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

Preesall Underground Gas Storage Facility, Lancashire

Non-Technical Summary of the Environmental Statement

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Preesall Underground Gas Storage Facility

Non-Technical Summary of the Environmental Statement
Regulation 5(2)(a)
DCO Application Document Reference 5.5

November 2011
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1.0 Introduction

1.1.1 Halite Energy Group has submitted an application for a Development Consent Order to the Infrastructure Planning Commission to construct and operate an underground gas storage facility at Preesall, Lancashire (‘the Project’).

Location plan

1.1.2 The application is accompanied by an Environmental Statement (ES) prepared in accordance with the Infrastructure Planning (Environmental Impact Assessment) Regulations 2009 (‘the Regulations’) (Statutory Instrument 2009/2263). This document is the Non-Technical Summary of the ES. The ES comprises four volumes:

- Volume 1A: Environmental Statement
- Volume 1B: Environmental Statement Technical Appendices
- Volume 2A: Environmental Statement Supporting Figures – Project Information
- Volume 2B: Environmental Statement Supporting Figures – Environmental Information

1.1.3 The following environmental aspects are considered within the ES and summarised in this Non-Technical Summary:

- Air Quality
- Archaeology and Built Heritage
- Climatic Factors
- Ecology and Nature Conservation
- Geology, Hydrogeology and Stability
- Land Use and Socio-Economics (including marine activities)
- Noise and Vibration
- Safety
- Seascape, Landscape, Townscape, and Visual Amenity
- Sustainability
- Transport and Access
- Water Environment
- Cumulative Effects
2.0 Consultation

2.1 Scoping

2.1.1 In October 2010, a written request for a Scoping Opinion, accompanied by an EIA Scoping Report outlining the proposed scope of the EIA and the anticipated structure of the ES, was submitted to the IPC. In accordance with the Regulations, the IPC consulted widely before issuing their Scoping Opinion in November 2010.

2.1.2 The ES has been prepared in accordance with the advice set out in the Scoping Opinion and the associated consultation responses (which are summarised in Volume 1B of the ES).

2.2 Section 42, 47 and 48 Consultation

2.2.1 The IPC application process requires pre-application consultation to be undertaken prior to the DCO submission:

- Section 42 consultation with specific consultees, local authorities, landowners and others with interests in land and significantly affected persons;
- Section 47 consultation with the local community; and
- Section 48 notice which is a requirement to publish statutory notice of the proposed application for a DCO in prescribed publications.

2.2.2 Comments made at all stages of the consultation process have been recorded and carefully considered by the Project team. Full details of the consultation that has been undertaken is presented in the Consultation Report (DCO Application Document Reference 3.1), which accompanies the DCO application.
Section 42 Consultation

2.2.3 As part of this consultation process, a Preliminary Environmental Information (PEI) Report was prepared, the aim of which was to provide a preliminary review of the likely environmental effects of the Project. This report was issued for consultation in April 2011, providing opportunity for consultees, local authorities, landowners and members of the public and the wider community to respond to the information in the report.

Section 47 Consultation

2.2.4 This formal consultation with the local community was undertaken from April to May 2011, and comprised a wide range of activities. Such activities included various consultation documents, a short documentary, a questionnaire, public exhibitions, appointment of a Community Liaison Coordinator and creation of a Community Liaison Panel.

2.3 Informal Consultation

2.3.1 In addition to the formal consultation undertaken, informal consultation with appropriate bodies has been conducted throughout the progression of the EIA, in order to obtain views on the Project, agree assessment methods, discuss mitigation / enhancement and to obtain information relating to constraints as appropriate.

Responses made during the pre-application consultation have been taken into consideration throughout the development of the Project design and also in preparing the ES.
3.1 Project Features

3.1.1 The following should be read together with four drawings which follow the Project description below. The drawings illustrate the process and features described below and include the masterplan for the Preesall area, an indicative cavern location plan and aerial views and a photomontage of the proposed Preesall development area before and after Project completion.

3.1.2 Halite Energy Group is proposing to create an Underground Gas Storage Facility in the salt body at Preesall.

3.1.3 Up to 19 caverns would be individually designed and constructed, deep underground and used for the storage of up to 600 million cubic metres of working natural gas. Gas distribution pipelines and connections to the wellheads and a pipeline that links the Gas Compressor Compound at Preesall to the National Transmission System at Nateby (12 kilometres to the east) would also be constructed.

