DEEP REPOSITORY PROJECT

Site Selection
Planning & Non-nuclear Environmental Appraisal
UK NIREX LTD

DEEP REPOSITORY PROJECT

SITE SELECTION

Planning & Non-Nuclear Environmental Appraisal

Draft Report
December 1988

Appendices

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<table>
<thead>
<tr>
<th>Contents</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preface</td>
<td></td>
</tr>
<tr>
<td>Appendix 1 ALTNABREAC</td>
<td>1.1</td>
</tr>
<tr>
<td>Appendix 2 BRADWELL</td>
<td>2.1</td>
</tr>
<tr>
<td>Appendix 3 DOUNREAY</td>
<td>3.1</td>
</tr>
<tr>
<td>Appendix 4 FUDAY</td>
<td>4.1</td>
</tr>
<tr>
<td>Appendix 5 KILLINGHOLME</td>
<td>5.1</td>
</tr>
<tr>
<td>Appendix 6 POTTON ISLAND</td>
<td>6.1</td>
</tr>
<tr>
<td>Appendix 7 SANDRAY</td>
<td>7.1</td>
</tr>
<tr>
<td>Appendix 8 SELLAFIELD A &amp; B</td>
<td>8.1</td>
</tr>
<tr>
<td>Appendix 9 STANFORD</td>
<td>9.1</td>
</tr>
<tr>
<td>Appendix 10 OFFSHORE WEST &amp; EAST</td>
<td>10.1</td>
</tr>
</tbody>
</table>
Preface

This volume of Appendices contains the background information and maps for the potential repository sites subject to the evaluation using the multi-attribute decision analysis.

The information has been gathered from published sources (e.g. local and structure plans), with no discussion between the consultants and local authorities or government agencies. As many of the details for the development have not been decided at this stage, assumptions were made regarding location, scale, transport etc. The evaluation has been made on the basis of these assumptions and the available data.

Each Appendix contains information and comment on the site characteristics, development proposals, community, local economy and natural environment around the land-based repository sites and the ports allocated for the offshore sites. The sites and ports considered are:

- Altnabreac
- Bradwell
- Dounreay
- Fuday
- Killingholme
- Potton Island
- Sandray
- Sellafield A & B
- Stanford
- Offshore West: Hunterston
- Offshore East: Redcar/Teesmouth
APPENDIX 1

Altnabreac
CONTENTS

SECTION

1.0 SITE CHARACTERISTICS 1.1

2.0 DEVELOPMENT PROPOSALS 1.2

3.0 COMMUNITY 1.3

4.0 LOCAL ECONOMY 1.5

5.0 NATURAL ENVIRONMENT 1.8

Following Text:

- 1:250,000 Location Map
- 1: 50,000 map with overlays showing development proposals designated areas and planning policy areas
- 1:100,000 map of population statistical areas
- 1: 50,000 map showing location of cross section and photographs
- cross section diagram
- photographs
1.0 SITE CHARACTERISTICS

Location: Highland Region
           Caithness District
Size: 1,620 hectares (4,000 acres)
Ownership: Private
Land Use: Peat bog and forestry (in "flow country")
Topography: flat/gently undulating
Grid Reference: ND 0650

1.1 The potential repository site near Altnabreac is situated in a remote part of Caithness some distance from any road or settlement but near the railway line (see maps). Most of the land is on blanket peat bog, with the numerous small lochans characteristic of the "flow country".

1.2 Some of the land in the area has been planted with trees, either by private companies or the Forestry Commission. The Commission owns an area of land - Braehour - just east of the potential site and land - Carn Nam Muc - east of Loch More. The latter, which is 5km from the site, had a planting application blocked in June 1988 by the Secretary of State for Scotland on nature conservation grounds.

1.3 The B870 road from Westerdale to the A895 at Mybster is single track with passing places. From Mybster, it is approximately 20km south to the A9(T) at Latheron.

1.4 The site is adjacent to the single track Highland rail line from Inverness to Thurso and Wick. About 14km up the line is Georgemas Junction, from where single track lines go to Thurso and Wick. Scotscalder station is some 7km up the line from the site.

1.5 The nearest harbour facilities are at Scrabster and Wick. Both these are limited in extent and subject to restricted access by weather conditions. Both are fishing ports. Scrabster is the terminal for the Caledonian MacBrayne ferry to Stromness, in Orkney.
2.0 DEVELOPMENT PROPOSALS

Assumptions

Land Take: 60ha surface workings
43ha road link

Infrastructure: new 8.5km road link
3.5km road upgraded
rail spur and passing loops

Waste Transport: rail - 497 trains pa

Spoil Disposal: 1m tonnes on site
12.9m te over 50 years - rail to central Scotland (approx 300 trains pa)

2.1 The surface workings have been located adjacent to the rail line and south of Lochan Dubh a'Chracairnie (see 1:50,000 map and red overlay).

2.2 A short rail spur would link the site to the Highland rail line. A new road access would be needed. The route identified by JMP Consultants lies to the east; bypassing Westerdale and linking with the B870, upgraded to its junction with the A895 at Mybster.

2.3 Construction materials and some transport of the workforce is likely to be by rail, with the remainder by road. JMP estimate 300 vehicles per day. Waste delivery and spoil removal would be by rail - amounting to about 2 trains per day.

2.4 The estimated annual labour requirements are:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction:</td>
<td>310 ( 9 years)</td>
</tr>
<tr>
<td>Operation:</td>
<td>330 (50 years)</td>
</tr>
<tr>
<td>De-commissioning:</td>
<td>50 ( 8 years)</td>
</tr>
</tbody>
</table>
3.0 **COMMUNITY**

Dwellings within 2km of site centre: None  
Estimated population within 9km of site centre: 200  
Estimated population density within 9km: 0.01 ppha  
District population density: 0.15 ppha (1981)

<table>
<thead>
<tr>
<th>Settlements</th>
<th>Approx Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>7km to Westerdale</td>
<td></td>
</tr>
<tr>
<td>11km to Halkirk</td>
<td>30 (estimate)</td>
</tr>
<tr>
<td>18km to Thurso</td>
<td>880</td>
</tr>
<tr>
<td></td>
<td>8830</td>
</tr>
</tbody>
</table>

3.1 Based on the 1981 census resident population by civil parish, the population within 9km of the site centre was estimated. As the map shows, there are few settlements within 9km. The estimate was calculated as follows:

<table>
<thead>
<tr>
<th>Parish</th>
<th>Total</th>
<th>Estimated within 9km</th>
</tr>
</thead>
<tbody>
<tr>
<td>Halkirk</td>
<td>1866</td>
<td>150</td>
</tr>
<tr>
<td>Reay</td>
<td>655</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td></td>
<td>170</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(rounded to 200)</td>
</tr>
</tbody>
</table>

3.2 The West Caithness Local Plan (adopted in 1987) states that the population (at the 1981 Census) in the Halkirk -Altnabreac area (including Halkirk, Roadside, Spittal, Westerdale and Altnabreac) was just under 1,600. The nearest dwellings to the site are Strathmore Lodge (4.5km to the south east) and at Dorrery (4.5km to the north).

3.3 Halkirk is the local service centre, with shops, school, hotels and some light industry. There has been a recent upsurge in residential development, which the Regional Council attribute to "ready availability of serviced land and demand displaced from Thurso" (Local Plan). There are still a number of areas within Halkirk which have consent for housing development but the Council does not expect growth to be at the same level as in recent years. To-date the pattern of development has been somewhat haphazard and the Local Plan aims to impose greater control "to safeguard future opportunities and enhance amenity".

3.4 The communities around Westerdale, Mybster and Olgrinmore comprise a few houses close together and a scattering of houses and farmsteads.
3.5 Thurso, 18km from the potential site, is the main centre for the area. It has a secondary school and technical college, hospital, swimming pool, sports centre, council offices, library, job centre and shopping centre. The technical college has training links with the Dounreay Nuclear Establishment.

**Disturbance from Development**

3.6 The repository surface works would be visible from the north (Dorrery) and north east (Braehour, Olgrinbeg) but not from Westerdale, which is lower-lying behind Achlibster Hill. Both visual and noise impacts will be likely but the dwellings in question are several kilometres away (see cross sections and photographs).

3.7 The proposed road access will have a greater impact on the community around Westerdale. Visual, noise and severance impacts are likely to affect the village. JMP estimate some 300 vehicles per day, one third using the B870 to the north and the rest using the A895. On the latter, this implies a 20% increase in traffic.

3.8 From present information, neither the repository nor road access appear to affect any archaeological sites.

**Local Nuclear Experience**

3.9 The community near Altnabreac has some experience of the nuclear industry from the Dounreay Establishment, which dominates the Caithness economy and thereby influences the local community.
4.0 ECONOMY

Travel to Work Area (TTWA): Thurso
Unemployment (in TTWA): 11.6% 803 people
Employment in Manufacturing sector (in Highland Region): 11,930
Economy: local - based on primary industries
area - dominated by Dounreay

4.1 The local economy in the Halkirk-Altnabreac part of Caithness is based on the primary sector. Agriculture, forestry, peat working and quarrying are the main sources of local employment, although there is some manufacturing in Halkirk. In recent years large-scale forestry planting has taken place in the area, often on land previously used for sporting purposes.

4.2 The Macaulay Institute Land Capability for Agriculture (LCA) classification puts the land around Altnabreac in class 6.3 - the lowest category, where land has severe limitations on agricultural production and is usually compromised of blanket bog or other such terrain.

4.3 The land on and around the potential site is identified in the West Caithness Local Plan as an area of high quality peat deposits. The Regional Council considers the peat reserves in West Caithness to be of national importance, with technological advances in extraction and utilisation making the potential as a fuel source even greater. The Local Plan policy (para 2.26) states:

"The Council will seek to ensure that high quality peat deposits in the area are not sterilised by inappropriate development".

4.4 Three categories of reserves are delineated, with Category 1 being "Deposits with a strong presumption against land use change/conservation designation". Dale Moss (near Westerdale) and East Altnabreac are Category 1 areas and specifically mentioned as "core areas to be vigorously safeguarded" (see 1:50,000 map overlay).

4.5 The Local Plan states that "some 990 and 1709ha of land at Lochdhu and Altnabreac have been cleared for private commercial forestry" (para 5.7). This includes the land east of the repository site over which the proposed access road is routed. In view of the recent changes in tax allowances and increased attention to nature conservation issues in the "flow country" the land given over to forestry is unlikely to rise at the rapid rate of the past decade.
4.6 There are limited sand and gravel reserves remaining at Dirlot and Knockdoo. Working has been unauthorised and haphazard but the Council plan to regularise the working and issue temporary consents subject to appropriate reinstatement measures.

4.7 In the wider area, the economy is dominated by the Dounreay Nuclear Establishment, with its workforce of some 2,100 (about 20% of employment in Caithness). Dounreay accounts for the high proportion (over 40%) of employment being in the professional and related services. Distribution, manufacturing and construction make up another 40%, with HMS Vulcan, adjacent to Dounreay, being one of the largest employment sources in manufacturing.

4.8 In July 1988 the Government announced a withdrawal of funding for the research programme at Dounreay. It is expected that employment will fall, as a result, to about 1,600 by the mid-1990's and to 500 by 1998. This substantial job loss will have a marked impact on both economy and community in the area.

Local Economic Benefit

4.9 From the level of information available, the Caithness area would be able to make some contribution towards the workforce required at a repository, particularly during operation with the possibility of recruiting local staff with experience in the nuclear industry.

4.10 The run down at Dounreay will mean that unemployment levels will rise. Depending on the skill levels present (and required), a workforce with appropriate knowledge and experience should be available. In an area where there are few other opportunities for employment, the local economic benefit could be significant.

Blight

4.11 The land around Altnabreac and the potential repository site is peat moorland, at present used for some forestry but predominantly very low intensity use - game shooting and/or grazing land with a poor carrying capacity. There is fishing in some of the lochs (eg Loch More) and the River Thurso.
4.12 The upper reaches of the River Thurso have been identified in the Local Plan as being a potential location for a salmon smolt production unit on the basis of the quality of the water. The repository surface works site drains to a tributary of the River Thurso and the land crossed by the proposed road access also drains to the River Thurso. Some blight effect is therefore possible.

Resource Sterilisation

4.13 A repository development could sterilise the high quality peat deposits but, alternatively, excavation could easily be promoted as part of the site preparations or at least permitted on land not directly used by the repository workings.

4.14 The land take for the road access will also involve removal of some peat deposits (particularly crossing the edge of Dale Moss, near Westerdale). The access is routed across land expected (in the Local Plan) to be used for commercial forestry.
5.0 **NATURAL ENVIRONMENT**

Designations: Proposed AGLV at Dirlot Gorge (6km SE)
- NNR - Blar Nam Faoileog (6.5km SE)
- SSSI - Dirlot Gorge (6km SE)
  - Bad Nam Bo (1km)
  - Lambsdale Leans (2.5km N)
  - Ben Dorrery (3.5km N)
  - Loch Olginery (7.5km NE)
  - Blar Geal (4km E)

(distance from repository site; see 1:50,000 map overlay)

5.1 There are no National Scenic Areas near Altnabreac. The Regional Council intends to designate 22ha at Dirlot Gorge as an Area of Great Landscape Value. Here, management policies are to maintain "historic attractiveness and ensure the access, safety and enjoyment by the public" (para 2.46).

5.2 There is one National Nature Reserve in the area:

Blar Nam Faoileog (4,500ha) biological

This, together with Dirlot Gorge (geological interest) and Bad Nam Bo (biological interest), are considered to be of national or international importance.

5.3 Bad Nam Bo is a range of peatlands and open waters of international importance for breeding waders and wildfowl. Lambsdale Leans is peatland swamp and fen vegetation valuable for nesting and wintering wildfowl and waders. Ben Dorrery is an important example of Caithness montane vegetation. Blar Geal and the land to the west of Loch More are of biological interest.

**Disturbance**

5.4 There are a number of sites of nature conservation value in the vicinity of the potential repository site and road link. However, providing special care is taken during construction and operation, the sites should remain protected from undue disturbance. The exception to this is the Blar Geal SSSI, which would be severely damaged by the access road on the route proposed.
5.5 Further details and advice would need to be sought to clarify the nature conservation aspects of a major development in the "flow country". The nature conservation issue has been brought to the fore in recent months. In June 1988, for example, the Secretary of State for Scotland refused to permit planting by the Forestry Commission on land at Carn Narm Muc (east of Loch More) on the grounds of the area's high conservation value in the heart of the flows.
CONTENTS

SECTION

1.0 SITE CHARACTERISTICS 2.1

2.0 DEVELOPMENT PROPOSALS 2.3

3.0 COMMUNITY 2.4

4.0 LOCAL ECONOMY 2.7

5.0 NATURAL ENVIRONMENT 2.9

Following Text:

- 1:250,000 Location Map

- 1: 50,000 map with overlays showing
  - development proposals
  - designated areas and planning policy areas

- 1:100,000 map of population statistical areas

- 1: 50,000 map showing location of cross section and photographs

- cross section diagram

- photographs
1.0 SITE CHARACTERISTICS

Location: Essex County Maldon District
Size: 210 hectares
Ownership: CEGB
Land Use: Power Station, Agricultural Land
Grid Reference: TM 0008

1.1 The Bradwell site is adjacent to Bradwell nuclear power station on the southern side of the lower Blackwater Estuary. The site is opposite the small town of West Mersea, 4km away across the estuary on Mersea Island.

