

Application to the relevant hazardous substances authority (planning authority)

The Planning (Hazardous Substances) Act 1990 - Section 7(1)

England - The Planning (Hazardous Substances) Regulations 2015 (Regulation 5)

Wales - The Planning (Hazardous Substances) (Wales) Regulations 2015 (Regulation 5)

Application for Hazardous Substances Consent

1	Applicant	SSE Hornsea Limited
	Address	No.1 Forbury Place, 43 Forbury Road, Reading, United Kingdom,
	Post code	RG1 3JH
	Telephone number	

	Person in control of the land to which the application relates, if different to above	As above
	Address	
	Post code	
	Telephone number	

2	Address or other location details of application site	SSE Hornsea Ltd
		Aldbrough Gas Storage, Garton, Hull
	Post code	HU11 4QB
	OS grid ref	Easting 526034, Northing 437015

3 Hazardous substance(s) covered by the application

- (a) List named substances falling within Part 2 of Schedule 1 to the Regulations first, then list any substances falling within the categories in Part 1 of that Schedule; finally list substances falling within the description in Part 3.
- (b) Substances falling within Parts 1 or 3 of Schedule 1 to the Regulations may be listed under the relevant category or description or named specifically. Where a substance falls within Part 1 and 2 list under Part 2 only; where a substance falls within more than one category in Part 1 list under the category which has the lowest controlled quantity. Where a substance falling within Part 1 or 2 also falls within Part 3 list under the Part which has the lowest controlled quantity. The “controlled quantity” means the quantity specified for that substance in column 2 of Parts 1, 2 or 3 of Schedule 1 to the Regulations.

Note: The addition rule as set out in the schedule to the regulations should be applied to determine whether consent is required for substances below the Controlled Quantity. Examples are given in the associated planning guidance. The Planning (Hazardous Substances) (Amendment) Regulations 2017 are relevant to the use of the addition rule in England only. The Planning (Hazardous Substances) (Amendment) Regulations 2015 are relevant to Q* (addition rule) for LPG, and relevant to notes about ammonium nitrate.

Table A

<i>Name, or relevant category or description of substance</i>	<i>Part number in Schedule 1 to the Regulations, and entry number if Part 2, category if Part 1, identity if Part 3</i>	<i>Do you have a current PHS consent* in respect of this substance? (Yes/No)</i>	<i>If “yes”, state quantity for which consent granted</i>	<i>Maximum quantity proposed to be present in tonnes</i>
Natural Gas (stored in Caverns Ald-1 to Ald-9)*	Part 2 – Item 18	Yes	755,000 tonnes	755,000
Methanol	Part 2 – Item 22	Yes	50 tonnes	50
Hydrogen (stored in Cavern Ald-1)*	Part 2 – Item 15	No	-	5,460

*a hazardous substances consent

+Cavern Ald-1 could be used to store either Natural Gas or Hydrogen, but not both substances at the same time. Refer to Table C.

Where in Table A consent is sought for any substance below the relevant Control Quantity, give the reason in the box below including the calculation for each relevant type of hazard (health, physical and/or environmental) with the q/Q fractions that add to greater than or equal to 1.

4 Manner in which substance(s) are to be kept and used

For each substance, category or description of substance, covered by the application, provide the following information, referring to the substance location plan where appropriate.

“vessel” means any container designed or adapted to contain hazardous substances which is affixed to the land, and includes a container which forms part of plant or machinery which is affixed to the land but does not include a pipeline.

“Buried” or “Mounded” vessel includes a vessel which is only partially buried or partially mounded.

“moveable container” means any container designed or adapted to contain hazardous substances other than a vessel.

- (a) Tick one box below to show whether the substance(s) will be present for storage only **or** will be stored and involved in a manufacturing, treatment or other industrial process:

Table B

<i>Substance including Part no. in Sch. 1 to the Regs, and entry no. if Part 2, category if Part 1, identity if Part 3</i>	<i>Storage only</i>	<i>Stored and involved in an industrial process</i>
Part 2 – Item 18	No	Yes
Part 2 – Item 22	No	Yes
Part 2 – Item 15	No	Yes

(b) For each vessel to be used for **storing** the substance(s) give the following information:

Table C (i)

