

3.0 SITE AND DEVELOPMENT DESCRIPTION

Site Context

- 3.1 The Site, shown on Figure 3.1, is located within the North York Moors National Park and Ryedale District.
- 3.2 The Site includes three elements:
- The Ebberston Moor South (EMS) Well Site;
 - The pipeline corridor between EMS Well Site and KGS; and
 - The Knapton Generating Station (KGS)
- 3.3 The northern extent of the Site including the EMS Well Site is located within a mix of woodland and agricultural land while the majority of the southern section of the pipeline corridor is located within agricultural fields in the Vale of Pickering. The existing EMS Well Site and northern extent of the gas pipeline corridor is located on the southern boundary of the North York Moors National Park to the east of Givendale Head Farm. The Well Site is screened on three sides by plantation woodland, to the east of Dalby Forest. From the EMS Well Site, the pipeline corridor follows a east-west alignment before then heading in a north easterly-south westerly direction through a section of the Dalby Forest, known as Givendale Rigg, following the boundary of the National Park. It then follows a general north-south alignment between Stonygate Moor and Given Dale before crossing the A170 and passing between the villages of Allerston and Wilton. The corridor continues southwards to the west of Yedingham. The pipeline corridor then continues across agricultural land before crossing the River Derwent, the railway between York and Scarborough and terminating at KGS where it connects into a pig receiver module within the pig handling area of the KGS.

Site Description

EMS Well Site

- 3.4 The EMS Well Site as shown on Figure 3.2 is located within the North York Moors National Park approximately 4.5km northeast of Ebberston and approximately 10.5km north east of Pickering at an elevation of approximately 220m above ordnance datum (AOD). The EMS Well Site is surrounded to the north, north west and east by mature forestry plantation. The southern boundary of the EMS Well Site is defined by the boundary of the National Park Authority and part of the Tabular Hills Walk which runs from the Cleveland Way in Helmsley

to the coast at Scalby. The EMS Well Site is separated from open farmland to the south by a substantial hedgerow which aligns the Tabular Hills Walk.

- 3.5 The EMS Well Site, as shown on Figure 3.2 is approximately 1.61 ha in area. The Site is enclosed by a 2m high post and wire fence. It currently contains a 0.66 ha area of flat bare ground (drilling platform), an existing borehole with an associated wellhead (Ebberston Moor South well) and a well cellar adjacent to the wellhead on the eastern part of the EMS Well Site. The EMS Well Site is covered with crushed hardcore, placed over a geotextile membrane and bentonite mat and connected into a lined perimeter drainage ditch. A soil bund approximately 2.5m in height lies beside the eastern boundary. A number of shorter bunds, similar in height, are located in the north-western corner of the EMS Well Site. The bunds comprise a mixture of previously excavated top soil and sub soil. The surfaces of the bunds are vegetated with coarse grass and brush.
- 3.6 A narrow unmanaged grass strip 10m wide separates the post and wire perimeter fence from the plantation to the east and north of the EMS Well Site. Scrub planting along the southern boundary separates the perimeter fence from the public footpath.
- 3.7 There are no large settlements within 3km of the existing EMS Well Site, although there are several large working farms in close proximity, including Givendale Head Farm and High Scamridge Farm, approximately 900m to the north-west. Neither of these properties has direct views into the EMS Well Site given the screening provided by intervening forestry planting.

Pipeline Corridor from EMS Well Site to KGS

- 3.8 The pipeline working width corridor is up to 30m wide and 13.9 km in length. The total area of the pipeline corridor is 62.12 ha. The northern extent of the pipeline route is located within the elevated plateau of the Dalby Forest, approximately 240m – 250m AOD on the southern slopes of the North York Moors National Park. From here it passes down a prominent escarpment, and beyond through a network of woodland, tree belts and hedgerow bounded fields south towards the Vale of Pickering. The northern section of the pipeline corridor between south of Givendale Head Farm and Warren House runs parallel to the existing Northern Gas Networks (NGN) 450mm Pickering to Whitby pipeline and the route of the 300mm and 100 mm pipelines of the Ryedale Gas Project (application NY/2010/0159/ENV) which was granted planning permission in June 2012.
- 3.9 It crosses beneath the A170 road at approximately 60m AOD and continues through the Vale of Pickering, where it crosses flat, large and open fields bordered by ditches and hedgerows

until it reaches the KGS. Along the route the corridor passes beneath a number of watercourses and field drains, including the River Derwent, the railway between York and Scarborough and a number of roads, including the A170 and the B1258.

