

4.0 THE PROPOSED DEVELOPMENT

Introduction

4.1 The Proposed Development will facilitate an appraisal of the central part of the Ebberston Moor gas field, with the aim of proving reservoir volumes within the gas field sufficient to support investment in future field development as described in Chapter 1 through:

- Gas production from the existing well, Ebberston Moor-1 at the Ebberston Moor 'A' Well Site; and
- Connection to the neighbouring Local Transmission Zone (LTZ) Above Ground Installation (AGI), including the construction of:
 - a gas conditioning facility (the facility where the impurities from the gas are removed to meet the LTZ gas quality specification);
 - metering facilities to deliver gas into the LTZ pipeline; and
 - facilities for the storage and transport of condensate-LPG mix, and gas treatment fluids from the Lockton Compound.

Key Elements of the Proposed Development

4.2 The Proposed Development as shown on **Figure 4.1**, **Figure 4.2** and **Appendix 4.1** comprises the following elements:

1. Gas production from the existing well (Ebberston Moor-1) which will be side tracked for the purpose of placing a horizontal well bore at the top of the Permian Kirkham Abbey Formation (KAF) reservoir to avoid producing the water underlying the gas reservoir. The side track is proposed to be drilled under planning permission NYM/2013/0068/FL prior to construction commencing on this Proposed Development;
2. Piping the produced gas to the adjacent Lockton Compound, where the gas will be conditioned (i.e. water and hydrogen sulphide content reduced to the required level); and
3. Flowing the conditioned gas into the neighbouring LTZ pipeline through the existing above ground pipeline connection within the Northern Gas Network (NGN) AGI, and which is operated by NGN. The gas will then be distributed to meet local demand for gas in the Scarborough and Whitby region of North Yorkshire.

4.3 The proposed construction sequence and programme of works are outlined in Chapter 6. The current project schedule anticipates planning and field development approval in 2013, construction commencing in January 2014, once the 'side-track' to Ebberston Moor – 1 well

has been drilled under planning permission NYM/2013/0068/FL, and gas production start-up after July 2014. The Proposed Development is expected to be operating for up to five years. If this Proposed Development is successful, a pipeline will be constructed in order to deliver gas and associated liquids from the existing Ebberston Moor 'A' Well Site to the Knapton Generating Station (KGS). The pipeline will be the subject of a separate planning application and is not considered further in this ES.

Description of the Proposed Development

4.4 The Ebberston Moor 'A' Well Site and the adjacent Lockton Compound lie within the Parish of Allerston at the edge of Dalby Forest approximately 6.5 km to the north of Ebberston.

4.5 The existing well site and compound will be developed to allow for gas production and conditioning to meet the gas quality specification of the neighbouring LTZ. It is anticipated that the volume of gas to be produced will be at an annual average rate of 15 million standard cubic feet per day (mmscf/d), sufficient to supply the gas needs to approximately 75,000 homes. In order to facilitate the construction and development of the Proposed Development, the following facilities listed below will be required as shown in **Figure 4.1**:

- Construction compound;
- Laydown area for pipes, material and associated equipment;
- Fabrication shed;
- Workforce facilities – messing, catering and offices;
- Security cabin;
- Parking spaces;
- Potable water tank; and
- 1000 kw natural gas fuelled electric generator.

4.6 The main equipment to enable the produced gas to be conditioned will include:

- Inlet separator complete with measurement devices for gas and liquids;
- 200kw Gas fired heater;
- Sulphur removal module (Amine);
- Dew point control unit;
- Storage tanks for lean and rich amine and glycol;
- Produced condensate storage;
- Hydrate inhibitor (methanol) storage and injection package;
- Corrosion and/or scale inhibitor storage and injection package;

- Fire water tank;
- Metering skid;
- Flare;
- Pipe track between the well and the flare;
- Utility systems;
- Natural gas fuelled electric generator;
- Interconnecting pressure pipework and valves;
- High Integrity Pressure Protection System (HIPPS) valves and pipelines tie-in arrangement; and
- Site office.

4.7 All storage tanks, loading and unloading areas and all gas conditioning equipment will be sited on an impermeable and curbed surface with suitable drains, catchment and hydrocarbon separation equipment. A specially designed interceptor will be provided to clean rain and surface water within the site drains before leaving the Assessment Site through the soakaway.

4.8 The separation and water handling unit, amine and glycol contactors, produced liquid drum, dew point control unit, and some auxiliary equipment will be enclosed within the Gas Conditioning Building. The building will be 20mx34mx8.5m and has been designed to accord with the guidelines set out in Design Guide 5 (New Agricultural Buildings), published by NYMNPA in February 2013 (Ref. 4.1).

