf of the Nuclear Decommissioning Authority (NDA), UKAEA is implementing a programme of decommissioning and site restoration for its nuclear installation site at Dounreay in Caithness, Scotland. The programme will involve the gradual dismantling and removal of facilities on site over the course of the next 20 years. To facilitate this, UKAEA has developed proposals for New LLW Facilities at Dounreay. From 1st April 2008 responsibility for the programme of decommissioning and restoration works at Dounreay transfers from UKAEA to DSRL. This includes responsibility for the proposed New LLW Facilities.

An Environmental Impact Assessment (EIA) of these proposals has been undertaken and completed as required by the *Environmental Impact Assessment (Scotland) Regulations 1999*. The findings and the mitigation measures to be undertaken are published in an ES.

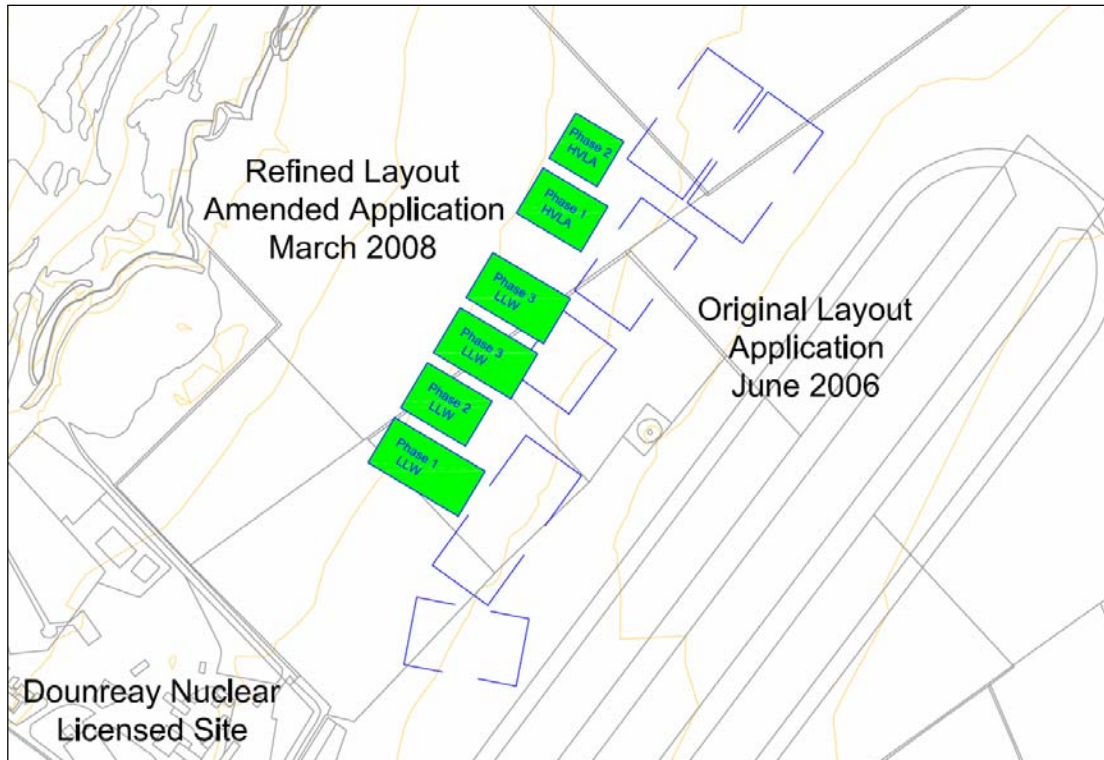
Following submission of the original Planning Application and ES in June 2006, The Highland Council consulted with a number of statutory consultees. The Scottish Environment Protection Agency (SEPA) requested an 18 month extension to the determination period to better understand the proposals prior to submitting its advice. UKAEA supported this request and therefore asked the Council for a formal extension to the planning determination period.

In keeping with the overall programme of works to support the development of the scheme UKAEA commissioned a number of additional studies in the intervening period since June 2006. These studies are all as required for such facilities and support the Radioactive Substances Act disposal authorisation application that is to be submitted to SEPA. Further detailed site characterisation work has been conducted on the geology, hydrogeology and geotechnical properties of the development area, as well as additional surveys on local ecology, wintering birds, geophysical and groundwater conditions. In addition, further site design work has refined the optimal layout of the proposed scheme.

Taken together, the improved site characterisation data and the refined design have resulted in a requirement for an amendment to the original Planning Application.

In brief, this amended scheme re-locates the disposal vaults several metres seawards and to the North, however they remain within the originally identified application area. The amended design also reduces the footprint of the vaults area by approximately 50% by constructing deeper vaults within a more efficient configuration.

Having taken the advice of The Highland Council, this ESA has been prepared by Jacobs to accompany the amended Planning Application for the proposed New LLW Facilities. For ease of reference, an overview of the vault layout for the original and amended application has been prepared.



From the EIA perspective, the overall effect of the amendments to the proposed scheme has been to further reduce the residual impacts of the development on the environment in a number of respects. In other words, the overall effect of the proposed changes has been beneficial in terms of environmental impact.

The proposal has been duly amended and, in accordance with current best practice, an Addendum to the original ES has been prepared to examine the impact of the revised proposal and any other developments since June 2006.

