# THE INFRASTRUCTURE PLANNING (APPLICATIONS: PRESCRIBED FORMS AND PROCEDURE) REGULATIONS 2009

**Preesall Underground Gas Storage Facility, Lancashire**

## Project Overview

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<p>| Date:         | November 2011 |
| Version Number: | 1 |</p>
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SUMMARY

1. Halite Energy Group Limited (Halite) is applying for a Development Consent Order (DCO) to construct and operate an Underground Gas Storage (UGS) facility at Preesall, Lancashire which includes an interconnector pipeline to the National Grid Transmission System at Nateby, 12 km to the east, and a brine discharge pipeline extending 2.3 km off shore from Rossall, Fleetwood (the Project).

2. The aim of this Report is to provide an introduction and a broad overview of the Project and the DCO application documentation and supporting Reports. The DCO application raises a number of key issues as shown in the Table at Appendix 1. The key issues identified are:

- Need
- Geology
- Consultation
- Design
- Construction
- Operation
- Decommissioning
- Safety and Risk
- Planning policy
- Environmental Assessment
- Alternatives
- Site Assembly
- Local benefits

3. The Table at Appendix 1 sets out the key DCO application documents relating to each of these issues. On some of these issues, a hierarchy of application documents are provided, starting with the project overview and backed up by technical reports providing more detailed analysis. A complete list of all DCO application documents is contained in the ‘Register of Application Documents’ (Document Ref 1.3)

4. The Project Overview summarises how the key issues identified above are addressed within the DCO application as follows:

5. **Need**: The planning basis for the need for the Project is derived from national planning policy. There is an acknowledged need for UGS facilities in the UK and this is recognised in the ‘Overarching National Policy Statement for Energy (EN-1)’. The NPS makes the point that the UK is ‘highly dependent on natural gas’ (para 3.8.1) with ‘strong seasonal variations in demand’ (para 3.8.3) such that it needs a diverse mix of gas storage and supply infrastructure to respond effectively in future to the large daily and seasonal changes in demand and to provide endurance capacity during a cold winter (para 3.8.7). A more detailed analysis of need is set out in the ‘Preesall Need Case’ (Document Ref 9.1.5) and in the ‘Planning and Sustainability Statement’ (Document Ref 9.1.1).
6. **Geology**: Since early 2010 Halite has been in discussion with Lancashire County Council (LCC) and their geological consultants and has reviewed and agreed with them a ‘Geology Summary Report’ (Document Ref 9.2.2). LCC has acknowledged during pre-application consultation that the geological assessment that has been undertaken show that previous concerns raised by the Council and the Secretary of State can no longer be justified and that underground gas storage caverns can be safely constructed at Preesall.

7. **Consultation**: Previous planning applications submitted by Canatxx Gas Storage Limited (CGS) for UGS facilities at Preesall have raised a substantial number of objections from the local community. These related to issues primarily in respect to geology, landscape and visual impact, safety and security and perceived fear. Halite has consulted the local community as part of its proposals and has sought to have regard to the views that were expressed in the design of the Project. Details of the consultation process and the responses received are set out in the ‘Consultation Report’ (Document Ref 3.1).

8. **Design**: The ‘Design and Access Statement’ (Document Ref 9.1.2) provides details of the design considerations for each building comprising the Project. That part of the Project that is located to the west of the Wyre Estuary, including the seawall crossing and the observation platform, the Seawater Pump Station and the route of the brine pipeline are acceptable to the LPAs. However, the LPAs have raised concerns about the visual and landscape impact of that part of the Project on the Preesall site on the east bank of the Wyre Estuary. The LPAs consider that the Booster Pump Station, the GCC and the wellheads represent an industrial form of development that is not appropriate in the countryside. Halite has examined alternative locations on the west bank of the Wyre Estuary for these aspects of the Project and has concluded, in consultation with Lancashire County Council (LCC) and the Health and Safety Executive (HSE), no suitable site exists. Details are provided in the Surface Infrastructure: Alternative Sites Report. To assist in mitigating the impact, Halite has sought to design the proposed buildings to reflect the character of existing buildings in the Preesall locality and has ‘sunk’ some elements of the Project into the ground. A comprehensive Landscape and Ecological Management Strategy Plan is also proposed for the Preesall area which includes earth mounding and significant new planting.

9. Although the Project includes development within the countryside it is acknowledged in planning policy that minerals can only be worked where they are found. The Preesall area is not designated as a nationally or locally important landscape area and has, to a certain extent, already been influenced by historic brine extraction activities. The location of some of the built development in the countryside, however, remains an issue for the LPAs and it is a matter which the IPC will need to consider in the planning balance in determining the DCO application.
10. **Construction**: Details of the construction of the Project are set out in the ‘Construction Report’ (Document Ref 9.1.6) but, in summary, the Project comprises a number of discrete but closely related elements as follows:-

(i) Creation of up to 19 underground gas storage caverns.
(ii) 7 multiple wellhead compounds to create the underground salt caverns and, once operational, to connect the gas manifolds.
(iii) Gas Compressor Compound comprising pig launchers and receivers; slug catchers; above ground high pressure pipelines; glycol contactors to dry the gas; glycol regeneration system; compressors; compressor knock out separators; compressor aftercoolers; gas filters; gas heaters; utility systems, plant drainage and power supply; emergency/maintenance vent stack; electrical/instrument and utilities buildings; 132kV substation, access roads and car parking areas.
(iv) Seawater Pump Station compound comprising a Pumping Station, standby generator and switchgear building, transformers and ancillary infrastructure, access roads and car parking areas;
(v) Booster Pump Station compound comprising the Booster Pump Station building; control room, a switchgear and standby generator building, transformers, a debrining facility, ancillary infrastructure, access roads and car parking areas;
(vi) Refurbishment of Higher Lickow Farm;
(vii) Gas manifold and distribution infrastructure;
(viii) Seawater pipeline from the Fleetwood Fish Dock to the Preesall site;
(ix) Brine discharge pipeline from the Preesall site to a point approximately 2.3km offshore to a two port diffuser;
(x) Power, communication and control cable routes from the Fleetwood Dock to the Preesall site;
(xi) Power cable routes from the United Utilities Switchgear at the Stanah Switchyard to the new electrical sub-station;
(xii) Temporary drilling compounds at the Fleetwood Fish Dock and at the Stanah caravan park;
(xiii) Extension to sea wall at West Way to accommodate brine outfall and new observation platform;
(xiv) Interconnector pipeline link to the Metering Station and NTS at Nateby;
(xv) Comprehensive landscape scheme;
(xvi) New access road from the A588 and new and upgraded internal access tracks within the site.
(xvii) Temporary construction compounds.

11. **Operation**: The Project has an operational design life of over 40 years. The overall philosophy of operation is that the Project would store gas at times of excess gas availability on the NTS and release gas at times of high demand. The Project would be designed with maximum operating flexibility to enable any or more of the following trading cycles to be accommodated:

- Seasonal Trading Cycle: Injection through summer months (April to October), withdrawal through winter months (November to March);
Weekly Trading Cycle: Injection through the weekend, withdrawal through the weekdays;

Daily Trading Cycle: Injection through the night, withdrawal on request.

12. The Project would be a fast cycle facility that is expected to be ‘churned’ (filled and emptied) several times per annum. Individual caverns would, however, seldom be completely emptied (except for maintenance) and only occasionally completely full.

13. Decommissioning: At the end of the life of the Project, the caverns may have the potential for alternative uses such as ‘carbon capture’ but any alternative uses would have to be considered at that time and do not form part of the current DCO application.

14. If there were no alternative uses for the caverns, these would be emptied of gas, filled with brine and sealed. The wellheads would be maintained and monitored in accordance with an approved scheme and in a manner consistent with the ongoing maintenance and monitoring activities being conducted for the existing ICI caverns. A restoration and management plan would be produced to ensure the long-term maintenance and safety of the caverns and the site. The remaining infrastructure could remain in place if required for alternative uses or alternatively demolished and removed from the site in accordance with a scheme to be agreed with the LPAs.

15. Safety and Risk: Safety is paramount to Halite and it has undertaken extensive and detailed work to ensure the Project is safe. Halite has prepared a ‘Risk Assessment’ (Document Ref 9.3.1) to assess the level of risk associated with the Project. The Risk Assessment and related Geology Summary Report confirm that the Project can be constructed and operated safely and that the risk of fatality from the Project is less than one in 100 million per year.

