

Permitting decisions

Variation to permit

We have decided to issue the variation for Gainsborough-Beckingham Oilfield operated by Igas Energy Production Limited.

The variation number is EPR/RP3937YT/V002.

We have also carried out an Environment Agency initiated variation to the permit.

We consider in reaching that decision we have taken into account all relevant considerations and legal requirements and that the permit will ensure that the appropriate level of environmental protection is provided.

This variation is required as the Environment Agency has a duty, under the Environmental Permitting (England and Wales) Regulations 2016, regulation 34(1), to periodically review permits. As a result of that review we have identified a number of necessary changes we must make to the permit to reflect current legislation and best practice. These changes principally relate to:

- Implementation of the Mining Waste Directive namely the addition of extractive waste management activities;
- Addition of groundwater activities; and
- Oil storage activities; and

The variation also aim to:

- Consolidate permits - all variations to your permit will be brought together into one permit so the requirements will be clearer.
- Formalise changes to monitoring requirements and compliance limits where we have agreed them in writing, for example as the result of a hydrogeological risk assessment review.
- Address site specific issues which result in a change to the current permit, for example incorporating completed improvement conditions into the permit and removing inconsistencies.

Purpose of this document

This decision document provides a record of the decision making process. It:

- highlights key issues in the determination
- summarises the decision making process in the decision checklist to show how all relevant factors have been taken into account
- explains why we have also made an Environment Agency initiated variation
- shows how we have considered the consultation responses.

Unless the decision document specifies otherwise we have accepted the applicant's proposals.

Read the permitting decisions in conjunction with the environmental permit. The introductory note summarises what the permit covers.

Radioactive Substances

Preliminary information

The Applicant also submitted a permit application for a radioactive substances activity for handling naturally occurring radioactive substances as a result of oil and gas production activities, which we have given the application number EPR/ZB3792DK/A001. That application is an application for a separate permit. The decision with regards to that application is not dealt with in this document.

Brief outline of the process

The main features of the installation are as follows.

The Gainsborough-Beckingham Oilfield has 30 sites, currently with 65 wells divided into 2 areas as shown in table below. Of these wells, 30 are producing oil, water and gas, 1 well produces gas, 4 are water injection wells and 30 wells are shut in. The general activities include extraction of hydrocarbons by artificial lift, reinjection of produced water, separation of well fluids, storage of oil and water, transportation of fluids, well and process plant equipment maintenance.

Both arms of Gainsborough and Beckingham Oilfields feed oil into the Gainsborough Gathering Centre (GB05), where the water and gas are separated and the oil is removed by tanker. In addition, GB05 receives oil from several other local installations for processing and export.

Gas released at Gainsborough 5 wellsite during separation is utilised in the heater treaters on site, the surplus is piped to the gas supply system based around Gainsborough 1, Gainsborough 2, and Gainsborough 34 wellsites. Gas is primarily produced at Gainsborough 2 and Gainsborough 34 sites, and treatment facilities (heating and odourisation) are present at Gainsborough 1 wellsite. Associated gases are pumped via

underground flow lines to Gainsborough 1 wellsite's power generation plant for electricity production.

Gas is burned in 6 x 1MW gas driven electricity generators at the Gainsborough 1 wellsite and in process heater at Gainsborough 05 Site. The electricity is metered and is utilised at seven local sites with any surplus supplying the National Grid. There is no flare at the installation. Oil storage tanks vent to atmosphere. Produced water is separated and stored on GB05. It is re-injected into the oil bearing reservoir through injection wells.

Gainsborough currently produces approximately 87 barrels of oil per day (bopd) from 12 active wells sites. Beckingham currently produces approximately 123 barrels of oil per day (bopd) from 11 active well sites (Igas, 2017).

- The Gainsborough arm consists of the following sites

Site Name / Reference	Site Location (Grid Ref)	Site Size (Hectare)	Description of process and activities	Emissions
Gainsborough 1	SK 832 903	1.1	6 x 1Mw gas driven electricity generators 1 X oil producing well pipeline manifold 1 x water abstraction well from Sherwood Sandstone maintenance workshop and office site interceptor	Combustion NOx, SOx & CO
				Rain water run off
Gainsborough 2	SK 817 908	0.2	1 x Gas well	No Emissions
Gainsborough 5	SK 811 896	0.6	Separation process, storage oil and water, pipeline manifold, gas fuelled process heaters, hot water heating, Gas Odourisation, slops recovery system, site water interceptor, road tanker loading/unloading system, control room, stores and office. 1 x water injection well	Vent Gases Methane/Non methane VOC's, Hydrogen Sulphide
				Combustion NOx, SOx & CO
				Produced water re-injection Produced, bund, sumps, well cellar water
				Interceptor Rain water run off
Gainsborough 6	SK 832 906	0.9	2 x producing wells Pipeline manifold	No Emissions
Gainsborough 8	SK 807 894	0.2	Previously silent site 1 x producing well connected to pipeline	No Emissions

