

Tinker Lane 1 Exploratory Well, Retford Road, between Blyth and
Barnby Moor, Nottinghamshire

Planning Supporting Statement



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1.0 INTRODUCTION

This document comprises the Planning Supporting Statement (PSS) on behalf of Dart Energy (East England) Limited, a subsidiary of IGas Energy plc, ('the Applicant') for the development of an exploratory well site at Tinker Lane on the Retford Road between Blyth and Barnby Moor.

The planning application has been made to Nottinghamshire County Council (as mineral planning authority).

1.1 Planning Application

The planning application is for permission to drill a single exploration well and three sets of monitoring boreholes, which would contain up to three boreholes in each set, to sample groundwater and ground gas.

The applicant, having regard to Schedule 3 of the EIA regulations, considers that no EIA is required, however, given that this is one of the first shale exploration well proposals in the area, the application is accompanied by a voluntary environmental statement (ES). The ES describes the findings of an environmental impact assessment (EIA) exercise which was carried out by an independent environmental consultant.

The exploratory well, to be known as Tinker Lane 1, would be a vertical multi core well, drilled to a maximum depth of 3,300 metres, which target the Namurian and Dinantian geological series and would recover samples from, and to measure the properties of, the Bowland Shale and Millstone Grit group geological formations that underlie the site. These strata are exposed at surface in the Peak District to the west of the site but in Nottinghamshire become buried to a significant depth by younger strata. The monitoring boreholes would target the Nottingham Castle Sandstone formation and any isolated shallow sandstone formations that may be present.

The exploratory well would be drilled through all of the coal and shale formations with core samples taken at multiple intervals whilst drilling. Hydraulic fracturing of the well is not being applied for under this application on either the coal or shale targets.

The drilling rigs currently under consideration to be used are the Bolden 92 (BDF Rig 92), which has a maximum height of 60m, or shorter rigs such as the Deutag Bentec T 208, the Bentec T-49, and the PR Marriot Drillmec HH220 (Rig 50) or a drilling rig of equal or improved technical, visual and acoustic performance. All the rigs considered can be accommodated within the proposed wellsite and would occupy a similar footprint.

Depending on the core analyses, electronic logging results and geological modelling, the well would either be plugged (to surface) and abandoned (in accordance with OGUK guidelines and regulatory requirements) and the site restored back to its current agricultural use.

If positive results from core analysis and geophysical logging are received a new planning application would be submitted for either:

- a) a new horizontal well (a new well on the same site keeping the original vertical well for monitoring purposes) to target the most prospective geological horizons and extended well testing (which may include hydraulic fracturing); or
- b) a well completion and well testing operation (which may include hydraulic fracturing) on the existing vertical well by means of well re-entry.

Following the exploration and testing phases (either a or b) and dependent on results, the site would be restored back to its current agricultural use or a further planning permission would be sought for hydrocarbon production.

Any such future planning application would be the subject of a full public information and consultation exercise and the application would be subject to the EIA Regulations.

2.0 THE SITE

2.1 Introduction

This section of the PSS provides a description of the site, in terms of physical features, topography and land use. The existing security cabins that are currently on site would be retained through the construction phase of the proposed development and then removed.

2.2 Location

The site is located in the Bassetlaw District area of Nottinghamshire, on the Retford Road (A634) between Blyth and Barnby Moor. The site is located on agricultural land with direct access on to the public highway, see Drawing TL1.

The Application Site is approximately 2.2ha in size.

For identification purposes, the proposed site is centred in National Grid Reference (NGR) 465032 (easting) 385344 (northing) and shown edged in red on Drawing TL2.

2.3 Site Description

The Application Site is currently in agricultural use and is surrounded by farmland to the north, west and south with the A634 forming the eastern boundary. It is located approximately 2.6km south-east of the outskirts of Blyth and 1.5km north-west of the outskirts of Barnby Moor. The edge of the village of Torworth is located approximately 1.4km to the north-east of the site.

The Application Site is located at an elevation of between 25-30m AOD. The broader topographical context is gently undulating associated with the basin of the River Idle at over 5km to the east and 4.5km to the south-east, and its tributary, the River Ryton at approximately 2.5km to the north-west and 2.5km to the west.

The nearest residential properties to the Application Site are Jubilee Farm, 670m to the north and Beech Farm, 630m to the west. To the east, the nearest property is College Farm at 900m and, to the north east, Billy Button Cottage is at a distance of 690m from the Application Site boundary.

There are footpaths and bridleways to the north, west and south of the Application Site, but the site itself has no rights of way across it or adjacent to it, see Drawing TL/1.

2.4 Land Use

2.4.1 Land Use

The Application Site is currently in agricultural use and is subject to an entry level environmental stewardship (ELS) agreement.

The Agricultural Land Classification is a mix of Grades 3a and 3b.

3.0 PROPOSED DEVELOPMENT

3.1 Introduction

The exploratory well would be a vertical multi-core well to target the Bowland Shale and Millstone Grit geological formations. In addition, three sets (with each set containing up to 3 boreholes) of monitoring boreholes would be installed to sample and monitor groundwater and ground gas during the drilling of the exploration well.

The proposed development would involve permission for the security cabins already on the site, together with the construction work associated with the development of the well site, the drilling and evaluation of the well and monitoring boreholes and then the decommissioning and restoration of the site back to agricultural use.

The development would be for a three year period from the commencement of site construction and, as such, only a temporary permission is being sought.

3.2 Phases of the Development

3.2.1 Construction

The construction phase of the proposed development would be operational during day time only between the hours of 0700 to 1900 hours Monday to Friday and 0700 to 1300 on Saturday. This phase of the development would take approximately three months to complete and would also include the retention of the existing security cabins that are on site for the duration of this period, see Drawing TL3/01.

Prior to the commencement of construction of the wellsite the proposed monitoring boreholes would be drilled to a depth of up to fifty metres, see Drawing TL3/03A. The drilling equipment used to construct these boreholes would be mounted on a heavy duty commercial 4x4 truck and would be a day time operation only, lasting up to 4 weeks.

The construction activity during this phase of operation would generate a maximum daily average of 56 vehicle movements per day (28 in and 28 out) of which 36 are likely to be HGVs and 20 light vehicles such as cars and vans.

Approximately 20 to 25 people would be employed during this phase of development.

The wellsite construction process would consist of the following, as shown on Drawings TL3/03A and 04:

- formation of a new site access;
- erection of new gates, security fencing and closed circuit television (CCTV) cameras;
- stripping and storage of top soil and formation of on-site bunds which would be put to grass and maintained for the life of the development;
- creation of a wellsite platform using impermeable geotextile membrane layers covered by a layer of aggregate hardstanding;
- the installation of a wellhead cellar with associated steel conductors (the development will incorporate two cellars, though only one well is applied for and will be drilled. The spare well cellar is a backup and is simply a contingency measure.);
- installation of bunded storage areas for chemicals and a surface water attenuation tank for surface water management; and
- staff welfare accommodation and on site vehicle parking.

3.2.2 Drilling

Drilling activity for the exploratory well would be a 24 hour, seven day a week process and would last for approximately four months including the installation and removal of the drilling rig. The exploratory well would be a single vertical well drilled to a maximum depth of 3,300 metres.

The delivery of the drilling rig, taking place over a two week period prior to drilling, would generate average daily HGV movements of 26 per day (13 in and 13 out), approximately 16 of which would be oversize vehicles. Light vehicle movements over this period would average to an approximate total of 20 per day (10 in and 10 out). The removal of the drill rig following the completion of drilling would take place over a two week period and would generate average daily HGV movements of 26 per day (13 in and 13 out), approximately 16 of which would be oversize vehicles. Light vehicle movements over this period would average to an approximate total of 20 per day (10 in and 10 out).

During the drilling phase, HGV movements would average 12 per day (6 in and 6 out) and light vehicle movements would be around 40 per day (20 in and 20 out).

Employment in this phase would increase to approximately 25-30 jobs with the site being operated in shifts to maintain the 24 hour drilling programme for the exploratory well.

Equipment required on site for the exploratory well would as shown on Drawings TL3/05A and 06B include:

- Drilling rig and ancillary equipment;
- Containerised diesel power generators;
- Pumps & storage tanks for diesel, water, drilling mud and cuttings;
- Drill casing storage area and pipe rack;
- Ancillary equipment and materials; and
- Staff welfare facilities, offices, workshop, stores and parking.

During the drilling phase, the proposed development would require artificial lighting for operational and security purposes as drilling operations would be undertaken 24 hours a day for a 4 month period. A lighting plan is shown in TL3/07A. Lighting would be kept to a minimum to ensure the safety of site personnel and operation of key equipment and would be designed to be highly targeted within the operational area which is enclosed by fencing and bunds. Artificial lighting would be contained within the site and that light spill and indirect illumination of boundary hedgerows would be largely avoided.

In respect to pollution control, the design of the well would engage best available techniques (BAT) and would provide sufficient barriers (steel and cement) between the well and groundwater, to reduce any such risk to as low as reasonably practicable (ALARP). The well design and drilling programme would be submitted to an independent well examiner for review. That examiner must be 'independent' and 'competent' as defined by Oil & Gas UK industry guidance. Any concerns that the examiner may have would be discussed, remedied and agreed between the operator and the well examiner. Following well examination the design and programme would be submitted to the Health & Safety Executive (HSE) under a 21-day notification regulatory requirement. The Health & Safety Executive (HSE) would review and comment if they have any concerns. Well consent is acquired from the Oil & Gas Authority (OGA). Following this, well operations can commence. The above is in line with the Borehole Sites and Operations Regulations 1995 and the Offshore Installations and Wells (Design and Construction, etc) Regulations 1996.