1.2 The relief of the area is flat and low lying, the coastline and the estuary requiring extensive protective dyking. Inland from Bradwell on Sea the land undulates between 15 and 40 metres.

1.3 Local access to the site would be from the same route as to the nuclear power station - off a minor unclassified road from the B1021. The route west to a major road is long and difficult with numerous right angle bends. Even if a lorry route were able to avoid the built-up areas of Chelmsford or Maldon, the route would still pass through numerous villages including several conservation areas.

1.4 There is no rail access to the site. The nearest railhead is at Southminster approximately 12.5km to the south of the site. The Blackwater Estuary has a deep water channel which enables ships to come relatively close inshore. A jetty with a travelling crane lies just offshore from the nuclear power station.

1.5 The land beyond the power station is in agricultural use, the land quality is predominantly Grade 3 with an area of Grade 2 in the south west of the site. There are numerous drains on the lower part of the site. The slightly higher ground, on the south west section, is part of a former airfield. Weymarks Farm lies in the centre of the site, just east of the disused runway area.
1.6 The Blackwater Estuary is a popular recreation area, particularly for sailing, caravanning and bird watching. Bradwell Waterside is one of the principal sailing areas with a marina, sailing school and yacht club. There are several caravan sites in the area mainly for static caravans.
2.0 DEVELOPMENT PROPOSALS

Assumptions

Landtake: Repository 60 hectares
          Road Improvements - 32.75 hectares

Infrastructure: Port beside repository
                3 by-passes of local villages

Waste Transport: ship- 75 ships pa

Spoil Disposal: used locally for sea defences or
disposed at sea

2.1 It has been estimated that approximately 60 hectares of
land will be required. Further land will also be needed
to construct the proposed road improvements to roads
giving access to the site.

2.2 The repository will be located to the east of the power
station adjacent to the coast. It is proposed to bring
the waste by ship requiring 75 ship deliveries per
annum. It is assumed that 50% of the spoil produced by
the site would be used locally as part of the work to
enhance sea defences, the remainder would be disposed of
at sea.

2.3 The labour requirements of the development are listed
below:

          Construction:    310
          Operational:     330
          De-commissioning: 50

It has been assumed that this workforce could be
recruited locally.
3.0 COMMUNITY

District population density – Maldon District 1.34 ppha

Surrounding Settlements

<table>
<thead>
<tr>
<th>Distance</th>
<th>Settlement</th>
<th>Approx Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>2km</td>
<td>Bradwell</td>
<td>770</td>
</tr>
<tr>
<td>4km</td>
<td>West Mersea</td>
<td>5,550</td>
</tr>
<tr>
<td>5km</td>
<td>Tillingham</td>
<td>910</td>
</tr>
<tr>
<td>9km</td>
<td>Southminster</td>
<td>3,210</td>
</tr>
<tr>
<td>15km</td>
<td>Colchester</td>
<td>87,500</td>
</tr>
</tbody>
</table>

Dwellings within 2km of the site centre: Approx 40

3.1 The population within 9km of the centre of the site has been calculated using 1981 census parish populations and the relevant settlements are listed below:

<table>
<thead>
<tr>
<th>Estimated Proportion within 9km</th>
<th>Population in Parish</th>
<th>Estimated Population within 9km</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bradwell on Sea</td>
<td>100%</td>
<td>769</td>
</tr>
<tr>
<td>Tillingham</td>
<td>100%</td>
<td>914</td>
</tr>
<tr>
<td>St Lawrence</td>
<td>100%</td>
<td>425</td>
</tr>
<tr>
<td>Steeple</td>
<td>50%</td>
<td>457</td>
</tr>
<tr>
<td>Tolleshurst D'arcy</td>
<td>90%</td>
<td>1,106</td>
</tr>
<tr>
<td>Tollesbury</td>
<td>100%</td>
<td>2,485</td>
</tr>
<tr>
<td>Salcott</td>
<td>100%</td>
<td>212</td>
</tr>
<tr>
<td>Virley</td>
<td>100%</td>
<td>60</td>
</tr>
<tr>
<td>Great &amp; Little Wigborough</td>
<td>100%</td>
<td>251</td>
</tr>
<tr>
<td>Peldon</td>
<td>90%</td>
<td>516</td>
</tr>
<tr>
<td>West Mersea</td>
<td>100%</td>
<td>5,545</td>
</tr>
<tr>
<td>East Mersea</td>
<td>100%</td>
<td>1,898</td>
</tr>
<tr>
<td>Langenhoe</td>
<td>30%</td>
<td>299</td>
</tr>
<tr>
<td>Dengie</td>
<td>90%</td>
<td>111</td>
</tr>
<tr>
<td>Asheldham</td>
<td>100%</td>
<td>130</td>
</tr>
</tbody>
</table>

Total 14,567

3.2 The urban focus of the area is Chelmsford, a sub-regional centre some 45km to the west, Maldon 30km to the west serves as a minor centre. Colchester to the north is also a sub-regional centre, but although it is only 15km away across the estuary, the distance by road through Maldon is four times as great.

3.3 The area has many old established attractive villages including, nearest the Bradwell site, Bradwell on Sea which dates from the later middle ages and Tillingham.
3.4 Although there are no major settlements close to the site, it is surrounded by a number of villages. Further expansion of Bradwell and Tillingham is severely restricted by the Nuclear Safeguard Zone around Bradwell Power Station.

3.5 The settlement policy for the area contained in the 1982 Structure Plan is essentially one of regional restraint of development, with Chelmsford the only designated (medium) growth area. The Coastal Protection Policy virtually restricts all new development near the coast to existing built up areas.

3.6 Within Maldon District there is an allocation of 4,200 new dwellings for the period 1977-91. The average rate of building during the first five years of this period conformed to this projection.

3.7 The historical character and attractiveness of the villages around Bradwell are reflected in the number of designated Conservation Areas including Bradwell on Sea and Tillingham which is designated an Outstanding Conservation Area.

3.8 Under the Structure Plan, Opportunity Areas for Countryside recreation have been identified along the coast from Bradwell Waterside east to St. Peters Chapel, from Steeple Creek to St. Lawrence Bay and along most of the north of the estuary in the area under consideration.

Disturbance

3.9 The nuclear power station dominates the landscape of the headland. The main buildings have not been screened but the switching station is hidden, at least from the south and west, by mounding and tree screens.

3.10 The visual impact of the proposed development will be mitigated by the presence of the existing power station but it is likely that the headworks will still be seen from West Mersea across the River Blackwater and from parts of Tillingham and Bradwell to the south. The development would be hidden to a large extent from the west by the existing power station buildings.
3.11 The recreational use of the River Blackwater could be restricted by the additional shipping movements and the development of the port.

3.12 The use of the local roads for access to the site could detrimentally affect the environment of the settlements along the routes. JMP have proposed several road improvement schemes and by-passes to ameliorate this impact but these in turn could present other social and environmental difficulties.

3.13 The surrounding population have experience of nuclear establishments in the form of Bradwell Power Station.

Local Nuclear Establishment
4.0 LOCAL ECONOMY

Travel to Work Area: Southend
Unemployment in TTWA: 8.4% 21,277 (April 1988)
Employment in manufacturing in county: 169,105
Major employers
Agriculture
Manufacturing centred in Maldon and Heybridge Commuting to Southend and Chelmsford

4.1 In 1977 38% of all employment in Maldon District was in manufacturing, 33% in the service sectors and the balance in agriculture, quarrying, construction and public utilities.

4.2 Half of all the jobs were concentrated in Maldon and Heybridge, where mechanical and electrical engineering, professional and scientific services, timber and furniture and food processing together provided almost 45% of all employment in the town. The majority of jobs in the local area around Bradwell are provided by agriculture and the nuclear power station.

4.3 Essex County Council policy is to concentrate industrial and office development in the larger settlements. Of 70 acres allocated to Maldon District for the Structure Plan period (1977-91), 38 acres are in Maldon/Heybridge and 11 acres are in Burnham. The District Council is against the principle of allocating greenfield sites to high technology industry.

Local Economic Benefit

4.4 There is a large number of unemployed people in the Southend travel to work area which could provide a labour force for the proposed repository although Bradwell is 50 km by road from Southend. The development of the repository will only produce limited local economic benefit for the surrounding communities because the area already has a substantial level and range of economic activity.

Blight

4.5 The blight effect of a repository is likely to be very limited. Agriculture, recreation and farming along the coastline have all been identified as sensitive activities, but these are unlikely to be affected by the development.
Resource Sterilisation

4.6 The repository would be located on part vacant site, part agricultural land. The land quality is predominantly Grade 3 with an area of Grade 2 in the south west of the site. The proposed road improvements will require additional agricultural land. The relatively high quality of agricultural land has been considered to be a regionally important resource likely to be sterilised but this only affects part of the site.
5.0 **NATURAL ENVIRONMENT**

Designations:
- National Nature Reserves at the Blackwater Estuary and Dengie
- Grade 1 SSSI at Blackwater Estuary
- Special Landscape Area
- Coastal Protection Belt

5.1 The area under consideration forms part of a much larger area including the Colne Estuary and the Foulness and Maplin Sands which are of great wildlife and landscape significance, especially for the overwintering of wildfowl and waders. For example, roughly half the world population of Brent Geese overwinter in Britain and of these, half are found in Essex.

5.2 The site is located adjacent to the Blackwater Estuary NNR and SSSI, but the impact on these is likely to be limited given the development will be located beside the existing power station. The proposed development will result in some loss of habitat but this will not be significant compared to the overall size of the NNR and SSSI.

5.3 Detailed studies have resulted in the designation of a Nature Conservation Zone and a Special Landscape Area. The Nature Conservation Zone is designed to protect the Grade 1 SSSI covering the whole Blackwater Estuary. The Special Landscape Area is one of several in Essex considered particularly valuable; the policy states that any development in these areas must accord with their character.
## CONTENTS

<table>
<thead>
<tr>
<th>SECTION</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0 SITE CHARACTERISTICS</td>
<td>3.1</td>
</tr>
<tr>
<td>2.0 DEVELOPMENT PROPOSALS</td>
<td>3.2</td>
</tr>
<tr>
<td>3.0 COMMUNITY</td>
<td>3.3</td>
</tr>
<tr>
<td>4.0 LOCAL ECONOMY</td>
<td>3.6</td>
</tr>
<tr>
<td>5.0 NATURAL ENVIRONMENT</td>
<td>3.9</td>
</tr>
</tbody>
</table>

**Following Text:**

- **1:250,000** Location Map
- **1:50,000** map with overlays showing
  - development proposals
  - designated areas and planning policy areas
- **1:100,000** map of population statistical areas
- **1:50,000** map showing location of cross section and photographs
- cross section diagram
- photographs
1.0 **SITE CHARACTERISTICS**

**Location:** Highland Region (Planning Authority)  
Caithness District

**Size:** 450 hectares (1,115 acres)

**Ownership:** UKAEA

**Land Use:** Agriculture

**Grid Reference:** NC 9766

1.1 Dounreay is located on the north coast of Scotland approximately 12 km to the west of Thurso (see maps).

1.2 The Dounreay Nuclear Establishment (DNE) was set up in the 1950s to research the fast reactor system. In 1976, a 250 MW fast reactor was commissioned, with the aim of developing the technology to build commercial reactors. In 1985 UKAEA and BNFL applied for outline planning permission for a European Demonstration Fast Reactor Fuel Reprocessing Plant (EDRP) east of the DNE. Following a 95 day public inquiry in 1986, the decision from the Secretary of State for Scotland is still awaited.

1.3 In July 1988 the Government announced the withdrawal of funding for research into the commercial fast reactor. By 1988 employment at Dounreay will be a quarter of current levels.

1.4 The Dounreay NE is a prominent land use and clearly visible from the A836 but not from most of the village of Reay, although the village is only 2km away. The surrounding land is used for agriculture - both arable and pasture.

1.5 The site is adjacent to the A836, 12 km from the A882(T) at Thurso. The A882(T) joins the A9(T) at Wick. Alternatively, the A895 branches from the A882(T) to joint the A9 at Latheron, 37km from Thurso. Whilst these are trunk roads, they are both narrow and of poor alignment in places.

1.6 The nearest railwayline is the Thurso/Inverness line approximately 14 km to the east at Thurso. The EDRP planning application included provision for a rail link to Dounreay. The preferred option was for an 18.7 km line from the plant, joining the BR North Highland line near Scotscalders station.
2.0 DEVELOPMENT PROPOSALS

Assumptions

Land Take: 60 ha surface working
83-97ha rail link

Infrastructure: new rail link 16.5-19.5km

Waste Transport: rail - 497 trains pa

Spoil Disposal: 1m tonne on site
12.9m te over 50 years - rail to central Scotland (approx 300 trains pa)

2.1 The potential repository surface workings have been located immediately adjacent to the Dounreay Nuclear Establishment, close to the coastal edge of the UKAEA land (see red overlay on 1:50,000 Map 1).

2.2 A short access road would link to the existing access to the Dounreay NE. Port facilities would not be provided.

2.3 A rail link would be constructed to the British Rail North Highland line near Scotscalder station. JMP Consultants have put forward two principal options: the East and West Routes, with a connection between the two near Westfield giving a third option.

2.4 The West Route passes close to Shebster, Broubster and Brawbin; the East Route is close to Upper Dounreay, Westfield and alongside Loch Calder and Loch Olginery (see overlays to maps 1 and 2).

2.5 JMP Consultants estimate approximately 320 vehicles per day will use the A836 from the site at Dounreay.

2.6 The annual workforce is estimated to be as follows:

Construction
310 under land (9 years)
290 under sea (10 years)

Operation
330

De-commissioning
50 under land (8 years)
55 under sea (8 years)

3.2
### 3.0 COMMUNITY

Dwellings within 2km of site centre: approx 40
Estimated population within 9km of site centre: 700
Estimated population density within 9km of site centre: 0.03 ppha
District Population density: 0.15 p.p.ha.

<table>
<thead>
<tr>
<th>Surrounding settlements</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 km to Reay</td>
<td>250 (estimate)</td>
</tr>
<tr>
<td>13 km to Thurso</td>
<td>8,828</td>
</tr>
</tbody>
</table>

**3.1** In the Environmental Impact Assessment for the EDRP, it was stated that the population within 1.6km of the Dounreay NE was 41 and within 4.8km it was 556.

**3.2** Based on the 1981 census data for resident population in civil parishes, the population within 9km of the site centre was estimated as follows: (see 1:100,000 map for parish boundaries):

<table>
<thead>
<tr>
<th>Parish</th>
<th>Total</th>
<th>est within 9km</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reay</td>
<td>655</td>
<td>635</td>
</tr>
<tr>
<td>Farr</td>
<td>1,113</td>
<td>20</td>
</tr>
<tr>
<td>Thurso</td>
<td>9,234</td>
<td>30</td>
</tr>
<tr>
<td>Halkirk</td>
<td>1,866</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td></td>
<td>715 (rounded to 700)</td>
</tr>
</tbody>
</table>

**3.3** Reay is the nearest settlement to the proposed repository site. The main part of the village is to the west, 2km from the potential repository site. There are several new houses in the village including a small estate under construction at the east end (see map overlay). There is a small shop, a garage, a primary school and a community hall in the village.