16. Planning policy: A review of the Project against the planning policies is set out in the ‘Planning and Sustainability Statement’ (Document ref 9.1.1). The assessment shows that planning policy seeks to encourage the provision of UGS facilities but regard must be had to the impact of the particular development on the environment and the amenity of local residents. The assessment concludes that the Project accords with the provisions of the development plan.

17. Environmental Effects and Alternatives: The assessment set out in the ‘Environmental Statement’ (Document Ref 5.1) identifies the likely significant effects of the proposed Project on the environment, covering the direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects at all stages of the Project, and also of the measures envisaged for avoiding or mitigating significant adverse effects. In accordance with the advice set out in NPSs EN-1 and EN-4, the ES also include information on the likely
significant social and economic effects of the development, and how any likely significant negative effects would be avoided or mitigated.

18. In developing its Project, Halite examined a number of alternative designs for the buildings and infrastructure. It also had regard to the issues that had been raised by previous planning applications that had been determined by Lancashire County Council (LCC) and Wyre Borough Council, as the Local Planning Authorities (LPAs), and the Secretary of State following an appeal.

19. Design alternatives are set out in Chapter 4 of the ES; alternative designs for the building in the ‘Design and Access Statement’ (Document Ref 9.1.2) and alternative routes for the interconnector pipeline in the ‘Gas Interconnector Pipeline to the NTS Report’ (Document Ref 9.2.6).

20. Site Assembly: Halite control approximately 500 ha of land at Preesall and this forms the majority of land required for the construction of the Project. The route of the brine pipeline and the interconnector pipeline involves a range of third parties with whom Halite are negotiating the rights to construct and operate the Project. The ‘Book of Reference’ (Document Ref 7.3) and the associated plans provide details of all those with an interest in the land. Although negotiations are proceeding, Halite is seeking the rights to compulsory purchase some of the interests and rights in the land required for the construction of the Project as may be necessary. The ‘Statement of Reasons’ (Document Ref 7.1) Document and the ‘Funding Statement’ (Document Ref 7.2) Document provide the background to the CPO proposals and the means by which the acquisition would be funded.

21. Local benefits: As well as assisting to meet the national need for UGS facilities, the Project provides a number of local benefits. During construction, the Project would generate 200-300 jobs and once operational it would generate 30 – 40 jobs. Halite are keen to ensure that the jobs go to local people and are proposing to achieve this through a legal commitment as summarised in the draft ‘DCO Obligation Heads of Terms’ (Document Ref 9.1.4). The Heads of Terms also seeks to establish a corporate social responsibility fund and a de-commissioning fund.

22. The Project represents an investment of £600 million. This figure, however, excludes indirect benefits and multiplier effects through the use of local goods and services and, therefore, the overall impact on the local economy would be higher.
1.0 INTRODUCTION

1.1 This Project Overview has been prepared by the Barton Willmore LLP on behalf of Halite Energy Group Limited (Halite) who are progressing an application to the Infrastructure Planning Commission (IPC) for a Development Consent Order (DCO) to construct and operate an Underground Gas Storage (UGS) Facility and associated infrastructure (the ‘Project’) at Preesall, Lancashire.

1.2 The Project proposes the construction and operation of an Underground Gas Storage Facility comprising up to 19 caverns with a total capacity up to 900 million cubic metres to provide a working capacity of 600 million cubic metres of natural gas measured at standard temperature and pressure (STP). The Project includes a connection to the Gas National Transmission System (NTS) at Nateby, 12 km to the east by an interconnector pipeline.

1.3 Significant amounts of water are required to create the gas storage caverns and this would be supplied to the Project site by an underground brine pipeline from the Fleetwood Fish Dock. The saturated brine that is created from the ‘washing’ caverns would be disposed of by an underground pipeline from Preesall to a point about 2.3 km from the shore in the Irish Sea.

1.4 The aim of this Report is to provide an introduction and a broad overview of the Project and the DCO application documentation and supporting Reports. The DCO application raises a number of key issues as shown in the Table at Appendix 1. The key issues identified are:

- Need
- Geology
- Consultation
- Design
- Construction
- Operation
- Decommissioning
- Safety and Risk
- Planning policy
- Environmental Effects and Alternatives
- Site Assembly/Compulsory Purchase
- Local Benefits

1.5 The Table at Appendix 1 sets out the key DCO application documents relating to each of these issues. On some of these issues, a hierarchy of application documents are provided, starting with the project overview and backed up by technical reports providing more detailed analysis. A complete list of all DCO application documents is contained in the ‘Register of Application Documents’ (Document Ref 1.3)
1.6 The Project Overview summarises how the key issues identified above are addressed within the DCO application. This Report is structured as follows:

- Section 2: Need
- Section 3: Geology
- Section 4: Consultation
- Section 5: Design
- Section 6: Construction
- Section 7: Operation
- Section 8: Decommissioning
- Section 9: Safety and Risk
- Section 10: Planning Policy
- Section 11: Environmental Effects and Alternatives
- Section 12: Site Assembly/Compulsory Purchase
- Section 13: Local Benefits
- Section 14: Conclusions
2.0 NEED

2.1 The planning basis to the need for the Project is derived from national planning policy. There is an acknowledged need for UGS facilities in the UK and this is recognised in the ‘Overarching National Policy Statement for Energy (EN-1).’ The NPS makes the point that the UK is ‘highly dependent on natural gas’ (para 3.8.1) with ‘strong seasonal variations in demand’ (para 3.8.3) such that it needs a diverse mix of gas storage and supply infrastructure to respond effectively in future to the large daily and seasonal changes in demand and to provide endurance capacity during a cold winter (para 3.8.7).

2.2 The NPS makes reference research commissioned by the Department of Energy and Climate Change (DECC) which examines the future risks to Great Britain’s security of gas supplies over the medium term to 2025. Under the heading of the ‘need for more gas infrastructure’ NPS EN1 states:

‘This assessment considered the impacts if various adverse events should occur – such as a particularly cold winter, an interruption to a major source of supply, a failure of a major piece of infrastructure, or a combination of these events. Using cautious assumptions about the build-up of gas supply infrastructure, the assessment showed that, whilst the gas market is largely robust to a range of adverse events, the risk of shortfalls in supply cannot be ruled out, nor the risk that there may need to be significant rises in wholesale gas prices in order to balance the market. Further infrastructure – beyond that which exists or is under construction at present – will be needed in future in order to reduce supply or price risks to consumers’ (para 3.8.8).

2.3 The NPS EN-1 makes the point that a range of gas infrastructure is required including ‘increased gas storage capacity, whether for gaseous gas in underground storage facilities, or as LNG in tanks above ground, is required to provide close-to-market ‘swing supply’ to help meet peak demand. Demand varies considerably throughout the day and it is necessary for some sources to be close to the market so that gas is quickly available. Gas supply infrastructure will also need to keep pace with any changes in the regional demand for gas across the UK – which may change due to changes in location of population and/or commercial or industrial demand’ (para 3.8.9)

2.4 The NPS notes that gas stored in caverns in salt strata deep underground, have fast withdrawal and refill rates which helps gas supply companies to respond to changing market conditions from day to day (“diurnal”) and week to week. Close-to-market gas storage also provides a prompt supply
Need
capability, which is particularly valuable when there is a delay before gas imports can respond to a market signal for increased supplies (para 3.8.12).

2.5 Preesall has a number of locational advantages for the development of a UGS facility including a :

2.6 **Ideal salt deposit:** The salt formation is not too deep being some 220 metres to 760 metres below ground. The geological assessment that has been carried out confirms that the salt body is capable of storing gas safely.

2.7 **Excellent water source:** Leaching salt caverns requires large amounts of water. Preesall's proximity to the sea allows the use of seawater for cavern washing and thus avoids significant demands on fresh water resources. The location also offers the opportunity to use the existing underutilised infrastructure at the Fleetwood Fish Dock as a water source.

2.8 **Large reliable existing electrical connection:** The ICI Hillhouse complex at Thornton has historically been fed from the Stanah substation. The Stanah substation is one of the most robust and reliable connections to the NTS electrical grid. The Stanah feed to the Project provides a dedicated, secure electrical supply for gas compression which is quiet, environmentally friendly and eliminates the need for any generation on site.