4.9 In addition there will be a new loading bay and impermeable hardstanding. The existing parking area for 18 vehicles at the well site entrance will remain. Within the adjacent NGN AGI, the existing neighbouring LTZ Pipe Manifold operated by NGN, the existing administration building and the existing access into the Lockton Compound will also remain in their current condition as they are located outside of the Assessment Site boundary.

Gas Conditioning/Treatment Facility

4.10 The gas conditioning/treatment process is illustrated in **Figure 4.2**. The gas, associated water and condensate will flow from the well head on the Eberston Moor – 1 well through a flow line and a line heater into the three phase inlet separator. The inlet separator and gas conditioning modules will operate at the LTZ pipeline pressure. Condensate and water from the inlet separator will be routed to their respective storage tanks prior to removal from site.

4.11 The water saturated gas from the inlet separator will flow through the amine contactor to

enable removal of hydrogen sulphide. The rich amine (containing the hydrogen sulphide removed from the gas) will be routed to the rich amine storage tank from where it will be loaded onto road tankers for transport to a remote amine regenerating plant to avoid being released into the atmosphere as sulphur dioxide inside the North York Moors National Park.

- 4.12 The still water saturated gas from the amine contactor will then flow into the Dew-Point control module for removal of excess water and condensate through contact with lean glycol and refrigeration. Lean glycol will be pumped from the lean glycol storage while the rich glycol (containing the water extracted from the gas) will be routed to the rich glycol storage tank, from where it will be loaded to a road tanker and transported to a remote glycol regeneration plant.
- 4.13 Once conditioned, the gas will be routed to the metering module where the export gas volume will be measured along with other quality parameters prior to the gas being delivered into the existing neighbouring NGN AGI pipeline connection on the Lockton Compound. At this point, it will flow into the NGN gas distribution system and will be distributed to the local gas market in the Scarborough and Whitby area.
- 4.14 Methanol will be stored in the well site storage tank and will be injected by pump immediately downstream of the wellhead and upstream of the choke valve and possibly into the gas conditioning/treatment facility to reduce the risk of corrosion and hydrate formation.
- 4.15 The Proposed Development will be monitored by a System Control and Data Acquisition (SCADA) system and safety systems will be remotely operated via a telephone or satellite link to KGS. The operation of the Proposed Development will be carried out by the KGS management. It will be able to be remotely operated with operators available at KGS to respond to alarms and to carry out routine inspection and maintenance.

Re-generation of Gas Treatment Fluids

- 4.16 The gas treatment fluids will be transported off site for regeneration.

Produced Water Disposal

- 4.17 Any water produced during the production of gas will be disposed of via a water disposal well within the well site. Planning permission has already been granted for two gas appraisal wells and it is intended that one of the wells will be used for water disposal. Therefore separate planning permission will be sought to use the existing well cellar to drill a borehole

for water disposal use, if required at a later date. The use of the borehole through the existing cellar will not be assessed further as part of this ES.

Flare

- 4.18 A flare system will be provided to assist start and stop operations and eliminate fugitive emissions. Flaring will occur when gas needs to be routed to the flare until it is of an acceptable quality before transfer into the NGN facilities.
- 4.19 The flare knock-out drum will be located inside an open pit with an area of 225 sqm so that all free liquids drain to it. A liquid level control will ensure that any liquid is maintained at a low level. Liquid (hydrocarbons) from the drum will be pumped to the produced liquid separator. Any rain water inside the open pit will be pumped to the drain system by a submersible pump.

Heights

- 4.20 **Table 4.1** provides the approximate heights of the tallest structures on the Assessment Site during operation.

Table 4.1: Approximate Heights of Structures/Buildings during Operation

Structure/Buildings	Height (m)
Inlet separator	1.8m
Gas fired heater	1.8m
Water storage tank	4.8m
Gas Conditioning Building	8.5m
Flare stack	8.5m

Access

- 4.21 Access to the Assessment Site is from the A170 via Eberston Common Lane. No unauthorised vehicles associated within the Proposed Development will use the Dalby Forest Drive. Eberston Common Lane is an unclassified road with passing places. Approximately 100m north of Givendale Head Farm, the road becomes an unimproved public highway (gravel track) as shown on **Figure 4.1**. There is already an established access using this route to Eberston Moor 'A' Well Site and the Lockton Compound.
- 4.22 A new access with a gated entrance will be created from Eberston Common Lane to enable transport tankers to enter the Lockton Compound. Vehicles will exit the Lockton Compound

via a separate gated new access. Two emergency exit gates will be located along the north western fence line of the Lockton Compound. The well site and Lockton Compound will be fenced.