**3.4** There are a number of Listed Buildings in the village and one at the harbour in Sandside Bay. Along both possibly rail routes there are brochs and chambered cairns. There are also a number of standing stones near the West Route.
3.5 Thurso is the major centre for the area, providing primary and secondary schools and a technical college, hospital, swimming pool, job centre, council offices and a variety of shops. The technical college has teaching links with Dounreay.

3.6 At the 1981 Census, 75% of all occupied housing in the West Caithness Local Plan area was rented accommodation, most of it owned either by the District Council or UKAEA.

3.7 The West Caithness Local Plan estimates distribution of new housing in the period 1986-91 to be 26 hectares (300 dwellings) in Thurso and 11 hectares (80 dwellings) in the landward area. Outline planning permission has been granted for a residential development on 16 hectares on the south-eastern side of Thurso. A further 18 hectares are to be safeguarded for longer term development. The provision of housing land is presently substantially greater than the average level of completions in the previous few years. Demand for housing is likely to diminish with the run-down of the Dounreay Nuclear Establishment.

Disturbance

3.8 The possible visual impact of the repository surface workings in illustrated by the section drawings and photographs. The development would be partially visible from Reay (and New Reay). As with the existing Nuclear Establishment, it would be clearly visible from the A836. Noise from the working may be heard in Reay.

3.9 Both possible rail routes pass close to a member of houses (see map overlays). The West Route runs near Shebster and through the scattered dwellings of Brawlbin. The East Route is close to Upper Dounreay, Westfield and houses east of Loch Calder. The railway construction would have an impact on these dwellings and during use there would be visual and noise inputs in an otherwise quiet rural area.

3.10 Care would need to be taken in order to prevent damage to the numerous historical remains along the routes. Amendments at the detailed routing stage could ensure that both dwellings and historical sites are avoided.
3.11 Thurso has a large and diverse community infrastructural base that should be able to absorb the additional demand from construction workers and permanent repository workers and their families. It is anticipated that a proportion of local people would be employed which will reduce the number and therefore impact of incoming workers.

Local Nuclear Experience

3.12 The Dounreay Nuclear Establishment has been a major influence on the local community for over 30 years. Many local people (including from Reay itself) work there at present.
4.0 LOCAL ECONOMY

Travel to Work Area (TTWA): Thurso
Employed in TTWA: 6,922 (April 1988)
Travel to Work Area
Unemployment (in TTWA): 11.6% 803 people (April 1988)
Major employer: Dounreay (employs 2,100)

4.1 At the 1981 Census, the employment structure of the 11,200 people living and in employment in Caithness was:

<table>
<thead>
<tr>
<th>Industry</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary</td>
<td>9.3</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>11.5</td>
</tr>
<tr>
<td>Construction</td>
<td>9.5</td>
</tr>
<tr>
<td>Distribution/catering</td>
<td>19.5</td>
</tr>
<tr>
<td>Transport</td>
<td>6.9</td>
</tr>
<tr>
<td>Professional and related services</td>
<td>43.4</td>
</tr>
</tbody>
</table>

4.2 The economy of the area is dominated by Dounreay which directly employs 20% of the workforce of Caithness. The West Caithness Local Plan states that the Establishment at Dounreay expects to lose about 150 jobs, by natural wastage, over the duration of the Local Plan period (1986-91). This is contrasted with the possible requirement for about 600 workers during the construction phase of the European Demonstration Fast Reactor Fuel Reprocessing Plant (EDRP). The Local Plan acknowledges that "local economic performance over the next 5-10 years hinges fundamentally upon Government decisions on the future of Dounreay".

4.3 In July 1988 this dependence of the local economy on Dounreay came to the fore with the announcement that the Government would be withdrawing funding for the research programme for commercial fast reactors. Employment at Dounreay is expected to fall from 2,100 to about 1,600 by the mid-1990's and to some 500 by 1998.

4.4 The Highlands and Island Development Board (HIDB) has instigated work to examine the likely impact of the rundown and assess the options to bring alternative employment to the area.

4.5 One of the largest employers in the manufacturing sector is also at Dounreay - HMS Vulcan - a spin-off of the UKAEA development. Elsewhere the main centres for employment are Thurso and Wick.
4.6 The natural resources of fishing, agriculture, forestry and peat are all important to the local economy, particularly in the rural areas. Tourism is also regarded as an important employment source. It is focused on John O'Groats, together with the area's natural attractions of cliffs, sandy beaches and recreational fishing, and Scrabster's role as the ferry terminal to the Orkney Islands.

4.7 The major economic policies of the Regional Council involve supporting the existing employment base, including Dounreay, and allocating land for future development. For example, Murkle Bay adjacent to The Spur in Dunnet Bay, has been earmarked for major industry requiring sea access. The Regional Council continue to consider the site appropriate for oil-related development, acknowledging that particular care would be needed to safeguard the surrounding area, which is important for agriculture and tourism.

4.8 At April 1988, there were 803 people unemployed (a rate of 11.6%) in the Thurso TTWA and 820 people (15.5%) in the Wick TTWA.

Local Economic Benefit

4.9 It is likely that the Caithness area could provide much of the labour supply for the construction and operation of a repository. During operation there could be a good skill match with the existing workforce, utilising training links with the College in Thurso. The imminent run-down of the Dounreay NE will result in high levels of unemployment in the area, with many of the people having experience of nuclear-related work or appropriate construction and maintenance skills.

4.10 The manufacturing base in Caithness is not particularly strong and would be unlikely to be able to provide inputs, other than labour, to the proposed repository.

4.11 With the narrow economic base in the local area and the lack of specific features (location, resources etc) there is probably very little scope to attract significant new economic activities into the area.
Blight

4.12 Around Dounreay the activities most likely to be affected by a repository development are fishing along the Coast, agriculture and tourism. However, it is considered that the existing presence of the nuclear establishment would substantially reduce any blighting effect of the repository. Blight is therefore not regarded as being a particular problem in this area.

Resource Sterilisation

4.13 The repository surface working would involve loss of about 60ha (150 acres), which is predominately grade 4.2 land quality (Macaulay Institute Land Capability for Agriculture classification). The new rail link would involve a substantial land take, most of which is moorland but some is cultivated or lowland grazing. JMP Consultants estimate a land take of 83-97 ha, depending on the route. The 83ha of the West Route involves about 15ha of grade 4 land, in contrast to the 97 ha of the East Route, which takes up some 59 ha. Locally, this grade 4 land is an important resource.
5.0 **NATURAL ENVIRONMENT**

**Designations:** Proposed AGLV - Sandside Bay  
SSSI - Sandside Bay  
- Red Point Coast  
- Westfield Bridge  
- Broubster Leans  
- Loch Olginey  
- Ben Dorrery

5.1 There are no National Scenic Areas near Dounreay. The coast from Sandside Bay to the west is identified as part of a Preferred Conservation Zone in the Scottish Development Department Coastal Planning Guidelines (1974). This zone is based on both nature conservation and landscape value. Highland Regional Council have a 'development restraint' policy (Local Plan para 2.50) covering Sandside Bay and the coastline to the west (see map overlay).

5.2 Highland Regional Council proposes to designate 61 ha at West Sandside Bay as an Area of Great Landscape Value.

5.3 The dunes and links of Sandside Bay are a designated SSSI (approx 77 ha) and Red Point Coast, west of Sandside Bay, is an SSSI nationally important as a breeding ground for seabirds.

5.4 South-east of Dounreay, alongside the proposed rail link routes, there are SSSIs at Westfield Bridge, Loch Olginey and Broubster Leans. The first is a rich wet meadow and the second a eutrophic loch important for its flora and winter wildfowl. Broubster Leans is a mire of national importance as a wetland habitat and for ornithology.

**Disturbance from Development**

5.5 The potential site of the repository does not appear to pose special problems from a landscape or nature conservation view. Careful design and screening would mitigate the visual intrusion, which would be lessened by the juxta position with the existing Dounreay NE. Sandside Bay should be unaffected.

5.6 Particular care would need to be taken during the construction of the railway line to avoid disturbance of the SSSIs nearby. This is pertinent whichever route is
selected but particularly relevant to the West Route, which at present is close to Broubster Leans (see map overlays). Both rail routes would be intrusive in the moorland landscape.

5.7 The East Route for the rail link passes adjacent to Loch Calder, which is the main water supply source for Caithness District (apart from Wick and Dounreay). Particular care would need to be exercised to prevent its pollution during construction of the line.
CONTENTS

SECTION

1.0 SITE CHARACTERISTICS 4.1

2.0 DEVELOPMENT PROPOSALS 4.2

3.0 COMMUNITY 4.3

4.0 LOCAL ECONOMY 4.6

5.0 NATURAL ENVIRONMENT 4.8

Following Text:

- 1:250,000  Location Map
- 1: 50,000  map with overlays showing
  - development proposals
  - designated areas and planning policy areas
- 1:100,000  map of population statistical areas
- 1: 50,000  map showing location of cross section and photographs
- cross section diagram
- photographs
1.0 SITE CHARACTERISTICS

Location Region: Western Isles  
Size: 250 hectares (approx)  
Ownership: Secretary of State for Scotland  
Grid Reference: NF 7308

1.1 Fudy is located just off the north east of Barra. It is situated between Barra, South Uist and Eriskay. The island is used for grazing cattle which are shipped out from Eoligarry on Barra. There are no roads or built port facilities on Fuday. The use of port facilities at Eoligarry jetty is restricted by rocks and sandbanks at low tide.

1.2 The island is gently sloping on the west side with a sweeping sandy beach backed by dunes. The east coastline has steeper slopes and a rocky coastline. The island is lowlying and rises to only 89 metres. There are a couple of small streams which drain into the sea.

1.3 The nearest inhabited island is Barra. The crofting township of Eoligarry is located on the northern tip of Barra approximately 1.5 km to the west of Fuday. The agricultural land around Eoligarry is probably one of the best farming areas on Barra. The land is used for grazing cattle and growing some crops.
2.0 DEVELOPMENT PROPOSALS

Assumptions

Landtake: 250 hectares (whole island)

Infrastructure: Port facilities on Fuday
                Causeway between Eoligarry and Fuday
                Extension to airfield

Waste transport: ship - 75 ship pa

Spoil Disposal: 13.9m tonnes to be disposed at sea

2.1 It is proposed to use the whole island (250 hectares) and to construct a port on the south east coast with the repository adjacent to the port. A construction camp will be required to house the construction labour force and it is proposed to locate this at Eoligarry on Barra and to construct a causeway link between Barra and Fuday. It is also proposed to upgrade and extend the existing airstrip onto the mainland of Barra.

2.2 The waste would be transported to Fuday by ship. JMP estimate that this would involve 75 return journeys a year. In addition, spoil would be removed by barge for sea dumping or tipped into the sea immediately offshore. The latter option may not be desirable considering the shallow depth of the sea in the area and the proximity of fish farms.

2.3 The estimated labour requirements are:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction:</td>
<td>320 for 10 years</td>
<td></td>
</tr>
<tr>
<td>Operational:</td>
<td>380 for 50 years</td>
<td></td>
</tr>
<tr>
<td>De-commissioning:</td>
<td>60 for 9 years</td>
<td></td>
</tr>
</tbody>
</table>

It has been assumed that 50% of the employees would live in married/family accommodation constructed on Barra and the remaining staff would be employed on a 2 week on/2 week off basis and would live in a construction camp.
3.0 COMMUNITY

District population density. 0.11 pp hectare (Western Isles)

Surrounding settlements

<table>
<thead>
<tr>
<th>Distance</th>
<th>Settlement</th>
<th>Approx Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5 km</td>
<td>Eoligarry/Brevig area</td>
<td>508</td>
</tr>
<tr>
<td>6 km</td>
<td>Eriskay - Total population on island</td>
<td>197</td>
</tr>
<tr>
<td></td>
<td>Kilpheder - South Glendale &amp; Uist</td>
<td>609</td>
</tr>
<tr>
<td></td>
<td>Barra - Total population on island</td>
<td>1,257</td>
</tr>
</tbody>
</table>

(Source: Western Isles Structure Plan and 1981 Census)

Number of properties within 2 km of the Centre of the site: Approx 20

3.1 The population with 9km of the centre of the site was calculated and the relevant Local Plan statistical areas (SA) are listed below:

<table>
<thead>
<tr>
<th>Statistical Area</th>
<th>Total Population</th>
<th>Estimated Population within 9km</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA 7.6 Kilpheder - South Glendale</td>
<td>609</td>
<td>300</td>
</tr>
<tr>
<td>7.7 Eriskay</td>
<td>197</td>
<td>197</td>
</tr>
<tr>
<td>8.1 Eoligarry + Brevig</td>
<td>508</td>
<td>508</td>
</tr>
<tr>
<td>8.2 Castlebay - Cliad</td>
<td>749</td>
<td>50</td>
</tr>
</tbody>
</table>

Total 1,055

There are therefore approximately 1,100 people within 9 km of the site, with parts of the islands of Barra, Eriskay and South Uist all in the area (see 1:100,000 map).

3.2 The island of Fuday is uninhabited. The nearest settlement is Eoligarry on Barra approximately 1.5 km to the west. There are only a limited number of community facilities in the area including a school and a church.

3.3 The main settlement on Barra is Castlebay approximately 12 km to the south west of Fuday. This is the islands' administrative and service centre. The remainder of the population is dispersed in townships on or near the coastal road and on the coastal strip in the north. The hilly interior of the island is uninhabited.
3.4 Housing in the Western Isles is closely linked with the crofting system. There is little movement between the crofting sector and the non-crofting private sector and therefore little mobility between house types, sites and locations within crofting townships. The crofting system, in particular the difficulty of releasing land for development can have a significant effect on the location of new housing. Contrary to immediate impressions the amount of land suitable for housing, other than croft housing, and which is acceptable in both physical and planning terms is fairly limited. This is the case in Castlebay.

3.5 Castlebay offers a range of facilities including the newly constructed community school which contains a library, a swimming pool and facilities for a theatre. There is also a small hospital (5 beds) and old peoples home. Castlebay has five shops, a bank and a post office, but there is no baker or butcher. The inhabitants are dependent on the ferry for most foodstuffs. There is little evidence of self sufficiency in vegetables etc. Mobile shops, bank and library operate from Castlebay.

3.6 The Western Isles as a whole are heavily dependent on their transport links with the Scottish Mainland. Caledonian MacBrayne operate a vehicle ferry between Oban, Castlebay and Lochboisdale, with three crossings per week in winter and four crossings per week in the summer. Castlebay has no roll on/roll off facilities although there are plans to provide this in the near future. There are also 2 small passenger ferries, between Castlebay and Vatersay and between Eoligarry and Ludag (South Uist), both these ferries appear to be well used. There is a daily air service between Barra, Tiree and Glasgow and a twice weekly service between Stornoway, Benbecula and Barra.

3.7 The only public transport on Barra is provided by the Post Bus and the privately operated school bus. Most residents have access to a car and at certain times ie just before school or a flight arriving the single track roads can be congested.