Two types of drilling mud would be used, as follows:

- Water based mud (WBM); and

- Low toxicity oil based mud (LTOBM).

WBM would be used for drilling through the Sherwood Sandstone formation, which is classified as a principal aquifer, and to below the Zechstein Group/Magnesian Limestone. For deeper sections of the well where additional lubrication and clay inhibition is required the LTOBM would be used. The drilling muds would also require the approval of the Environment Agency (EA) through the environmental permitting process prior to their use on site.

The anticipated vertical geological section for the exploratory well is as follows:

- Sherwood Sandstone;
- Zechstein Group;
- Magnesian Limestone;
- Westphalian Coal Measures;
- Millstone Grit;
- Bowland Shale; and
- Carboniferous Limestone.

The exploratory well has two main targets:

- Primary target : Bowland Shale (expected to be c. 70m thick); and
- Secondary target: Millstone Grit Group shales and tight sands (expected to be c. 300m thick).

The well has been designed to obtain logs and core. This would enable an understanding of the geological sequence beneath the site to be obtained. Logging is the physical measurement of subsurface properties by lowering specialist tools down the wellbore. Coring is the collection of rock samples from the wellbore. These would then be analysed at the surface in order to understand the small scale properties of the rocks.

One component of the logging programme is a Vertical Seismic Profiling (VSP). This would be carried out under permitted development rights and would involve the use of one vibrator vehicle which will operate for a short period of time (a few hours or less operating in periods lasting a few seconds each), in order to obtain more information about the geological profile of the area.

It is also proposed to carry out a Pressure Determination Test (PDT) at the end of the drilling period in order to test the strength of the rock formation and determine the in-situ pressure. This would involve the running of a perforating device down the well to make approximately 10 holes in the well casing in the area of interest. Fresh water injection, totalling approximately three cubic metres, would be performed at a low rate for a short duration, (typically one to two hours) in order to create a 'pressure pulse'. Down hole memory gauges are used to record pressure. These memory gauges would be left in place for up to 20 days to record pressure data and are then retrieved and analysed. The perforations are then isolated and /or plugged. The casing string would be fully cemented above and below the perforations. The only communication between the well and the formation is via the perforation. As such well integrity is not compromised.

The well would be designed and constructed to comply with the following guidance and regulations:

- The Boreholes Sites and Operations Regulations 1995 (SI 1995/2008)
- The Offshore Installations and Wells (Design and Construction, etc.) Regulations 1996, (SI 1996/2008);
- OG UK Well Life Cycle Integrity Guidelines, Issue 3, March 2016;

- UK Onshore Shale Gas Well Guidelines Exploration and Appraisal Phase Issue 3, UKOOG, March 2015;
- OGUK Guidelines for the Abandonment of Wells, Issue 5, July 2015;
- Guidelines on Qualification of Materials for the Abandonment of Wells, Issue 2, October 2015; and
- API standards (where applicable).

It is not commercially possible at this stage in the project to state exactly which drilling rig would be used as this would be subject to planning permission being granted and rig market availability at that time. The drilling rigs currently under consideration to be used are the Bolden 92 (BDF Rig 92), which has a maximum height of approx. 60m, or shorter rigs such as the Deutag Bentec T 208, the Bentec T-49, and the PR Marriot Drillmec HH220 (Rig 50) or a drilling rig of equal or improved technical, visual and acoustic performance. All the rigs considered can be accommodated within the proposed wellsite and would occupy a similar footprint.

For assessment purposes it is therefore proposed that the Landscape and Visual, Lighting and Cultural Heritage assessments consider the worst case scenario, which in this case would be the tallest drilling rig, which is the Bolden 92. Drawings TL3/05 and 06 are therefore based on the Bolden 92 rig

In respect of noise, the assessment considers a number of potential drilling rigs and the assessment of impacts and mitigation for this development is based on the one with the highest noise levels, the Bentec T-49.

3.2.3 Evaluation

Following the removal of the drill rig, the evaluation period could last up to two years and during this stage the well would be suspended and maintained in accordance with industry best available technique and all above ground equipment would be removed from the site apart from the wellhead, site offices and security fencing, as shown in Drawings TL3/10A and 11.

Traffic movements would be minimal during this period with mostly light traffic generated by monitoring and security visits. There would be no night time activities or lighting required.

The collection of data from the monitoring boreholes would continue through this period.

The well would be monitored in accordance with IGas procedures, namely Well Design and Operation Standard: Part 2 – Production Wells. This procedure has been reviewed by an independent well examiner.

3.2.4 Decommissioning and Restoration

In the event that the results of the exploration work indicates that further development of the site is not viable, the exploratory well would be plugged and capped (using steel plugs and cement) and the wellhead removed in accordance with industry best available technique including the OGUK Guidelines for the Abandonment of Wells Issue 5, 2015. In respect of the monitoring boreholes, the headworks and the uppermost 0.5m of casing would be removed from each borehole and the boreholes plugged and capped in accordance with EA guidelines.

All construction materials (aggregates, reinforced concrete, the geotextile membranes), services below the geotextile membranes and remaining on-site infrastructure (site offices,

security and fencing / gates) would be removed from the site to be reused, recycled or disposed of at a suitably permitted waste disposal facility. The stockpiled topsoil would be replaced and the site would be restored back to its previous agricultural use, see Drawing TL3/12A.

Operating hours would be a day time only operation (07:00 to 19:00hrs Monday to Friday and 07:00 to 13:00hrs on Saturdays) and would take approximately eight weeks to complete. Maximum traffic movements would be 56 vehicle movements each day (28 in and 28 out) 36 of which would be classed as Heavy Goods Vehicle (HGV).

Following restoration, the restored land would be subject to a five year aftercare period to ensure the site was returned to full agricultural productivity.

3.3 Additional Details

3.3.1 Lighting

A detailed lighting plan has been prepared, see Drawing TL3/07A, which includes details of the operational and general/security lighting that is required for the safe operation of the site. 24 hour lighting at the site would only be required during the drilling phase.

Lighting units proposed include:

- Horizontal fluorescent strip lights mounted on the drilling rig;
- Victor Titan lights mounted on the drilling rig;
- Freestanding 3m high fluorescent lighting units facing into the site to illuminate the drilling area;
- 5m high pole lighting at the site access;
- Low level bollard lighting on the internal site roads;
- Security lighting mounted on the site cabins; and
- A low intensity light on top of the derrick as per Civil Aviation Authority guidance.

3.3.2 Fencing

Drawing TL3/09A provides details of the proposed site fencing which would include:

- 2m high heras fencing on the outer perimeter of the site;
- 2.5m high site hoarding located just inside the heras fencing;
- 3m high weld mesh fencing and gate provided at the site access; and
- Sections of 2m high hoarding located within the perimeter of the site.

All fencing would be coloured dark green.

3.3.3 Drainage

A site drainage plan is provided, see Drawing TL3/08A. This would include a perimeter French drain around the boundary of the wellsite platform to capture all surface water run off, which would drain to a 45,000 litre below ground attenuation tank. The capacity of the tank would be maintained by regular emptying by vacuum tanker with the water being taken off site to a waste water treatment plant for treatment/disposal.

3.3.4 Materials and Waste Management

All materials required for the construction and operation of the site would be imported by road and this has been allowed for within the daily traffic movements set out above.

Topsoil would be stripped and stored on site to be used in the restoration of the site.

Spoil arising from the construction of the well cellar and attenuation tank would be stored on site. Drill cuttings produced during the Drilling phase (subject to final well design and to be governed by the Mining Waste Permit for the site, but expected to be approximately 1200 cubic metres) would be temporarily stored in containers within the sealed section of the site (within the wellsite). Drill cuttings would be removed from site weekly to a suitably permitted waste disposal/treatment facility. Any waste water / fluids from the drilling process would be stored as required within the wellsite area and would be removed periodically by tanker to a suitably permitted waste water treatment works.

All sewage/waste would be collected in a tank and taken off site to a licensed waste disposal / treatment facility. Skips would be provided for the segregation, collection and containment of non-hazardous solid waste e.g. packaging waste.

3.3.5 Utilities

Electrical power would be provided by on site diesel generators which would be containerised to reduce noise emissions.

Water would be provided by tanker and foul water would be disposed off site by tanker. There would be no recycling of water on site.

3.3.6 Management and Operational Procedures

The management and operational procedures that would be used to prevent or reduce impacts are as follows:

- IGas has an Integrated Management System Manual which sets out the standards and procedures to which IGas is committed to uphold at all sites, see Appendix 3-1 of the ES.
- The Applicant will prepare a site monitoring plan (for the monitoring of groundwater and ground gas) which will state monitoring locations, analytical suite, sampling method and frequencies, set triggers and warnings for concentrations all to be agreed and approved by the EA and Nottinghamshire County Council.
- The Applicant would undertake all statutory reporting obligations for the Proposed Development, including data collection and reporting to DECC, EA, HSE and the BGS.
- A Construction and Environmental Management Plan (CEMP) that considers accidental pollution would be prepared and agreed with key statutory stakeholders prior to any construction at site.

Diesel tanks on site would have secondary containment which in addition to the sealed wellsite would ensure that any spillages would be contained within the wellsite. Spill kits would be available and staff would be trained to use them. An emergency spillage plan would form part of the proposed CEMP.