Parking

- 4.23 Eighteen car parking spaces are already provided at the Eberston Moor 'A' Well Site and these would be retained and used during all phases of the Proposed Development.

Landscaping

- 4.24 The landscape strategy for the Proposed Development has been designed with particular consideration to the topography, landscape and ecological constraints and opportunities identified on the Assessment Site. Landscaping works will involve some ground modelling works associated with careful felling of woodland and the creation of new bunds surrounding the flare within the Assessment Site. Elsewhere within the Assessment Site, works will include soil preparation, tree and vegetation planting and seeding. The existing screening along the frontage with the Eberston Common Lane will be retained and enhanced where possible, with the exception of a small number of trees and a section of hedgerow which will be lost to create the two new entry points into the Assessment Site. A distance of 5m radius from the flare will need to be cleared of vegetation to mitigate fire risk.

Sustainable Drainage Measures

- 4.25 Sustainable Drainage Systems (SuDS) will be used to reduce flood risk, improve water quality, assist groundwater recharge whilst also providing amenity and wildlife benefits.
- 4.26 The existing drainage system at Eberston Moor 'A' Well Site and Lockton Compound will be upgraded to ensure that the Assessment Site is capable of safely containing, separating and disposing of both rainwater and any fluid spills from the tanks and piping. A closed drain system will recover and store any liquids drained from the process equipment, which will be disposed of in an approved manner. Surface water site drains will be sent to a receiving interceptor and then routed to a clean water discharge point. See Chapter 12 for more details.

Utilities

- 4.27 The Proposed Development will connect into the existing telephone network in close proximity to the Assessment Site, with new infrastructure installed beneath roads, and verges wherever possible. Electric power will be generated on site by a natural gas fuelled engine driven generator. Use of natural gas as fuel instead of diesel for power generation reduces the carbon footprint of the Proposed Development. Natural gas will also be used to fuel a 200kw heater to keep the gas from forming hydrates in the plant inlet.

Lighting

- 4.28 The facility will not be lit at night except in emergencies or for urgent maintenance. During the winter months, it will be necessary for part of the Assessment Site to be lit during late afternoon and early evening when deliveries and loading takes place for health and safety reasons. A lighting assessment is provided in Chapter 8 and its accompanying **Appendix 8.6**.

Waste Management

- 4.29 The Proposed 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 storage and collection will be provided within the Proposed Development as required by NYMNPAs.

The scaling of this drawing cannot be assured

Revision	Date	Dwn	Ckd
A	04.06.13	SJ/RP	NC
B	14.06.13	SJ/RP	NC
C	18.06.13	SJ/RP	NC
D	20.06.13	SJ/RP	NC
E	27.06.13	SJ/RP	NC
F	03.07.13	SJ/RP	NC
G	05.07.13	SJ/RP	NC
H	10.07.13	SJ/RP	NC

LEGEND

- SITE BOUNDARY
21,604 sqm (approx) (New development within 'green' area : 13,198 sqm [1.3 Ha])
- EXISTING FENCE
- PROPOSED FENCE
- Existing Planting to be Retained
- Proposed Canopy Tree
- Proposed Whip and Transplant Planting
- Proposed Grassland mix

Note: Drawing to be read in conjunction with Landscape Strategy Plan : 19819/L207

- 1 Indicative Gas Well
- 2 Indicative Water Disposal Well
- 3 Drainage Interceptor Pit
- 4 Drainage Soakaway
- 5 Site Office
- 6 Gas Conditioning Building (20m x 34m x 8.5 m); Separation and Water Handling Unit, Amine and Glycol Contactors, Auxiliary Equipment, Produced Liquid Drum, Dew Point Control Unit, Pig Launcher.
- 7 Fire Water Tank: 50 Cubic Meters
- 8 Pipeline Pig Trap Area
- 9 Lean Rich Amine and Glycol Storage
- 10 Metering Skid (10m x 5m)
- 11 Indicative existing LTZ Pipe Manifold
- 12 Indicative existing NGN Building
- 13 Flare (footprint 225 sqm)
- 14 Loading Area
- 15 Water Separator Building
- 16 Gas Fired Heater
- 17 Water Storage Tank
- 18 Gas Generator

Figure 4.1

Project
EBBERSTON EDS

Drawing Title
PROPOSED SITE LAYOUT

Date	Scale	Drawn by	Check by
June 2013	1:500@A1	SJ/RP	NC
Project No	Drawing No	Revision	
19819	P_12	H	

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Proposed new bund to flare. NOTE: 706 m³ to be displaced to form new bund.