3.1.4 The project would also require a number of buildings to be built above ground as follows:

- **Seawater Pumping Station** – this single storey facility would enable seawater to be taken from the Fleetwood Fish Dock to the Preesall site for use in the cavern creation process. It would be located on the west bank of the Wyre Estuary.
- **Security and Support Facility** – this would be located at Higher Lickow Farm.
- **Booster Pump Station** – this facility would include a De-brining facility needed to treat saturated brine produced as a result of the cavern creation process and would also house the control centre for the Project.
- **Wellhead Compounds** – once operational these seven low structures would be screened by earth mounds and planting.
- **Gas Compressor Compound** – this highly secure compound would be the starting point for the gas before travelling through the pipelines to the National Transmission System at Nateby. Due to the strict health and safety regulations that apply to a facility of this nature, it is considered that the main Preesall site to the east of the Wyre Estuary is the most suitable location.

3.1.5 Improvements to the road infrastructure in the area would be required. A new road is proposed from the A588 to the site, as well as tracks linking the access road to the main buildings and wellheads.

3.1.6 Two further pipelines would also be required as part of the Project:

- **Brine Discharge Pipe** – after the seawater pumped from the Fleetwood Fish Dock to the Preesall site has been used in the cavern creation process, the brine would be returned by pipeline under the River Wyre to the Booster
Pump Station. The brine discharge would then be conveyed through a pipeline to a point approximately 2.3 kilometres offshore where it would be discharged to the Irish Sea.

**Electricity Pipeline** – underground electricity cables would be constructed from the United Utilities switchgear in the Stanah Switchyard to the proposed Gas Compressor Compound.

### 3.2 Cavern Creation

3.2.1 The locations of the areas to create each cavern have been identified following careful and extensive investigations by Halite’s geological team.

3.2.2 The process used to create caverns in salt is known as ‘solution mining’. This technology has been used at locations across the world to construct underground storage caverns in areas where there is a thick, high quality layer of salt beneath the surface.

3.2.3 Water is pumped through a borehole and used to dissolve the salt in a process called cavern washing (the process diagram contained in this document includes an illustration of the sequences).

3.2.4 A large supply of water is needed to do this which would be taken from Fleetwood Fish Dock and then piped to the Preesall site.

3.2.5 A typical gas storage cavern would be cylindrical in shape and the top approximately 220 metres (700 feet) below ground.

3.2.6 There would be up to 19 caverns at the Preesall site which, in total, would take up to eight years to complete.

3.2.7 The final design, size, location and construction of the caverns would be assessed and monitored by the Health and Safety Executive under the Control of Major Accident Hazards (COMAH) Regulations.
CAVERN CREATION PROCESS DIAGRAM

PLAN A

1. DEMARcation FROM TOPWOOD FISH-FOOD FILTERING AND PUMPED AT PRIMARY PUMP STATION
   - PRIMARY PUMP STATION CONTAINS PUMPS, ELECTRICAL CONTROL EQUIPMENT, BIBBERIAN
   - TRANSFORMER, AND ACCESS ROAD AND CAR PARKING

2. MAIN PUmp PUMPED TROUGH PIPES AT LEAST 1 METRE BELOW THE BED OF THE RIVER

3. main pUmP pUMPG taRGET FLOOR VIA PIPES AT LEAST 1 METRE ABOVE THE BED OF THE RIVER

4. Gases STORED UNDERGROUND IN CAVERNS IN AREAS FOR CAVENr DEVELOPMENT

PLAN B

5. INTERCONNECTOR METERING STATION
   - HOUSES A STRONG MATERIAL AND GAS FUEL FOR SURVEY OR CORROSION

6. NEW ROAD CONSTRUCTED FROM 4KM TO 49KM

7. ELECTRICAL CABLES Laid UNDERGROUND AT LEAST 1 METRE BELOW THE BED OF THE RIVER
   - GAS COMPRESSOR COMES AT THE NATIONAL TRANSMISSION SYSTEM NEAR STANSTED WITH THE ZONE/StATION

8. REPRODUCED FROM THE DEMARCATION SURVEY MAP WITH PERMISSION OF THE CONTROLLER OF HER MAJESTY'S STATIONERY OFFICE. COPYRIGHT RESERVED. COPYRIGHT LICENSE N° 0015/0153

9. Process Diagram
Preesall Masterplan
Indicative Cavern Location Plan
Aerial Views of the Proposed Preesall Development Area Before and After Project Completion
Existing View along Wyre Way Looking North Towards Knott End Golf Course (Preesall side of the Wyre Estuary)

Proposed View along Wyre Way Looking North Towards Knott End Golf Course (Preesall side of the Wyre Estuary) – Year 19 Operation
3.3 Project Timetable

3.3.1 Following the detailed engineering work, the receipt of all necessary consents and licences and the appointment of a contractor, construction of the Project would take place in phases over a period of up to 8 years.