This booklet provides a Non-Technical Summary of the ES and the ESA as required by the EIA Regulations.

The Site

An area of land owned by the Nuclear Decommissioning Authority (currently tenanted) and located adjacent to the eastern boundary of the existing Dounreay licensed site has been selected for the construction of the New LLW Facilities. This site was selected after consideration of a range of factors during the EIA process including:

- Environmental issues
- Stakeholder issues
- Physical constraints
- Technical constraints

The chosen location benefits from meeting a range of criteria important both technically and from a stakeholder perspective. Technical considerations included its elevation and distance from the coast, such that the facilities are unlikely to be affected by coastal erosion and inundation over the next 10,000 years. Importantly, the site will be visually

unobtrusive and yet be located adjacent to the existing Dounreay site from where the waste will come. Further details of the site selection process are provided in Chapter 3 of the ES and ESA.

Need for the Scheme



Over the next 20 years most of the buildings on the Dounreay site will be decommissioned and demolished. As decommissioning progresses, the low level waste currently on site and that which will be produced as decommissioning is implemented has to be effectively managed. It is estimated that between 64,000m³ and 109,000m³ of packaged LLW and High Volume Low Activity (HVLA) waste will be produced from existing and new arisings. HVLA is a sub-category of LLW and is less hazardous than LLW and can therefore be managed in a more simple manner.

The existing authorised disposal facility on the Dounreay site, Pits 1 to 6, has been used over the past forty years to dispose of Dounreay's low level waste. This facility is now full and, as an interim measure, current LLW arisings are being managed at an authorised storage facility known as Whatling's Hangar and a purpose built interim store. The planned retrieval of waste from the existing disposal facilities would contribute an additional 66,000m³ of packaged LLW volume to the new facilities.

LLW will continue to be managed temporarily in these above ground interim storage facilities prior to the proposed sub-surface disposal facilities becoming operational (The Highland Council Reference No. 00/00354/FULCA). This waste will then be transferred to the new disposal facilities when they are available.



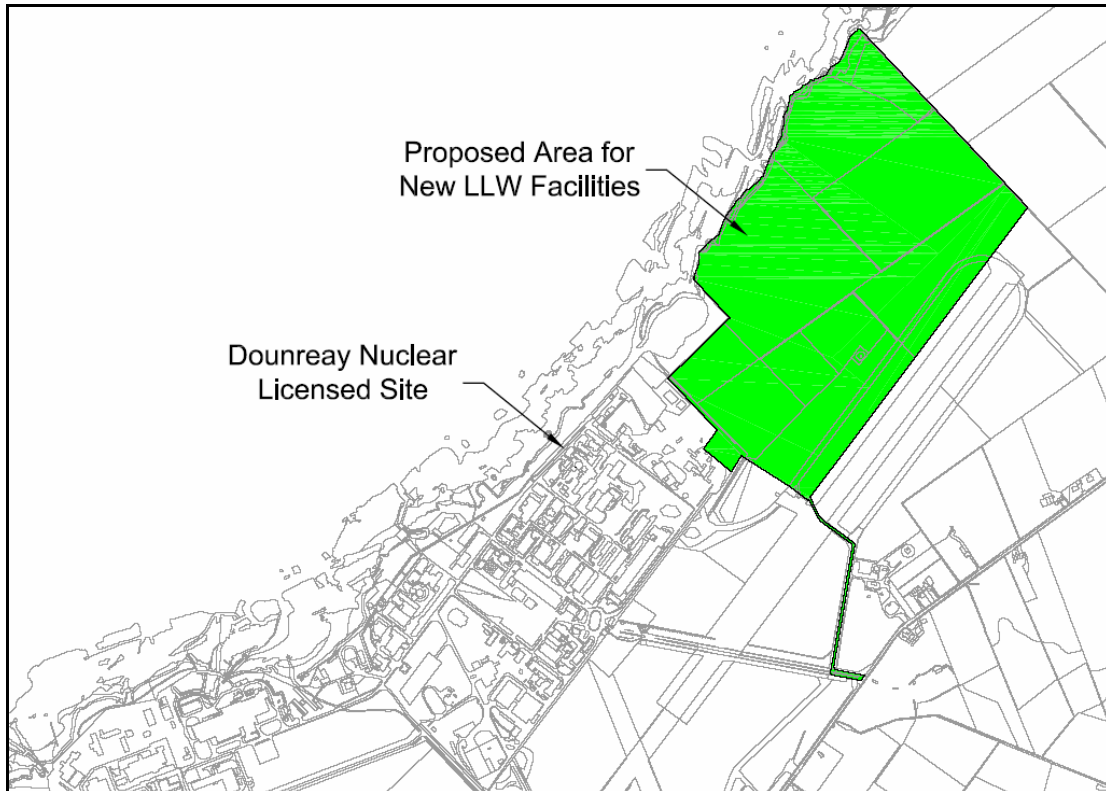
Currently, UKAEA has no authorisation to dispose of operational or decommissioning Dounreay LLW and HVLA elsewhere and solutions for the long-term management of both the already disposed and future LLW arisings are therefore a necessity to enable decommissioning of the site to proceed.