2.9 **The existing NTS infrastructure:** The National Gas Transmission System (NTS) near Nateby was designed to handle the variable swing production from Morecambe Bay. It is extremely robust and ideally suited to supply and receive gas from Preesall.

2.10 **The location is at a physical midpoint on the NTS:** The proposed pipeline connection is near the midpoint of the NTS. As pipelines are essentially pressure maintenance systems, ideally gas should enter any system at the midpoint. The midpoint connection is especially good for system pressure maintenance during periods of high system demand or terminal interruption.

2.11 **Replacement of Morecambe Bay’s capabilities:** The Morecambe Bay Gas Field was developed by British Gas as a super peaking gas supply. With the privatisation of British Gas, Morecambe Bay was used as a low load, high swing field that acted as a very large backstop to the capacity of the terminals. Morecambe Bay is now in decline and can no longer provide the swing it once could. The Project would have the ability to increase the swing capacity to make up for part of that which is being lost from Morecambe Bay.

2.12 **West coast terminals:** The western leg of the Gas NTS has three main sources of supply, Fergus in Scotland, Barrow from Morecambe Bay and
Burton Point from Liverpool Bay. These terminals are in decline and will continue to supply less gas each year to the UK. The Project would add capacity to the western leg of the NTS and assist the replacement of some of the lost terminal capacity.

2.13 The Project would be an energy efficient gas storage project as the gas is stored virtually at the same pressure as the NTS which means that it requires less energy to store and return the gas to the NTS than is used in storage schemes that operate at greater depth and pressure.

2.14 Capabilities of the Project include:

2.15 **Scale**: The Project, upon completion, would have a working gas capacity of 600 million cubic metres at STP, which would make a valuable addition to the very low gas storage capacity in the UK. The Project would provide about 3 days (or about 20%) additional capacity to that currently available in the UK.

2.16 **High injection and withdrawal rates**: The Project has been designed to operate in the same pressure range as the NTS. The NTS system near Preesall also has a very large capacity and can supply and receive large amounts of gas to and from the Project. The high injection rates mean that when gas is available in the system for storage, the Project can absorb it. The Project’s high rates of withdrawal also mean that when gas is required by the system, the Project can supply a significant proportion (about 10%) of the UK’s average daily gas requirements, particularly in high demand winter days.

2.17 The UK system is susceptible to large-scale interruption if supplies are curtailed during periods of high demand. The Project would represent an important source of stored gas for short-term gas system requirements. The high injection and withdrawal rates are also useful for the NTS operations. Diurnal pressure swings on the NTS can be mitigated very efficiently by the Project and National Grid Gas would benefit from better system efficiency and operating costs.

2.18 **Winter refill capability**: Gas is available during the winter for injection, albeit it is typically available on an intermittent basis. The Project would cope with winter injection; the combination of high injection rates and fast reaction time allow the Project to absorb gas when it is available.

2.19 **Fast reaction time**: Deep storage facilities operating in the UK are predominantly used as single turn, one cycle per year facilities. They are primarily used to store gas during the temperate months and to deliver gas to the system during the winter. The design and operating regime of this type of facility, particularly their low injection capability, limits their ability to react quickly. The Project is different as it has been designed to have very fast reaction times and, additionally, can change the direction of gas flow very quickly. The Project would provide hourly balancing, pressure maintenance, short-term storage services and gas system needs at
speeds, scale and efficiency, which other deep storage facilities cannot easily match.

2.20 **Reliability**: Multiple caverns, manifolds, pipeline and electrical connections are designed to achieve very high levels of reliability. Many of the UK’s existing terminals and associated gas infrastructure are ageing. Whilst the Health and Safety Executive (HSE) ensures continued safety of all gas storage and transmission infrastructure, ageing equipment inevitably means greater risk of outage, with a predictable decline in reliability. The Project would be new, modern, on shore and would add to the overall reliability of the UK gas system.

2.21 **Cost**: Cost is an important factor in the development and construction of essential gas infrastructure. Some deep storage schemes that are proposed and even consented may not come to fruition because of the high costs of construction and commissioning. In contrast, the Project would be relatively low cost as the caverns are not as deep.

2.22 **Flexibility**: The physical capabilities of the Project would create a storage facility that would be able to provide a complete portfolio of storage services. The Project would be able to provide large scale, seasonal storage, and medium-term and fast cycle storage. It would also provide balancing, pressure maintenance and physical back-up to the NTS. These capabilities would also create new storage products currently limited or unavailable in the UK and boost the options for gas users to use energy reserves efficiently and cost effectively.

2.23 These locational and Project specific capabilities give the Project specific advantages of scale, speed, reliability and costs in assisting security of gas supply in the UK. A more detailed analysis of need is set out in the ‘Preesall Need Case’ (Document Ref 9.1.5) and in the ‘Planning and Sustainability Statement’ (Document Ref 9.1.1).
3.0 GEOLOGY

3.1 Salt formations are excellent locations for natural gas storage because, once they are formed, the caverns allow no injected gas to escape unless specifically extracted. Salt cavern walls are extremely strong which makes them resilient to degradation over the life of the Project. There is also no opportunity for stored gas to migrate out of the cavern due to the impermeable nature of the salt.

3.2 The caverns are created by dissolving the salt and extracting the brine to create cavities in which gas can be stored. The technology associated with the creation of the caverns in the salt and their use for gas storage is ‘proven’ and is common practice in the UK, Europe and America. In this context, the British Standard on ‘Gas Supply Systems – Underground Gas Storage’ (1998) states:

‘The underground storage of compressed natural gas (CNG) and liquefied petroleum gas (LPG) in solution mined salt cavities is a proven technology for adjusting gas supply systems to short term and seasonal changes in gas demand.

It is known that suitable salt layers and salt domes are impermeable to gas at normal pressures. In addition, cracks and faults in the salt are healed by the viscoplastic behaviour of the salt under the geostatic pressure.’

3.3 A number of gas storage facilities are already operating or are planned within the UK as follows:

Existing UK gas storage

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<tr>
<th>Storage Project</th>
<th>Operator</th>
<th>Location</th>
<th>Space (bcm)</th>
<th>Deliverability (mcm)</th>
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## Storage projects under construction

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<th>Location</th>
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## Storage projects with planning consents, final investment approval not made

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3.4 Previous planning applications and an appeal for UGS facilities at Preesall have been refused primarily because of a lack of information and understanding of the geology at Preesall and, therefore, the safety of gas storage. Halite has been in discussion with LCC and their geological consultants (Atkins) to resolve the geological issues since 2010. Further geological investigations and assessments undertaken by Halite suggest that the optimum location for the construction of caverns is at the northern part of the Preesall site. The geological work summarised in the ‘Geology Summary Report’ (GSR, Document Ref 9.2.2), includes a review of the geological data and identifies potential geological hazards at Preesall. This assessment led to the development of ‘hazard exclusion zones’ where, based on available data, the composition and character of the salt was not sufficiently defined. Two polygonal areas called ‘Areas for Cavern Development’ were identified outside of the buffer area in the northern part of the site where the development of the caverns would take place.

3.5 Having regard to the GSR, a plan showing ‘Areas for Cavern Development’ and an indicative cavern layout has been produced showing the approximate location and size of each cavern (Drawing No D-9000-030). The layout is ‘indicative’ as the precise location and extent of each cavern within the two polygons will be subject to acceptance by the HSE under the Control of Major Accident Hazards (COMAH) Regulations 1999. As the cavern locations cannot be fixed in the DCO application until a full COMAH assessment has been completed and accepted by the HSE, it has been necessary to include requirements within Part 3 of Schedule 1 of the DCO to allow some flexibility in their final locations provided that the caverns are within the defined ‘Areas of Cavern Development’.

3.6 The cavern siting determines the type of the borehole and the siting of the wellhead compounds that are required to complete them. Halite has engaged specialist drilling contractors, Baker Hughes, to evaluate the required programme to successfully drill and create caverns located in the cavern development area. Because some of the salt formation lies under the Wyre Estuary, most well trajectories would use deviated drilling. In some instances, up to a 600 metre ‘step out’ would be required from the well head to the location of the cavern that is proposed to be created. Four distinct well types have been identified; vertical, S-shaped, slant and extended reach slant wells. Details of the proposed drilling programme are set out in the ‘Review of the Proposed Drilling and Completion Programmes for the Preesall Underground Gas Storage Project’ (Document Ref 9.2.5) prepared by Baker Hughes. The Review concludes that the existing conceptual programmes are suitable to successfully drill and complete all well types required for the cavern construction process.