Tool box talks would form part of the site operations and would be used to ensure that all staff present on site were fully aware of the potential impacts associated with proposed operations and procedures to be followed should an accidental pollution event occur.

The Site Health and Safety document would set out the approach to safely manage and regain control of an emergency situation and would include the following details:

- Point of contact and liaison with the emergency services

- Escape and rescue plan
- Fire protection plan ;
- Emergency warnings and evacuation procedure, including a pre-defined exclusion zone;
- Management of access and traffic to ensure emergency services can gain access to the incident; and
- Provision of medical assistance.

4.0 POTENTIAL ENVIRONMENTAL EFFECTS AND PROPOSED MITIGATION

4.1 Introduction

The potential environmental effects of the proposed development have been rigorously assessed in the Environmental Statement that accompanies this planning application. The sections below identify the significance of any impacts that have been identified and the mitigation that is proposed to minimise those impacts.

4.2 Designed-In Mitigation

Designed-in mitigation measures are those that are built into the design of a project to avoid, reduce or mitigate any adverse impacts.

Designed in mitigation measures for the proposed development are as follows:

- Wellsite design – this includes the placing of a geotextile membrane, an impermeable Bentomat lining and a further geotextile membrane which is then covered by aggregate to form the working wellsite platform. This design forms an impermeable working area which removes the direct pathway between the on-site activities and potential soil and water receptors. This working area would then be surrounded by a perimeter French drain which would capture all surface water runoff and direct it to the underground attenuation tank. All construction work would be subject to quality assurance procedures;
- Well integrity – the well design programme would comply with current regulations and industry best available technique and would be reviewed by an independent well examiner and the HSE. It is proposed that:
 - Steel casing would be used to construct the well. This is cemented in the well in stages to protect groundwater, isolate between pressure regimes and maintain well integrity;
 - All casing strings would be pressure tested during installation to confirm full integrity and the results would be recorded and maintained;
 - A WBM would be used when the well is being drilled through the Sherwood Sandstone strata, the Zechstein Group strata and the Magnesian Limestone strata;
 - After adequate isolation by casing and cement grout (which would be agreed with the EA) a low toxicity oil based drilling mud would be used to drill through the deposits below the Magnesian Limestone. The composition of the mud would also be agreed with the EA prior to use;
 - In accordance with common industry practice, best available technique (BAT) and to reduce risk of unplanned escape of well fluids to as low as reasonably practicable (ALARP) a suitably pressure rated wellhead would be installed on the well within the well cellar. The pressure rated wellhead would be installed on the surface, intermediate and production casing strings during well construction. The wellhead would remain on the well for its full lifecycle duration. During drilling operations a blow-out preventer would be installed for drilling sections below the Sherwood sandstone to provide secondary well control. Primary well control is by means of hydrostatic mud column.
- Well abandonment – to ensure the well does not provide a pathway for contaminants in the future, abandonment would be undertaken in accordance with industry best available technique as approved by the regulators.

- Materials storage – all fuel and chemical containers would have secondary containment and be stored on the lined wellsite with spill kits provided.

4.3 Traffic

A detailed audit of the local highway network has been undertaken. It is concluded that the Application Site is located with good links to the principal road network via the A1/A1(M).

The Application Site will generate a reasonably low number of vehicles across a temporary period. During the determined 'worst case' period the Application Site would generate a maximum average of 5 vehicle movements per hour across a twelve hour day. This level of vehicles is well below the threshold at which the Local Highway Authority would usually seek a Transport Assessment which is 30 two-way peak hour movements, which constitutes a significant impact.

Accident data has been considered in detail and it has been determined that there are no incident patterns that could be attributed to poor highway design. It has been determined, therefore, that the Application Site does not have any kind of detrimental effect in terms of road safety.

A review of the proposed vehicle types has determined that all vehicles can route via Blyth and avoid any surrounding villages which may not have the required standard of highway to accommodate HGVs.

The proposed site access is deemed suitable for the application proposals with adequate junction visibility splays. A swept-path analysis has also been undertaken to demonstrate that all of the required vehicles can be accommodated at the proposed site access.

Mitigation measures are proposed to further minimise the low level of impact that may be caused by HGV traffic generated by the application proposals.

In view of the above, the Application Site does not result in an unacceptable impact on road or junction capacity, driver delay, road safety or amenity; by virtue of this, the application proposal is acceptable in traffic and transport terms.

4.3.1 Proposed Mitigation

Mitigation measures are proposed to facilitate safe access to the site, whilst also offsetting the potential impact caused by additional HGV traffic on the surrounding road network:

- HGVs will be restricted to the A634 and B6045 where they will gain access to the A1 at Blyth;
- No HGV movements between the hours of 0800-0900hrs and 1515-1615hrs when school transport activity is present;
- ensure that good visibility is maintained at the proposed site access junction i.e. any trees/hedges trimmed;
- ensure that all loose material transported to/from the site is suitably covered and that HGVs are not overloaded, to minimise the impact of dust resulting from material transport;
- the induction of drivers of all HGV traffic accessing the development, highlighting safety issues and ensuring they follow agreed access routes to and from the site; and
- a road sign informing drivers of the site access location and the nature of its operation (to be designed and agreed with the Local Highways Authority).

4.4 Air Quality

Impacts on air quality from the onsite power generation plant have been assessed in addition to emissions from road vehicles and construction dust.

A qualitative assessment of the potential dust impacts for the proposed development has been undertaken. Through good practice and implementation of appropriate mitigation measures, the release of dust during construction and operation, would be effectively controlled and mitigated.

Road vehicle movements associated with the proposed development will generate emissions of pollutants and the potential air quality impacts associated with development traffic were quantified using the ADMS Roads dispersion model with NO₂ concentrations verified using monitoring data from the development locale. The assessment determined that the proposed development would result in an 'imperceptible' or 'small' contribution to NO₂ concentrations at receptors located in the centre of Blyth and that the overall effects can be classified as 'negligible'.

The emissions of combustion pollutants from the onsite power generation plant were quantified based on manufacturer's data relating to flow and pollutant concentrations. The impact of these emissions on sensitive receptor locations (human and ecological) were assessed using atmospheric dispersion modelling tools in accordance with EA guidance. To ensure a worst-case assessment was undertaken, the model assumed that all onsite power generation plant was operational for an entire year; in reality the drill rig generators will only be operational for approximately 4 months and therefore, as per EA guidance, it can be assumed that actual long-term impacts will be approximately a factor of three lower (i.e. <35%) than the predicted values..

The predicted impacts of combustion pollutants from the onsite power generation plant did not result in any predicted exceedance of the relevant AQO at sensitive residential properties. However, in order to reduce the impact, particularly of NO_x and NO₂ which were classified as 'slight adverse', the Applicant has identified additional abatement measures, which are outlined in section 4.4.1 below.

4.4.1 Proposed Mitigation

Dust mitigation measures that will be employed onsite during the construction, drilling and restoration of the site to reduce the risk of dust impact are presented below in Table 4-1.

Table 4-1
Summary of Construction Dust Control Measures

Activity	Dust Control Measure
General Measures	Develop and implement a stakeholder communications plan that includes community engagements before work commences onsite
	Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary and head office contact details
	Undertake regular site inspections to monitor dust. Record all complaints and exceptional incidences and take appropriate action to minimise emissions
	Record all dust and air quality complaints, identify causes, and take appropriate measures. Make the complaints log available to the local authority.
	Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles onsite.
	Spillages should be cleaned as soon as possible and not allowed to

	dry out.
Earthworks	Stabilise soil bund as soon as practicable; by profiling and seeding.
	Locate stockpiles taking into account the direction of the prevailing wind from the south west.
	Minimise drop heights
	Avoid removal of topsoil and subsoil during adverse weather conditions
Construction	Ensure sand and other aggregates are stored in bunded areas and not allowed to dry out where possible
	For smaller supplies of fine powder materials ensure bags are sealed after use and stored appropriately to prevent dust.
	Only use cutting, grinding or sawing equipment in conjunction with dust suppression techniques such as water sprays or local extraction
Decommissioning and Restoration	Ensure effective water suppression (water bowser) is used during demolition operations.
Track Out	All vehicles to switch off engines; no idling vehicles
	Ensure adequate water supply for effective dust mitigation
	Ensure vehicles entering and leaving the site are covered to prevent escape of materials during transport loads
	Access, local roads and haul road to be cleaned using water assisted dust sweeper or similar
	Minimise movement of traffic around site where possible
	Fixed speed limits around the site to 15mph
	Inspect hardstanding for integrity and instigate necessary repairs to the surface as soon as reasonably practicable and record in site log book

Whilst the 'unmitigated' impact of combustion emissions from the onsite power generation units do not exceed the Air Quality Objective's at relevant receptor locations, in order to reduce the impact, particularly of NO_x and NO₂, the Applicant has identified additional abatement measures.

Specifically the Applicant is proposing that additional abatement will be provided to the onsite power generators in line with the requirements of Stage IV of the NRMM regulations. This abatement plant will reduce NO_x emissions by 80% and as a consequence reduce PM emissions by 40%, CO emissions by 90% and unburnt hydrocarbon emissions by 70%.

The predicted impacts of the mitigated combustion pollutants from the onsite power generation plant are significantly reduced and the effect classified as 'negligible' and not significant.

Therefore the conclusion of the air quality assessment is that the proposed development is acceptable in air quality terms.