3.8 Planning policy is based on a recognised settlement hierarchy which helps in the assessment of competing needs and the allocation of council resources in a rational manner. Castlebay is classified as a "level 2" settlement providing service and administrative functions to the whole island. Stornoway has been identified as the only "level one" settlement. Eoligarry is classified as a "level 4" settlement ie with few community facilities.
3.9 The Western Isles Council has a general policy against development in remote areas, Policy C21 states:

"The Council will not permit new development in very remote locations and an uninhabited island except:

(a) if the development is of a particularly hazardous nature and cannot be located elsewhere; or

(b) in the case of resource based developments where such development is not possible or is unsuitable or environmental grounds in a more accessible area.

Disturbance

3.10 The islands of South Uist and Eriskay are approximately 5 km to the north and east of Fuday. Both these islands are inhabited and and a large proportion of the housing on Eriskay and several townships on South Uist look out over Fuday. The proposed repository, and in particular the causeway, would inflict considerable visual and noise impacts on the surrounding communities.

3.11 The construction phase of the proposed repository would probably require a residential camp for workers, the best location for this would be on Fuday. In the long run it would be desirable from an operational viewpoint to house the permanent workers on Barra. Eoligarry could not support a large influx of people, it has very few facilities at the moment. The alternative location of Castlebay is a considerable distance away and this would involve workers travelling the whole length of Barra on single track roads or alternatively a lengthy sea journey from Castlebay to Fuday.

3.12 Even then the impact on Castlebay would be severe. It could involve the virtual doubling of its population which whilst helping to support some services could overload the provision of others such as medical facilities. Purpose built housing would have to be provided and the availability of land may mean that this is isolated from the main settlement. Barra is a gaelic speaking area and the schools are bi-lingual, a large influx of non-gaelic speakers would alter the balance of the community.

Local Nuclear Experience

3.13 There are no nuclear establishments in the Western Isles.
4.0 **LOCAL ECONOMY**

**Travel to Work Area:** Western Isles  
**Unemployment:** 20.8% 2,050  
**Employment in manufacturing in region:** 2,036  
**Major employment:** Crofting, fishing, tourism

4.1 Crofting and fishing are the major economic activities at Eoligarry on Barra. There is also a school, a small haulage business and three chalets providing tourist accommodation.

4.2 The employment structure on Barra is centred on job pluralism, that is many people have a number of part time jobs such as crofting, fishing and providing tourist accommodation. In addition, the local services and transport are major employers. There are very few manufacturing employers, the major two are Barra Shell (concrete block manufacture) and Barra Atlantic fish processing factory. The labour force of the latter varies considerably. Both these factories are located towards the northern end of Barra.

4.3 The 1981 employment survey also identified a large number of people who work away from Barra; it was estimated that 40 were working in the North Sea Oil industry and a further 40 were in the merchant navy.

4.4 The local labour supply from the immediate area for development on Fuday would be very limited. Even major construction projects on Barra, such as the community school, had to import some of the workforce because the work involved heavy machinery and required suitably experienced labour.

4.5 Whilst labour supply on Barra is limited the Western Isles as a whole could offer greater potential. Heavy steel fabrication was introduced to the Western Isles in 1976 with the setting up of Lewis Offshore Ltd at Arnish Point, Stornoway. Its labour force reached a peak of almost 1000 in 1978, many of the employees were local. Its workload has dropped considerably and its workforce now numbers less than 100. This suggests that suitable workers many be available in Stornoway.

4.6
4.6 The economy of Eriskay is centred on fishing because the physical nature of the island does not encourage crofting. In 1982 the fleet consisted of 6 boats with a total crew of 32 and two lobster boats with a crew of four.

4.7 The existing economic policy is based on concentrating on and developing the existing economic and employment base and skills of the islands. In particular, attention is given by the Western Isles Council to the encouragement of economic development outside the established settlements of Stornoway and Balivarich, where up to now most development has been concentrated.

Local Economic Benefit

4.8 The local economic benefit of the construction and operation of a repository on Sandray could be relatively large. There will be employment benefit in the surrounding community because there is little local employment, the range of existing job opportunities is very limited and the scope to introduce new types of economic activity is also very limited. The only constraint is that the number of people to benefit from the employment opportunities will be small, particularly in the immediate area of Vatersay and Barra.

Blight

4.9 The existing economic activities in the communities around Fuday could be threatened by blight because there is a high proportion of sensitive economic activities such as farming, fishing and tourism. The cockle beach landstrip is one of the major tourist attractions on Barra and this will be severely affected by the proposal to extend the airstrip. In addition, the Western Isles are heavily dependent on these activities.

Resource Sterilisation

4.10 Fuday is used for grazing cattle which are shipped out from Eoligarry on Barra. The agricultural land around Eoligarry is probably one of the best farming areas on Barra, the land is used for grazing cattle and growing some crops. The development of Fuday would result in the loss of grazing land and the development of a construction camp at Eoligarry would require more agricultural land.

4.7
5.0 NATURAL ENVIRONMENT

Designations:  ESA adjacent on Barra
              NSA on South Uist
              Preferred Conservation Zone

5.1 No nature conservation or landscape designations have been identified on Fuday. Much of the west coast of South Uist has been designated a National Scenic Area (NSA). The area covers the machair and stretches from Stillgarry in the north to Ludag in the south. Parts of this machair dune system is also designated as a SSSI.

Disturbance

5.2 The construction of the port, repository and causeway will result in the loss of natural habitat. Much of the Eoligarry peninsular has been designated an Environmentally Sensitive area (ESA) and the quality of this environment could be severely affected by the proposed construction camp at Eoligarry.

5.3 The proposed extension of the airport onto Barra will have a significant effect on the natural environment. It will destroy much of the cockle beach and machair areas which are both important features providing habitats for a number of fauna and flora. This area is also a major tourist attraction on Barra.

5.4 The quality of the natural environment is an important resource in the Western Isles; for crofting, fishing, recreation and tourism.

5.5 The location of Fuday nestled between Barra, Eriskay and South Uist would mean that its proposed use as a repository would be very visible from these islands and also by visitors arriving by air.
VIEW FROM WEST
(grid ref. 706074)

Potential to conceal headworks by putting them at sea level.
APPENDIX 5

Killingholme
# CONTENTS

<table>
<thead>
<tr>
<th>SECTION</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0 SITE CHARACTERISTICS</td>
<td>5.1</td>
</tr>
<tr>
<td>2.0 DEVELOPMENT PROPOSALS</td>
<td>5.2</td>
</tr>
<tr>
<td>3.0 COMMUNITY</td>
<td>5.3</td>
</tr>
<tr>
<td>4.0 LOCAL ECONOMY</td>
<td>5.6</td>
</tr>
<tr>
<td>5.0 NATURAL ENVIRONMENT</td>
<td>5.8</td>
</tr>
</tbody>
</table>

**Following Text:**

- 1:250,000 Location Map
- 1:50,000 map with overlays showing
  - development proposals
  - designated areas and planning policy areas
- 1:100,000 map of population statistical areas
- photographs
1.0 SITE CHARACTERISTICS

Location: Humberside County
Glanford District
Size: 260 Hectares
Ownership: CEGB
Grid Reference: TA 1519

1.1 The proposed site is located near River Humber approximately half way between Kingston Upon Hull to the north west and Grimsby to the south east. The CEGB also own land adjacent to the estuary.

1.2 The site is situated between the oil terminal and Chase Hill Wood and the village of East Halton. The two CEGB sites extend to approximate 260 hectares.

1.3 The surrounding landuse is industrial, an oil refinery and to the north agriculture. The agricultural land is relatively good grade 3 quality. The site is presently in agricultural use.

1.4 The site is approximately 5km from the recently constructed M180. The connecting roads in particular the A160 are designed to take lorries to Immingham dock area. There is already a system of lorry routes in force to prevent heavy vehicles travelling through residential areas. The site is close to and would be clearly visible from the village of East Halton. In contrast the eastern site would be visually screened from the nearest settlements of East Halton, South Killingholme and North Killingholme by the existing oil refinery.
2.0 DEVELOPMENT PROPOSALS

Assumptions

Land take: repository - 60 hectares
rail link - 11 hectares
Infrastructure: 2.2km of new rail link
Spoil disposal: train to disused brickworks,
              Bedfordshire; 310 trains p.a.

2.1 It is estimated that 60 hectares will be required for
the surface workings of the repository, a further 11
hectares will be required to construct the railway link.

2.2 It is proposed to bring the waste to the site by train,
this would involve 497 train journeys per year. The
major part of the spoil produced at the site would be
disposed of in the disused brick workings around
Bedfordshire, this would involve the movement of 310
trains a year. A small amount of spoil would stay on
the site for local landscaping.

2.3 Construction materials will be bought to the site by
road by approximately 28 lorries per day.

2.4 The following workforce will be required:

Construction: 260 for 10 years
Operation: 420 for 50 years
Decommissioning: 65 for 9 years
3.0 COMMUNITY

District Population Density: Glanford 1.14 ppha

Surrounding Settlements

<table>
<thead>
<tr>
<th>Distance</th>
<th>Settlement</th>
<th>Approx Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.6 km</td>
<td>East Halton</td>
<td>705</td>
</tr>
<tr>
<td>3 km</td>
<td>South Killingholme</td>
<td>1,316</td>
</tr>
<tr>
<td>2 km</td>
<td>North Killingholme</td>
<td>309</td>
</tr>
<tr>
<td>6 km</td>
<td>Immingham</td>
<td>11,506</td>
</tr>
<tr>
<td>11 km</td>
<td>Hull</td>
<td>319,400</td>
</tr>
<tr>
<td>15 km</td>
<td>Grimsby/Cleethorpe</td>
<td>136,600</td>
</tr>
</tbody>
</table>

Number of properties within 2km of centre of site: Approx 250 west site

3.1 The population within 9km of the centre of the site has been estimated using 1981 Census Parish populations. The relevant parishes are listed below:

<table>
<thead>
<tr>
<th>Parish</th>
<th>Estimated Population within 9km</th>
<th>Estimated Population in Parish</th>
<th>Estimated Population within 9km</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goxhill</td>
<td>100%</td>
<td>1,513</td>
<td>1,513</td>
</tr>
<tr>
<td>East Halton</td>
<td>100%</td>
<td>705</td>
<td>705</td>
</tr>
<tr>
<td>North Killingholme</td>
<td>100%</td>
<td>309</td>
<td>309</td>
</tr>
<tr>
<td>South Killingholme</td>
<td>100%</td>
<td>1,316</td>
<td>1,316</td>
</tr>
<tr>
<td>Immingham</td>
<td>100%</td>
<td>11,506</td>
<td>11,506</td>
</tr>
<tr>
<td>Haborough</td>
<td>100%</td>
<td>69</td>
<td>69</td>
</tr>
<tr>
<td>Ulceby</td>
<td>100%</td>
<td>1,433</td>
<td>1,433</td>
</tr>
<tr>
<td>Paull</td>
<td>100%</td>
<td>747</td>
<td>747</td>
</tr>
<tr>
<td>Thorngumbald</td>
<td>25%</td>
<td>2,984</td>
<td>746</td>
</tr>
<tr>
<td>Brocklesby</td>
<td>80%</td>
<td>133</td>
<td>106</td>
</tr>
<tr>
<td>Keelby</td>
<td>50%</td>
<td>2,030</td>
<td>1,015</td>
</tr>
<tr>
<td>Stallingsborough</td>
<td>80%</td>
<td>960</td>
<td>768</td>
</tr>
<tr>
<td>Kirmington</td>
<td>10%</td>
<td>356</td>
<td>36</td>
</tr>
<tr>
<td>Barrow upon Humber</td>
<td>80%</td>
<td>2,502</td>
<td>2,002</td>
</tr>
<tr>
<td>Woodton</td>
<td>90%</td>
<td>400</td>
<td>360</td>
</tr>
<tr>
<td>Croxton</td>
<td>50%</td>
<td>47</td>
<td>24</td>
</tr>
<tr>
<td>Thornton Curtis</td>
<td>70%</td>
<td>308</td>
<td>440</td>
</tr>
</tbody>
</table>

Total: 23,095

* 1981 Census Present Population
3.2 The proposed site at Killingholme is close to the village of East Halton. The village has a number of small lanes running down towards the site which provide access to housing and outbuildings. Community facilities provided in the village include a shop, a primary school, a village hall and a public house.

3.3 North Killingholme is a small and attractive village centred around the church. South Killingholme is a larger settlement with a small range of shops. The A160 has been upgraded to provide access to the refinery and dock area and although by-passing the centre of the village it passes very close to the edge of the housing area.

3.4 Thornton Abbey, approximately 4km to the west of the site is a scheduled ancient monument.

3.5 Immingham is the largest settlement within the immediate area. It serves the surrounding smaller villages providing swimming pool and sports hall and a small shopping centre. Immingham has developed largely as a result of the industrial development in the area. Much of the housing is relatively modern and of low value.

3.6 The Humberside Structure Plan has designated Immingham as an urban centre which essentially means that Immingham has priority over the villages in the provision of services and new housing development. The future expansion of Immingham is constrained by a shortage of suitable housing land. On one side it is bounded by the potentially hazardous industry and on the other by good quality agricultural land.

3.7 Goxill and Ulceby have been classed as selected settlements with capacity for a reasonable amount of development. New housing in the villages of East Halton, North Killingholme and South Killingholme is constrained by the Structure Plan Policy (policy 5.10) to prevent new housing being near the Estuary Related Industry Area on the South Humber Bank. This policy seeks to protect people who may be affected by an accident at a proposed potentially hazardous plant and to avoid any substantial increase in the number of people near such plants.
Disturbance

3.8 The proposed site is close to and would be clearly visible from the village of East Halton. The site would probably also be visible from North Killingholme. Both villages would be likely to experience noise disturbance. There are a number of large industrial land uses in the area which generate a considerable amount of heavy traffic. The impact of the repository on the surrounding area is therefore likely to be notably less than a repository development in open countryside.

Local Nuclear Experience

3.9 There are no nuclear establishments within 25km of the site.
4.0 LOCAL ECONOMY

Travel to Work Area: Grimsby
Unemployment: 12.9% 10,562 people
Employment in manufacturing in county: 94,917
Major employers: Oil, chemical and petrochemical
Fishing
Bulk cargo transportation
Food production and processing

4.1 The economic activity of the usually resident population of the site urban areas within the 10km travel time area of Killingholme is summarised in the table below:

<table>
<thead>
<tr>
<th>Economic Activity</th>
<th>% of employed residents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>1.7</td>
</tr>
<tr>
<td>Energy &amp; Water</td>
<td>2.8</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>30.4</td>
</tr>
<tr>
<td>Construction</td>
<td>7.1</td>
</tr>
<tr>
<td>Distribution &amp; Catering</td>
<td>21.1</td>
</tr>
<tr>
<td>Transport</td>
<td>11.2</td>
</tr>
<tr>
<td>Other services</td>
<td>24.6</td>
</tr>
<tr>
<td>Total</td>
<td>46,961 people</td>
</tr>
</tbody>
</table>

Source: OPCS Key Statistics for Urban Areas, the North 1981 Census

4.2 The economic activity within the area is varied. The development of the deep water channels of the Humber has made its banks valuable sites for major industries. Oil storage and distribution depots, refineries and other major chemical factories have been established.