KGS

- 3.10 KGS, near Malton, has an Open Cycle Gas Turbine (OCGT) of approximately 110 Megawatt (MW) thermal input, 41.5 MW electrical output, capable of generating enough power to supply 40,000 homes and was commissioned in 1994. The sole fuel for power generation plant is natural gas from four reservoirs beneath the Vale of Pickering in Ryedale.
- 3.11 A network of pipelines transports gas from the supply wells to the gas conditioning plant, which shares the Knapton site, ready for generation.
- 3.12 The wells have not been developed for feeding the gas into the National Grid, partly because the gas from the five supply wells contains a small amount of sulphur, and is thereby not of a quality acceptable for injection into the national gas transmission system. The gas is conditioned at the plant to remove water and small quantities of light hydrocarbon condensate and is used as fuel feed to a simple cycle gas turbine of a nominal 41.5 MW electrical output.
- 3.13 Electricity generated at the plant is exported via an overhead 132 kV transmission line extending some 0.6 km to connect with the existing nearby 132 kV overhead transmission line. Three 30 m high pylons support this connection along the route of the transmission line.

Description of the Development

Background to the Development

- 3.14 The EMS Well Site was constructed in late 2008 by Moorland Energy Limited (MEL) and drilled in spring 2009 as an exploratory well. The EMS Well Site lies wholly within the North York Moors National Park. Planning permission was subsequently granted by the Secretary of State in June 2012, following a public inquiry, to MEL for gas production at the Well Site, together with a 8 km underground gas pipeline to Hurrell Lane near Thornton-le-Dale, where the natural gas would be processed in a purpose-built gas processing facility before being injected via a hot tap into the existing National Transmission Scheme pipeline. This scheme is known as the Ryedale Gas Project (RGP). As of July 2014, this permission has not been implemented.

3.15 More recently, planning permission was granted by the North York Moors National Park Authority (NYMNP) and North Yorkshire County Council (NYCC) in December 2013 and April 2014 respectively to Third Energy UK Gas Limited for gas production at the Ebberston Moor A (EMA) Well Site, located 2.5 km to the north of the EMS Well Site within the North York Moors National Park, and for a 15.3 km underground gas pipeline from the EMA well Site to the KGS. Known as the 'Ebberston Moor-Knapton Gas Pipeline' scheme, this formed part of the phased approach by Third Energy UK Gas Limited to develop the Ebberston Moor gas field development. As of July 2014, this planning permission has not been implemented.

3.16 The Development seeks planning permission to effectively combine elements of the two extant planning permissions referred to above (the RGP and the Ebberston Moor-Knapton Gas Pipeline). Further information on the Development and proposed activities is set out below.

Introduction

3.17 The Development aims to carry out the following activities as shown on Figure 3.3 and Figure 3.4a-n and Figure 3.5a:

- Gas production and water re-injection from the existing borehole well at the EMS Well Site;
- Drilling a second borehole for water production and re-injection;
- Construction of an 12" (300 mm) diameter steel underground pipeline from the existing EMS Well Site to deliver natural gas and condensate to the KGS at East Knapton where it will be used to produce energy; and
- Construction of a gas reception facility at KGS.

3.18 The current project schedule for the Development anticipates planning and field development approval in 2014, construction commencing in 2015 and transfer of gas via the pipeline between the EMS Well Site and KGS commencing in 2016. The gas production associated with the Development is expected to be up to 15 years in duration.

3.19 The construction activities associated with constructing the Development are discussed further in Chapter 5.

The Development

EMS Well Site

3.20 The EMS Well Site is located near Givendale Head Farm, Ebberston and utilises an existing access route used during the exploration and appraisal of the EMS Well Site in February 2009. The compound measures some 114.5m x 146m and will accommodate buildings and equipment for the separation of the natural gas and condensates and transfer of gas. Equipment and buildings will be located within the confines of the existing Well site compound.

3.21 The existing well site will be developed to allow for gas production as shown in Figure 3.2. It is anticipated that the volume of gas to be produced will be up to 15 million standard cubic feet per day (mmscf/d). In order to facilitate the construction and operation of the Development, the following facilities listed below will be required:

- Construction compound
- Laydown area
- Workforce facilities – messing, catering and offices
- Security cabin
- 19 parking spaces
- Potable water tank
- Power generator

3.22 The main equipment at the EMS Well Site will include:

- Local equipment room
- Satellite dish
- Nitrogen cylinders
- Instrument air compressor
- EMS wellhead
- Hydrate inhibitor package
- Corrosion/scale inhibitor package
- Wellhead water separator
- Water production & injection well
- Twelve inch gas pipeline pig launcher
- Closed circuit television (CCTV) tower
- Surface water interceptor pit