4.5 Noise and Vibration

Noise

Noise from construction traffic will lead to an extremely small temporary increase in traffic noise which is likely to be barely noticeable and is therefore not considered a significant impact.

Noise from construction and remediation of the site compound will be below the criteria for a significant impact contained in BS 5228, even if it is assumed as a very worst case that all plant will operate at the same time for 100% of the time, which is extremely unlikely. In reality, noise levels will be significantly less than predicted in the noise assessment for the majority of the construction period.

No increase in ambient noise is expected during the daytime due to drilling. Noise from drilling will be well below the noise standards contained in national guidance for minerals extraction sites (which includes oil and gas extraction in its definition of minerals extraction sites). The predicted residual noise level from drilling is below the WHO guideline limits for onset of sleep disturbance effects. There will be no noticeable change in noise levels at locations where baseline noise levels already exceed the WHO noise criteria for onset of sleep disturbance.

Therefore the conclusion of the noise assessment is that the proposed development is acceptable in noise terms

Vibration

There are no anticipated impacts that will arise due to ground borne vibration resulting directly from the drilling operations. The drills are rotary bored only and therefore impart relatively small amounts of energy into the ground, for example compared to percussive pilling techniques. Data available for continuous flight augers suggests that ground borne vibration would be imperceptible at distances of around 20 metres. Vibration levels from the drilling operations are not expected to be significantly different in magnitude. Consequently, at the nearest receptors which are approx 710 metres from the rig, ground borne vibration would be considerably lower and certainly not perceptible.

Vertical Seismic Profiling (VSP), carried out under Permitted Development Rights, is likely to utilise one vibrator vehicle which will operate for a short period of time (a few hours or less operating in periods lasting a few seconds each). It is understood that any VSP operations will take place within the confines of the site perimeter. Consequently, the vibration vehicles will be several hundred meters from the nearest residential premises.

According to BS 5228-2:2009+A1:2014, vibration will be just perceptible when levels exceed 0.3 mm/s and complaints may occur at levels of 1 mm/s or more. It is estimated that the PPV level at 500 m from one unit will be less than 0.3 mm/s. Consequently, it can be concluded that vibration due to VSP will not be perceptible at the nearest properties to the Application Site.

Therefore the conclusion of the vibration assessment is that the proposed development is not significant in vibration terms.

4.5.1 Proposed Mitigation

The noise assessment has shown that noise from the noisiest of the candidate rigs with factory fitted mitigation will be of minor significance and well within the limits set by the PPG for minerals extraction, which are:

- Daytime and evening (07.00 – 22.00) - 55 dB $L_{Aeq,1h}$ (free-field);
- Night-time (22.00 – 07.00) - 42 dB $L_{Aeq,1h}$ (free-field).

Therefore it is concluded that additional mitigation measures are not required.

No mitigation is considered necessary in respect of vibration.

4.6 Geology and Water Environment

This assessment has considered the likely significance of effects of the proposed development during establishment, drilling and evaluation, and decommissioning and restoration on geology and the water environment (hydrology and hydrogeology).

The assessment, which has included a detailed site walkover survey and a detailed review of the existing site conditions, has concluded that the proposed development has no significant effects following the adoption of good practice measures and regulatory best practice.

The assessment has shown that the proposed development would not impair the wholesomeness of groundwater or surface water, effect water abstractions, recreational users or ecological habitats dependent on ground or surface water, nor effect designated ecological sites near to the Application Site.

Therefore the conclusion of the geology and water assessment is that the proposed development is acceptable in geological and water terms.

4.6.1 Proposed Mitigation

No additional mitigation to that proposed in section 4.2 is required.

4.7 Ecology

Detailed assessments of the potential for indirect effects on statutory and non-statutory wildlife sites have been undertaken and have concluded that subject to the implementation of appropriate avoidance, control and mitigation measures no significant adverse impacts are predicted to occur.

The Application Site comprises of part of an intensively managed arable field bordered by species-poor hedgerows. As such, it does not support undesignated habitats of high conservation value (e.g. ancient woodland) and none are present nearby. An appraisal of the Application Site undertaken by qualified ecologists has concluded that the arable habitats which occur are ubiquitous and man-made in character.

The potential for protected species to occur within or near to the Application Site has been assessed as being very low. A specific survey undertaken for reptiles was negative.

The application proposes measures to protect and buffer boundary hedgerows and margins from direct damage through the use of a 2.5m high hoarding, which would also ensure that indirect effects including light spill, noise and visual disturbance are avoided. The localised removal of very small amounts of structured vegetation to improve the existing site access would be undertaken outside of the bird nesting season or be preceded by a check by an appropriately qualified ecologist.

The assessment concludes that no significant residual effects on Valued Ecological Receptors (VER's) are predicted and that the proposed development is acceptable in ecological terms.

4.7.1 Proposed Mitigation

Arable Field Margins are to be retained and managed in accordance with an ELS agreement.

If the removal of vegetation is required during the nesting season (March to August inclusive) then a prior check should be made by an experienced ecologist. If nests are recorded then works would need to cease until such time as nesting activity has ceased and any young have fledged.

No mitigation measures for protected species are required as none would be impacted on.

4.8 Landscape and Visual

The landscape effects upon the existing large-scale, rolling arable field and adjacent roadside verge of the Application Site during the short-term operational phases include:

- moderate and adverse physical changes to landscape elements and features associated with site clearance and preparation of the hardstanding and access, followed by installation and removal of various structures (rig, tanks, generators, cabins, etc); and
- moderate and adverse changes to aesthetic and perceptual aspects relating to the reduction in scale, increase in enclosure and diversity, with a more organised pattern of the site layout with vertical forms and new colours and reduction of tranquillity.

However, the effects upon overall character and key characteristics of this part of “Sherwood” (both “Sandstone Estatelands” and/or “Policy Zone 40: Babworth”) will be slight as the published character area is relatively large in comparison to the Application Site and the scale of change is limited.

The visibility of the Application Site is influenced at a local level by the rolling topography and screening effects of vegetation in the surrounding area, in particular along roadsides and around properties.

The drill rig will be the most visible feature, appearing as a relatively narrow and tall industrial element, often adjacent to the existing overhead powerlines that pass close by the western boundary of the site, and a small part of a broader horizontal skyline. The lower parts of the development (for example the perimeter fencing or tanks) will typically be much less visible, being confined principally to a 1-2km section of the A634 which passes by the site. At other locations, the lower parts of the development will be screened and/or set down on the horizon and/or backgrounded.

The short duration of time that the development may be visible also limits the overall effects, with the rig being limited to four months and then the perimeter fencing, gates and soil bund, etc during construction, drilling and then the evaluation period still being less than three years. After final restoration there will be no change to views.

Although there are several sensitive visual receptors in the study area (mainly of a residential or recreational nature), most of the changes during the operational phases would be no more than moderate; change would be discernible but the underlying landscape character or view composition would be similar to baseline.

Overall it is concluded that there will be no significant landscape or visual effects as a result of the proposed development and that it is therefore acceptable in landscape and visual terms.

4.8.1 *Proposed Mitigation*

The following mitigation is proposed:

- hedgerow management, to allow existing hedgerows around the perimeter of the site to grow out / in height, by cutting sides only (whilst avoiding sight lines for road access);
- strengthening/infill planting of existing hedgerows around site using locally native plant species to increase landscape structure, enclosure / screening and habitat connectivity (whilst avoiding sight lines for road access); and
- use of 2.5m high hoarding around site perimeter and 3m high temporary soil storage along roadside, on inside of the heras fence, to provide screening of

ground level disturbance and activity. The fencing and hoarding would be painted a recessive dark green colour and the soil bund would be grass seeded immediately following construction to improve assimilation with the landscape setting.

4.9 Cultural Heritage

There is evidence for a number of historic routeways passing the Application Site in its vicinity and an extensive Roman-period field system of a type known as 'brickwork-plan'. These appear to have been a relatively transient stage in landscape development and have left no visible indication of their former presence in the existing landscape. One component of the field system lies within the Application Site.

The small detrimental effect to the significance of a heritage asset (the ditch which forms part of the brickwork-plan field system) is not considered to be significant.

A large number of designated heritage assets are present within the study area, located both in the villages and at isolated locations in the landscape. However taking into account the scale, nature and duration of the proposed development and the contribution from setting to the heritage significance of the assets, the predicted indirect impacts, though adverse, are not significant.

The proposed development is therefore considered acceptable in cultural heritage terms

4.9.1 Proposed Mitigation

A programme of archaeological survey is proposed to be carried out prior to construction, with attendant recording, assessment, analysis, archiving and reporting placed in the public domain.

4.10 Population and Land Use

The potential impact of the development upon surrounding population and land use has been considered in detail in the ES chapters, including those addressing traffic, air quality, water, landscape and visual impact, noise, ecology and cultural heritage. These assessments did not identify any significant environmental impacts that, either individually or collectively, would result in significant adverse effects on land use or population.

The proposed development is temporary and the land would be returned to its former agricultural use. The short term loss of this agricultural productivity is not considered significant and upon completion of restoration there would be no long term impacts as the land would return to its former agricultural use.

A small, short term beneficial effect on the local economy is predicted from the jobs, use of local suppliers and investment the proposed development will provide, together with the potential for significant longer term beneficial impacts for the local and national economy from the developments that may result from the data that would be obtained from the proposed development.

The proposed development is therefore considered acceptable in population and land use terms with the potential for significant long term benefits to the local and national economy.