4.3 Although Grimsby is a major fishing port it is no longer totally dependent on this as a means of employment and income. Other industrial outlets have been developed, notably the processing and freezing of foodstuffs. Immingham is one of the top bulk cargo ports and has four specialised river jetties to deal with the variety of goods that are handled at the port. As well as storage and warehouse facilities and crane handling, dry dock facilities are also available.

4.4 Moving away from the banks of the Humber and further into Glanford District agriculture and food production became an important part of the local economy.
4.5 The area to the north of Immingham has been developed and designated as an area for 'special industries' which are 'not compatible with normal urban development.' and caters specifically for those industries which include the storage or use of hazardous materials and processes.

Local Employment Benefit

4.6 The local economic benefit of a repository in the area is likely to be limited because there is already a high level of economic activity and opportunities to extend the range of existing economic activity.

4.7 The labour supply for the construction and operation of the repository could primarily come from the local area. Over 10,500 people in the Grimsby TTWA were registered as unemployed in April 1988. Killingholme is on the boundary of several TTWA's and the total number unemployed in the area is much higher.

Blight

4.8 Concern was expressed by Humberside County Council about the possible effect of blight from the near surface repository proposals. However, there are only a limited number of sensitive activities in the area. Agriculture and food processing at Grimsby are unlikely to be affected.

Resource Sterilisation

4.9 The site is part of an area designated for special industry with the particular asset of having access to a deep water estuary. This resource is considered to be of regional importance.
5.0 NATURAL ENVIRONMENT

Designations: No SSSI's in immediate vicinity
SSSI in the Humber Estuary

5.1 Killingholme is located on a flat coastal area, views across the site, particularly the eastern site, are limited by the bulk of the oil refinery and small wooded areas. The oil refinery is the most prominent feature in the area.

5.2 Although there are no official landscape or nature designations covering the site the area of water to the east beside North Killingholme Haven is of local interest for wildlife.

Disturbance

5.3 The proposed development would cause minimal disturbance to the natural environment.
APPENDIX 6

Potton Island
<table>
<thead>
<tr>
<th>SECTION</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0 SITE CHARACTERISTICS</td>
<td>6.1</td>
</tr>
<tr>
<td>2.0 DEVELOPMENT PROPOSALS</td>
<td>6.2</td>
</tr>
<tr>
<td>3.0 COMMUNITY</td>
<td>6.3</td>
</tr>
<tr>
<td>4.0 LOCAL ECONOMY</td>
<td>6.6</td>
</tr>
<tr>
<td>5.0 NATURAL ENVIRONMENT</td>
<td>6.8</td>
</tr>
</tbody>
</table>

**Following Text:**

- 1:250,000 Location Map
- 1:50,000 map with overlays showing development proposals
  - designated areas and planning policy areas
- 1:100,000 map of population statistical areas
- photographs
1.0 **SITE CHARACTERISTICS**

<table>
<thead>
<tr>
<th>Location:</th>
<th>Essex County</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rochford District</td>
</tr>
<tr>
<td>Size:</td>
<td>368</td>
</tr>
<tr>
<td>Ownership:</td>
<td>MOD</td>
</tr>
<tr>
<td>Land use:</td>
<td>Royal armament R &amp; D establishment</td>
</tr>
<tr>
<td>Grid Reference:</td>
<td>TQ 9591</td>
</tr>
</tbody>
</table>

1.1 Potton Island is located approximately 8km to the north east of Southend on Sea (see accompanying map).

1.2 A large proportion of the surrounding marsh land is used by the Ministry of Defence. There are also areas of agricultural land, mainly to the west and south of Potton Island. The land is poorer quality grade 3 and 4 on Potton Island and the surrounding marshland but further south near Little Wakering and Southend on Sea there is a large area of good quality (Grade 1) agricultural land.

1.3 The site is approximately 5km to the A13 on the B1017 and a further 4km on the A1159 to the A127T. Access to Potton Island is poor along tracks and the B1017 is only of poor to moderate standard. The A1159 is a good standard road but carries heavy traffic. There are no routes between the site and the A13T road that avoid passing through settlements and the A1159 passes very close to the Southend on Sea urban area.

1.4 The nearest railway line is the army line to Foulness to the south east of the site across MOD Marshland. It has been concluded that it would be very difficult to construct a rail line to Potton Island.

1.5 The site adjoins the River Roach. The coastline is approximately 3km to the south east again across MOD Marshland.
2.0 DEVELOPMENT PROPOSALS

Assumptions

Landtake: repository - 60 hectares
            road link - 15 hectares

Infrastructure: new port
               3km of new road

Waste Transport: ship - 75 ships pa

Spoil Disposal: disposed of locally, probably on Potton Island

2.1 It has been estimated that approximately 60 hectares of land would be required for the surface works. A further 15 hectares would be required to construct the road link.

2.2 A new road link has been proposed to Potton Island from the south east. This preferred route avoids the high quality agricultural land (Grade 1).

2.3 It is proposed to locate the port at the north east corner of the island with the repository adjacent to it. Waste will be transported to the site by ship, this will involve approximately 75 return journeys per annum. It has been assumed that all of the spoil material will be disposed of locally, probably on the island and there will be no need for extra transport.

2.4 The labour requirements of the development are listed below:

    Construction:   310
    Operational:    330
    De-commissioning: 50

It has been assumed that the workforce to construct and operate the site could be recruited from the adjacent areas of Southend and Shoeburyness.
3.0 COMMUNITY

District population density: Rochford 4.37 ppha

Surrounding Settlements     Approximate Population
1.0 km Paglesham           250
3.5 km Great Wakering      5,150
5.0 km Barling/Stonebridge 1,400
8.0 km Southend on Sea     262,300

Approximate number of houses within 2km of site centre: Approx 100

3.1 The population within 9km of the centre of the site has been calculated using 1981 census parish populations, the parish boundaries are shown on the accompanying map, and the relevant settlements are listed below:

<table>
<thead>
<tr>
<th>Estimated Population within 9km</th>
<th>Estimated Population in Parish</th>
<th>Estimated Population within 9km</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burnham on Crouch</td>
<td>100%</td>
<td>6,308</td>
</tr>
<tr>
<td>Denge</td>
<td>30%</td>
<td>111</td>
</tr>
<tr>
<td>Southminster</td>
<td>90%</td>
<td>3,206</td>
</tr>
<tr>
<td>Althorne</td>
<td>50%</td>
<td>976</td>
</tr>
<tr>
<td>Canewden</td>
<td>100%</td>
<td>1,450</td>
</tr>
<tr>
<td>Ashingdon</td>
<td>30%</td>
<td>2,933</td>
</tr>
<tr>
<td>Rochford</td>
<td>100%</td>
<td>7,251</td>
</tr>
<tr>
<td>Sutton</td>
<td>100%</td>
<td>147</td>
</tr>
<tr>
<td>Stambridge</td>
<td>100%</td>
<td>562</td>
</tr>
<tr>
<td>Paglesham</td>
<td>100%</td>
<td>246</td>
</tr>
<tr>
<td>Foulness</td>
<td>100%</td>
<td>203</td>
</tr>
<tr>
<td>Barling Magna</td>
<td>100%</td>
<td>1,384</td>
</tr>
<tr>
<td>Great Wakering</td>
<td>100%</td>
<td>5,139</td>
</tr>
<tr>
<td>Southend on Sea</td>
<td>40%</td>
<td>157,083</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>89,819</td>
</tr>
</tbody>
</table>

3.2 Southend on Sea, including the eastern suburb of Shoeburyness, is a large popular seaside town. Whilst the population of Southend Borough dropped slightly between 1971 and 1981 the population of the surrounding settlements increased.

3.3 Great Wakering on the western edge of the site is a small rapidly expanding town. Its population grew by almost 20% between 1971 and 1981. The population of Barling Magna Parish also increased by approximately 5%. Paglesham is a scattered community located across Paglesham reach. Its small population dropped by almost 10% between 1971 and 1981.
Although the site is located on open marshland, the population in the surrounding area is relatively high. It is beside a number of villages and is close to the major settlement of Southend.

There is a substantial demand for housing in Essex, it is estimated that 37,000 additional dwellings would be required in the 1990s. The definition of Green Belt boundaries fundamentally influences the location of future development in the county. The settlement policy for Rochford District is for housing development to be limited to committed land, small sites and safeguarded sites identified in the Rochford District Plan.

Housebuilding in Southend Borough is also limited to the development of committed land, small sites and recycled urban land within the built up area. The Secretary of State for the Environment, in approving the current Structure Plan, concluded that Southend had reached the limit of its potential for development. In addition to Green Belt considerations, there is also high grade agricultural land and the coastal protection belt abutting the built up area.

The River Roach is a popular pleasure sailing area and the area is also popular for bird watching area. Southend on Sea offers a whole range of recreational and tourist facilities. The development of a repository, in particular the port facilities could affect the recreation potential of the River Roach area although access is already limited by the MOD.

The County Council has general policies to encourage the development of tourist and recreational facilities in the major settlements. The Structure Plan states that "the development or expansion of major water recreation facilities will not be permitted on the rural coastline but would be encouraged in those coastal towns where there would be no detriment to townscape and nature conservation ......." (Policy 19).

An area at Maplin Sands has been safeguarded for a number of years for a possible seaport. There was uncertainty in the late 1970's as to whether it would be needed and it is the County Councils view that there is now no justification for its continued safeguarding.
Disturbance

3.10 The proposed development will be visible from all directions although the views across the site will be limited because the landscape is so flat and more distant views will be obscured by the surrounding settlements.

3.11 The provision of an access road to the site will increase traffic on some local roads leading to the construction sites.

Local Nuclear Experience

3.12 There are no nuclear establishments within the surrounding area.
4.0 LOCAL ECONOMY

Travel to Work Area: Southend on Sea
Unemployment: 8.4% 21,277 people
Employment in manufacturing in county: 169,105
Major employers: Oil refineries on Canvey Island
                   Offices
                   Tourism at Southend
                   Substantial commuting to London

4.1 The employment structure of the Southend urban area at the 1981 census was as follows:

<table>
<thead>
<tr>
<th>Industry</th>
<th>% of employed residents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>0.6</td>
</tr>
<tr>
<td>Energy &amp; Water</td>
<td>2.4</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>22.8</td>
</tr>
<tr>
<td>Construction</td>
<td>7.6</td>
</tr>
<tr>
<td>Distribution &amp; Catering</td>
<td>18.6</td>
</tr>
<tr>
<td>Transport</td>
<td>7.8</td>
</tr>
<tr>
<td>Other services</td>
<td>39.6</td>
</tr>
</tbody>
</table>

4.2 In Essex there has been a fall in the number of jobs available and an increasing potential labour supply; this has led to an increase in commuting out of the county and also in the levels of unemployment which are high compared to other areas in the South East.

4.3 The employment policies for the county are centred on the expansion of existing firms and the introduction of new employment to be concentrated in the major settlements. There is a shortage of industrial land within the Southend urban area because the land on the outskirts of the town is primarily good quality grade 1 and 2 agricultural land. There are also competing demands for the available industrial land from retail and leisure uses.

4.4 The Structure Plan states that industrial and commercial development outside the major settlements will only be permitted if the development is not detrimental to local amenity and character.

4.5 The Structure Plan also identifies Southend as being suitable for large office development.
**Local Economic Benefit**

4.6 The Southend Area has a wide pool of labour and industries available to service a proposed repository on Potton Island. The development of the repository will only produce limited local economic benefit for the surrounding communities because the area already has a substantial level and range of economic activity.

**Blight**

4.7 Although tourism and agriculture are "sensitive" activities in the area, any blight impact is likely to be limited. These activities form only a small proportion of a range of economic activities in the area, in addition, the MOD have been operating from Potton Island for a considerable length of time, restricting public access into the area.

**Resource Sterilisation**

4.8 The proposed repository is located on MOD owned land and low quality agricultural land. Resource sterilisation is therefore not considered to be a particularly important factor in this site.
5.0 **NATURAL ENVIRONMENT**

Designations:
- SSSI on MOD land from Foulness Island to Shoeburyness
- Part of Coastal Protection Belt
- Part of Special Landscape Area

5.1 The coastal area between Shoeburyness and Foulness is flat and lowlying, most of it less than 10 metres above sea level. The area is divided by numerous streams and tidal creeks. The coastal area is characterised by salt marshes and extensive sand flats.

5.2 This coastline is important for waders and wildfowl particularly on its extensive saltings, marshes and mudflats. The site is part of a large SSSI.

5.3 The Structure Plan contains a number of policies to protect good quality agricultural land, open countryside and the coastline. There is a general presumption against development in these areas. The County Council have identified a coastal protection Belt and Special Landscape areas where particular consideration should be given to the landscape, character and natural habitats of the area. The repository is within and the proposed new road would cross these designated areas. These conservation policies cover a large area of the coastline restricting developments to the coastal towns.

**Disturbance**

5.4 The repository, port and new road link would result in the loss of habitat and disturbance to the SSSI. Although this impact would be locally severe it's significance is diminished because the SSSI covers a very large area and the development would only affect a small part of this area.
CONTENTS

SECTION

1.0 SITE CHARACTERISTICS 7.1

2.0 DEVELOPMENT PROPOSALS 7.2

3.0 COMMUNITY 7.3

4.0 LOCAL ECONOMY 7.6

5.0 NATURAL ENVIRONMENT 7.8

Following Text:

- 1:250,000 Location Map

- 1: 50,000 map with overlays showing
  - development proposals
  - designated areas and planning policy areas

- 1:100,000 map of population statistical areas

- 1: 50,000 map showing location of cross section and photographs

- cross section diagram

- photographs
1.0 SITE CHARACTERISTICS

Location: Western Isles
Size: 406 hectares (1000 acres)
Ownership: Secretary of State for Scotland
Grid Reference: NL 6491

1.1 Sandray is located at the southern end of the Western Isles. It is the most northerly of a group of uninhabited islands lying to the south of Barra.

1.2 Although it is now uninhabited, the island was used for rough sheep grazing up until the 1930s. Sandray has a predominantly rocky coastline and rises to a height of just over 200 metres, much of the island comprises steep slopes. There is an area of dunes at the eastern end. There are several burns draining the hill and a small loch is located in the south west of the island. There are no roads or landing facilities on Sandray.

1.3 The nearest inhabited island is Vatersay approximately 1 km across the Sound of Sandray. This has a population of just over 100 located in three small crofting townships. Crofting and fishing are the major activities on the island.
2.0 DEVELOPMENT PROPOSALS

Assumptions

Landtake: repository - 406 hectares (whole island)

Infrastructure: port on Sandray

Waste Transport: ship - 75 ships pa

Spoil Disposal: 13.9m t over 50 years - offshore disposal

2.1 The harbour would be located on the east coast of Sandray with the repository adjacent to it. It is anticipated that an accommodation camp will be required during the construction and operation of the port and repository facilities and this would also be located on Sandray. The location of these facilities is shown on the 1:50,000 map overlay. The surface workings will only cover a small proportion of the island.