Prior to the proposed facilities taking receipt of waste, an 'authorisation to dispose' is required from SEPA under the Radioactive Substances Act 1993 (RSA 93). The application for this authorisation is to be supported by an Environmental Safety Case and a Best Practicable Means appraisal. The authorisation will be reviewed by SEPA at regular intervals until consent for closure of the facilities is ultimately sought in 2024.

Summary Description

The Planning Application submission describes the provision of New LLW disposal Facilities capable of accepting all existing and future solid LLW waste arisings from the Dounreay and Vulcan sites. The development proposals consist of the construction of engineered, sub-surface vaults into which the LLW will be placed. Constructed in three separate phases, the vaults will be closed when full by the installation of an engineered cap after removal of the temporary barrel shaped roofs. The cap will include an anti-intrusion layer of previously excavated rock, covered with soils and will be grassed over. The capped facility will reinstate the existing landforms at the site and will be designed to merge with the surrounding landscape pattern. Ancillary facilities will include a grouting plant, for cementing some of the waste prior to disposal, a pump control building and an administration building. It is proposed that these facilities will be decommissioned upon closure of the vaults.

It is intended to develop the proposed New LLW Facilities in three phases each of which is addressed in the EIA process. Phase 1 will accommodate the minimum predicted waste volumes. The full extent of Phases 2 and 3 will only be confirmed as the site decommissioning progresses and waste volumes are refined. For example there may be an opportunity to engineer smaller vault sizes at the start of Phase 2 when volumes can be predicted more accurately. Phase 3 will accommodate the LLW arising from the planned retrieval of the waste in the existing disposal facility (Pits 1 to 6). To ensure that all of the environmental issues were identified and fully addressed the EIA considered the maximum volumes envisaged.



Development of a Strategy for Dounreay LLW

The Dounreay Solid Low Level Radioactive Waste Overall Strategy was published in March 2005 and is the key overarching document for LLW management at Dounreay. The LLW Strategy describes both short and long term strategies, varying from waste minimisation to disposal options. The strategy is supported by a Best Practicable Environmental Option (BPEO) study which assessed various long-term management options for solid LLW arising from Dounreay.

The use of a BPEO analysis to support the decision-making process and strategy development is consistent with UK best practice. The BPEO study was supported by more than sixty individual technical assessments and reports. In addition to the technical work, three stakeholder workshops were held to review the options and identify the relevant issues considered important by the stakeholders. These workshops were followed by a three-month period of public consultation. The report on the BPEO study, published in April 2005, identified that the BPEO for the long-term management of LLW was to construct new shallow sub-surface disposal facilities at Dounreay.

The Proposed Scheme

The ES and ESA are based on a scheme design which is described in the following section. The final design will be required to have no greater impact than that described in the ES and ESA.

Proposed Facilities

The site of the proposed development is immediately adjacent to the eastern boundary of the existing Dounreay nuclear licensed site, with the associated grouting plant located within the existing site boundary. The majority of the site is located on land used for grazing purposes. Parts of the nearby former airfield, located to the south-west of the proposed facilities, are currently used as Dounreay site car parking and this will be unaffected by the proposed development. The revised proposals are more condensed and directly affect a smaller proportion of the development site area than was previously the case.

The new facilities will be in the form of shallow sub-surface vaults and require excavations to a near vertical profile to a depth of between 17 and 20 metres, much of which is in rock. The overlying soil and clay layers will be excavated to a more gently sloping profile.

The proposed vaults will be constructed with reinforced concrete bases and walls and will be covered by temporary roof structures during the operational stage. Design development examined alternative roof types and colours, and the final selection considered landscape and visual impacts.

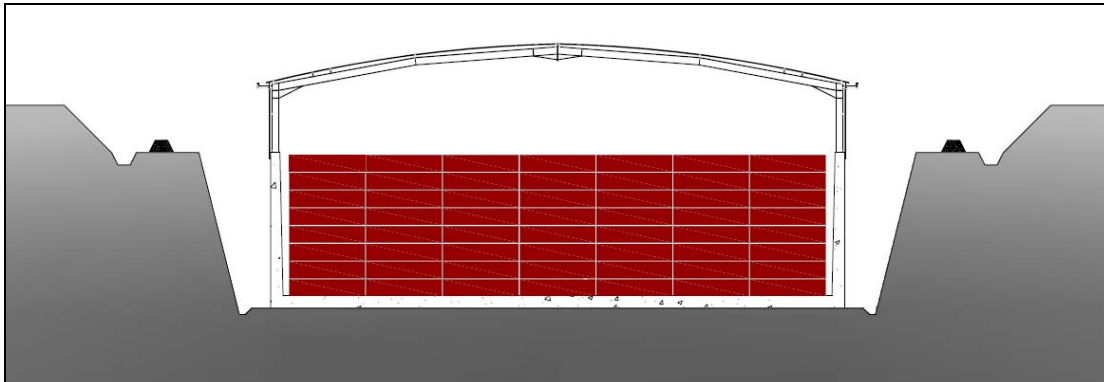


The infrastructure for the facilities will comprise:

- A grouting plant where the LLW packages will be grouted internally prior to placement within the vaults
- A single storey administration building
- A drainage and discharge system with a water treatment area and pump control building
- A perimeter security fence with access gates
- Site roads with footpath and lighting
- Services to the new installations

Surface water and groundwater will be intercepted to prevent it coming into contact with the waste during operations. Intercepted water will be discharged through a new drainage system which has the capability of being sampled or monitored as required.