4.10.1 Proposed Mitigation

Topsoil would be stripped using the excavator and dumper method as described by Sheet 1 in the MAFF Good Practice Guide for Handling Soils. Soil handling would not take place within 24 hours of significant rainfall (defined as greater than 10mm in 24 hours).

Bunds would be kept free from construction traffic until re-instatement and seeded to create a vegetative cover.

The topsoil would be removed from storage (Sheet 3 of the MAFF Good Practice Guide) and replaced by excavator using the loose tipping technique (Sheet 4 of the MAFF Good Practice Guide) which avoids traffic on the restored surfaces.

Prior to the replacement of the topsoil the top 300mm of the subsoil would be cultivated to relieve any compaction.

4.11 Summary

The assessments undertaken and the mitigation proposed confirm that the proposed development would have no unacceptable impacts on the environment or local communities.

5.0 NEED FOR THE DEVELOPMENT

5.1 National Planning Policy Framework

The National Planning Policy Framework (NPPF) confirms that minerals are essential to support sustainable economic growth and our quality of life. It is therefore important that there is a sufficient supply of material to provide the infrastructure, buildings, energy and goods the country needs.

It goes on to advise that when determining planning applications, local planning authorities should:

- give great weight to the benefits of mineral extraction, including to the economy;
- ensure, in granting planning permission for mineral development, that there are no unacceptable adverse impacts on the natural and historic environment or human health;
- ensure that any unavoidable noise, dust or particle emissions and any blasting vibrations are controlled, mitigated or removed at source and establish appropriate noise limits for extraction in proximity to noise sensitive properties; and
- provide for the restoration and aftercare of the site at the earliest opportunity.

5.2 Planning Practice Guidance

The Minerals section of the PPG Guidance states that *“as an emerging form of energy supply, there is a pressing need to establish - through exploratory drilling - whether or not there are sufficient recoverable quantities of unconventional hydrocarbons such as shale gas.....present to facilitate economically viable full scale production”*.

5.3 Shale Gas and Oil Policy Statement

The Shale Gas and Oil Policy Statement was published in August 2015 by the Department for Energy and Climate Change (DECC) and Department for Communities and Local Government (DCLG).

The Statement recognises that there is a national need to explore and exploit the UK's shale gas and oil resources in a safe, sustainable and timely way. The Statement emphasises that having a clean, safe and secure supply of natural gas is a key requirement if the UK is to successfully transition to a low carbon economy.

Natural gas is vital to the UK economy, providing one third of our energy supply. The Statement suggests that exploring and developing shale gas and oil resources could potentially bring substantial benefits and help to meet UK objectives for secure energy supplies, economic growth and lower carbon emissions.

The Statement recognises the potential economic benefits of building a new shale gas industry both locally and nationally by:

- Nationally benefitting from development of a new industrial sector;
- Developing shale resources that would deliver investment in key domestic energy infrastructure, boosting the UK's capital stock and leading to increased productivity and growth.
- It is estimated by the IoD that a thriving shale industry would mean cumulative investment of £33billion and support 64,500 jobs in the gas,

oil, construction, engineering and chemical sectors at peak. Locally, this may result in new facilities and jobs for local communities.

The statement suggests that shale gas has the potential to form a bridge whilst renewable energy, improved energy efficiency and nuclear generating capacity are developed. Studies have shown that the carbon footprint of electricity from UK shale gas would be significantly less than unabated coal and also less than Liquefied Natural Gas.

5.4 Summary

The above national policy guidance clearly establishes that there is a national need for the proposed development and that this must be given substantial weight in the planning process.

6.0 REVIEW OF PLANNING POLICY

6.1 Development Plan Policy

It is clear from published guidance that the Government is committed to a plan led system, with the Development Plan forming the basis of all planning decisions. Section 38(6) of the Planning and Compulsory Purchase Act 2004 (PCPA 2004) confers a presumption in favour of development proposals which accord with the Development Plan, unless material considerations indicate otherwise.

Sub Section 5 of Section 38 also states that, “if to any extent a policy contained in a development plan for an area conflicts with another policy in the development plan the conflict must be resolved in favour of the policy which is contained in the last document to be adopted, approved or published (as the case may be)”.

This principle has been developed and clarified by subsequent case law¹, which has confirmed that a particular proposal does not need to accord with each and every policy in a development plan; the key issue is that it accords with the overall thrust of development plan policies taken as a whole.

Accordingly, adopted policy and plans play an important role in determining any planning application.

6.1.1 Nottinghamshire Minerals Local Plan 2005

Nottinghamshire County Council formally adopted the Minerals Local Plan on 5th December 2005, in accordance with the requirements of the Town and Country Planning Act 1990 and the Town and Country Planning (Development Plan) (England) Regulations 1999.

The plan sets out the framework for minerals planning in Nottinghamshire. The purpose of the plan is to balance society’s need for minerals against the environmental harm that mineral extraction can cause.

Policy M2.1 states that “planning permission for minerals development will only be granted where it has been demonstrated that the Plan’s sustainable development objectives have, where appropriate, been fully addressed”. The sustainability objectives are identified as conserving minerals as far as possible whilst ensuring an adequate and steady supply; keeping environmental impacts to an acceptable minimum, using sensitive working and restoration practices, protecting designated landscapes and nature conservation sites, giving appropriate protection to heritage assets and not sterilising minerals. The proposed development is for mineral exploration rather than production but is will contribute towards ensuring there is an adequate and steady supply of energy minerals. The assessments undertaken demonstrate that environmental impacts are within acceptable limits and the mitigation proposed demonstrates that sensitive working and restoration practices will be used. The development does not impact on designated landscapes or nature conservation sites and appropriate mitigation is proposed in respect of the level of heritage interest identified on the site. Finally the proposed development will not result in the sterilisation of mineral resources. The proposed development is therefore considered to comply with policy M2.1.

¹ R v Rochdale Metropolitan Borough Council – [2001] ENV.L.R 22

Policy M3.1 outlines the information requirements that should be provided in support of planning applications and the supporting assessments and drawings submitted as part of this planning application ensure that the requirements of this policy are met, as follows:

- a) Present use of the site – agriculture;
- b) Geology – see Chapter 9 of the ES
- c) Mineral content, output and life of working – the proposed development is an exploratory well so there is no mineral content or output, the life of the operation would be three years;
- d) Quality of material – the proposed development is for an exploratory borehole;
- e) Need for the mineral – Government policy confirms there is a national need, see section 5 of this Statement;
- f) Measures taken to maximise the potential for re-use and recycling of materials on site – materials used in the construction of the wellsite would be recycled at the decommissioning/restoration stage where possible;
- g) Method of extraction, depth direction and phasing – the proposed development is for an exploratory well so there would be no extraction; the maximum depth of the borehole would be 3,300m and the phases of the development would be construction, drilling, evaluation and decommissioning/restoration;
- h) Surface drainage and hydrology – see Chapter 9 of the ES and Drawing TL3/08A;
- i) Layout and design of buildings and operational areas – see Drawings TL3/03A, TL3/05A and TL3/10A;
- j) Soil survey and conservation measures – see Chapter 13 and appendix 13.1 of the ES;
- k) Transport arrangements – see Chapter 6 of the ES;
- l) Hours of Operation – see section 3 of this Statement;
- m) Employment – see section 3 of this Statement;
- n) Measures to minimise pollution and environmental disturbance - see the proposed mitigation measures set out in section 4 of this Statement;
- o) Impact on existing and adjacent land uses – see Chapters 6,7,8,9,10,11,12 and 13 of the ES;
- p) An assessment of the landscape and ecological value of the area and the potential impact of the development – see Chapters 10 and 11 of the ES;
- q) An assessment of the archaeological remains and historic features and measures for their preservation and recording – see Chapter 12 of the ES;
- r) Impact on public rights of way – no rights of way cross the application site, visual effects are considered within Chapter 10 of the ES;
- s) An overall scheme for restoration – see Drawing TL3/12A
- t) Landscaping measures and boundary treatment of the site - see section 4.8.1 of this Statement;
- u) Integrated working and reclamation – the proposed development is for an exploratory well site and restoration is proposed following the completion of the construction, drilling and evaluation phases;
- v) Aftercare – a five year aftercare period is proposed;
- w) After use – the site would be returned to agriculture;
- x) Long term management provisions – no provisions beyond the five year after care are considered necessary.

Policy M3.3 discusses the potential for adverse visual impact of the proposed development. The policy details a list of conditions that may be imposed to mitigate any adverse visual impacts and the need to avoid light intrusion. The drilling rig will be the most visible feature, appearing as a relatively narrow and tall industrial element, often adjacent to the existing overhead powerlines that pass close by the western boundary of the site, and a small part of a broader horizontal skyline. The lower parts of the development (for example the perimeter fencing or tanks) will typically be much less visible. The short duration of time that the development will be visible also limits the

overall effects, with the rig being limited to four months and then the perimeter fencing, gates and soil bund, etc during construction, drilling and then the evaluation period still being less than three years. After final restoration there will be no change to views. Overall it is concluded that there will be no significant visual effects as a result of the proposed development and the lighting assessment confirms that lighting would be directed onto the site itself. The proposed development does not therefore conflict with policy M3.3.

Policy M3.4 goes on to detail screening and landscape proposals as a mitigating measure, however, the policy recognises that this is typically associated with long-term development proposals. Having regard to the short term and temporary nature of the proposed development planting is not considered appropriate but the proposed site hoarding will screen a lot the daily activity on the site and the use of dark green colouring is proposed to ensure it matches the rural environment it is within. The proposed development therefore complies with policy M3.4.