3.7 The LPAs have raised concerns about the routing of the interconnector pipeline through the existing brinefield and whether the existence of
historic caverns could affect the stability of the pipeline route. Halite has investigated this issue and the assessment is set out in the ‘NTS Interconnector at Preesall Pipeline Subsidence Assessment Report’ (Document Ref 9.2.3). This proposes that a monitoring system is put in place prior to pipeline construction such that ground deformation risk may be monitored and in the event that ground movements occur they could be detected early. In the unlikely event that monitoring detects unpredicted ground movement, the Report recommends a range of mitigation measures.

3.8 Concerns have also been raised by some groups and the public about the Halite’s geology assessment following a failure of an existing brine well (BW45) at Preesall in June 2011. At BW45, the existing wellhead failed and saturated brine within the cavern was released under pressure to the atmosphere. Halite has examined the causes of this failure and the stability of the cavern was found to be sound and that there were no implications for the construction and operation of the Project. Details are set out in the ‘Legacy Brinewell Impact Assessment’ (Document Ref 9.2.1), ‘Assessment of Brinewell Incident (Subsurface Aspects) Report’ (Document Ref 9.2.4) and the Geology Summary Report (9.2.2).

3.9 In their Section 42 consultation response, which had regard to the BW45 incident, LCC concluded that Halite has demonstrated that previous concerns expressed by the County Council and the Secretary of State could not be maintained and that underground gas storage caverns can be safely constructed at Preesall.
4.0 CONSULTATION

4.1 The Project design was heavily influenced by the results of the Secretary of State’s appeal decision in 2007, the consultation responses to the 2009 planning application, the informal consultation with the LPAs and statutory and other consultees throughout 2010 as well as the results of the formal consultation under Section 42, 47 and 48 of the PA2008. The planning history and the consultation responses at each phase of the Project development identified the important issues as geology, risk, security and fear and landscape and visual impact and these matters were discussed with the statutory and other consultees as part of the Project design. At each phase of consultation, Halite has amended its Project design to have regard to the representations that have been made.

4.2 Details of the consultation exercise and the responses are set out in the ‘Consultation Report’ (Document Ref 3.1). The Report was prepared in accordance with Section 37(3) (c) of the PA 2008 and seeks to demonstrate compliance with Section 42, 47 48 and 49 of that Act in that it has:

- Consulted the local authority and all local authorities that have a border with the host authority; all landowners (which is widely defined, and includes those with rights of common land) of land to which the application relates; and a list of consultees set out in Schedule 1 of the Applications Regulations (the ‘statutory consultees’).

- Consulted the local community in accordance with the requirement of the Statement of Community Consultation (SOCC).

- Published the requisite Public Notices in national and local newspapers.

- Had regard to the responses to the consultation process in its Project design.

4.3 The Project has been defined following four stages of consultation as follows:

- **January and October 2010: Initial Project Design** There has been a long history of previous planning applications for UGS Facility’s at Preesall submitted to the Local Planning Authorities (LPAs) by Canatxx Gas Storage Limited (CGS). These previous planning applications were subject to public consultation and, in one instance, a public inquiry. Halite carried out a full review of these previous planning applications and the issues that were raised to inform its initial Project design. As well as reviewing the technical information submitted as part of previous applications, this involved
discussions with the LPAs and the statutory and other consultees so a full understanding of the issues was achieved.

- **November 2010 to March 2011: Consultation on the Indicative Project design.** The initial Project design was complete by November 2010 and Halite decided to consult the LPAs and the statutory agencies on its indicative Project. This phase of the process included informal consultation with Section 42 consultees to 'test' the emerging Project design.

- **April to May 2011: Statutory Pre-application Consultation.** Following a review of the responses to the consultation of the indicative Project design, Halite updated its plans and in April 2011 commenced the statutory pre-application consultation phase under Section 42, 47 and 48 of the Act.

- **May to November 2011: Ongoing consultation** This phase involved an assessment of the formal consultation responses and updating the Project design. Dialogue with a range of consultees, including Parish Councils, Local Authorities and other statutory bodies has continued to shape the proposals until the point of submission of the DCO application to the IPC.

4.4 The consultation activities carried out on the Project included:

- Review and assessment of the issues arising from the planning history of the site
- Preparation of Technical Reports
- Preparation of brochures and non technical summaries
- Liaison and discussion with the statutory and other consultees
- Media relations
- Presentations
- Website
- Newsletters
- Public exhibitions
- Drop-in sessions
- Community Liaison Panel
- Feedback Report

4.5 The Consultation Report provides details of how the consultation activities influenced the design of the project as submitted to the IPC.

4.6 Consultation was also undertaken on the format and scope of the ‘Environmental Statement’ (Document Ref 5.1) and a summary of the responses are set out in Chapter 5 of the ES.
5.0 DESIGN

5.1 The ‘Design and Access Statement’ (Document Ref 9.1.2) provides details of the design considerations for each building comprising the Project. The permanent above ground built development necessary for the construction and operation of the Project comprises:

- Security and Support Facility
- Seawater Pump Station
- Booster Pump Station
- Gas Compressor Compound
- Wellhead Compounds
- Seawall Crossing and Observation Platform
- Interconnector Metering Station

5.2 A copy of the Masterplan of the Preesall site is attached at Appendix 2 for ease of reference.

5.3 The design of the buildings has been influenced by the context to the Project and the design principles developed by the Project architect. The context is provided by:-

- The needs of the development;
- The site context having particular regard to its landscape and surroundings;
- The planning history of the site and comments by the LPAs on previous designs;
- The planning policy considerations with particular reference to the requirements of Section 10 of the Planning Act 2008, the sustainable development principles set out in Planning Policy Statement 1 – Delivering Sustainable Development and the ‘good design’ objectives outlined in the National Policy Statements; and
- The comments made by the consultees and the community through the formal Section 42 and 47 consultation process.

5.4 Having regard to the context, the Project architect identified the following design principles:-

(i) The proposed development should seek to retain those parts of previous schemes that were deemed acceptable by the LPAs and the Secretary of State including :

- The route of the brine pipeline;
- The design of the seawall crossing and the observation platform;
- The siting and design of the brine diffuser;
- The general route of the gas interconnector to the NTS;
- The siting and design of the Metering Station; and
- The siting and design of the Seawater Pump Station.
The proposed development should have regard to the matters raised by the LPAs and the Secretary of State in respect of the previous schemes, particularly in respect of the impact of the siting and design of the:

- Reception and Warehouse Compound
- Gas Compressor Compound
- Booster Pump Station

The proposed development should accommodate the equipment and technical functions of the Project in a safe and secure manner.

Buildings should be designed individually to reflect the character of their location and surroundings rather than providing a ‘family’ or consistent design across all buildings.

Where possible, preference should be given to siting buildings in urban rather than the rural areas. Buildings should only be sited in the countryside if there are no more appropriate alternative locations.

Buildings should not be concentrated together as a single complex but provided as single buildings that are more easily assimilated into the landscape.

Where possible and appropriate, use is made of existing buildings.

Where possible, the height of buildings or infrastructure should be minimised and/or major buildings ‘sunk’ into the ground in order to minimise visual impact.

Where possible, no building or structure should be constructed in a nature conservation area.

Where possible and appropriate, all buildings should be provided above 10 metres AOD to avoid flood risk.

Where possible and appropriate, earth bunding should be provided at low gradients so that the bund can continue to be used for agricultural purposes.

Where possible and appropriate, buildings should be provided close or adjacent to existing roads or tracks to avoid the need for the construction of new access roads.

The proposed development should seek to achieve economical fabrication and construction.
(xiv) The proposed development should seek to allow for staged construction and to allow the proposed buildings to be constructed in parallel.

(xv) The proposed development should seek to maximise the use of local materials and products in the built form.

5.5 The major impact on the siting and design of the buildings comprising the Project has arisen from the reduction in the number of gas storage caverns that are proposed. The Project provides up to 19 caverns with a working gas capacity of 600 million cubic metres measured at standard temperature and pressure (STP) – about half that of the previous Canatxx Gas Storage (CGS) proposals. The reduction in the size of the scheme and the proposed location of the caverns in the northern part of the Preessall site has allowed for a reduction in the amount of above ground development that is required and has allowed a more compact scheme to be designed.