The basic infrastructure for the facilities will be installed in the initial phase of work, when the site will be under the control of the construction contractor. Construction and operational safety issues within the facilities will be under the statutory regulation of the Health and Safety Executive.



Waste Packages

The new facilities may be required to accept up to 175,000 m³ of packaged or bulk LLW and HVLA, which will be consigned to separate vaults. Waste will generally be packaged in containers similar to Half Height Isofreight (HHISO) containers. For initial design and planning purposes HHISOs have been adopted as the reference waste package. It is anticipated that different containers may be developed as part of the design process.

Average LLW disposal volumes are currently estimated at around 650 HHISOs per annum, noting that actual annual arisings will fluctuate depending on the Dounreay decommissioning programme.

Initially the backlog of waste stored in the interim facilities will be cleared. The filled waste packages will be transported from the plants on the existing Dounreay and Vulcan sites to the grouting plant and thereafter to the vaults through an existing gate in the east boundary fence.



Grout Production and Operations

All LLW waste containers will be filled with grout at the grouting plant prior to being placed in a vault. The grout immobilises and shields the radioactivity within the waste and will also provide some support to the lid and cap upon closure of the vaults. HVLA will not need to be grouted, because of the lower hazard associated with this type of waste.

Closure Stage

Once the vaults are full, any voids around the LLW containers will be in filled with grout. The grout will provide long term stability of the stacked waste packages and will support the overlying lid and cap in perpetuity. It will also restrict movement of groundwater through the waste. Again the lower hazard associated with the HVLA means that grout backfill is not required, with sufficient containment being provided by the concrete vault base and walls along with a low permeability flexible lid.

Following backfilling of the vaults, the roof, wall cladding and associated steelwork will be removed. Suitably engineered caps will then be installed over the vaults along with reinstatement of the final landform.

Environmental Assessment

The EIA has been carried out as an integral part of the New LLW Facilities scheme design development and appraisal. A summary of the main impacts on each environmental issue is discussed in the subsequent sections of this NTS. A more detailed assessment of impacts and mitigation measures is provided in the ES and subsequent ESA.

Environmental Issues and Constraints

As previously stated, the site of the proposed development is immediately adjacent to the eastern boundary of the existing Dounreay nuclear licensed site, with the associated grouting plant located within the existing site boundary.

The general arrangements of the facilities and the key environmental features in the area are shown within the plans submitted with the Planning Application and the figures within Volume 2 of the ESA. The key environmental features and other issues have been identified from a range of environmental studies and consultations and comprise:

- Potential sea level rise scenarios in conjunction with coastal erosion. A sea level rise, which would impact up to the 20m contour (a rise of approximately 10m above existing sea level), with an allowance for 100m of coastal erosion has been taken as a constraint on the facility location. Since the summer of 2006, the opportunity has been taken to further investigate the data and assumptions in relation to potential sea level rise and Jacobs remains confident that a safe and reasonable position has been adopted. This is discussed in more detail within the Environmental Safety Case.
- Geological and hydrogeological investigations. From the outset, the project has involved the investigation of the underlying bed rock. Construction of the vaults on major geological faults is to be avoided for construction and long term safety reasons. Since 2006, extensive site drilling work has considerably improved the understanding of the site geology and for this reason the proposal has been amended. Simply put, the site characterisation works in 2007 found the Geodh nam Fitheach fault to lie within the original vault footprint and the amended proposal avoids this fault by re-locating the facility slightly to the North of the original intended location.
- Nationally and regionally important cultural heritage sites in the area which include the scheduled monument Cnoc na h'Uiseig
- The open and largely rural landscape which enables long distance views in most directions
- The opinions of near neighbours and other stakeholders
- The presence of coastal heath and grassland
- Water courses in the vicinity, including the Mill Lade
- The existing low level waste disposal issues constraining decommissioning progression of the Dounreay site

Consultations



As part of the EIA process, a comprehensive consultation exercise was carried out (and this has been augmented by other meetings since the submission of the original application) whereby a wide range of stakeholders, including government agencies, non-government organisations, landowners, neighbours and tenants were contacted to inform them of the proposals and to request comments and any relevant information concerning the scheme. This exercise assisted in the identification of possible environmental impacts and the selection of appropriate study methods and mitigation measures. The consultation responses have also enabled the EIA to focus on the most important environmental issues. The following key issues were identified and have been addressed in the ES and ESA:

- Nuisance factors for near neighbours
- Stakeholder opinion
- Effects on groundwater
- Impacts on the landscape and views due to the open nature of the area
- Impacts on areas and sites of historic importance
- Effects on coastal heath habitat and breeding and wintering birds

Environmental Impact Assessment

The EIA considers all three phases of the proposed facilities and the maximum volume of waste envisaged. This ensures that that all environmental issues are identified and addressed.

The following sections outline the main issues and findings of the EIA in terms of the assessed impact of the proposed New LLW Facilities on the following:

- Policies and Plans
- Geology and Contaminated Land
- Surface Water and Ground Water
- Waste Management
- Ecology and Nature Conservation
- Landscape and Visual
- Archeology and Cultural Heritage
- Air Quality
- Noise and Vibration
- Traffic and Transportation
- Socio-Economics
- Land Use

Policies and Plans

The proposed New LLW Facilities were assessed in terms of compliance or conflict with relevant planning policies and guidance at national, regional and local level. It was found that the proposals generally comply with all the relevant policies and guidelines. These policies have continued to develop and evolve since the time of the original application and the proposals remain consistent with current policies and guidelines.