2.2 The waste would be transported to Sandray by ship. It has been estimated that this would involve 75 return journeys per annum. In addition, spoil would be removed either by barge for sea dumping or tipped into the sea immediately offshore. Some of the rock spoil will be required to construct the sea breakwater.

2.3 The estimated labour requirements are:

<table>
<thead>
<tr>
<th>Type</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction</td>
<td>320</td>
</tr>
<tr>
<td>Operational</td>
<td>380</td>
</tr>
<tr>
<td>De-commissioning</td>
<td>60</td>
</tr>
</tbody>
</table>

It is likely that most of the workforce will come from mainland Scotland.
3.0 COMMUNITY

Western Isles population density: 0.11 pp hectare

Surrounding settlements

<table>
<thead>
<tr>
<th>Distance</th>
<th>Settlement</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 km</td>
<td>Vatersay</td>
<td>107</td>
</tr>
<tr>
<td>7 km</td>
<td>Castlebay</td>
<td>500 (est)</td>
</tr>
<tr>
<td>Total</td>
<td>Population of Barra and Vatersay</td>
<td>1,364</td>
</tr>
</tbody>
</table>

(Source: Western Isles Structure Plan and 1981 Census)

Number of properties within 2 km of the centre of the site: 0

3.1 The population within 9km of the centre of the site was calculated and the relevant Local Plan Statistical Areas (SA) are listed below:

<table>
<thead>
<tr>
<th>Statistical Area</th>
<th>Total Population</th>
<th>Assumed Population Within 9km</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA 8.2 Castlebay - Clidad</td>
<td>749</td>
<td>600</td>
</tr>
<tr>
<td>8.3 Vatersay</td>
<td>107</td>
<td>107</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>707</td>
</tr>
</tbody>
</table>

There are therefore approximately 700 people within 9km of the site. This very low figure reflects the fact that Sandray is an isolated and uninhabited island.

3.2 Although the population of Vatersay was 107 at the 1981 Census, more recent information suggests that the island has experienced a rapid decline in population. Newspaper articles in 1988 state that the population is now approximately 60.

3.3 The island of Vatersay comprises three small townships, Vatersay township is the nearest to Sandray. The island has a post office, a shop run by the Vatersay Community Co-op and a 2 teacher primary school. There are no specific facilities for tourists.

3.4 The main settlement on Barra is Castlebay which is the island's administrative and service centre. The remainder of the population is dispersed in townships on or near the coastal road and on the coastal strip in the north. The hilly interior of the island is uninhabited.
3.5 Housing in the Western Isles is closely linked with the crofting system. There is little movement between the crofting sector and the non-crofting private sector and therefore little mobility between house types, sites and locations within crofting townships. It is difficult to buy a house due to the small size of the market. The crofting system, in particular the difficulty of releasing land for development can have a significant effect on the location of new housing. Contrary to immediate impressions the amount of land suitable for housing, other than croft housing, and which is acceptable in both physical and planning terms is fairly limited. This is the case in Castlebay.

3.6 Castlebay offers a range of facilities including the newly constructed community school which contains a library, a swimming pool and facilities for a theatre. There is also a small hospital (5 beds) and old peoples home. Castlebay has five shops, a bank and a post office, but there is no baker or butcher. The inhabitants are dependent on the ferry for most foodstuffs. There is little evidence of self sufficiency in vegetables etc. Mobile shops, bank and library operate from Castlebay.

3.7 The Western Isles as a whole are heavily dependent on their transport links with the Scottish Mainland. Caledonian MacBrayne operate a vehicle ferry between Oban, Castlebay and Lochboisdale, with three crossings per week in winter and four crossings per week in the summer. Castlebay has no roll on/roll off facilities although there are plans to provide this in the near future. There are also 2 small passenger ferries, between Castlebay and Vatersay and between Eoligarry and Ludag (South Uist), both these ferries appear to be well used. There is a daily air service between Barra, Tiree and Glasgow and a twice weekly service between Stornoway, Benbecula and Barra.

3.8 The only public transport on Barra is provided by the Post Bus and the privately operated school bus. There is a community minibus on Vatersay.

3.9 Planning policy is based on a recognised settlement hierarchy which helps in the assessment of competing needs and the allocation of council resources in a rational manner. Castlebay is classified as a "level 2" settlement providing service and administrative functions to the whole island. Stornoway has been identified as the only "level one" settlement.
3.10 The Western Isles Council has a general policy against development in remote areas, Policy C21 states:

"The Council will not permit new development in very remote locations and an uninhabited island except:

(a) if the development is of a particularly hazardous nature and cannot be located elsewhere; or

(b) in the case of resource based developments where such development is not possible or is unsuitable or environmental grounds in a more accessible area".

Disturbance from Development

3.11 Whilst Sandray is a remote, uninhabited island it is clearly visible from Castlebay over low lying Vatersay and a large proportion of houses in Castlebay look over Vatersay and Sandray. It is unlikely that the construction camp would be visible from Castlebay but the headworks would be partially visible.

3.12 Although it is likely that much of the servicing of a repository on Sandray would be from mainland Scotland there is likely to be some social impact on the community on Barra, particularly Castlebay.

Local Nuclear Experience

3.13 There is no nuclear establishment in the Western Isles.
4.0 LOCAL ECONOMY

Travel to Work Area: Western Isles
Unemployment: 20.8% 2,050 people
Employment in manufacturing in region: 2,036
Major employment: Crofting, Fishing, Tourism

4.1 Crofting is the main economic activity on Vatersay, the other major activity is the provision of local services. In 1981 the number of jobs on Vatersay was estimated to be 18 full time and 1 part time. A further 8 people were unemployed, these were predominantly male and young.

4.2 The employment structure in Barra is more diverse. Many people have a number of part time jobs such as crofting, fishing and providing accommodation. In addition to these activities the local services are major employers. There are very few manufacturing employers, the major two are Barra Shell and Barratlantic fish processing factory. The labour force of the latter fluctuates considerably.

4.3 The 1981 employment survey also identified a large number of people who work away from Barra: it was estimated that 40 were working in the North Sea Oil industry and a further 40 were in the merchant navy.

4.4 The local labour supply from the immediate area for development on Sandray would be very limited. Even major construction projects on Barra, such as the community school, have imported some of the workforce because the work involved heavy machinery and required suitably experienced labour.

4.5 Whilst labour supply on Barra and Vatersay is limited the Western Isles as a whole could offer greater potential. Heavy steel fabrication was introduced to the Western Isles in 1976 with the setting up of Lewis Offshore Ltd at Arnish Point, Stornoway. Its labour force reached a peak of almost 1000 in 1978, many of the employees were local. Its workload has dropped considerably and its workforce now numbers less than 100. This suggests that suitable workers may be available in Stornoway.
4.6 The existing economic policy is based on concentrating on and developing the existing economic and employment base and skills of the islands. In particular, attention is given by the Western Isles Council to the encouragement of economic development outside the established settlements of Stornoway and Balivanich, where up to now most development has been concentrated.

Local Economic Benefit

4.7 The local economic benefit of the construction and operation of a repository on Sandray could be relatively large. There will be employment benefit in the surrounding community because there is little local employment, the range of existing job opportunities is very limited and the scope to introduce new types of economic activity is also very limited. The only constraint is that the number of people to benefit from the employment opportunities will be small particularly in the immediate area of Vatersay and Barra.

Blight

4.8 The communities around Sandray are considered to be threatened by blight because there is a high proportion of sensitive economic activities namely farming, fishing, and tourism and the Western Isles is heavily dependent on these activities.

Resource Sterilisation

4.9 No mineral resources have been identified on Sandray. At present mining and quarrying play a limited part in the economy of the Western Isles, providing material wholly, with the exception of Barra Harl, for local use. The island of Sandray would appear to be unused and therefore the potential resource sterilisation is very limited.
5.0 **NATURAL ENVIRONMENT**

Designations: ESA on parts of Barra and Vatersay
Preferred Conservation Zone

5.1 The machair land of Barra and Vatersay have been designated Environmentally Sensitive Areas, this includes much of the southern part of Vatersay.

5.2 The quality of the natural environmental is an important resource in the Western Isles; both for crofting, fishing, and also for recreation and tourism.

5.3 Sandray is an integral part of the Western Isles, clearly visible from Vatersay and Barra. The unspoilt appearance and natural habitat would be severely affected by the proposed development. The ESA on Vatersay is unlikely to be affected.
APPENDIX 8

Sellafield A & B
CONTENTS

SECTION

1.0 SITE CHARACTERISTICS 8.1
2.0 DEVELOPMENT PROPOSALS 8.3
3.0 COMMUNITY 8.4
4.0 LOCAL ECONOMY 8.7
5.0 NATURAL ENVIRONMENT 8.9

Following Text:

- 1:250,000 Location Map
- 1:50,000 map with overlays showing
  - development proposals
  - designated areas and planning
    policy areas
- 1:100,000 map of population statistical areas
- 1:50,000 map showing location of cross section
  and photographs
- cross section diagram
- photographs
1.0 SITE CHARACTERISTICS

Location: Cumbria County
Copeland District

Size: Not known

Ownership: BNFL?

Land use: Agriculture/parkland/unused

Topography: Gently rolling coastal plain

Grid Reference: NY 0202 & NY 0305

1.1 The Sellafield site lies on the Cumbrian coast 16km south of the centre of Whitehaven. The Sellafield Works are on the coastal plain, with the fells of the Lake District National Park rising a few kilometres to the east. The Park boundary is 3km from the coast at Sellafield, running alongside the A595(T) between Calder Bridge and Gosforth. (See 1:250,000 and 1:50,000 maps.)

1.2 The extent of the BNFL ownership at Sellafield is not known. For the purpose of this appraisal, the potential repository site, Sellafield A, has been located on the southern side of the Sellafield Works. An inland site, Sellafield B, has been included to permit appraisal of a repository in the Borrowdale volcanics. The headworks for the Sellafield B option have been nominally located at Pelham House School, where it is known that BNFL own some land.

1.3 The potential repository site are partly in agricultural use. It and the surrounding agricultural land is classified as Grade 3 by MAFF. To the east, beyond the A595(T), the land quality drops to Grades 4 and 5 as the land rises to the fells.

1.4 Immediately adjacent is the Sellafield Works, comprising the nuclear reprocessing plant of Windscale and the nuclear power station of Calder Hall. Reprocessing work has been undertaken at Sellafield since 1952, with the present plant coming on stream in 1964. Construction is underway on a plant to handle AGR and LWR oxide fuel pins from the UK and other countries. This Thermal Oxide Reprocessing Plant (THORP) is due to be completed in 1991. Low level radioactive waste is disposed of in the site at Drigg, 4km down the coast.

1.5 A new access road from the A595(T) to Sellafield has recently been completed. The junction with the A595 is a roundabout near Blackbeck, North of Calder Bridge. This road gives easy access to the northern side of Sellafield where the THORP development is located.
1.6 A new access road has also been constructed to Calder Hall, on the southern side of Sellafield. This road is from the B5344 towards Seascale.

1.7 There is an existing spur into the Sellafield site from the adjacent British Rail Cumbrian Coast line.

1.8 At present, some of the nuclear material is delivered to Sellafield by sea to the port at Barrow and then transported by rail to Sellafield.
2.0 DEVELOPMENT PROPOSALS

Assumptions

<table>
<thead>
<tr>
<th></th>
<th>Sellafield A</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Land take:</strong></td>
<td>surface works 60 ha (150 acres)</td>
<td></td>
</tr>
<tr>
<td><strong>Infrastructure:</strong></td>
<td>road/rail</td>
<td>none</td>
</tr>
<tr>
<td><strong>Waste transport</strong>:</td>
<td>rail - 261 trains p.a.</td>
<td>lm tonne on site</td>
</tr>
<tr>
<td><strong>Spoil disposal:</strong></td>
<td>17.2m te over 50 years</td>
<td>rail to Lancashire</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Sellafield B</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Land take:</strong></td>
<td>surface works 80 ha (200 acres)</td>
<td></td>
</tr>
<tr>
<td><strong>Infrastructure:</strong></td>
<td>road/rail 10 ha</td>
<td>internal rail &amp; road link &amp; access road as 'A'</td>
</tr>
<tr>
<td><strong>Waste transport</strong>:</td>
<td>lm to on site</td>
<td>12.9m te over 50 years rail to Lancashire</td>
</tr>
</tbody>
</table>

2.1 The two red overlays for the 1:50,000 map illustrate the layout and location of the Sellafield options. Ownership details are not known so the site locations are assumed for the purpose of this appraisal.

2.2 Sellafield A (for a repository in the coastal anhydrite deposits) is on the south side of the existing Works and north of Newmill Beck. Sellafield B (for a repository in the Borrowdale volcanics inland) is split between the coastal site (as 'A'), for the reception facilities, and inland, for the headworks.

2.3 A rail and road link would be required between the two parts of the Sellafield B site and a new road access from the A595. No new transport facilities would be required for the Sellafield A site.

2.4 JMP Consultants estimate approximately 340 vehicles per day for 'A' and 320 vpd for 'B; using the A595.

2.5 The annual workforce is estimated to be as follows:

<table>
<thead>
<tr>
<th></th>
<th>'A'</th>
<th>'B'</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Construction:</strong></td>
<td>310 (11 years)</td>
<td>340 (9 years)</td>
</tr>
<tr>
<td><strong>Operation:</strong></td>
<td>340 (50 years)</td>
<td>330 (50 years)</td>
</tr>
<tr>
<td><strong>Decommissioning:</strong></td>
<td>70 (8 years)</td>
<td>60 (8 years)</td>
</tr>
</tbody>
</table>
3.0 **COMMUNITY**

Dwellings within 2km of site centre:  
A - approx 550  
B - approx 600

Estimated population with 9km of site centre:  
A - 14,000  
B - 17,600

Estimated population density within 9km of site centre:  
A - 0.55 ppha  
B - 0.69 ppha

District population density: Copeland 0.99 ppha

<table>
<thead>
<tr>
<th>Settlement</th>
<th>Distance (km)</th>
<th>Approx Population</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>Seascale</td>
<td>1.5</td>
<td>3.5</td>
</tr>
<tr>
<td>Calder Bridge</td>
<td>3.0</td>
<td>0.5</td>
</tr>
<tr>
<td>Gosforth</td>
<td>3.5</td>
<td>3.0</td>
</tr>
<tr>
<td>Beckermet</td>
<td>4.0</td>
<td>2.0</td>
</tr>
<tr>
<td>Egremont</td>
<td>8.0</td>
<td>5.5</td>
</tr>
<tr>
<td>Whitehaven</td>
<td>16.0</td>
<td>15.0</td>
</tr>
</tbody>
</table>

3.1 Based on the 1981 Census data for resident population is civil parishes, the population within 9km of the sites was estimated as follows (see 1:100,000 map for parish boundaries):