Policy M3.5 states that “planning permission for minerals development will only be granted where noise emissions outside the boundary of the mineral workings do not exceed acceptable levels”. The policy also confirms that conditions may be imposed in order to satisfy the requirements of the Policy. The noise assessment and mitigation proposed clearly demonstrates that there would be no adverse noise impacts as a result of the proposed development and the requirements of this policy are therefore met.

Policy M3.7 states that “planning permission for minerals development will only be granted where dust generation will not lead to an unacceptable impact”. The Policy recommends a dust assessment study to be undertaken in such instances where a significant amount of dust may be generated by virtue of the development and its associated operations. The dust assessment and proposed mitigation confirm that there would be no unacceptable dust impacts as a result of the proposed development and the requirements of this policy are met.

Policy M3.8 outlines that “planning permission for minerals development will only be granted where surface water flows are not detrimentally altered; groundwater levels, where critical, are not affected; and there are no risks of polluting ground or surface waters”. A comprehensive assessment of potential impacts on the water environment has been undertaken and no significant adverse impacts have been identified so there is no conflict with this policy.

Policy M3.9 deals with flooding but the proposed development is not in a flood risk area and has designed in mitigation for dealing with surface water run off.

Policy M3.12 refers explicitly to highways and transport issues stating that “Planning permission for minerals development will only be granted where measures are in place to the County Council’s satisfaction that prevents damage to the highway.” It then goes on to say that such policy is also intended to “prevent mud and other deleterious material contaminating public highways”. This policy considers that lorry routeing may be a critical consideration alongside vehicular movements contained within Policy M3.13. Policy M3.13 states that “planning permission for minerals development will only be granted where the highway network can satisfactorily accommodate the vehicle movements likely to be generated and would not cause unacceptable impact upon the environment and disturbance to local amenity”. Policy M3.14 addresses vehicle routeing.

A detailed audit of the local highway network has been undertaken which concluded that the Application Site is located with good links to the principal road network via the A634 and B6045 to the A1/A1(M). A review of the proposed vehicle types has determined that

all vehicles can route via Blyth and avoid any surrounding villages which may not have the required standard of highway to accommodate HGVs.

The proposed site access is deemed suitable for the application proposals with adequate junction visibility splays. A swept-path analysis has also been undertaken to demonstrate that all of the required vehicles can be accommodated at the proposed site access.

It is therefore considered that the proposed development will not have an unacceptable impact on road or junction capacity, driver delay, road safety or amenity and therefore complies with Policies M3.12, 13 and 14.

Policy M3.16 affords protection to agricultural land. It seeks to protect “the best and most versatile agricultural land (grades 1, 2 and 3a) unless proposals will not affect the long term agricultural potential of the land. The ALC survey has established that site is a mix of Grade 3a and 3b. It is proposed that topsoil is stripped and stored on site so that it can be used to restore the land back to agriculture. Have regarding to the size of the site and short term nature of the proposed development it is considered that the long term potential of agricultural land will not be adversely affected and there is no conflict with this policy.

Policy M3.17 covers Biodiversity and seeks to prevent development that will adversely affect the integrity of habitats or features in UK and Local Biodiversity Action Plans unless there is an overriding need for the development and compensatory habitat can be provided. Policies M3.18, 19 and 20 deal with international, national and local designated sites respectively. The ecological assessment undertaken confirms that the proposed development will not have an adverse effect on biodiversity and confirms that no designated sites will be impacted on by the proposed development. There is therefore no conflict with Policies M3.17,18,19 and 20.

Policy M3.22 states that “operators must demonstrate that landscape character and local distinctiveness are fully taken into consideration within development proposals” and permission will not be granted for development which has an adverse impact on these unless there are reasons of overriding public interest or where the impact can be reduced to acceptable levels. The landscape effects upon the existing large-scale arable field and adjacent roadside verge of the Application Site during the short-term operational phases include:

- moderate and adverse physical changes to landscape elements and features associated with site clearance and preparation of the hardstanding and access, followed by installation and removal of various structures (rig, tanks, generators, cabins, etc); and
- moderate and adverse changes to aesthetic and perceptual aspects relating to the reduction in scale, increase in enclosure and diversity, with a more organised pattern of the site layout with vertical forms and new colours and reduction of tranquillity.

However, the effects upon overall character and key characteristics of this part of “Sherwood” (both “Sandstone Estatelands” and/or “Policy Zone 40: Babworth”) will be slight as the published character area is relatively large in comparison to the Application Site and the scale of change is limited. No significant adverse effects on landscape character have therefore been identified and there is no conflict with policy M3.22.

Policy M3.24 deals with archaeology and permission will not be granted for development which would destroy or degrade nationally important remains. For remains of less than national importance permission will be granted where the importance of the development outweighs that of the remains and where provision for excavation and recording is made. There is evidence for a number of historic routeways passing the Application Site in its vicinity and an extensive Roman-period field system of a type known as ‘brickwork-plan’.

One component of the field system lies within the Application Site. A programme of archaeological survey and - if appropriate – excavation of the Application Site is therefore proposed to be carried out prior to construction, with attendant recording, assessment, analysis, archiving and reporting placed in the public domain. This approach is considered to comply with the requirements of Policy M3.24.

Policy M3.25 deals with designated heritage assets and their settings and permission will not be granted for development which causes an unacceptable level of harm. In respect of the proposed development there will be no direct impacts on designated heritage assets and taking into account the scale nature and duration of the proposed development and the contribution from setting to the heritage significance of the assets the predicted indirect impacts though adverse are not significant and do not therefore cause an unacceptable level of harm and there is no conflict with Policy M3.25.

Policy M3.27 deals with cumulative impacts and permission will not be granted for development which would, cumulatively, result in significant adverse impacts on the environment or local communities. However no significant adverse cumulative effects have been identified by the assessments undertaken so there is no conflict with this policy.

Policy M5.1 cites that “proposals for minerals exploration will be permitted, subject to satisfactory environmental, amenity and reclamation safeguards”. The plan recognises that mineral exploration is essential in identifying mineral provisions and their viability but also emphasises the need for safeguarding measures to be in place to minimise environmental any potential environmental impact. The Plan then goes on to discuss each potential environmental impact in turn. Under Policy M5.1, the Plan states that “although sites can be very visible, this rarely causes conflict since activities are temporary”. In terms of noise, the Plan recognises the potential for conflict where drilling rigs are situated in close proximity to residential properties. The Plan therefore advises that boreholes should be located away from any sensitive receptors, however, if this is not possible, it is imperative to impose mitigation measures to minimise any noise impact. Similarly, the Plan recognises the potential for temporary traffic generation to generate significant pressure on the local highway system and proposes to minimise any impacts through mitigation measures such as routeing and temporary signposting. In respect of water pollution the Plan advises that care should be taken to protect surface and groundwater from contamination and to avoid damage to aquifers.

The assessments undertaken clearly demonstrate that there would be no unacceptable environmental, amenity or reclamation impacts as a result of the proposed development and that, in accordance with the requirements of Policy M5.1, that permission should be granted.

Policy M5.2 deals with deep boreholes in sensitive areas but the Application Site is not considered to be within a sensitive area, as defined in the Plan, so this policy is not considered further.

Policy M5.3 deals with the retention of haul roads and hardstandings and states that proposals to retain these following exploratory drilling will not be permitted unless there are clear agricultural or other benefits. it is not proposed to retain any haul roads or hardstandings so there is no conflict with this policy.

Chapter 13 of the Plan deals with Oil, Coalbed Methane and Mine Gas but because of the age of the Plan it does not specifically address shale gas exploration. However the principles contained in policies M13.6 and 13.7 are relevant. Policy M13.6 deals with the situation where deep boreholes may conflict with other underground mineral resources and seeks to ensure that their exploitation will not be unreasonably affected. Consultation with the Coal Authority has taken place in respect of the proposed development and this

has confirmed that there will be no conflict with other underground mineral resources. This also means that there is no conflict with policy M2.2 of the Plan.

Policy M13.7 covers reclamation and states that conditions will be imposed to ensure that sites are restored to their original condition as soon as practicable once the development is no longer required. The restoration proposals that form part of this application confirm that the site will be returned to agriculture and it therefore complies with this policy.

6.1.2 Bassetlaw Core Strategy and Development Management Policies DPD 2011

The Bassetlaw Core Strategy and Development Management Policies development plan document was adopted in 2011.

Policy DM8 deals with the Historic Environment and has a presumption against development that would be detrimental to the significance of a heritage asset. In respect of the proposed development there will be no direct impacts on designated heritage assets and taking into account the scale nature and duration of the proposed development and the contribution from setting to the heritage significance of the assets the predicted indirect impacts though adverse are not significant and do not therefore cause an unacceptable level of harm and there is no conflict with Policy DM8.

Relevant sections of DM9 relate to biodiversity and landscape and the ecological assessment undertaken confirms that the proposed development will not have an adverse effect on biodiversity and confirms that no designated sites will be impacted on by the proposed development. With regard to landscape the effects upon overall character and key characteristics of this part of “Sherwood” (both “Sandstone Estatelands” and/or “Policy Zone 40: Babworth”) will be slight as the published character area is relatively large in comparison to the Application Site and the scale of change is limited. No significant adverse effects on landscape character have therefore been identified and there is no conflict with policy DM9.