3.3.2 A number of the construction and operational phases would be progressed in parallel. This is referred to as the combined construction and operation phase. 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 as each cavern is created and tested individually. As caverns become available and subject to Health and Safety Executive approval, caverns may be operational whilst others are still being washed or tested.

3.3.3 The indicative construction programme is provided below.

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<th>Years</th>
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<td>Haul and Access Roads</td>
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<td>Higher Lickow Farm Works</td>
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<td>Brine Pipeline</td>
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<td>Seawall Crossing</td>
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<td>Brine Outfall</td>
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<td>Seawater Pump Station</td>
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<td>Booster Pump Station</td>
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<td>Gas Compressor Compound</td>
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<tr>
<td>Interconnector Pipeline</td>
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<tr>
<td>Metering Station</td>
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<tr>
<td>Wellheads</td>
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<tr>
<td>Creation of Caverns</td>
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3.4 Alternatives Considered

3.4.1 Numerous alternatives have been considered over time. These include alternative means of gas storage, alternative locations and alternatives within the project design.

3.4.2 Chapter 4 of Volume 1A of the ES provides details of the design alternatives which have been considered. Some of the main alternatives that have previously been considered include:

- Forming drilling sites and access tracks on the saltmarsh associated with the Wyre Estuary to access salt deposits below this area. Instead, directional drilling techniques have been chosen to avoid affecting the saltmarsh which is protected by European legislation.

- Using the Gas Compressor Compound to house a security facility. Instead, Higher Lickow Farm would be refurbished and an associated barn rebuilt.

- Abstracting water from the Wyre Estuary or Morecambe Bay for the cavern washing process. Instead, water would be abstracted from Fleetwood Fish Dock to avoid impacts on European protected areas.

- Locating the Gas Compressor Compound on the west bank of the Wyre Estuary. This was considered to be unacceptable from a hazardous zoning regulations perspective.
- Use of the brine for salt production. This was found not to be financially viable.
- A range of offshore pipeline and outfall arrangements were considered before the best arrangement was determined through modelling.
- Alternative haul roads, access tracks and electrical connections have also been considered in addition to alternative routes for the National Transmission System Interconnector pipeline.
4.0 Potential Environmental Effects

4.1 Introduction

4.1.1 The ES reports the findings of the EIA, identifying the potential environmental effects as a result of the Project, together with the mitigation measures. A summary of the findings for each aspect of the environment is presented below.

4.2 Air Quality

4.2.1 The Project would not affect any Air Quality Management Areas but could potentially affect nearby sensitive receptors (both human and ecological). The air quality assessment has therefore considered the significance of potential air quality effects arising from the Project at representative sensitive receptors. Worst case scenarios have been assumed.

4.2.2 The construction and decommissioning phases of the Project would generate temporary, local, dust and road vehicle exhaust emissions. The impact of an increase in road traffic is considered to be negligible at all sensitive receptors. The operation phase would generate atmospheric emissions from natural gas combustion and exhaust emissions from road vehicles, however it is considered that impacts would be negligible at all sensitive receptors. For the combined construction and operation phase, the assessment of effects from the separate construction and operation phases have been combined to provide a worst case scenario, although it is considered that these would also be of negligible significance at all receptors.

4.2.3 Construction phase (and decommissioning) dust emissions would be controlled by the implementation of mitigation measures. In addition, a Construction Environmental Management Plan (CEMP) would be prepared prior to any works commencing on site. The CEMP would include requirements for maintenance and operation of construction plant and detail measures to limit dust on site. Following the implementation of mitigation measures, the impact significance of construction dust emissions is predicted to be, at worst, slight adverse.

4.3 Archaeology and Built Heritage

4.3.1 The Project would not affect any Scheduled Ancient Monuments or have any direct physical effect on listed buildings. A non-designated built heritage asset, Higher Lickow Farm, would experience a positive effect as a result of the proposed refurbishment as it is currently derelict, providing the refurbishment is carried out in a manner that is sympathetic to the character of the Post-medieval farmstead.