5.6 In progressing the revised design, Halite has sought to:-

- Retain that part of the CGS proposals on the west bank of the Wyre Estuary that was acceptable to the Local Planning Authorities (LPA) i.e. the design of the Seawall Crossing and the Observation Platform, the route of the brine pipeline, the siting and design of the Seawater Pump Station and the locations of the north and south River Wyre crossings.
- Locate the built form on the east side of the River Wyre to the northern part of the site to provide a more compact development.
- Relocate the Booster Pump Station to the east of the Hackensall STW to reduce its visual impact when viewed from the west.
- Remove the need for a second Booster Pump Station from the Project.
- Remove the Control and Warehousing building from the Project.
- Refurbish and re-use of Higher Lickow Farm.

5.7 The Security and Support Facility is located at Higher Lickow Farm. The farmhouse and farm buildings are currently redundant and are in a poor state of repair. The proposals are to refurbish the farmhouse and one of the existing barns for use as part of the Project. There are no objections to the re-use of these farm buildings from WBC who ‘commend’ this part of the proposal as a means of reducing the visual impact of the development.

5.8 The remaining buildings are all new build. The Seawater Pump Station is located at Fleetwood Dock within an area allocated for mixed use development in the development plan. Following concerns raised by the LPAs in the Section 42 consultation to the design of the proposed building, Halite has re-designed the building to meet their requirements.
5.9 The Booster Pump Station, the Gas Compressor Compound (GCC) and the wellheads are located in a rural area at Preesall and through the Section 42 consultation both LPAs are objecting to this part of the Project. The GCC, in particular, is considered to be industrial development in the countryside which would have an adverse impact on the landscape and visual amenity.

5.10 At the request of the LPAs, Halite has considered alternative sites for the GCC on the west bank of the Wyre Estuary. In consultation with the LPAs and the HSE a number of alternative sites were examined but all were rejected on health and safety grounds. A review of the analysis in set out in the ‘Surface Infrastructure: Alternative Site Assessment’ which forms an Appendix to the Planning and Sustainability Report (Document Ref 9.1.1).

5.11 Halite has sought to minimise the impact of the GCC on the countryside by careful siting in the lee of a hill, and the implementation of a comprehensive Landscape and Ecological Management Strategy Plan.

5.12 The Booster Pump Station is a relatively small building and this has been located adjacent to the Hackensall Sewage Treatment Works (STW). The STW is already an ‘industrial’ type of development and the Booster Pump Station has been sited to the east of the STW to mitigate views from the Wyre Way and the west bank of the Wyre Estuary. The building has also been designed to reflect the agricultural appearance of the surrounding rural area.

5.13 The 7 wellhead compounds are sited to allow for the drilling of boreholes and the creation of the underground caverns and there is limited flexibility for their siting. The wellhead compounds are relatively low and will be surrounded by a landscaped bund to mitigate impact on the countryside. The main environmental impact will arise during the drilling of the boreholes to create the caverns as the drill rig will be on the site. However, the drilling for each cavern is only for a short period of time (6-8 weeks).

5.14 Following the creation of the caverns, new wellheads are provided in the Compounds. These are low structures less than 1.5 metres in height and can easily be assimilated into the environment. The wellhead compounds would be significantly smaller during the operational phase of the Project.

5.15 Details of the design of the interconnector pipeline to the Gas National Transmission System (NTS) is provided in the ‘Gas Interconnector Pipeline to the NTS Report’ (Document Ref 9.2.6). The pipeline would be constructed in accordance with normal techniques within the working corridor identified in the Works Plans.

5.16 The interconnector Metering Station at Nateby is also in the open countryside although it would form part of an existing compound associated with the Gas NTS. Following concerns raised by the LPAs
during the Section 42 consultation process, the Metering Station has been re-designed to reflect its location in a rural area.

5.17 During the pre application consultation period, the LPAs have raised concerns about the visual; and landscape impact of the development of the Booster Pump Station, the GCC and the wellheads in the rural area. These elements are considered to represent an industrial form of development that is not appropriate in the countryside. Halite has sought to design the proposed buildings to reflect the character of existing buildings in the locality and has ‘sunk’ some elements of the Project into the ground to mitigate their impact. A comprehensive Landscape and Ecological Management Strategy Plan is also proposed which includes earth mounding and significant new planting. Details of the plan are provided in the ‘Environmental Statement’ (Document Ref 5.1).

5.18 Although the Project includes development within the countryside it is acknowledged in planning policy that minerals can only be worked where they are found. The Preesall area is not designated as a nationally or locally important landscape area and has, to a certain extent, already been influenced by historic brine extraction activities. The location of some of the built development in the countryside, however, remains an issue for the LPAs and it is a matter which the IPC will need to consider in the planning balance in determining the DCO application.
6.0 CONSTRUCTION

6.1 Details of the construction of the Project are set out in the ‘Construction Report’ (Document Ref 9.1.6) but, in summary, the Project comprises a number of discrete but closely related elements as follows:-

(i) Creation of up to 19 underground gas storage caverns.
(ii) 7 multiple wellhead compounds to create the underground salt caverns and, once operational, to connect the gas manifolds.
(iii) Gas Compressor Compound comprising pig launchers and receivers; slug catchers; above ground high pressure pipelines; glycol contactors to dry the gas; glycol regeneration system; compressors; compressor knock out separators; compressor aftercoolers; gas filters; gas heaters; utility systems, plant drainage and power supply; emergency/maintenance vent stack; electrical/instrument and utilities buildings; 132kV substation, access roads and car parking areas.
(iv) Seawater Pump Station compound comprising a Pumping Station, standby generator and switchgear building, transformers and ancillary infrastructure, access roads and car parking areas;
(v) Booster Pump Station compound comprising the Booster Pump Station building; control room, a switchgear and standby generator building, transformers, a debrining facility, ancillary infrastructure, access roads and car parking areas;
(vi) Refurbishment of Higher Lickow Farm;
(vii) Gas manifold and distribution infrastructure;
(viii) Seawater pipeline from the Fleetwood Fish Dock to the Preesall site;
(ix) Brine discharge pipeline from the Preesall site to a point approximately 2.3km offshore to a two port diffuser;
(x) Power, communication and control cable routes from the Fleetwood Dock to the Preesall site;
(xi) Power cable routes from the United Utilities Switchgear at the Stanah Switchyard to the new electrical sub-station;
(xii) Temporary drilling compounds at the Fleetwood Fish Dock and at the Stanah caravan park;
(xiii) Extension to sea wall at West Way to accommodate brine outfall and new observation platform;
(xiv) Interconnector pipeline link to the Metering Station and NTS at Nateby;
(xv) Comprehensive landscape scheme;
(xvi) New access road from the A588 and new and upgraded internal access tracks within the site.
(xvii) Temporary construction compounds.

6.2 The caverns would be created in the underground salt formation which is some 220 metres to 760 metres below ground. Boreholes would be created to access the salt at the locations identified for the proposed caverns.
6.3 The caverns are created by dissolving the salt and extracting the brine to create cavities in which gas can be stored. A significant amount of water is required to dissolve the salt and this would be supplied from the Seawater Pump Station at the Fleetwood Fish Dock. A pipeline would be laid under the River Wyre from the Seawater Pump Station to a Booster Pump Station on the Preesall site. From here water would be supplied to the wellheads and used to wash the salt caverns. The saturated brine would be returned by pipeline to the Irish Sea where it would be disposed at a point some 2.3km from the sea shore.

6.4 An underground interconnector pipeline would be constructed from the existing Gas National Transmission System (NTS) at Nateby to the proposed Gas Compressor Compound (GCC) at Preesall. Details of the routing and construction of the pipeline is set out in the ‘Gas Interconnector Pipeline to the NTS’ (Document Ref 9.2.6). The GCC is used to condition and import/export gas from/to the NTS and the underground caverns. Each cavern wellhead is linked to the GCC by underground gas manifolds.

6.5 The Project requires a safe and secure electricity supply and this would be provided from the Stanah Switchyard through new electricity cables to be provided under the River Wyre.

6.6 A new haul road would be provided from the A558 at Preesall to access the site. A number of tracks would also be provided to link the various elements of the Project to the public highway.