Finally in respect of policy DM12 which deals with flood risk, drainage and sewage, a comprehensive assessment of potential impacts on the water environment has been undertaken and the Application Site is not located within a flood risk area and nor will it increase the risk of flooding elsewhere so there is no conflict with this policy.

6.1.3 Summary

The proposed development is therefore considered to comply with the relevant Development Plan policies.

6.2 Emerging Local Policy

6.2.1 Nottinghamshire Minerals Local Plan – submission draft

Nottinghamshire’s Minerals Local Plan – submission draft was subject to public consultation in Spring 2016. The Plan is therefore still at its early stages of production. The policies published to date therefore only carry limited weight. However the work that has been done to date does provide an indication as to how the Council see the future policy for minerals in the County developing in respect of shale gas proposals.

Policy MP12: Hydrocarbon Minerals supports proposals for exploration where they do not give rise to unacceptable impacts on the environment or residential amenity and the assessments accompanying this planning application clearly demonstrate this to be the case.

The Plan also has a set of Development Management policies against which future minerals development would be assessed. Policy DM1: Protecting Local Amenity supports minerals development where it can be demonstrated that any potential adverse impacts on amenity can be avoided or mitigated to an acceptable level. The assessments undertaken and the mitigation proposed as part of this application are considered to comply with the requirements of this policy.

Policy DM2: Water Resources and Flood Risk again supports development that can demonstrate that surface water flows and groundwater quality and levels would not be detrimentally altered, that there are no risks of polluting ground or surface water and that water resources are used as efficiently as possible. Chapter 9 of the ES confirms that with the mitigation proposed that no significant effects on the ground or surface water environments are likely as a result of the proposed development and the water required for the development would be delivered as required. In respect of flood risk the policy requires that there should be no unacceptable impacts on flood flows or storage, the integrity and function of flood defences or local land drainage systems. The proposed development is not within a flood risk area and does not therefore impact on any of these matters. In respect of mineral extraction proposals that increase flood risk to local communities the proposed development is not for mineral extraction but in any event it does not increase the risk of flooding to local communities. The policy also seeks, where the opportunity exists, for restoration proposals to incorporate flood risk reduction measures. However in respect of the proposed development which involves the temporary use of part of an agricultural field that it not within a flood risk area it is considered that the opportunity for this does not exist. Finally the policy looks for mineral development to incorporate sustainable drainage systems unless it can be demonstrated that alternative measures are acceptable. Having regard to the short term, temporary nature of the proposed development the proposed use of a perimeter ditch and storage tank to manage surface water run off are considered to be acceptable alternative measures.

Policy DM3: Agricultural Land and Soil Quality only supports mineral development on the best and most versatile agricultural land (Grades 1, 2 and 3a) where it can be demonstrated that proposals will not affect the long term agricultural potential of the land or soils. The ALC survey has established that site is a mix of Grade 3a and 3b. It is proposed that topsoil is stripped and stored on site so that it can be used to restore the land back to agriculture. Have regarding to the size of the site and short term nature of the proposed development it is considered that the long term potential of agricultural land would not be adversely affected and there is no conflict with this policy. In respect of soil quality the policy also requires that measures are taken to protect and maintain it during the stripping, storage and replacement phases of the development and it is considered that the mitigation measures set out in section 4.10.1 of this Statement comply with these requirements.

Policy DM4 deals with the protection and enhancement of biodiversity and geodiversity and the ecological assessment undertaken confirms that the proposed development will not have an adverse effect on biodiversity and confirms that no designated sites will be impacted on by the proposed development. In respect of enhancement Chapter 10 of the ES proposes that there would be strengthening/infill planting of hedgerows around the site using locally native species to increase landscape structure, enclosure / screening and habitat connectivity. Such measures would be of local benefit for ecology, for example, by increasing nesting opportunities for birds.

Policy DM5 deals with landscape character and requires that proposals should not adversely impact on the character and distinctiveness of the landscape. The landscape effects upon the existing large-scale arable field and adjacent roadside verge of the Application Site during the short-term operational phases include:

- moderate and adverse physical changes to landscape elements and features associated with site clearance and preparation of the hardstanding and access, followed by installation and removal of various structures (rig, tanks, generators, cabins, etc); and
- moderate and adverse changes to aesthetic and perceptual aspects relating to the reduction in scale, increase in enclosure and diversity, with a more organised pattern of the site layout with vertical forms and new colours and reduction of tranquillity.

However, the effects upon overall character and key characteristics of this part of “Sherwood” (both “Sandstone Estatelands” and/or “Policy Zone 40: Babworth”) will be slight as the published character area is relatively large in comparison to the Application Site and the scale of change is limited. No significant adverse effects on landscape character have therefore been identified and there is no conflict with policy DM5. In respect of restoration proposals it is proposed that the site is returned to its original contours and land use.

Policy DM6 covers the historic environment and supports proposals that do not have an adverse impact on designated or non-designated heritage assets or where the public benefits of the development outweigh the harm. In respect of the proposed development there will be no direct impacts on heritage assets and taking into account the scale nature and duration of the proposed development and the contribution from setting to the heritage significance of the assets the predicted indirect impacts though adverse are not significant and do not therefore cause an unacceptable level of harm and as such there is considered to be no conflict with this policy. In respect of archaeology the policy requires that proposals for minerals development on sites of archaeological importance must ensure that satisfactory mitigation measures are in place. The Application Site is not considered to be a site of archaeological importance however there is evidence for a number of historic routeways passing the Application Site in its vicinity and an extensive Roman-period field system of a type known as ‘brickwork-plan’. One component of the field system lies within the Application Site. A programme of archaeological survey and - if appropriate – excavation of the application site is therefore proposed to be carried out prior to construction, with attendant recording, assessment, analysis, archiving and reporting placed in the public domain. This approach is considered to comply with the requirements of policy DM6.

Policy DM7 supports minerals development that will not have an unacceptable impact on rights of way and none have been identified in respect of the proposed development. No rights of way cross the Application Site so no diversions are required and having regard to the small scale of the Application Site and the routes of the existing rights of way in the area it is not considered that allowing public access to the site upon the restoration would enhance the rights of way network.

Policy DM8 deals with cumulative impacts and having regard to the nature, scale and duration of the proposed development no unacceptable cumulative impacts have been identified.

Policy DM9 covers highway safety, vehicle movements and routeing and supports mineral development where:

- the highway network can satisfactorily accommodate the vehicle movements likely to be generated;
- those movements would not have an unacceptable impact on the environment or local amenity;
- where appropriate, adequate routeing schemes have been put in place to minimise impacts; and

- measures have been put in place to minimise mud/materials on the public highway.

A detailed audit of the local highway network has been undertaken which concluded that the Application Site is located with good links to the principal road network via the A634 and B6045 to the A1/A1(M) and that there is adequate capacity for the levels of traffic proposed. A review of the proposed vehicle types has determined that all vehicles can route via Blyth and avoid any surrounding villages which may not have the required standard of highway to accommodate HGVs. Finally mitigation measures in respect of sheeting of vehicles, surfacing of site access and haul roads and road sweeping are proposed to prevent materials being deposited on the public highway. The proposed development is therefore considered to comply with policy DM9.

DM10 deals with airfield safeguarding but the proposed development is remote from airfields and would not have an adverse impact on aviation safety.

Policy DM11 identifies that the County Council will seek to negotiate planning obligations to control mineral operations or secure sustainable development objectives which cannot be achieved by planning condition. No need for a planning obligation has been identified in respect of the proposed development.

Policy DM12 cover restoration, aftercare and after use. The proposed development is temporary and it is proposed that the site would be returned to its original contours and to an agricultural after use. A five year aftercare period is also proposed. This is considered to comply with the requirements of this policy.

The proposed development would not sterilise mineral resource so there is no conflict with policy DM13 and policies DM14, DM15, DM16 and DM17 are not considered relevant to the proposed development.

Policy DM18 deals with mineral exploration which will be permitted subject to satisfactory environmental, amenity and restoration safeguards. It is considered that the mitigation set out in section 4 of this Statement provides a satisfactory level of safeguarding of environmental and amenity interest and that satisfactory restoration proposals in accordance with policy DM12 of this Plan have been proposed.

6.2.2 Summary

The proposed development is therefore considered to comply with the policies of the emerging Minerals Local Plan.

6.3 National Policy

6.3.1 National Planning Policy Framework

The National Planning Policy Framework (NPPF) sets out the Government's planning policies for England and how these are expected to be applied. Underpinning the NPPF is a presumption in favour of sustainable development, which is woven into both plan-making and decision taking.²

In terms of sustainable development, the NPPF identifies three dimensions; economic, social and environmental sustainability. These dimensions give rise to the need for the planning system to perform a number of roles:

² Paragraph 14, NPPF.

- an economic role - contributing to building a strong, responsive and competitive economy by ensuring that sufficient land of the right type is available in the right places and at the right time to support growth and innovation; and by identifying and coordinating development requirements;
- a social role - supporting strong, vibrant and healthy communities by providing the supply of housing required to meet the needs of present and future generations; and by creating a high quality built environment, with accessible local services that reflect the community's needs and supports its health, social and cultural wellbeing; and
- an environmental role - contributing to protecting and enhancing our natural, built and historic environment; and, as part of this, helping to improve biodiversity, use natural resources prudently, minimise waste and pollution, and mitigate and adapt to climate change by moving towards a low carbon economy.