4.3.2 The main potential effects would be on the setting of a small number of listed and non-listed buildings, direct physical effects on non-designated archaeological remains and marine sites. The built heritage assets which are located within the vicinity of the proposed permanent above ground structures have the potential to experience permanent impacts on their setting, although these will be minor. A programme of archaeological mitigation would be agreed with Lancashire County Council’s Archaeologist which will allow the
archaeological assets within the application site to be identified and recorded. A similar programme of mitigation will be agreed with the Marine Planning Department of English Heritage to identify and record the marine archaeology that will be impacted by the Project.

4.4 Climatic Factors

4.4.1 The climatic factors assessment has examined the possible effects upon greenhouse gas emissions, the microclimate, and receptors as a result of adapting the Project in order to account for climate change.

4.4.2 Adverse effects as a result of the Project are possible due to increased greenhouse gas emissions and reduced carbon dioxide removal by vegetation. In order to reduce these effects a range of measures would be implemented including adherence to the CEMP, implementing the Construction Worker’s Travel Plan and ensuring building design, material and planting specifications result in reduced emissions or are tolerant to the effects of climate change. Potential beneficial effects could occur due to the Project supporting low-carbon generation and increasing the amount of carbon captured due to the landscape planting and management proposals.

4.4.3 The Project is unlikely to have a significant effect on the microclimate. For example changes in shading and wind conditions as a result of the siting of the buildings are unlikely to significantly affect the human environment and ecological receptors.

4.4.4 The Flood Risk Assessment (FRA) has identified that only minor changes to the Project would be required to adapt to climate change and therefore no additional mitigation or enhancement measures would be required. The effects due to climate change adaptation on receptors such as properties, existing infrastructure, the Wyre Way, other Public Rights of Way (PRoW) and agricultural land would not therefore be significant.

4.5 Ecology and Nature Conservation

4.5.1 The Project would not directly affect any European or nationally designated sites. Any indirect impacts are unlikely to be significant with the provision of mitigation and enhancement measures. The Project would however affect some locally designated sites (known as Biological Heritage Sites) and affect other habitats and species. There are a number of important species in the area including water voles, great crested newts and wintering birds together with certain scarce marine species in the vicinity of the brine discharge outfall.

4.5.2 In order to reduce the effects on important habitats and species, suitable mitigation and enhancement measures would be implemented to ensure that the conservation status of the habitats and species in question is preserved. Furthermore, a Landscape and Ecological Management Strategy Plan has been prepared for the main site area in consultation with Natural England, the Environment Agency, Royal Society for the Protection of Birds (RSPB), Lancashire County Council, Wyre Borough Council and the Wildlife Trust for Lancashire, Manchester and North Merseyside. This Management Strategy Plan is included within the DCO Application. The purpose of the Management
Strategy Plan will be to ensure that the visual impact of the Project (during operation) is minimised, as well as creating opportunities for maintaining and enhancing the area for wildlife.

4.6 Geology, Hydrogeology and Stability

4.6.1 Part of the Project would be located on a Local Geological Site although it is considered the features associated with site would not be affected.

4.6.2 A Geological Summary Report has been prepared for the Project and is available as a separate document (DCO Application Document Reference 9.2.2 Geology Summary Report (Mott Macdonald (2011))). The report presents a complete review of the geology of the Preesall area to assess whether a suitable salt body exists within which caverns for gas storage can be constructed and operated safely. The geological review has been carried out by an experienced design team and then peer reviewed by a team of expert geologists not previously involved with the design of the Project.

4.6.3 The proposed development of new caverns has been assessed with regard to the known geological and mining hazards applying general assessment tools in cavern design, such as the internationally recognised conservative recommendations for the safe design of salt caverns as developed by Professor Rokahr, University of Hannover. Professor Rokahr is an international expert in the design of caverns in salt. The generic design rules provide guidance for the depth range within salt at which a cavern be located, maximum and minimum operating pressures, minimum distances between adjacent caverns and distances from hazards such as old mine workings and geological faults. Applying these rules led to the identification of two areas in the west of the Preesall area within which it is considered that caverns for the storage of gas can be safely constructed and operated. The area identified is much reduced in area from the previous proposals promoted by Canatxx Gas Storage.

4.6.4 The data review and the reappraisal of the geology with respect to the hazards associated with gas storage in caverns are considered to be adequate for planning purposes. Further work would be undertaken during the detailed design and construction phases. This further information will be added to the geological and mechanical models and used to refine the risk assessments.

4.7 Land Use and Socio-Economics (including Marine Activities)

4.7.1 Grades 1, 2 and Grade 3a land are classed as best and most versatile agricultural land. The Project would require Grade 2 and 3 land for the permanent Project buildings. Land which is not permanently taken would be reinstated.