The Scottish Government is also responsible for providing a policy framework to manage the safe disposal of radioactive waste. In terms of LLW this is provided by the Policy for the Long Term Management of Solid Low Level Radioactive Waste in the United Kingdom which was published in March 2007. The Scottish Government has confirmed that this is the adopted policy basis in Scotland.

The Caithness Local Plan 2002 confirms The Highland Council's preference for maintaining the site as a location for large-scale business and industrial activities, particularly in view of the major site infrastructure that exists. However, in view of its strategic significance, the issue of radioactive waste associated with activities at Dounreay is dealt with in more detail in the Highland Structure Plan 2001.

The Highland Structure Plan 2001 confirms the Council's support for the decommissioning and environmental remediation of the Dounreay site. The Structure Plan also supports proposals for the treatment of LLW in accordance with a waste management strategy and recognises that in due course disposal will be necessary.

The Dounreay Planning Framework (2006), published by The Highland Council, provides an updated representation of the Dounreay Site Restoration Plan (DSRP) (2000), and constitutes formal planning guidance for the future decommissioning of the Dounreay site. It stresses that in order to achieve the goals of the DSRP, significant investment in new buildings, infrastructure and facilities will be required. Specific reference is made to the need for the construction of LLW facilities, confirming the Council's support for UKAEA's waste management strategy.

The New LLW Facilities project is an integral requirement for the successful completion of the overall programme of restoration of the Dounreay site.

Geology and Contaminated Land

Dounreay lies in a gently undulating lowland area within the Caithness Plain, between Sandside Bay and Crosskirk Bay. The Dounreay nuclear site is built on the Dounreay Shore geological formation.

There are no sites or features of geological interest either in the proposed development site or in close proximity to it. The rocks and surface deposits that will be affected by the development are typical of a much wider area and there is therefore no impact on scarce or locally restricted deposits. No residual impact is therefore predicted in relation to geology.

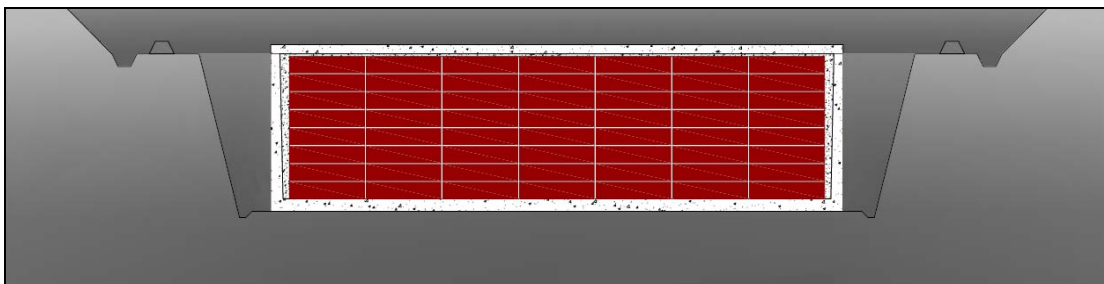
Further site investigation works undertaken since the original application include trenching and the drilling of several boreholes to develop a greater understanding of below ground conditions and allow monitoring of groundwater. Subsurface geophysical surveys were also undertaken during 2007 all of which indicated that the original vault locations lay within the disturbed zone of rock associated with the Geo nam Fiteach fault. Further site characterisation works will be undertaken prior to the construction stage to provide additional information on shallow and deeper geology.

A key objective of these investigations is to identify and characterise any occurrences of ground contamination in the proposed development area. To date the investigations have shown the area to be relatively free from contaminants. However, should contaminated soils be identified or encountered during site works, the contractor will be required to treat and/or remove the contamination in accordance with appropriate guidance and regulations.

Soil storage and handling measures are predicted to produce post closure soil quality at the proposed facilities site that is in line with existing soil quality and no remaining impacts were identified during the EIA.

Surface Water and Groundwater

Potential surface water impacts can include changes to the pattern, speed and volume of surface water flows which could alter catchment systems or create a flood risk situation. Minor alterations in the local pattern of groundwater flows will be induced by the required sub-water table excavations during construction, operation and to a lesser degree following closure due to the capped, impermeable grouted vaults.



The adoption of appropriate site practices and emergency procedures will minimise the risk to groundwater and surface water from accidental pollution during construction and closure works.

Following closure of the facilities, consideration has been given to the risk of pollution leaching from the vaults into groundwater and from there to surface waters. The Best Practicable Means approach to the vault design has resulted in performance modelling which confirms radioactive release well below existing dose levels and environmental target levels. Further details are provided in the Environmental Safety Case.