<table>
<thead>
<tr>
<th>Parish</th>
<th>Total</th>
<th>% parish</th>
<th>No.</th>
<th>% parish</th>
<th>No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>St Bees</td>
<td>1,611</td>
<td>10</td>
<td>161</td>
<td>40</td>
<td>644</td>
</tr>
<tr>
<td>Egremont</td>
<td>7,996</td>
<td>80</td>
<td>6,397</td>
<td>90</td>
<td>7,196</td>
</tr>
<tr>
<td>Lonside Quarter</td>
<td>392</td>
<td>100</td>
<td>392</td>
<td>100</td>
<td>392</td>
</tr>
<tr>
<td>St Johns Beckermet</td>
<td>2,009</td>
<td>100</td>
<td>2,009</td>
<td>100</td>
<td>2,009</td>
</tr>
<tr>
<td>Haile</td>
<td>226</td>
<td>100</td>
<td>226</td>
<td>100</td>
<td>226</td>
</tr>
<tr>
<td>St Bridget Beckermet</td>
<td>501</td>
<td>100</td>
<td>501</td>
<td>100</td>
<td>501</td>
</tr>
<tr>
<td>Penrithby</td>
<td>164</td>
<td>100</td>
<td>164</td>
<td>100</td>
<td>164</td>
</tr>
<tr>
<td>Netherwasdale</td>
<td>265</td>
<td>10</td>
<td>27</td>
<td>75</td>
<td>133</td>
</tr>
<tr>
<td>Gosforth</td>
<td>1,272</td>
<td>100</td>
<td>1,272</td>
<td>100</td>
<td>1,272</td>
</tr>
<tr>
<td>Seascale</td>
<td>2,038</td>
<td>100</td>
<td>2,038</td>
<td>100</td>
<td>2,038</td>
</tr>
<tr>
<td>Drigg &amp; Carleton</td>
<td>488</td>
<td>100</td>
<td>488</td>
<td>100</td>
<td>488</td>
</tr>
<tr>
<td>Ironton with Stanton</td>
<td>498</td>
<td>50</td>
<td>249</td>
<td>50</td>
<td>249</td>
</tr>
<tr>
<td>Muncaster</td>
<td>272</td>
<td>30</td>
<td>82</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Cleator</td>
<td>7,371</td>
<td>-</td>
<td>-</td>
<td>30</td>
<td>2,211</td>
</tr>
<tr>
<td>Ennerdale &amp; Kinnisle</td>
<td>288</td>
<td>-</td>
<td>-</td>
<td>20</td>
<td>58</td>
</tr>
</tbody>
</table>

| Total                  | 14,007| 17,581 |

3.2 There are a number of villages and small towns in the vicinity of Sellafield. Beckermet, Calder Bridge and Gosforth are on the lower land of the river valleys and, particularly the latter two, are surrounded by deciduous trees. Views of the Sellafield Works from these villages are limited.

8.4
3.3 Seascale is a larger village just to the south of the works. Intervening higher ground affords some screening but further extensive landscape bunds are being created on the southern side.

3.4 The Sellafield Works is a dominant industrial complex set in the agricultural land of the coastal plain. The towers and sphere of the old Windscale works and the cooling towers of Calder Hall are all distinctive features visible from some distance. (In due course, the windscale sphere and towers are to be dismantled.)

3.5 Sellafield dominates the local communities by its physical presence and its role as the major source of employment. Many of the residents of the settlements work at Sellafield. The overall impression of the area is of an attractive rural location, particularly north towards St. Bees Head and east towards the Lake District. The centre of Beckermet is designated as a Conservation Area. There are also a number of historical sites in the countryside, including a stone circle near Seascale which is a scheduled ancient monument.

3.6 Land at Beckermet and Seascale has planning permission for residential development. At Beckermet 40 dwellings are expected to be developed by 1996. There is little demand for private sector housing in Seascale so development on one site is to be reduced to 40 rather than 70 dwellings for the period to 1996. Both villages have primary schools.

3.7 Egremont is the local services centre for the area (e.g. secondary school) with Whitehaven providing a wider range of shopping and community facilities.

**Disturbance from Development**

3.8 Development of a repository at Sellafield A is close to a village of Seascale. However, the surface buildings, including the headworks, would be seen against the backdrop of the existing Sellafield Works. With careful landscape schemes, the bulk of the development could be screened. Landscaping could also reduce noise impact.
3.9 The development of the Sellafield B option splits the headworks from the reception buildings. The latter, on the coastal site, could be treated as the Sellafield A development and screened from the south. The headworks are close to Calder Bridge but separated by the woodland. This woodland would obscure or prevent close views but the works would be visible from the south and east, noise could cause disturbance in Calder Bridge.

3.10 As the new transport infrastructure for both Sellafield A and B is minimal, the visual and noise disturbance would also be minimal. However, there will be increased traffic levels on the local roads, particularly during construction. There may also be noise disturbance from transport between the reception and headworks in the Sellafield B option.

Local Nuclear Experience

3.11 with the dominance of the existing Sellafield Works in the local economy and community, many of the residents in the vicinity will have direct experience of the nuclear industry.
4.0 LOCAL ECONOMY

Travel to Work Area: Whitehaven
Unemployment (in TTWA): 9.3% 3,062 people (April 1988)
Employment in manufacturing in Cumbria: 64,457
Economy: dominated by Sellafield Works; rural area: agriculture

4.1 The economy of the Mid Copeland Local Plan area, and the wider area of West Cumbria in general, is dominated by the role of the Sellafield Works. The total employment at Sellafield is around 11,000, including an estimated 920 (35% of the workforce) in the Local Plan area, which extends from Drigg to St. Bees but excludes Egremont.

4.2 BNFL acknowledge the importance of providing job opportunities to the local population and require contractors recruiting specifically for Sellafield work to taken on people usually resident in West Cumbria (subject to them having the appropriate skill level). In 1986 about 70% of the contracted workforce was local to West Cumbria (Local Plan para 2.6).

4.3 After Sellafield, agriculture is the most important sector of the local economy, accounting for about 11% of the workforce. The remaining employees (including a high proportion of professional people) commute to the urban areas of West Cumbria, particularly Whitehaven.

4.4 The District Council has expressed some concern over the dependence of the local economy of West Cumbria on Sellafield and is encouraging diversification where possible. Poor strategic access and the absence of government financial assistance are seen as the two key constraints to attracting new industry to the area. Local employment initiatives, therefore, are seen as perhaps offering the greatest potential.

4.5 Tourism plays a minor role in the local economy but the local authorities have recently launched a programme to improve its facilities and attract more visitors. Sellafield itself is now promoting visits to the Works and has recently completed a £5 million visitor centre designed to cope with some 150,000 visitors a year. There are holiday cottages along the coast north of Sellafield and St. Bees Head is a particularly popular area.
Local Economic Benefit

4.6 The number unemployed in the local Travel to Work Area and the proximity of population centres of Whitehaven and, further north, Workington (with 3,593 unemployed in the TTWA in April 1988) means that the workforce could be recruited largely from West Cumbria, both during construction and operation. The latter may be helped by the presence of the existing Works.

4.7 The demise of the traditional industries in West Cumbria (mining, iron and steel) has not been counteracted by the introduction of other industries, including the nuclear industry. The peripheral location of West Cumbria and the resultant distance from the markets of the Midlands have meant that it is difficult to create new employment opportunities or attract new major employers.

Blight

4.8 Sensitive activities in the area of Sellafield comprise agriculture and some tourism. In the case of the latter, the Sellafield Visitor Centre is the major tourist attraction in West Cumbria and therefore appears to benefit rather than blight tourism. The presence of the existing Sellafield works should reduce any blight effect of a repository development.

Resource Sterilisation

4.9 Both Sellafield A and B options would result in the loss of agricultural land, which is classed as grade 3 by MAFF. Part of 'A' site is allocated in the Local Plan for extension to the Works (see map overlay). Part of 'B' is allocated in the Local Plan for 'prestige industrial use'. BNFL intended to use this for offices but now has plans to develop a business park on the site.
5.0 **NATURAL ENVIRONMENT**

**Designations:**
- Lake District National Park - 3km
- Heritage Coast - St. Bees Head 10km
- AGLV - adjacent
- SSSI - Drigg 10km
- Braystones Tarn 8km
- St. Bees Head 10km
- Local - Sellafield coast

5.1 St. Bees Head is a designated Heritage Coast, where the District Council "will support proposals to manage and develop the stretch of coastline as a national recreational and wildlife resource" (Policy 6m).

5.2 The coastal strip, excluding Sellafield, was designated in the old Country Development Plan as an Area of Great Landscape Value. The current Structure and Local Plans retains the designated area and have policies to "protect the landscape from non essential and inappropriate development". (See map overlay.)

5.3 The provisional route of the Cumbrian Coastal Footpath lies to the west of the railway line, except next to Sellafield, where it crosses to the east of the line. The footpath is still being developed and promoted as a recreational resource.

5.4 The sand dunes, single, saltmarsh and dune heath at Drigg is a designated SSSI for the importance of the coastal wildlife species. Braystones Tarn, to the north, is of interest for the fen vegetation. St. Bees Head is designated for its geological, botanical and ornithological value.

5.5 A narrow stretch of the coastline adjacent to Sellafield has been identified as being of wildlife importance although not SSSI value.

**Disturbance**

5.6 The Sellafield Works dominate the local landscape so the intrusion from a repository development would not be significant. However, the Sellafield B site would result in a greater impact by locating the headworks away from the existing industrial area into the rural area towards the National Park.
5.7 Nature conservation interests are not likely to be significantly affected by development or transport implications of either site. Again, Sellafield B would have a greater impact by involving more land and a transport link.
View 1

VIEW FROM SEASCALE SCHOOL

SELLAFIELD - B
View 2

VIEW FROM A595T WEST OF GOSFORTH
(Grid ref. SJ63038)

[Diagram showing elevation changes and distances]
APPENDIX 9

Stanford
CONTENTS

SECTION

1.0 SITE CHARACTERISTICS 9.1
2.0 DEVELOPMENT PROPOSALS 9.3
3.0 COMMUNITY 9.4
4.0 LOCAL ECONOMY 9.7
5.0 NATURAL ENVIRONMENT 9.9

Following Text:

- 1:250,000 Location Map
- 1: 50,000 map with overlays showing
  - development proposals
  - designated areas and planning policy areas
- 1:100,000 map of population statistical areas
- 1: 50,000 map showing location of cross section and photographs
- cross section diagram
- photographs
1.0 STANFORD

Location: Norfolk County
Breckland District

Size: 7,048 ha

Ownership: MoD

Land use: MoD training area

Grid Reference: TL 8693

1.1 Stanford is located 12km to the north of the town of Thetford within the Thetford forest area (see map accompanying).

1.2 The site is relatively flat varying between 30 and 50 metres above sea level. A small stream crosses the site and there are several areas of standing water, the largest being Stanford Water.

1.3 The site is used for military training and the surrounding land uses are predominantly forestry. A large part of the forests are promoted for recreational uses and there are a number of forest walks and picnic sites in the area. The Pedars Way Long Distance footpath passes just to the east of the site.

1.4 Access to the various ranges and training areas is gained through private military roads. The local roads in the area of a reasonably high standard. The site is approximately 15km from the All trunk road. A by-pass of Thetford is under construction.

1.5 There is no rail access to the site, the nearest railway is approximately 8km to the south west of the site. The site is approximately 40 km inland and therefore no ports have been proposed.
2.0 DEVELOPMENT PROPOSALS

Assumptions

Landtake: repository - 60 hectares
rail link & upgraded road link - 69 hectares

Infrastructure: 8.5km of new rail link
5.3km of upgraded road

Waste Transport: train - 497 trains pa

Spoil Disposal: train to disused brickworks Bedfordshire - 292 trains pa

2.1 It is estimated that the proposed repository will require 60 hectares, in addition, more land will be required for the construction of the railway to connect the site to the existing network and for land over the underground vault.

2.2 It is proposed to bring the waste to the site by train, this would involve 497 train journeys per year. The major part of the spoil produced at the site would be disposed of in the disused brick workings around Bedfordshire, this would involve the movement of 292 trains a year. A small amount of spoil would stay on the site for local landscaping.

2.3 The proposed rail link will cross forestry land, farmland and MOD land before reaching the site. It is proposed to upgrade an existing, partially asphalted road to provide road access to the site. The increase in road traffic on the existing roads is estimated to be of the order of 160 vehicles a day, 20 of which are likely to be lorries.

2.4 The labour requirements of the site are listed below:

<table>
<thead>
<tr>
<th>Category</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction:</td>
<td>310 for 10 years</td>
</tr>
<tr>
<td>Operational:</td>
<td>330 for 50 years</td>
</tr>
<tr>
<td>De-commissioning:</td>
<td>50 for 9 years</td>
</tr>
</tbody>
</table>

It is anticipated that this labour force can be obtained locally, in particular from the Thetford area.
3.0 **COMMUNITY**

District population density: Breckland 0.74 ppha

Surrounding settlements

<table>
<thead>
<tr>
<th>Distance</th>
<th>Settlement</th>
<th>Approx Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 km</td>
<td>Thompson</td>
<td>309</td>
</tr>
<tr>
<td>5 km</td>
<td>Lynford</td>
<td>50</td>
</tr>
<tr>
<td>6 km</td>
<td>Wretham</td>
<td>283</td>
</tr>
<tr>
<td>7 km</td>
<td>Mundford</td>
<td>1,082</td>
</tr>
<tr>
<td>8 km</td>
<td>Great Hockham</td>
<td>541</td>
</tr>
<tr>
<td>10 km</td>
<td>Thetford</td>
<td>19,500</td>
</tr>
</tbody>
</table>

Number of houses within 2km of centre of site: 0

3.1 The population within 9km of the centre of the site has been estimated using the 1981 Census Parish Populations. The parish boundaries are shown on the map. The relevant settlements are listed below:

<table>
<thead>
<tr>
<th>Settlement</th>
<th>Estimated Population</th>
<th>Estimated Population</th>
<th>Estimated Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>within 9km</td>
<td>within 9km</td>
<td>within 9km</td>
<td>within 9km</td>
</tr>
<tr>
<td>Mundford</td>
<td>100% 1,082</td>
<td>1,082</td>
<td>1,082</td>
</tr>
<tr>
<td>Lynford</td>
<td>100% 182</td>
<td>182</td>
<td>182</td>
</tr>
<tr>
<td>Stanford</td>
<td>100% 7</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Sturston</td>
<td>100% 0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Tottington</td>
<td>100% 0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Thompson</td>
<td>100% 309</td>
<td>309</td>
<td>309</td>
</tr>
<tr>
<td>Marton</td>
<td>100% 144</td>
<td>144</td>
<td>144</td>
</tr>
<tr>
<td>Little Cressingham</td>
<td>100% 191</td>
<td>191</td>
<td>191</td>
</tr>
<tr>
<td>Ickburgh</td>
<td>100% 174</td>
<td>174</td>
<td>174</td>
</tr>
<tr>
<td>Hilborough</td>
<td>90% 121</td>
<td>121</td>
<td>121</td>
</tr>
<tr>
<td>Diddington</td>
<td>75% 49</td>
<td>49</td>
<td>49</td>
</tr>
<tr>
<td>Cranwich</td>
<td>80% 37</td>
<td>37</td>
<td>37</td>
</tr>
<tr>
<td>Weeting &amp; Broomhill</td>
<td>20% 1,619</td>
<td>1,619</td>
<td>1,619</td>
</tr>
<tr>
<td>Thetford</td>
<td>5% 19,593</td>
<td>19,593</td>
<td>19,593</td>
</tr>
<tr>
<td>Croxton</td>
<td>95% 311</td>
<td>311</td>
<td>311</td>
</tr>
<tr>
<td>Kilverstone</td>
<td>30% 74</td>
<td>74</td>
<td>74</td>
</tr>
<tr>
<td>Wretham</td>
<td>60% 283</td>
<td>283</td>
<td>283</td>
</tr>
<tr>
<td>Hockham</td>
<td>20% 541</td>
<td>541</td>
<td>541</td>
</tr>
<tr>
<td>Stow Bedon</td>
<td>50% 275</td>
<td>275</td>
<td>275</td>
</tr>
<tr>
<td>Kriston</td>
<td>10% 322</td>
<td>322</td>
<td>322</td>
</tr>
<tr>
<td>Watton</td>
<td>60% 4,790</td>
<td>4,790</td>
<td>4,790</td>
</tr>
<tr>
<td>Soham Toney</td>
<td>30% 1,262</td>
<td>1,262</td>
<td>1,262</td>
</tr>
<tr>
<td>Ashill</td>
<td>5% 1,371</td>
<td>1,371</td>
<td>1,371</td>
</tr>
<tr>
<td>Great Cressingham</td>
<td>90% 250</td>
<td>250</td>
<td>250</td>
</tr>
<tr>
<td>Santon Downham</td>
<td>80% 237</td>
<td>237</td>
<td>237</td>
</tr>
</tbody>
</table>

Total 8,167
3.2 There are very few settlements in the immediate vicinity and very few dwellings within 5km of the site.