4.7.2 Positive effects on the local economy are anticipated during the construction phase, the construction and operation combined phase, and the operation phase, through the creation of direct and indirect employment and increased spending within local retail outlets. In addition, there would be opportunities for improving local workforce skills as a result of training and apprenticeships.
(especially during construction). There would be positive effects for the regional and national economy as a result of enhanced security of gas supply infrastructure. National objectives relating to security of supply cannot be achieved without new infrastructure. Effects on the tourism economy are likely to be negligible.

4.7.3 Two recreational routes (the Wyre Way and Lancashire Coastal Way), 2 footpaths and 1 bridleway are likely to be temporarily affected by the Project during the construction phase, after which, these routes would be reinstated. Clear diversion signs would be provided on all routes potentially affected. In the long-term, pedestrians and other path users are likely to experience benefits as a result of the proposed viewing platform at the seawall at Rossall.

4.7.4 The Project is unlikely to generate any long-term residual effects on beach and marine activities. However, users of the beach, King George’s Memorial Field and cycle routes, together with recreational anglers using the Irish Sea, would experience temporary disruption during the construction phase. Construction disturbance would be minimised by adherence to the CEMP and best practice methods.

4.7.5 In addition, water abstraction required in Fleetwood Fish Dock may increase sand accretion within the dock and cause the dock to silt up, during the construction, construction and operation combined phases. This could generate adverse impacts upon the Fleetwood Fish Dock. If water abstraction does generate such silting, the Applicant would bear the cost of additional dredging. Conditions outlined in the Deemed Marine Licence would be complied with.

4.7.6 During the construction phase there would be a 300 metre safety exclusion zone enforced around the proposed brine discharge pipe (while the pipe is buried), which would overlap with shrimping areas leading to temporary adverse effects. However, during the construction and operation combined, operation and decommissioning phases there would be no effects on shrimp fishing as the proposed brine discharge would be buried.

4.8 Noise and Vibration

4.8.1 Existing noise measurements were taken at various sensitive receptors in the vicinity of the Project as agreed with Wyre Borough Council.

4.8.2 The construction of the pipeline between the Irish Sea and Wyre Estuary would involve a combination of open cut excavation and thrust boring. The types of plant used for these operations are noisy, and in some places would be within 20 metres of the nearest residential properties. However, each piece of plant would only be used intermittently depending on the phase of construction, and the potential impact would be minimised through limiting working hours to the daytime only, and ensuring a short time is spent at each location during excavation and construction of the pipeline as it is being laid.

4.8.3 The directional drilling also has potential to be a noisy operation, and would be carried out at night close to the new Harbour Village Development at Fleetwood.
However, impacts would be minimised by ensuring noise levels meet acceptable noise level standards, particularly at night.

4.8.4 The construction of the Booster Pump Stations and Gas Compressor Compound would occur in excess of 100 metres from the nearest sensitive receptors. Mitigation measures implemented during the construction phase would ensure that noise effects at the receptors are not significant.

4.8.5 Combined noise impacts from operation and construction works on the wellheads are not anticipated to result in any significant noise effects at nearby receptors.

4.8.6 During operation of the Project, the pipelines and air vents are not anticipated to be audible, and the Seawater Pumping Station, Booster Pump Station and Gas Compressor Compound are not anticipated to create a significant noise effect.

4.8.7 Construction of the Project would result in increases in traffic on the road network. Although it has been calculated that traffic related noise levels would slightly increase along some of the road links, they are not considered to be significant according to relevant guidance. Additional traffic due to people travelling to and from work is considered to be insignificant.

4.8.8 Construction noise and vibration effects would occur and be managed through the Construction Environmental Management Plan and through other measures to be agreed with the Local Planning Authority. Measures would be taken through detailed design to limit operational noise from plant including specifying quiet plant, providing appropriate enclosure (e.g. through building design) and screening (e.g. through earth mounding).
4.9 Safety

4.9.1 A Preliminary Risk Assessment has been carried out for the Project and is available as a separate document (DCO Application Document 9.3.1 Risk Assessment (Mott MacDonald, 2011)).

4.9.2 The Risk Assessment considered the most significant risk to be from the escape of gas into the environment in an uncontrolled manner leading to asphyxiation or explosion. Therefore the risks have been assessed for an escape from:

- Caverns
- Well casings
- Wellheads
- Surface infrastructure
- Pipelines

4.9.3 The highest potential risk from underground sources was found to be from a cavern which is formed through an old borehole which is currently plugged, remains undetected during cavern construction and testing and completely fails during cavern operation. The risk associated with this scenario was considered to be extremely low with other scenarios having even lower risks associated with them.