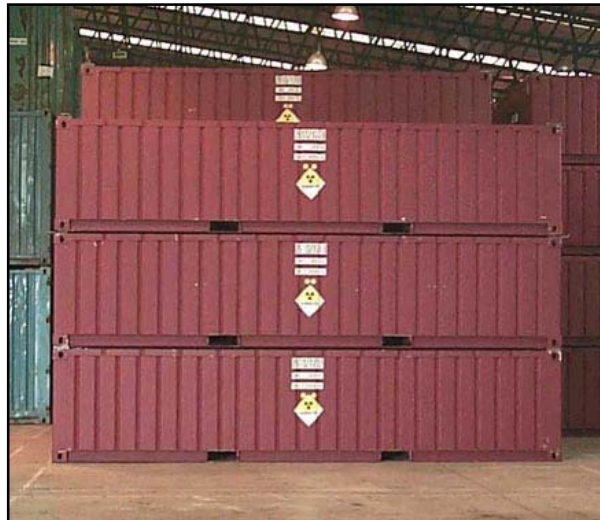
The residual impacts identified during the EIA are considered to be of negligible significance, with the exception of a slight impact on local groundwater flow patterns during construction and operation stages.

Waste Management

Wastes arising during all phases and stages of the new facilities will be managed through the application of appropriate procedures in accordance with relevant legislation. Waste prevention and minimisation measures will be incorporated in the Employer's Requirements for the Design and Build contractor and will be consistent with existing measures employed at Dounreay.

Waste effluents will be directed to a specifically designed waste water treatment and discharge area. This will include surface waters and groundwater arising during construction phases and grey waters arising from the administration building and grouting plant during operational activity.

Conventional solid wastes arising during construction and closure will include site clearance debris, waste materials and arisings from temporary office and welfare facilities. Operational wastes will be limited to arisings at the administration building and at the grouting plant and it is likely that a waste management contractor will be employed to deal with these wastes in a manner consistent with current practices at Dounreay.



Should solid radioactive waste arise during operational activities at the New LLW Facilities, it would be treated as other LLW and be placed in a container for disposal in the facilities. There is a small potential for very low level radioactive waste to arise at the grouting plant during operation. This could occur where particulates present in the air displaced from the containers by the grout are captured in the air extraction filters within the ventilation system that serves the grouting process. Potentially other wastes might arise as a result of an unplanned occurrence or accident. All operations and processes will be the subject of dedicated safety studies during the development of the design to ensure measures are in place to either prevent or deal with such unplanned events.

Ecology and Nature Conservation

There are no designated areas of nature conservation at the proposed development site or in the near vicinity.

The proposed facilities will be constructed in an area which is partly improved pasture used for grazing and partly coastal heath which is used as occasional rough grazing. The species rich semi-improved grassland provides valuable habitat, food and shelter for invertebrates and small mammals and a source of food and nesting opportunities for ground nesting birds. There are known breeding and wintering bird species of note using this area.



Targeted flora surveys have confirmed the presence of Scottish Primrose (*Primula Scotica*) and some eyebrights, a national priority species. The amended design layout has reduced the extent to which the proposals impinge on these locations. As the scheme evolves consultations will continue with Scottish Natural Heritage (SNH) and The Highland Council to prepare a post-closure restoration plan for the site.

Prior to the start of site clearance and construction activities, a post-closure site restoration plan will be drawn up in consultation with SNH to ensure an agreed habitat management strategy. This strategy will be in place through the years of construction and operation with an ultimate habitat restoration phase once the vaults have been closed.

Any potential impact on breeding birds will be reduced by initiating site clearance activities prior to the breeding season which extends from March to August. Traditional methods for bird scaring prior to and during clearance of vegetation will ensure breeding and wintering birds that use the area will not be significantly impacted.

Coastal heath is considered to be of national importance. Although there is only a fragment of this habitat present at the proposed location of the new facilities, its loss was assessed as being of major significance and reinstatement may be difficult. To reduce this impact species rich areas of the habitat will be avoided where feasible in order to provide refuge species that can re-colonise the area following the closure of the facilities.

There are otters and bats present in the Dounreay area but their range is such that their activity lies outside the proposed construction area. Nevertheless, some measures will be taken to further ensure that the proposed development is unlikely to have any impact on these species.

The Employer's Requirements for the Design and Build contract will require all contractors to work to SEPA pollution prevention guidelines and employ industry best practice construction methods and techniques to minimise damage to habitats and species. Approved construction method statements will be obligatory for all activities. Further specific mitigation measures are provided in the ES and ESA which seeks to reduce most predicted impacts to a minor or negligible level of significance.

Landscape and Visual

The region is generally fairly flat and open rolling countryside, with hills west and south of the area. The highest hills are Beinn nam Bad Mor, 300m; Beinn Ratha, 250m; and Beinn Freachdainn, 240m; which overlooks Loch Shurrery.



The majority of the study area consists of long sweeping slopes, broad valleys, or relatively flat raised beach terraces adjacent to the coast, becoming more open and rolling inland. Dounreay and the proposed development site are located in a shallow basin within the coastal raised beach between the shallow valley of Forss Water and Sandside Bay.

Overall the proposed scheme will result in less adverse landscape and visual impacts than previous options considered, in particular, the option where the vaults would have been located further to the south-east on the redundant airfield. In this previously discounted option the vaults, grouting plant and administration building were located in a position remote from the existing facilities at Dounreay and on higher, more prominent ground, closer to sensitive dwellings.