<i>Vessel No*</i>	<i>Substance including Part no. in Sch. 1 to the Regs, and entry no. if Part 2, category if Part 1, identity if Part 3</i>	<i>Installed above ground† (Yes/No)</i>	<i>Buried (Yes/No)</i>	<i>Mounded (Yes/No)</i>	<i>Maximum capacity (cubic metres)</i>	<i>Highest vessel design temperature °C</i>	<i>Highest vessel design pressure (bar absolute)</i>
Cavern Ald 2 to 9	Part 2 – Item 18	No	No (Underground)	No	3,200,000	N/A	300
Cavern Ald 1	Part 2 – Item 15 OR Part 2 – Item 18	No	No (Underground)	No	311,400	N/A	300
T-8001 T-6001	Part 2 – Item 22	Yes (provided with full secondary containment)	No	No	65	80	0.056

* identify by reference to substance location plan

† if “Yes”, specify whether or not it will be provided with full secondary containment

(c) For each substance, category, or description of substance, state the largest size (capacity in cubic metres) of any **moveable** container(s) to be used for that substance, category, or description of substances:

Table C (ii)

<i>Substance including Part no. in Sch. 1 to the Regs, and entry no. if Part 2, category if Part 1, identity if Part 3</i>	<i>Storage area on site*</i>	<i>Maximum capacity (cubic metres) of individual moveable containers</i>
Not applicable	-	-

* identify by reference to substance location plan

- (d) Where a substance, category or description of substance is to be used in a **manufacturing, treatment or other industrial process(es)**, give a general description of the process(es), describe the major items of plant which will contain the substance(s); and state the maximum quantity (in tonnes) which is liable to be present in the major items of the plant, and the maximum temperature (°C) and pressure (bar absolute) at which the substance, category or description of substance is liable to be present:

Table D

<i>Substance including Part no. in Schedule 1 to the Regs, and entry no. if Part 2, category if Part 1, identity if Part 3</i>	<i>Description of process(es)</i>	<i>Major items of plant*</i>	<i>Max. quantity (tonnes)</i>	<i>Max. temp. (°C)</i>	<i>Max. pressure (bar absolute)</i>
Part 2 – Item 18	Facility designed to store natural gas imported from the National Transmission system (NTS) operated by Transco.	Compression plant Gas Export Facilities - separators & vessels.	110	225 regeneration stage	270
Part 2 – Item 22	May be required at the wellhead to prevent the formation of solid methane Hydrate.	Storage tank Tank Recovery Unit.	50	Ambient conditions	275
Part 2 – Item 15	Electrolyser system, underground hydrogen storage and a hydrogen fired Open Cycle Gas Turbine (OCGT).	Electrolyser, compression plant, OCGT.	5,460	60	279

* identify by reference to substance location plan

5 Additional Information

- (a) If you have an existing PHS consent(s) as referred to in Table A, **attach a copy of each consent** to this application.

Yes, Consent 05/07979/PHAZ for Methanol and NG are attached to this application.

- (b) **List the maps or plans** or any explanatory scale drawings of plant/buildings submitted with this application (**as a minimum submit a site map and a substance location plan** – see **Notes** below).

- Appendix A – Cavern Location Plan (329_0802_0007- Rev. B)
- Appendix B – Methanol Location Plan (ALDB01-ARC-PLN-0041-001 / 002)

- (c) Provide a brief overview description of the **main activities** carried out or proposed to be carried out on the land to which the application relates.

The Aldbrough Salt Cavity Gas Storage Installation is designed to store natural gas in salt cavities artificially created in a underground bed of salt. The purpose of the storage site is to provide a range of storage services to the owners of the facility and users of the National Transmission System (NTS), including peak shaving in periods of high demand, system support and daily balancing under the Network Code. Additionally, the site also provides security of supply for the NTS, and in particular the supply of gas during periods of high demand, supply shortages, or local area failures. This function is of strategic importance, as failure to maintain a minimum pressure in the gas distribution system would have legal, safety and commercial implications.

The installation consists of a gas processing plant, compressors, metering and gas connection to the NTS in the central area hereafter referred to as the Central Processing Area (CPA). Also, there are 9 gas storage cavities in the surrounding area, linked to the CPA via two vertical and seven directionally-drilled wells.

SSE Thermal and Equinor, working in collaboration, are developing a portfolio of hydrogen projects for deployment within the UK including hydrogen-fired gas turbine applications, hydrogen storage and electrolytic hydrogen production.

The Aldbrough Hydrogen Pathfinder (AHP) development consists of an electrolyser, underground hydrogen storage and a hydrogen fired Open Cycle Gas Turbine (OCGT). The existing Aldbrough 1 (Ald-1) cavern and well will be converted to hydrogen storage. This project will act as proof of concept for potential future large-scale hydrogen storage projects which will contribute to the balancing of national supply and demand.