4.9.4 Events at the surface that could result in the release of gas are mainly associated with a failure of the wellhead, or of the surface pipework from the wellhead to the Gas Compressor Compound. Results have been assessed based on guidance issued by the UK Health & Safety Executive (HSE). The HSE land use planning guidance is based on assessing the risk of fatality rather than just the potential consequences of accidents. The analysis has demonstrated that only in the very worst case accidents could members of the public, including users of the Wyre Way, be at risk. The risk of fatality to the general public, even in the worst case accidents, is extremely low, and by comparison is 5 times lower than the risk of being struck by lightning. The risk is well within HSE guidance levels.

4.10 Seascape, Landscape, Townscape and Visual Amenity

4.10.1 In accordance with the Landscape Character Assessment: Guidance for England and Scotland (Natural England (Countryside Agency) and Scottish Natural Heritage, 2002), the basis of the assessment of effects on the seascape, landscape, townscape and visual amenity as a result of the Project, is the characterisation of types and areas of distinctive character. At the Project specific level, 1 seascape type, 6 landscape types and 3 townscape types have been identified, which have been further sub-divided into 2 seascape character areas, 22 landscape character areas and 10 townscape character areas.
Effects on the Seascape Type

4.10.2 The effects on seascape and its visual amenity would vary. The potential effects on the Rossall promenade, beach and open sea, and the users of the Lancashire Coastal Way, would occur mainly during construction and would therefore be of a temporary duration. A viewing platform constructed at the Rossall sea wall crossing would enhance the visual amenity of the promenade within this area once construction has finished. The effects on the Wyre estuary would occur over a longer term as a result of construction and operation activity within its adjacent eastern shoreline. However, over time, these effects would reduce, resulting in no effect on the character and visual amenity of this area.

Effects on the Landscape Types

4.10.3 Effects on the designated green belt urban fringe landscape between the built up areas of Fleetwood and Cleveleys and its users would occur mainly during construction and would therefore be either of temporary or short-term duration. Similarly, the effects on the adjacent industrial fringe recreational / future recreational landscape, which forms the immediate western setting to the Wyre Estuary, would occur mainly during construction and would therefore be of a temporary duration. The proposed Seawater Pumping Station at the Fleetwood Fish Docks would be integrated into the wider built setting of this area and would therefore not result in a significant adverse effect on this landscape or on its visual amenity.

4.10.4 The landscape and visual effects within the rural landscape to the east of the Wyre Estuary, including views from the Wyre Way and further afield within the low lying flat mosslands would vary. Potential effects at the main Project site (i.e. the rural low lying landscape to the west of Preesall and Stalmine) would result from a number of temporary, short-term and permanent proposed features including access and haul roads, the Gas Compressor Station, well heads and the Booster Pump Station, together with excavations undertaken in order to lay various pipelines and cables. There would also be a corresponding significant effect on some views from the Wyre Way, although over time these would not be significant as the landscape mitigation establishes.
4.10.5 The temporary and short-term effects on landscape and visual amenity would be experienced over a relatively wide area but would be of a short duration with the majority of work being completed within one year. The effects associated with permanent features would be experienced over a longer timescale but over a much smaller footprint compared with the construction phase. Over time and through earth mounding, planting, careful design and positioning of the above ground features and the establishment of a Landscape and Ecological Management Strategy Plan the effects would reduce. Despite these measures, it is anticipated that in certain areas the adverse visual effects of the Project would not be fully mitigated, particularly in relation to views from visual receptors located in an open landscape and in close proximity to the wellhead compounds. The proposed metering station, located to the north of Nateby, would not result in any significant effects on landscape or visual amenity.

Effects on the Townscape Types

4.10.6 The potential impacts upon townscape types would be limited mainly to effects on their visual amenity, occurring mainly during construction, and would therefore be of either temporary or short-term duration.

4.11 Sustainability

4.11.1 The Sustainability assessment has assessed the performance of the Project using Hyder’s sustainability model the ‘Hyder Heartbeat’. The performance of the Project has been assessed against the ten sustainability themes of the model: Ecosystem Services; Transport; Communications/Information and Communication Technology (ICT); Building Design; Water; Materials; Resource Security; Energy; Best Practice Management in Construction; and Business, Society and Community. The purpose of the assessment has been to determine to what extent the Project design has been developed to reduce potential adverse sustainability effects and to deliver sustainability enhancements.