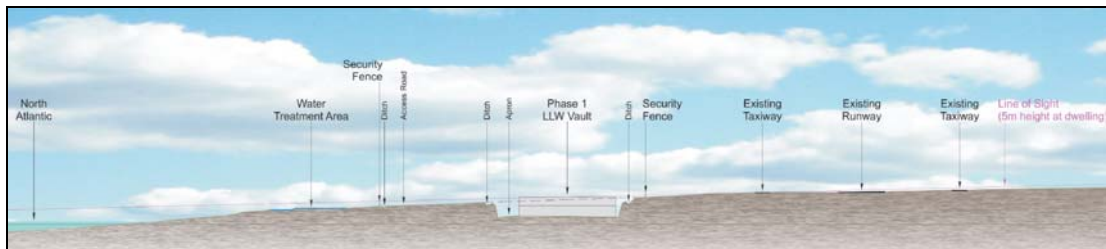
The most significant landscape impact will be in the Coastal Plain, which is of high sensitivity and within which the majority of the proposed development will lie. The presence of the existing Dounreay site locally reduces the sensitivity of this area, but adverse impacts during construction and closure have been assessed as being significant. After closure of the facilities, this impact will be nil.

Although the revised vault layout is more condensed than earlier proposals, indirect landscape impacts in areas from which the development and construction operations will be visible will peak during the operation of Phase 3 and closure. This is due to the fact that by this time, the decommissioning of Dounreay will have resulted in the removal of a great deal of the existing industrial buildings and structures.

The most significant visual impacts were assessed as occurring during the construction and closure stages of the scheme when between six and sixteen receptors will be affected. Significant visual impacts from the operational phases of the development will be limited to a small number of nearby receptors.

It has been possible to mitigate potential impacts of the proposed scheme to a significant extent through careful siting and design of the proposals and measures to further reduce adverse impacts. The most significant landscape and visual impacts will be temporary, occurring during construction and closure operations, the latter involving the most extensive disturbance and greatest impacts.

Once the facilities have been closed and the site has been landscaped and re-seeded, visual impacts were assessed as negligible with no remaining significant visual impact into the future.



Archaeology and Cultural Heritage

A total of nine sites of archaeological significance were identified within or near to the proposed site boundary largely comprising cairns, structures and modern buildings. One site, a chambered cairn known as Cnoc na h'Uiseig, is of National Importance and the remaining sites are of local or negligible importance.



Two of the identified sites will be disrupted through direct physical disturbance during the Phase 1 development. The revised layout increases the clearance between the vault locations and the chambered cairn to further reduce any prospect of the development affecting the cairn.

Construction may affect additional unidentified archaeologically sensitive remains or deposits associated with it. However, measures are proposed to ensure that an archaeological assessment is carried out in advance of the works in order to minimise disturbance to any such unidentified sites, in agreement with Historic Scotland and The Highland Council. The occurrence, magnitude and significance of this potential impact cannot be confirmed or assessed until site clearance begins.

A further 38 areas/sites of potential cultural heritage significance were identified lying beyond the site boundary. The setting of these sites could be affected by the proposed development. During the operational stage impacts on cultural heritage will only be of an indirect and visual nature with the features of the proposed development changing the setting of the archaeological sites both within the development site and in the wider area. These indirect impacts were assessed as being of varying significance but all are a temporary indirect impact for 30 years until the post-closure stage of the facilities when the landscape will be largely restored.

Mitigation of direct impacts has been incorporated through site selection and layout design to avoid important archaeological sites. For those sites where *in situ* preservation is not possible, a programme of archaeological evaluation by geophysical survey, trial trenching and set piece excavation/recording of known sites is intended. The details of this will be agreed with The Highland Council as part of a detailed Written Scheme of Investigation. The residual direct impacts on archaeological remains were judged to be of moderate significance, however it is considered that these can be mitigated to a negligible level by archaeological recording.

Air Quality

The EIA found that potential air quality impacts associated with the proposed development were not considered to be significant. However, during the construction phases, particularly during excavations when large numbers of vehicle movements across the site are expected, air quality impacts will arise. These will principally comprise vehicle and equipment exhaust emissions and dust, which could occur during periods of dry weather.

Road traffic emissions, equipment, machinery and grouting plant emissions and dust deposition during operational activities were assessed through the EIA as having a less than 1% contribution to average concentrations at the nearest sensitive receptor and predicted environmental concentrations of less than the relevant air quality standard objective.

In terms of air quality, the nearest sensitive receptors are the residents at Buldoo. Following measures taken to prevent or reduce air emissions the development was assessed as having, at worst, a minor effect on air quality for a temporary period of time during the construction and closure stages. The revised layout results in the main construction activities taking place further from the Buldoo properties, thus reducing any potential negative impacts.

There will be no nuisance to the residents from air emissions caused by operation of the facilities and there will be no air emissions following closure of the facilities.

Noise and Vibration

Existing noise levels in the vicinity of the proposed facilities arise from a variety of natural and human sources. The principal sources are existing Dounreay site activities, road traffic, domestic activities, agricultural equipment and farm animals, breaking waves and wind generated noise.

During the construction stage of the proposed development, potential noise and vibration impacts arise through traffic on local roads and onsite, heavy machinery in use, particularly during excavation activities and concreting operations. Noise assessment calculations have been carried out and noise contours prepared to show the potential impact on local receptors based on a worst case scenario. The worst case was calculated to occur during the initial excavation stages of the construction phases.