6.7 It would take approximately 8 years to construct the Project and it would have an operational design life in excess of 40 years. All of the built development would be achieved in the first three years of the construction programme but the washing and creation of the caverns would take place sequentially over a 6 year period as each cavern is created and tested individually. As caverns become available and subject to HSE acceptance, caverns may be operational whilst others are still being washed or tested. At the end of its useful life, alternative uses for the infrastructure would be considered or the Project would be decommissioned in accordance with a scheme to be agreed with the LPA.
7.0 OPERATION

7.1 The construction of the Project would take some 8 years to complete and once operational its life could be in excess of 40 years. Over this period it is likely that the operational characteristics of the Project are likely to change in response to market demand and economics. It is difficult to be precise about the day to day functioning of the Project as this may change between now and the completion of construction and through its operational life.

7.2 The overall philosophy of operation is that the Project would store gas at times of excess gas availability on the NTS and release gas at times of high demand. The Project would be designed with maximum operating flexibility to enable any or more of the following trading cycles to be accommodated:-

- Seasonal Trading Cycle: Injection through summer months (April to October), withdrawal through winder months (November to March);
- Weekly Trading Cycle: Injection through the weekend, withdrawal through the weekdays;
- Daily Trading Cycle: Injection through the night, withdrawal on request.

7.3 The Project would be a fast cycle facility that is expected to be ‘churned’ (filled and emptied) several times per annum. Individual caverns would, however, seldom be completely emptied (except for maintenance) and only occasionally completely full.

7.4 The Project would be capable of rapid start up and ramping up to maximum injection and withdrawal rates.

7.5 There is a Control Room at the Booster Pump Station Compound from which the Project would be monitored and controlled. The Project would be manned at all times although it would also be possible to monitor operations from remote locations.

7.6 When operating, the gas compressors would be used to inject and withdraw natural gas into and out of the storage caverns. The depth of the salt caverns would allow the Project to operate at pressures similar to those on the NTS.

7.7 The Project would store 600 million cubic metres of working gas at STP in up to 19 separate caverns with a range of operating pressures. The caverns are capable of being operated individually but, in most circumstances, would be traded in groups. The caverns would have two gas trading strings, which allow high flow, but also allows simultaneous gas withdrawal and injection.

7.8 The operation of the caverns is dictated by the allowable temperature and pressure changes in the salt as determined by the rock mechanics. The
caverns must be operated within strict pressure and temperature limits and the trading opportunities will not always be available as the caverns would not be permitted to operate outside the set parameters.

7.9 Salt cavern storage is generally ‘fast cycle’ rather than ‘seasonal’. In a seasonal storage the gas is injected during the summer and withdrawn during the winter. This is strategic and also earns revenue on the difference between the summer and winter gas price. For fast cycle storage the gas is injected and withdrawn throughout the year and can respond to differences in demand between day and night, between weekday and weekend and can also respond quickly to Grid requirements.

7.10 The caverns would have two gas trading strings and the gas would be transported from the caverns through 3 manifolds to the GCC, which essentially comprises gas compression, gas heating and gas drying. Gas compression would be provided by 2 compressors, whose capacity varies with speed and by operating in series or in parallel configuration. This would allow flexibility of operation that can control the temperature of the caverns within the permissible parameters.

7.11 If the export of gas is for a long period or at high pressure, then the caverns would need temperature management. The dual strings would give flexibility to keep the velocity of the gas in the strings within the permissible limits such that large flows of gas could be withdrawn. The gas injected into the cavern could be warmed to ensure that the temperature is sufficient before the gas withdrawal commences and the temperature starts to fall. When the temperature starts to fall, it would be possible to withdraw gas from a single string, compress and heat part of the gas and recycle it back into the cavern to control the temperature fall.

7.12 The following trading scenarios would be possible:

7.13 **Free Flow from the Caverns to the NTS.** Gas would be stored in the caverns at up to 95 barg and at times the NTS pressure may be as low as 55 barg. Under these conditions there would be an opportunity to free flow gas from the caverns into the NTS, bypassing compression and using the dehydration as required. This mode of operation could only be sustained for a short period, perhaps up to two days, depending on the withdrawal flow rates and the actual NTS pressure. There is an assumption that as the caverns are at high pressure, they are likely to be warm and there would be no need to add additional heat into the caverns as the temperature fall would be within the permissible values during free flow. If this is not the case it would be possible to add heat to the gas being withdrawn and recycle it back to the cavern using one of the compressors.

7.14 This scenario would support the staging of gas from the low pressure caverns to the high pressure caverns such that when large volumes are required, they can be withdrawn for long periods under free flow with minimal or no cavern temperature control. The plant design, with multiple
compressors and manifolds would be sufficiently flexible to support staging and recycle.

7.15 It would also be possible to avoid staging by importing gas from the grid and compressing it so that it can be stored in the high pressure caverns, but generally staging would be a better option as the gas price tends to be higher during the winter when the free flow trading would be most likely to occur.

7.16 The caverns would also be more robust when the pressure is towards the cavern maximum pressure as it would be more able to withstand the reduction in pressure on withdrawal than when the cavern would be operating at the minimum pressure.

7.17 **Compressor Assisted Flow from the Caverns to the NTS.** As the cavern pressure approaches the NTS pressure, the compressors would be needed to export gas to the NTS. Depending on the flow rate required, one compressor can be dedicated to export of the gas to the NTS and the second to recycling gas to the caverns to control the temperature. If larger flows are required that require both compressors in parallel to export to the NTS, then the duration for which this flow can be sustained would be short as the temperature fall in the cavern approached permissible limits.

7.18 As the cavern pressures fall towards the minimum cavern operating pressure, export to the NTS would require both compressors to be operating in series. It is likely that as low pressure gas would need to be recycled to the caverns to control the temperature, leaving a relatively small flow only for export to the NTS. The operation of the caverns at low pressures would be subject to restrictions in rate of change of pressure and can only be repeated a certain number of times each year. This would probably lead to the caverns being maintained at high pressure, to allow the maximum export rate with an opportunity to minimise export compression and maximise the number of churns.

7.19 The monitoring and control system for the Project would be designed to maintain the process at the normal operating conditions. This system would provide comprehensive data storage for all key process measurements and actions.

7.20 A separate high integrity shutdown system would be used to maintain the plant in a safe state at all times. This would be independent of the control system and if there was any significant deviation from normal operating conditions the process would be automatically shut-down without the need for human intervention. Further details on risk and safety are provided in Section 8 of this Report.

7.21 The interconnector pipeline would be available for use 24 hours a day, seven days a week. Using modern communication techniques a controller would be able to observe, monitor and control the functions of the pipeline at any given time.
8.0 DECOMMISSIONING

8.1 There are a number of potential options about the future de-commissioning of the Project and a decision on the most appropriate option would need to be taken at the end of its operational life.

8.2 The Project has an operational design life of over 40 years but its longer term operation would be dependent on the continued demand for gas, gas prices, potential new sources of gas and their reliability. Dependent on the continued demand for gas storage, Halite may consider proposals to extend the life of the Project or to increase/decrease its size.

8.3 At the end of the life of the Project, the caverns may have the potential for alternative uses such as ‘carbon capture’ but any alternative uses would have to be considered at that time and do not form part of the current DCO application.

8.4 If there were no alternative uses for the caverns, these would be emptied of gas, filled with brine and sealed. The wellheads would be maintained and monitored in accordance with an approved scheme and in a manner consistent with the ongoing maintenance and monitoring activities being conducted for the existing ICI caverns. A restoration and management plan would be produced to ensure the long-term maintenance and safety of the caverns and the site.

8.5 The remaining infrastructure could remain in place if required for alternative uses. The seawater pipelines may have particular long term benefits in respect of flood control. The buildings, particularly those at Higher Lickow Farm, could have an alternative use associated with the farming of the land. The Seawater Pump Station and Booster Pump Station may have potential for alternative uses in association with the Fish Dock and Hackensall STW respectively.

8.6 The interconnector pipeline would be purged of natural gas and sealed. The natural gas would be replaced with an inert gas, probably nitrogen, pending any further decommissioning works which may be required by *best practice at the time. At the Metering Station, all above ground pipework, together with valves and fittings would be removed. Subject to best practice at the time, the related underground pipework at the Metering Station would also be removed and the ground reinstated and returned to its original use.