4.11.2 The assessment identified that the Project performs positively against nine of the ten sustainability themes as a result of the following key measures:

- Significant changes to the Project design compared to previous applications including a reduction in the size of the Project and the amount of infrastructure that would be required.
- The design of the Project to avoid adverse effects on key ecological sites including the Wyre Estuary and Morecambe Bay.
- The selection of construction techniques to minimise adverse environmental effects, for example, directional drilling under the Wyre Estuary.
- The integration of measures in the Project design to reduce adverse visual effects, for example, the amendment to the finish of key structures so they are better integrated into the existing landscape and the use of landscape screening.
- Extensive consultation with local communities to understand their concerns and comments about the Project and the implementation of Project design changes to address some of the concerns raised.
- The re-use of existing infrastructure for the Project, for example, some of the infrastructure at the Fleetwood Fish Dock and existing buildings.
The implementation of a Construction Worker Travel Plan to ensure the use of sustainable modes of transport.
- The commitment to re-use construction materials where possible and the development of a Site Waste Management Plan to monitor waste management for the Project.

4.11.3 To further improve the sustainability performance of the Project a number of mitigation measures have been identified through the assessment process, including:

- Development and adherence to a Construction Environmental Management Plan.
- Development of a Sustainable Construction Plan.
- Implementation of the recommendations in the Health Impact Assessment
- Continued engagement with the community.
- Delivery of a number of community events during the lifetime of the Project including training presentations and facilitation of school visits to the site.
- Further review of the potential to integrate grey-water recycling into Project buildings and to select the most sustainable building materials in the long-term.

4.11.4 Negative sustainability effects were assessed for the ‘Materials’ theme as the Project would result in the discharge of waste brine from the cavern washing process to the Irish Sea. The Applicant has investigated the potential re-use of this material and it has been concluded at the present time that the Preesall salt is an under-utilised resource for which there is no current use. Furthermore, the Project would make good use of the resource in the short-term for gas storage for which there is a national need. The amount of salt that would be ‘lost’ to the Project would be an extremely low proportion of the Preesall salt.

4.12 Transport and Access

4.12.1 This assessment has examined the possible effects of the Project on traffic volumes on the local and strategic highway network that currently surrounds and would ultimately serve the Project site.

4.12.2 Traffic surveys conducted on the local and strategic highway network during July 2011, in addition to the assessment of personal injury accident recorded over the latest 5-year period, have helped to establish relevant baseline conditions. Traffic generation projections have been calculated based on anticipated construction activity at the Project, and a traffic impact assessment has been performed based upon the estimated period of maximum construction activity.

4.12.3 On the A588 Shard Road, the number of cars/light vehicles and Heavy Goods Vehicles without the Project is predicted to be 11,153 and 396 respectively whilst the additional number of cars/light vehicles and HGVs with the Project would amount to 76 and 54 respectively during the period of maximum construction activity. On the A585 Amounderness Way, the number of cars/light vehicles and Heavy Goods Vehicles without the Project is predicted to
be 18,332 and 834 respectively whilst the additional number of cars/light vehicles and HGVs with the Project would amount to 38 and 42 respectively during the period of maximum construction activity.

4.12.4 Whilst the Project would increase the number of vehicles on the surrounding highway network during the construction phase, the existing carriageways are capable of accommodating the additional vehicles and, therefore, potential adverse effects as a result of the Project are not expected. In light of this, it is considered that no mitigation or enhancement measures would be required.

4.12.5 A key measure that would be put in place to minimise the effect of the Project on the highway network is to implement and monitor a Construction Worker Travel Plan (which sets out the sustainable transport initiatives to reduce dependence on the private vehicle). Identified measures include providing a works bus service into the site, encouraging walking, cycling and the use of public transport as well as promoting car sharing amongst staff.

4.13 Water Environment

4.13.1 The water environment within the proposed Project site comprises coastal waters, surface watercourses, still waters and groundwater.

4.13.2 A consent to discharge for the disposal of hypersaline washwater into the Irish Sea has been obtained from the Environment Agency. The outfall location has been chosen to maximise potential dispersion while minimising effects on Morecambe Bay and the coastline. Modelling has been undertaken on the extent of the plume created by the discharge and assessments concluded that there would be no significant effects on marine ecology or coastal processes.