- Gas fired electrical generator
- 3.23 The equipment at the EMS Well Site described herein and assessed in the ES, illustrates the maximum parameters for development. Parameters have been developed for assessment within the ES as the exact location and size of some of the equipment needed at the EMS Well Site is not known at this stage and an assessment based on maximum parameters allows for the worst case effects to be assessed. This will mean the conclusions of the ES will remain valid regardless of the exact location and type of some of the equipment selected for the Development.
- 3.24 The development parameters for the EMS Well Site are shown on Figures 3.7 and Figure 3.8. The built development at the EMS Well Site will not exceed these parameters.
- 3.25 Gas will flow from the reservoir and through the choke valve which regulates the flow rate of the gas. The produced water will be re-injected into the Sherwood Sandstone via the injection well. A horizontal two-phase wellhead separator will separate the gas and liquids, before transferring the gas to the KGS. The flowing wellhead pressure will provide the driving force for the gas flow.
- 3.26 Pig launchers will allow the pipelines to be inspected and maintained but will not be used during normal operation. Methanol is proposed for hydrate inhibition at the EMS Well Site, requiring a storage tank and injection pumps. Corrosion inhibitor and/or scale inhibitor may also be required for pipeline protection.
- 3.27 Electrical distribution, control, shutdown systems, telecommunications, instrument air and wellhead hydraulic panel will be housed within a local equipment room on the EMS Well Site (normally unmanned).
- 3.28 The following utilities/systems will be required at the EMS Well Site:
- Gas fired generator
 - Standby diesel generator & Uninterrupted Power Supply (UPS) System (backup for gas fired generator)
 - Wellhead hydraulic system/panel
 - Nitrogen cylinders (backup for hydraulic failure)
 - Process area drains/interceptor
 - Integrated Services Digital Network (ISDN) telephone line

- 3.29 The proposed rate of extraction of the gas from the reservoir is less than 1.2mmscmd and, therefore, the Development does not fall within the remit of the National Infrastructure Directorate of the Planning Inspectorate which deals with developments with extraction rates in excess of 4.5mmscmd.

Produced Water Disposal

- 3.30 The existing borehole at the EMS Well Site will be used for gas production and re-injection of water (the water produced during the production of gas will be disposed of via the same borehole). In addition a new water production and re-injection well is proposed (see Figure 3.3).
- 3.31 At the existing borehole, gas will be transported up the tubing and the produced water will then be combined with water from the water production well and exported back down the liner to casing annulus into the Sherwood Sandstone rock layer beneath the EMS Well Site.
- 3.32 The produced water injection will be achieved by low pressure injection from the surface with the hydrostatic pressure of the water column assisting the water injection process. Injection at the existing well is anticipated to be at a rate of 556 m³ per day, injection at the second proposed well is anticipated to be 1,344 m³ per day. The well will be cased and grouted to the injection zone and injection will take place in either an open hole or through a perforated section, depending on the stability of the borehole wall. A groundwater permit is required from the Environment Agency to carry out this process and a permit application will be submitted and considered in parallel with the planning application.

Pipeline from EMS Well Site to KGS

- 3.33 The length of the pipeline route is 13.9 km.
- 3.34 One underground 12" diameter pipeline will be constructed from EMS Well Site to KGS to transport gas. The pipeline will be accompanied by a fibre optic cable within the construction working width. It should be noted that where reference in the ES is made to the pipeline, it should be assumed that this also includes the fibre optic cable. The construction working width will normally be 30m a typical cross-section for the pipeline is shown on Figure 3.6a, Figure 3.6b shows a typical cross section of the pipeline through the Dalby forest.
- 3.35 Once construction has been completed, a 10m easement will be maintained during the operational lifetime of the proposed pipeline for maintenance purposes.

KGS

- 3.36 The gas will be used as fuel-gas to generate power after arriving at KGS.
- 3.37 A pipeline and Pig Receiver Module will be required at the KGS to receive the gas pipeline (see Figure 3.5a and 3.5b).

Access

- 3.38 Access to the EMS Well Site will be via an existing access route used during the exploration and appraisal of the EMS Well Site and will remain unchanged. Access to KGS will also be via the existing access road and will remain unchanged.
- 3.39 Access to the pipeline route is from the local road network including: A170; B1415 Penniston Lane; Allerston Lane; Marishes Lane and B1258 Malton Road where the pipeline route crosses these roads.

Parking

- 3.40 There will be no car parking spaces available along the pipeline route. 16 spaces will be provided at the EMS Well Site and no parking will be required at the KGS.

Landscaping

- 3.41 The landscape strategy for the Development has been designed with particular consideration to the topography, landscape and ecological constraints and opportunities identified on the Site. Landscaping works will involve some ground modelling works associated with careful felling of woodland. Elsewhere within the Site, works will include soil preparation, tree and vegetation planting and seeding once the pipeline has been constructed (see Chapter 7 Landscape and Visual for further information).

Sustainable Drainage Measures

- 3.42 Sustainable Drainage Systems (SuDS) will be used to reduce flood risk, improve water quality, assist groundwater recharge whilst also providing amenity and wildlife benefits. Further information is provided in Chapter 11 Flood Risk, Hydrology and Drainage.

Lighting

- 3.43 Lighting will only be required during the drilling phase at the EMS Well Site, further information is provided in Chapter 5. Following the drilling phase, the facility will not be lit at night except in emergencies or for urgent maintenance and therefore has not been described or discussed further in this ES.

Waste Management

- 3.44 The Development will provide an appropriate plan and facilities for the efficient collection, storage and transport of waste to an approved and licensed waste company for recycling or disposal. Adequate space for refuse for storage and collection will be provided within the Development as required by North Yorkshire County Council (NYCC), North York Moors National Park Authority (NYMNP) and Ryedale District Council (RDC).