- (d) Provide details of how each relevant substance is proposed to be transported to and from the land to which the application relates, for example the size and frequency of vehicle deliveries, the size or maximum flow rate of pipeline imports/exports.

<i>Substance including Part number in Schedule 1 to the Regulations, and entry number if Part 2, category if Part 1, identity if Part 3</i>	<i>How, and other details such as frequency and quantity, transported to and from the land to which the application relates</i>	
	<i>Transported to site</i>	<i>Transported from site</i>
Part 2 – Item 18	Natural gas is supplied to the site via a 900 mm diameter pipeline from the NTS No. 6 Feeder at Sproatley.	Not applicable
Part 2 – Item 22	Methanol is stored in a 35 m ³ bulk tank with appropriate protection against bulk spillages and is loaded into the tank by transfer from road tankers.	Not applicable
Part 2 – Item 15	Not applicable – produced onsite	Not applicable

- (e) Provide details of the vicinity of the land to which the application relates, where such details are relevant to the risks or consequences of a major accident (relevant details include numbers of people in neighbouring developments that could be affected by a major accident and details about environmentally sensitive receptors).

The gas storage installation at Aldbrough is located approximately a mile inland off the East Yorkshire coast, in a rural coastal area surrounded by agricultural land with few dwellings close to the site. The occupied locations offsite within range of the site hazards are private dwellings and farms with relatively low occupancy levels (2.5 on average) and the B1242 road. A Quantitative Risk Assessment (QRA) indicates that all potentially occupied off site locations are exposed to low risk levels, with the maximum Individual Risk Per Annum (IRPA) for all offsite populations falling within the 'broadly acceptable' region of risk.

The assessment of the environmental impact and the evaluation of potential major accidents has also been reviewed.

The QRA indicates that on-site scenarios are unlikely to cause a Major Accident to the Environment (MATTE). The impact of fire on ecosystems is complex and unpredictable, making it challenging to ascertain if a fire has resulted in a MATTE without extensive post-event studies.

The site stores various substances including methanol, diesel, condensates (Natural Gas Liquids), water treatment chemicals, antifreeze, waste oils, and lubrication oil. Worst-case scenarios are considered to identify potential issues, although it's improbable these scenarios will actually occur. It is concluded that a release of substances from the site is unlikely to result in a MATTE. However, specific risks are identified, such as a diesel release potentially impacting the aquifer and groundwater, and lubrication oil release affecting internationally important sites like the Humber Estuary Ramsar and the Greater Wash SPA. These risks are deemed 'broadly acceptable' due to their low frequency. Ultimately, determining whether an incident has led to a MATTE requires detailed post-incident analysis.

Section 4.2.5.1 of the COMAH report details the environmental aspects within 2 km of the Aldbrough storage site. Key points include:

1. Absence of SSSIs: No Sites of Special Scientific Interest are located within 2 km of the site.
2. Local Wildlife Site: Bail Wood, approximately 1 km southwest of the site, is a non-statutory Local Wildlife Site of about 9.6 hectares. It's an ancient, semi-natural woodland, notable for species like ash and sycamore.
3. Surrounding Landscape: The area around the Aldbrough site mainly consists of arable fields, bordered by hedgerows, ditches, and drains. These field drains, particularly Cess Dale and East Newton drains, are locally significant for their botanical diversity and support for invertebrates.
4. Protected Hedgerows: Several hedgerows within 2 km of the site are protected under the Aldbrough Parish enclosure award, a historical designation unrelated to ecological value.
5. Nearby Coastline and Habitats: The site is about 1 km from the Holderness coastline, with sections near the site classified as maritime cliffs and slopes. The coastline to the north and south is designated as 'Heritage Coast'. There are also deciduous woodland areas classified as priority habitats within 2 km.
6. Important Species Consideration: The analysis included impacts on important species as defined by DEFRA guidance. This includes priority species under the UK Biodiversity Action Plan, species listed in the EC Habitats Directive and Birds Directive, species in the Wildlife and Countryside Act 1981 schedules, and all Red Data Book species.