Gainsborough 11	SK 807 900	0.2	Suspended water injection well	No Emissions
Gainsborough 14	SK 833 894	0.2	1 x producing well	No Emissions
Gainsborough 29	SK 824 889	0.4	1 x producing wells 4 x Wells shut-in pipeline manifold	No Emissions
Gainsborough 31	SK 832 911	0.2	1 x producing well	No Emissions
Gainsborough 33	SK 828 913	0.1	1 x producing well	No Emissions
Gainsborough 34	SK 825 915	0.6	3 x producing wells 3 x Wells Shut-in Gas pressure reduction and liquid removal 1 x oil storage tanks	Vent Gases Methane/Non methane VOC's, Hydrogen Sulphide
Gainsborough 36	SK 804 891	0.15	Previously silent site	
Gainsborough 37	SK 821 918	0.84	Previously silent site	
Gainsborough 38	SK 815 912	0.1	Previously silent site	
Gainsborough 41	SK 806 897	0.2	1 x producing well pipeline manifold process vent stack	Vent Gases Methane/Non methane VOC's, Hydrogen Sulphide
Gainsborough 43	SK 819 898	0.4	2 x producing wells, 6 x Wells Shut-in pipeline manifold	No Emissions
Gainsborough 59	SK 808 891	0.11		
Gainsborough 60	SK 803 897	0.2	1 x well producing 1 x Well Shut-in	No Emissions
Lea Road Sidings	SK 816 885	0.5	Pipeline manifold	No Emissions

- The Beckingham arm consists of the following sites

Site Name / Reference	Site Location (Grid Ref)	Site Size (Hectare)	Description of process and activities	Emission parameters
Beckingham 1	SK 792 903	0.7	1 x shut-in well 2 x oil storage tank and transfer pump Pipeline manifold	Vent Gases Methane/Non methane VOC's, Hydrogen Sulphide
Beckingham 3	SK 790 902	0.3	2 x producing wells, 1 x well shut-in pipeline manifold	Produced, bund, sumps, well cellar water
Beckingham 4	SK 791 906	0.1	Previously silent site	
Beckingham 5	SK 795 905	0.1	1 x producing well	No Emissions
Beckingham 6	SK 789 906	0.2	Previously silent site 1 x shut-in well	No Emissions
Beckingham 8	SK 785 907	0.5	1 x producing well 3 x shut-in well, 3 x water injection wells pipeline manifold	Produced, , bund, sumps, well cellar water Produced water re-injection
Beckingham 21	SK 776 910	0.5	2 x producing wells, 2 x wells shut-in pipeline manifold	No Emissions
Beckingham 25	SK 770 902	0.9	2 x producing wells 2 x Wells shut-in	No Emissions
Beckingham 28	SK 798 901	0.4	2 x producing wells 1 x pipeline manifold	No Emissions
Beckingham 31	SK 773 904	0.7	1 x producing well 2 x wells shut-in	No Emissions
Beckingham 33	SK 765 904	0.6	1 x producing well	No Emissions
Beckingham 36	SK 765 900	0.7	1 x producing well 1 x Well shut-in 1 x abstraction well from Sherwood sandstone 1 x water storage tank	No Emissions
Beckingham 37	SK 759 899	0.7	1 x producing well	Produced, bund, sumps, well cellar water Rain water run off to ground via soakaway

Description of the changes introduced by the variation

This variation is to add -

1. A Mining Waste Operation, as defined by the Mining Waste Directive and Schedule 20 of the Environmental Permitting (England and Wales) Regulations 2016 as amended, relating to the management of extractive waste not involving a Mining Waste Facility. The permit is being varied to include activities specified in the approved Waste Management Plan and these include management of extractive mining wastes from near well-bore treatments involving acid wash, hot oil wash, hot water wash and scale removal and well workover operations.
2. Groundwater activities, as defined by the Groundwater Directive and Schedule 22 of the Environmental Permitting (England and Wales) Regulations 2016, as amended, for the re-injection of produced and clean surface water for production support and the discharge of site surface water to ground via field drains and a soakaway.
3. Permitted area by incorporating previously silent sites. Previous silent sites that are being incorporated into the permitted area include wellsites for Beckingham 4, Beckingham 6, Beckingham 7, Gainsborough 8, Gainsborough 36, Gainsborough 37 and Gainsborough 38,

The variation removes Gainsborough 27 wellsite from the permitted area. The site has been reinstated to its original condition

The variation also changes the operator's registered office address

The original permit was issued for an Industrial Emission activity as defined by the Industrial Emissions Directive and Part 2 Schedule 1.2 of the Environmental Permitting (England and Wales) Regulations 2016, relating to the loading, unloading, handling and storage of crude oil. This variation allows oil storage activities to be carried out at Gainsborough 5, Gainsborough 34 and Beckingham 1 wellsites.