4.13.3 Surface watercourses and groundwater generally have Good to Moderate existing quality and the Project has potential to cause pollution of these water features. Measures to avoid their contamination during construction would be incorporated into the construction programme and the Project design, and would be agreed with the Environment Agency prior to construction. The need to prepare and enforce appropriate working practices during construction would be included in the CEMP. A contingency plan to deal with emergencies, agreed with the Environment Agency, would also be put in place.

4.13.4 Coastal flooding is the main source of flood risk but the majority of the Project infrastructure located in the high risk flood zone would be able to accommodate floodwater and would also be located behind existing defences. Works to the seawall at Rossall during the construction phase would be designed so that there is no reduction to the existing standard of protection to defended areas of land. For any raised infrastructure located within the high risk flood zone appropriate compensation storage would be provided. With the implementation of a suitable surface water drainage strategy, no increase in third party flood risk is anticipated.
4.14 Cumulative Effects

4.14.1 Three types of cumulative effects have been assessed as follows:

- Cumulative Effects from Different Environmental Features.
- Cumulative Effects from Different Developments.
- Cumulative Effects of Overlapping Phases of the Project

4.14.2 Once the Project is operational and mitigation measures have become effective there would be no cumulative effects from different environmental features.

4.14.3 A number of developments have been identified for consideration within the assessment of cumulative effects from different developments, the majority of which are considered unlikely to generate significant cumulative effects in combination with the Project. From the developments that were taken forward for further consideration within the cumulative effects assessment, the following potentially significant cumulative effects have been identified.

4.14.4 Cumulative effects from the Project’s proposed metering station and a planning application for the erection of two wind turbines at Orchard End Farm, Eagland Hill, Pilling, consisting of potential localised temporary, short-term visual effects upon Landscape Character Areas (LCA) and visual receptors within them, during the Project construction phase. In addition, there would be potential long-term cumulative effects during the construction, construction and operation combined and operation phases on some visual receptors within these LCAs.

4.14.5 The proposed Seawater Pumping Station, in-combination with the proposed Riverside Waste Transfer and Recycling Centre development (Jameson Road), would generate potential short-term, adverse cumulative effects upon an LCA and a Townscape Character Area (TCA) and visual receptors within them.

4.14.6 The assessment of cumulative effects of overlapping phases of the Project has been considered within each individual environmental topic chapter and is summarised above where relevant.
5.0 Further Information

5.1.1 The ES was submitted as part of the application to the IPC for an order granting Development Consent for the Project, and has been published as part of a wide ranging consultation programme which will inform the local community, the regulators and other stakeholders of the Project.

Accessing and Viewing Documents

5.1.2 Hard copies of documents can be provided. Where appropriate, a reasonable charge will be made for hard copies of the ES (£500 for a full set of reports and drawings) and £15 each for a DVD containing the files. This Non-Technical Summary of the ES will be provided free of charge.

5.1.3 The DCO application, including the ES documents, is available directly from Halite:

Visit the website, www.halite-energy.co.uk
Email: community@halite.net
Call Halite on 01772 672244
Write to: Halite Energy Group, Freepost RSRC-UETY-CHSU, Unit 5 St Georges Court, St Georges Park, Kirkham PR4 2EF (9am to 5pm weekdays)

5.1.4 In addition, the documents are available from the following inspection locations:

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<tr>
<th>Lancashire County Council (9am to 5pm weekdays)*</th>
<th>Fleetwood Library**</th>
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<tr>
<td>Environment and Public Protection Services</td>
<td>North Albert Street</td>
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<tr>
<td>Environment Directorate</td>
<td>Fleetwood</td>
</tr>
<tr>
<td>PO BOX 100</td>
<td>FY7 6AJ</td>
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<tr>
<td>Preston</td>
<td>Tel: 01253 775800</td>
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<tr>
<td>PR1 0LD</td>
<td>Thornton Library**</td>
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<tr>
<td>Tel: 01772 534181</td>
<td>Victoria Road East</td>
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<td><a href="mailto:DevCon@lancashire.gov.uk">DevCon@lancashire.gov.uk</a></td>
<td>Thornton</td>
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<tr>
<td>Wyre Borough Council (Mon – Thurs, 8.30am to</td>
<td>FY5 3SZ</td>
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<td>5pm, Fri, 8.30am to 4.30pm)</td>
<td>Tel: 01253 869138</td>
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<td>Civic Centre</td>
<td>Poulton-le-Fylde Library**</td>
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<td>Breck Road</td>
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*Please contact Lancashire County Council on 01772 534181 or e-mail DevCon@lancashire.gov.uk to arrange an appointment to view the documents

**Please contact the libraries and deposit locations for details of their opening hours