These roles should not be undertaken in isolation, because they are not mutually exclusive; in order to achieve sustainable development, economic, social and environmental gains should be sought simultaneously through the planning system. Government policy is clear on the social and economic benefits of shale gas in terms of the jobs, investment and the security of energy supply benefits it could bring. The exploration phase is the essential first step in this process and the assessments undertaken have demonstrated that there would be no unacceptable impacts on the environment or local communities as a result of the proposed development. It is therefore considered that the proposed development benefits from the presumption in favour of sustainable development contained within national policy.

The NPPF refers to specific categories of minerals; under this framework, the term 'energy minerals' is used as an umbrella definition for *inter alia* hydrocarbons such as shale gas.

Within the NPPF, emphasis is placed on the requirement for the Mineral Planning Authority (MPA) to "*clearly distinguish between the three phases of development; exploration, appraisal and production*" when planning for onshore oil and gas development, including unconventional hydrocarbons.

Unconventional hydrocarbons are emerging as a form of energy supply and there is a need to establish, through exploratory drilling, whether or not there are sufficient recoverable quantities of unconventional hydrocarbons present to facilitate economically viable full-scale production.

National policy advises that "*although substantially less costly than offshore development, onshore operations are still high cost and high risk ventures. Even when hydrocarbons are found, development will not necessarily follow. However, exploration is valuable in its own right as it extends the knowledge of the country's resources*".

The NPPF acknowledges that unconventional hydrocarbon exploration is a relatively new economic venture in the UK and, as a result, it is anticipated that the number of unconventional hydrocarbon developments will continue to grow.

The NPPF recognises that minerals are essential in supporting sustainable economic growth and maintaining our quality of life. The NPPF therefore places great importance on the need to ensure there is a sufficient supply of material to provide infrastructure, buildings, energy and goods that communities need.

There is also recognition that energy minerals are a finite resource and can only be worked where they are found.

The NPPF policies that are particularly relevant in the context of the exploratory borehole are:

- competitive economy;
- sustainable transport;
- natural environment;
- historic and cultural environment; and
- minerals.

Competitive Economy

The government is committed to securing economic growth in order to create jobs and prosperity, building on the country's inherent strengths, and to meet the challenges of both global competition and a low carbon future.

The NPPF notes that "planning should operate to encourage and not act as an impediment to sustainable growth. Therefore significant weight should be placed on the need to support economic growth through the planning system".

National policy on shale gas recognises the potential economic benefits of building a new shale gas industry both locally and nationally by:

- Nationally benefitting from development of a new industrial sector;
- Developing shale resources that would deliver investment in key domestic energy infrastructure, boosting the UK's capital stock and leading to increased productivity and growth.
- It is estimated by the IoD that a thriving shale industry would mean cumulative investment of £33billion and support 64,500 jobs in the gas, oil, construction, engineering and chemical sectors at peak. Locally, this may result in new facilities and jobs for local communities.

Significant weight should therefore be attached to the economic benefits of the proposed development.

Sustainable Transport

All developments that generate significant amounts of movements should be supported by a Transport Statement or a Transport Assessment. Both plans and decisions should take into account whether:

- the opportunities for sustainable transport models have been taken up depending on the nature and location of the site, to reduce the need for major transport infrastructure;
- safe and suitable access to the site can be achieved for all people; and
- improvements can be undertaken within the transport network that cost effectively limits the significant impacts on the development.

The policy then goes on to say that development should only be prevented or refused on transport grounds where residual cumulative impacts of development are severe.

The transport assessment undertaken clearly demonstrates that there would be no severe cumulative impacts and that safe and suitable access to the site can be achieved without the need for improvements to the network.

Conserving the Natural Environment

Paragraph 109 of the NPPF states that "the planning system should contribute to and enhance the natural and local environment by; protecting and enhancing valued

landscapes, geological conservation interests and soils; recognising the wider benefits of ecosystem services; and minimising possible impacts on biodiversity and providing net gains in biodiversity where possible.

In preparing plans to meet development needs, the aim should be to minimise pollution and other adverse effects on the local and natural environment.

In order to prevent unacceptable risks from pollution and land instability, planning policy and decision making should ensure that the new development is appropriate for its location. The effects (including cumulative effects) of pollution on health, the natural environment and general amenity, and the potential sensitive to the area or proposed development to adverse effects from pollution, should be taken into account.

The proposed development has been comprehensively assessed and no significant adverse effects on the natural environment have been identified. The proposed mitigation will ensure that impacts on pollution and soils will be minimised and there will be no unacceptable impacts on health and/or amenity.

Conserving and Enhancing the Historic Environment

Paragraph 128 of the NPPF states that *“in determining applications, local planning authorities should require an applicant to describe the significance of any heritage assets affected, including any contributions made by their setting. The level of detail should be proportional to the assets importance and no more than is sufficient to understand the potential impact of the proposal on their significance.”*

Paragraph 132 requires that great weight should be given to the conservation of a designated heritage asset, and that the heritage significance of such an asset can be harmed or lost through alteration or destruction of the asset or from development within its setting. Substantial harm to, or loss of, a Grade II listed building or registered park or garden should be exceptional, and wholly exceptional to assets of the highest significance (notably scheduled monuments, protected wreck sites, battlefields, grade I and II* listed buildings parks or gardens, and World Heritage Sites) (paragraph 133). For a development which had such an effect to obtain planning permission, it would need to provide substantial public benefits which outweighed the effect, or fulfil a number of other specific criteria (paragraph 133). Less than substantial harm should be weighed against the wider public benefits of the proposed development (paragraph 134).

Paragraph 135 requires that both direct and indirect effects on the heritage significance of non-designated heritage assets should be taken into account when determining an application.

The assessments undertaken confirm that there would be no significant effects on heritage assets as a result of the proposed development.

Facilitating the Sustainable Use of Materials

Minerals are essential to support sustainable economic growth and our quality of life. It is therefore important that there is a sufficient supply of material to provide the infrastructure, buildings, energy and goods the country needs.

When determining planning applications, local planning authorities should:

- give great weight to the benefits of mineral extraction, including to the economy;

- ensure, in granting planning permission for mineral development, that there are no unacceptable adverse impacts on the natural and historic environment or human health;
- ensure that any unavoidable noise, dust or particle emissions and any blasting vibrations are controlled, mitigated or removed at source and establish appropriate noise limits for extraction in proximity to noise sensitive properties; and
- provide for restoration and aftercare at the earliest opportunity.

The economic benefits of shale gas exploration have already been highlighted and the assessments undertaken confirm that there would be no unacceptable adverse effects as a result of the proposed development. Comprehensive noise and dust mitigation is proposed to ensure there are no unacceptable impacts and the temporary nature of the proposed development ensures that it will be restored at the earliest opportunity.

6.3.2 Planning Practice Guidance

The Planning Practice Guidance (PPG) contains supplementary clarification and assistance to the information contained within the NPPF. The PPG was published in March 2014 by the Department for Communities and Local Government (DCLG).

The Minerals section of the PPG Guidance states that “as an emerging form of energy supply, there is a pressing need to establish - through exploratory drilling - whether or not there are sufficient recoverable quantities of unconventional hydrocarbons such as shale gas.....present to facilitate economically viable full scale production”.

Paragraph 120 considers the potentially contentious nature of unconventional hydrocarbon exploration and urges that “individual applications for the exploratory phase should be considered on their own merits. They **should not** take account of hypothetical future activities for which consent has not yet been sought, since the further appraisal and production phases will be subject to separate planning applications and assessments.”

The Guidance therefore confirms the national need for this type of development and the assessments undertaken confirm that there would be no unacceptable impacts on the environment or local communities as a result of the proposed development.

6.3.3 Summary

The proposed development is therefore considered to comply with national policy.

7.0 SUMMARY AND BENEFITS OF THE DEVELOPMENT

The exploratory well would be a vertical multi-core well to target the Namurian and Dinantian geological formations. In addition, three sets (with each set containing up to 3 boreholes) of monitoring boreholes would be installed to sample and monitor groundwater and ground gas during the drilling of the exploration well.

The exploratory well would be drilled through all of the coal and shale formations with core samples taken at multiple intervals whilst drilling. Hydraulic fracturing would not be performed in the well on either the coal or shale targets at this stage of the operation.

The proposed development would involve the construction work associated with the development of the well site, the drilling and evaluation of the well and monitoring boreholes and then the decommissioning and restoration of the site back to agricultural use.

The development would be for a three year period and, as such, only a temporary permission is being sought.

A comprehensive range of assessments has been undertaken which clearly demonstrate that the proposed development would not have any unacceptable impacts on the environment and local communities and an extensive range of mitigation measures is proposed to deliver this. The proposed development is therefore considered to be in accordance with adopted and emerging Development Plan policy for mineral exploration.

National policy recognises that there is a national need to explore and exploit the UK's shale gas and oil resources in a safe, sustainable and timely way and emphasises that having a clean, safe and secure supply of natural gas is a key requirement if the UK is to successfully transition to a low carbon economy.

Exploring and developing shale gas and oil resources could potentially bring substantial benefits and help to meet UK objectives for secure energy supplies, economic growth and lower carbon emissions.

The potential economic benefits of building a new shale gas industry both locally and nationally include:

- Nationally benefitting from development of a new industrial sector;
- Developing shale resources that would deliver investment in key domestic energy infrastructure, boosting the UK's capital stock and leading to increased productivity and growth.

As such there is a pressing need to establish - through exploratory drilling - whether or not there are sufficient recoverable quantities of shale gas present to facilitate economically viable full scale production.

Drawings