The variation removes oil storage activities at the following wellsites:

Gainsborough well sites	2, 11, 14, 29, 31, 33, 41, 43, 58, 59, 60, Lea Road Station
Beckingham well sites	3, 5, 8, 21, 25, 28, 31, 33, 36, 40

There are no other changes to the permit.

Key issues of the decision

Changes in permitted area due to legacy abandonment of Gainsborough 27 wellsite

Prior to 1st October 2013, mining waste operations for oil prospecting were considered a low risk activity. Operators could prospect for oil and gas without an environmental permit authorising mining waste operations at that time. The operators were required to have environmental permits authorising oil storage activities only for those sites that produced oil. It was during this time that the operator abandoned Gainsborough 27 wellsite in line with conditions of the mining licence ML004. The operator handed back the site to the landowner. The decommissioning and abandonment of the well and restoration of the wellsite was approved by the Secretary of State for Trade and Industry who was the then Appropriate Authority for regulating the oil mining activities. Subsequently the permit was transferred to the current permit holder.

Policy changes in 2013 required all oil prospecting and production activities to be carried out under an environmental permit that authorised mining waste operations. In 2016, the Environment Agency began an exercise to review all legacy oil and gas production sites that existed before 2013 so as to bring them into line with modern standards and policies. As such this variation is part of that review of permits for legacy sites.

Recognising that the permitted site changed over 10 years under the circumstances that existed then, and that the Secretary of State for Trade and Industry consented to well abandonment and remediation of Gainsborough 27 under conditions of the mining licence ML004, we have accepted the operators submission of plans showing the extent of the permitted site to exclude the abandoned sites of Gainsborough 27.

Mining Waste Activities

For clarity a permit subject to the Mining Waste Directive covers the management of extracted waste and not the oil extraction process. The permit is being varied to add a mining waste operation which includes activities specified by the approved Waste Management Plan. This includes emissions from well maintenance and workovers. Well maintenance includes hot oil washing, wax dissolver treatment and acid treatment for scale removal. This variation does not permit any hydraulic fracturing. We have specified this limit in Schedule 1 of the permit under Table S1.1, activity A3.

The Operator may also undertake near wellbore treatments during the lifetime of hydrocarbon production from the wells, as part of routine maintenance activities. These will include hot oil washing, wax dissolver treatments and an acid wash.

The purpose of hot oil washing is to remove the build-up of paraffin precipitates. The process involves circulating hot oil down the well, to the production tubing above the perforations and is circulated back to the surface. Paraffin precipitates dissolved in the hot water or hot oil at the surface are passed through a free phase separator and directed to on-site storage tanks. The hot oil wash does not have any contact with the reservoir formation and does not pose a risk to groundwater.

The purpose of the acid wash is to dissolve scale from minerals in the produced water which has deposited on downhole equipment including tools, tubes, pumps and casing perforations. 15% Hydrochloric acid with water is circulated down the well and across the perforated sections of the well. The acid reacts with the minerals in the formation and all spent acid is recovered to the surface. We have considered the acid wash as described in the waste management plan and concluded that it meets the ground activity exclusion as described in Schedule 22 Paragraph 3.3(b) of the Environmental Permitting Regulations.

Groundwater Activities

A groundwater activity, in general terms, is defined in Schedule 22 of the 2016 Regulations as meaning the discharge of a pollutant that results in the direct input of that pollutant to groundwater, or a discharge of a pollutant in circumstances that might lead to an indirect input of that pollutant to groundwater or any other discharge or activity that might lead to a direct or indirect input of a pollutant to groundwater.

The groundwater activity for this site is to re-inject produced water resulting from the extraction of hydrocarbons into the Eagle Sandstone of the Pennine Middle Coal Measures and the Flood Sandstone of the Millstone Grit Group. The Eagle Sandstone Formation is located at approximately 960 m below ground level (m bgl) and the Flood Sandstone is present at approximately 1386 m bgl. Both of these formations contain groundwater.

The discharge is a direct discharge to groundwater which is prohibited under by the Water Framework Directive except under certain exemptions. One of these exemptions is:

“The injection of water containing substances resulting from the operations for exploration and extraction of hydrocarbons or mining activities, and injection of water for technical reasons, into geological formations from which hydrocarbons or other substances have been extracted or into geological formations which for natural reasons are permanently unsuitable for other purposes, provided that the injection does not contain substances other than those resulting from the above operations”

We are satisfied that this activity meets the above exemption. A permit can only be granted provided it does not compromise the achievement of any of the environmental objectives relating to groundwater in Article 4 of the Water Framework Directive. We have given detailed consideration to the proposal and we are satisfied that none of the relevant environmental objectives set out in Article 4 of the Water Framework Directive will be compromised.