8.7 As with the caverns, the preferred option would be to consider alternative uses for all the built development at the end of the useful life of the Project. Should alternative uses not be available or be unacceptable to the LPA, the buildings would be removed in accordance with a scheme to be agreed with the LPA. The pipelines would, however, remain in situ and be sealed.
8.8 The cost of decommissioning would be funded by the sale of the cushion gas within the caverns. The natural gas would have a value in excess of £60 million which would be adequate for the funding of the decommissioning of the Project. The mechanism for achieving this is set out in the draft ‘Heads of Terms’ (Document Ref 9.1.4) for the Planning Obligation.
9.0 SAFETY AND RISK

9.1 Safety is paramount to Halite and it has undertaken extensive and detailed work to ensure the Project is safe. The UK guidelines around the construction of projects of this nature are stringent and at all stages of construction and operation Halite will comply with HSE guidance and the Control of Major Hazards (COMAH) Regulations.

9.2 Halite has prepared a ‘Risk Assessment’ (RA, Document Ref 9.3.1) to assess the level of risk associated with the Project. The Risk Assessment and related Geology Summary Report confirm that the Project would safely store gas and that the risk of fatality from the Project is less than one in 100 million per year.

9.3 As part of the DCO application, Halite is also making an application for a deemed Hazardous Substances Consent. Details are provided in the ‘Report in respect of application for deemed Hazardous Substances Consent (HSC) Application including draft conditions’ (Document Ref 4.1).

9.4 Parts of the route of the interconnector pipeline and the electrical connection to the Stanah Substation are close to existing caverns some of which may be prone to crownhole collapse. In order to protect the new infrastructure, the Project includes mitigation measures details of which are provided in the ‘NTS Inter-connector at Preesall – Pipeline Subsidence Assessment Report’ (Document ref 9.2.3).

9.5 In terms of safety, reference has already been made to the COMAH consenting process. There is also a raft of parallel legislation and requirements concerning safety that must be met including:

- The Health and Safety at Work etc. Act 1974;
- The Borehole Sites and Operations Regulations 1995;
- The Dangerous Substances and Explosive Atmospheres Regulations 2002;
- The Construction (Design and Management) Regulations 1994 (as amended);
- The Pipelines Safety Regulations 1996; and

9.6 Halite is also monitoring the existing caverns that from part of its landholding and this would continue throughout the life of the Project.
10.0 PLANNING POLICY

10.1 A review of the Project against the planning policies is set out in the ‘Planning and Sustainability Statement’ (Document ref 9.1.1). The assessment shows that planning policy seeks to encourage the provision of UGS facilities but regard must be had to the impact of the particular development on the environment and the amenity of local residents. The assessment concludes that the Project accords with the provisions of the development plan. The construction of the Booster Pump Station, the GCC, the wellheads and the interconnector Metering Station is development within the open countryside for which planning permission would not normally be granted. However, planning policy does make it clear that minerals can only be worked where they are found and, therefore, development within the countryside can be acceptable. This is particularly the case with the Project as alternative sites for these aspects of the Project have been considered and rejected on operational and safety grounds.

10.2 The Planning and Sustainability Statement also includes a review of the Project against a range of national and local sustainability criteria. The assessment concludes that Preesall is one of the few locations in the UK where UGS is feasible and although the Project would have an impact on the landscape, the need for such facilities is such that the DCO should be granted.
11.0 ENVIRONMENTAL EFFECTS AND ALTERNATIVES

11.1 Halite’s DCO application includes an ‘Environmental Statement’ (ES, Document Ref 5.1) with its application. The ES meets the requirements of the Scoping Opinion that was provided by the IPC and has regard to the late submissions received from some of the statutory and other consultees.

11.2 The assessment set out in the ES identifies the likely significant effects of the proposed Project on the environment, covering the direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects at all stages of the Project, and also of the measures envisaged for avoiding or mitigating significant adverse effects. In accordance with the advice set out in NPSs EN-1 and EN-4, the ES also include information on the likely significant social and economic effects of the development, and how any likely significant negative effects would be avoided or mitigated.

11.3 For specific topics such as health, the DCO application is supported by a ‘Health Impact Assessment Report’ (Document Ref 9.1.7).

11.4 Although the ES contains an assessment of the ecological impacts of the Project, in accordance with Regulation 5(2)(g) of the (Applications Prescribed Forms and Procedure) Regulations 2009 two separate reports, ‘Information to Support a Habitats Regulations Assessment Morcambe Bay SAC, Liverpool Bay SPA, Shell Flat and Lune Deep cSAC’ (Document Ref 3.2) and ‘Information to Support a Habitats Regulation Assessment Morecambe Bay SPA and Ramsar’ (Documents Ref 3.3) are submitted with the DCO application to enable the IPC to undertake a formal assessment of whether there is likely to be a significant effect on any European sites to which the Habitats Regulations applies or to any Ramsar site which may be affected by the Project. The assessments conclude that there are no significant impacts on these ecological areas.

11.5 A ‘Statement of Engagement of Section 79 (1) of the Environmental Protection Act 1990 Matters’ (Document Ref 3.4) is also submitted sealing with statutory nuisances such as noise and dust.

11.6 The ES also provides information on alternatives. In developing its Project, Halite examined a number of alternative designs for the buildings and infrastructure. It also had regard to the issues that had been raised by previous planning applications that had been determined by LCC and WBC, and the Secretary of State following an appeal. Alternative designs for the buildings are set out in the ‘Design and Access Statement’ (Document Ref 9.1.2) and alternative routes for the interconnector pipeline in the ‘Gas Interconnector Pipeline to the NTS Report’ (Document Ref 9.2.6).

11.7 The DCO application also seeks approval for Hazardous Substances Consent and a deemed Marine Management Consent. The information in
respect of the hazardous substances consent is provided in a ‘Report in respect of an application deemed Hazardous Substances Consent Application’ (Document Ref: 4.1). The information in support of the MMO Marine Licence, which is required for the construction of the brine pipeline in the Irish Sea, is set out in a ‘Report in respect of applications for deemed Marine Consent Application’ (Document Ref: 4.2).
12.0 SITE ASSEMBLY/COMPULSORY PURCHASE

12.1 To date, Halite has expended approximately £19.8 million to acquire the necessary interests and rights in land for the Project. This is approximately 89% of the estimated total cost of property related acquisitions required for the Project. Pursuant to its application for the DCO, Halite is requesting compulsory purchase powers for the acquisition of the interests, rights and use of land not secured to date.

12.2 Total estimated costs to acquire the remaining land rights required for the Project are approximately £2.5 million. Halite has sufficient committed funds and resources available to fund these acquisitions, related compensation and any statutory blight claims that may arise.

12.3 Although negotiations with landowners are proceeding, Halite is in parallel seeking the rights to compulsory purchase some of the interests and rights in the land required for the Project as may be necessary. The ‘Statement of Reasons’ (Document Ref 7.1) Document and the ‘Funding Statement’ (Document Ref 7.2) Document provide the background to the proposed compulsory purchase and the means by which the acquisition would be funded. The ‘Book of Reference’ (Document Ref 7.3) identifies the interests and rights in respect of which Halite is seeking compulsory purchase powers to enable the remaining land to be assembled for the Project.

12.4 Halite will continue negotiations with landowners to try and secure the remaining interests and rights following submission of the application for the DCO.
13.0 LOCAL BENEFITS

13.1 As well as assisting to meet the national need for UGS facilities, the Project provides a number of local benefits.

13.2 During construction, the Project would generate 200-300 jobs and once operational it would generate 30 – 40 jobs. Halite are keen to ensure that the jobs go to local people and are proposing to achieve this through a legal commitment as summarised in the draft ‘DCO Obligation Heads of Terms’ (Document Ref 9.1.4).

13.3 The Project represents an investment of £600 million. This figure, however, excludes indirect benefits and multiplier effects through the use of local goods and services and, therefore, the overall impact on the local economy would be higher.

13.4 Subject to compliance with European and UK law in regard to employment, competition and procurement, Halite would seek to ensure it (and its supply chain) primarily uses local sourcing, where possible, and that it adopts best practice in terms of: transportation, materials use, construction, energy use and asset design.

13.5 Halite would also seek to employ local people, where possible, and for those skills it needs to bring into the area would look to ensure that the community benefits, either by seeking to encourage employees to locate locally and/or use local facilities.

13.6 Halite, and its supply chain, would promote local borough corporate plan objectives with regard to employment, and whilst recognising the skill requirements of such a project, will where possible provide opportunities for apprenticeships, graduate placements and young people not in education, employment or training.