Section 4.2.5.2 of the COMAH report covers environmentally sensitive sites within 10 km of the Aldbrough storage site, highlighting the following:

1. SSSIs Proximity: Several designated Sites of Special Scientific Interest (SSSIs) are located within 10 km but beyond 2 km of the site. These include Sigglesthorne Station, Kelsey Hill Gravel Pits, Lambwath Meadows, and Roos Bog.
2. Humber Estuary Connection: The Humber Estuary, about 13 km away, is connected to the site via East Newton and Cess Dale drains. This estuary is significant as a Ramsar site, Special Protection Area (SPA), Special Area of Conservation (SAC), and an SSSI.
3. Other Nearby Designations: The Greater Wash SPA in the North Sea is about 1 km away. Hornsea Mere (SPA) is just over 10 km from the site. The area within 10 km also includes the Heywoods Community Forest, 14 Local Wildlife Sites (LWS), 2 historic LWS, and 27 deleted LWS.

4. Important Species: Flamborough Head, over 30 km away, is home to over 200,000 breeding pairs of seabirds. The Holderness coast regularly supports various shorebird species, and gull species are also present along the coastline.

The site stores various liquids, including those classified as dangerous substances under COMAH regulations. Releases of substances with small inventories are not considered significant, as they are unlikely to cause a Major Accident to the Environment (MATTE). Although there is a pathway from the site's drains to the Humber Estuary, a site of international importance, this pathway is over 18 km long, and most substances are present in quantities too small to significantly affect the estuary. However, due to the volume of lubrication oil onsite, the estuary is considered to be at risk.

- (f) Provide a brief overview of the measures taken or proposed to be taken to limit the consequences of a major accident.

In accordance with the COMAH Report for the site, the Aldbrough Natural Gas Storage Installation has established a comprehensive set of intervention and protection measures to be enacted in the event of a major incident. These measures, detailed in the Internal Emergency Plan, have been devised in collaboration with employees, emergency services, local health authorities, the local authority, and relevant agencies. The plan, alongside documents outlined in the COMAH Report, fulfills the obligations under Regulation 11(1) of the COMAH Regulations. These obligations include incident containment and control, health and environmental protection measures, information dissemination, and environmental restoration strategies. The emergency procedures address incident detection, evacuation, and the activation of internal and external emergency plans, among other actions.

The initiation of this emergency procedure is at the discretion of the Duty Production Engineer or any other employee upon the detection or report of major incidents such as fire, significant gas or methanol release, hazardous liquid spills (e.g., diesel, condensate), or any other situation deemed a major emergency by the Production Engineer. These incidents correlate with the findings from the 2021 Process Hazard Review study [referenced in the COMAH Report] and the identified Major Accident Hazard scenarios. The site's Incident Response Manual, available in the Control Room, contains prompt lists for various scenarios, including those identified in the Safety Report.

In a major incident scenario, individual or simultaneous closure of the emergency shutdown (ESD) valves for each storage cavity and the main site National Grid isolation valve is a key mitigation measure as per the on-site emergency plan. Firefighting resources are maintained on-site, supplementing those of the Emergency Services. The Aldbrough site is equipped with several early warning systems, such as smoke, gas, ultra-violet, and thermal radiation detectors, and additional surveillance by internal personnel. Upon identification of a major emergency, the Internal Emergency Plan is immediately activated, signaled by the site siren, and non-essential personnel are evacuated. Concurrently, the Emergency Services are notified by telephone as part of the immediate response actions.

A Public Information Zone (PIZ) has been established around the site. Details of the dangerous substances, the possible major accidents and their consequences and what to do in the event of an accident shall be made available to all those within the PIZ.

- (g) Give any further information which you consider to be relevant to the determination of this application. (For example, details about any exempted established substances on site or a copy of any notification about 'other establishments'/exempted established substances if already submitted).


(Will print as blank space if no further information provided)

I/We hereby apply for hazardous substances consent in accordance with the proposals described in the application

Signed 

on behalf of..... Director of Gas Storage, SSE Hornsea Ltd.

(insert name of person in control of the land if different to applicant)


Date

To be accompanied by the notices and certificates required by regulations 6 and 7 of the Regulations.

Notes

“**Site map**” is a map, reproduced from, or based on, an Ordnance Survey map with a scale of not less than 1:10,000, which identifies the land to which the application relates and shows National Grid lines and reference numbers.

“**Substance location plan**” is a plan of the land to which the application relates, drawn to a scale of not less than 1:2,500, which identifies-

- (a) any area of land intended to be used for the storage of the substance;
- (b) where the substance is to be used in a manufacturing, treatment or other industrial process, the location of the major items of plant involved in that process in which the substance will be present; and
- (c) access points to and from the land.