Excavation was shown to have the potential to generate a moderate adverse noise impact at the closest sensitive receptor, with a negligible vibration impact. However, with appropriate measures to reduce noise levels at source and by barriers, it is considered that the noise impact could be reduced to slight. The noise and vibration impacts of construction traffic were considered to be negligible. Again, the revised layout results in the main construction activities taking place further from the Buldoo properties and consequently reduces any potential negative impacts. Further site characterisation works during 2007 have indicated that the material to be excavated in the shallow zone is relatively easily dug with resultant benefits in duration and noise level impacts during the construction phases.

Construction contractors will be required to comply with relevant guidance and ensure all plant and machinery is properly maintained and fitted with appropriate silencing equipment. Super-silenced equipment will be strongly recommended in addition to best practices such as ensuring enclosure panels are kept closed, fitting the most efficient exhaust silencing systems to heavy plant, dampening drill bits to reduce ringing and ensuring there are no leaks in air lines for pneumatic equipment.

Before work starts, the contractor will be required to carry out a detailed noise assessment to ensure the noise impacts of the particular equipment chosen are kept to an acceptable level.

Operation of the facilities has the potential for noise and vibration impacts due to the transporting of waste from the main site and into the disposal facilities and through the operation of the grouting plant. The EIA established that these activities are not considered to cause a significant noise impact at any sensitive receptors.

Although heavy plant will be required for closure activities, it is unlikely that the amount of plant will be comparable to that in use during the excavation of the vaults and therefore noise levels were not expected to be significant.

No noise emitting activities will occur at the site once closure and reinstatement activities are complete.

Traffic and Transportation

No significant impacts on the local transport infrastructure are expected during any stage of the development. This is due to the requirement for the excavated material to be retained on site for re-use at closure, thus minimising haulage off-site. Traffic issues are also eased by the connection of the new facilities to the existing Dounreay site via a gate in its eastern boundary.

Analysis shows the junctions to be operating at a satisfactory level, whilst in reality the impact on junctions will reduce over time, as staff numbers at Dounreay decrease. The existing road network is considered sufficient to accommodate both the additional worker trips and Heavy Goods Vehicles (HGV) flows expected during the construction period. Increased waiting times, by a number of seconds, may occur at the Dounreay site entrance junction with the A836 public road during both the am and pm peak hours. This can be avoided by ensuring start and finish times for construction workers do not coincide with those of existing workers at Dounreay.

In this same way, cumulative impacts due to concurrent activities with other construction developments at Dounreay can be minimised by agreement on delivery timing and worker hours.

Land Use and Socio-Economics

UKAEA has been deeply involved in the socio-economic well-being of Caithness since the existing site was constructed in the 1950s and, with the NDA, is involved in a wide-ranging selection of activities and initiatives to the benefit of the community. The Dounreay decommissioning process is providing an opportunity to diversify the economy of the region through inward investment and indigenous business growth.

The closest residential building (adjacent to the A836 public road at Buldoo) lies 0.58km from the proposed New LLW Facilities. Reay, 2km to the southwest, is the closest settlement of any size (population 300) with Thurso (population c.9000) being the closest town some 13km to the east of Dounreay.

The land on which the proposed New LLW Facilities are to be located is owned by NDA and is currently used by tenant farmers on agricultural lets. The area of the proposed facilities extends to around 40 hectares and is largely improved or semi-improved grass used for livestock grazing. Impacts related to land take and soil compaction were assessed as negligible as they will be localised and temporary in nature. A post-closure site restoration plan will be developed to ensure that the land is made available for suitable reuse where appropriate with more than 50% of the original application site being returned to original use at closure. It is not anticipated that construction, operation, closure or post-closure activities will cause access restrictions to other parts of the Dounreay site or NDA owned land.

Residual socio-economic impacts of the proposed New LLW Facilities were considered to be largely beneficial over the short to medium term. Most positive impacts will be felt during the construction phases when a significant number of temporary jobs will be created and these are expected to be staffed principally by local personnel. Local financial influx linked to project development is also anticipated. The New LLW Facilities development is a major capital project and estimated to cost several tens of millions of pounds. A significant portion of this money will be spent in the region, mostly during the construction phases and at closure. Hence, a positive moderate financial input into local economy is expected, particularly in terms of employment and amenity resources, and to a lesser extent through the use of local materials and suppliers. A negligible benefit will be incurred during operation given the limited number of expected job requirements (maximum 12 people) although there may be a minor beneficial impact should fabrication of the waste containers be carried out locally.

As the proposed New LLW Facilities are fundamental to the Dounreay decommissioning process, significant socio-economic impacts would arise if the project were not to proceed. This would lead to the stalling of decommissioning works with an associated negative impact on employment and the local economy. It would also lead to less effective management of the nuclear wastes at Dounreay.

Summary

The benefits of this proposal extend far beyond the management of LLW. The proposed New LLW Facilities will allow the continued restoration of the Dounreay site and bring direct benefits to the local area in terms of economic development and the safeguarding of jobs.

All of the environmental impacts associated with the scheme have been subject to thorough assessment and mitigation measures identified. The residual impacts of the scheme have been established and are reported in detail within the ES and ESA submitted with the Planning Application.