13.7 Halite is also proposing a Corporate and Social Responsibility Policy which includes provision for a social enterprise within Over-Wyre and associated areas in close proximity to the boundaries of the Project; to promote and fund activities that support the sustainability of the local community particularly through actions relating to community safety & security, heritage and education. The fund would be incorporated to best meet the needs of its beneficiaries by way of a community interest company (CiC) or a charitable trust as appropriate.

13.8 Halite would contribute £50,000 during each year of the construction period with further grant funding to be agreed with the social enterprise directors/trustees for the period thereafter. The CiC or charitable trust would identify the social and environmental issues that were most relevant and pressing within the communities.
13.9 The commitment to local sourcing and a community fund would be achieved through a Legal Obligation for which draft 'DCO Obligation Heads of Terms' are provided as part of the DCO application.
14.0 CONCLUSION

14.1 The aim of this Report is to provide an introduction and a broad overview of the Project, the DCO application documentation and supporting Reports. Halite has identified a number of topics relating to the more important issues raised by the application as follows:

- Need
- Geology
- Consultation
- Design
- Construction
- Operation
- Decommissioning
- Safety and Risk
- Planning policy
- Environmental Effects and Alternatives
- Site Assembly/Compulsory Purchase
- Local benefits

14.2 There is an acknowledged need for UGS facilities in the UK and this is recognised in both NPS EN-1 and EN-2. The NPSs make the point that the UK is highly dependent on natural gas with strong seasonal variations in demand such that it needs a diverse mix of gas storage and supply infrastructure to respond effectively in future to the large daily and seasonal changes in demand and to provide endurance capacity during a cold winter.

14.3 Previous planning proposals for UGS facilities have been rejected primarily on the basis of lack of geological information and concerns about safety. Halite has been in discussion with LCC and their geological consultants since early 2010 and has agreed a Geology Summary Report which acknowledges that the geological assessment that has been undertaken show that the previous concerns raised by the Council and the Secretary of State can no longer be justified and that underground gas storage caverns can be safely constructed at Preesall.

14.4 The Geology Summary Report identifies two polygon areas in the north of the Preesall site where caverns can be safely constructed. Compared with previous planning applications at Preesall, the Halite proposals are significantly smaller in terms of the number of caverns that are to be created and the amount of gas that can be stored. The Project provides up to 19 caverns with a working gas capacity of 600 million cubic metres measured at standard temperature and pressure (STP) – about half that of the previous CGS proposals.

14.5 The reduction in the size of the scheme and the proposed location of the caverns in the northern part of the Preesall site has allowed for a reduction in the amount of above ground development that is required and has allowed a more compact scheme to be designed.
14.6 That part of the Project that is located to the west of the Wyre Estuary, including the seawall crossing and the observation platform, the Seawater Pump Station and the route of the brine pipeline are acceptable to the LPAs. However, the LPAs have raised concerns about the visual and landscape impact of that part of the Project on the Preesall site on the east bank of the Wyre Estuary. The LPAs consider that the Booster Pump Station, the GCC and the wellheads represent an industrial form of development that is not appropriate in the countryside. Halite has examined alternative locations on the west bank of the Wyre Estuary for these aspects of the Project without success. Details are provided in the Surface Infrastructure: Alternative Sites Report. To assist in mitigating the impact, Halite has sought to design the proposed buildings to reflect the character of existing buildings in the Preesall locality and has ‘sunk’ some elements of the Project into the ground. A comprehensive Landscape and Ecological Management Strategy Plan is also proposed for the Preesall area which includes earth mounding and significant new planting.

14.7 Although the Project includes development within the countryside it is acknowledged in planning policy that minerals can only be worked where they are found. The Preesall area is not designated as a nationally or locally important landscape area and has, to a certain extent, already been influenced by historic brine extraction activities. The location of some of the built development in the countryside, however, remains an issue for the LPAs and it is a matter which the IPC will need to consider in the planning balance in determining the DCO application.

14.8 Safety is paramount to Halite and it has undertaken extensive and detailed work to ensure the Project is safe. Halite has prepared a ‘Risk Assessment’ to assess the level of risk associated with the Project. The Risk Assessment and related Geology Summary Report confirm that the Project can be constructed and operated safely and that the risk of fatality from the Project is less than one in 100 million per year.

14.9 The Planning and Sustainability Report assesses the Project against the assessment principles set out in the NPSs and the relevant planning policies conclude that the Project accords with the provisions of the development plan. Planning policy seeks to encourage the development of UGS facilities at appropriate locations of the UK providing that the impact on the environment is considered. The NPSs acknowledge that all major infrastructure projects are likely to have an adverse impact on the environment but these impacts must be weighed against the need for such developments.

14.10 The impact of the Project on the environment is assessed in the Environmental Statement. The assessment identifies the likely significant effects of the proposed Project on the environment, covering the direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects at all stages of the Project, and also of the measures envisaged for avoiding or mitigating significant adverse effects. In accordance with the advice set
out in NPSs EN-1 and EN-4, the ES also include information on the likely significant social and economic effects of the development, and how any likely significant negative effects would be avoided or mitigated. The ES also sets out the alternatives that were examined as part of the development of the Project.

14.11 Halite control approximately 500 ha of land at Preesall and this forms the majority of land required for the construction of the Project. The route of the brine pipeline and the interconnector pipeline involves a range of third parties with whom Halite are negotiating the rights to construct and operate the Project.

14.12 The DCO application includes Draft Heads of Terms which provide for the:

- continued management of the Community Liaison Panel that has already been established;
- establishment of a corporate social responsibility fund;
- use of local employment and services;
- de-commissioning at the end of the Project; and
- the monitoring of existing brinewells.

14.13 In conclusion, the Project would make a significant contribution to underground gas storage in the UK for which there is an acknowledged need. The Project has been developed in consultation with the LPAs, the statutory and other consultees and the local community. Halite has had regard to all the consultation responses and has provided details in the application documentation of how the Project has evolved to meet the comments that have been made. The Project has had regard to the contents of the NPSs and accords with the provisions of the development plan. The Project would have an impact on the environment but the ES concludes that mitigation measures reduce these impacts to an acceptable level. The construction of that part of the Project in the countryside has been identified by the LPAs is an issue with concerns about landscape and visual impact. Halite has examined alternative options for the siting of the plant, particularly the GCC, but alternative sites have been rejected for operational and safety reasons. In order to minimise the environmental impact of development Halite has carefully sited and designed those buildings that must be located in the countryside. Halite are also proposing earth bunding and landscaping as a means of mitigating their impact.

14.14 The landscape at Preesall is not designated as being of national, regional or local importance and, as planning policy recognises, minerals can only be worked where they are found. Policy acknowledges that there are only a limited number of opportunities in the UK where the geology is able to support UGS and Preesall is one of these areas. In the planning balance, it is considered that the national need for UGS, particularly when coupled with the specific locational advantages of Preesall as summarised above, outweigh the limited environmental impact such that the DCO application should be granted.
### Abbreviations

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<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>BW</td>
<td>Brine Well</td>
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<td>DCO</td>
<td>Development Consent Order</td>
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<td>EA</td>
<td>Environment Agency</td>
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<td>EIA</td>
<td>Environmental Impact Assessment</td>
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<td>Geology Summary Report</td>
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<td>Infrastructure Planning Commission</td>
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<td>LCC</td>
<td>Lancashire County Council</td>
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<td>LNG</td>
<td>Liquefied Natural Gas</td>
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<td>National Transmission System</td>
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<td>Planning Act 2008</td>
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<td>Risk Assessment</td>
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<td>RSPB</td>
<td>Royal Society for the Protection of Birds</td>
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<td>STP</td>
<td>Standard temperature and pressure (15 deg C and 101.325 kPa)</td>
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<td>STW</td>
<td>Sewage Treatment Works</td>
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<td>UGS</td>
<td>Underground Gas Storage</td>
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<td>UK</td>
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<td>WBC</td>
<td>Wyre Borough Council</td>
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## THE PREESALL UNDERGROUND GAS STORAGE FACILITY - OVERVIEW OF DCO APPLICATION REPORTS

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<td>Review of the Proposed Drilling and Completion Programmes for the Preesall Underground Gas Storage Project (Doc 9.2.5)</td>
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