3.3 The major town in the area is Thetford approximately 10km to the south of the site. Thetford has experienced the most rapid growth rate of any part of Norfolk. Its population has more than tripled since 1961. Much of this growth has been as a result of the Town Expansion Scheme agreement with the then Greater London Council. The town has developed a youthful age structure with over 28% of the population under the age of 16 in 1981. The Town Expansion Scheme agreement ceased in the mid 1970s.

3.4 Other than Thetford there are a number of small towns and villages within 15km of the site. Generally the population of the smaller villages has tended to decline but the larger settlements have experienced considerable growth. For example between 1971 and 1981 the populations of Mundford and Hockham both increased by over 50%. Conversely the population of Wretham decreased by over 40% this is likely to have been a result of MoD policy because there is a small military camp located on the edge of the village.

3.5 The Structure Plan settlement policy has been based on a hierarchy of settlements from growth centres, these tend to be the market towns, down to small villages where new housing will only be permitted where evidence of "local need" can be shown. Applications for residential buildings outside villages will only be permitted where they replace existing dwellings or in exceptional circumstances.

3.6 Thetford is identified as an employment growth area where residential development will be permitted and the present Town Map allows for considerable growth. Watton has been identified as a centre for services, residential and limited industrial development but development will only be permitted on the existing allocated land. Mundford is identified as a location for limited residential development and considerable new housing development has already taken place.
3.7 Much of the site is hidden from public view by forests and extensive tree belts and the site can only be seen from local roads through the woodlands. Therefore the site is unlikely to be visible to the local population given the amount of tree cover and the considerable distance to the nearest villages.

3.8 The proposed rail link could have a greater environmental impact than the actual development. There will be 160 houses within 1km of the railway line, although for over half its length the railway will be in cutting which will reduce it noise and visual impact.

3.9 There are no nuclear establishments within 25 km of the site.
4.0 LOCAL ECONOMY

Travel to Work Areas: Thetford
Unemployment: 6.4% 1,609 people
Employment in manufacturing county: 69,184
Major Employers: Forestry Commission and MoD in Local Areas. Industrial Estates at Thetford

4.1 Employment in Thetford has grown rapidly over the past two decades. The status of Thetford being a Town Development Scheme has led to the establishment of many new manufacturing businesses on industrial estates in the town.

4.2 A large proportion of people are employed in the manufacturing industries. 55% in 1981 and consequently a lower proportion are employed in distribution and services although attempts are being made to increase the number and variety of service jobs available. Despite Thetford's association with the forest only a small proportion of the total working population are employed in agriculture and forestry. Although small in overall terms this is an important source of employment in the local area.

4.3 Because of the initial difficulties experienced by firms in obtaining adequate labour, the level of commuting into Thetford from the surrounding rural areas has grown, and commuters account for a considerable proportion of the industrial workforce.

Local Economic Benefit

4.4 Whilst the surrounding area will experience local economic benefit this is not so important because the area, in particular Thetford, has been shown to be capable of attracting a range of economic activities.

Blight

4.5 There are few economic activities in the immediate area. The recreational use of Thetford Forest and surrounding agriculture are sensitive activities but they are unlikely to be affected by the proposed development.
Resource Sterilisation

4.6 The site is presently used for military training and the surrounding land uses are forestry and agriculture. The proposal development will result in a resource of local importance being sterilised.
5.0 **NATURAL ENVIRONMENT**

**Designations:**

- Within Breckland ESA
  - Area of attractive and important landscape. Important wildlife conservation zone.
  - 12.5km from Brattisham Heath NNR
  - 15 km from Thetford Heath NNR

5.1 The proposed site is located within the Breckland area of Norfolk which is considered to be of national importance and contain wildlife resources of particular significance. Part of this area has been designated in ESA.

5.2 The site is part of an area of attractive and important landscape identified in the Norfolk Structure Plan, which covers the whole of the Brecklands including Thetford Forest and the River Waveney Valley. Other areas of attractive and important landscape include the Norfolk Broads and the north Norfolk Coast. A smaller proportion of these areas have also been identified as important wildlife Conservation Zone by the Nature Conservancy Council. The Council will be consulted on any application for development within the zones that is likely to affect wildlife.

5.3 Thetford Forest is an important recreational resource and the Forestry Commission have developed a number of facilities including information centres, signposted walks and informal picnic sites.

5.4 There are two National Nature Reserves within 15km of the site, but it is not known if there are any SSSI in the vicinity.

5.5 Although the proposed repository and rail link are located in areas designated important for landscape and nature, the disturbance to these areas is likely to be minimal given the scale of the designated areas and the fact that the MOD are already active on the site.
APPENDIX 10

Offshore
West & East
CONTENTS

SECTION

1.0 INTRODUCTION  10.1

2.0 HUNTERSTON  10.2
  - site characteristics & proposals
  - community
  - local economy
  - natural environment

3.0 REDCAR/TEESMOUTH  10.3
  - site characteristics & proposals
  - community
  - local economy
  - natural environment

Following Text:

- Hunterston  1:250,000 location map
  1:50,000 map with overlays sharing
  - development proposals
  - designated areas & planning policy area

- Redcar/ Teesmouth  1:250,000 location map
  1:50,000 map with overlays showing
  - development proposals
  - designated areas & planning policy areas
1.0 **INTRODUCTION**

1.1 One of the design concepts for a repository is for disposal offshore, underground with access from a structure (similar to an oil rig). The waste would be transported to the site by a semi-submersible crane vessel (SSCV). Waste from all sources would be assembled at one port on the mainland for transport to the site.

1.2 Two sites have been identified for appraisal at this stage of the selection process. These are design options in different rock environments and have not been allocated to specific locations but both would be some distance from the mainland (i.e. outside the coastal waters). The general locations are:

Offshore West (in hard rock): between Inner Hebrides and Northern Ireland

Offshore East (in sedimentary rock): North Sea

1.3 The sites for this repository option are very different in nature from the land-based sites, making accurate and meaningful comparison extremely difficult. Offshore sites are outwith the UK planning jurisdiction and will therefore pose legal as well as engineering problems.

1.4 As far as possible the Offshore sites have been included in the evaluation procedure. In all sites, the emphasis has been placed on the repository area itself, so with no 'local community', the Offshore sites will have no direct disturbance impact on people.

1.5 With the transport arrangements focused on one point on the mainland (which is not the case with the small islands sites) greater attention is given to the port facilities. The following sections summarise the features of the two port sites identified:

Offshore West site: port at Hunterston

Offshore East site: port at Redcar/Teesmouth
2.0 **HUNTERSTON**

### Site Characteristics and Proposals

**Location:** Strathclyde Region  
Cunninghame District

**Land Use:** disused construction yard

**Grid Reference:** NS 1852

2.1 Hunterston is on the west coast of Scotland, south west of Glasgow. The site identified for the port facilities is the unused platform construction yard lying between the Hunterston nuclear power station (SSEB) and the ore terminal (which serves the Ravenscraig steel mills) (see 1:250,000 and 1:50,000 maps).

2.2 The site is part of an area of land allocated, by the Secretary of State for Scotland, for industrial development requiring the unique facilities of the site, in particular deep water capable of accommodating the very largest vessels" (North Coast & Cumbraes Local Plan, Aug 1987, p63).

2.3 Hunterston is on the Firth of Clyde. It is overlooked by the town of Millport on the island of Great Cumbrae and the hills inland to the east. The construction yard itself, designed for platform construction for the oil industry but unused, is situated on the seaward side of the Hunterston Sands. It is reached by a Causeway, with the access road joining the A78 trunk road adjacent to the ore terminal.

2.4 The proposed port facilities would be located on the site of the construction yard. Details of facilities and layout are not known. A new rail link would be provided from the port to the British Rail line to the east (approximately 3km) (see map overlay).

### Community

2.5 The town of Fairlie (pop 1,350 1981) lies 3km to the north east Millport, (pop 1,220 1981) to 3km to the north west. Ardrossan and Saltcoats are south of Hunterston, along the coast. Largs (pop 6,978 1981) is 6.5km to the north.
2.6 Hunterston House and a number of individual houses and farms to the east overlook the site and proposed rail link. The views from Millport and Fairlie would be partially obscured by intervening land or existing development.

Local Economy

2.7 The port site lies within an area zoned in 1971 for industrial purposes. The land is also covered by a Direction from the Secretary of State for Scotland which requires that all applications for planning permission for industrial development are to be referred to him for determination (see map overlay for Direction area). It is identified as a major industry site in the National Planning Guidelines.

2.8 The Local Plan sets out specific policies for the Hunterston area. The northern part (reference 1 on overlay) is for industrial development (policy HUN 2):

"Development for industrial purposes (including steel production, port and related development and oil related development) within the northern part of the site shall accord with the Local Plan where it meets the following criteria:

(a) it requires Hunterston's deep water access;

(b) it confers a major and lasting net benefit on the Scottish economy particularly in terms of employment created;

(c) it is properly planned, together with other projects, to make the most effective use of the site as a whole, including a satisfactory scheme for the reclamation of the foreshore;

(d) it is carried out in such a way as to minimise environmental damage and contribute to the leisure and recreational use of adjoining areas eg the remaining part of Southannam Sands. For major new developments an environmental impact analysis will be required and the developer will be required to define the measures they will take to overcome any problems identified; and

(e) it is able to operate acceptably beside the nuclear power station" (Local Plan p67-68).
2.9 The southern part of the area (reference 2 on the overlay) is to remain in its present, mainly agricultural use, unless specifically required for use in line with the National Planning Guidelines (ie industrial). Tourist development and environmental protection policies apply to the area.

2.10 Development proposals for any part of the Direction area would be subject to careful scrutiny to ensure appropriate design etc in order to minimise the environmental impact.

2.11 Hunterston is within the Largs employment exchange area (EEA) and Irvine travel to work area (TTWA). In 1978, the breakdown of employment in the Large EEA was:

<table>
<thead>
<tr>
<th>Industry</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary</td>
<td>163</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>213</td>
</tr>
<tr>
<td>Construction</td>
<td>2128</td>
</tr>
<tr>
<td>Services</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>2504</td>
</tr>
</tbody>
</table>

2.12 In April 1988, the unemployment rate in the Irvine TTWA was 20.9%, amounting to 9,980 people. If construction workers were recruited in the area for the repository development offshore, it is likely that much of the employment needs could be met locally. This would depend on the skills required and available.

2.13 In the area around Hunterston, it is apparent that alternative sources of employment are difficult to find and there is little scope to attract new economic activities.

**Natural Environment**

2.14 The map overlay shows the landscape and nature conservation designations in the area. The hills to the east are part of the Renfrew Hills Regional Scenic Area, designated by Strathclyde Regional Council. Hunterston Sands is an SSSI for its geological features and variety of seashore habitats (for plants, wildfowl and waders). There are also Listed Wildlife Sites at:
Glen Burn: ornithological, entomological and botanical interest

Hunterston-Portencross/Goldenberry Hill: woodland, heath and coastal communities

Farland Point, Great Cumbrae: raised beach grassland and marsh area.

2.15 During construction and operation of the port, measures would have to be taken to ensure the nature conservation interest were safeguarded, particularly the SSSI along the shoreline. The construction of the rail link may affect this but damage should be restricted to the causeway area.
3.0 REDCAR

Site Characteristics

Location: Cleveland County
Langbaurgh District

Grid Reference: NZ 5524

3.1 The site is located adjacent to the River Tees between the Teeside Steelworks and the oil refinery. (See 1:250,000 and 1:50,000 maps.)

3.2 The surrounding land uses are predominantly heavy industrial and the River Tees is a major port with numerous jetties and berthing facilities.

3.3 As well as the river access the site is well served by rail and road, only short new stretches of rail and road would be required to link the proposed part to the existing rail and road network.

3.4 The proposed port is approximately 5km west of Redcar and 8km north east of Middlesbrough.

Community

3.5 Although the landuses immediately around the site are industrial the site is located on the edge of Middlesbrough which has a population of approximately 150,000. The population of Langbaurgh District is approximately 150,000 which gives a population density of 6.25 persons per hectare.

3.6 In the Cleveland Draft Structure Plan the land is zoned for industry. The site has deepwater riverside access and therefore priority will be given to port related industrial development.

3.7 The port development is unlikely to create noticeable visual and noise disturbance because it will be located among other industrial uses which comprise large buildings and structures. There is also considerable industrial traffic on the existing road and rail network and therefore the additional traffic generated by the proposed port will have minimal impact on the environment.
3.8 Hartlepool nuclear power station is located approximately 3km to the North West of the proposed port.

Local Economy

3.9 The local economy is still very dependent on the chemicals, steel and heavy engineering industries although these industries have been declining in recent years. Growth of light industry has not compensated for the decline in the traditional industrial base and Cleveland has a relatively small service sector.

3.10 The site is in the Middlesbrough TTWA. Almost 24,000 people were unemployed in the TTWA in April 1988. The local economic benefit of the port is limited because although there are a large number of unemployed the site has potential to attract alternative economic activities.

3.11 There are very few economic activities that would be sensitive to blight in the area and these are unlikely to be affected by the development particularly considering the number of refineries and chemical industries etc already in the immediate area.

3.12 The proposed site is zoned for port facilities therefore the development of a port will result in the utilisation of a recognised resource.

Natural Environment

3.13 Although the area is predominantly industrial in nature the land either side of the mouth of the River Tees has been designated an SSSI.

3.14 The land at Seal Sands and Bran Sands was originally allocated for industry but this designation has been removed in the latest Cleveland Draft Structure Plan.

3.15 The River Tees subject plan proposes that environmental upgrading, including demanding a high standard of new development, should be promoted along the banks of the River Tees adjacent to the proposed site.