Existing gravel surface

Existing bund reprofiled

Proposed gravel surface to match existing
Proposed concrete surface

Proposed gravel surface to match existing

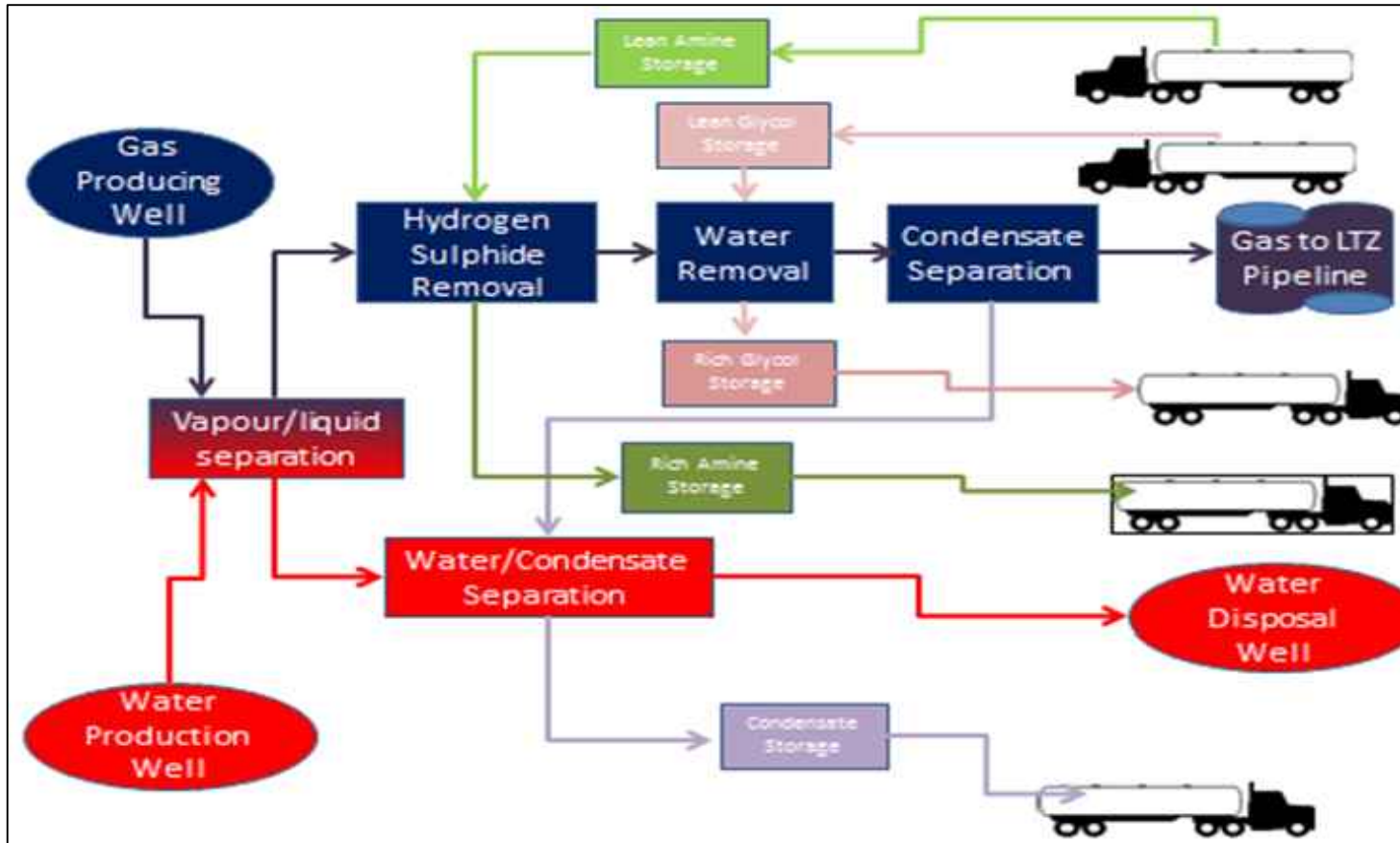


Figure 4.2

Project
 Eberston Moor EDS,
 North Yorkshire

Drawing Title
 Flow Diagram

Date 03.07.2013	Scale N.T.S.	Drawn by ML	Check by MC
Project No 19819	Drawing No E009	Revision A	



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