We have reviewed the Hydrogeological Risk Assessment and Site Condition Report submitted with the supporting documents against our information and conceptual understanding of the location. We are satisfied that the potential risks to groundwater have been identified and addressed through mitigation measures and controls specified in this permit. This includes a requirement for additional groundwater monitoring to be carried out under Improvement Condition 3 to ensure that the risk of pollution from re-injection of produced water continues to be assessed through the lifetime of the permit.

We have included the discharge of site surface water runoff from non-process areas to ground via field drains at Gainsborough 1 and 5 and a soakaway at Beckingham 37 as three separate groundwater activities in the permit. We are satisfied that the potential risks to groundwater have been identified and addressed through mitigation measures and controls specified in this permit.

Discharge parameter limits for volume, chloride and visible oil or grease are included in Table S3.2 of the permit to prevent any potential impact to underlying groundwater in the

superficial till Secondary undifferentiated aquifer, superficial alluvium Secondary A aquifer and Mercia Mudstone Secondary B aquifer.

We have also included an Improvement Condition which requires the operator to review their site surface water management and submit a Surface Water Management Plan to show how rainfall is managed to ensure the environment is being protected. Groundwater monitoring under Improvement Condition 3 will also help show whether satisfactory measures are in place to prevent pollution of groundwater.

Future re-injection wells

As part of their application, the Applicant applied for a groundwater activity where some wells currently used for production will be converted to reinjection wells in future. These wells have not been considered in the Hydrogeological Risk Assessment that was provided with the current application. There was no adequate information on the reservoirs targeted for re-injection, anticipated re-injection depths or plans to monitor the impacts of reinjecting produced water into these additional boreholes.

There was insufficient information to assess the risk of converting these wells in future. We would require a satisfactory Hydrogeological Risk Assessment for these future reinjection wells before we could permit, with relevant conditions, changing existing production wells to future re-injection wells. We have therefore not included the future reinjection wells as permitted discharge points under this permit variation. However should the applicant wish to convert some of the current production wells to re-injection wells in future, they could apply for a variation of their permit. Such an application must be supported by a satisfactory Hydrogeological Risk Assessment and supporting information as required.

Permit conditions and future permit variation

If the Applicant wishes to carry out different or additional activities not covered by this permit, a further variation of the permit will be required. Any such variation application would be determined on its merits and would be subject to our normal consultation process. Any further application to vary operations to manage mining waste will require an amended waste management plan to be submitted.

Except where a permit condition imposes a different requirement, the permit requires the Operator to comply with the techniques in the waste management plan (WMP) and limits the activities to those stated unless otherwise agreed in writing by the Environment Agency. We will authorize only minor amendments to the WMP without the need to vary the Permit.

The Permit includes conditions taken from our standard environmental permit template including the relevant Annexes. We developed these conditions in consultation with industry, having regard to the legal requirements of the Environmental Permitting Regulations, Mining Waste Directive, Industrial Emissions Directive, Groundwater Directive, Water Framework Directive and other relevant legislation.

This document does not therefore include an explanation for these standard conditions. Where they are included in the permit, we have considered the Application and accepted that the details are sufficient and satisfactory to make the standard conditions appropriate.

Improvement Programme

We have imposed improvement conditions for the following reasons

1) Secondary and tertiary containment plan – Improvement condition IC1

Improvement condition IC1 is necessary to ensure that secondary and tertiary containment systems meet the standards required of a new oil and gas site. This will reduce the likelihood of any uncontrolled polluting discharges to the environment.

2) Leak detection and repair plan - Improvement condition IC2

A leak detection and repair plan is needed to manage fugitive VOC emissions from potential leak points such as seals, flanges, pumps and valves. This standard technique is a method for identifying and prioritising potential sources of leaks, developing a leak detection and repair programme using the monitoring standard EN 15446 including assessing reductions in emissions resulting from the programme and estimation/calculation of any residual emissions. The EN 15446 method is described in the Refineries BRef (2015) as an available method for carrying out monitoring of fugitive emissions. Alternative but equivalent methods can be proposed.

3) Groundwater Monitoring Plan – Improvement condition IC3

Improvement condition IC3 is necessary because the groundwater monitoring plan requires review, updating, and formalising. The groundwater monitoring plan, once approved, shall be incorporated into the permit as an operating technique.

Groundwater Monitoring is necessary to help determine whether the reinjection of produced water and the discharge of site surface water runoff from non-process areas to ground is affecting the quality of groundwater and whether satisfactory measures are being undertaken to prevent groundwater pollution. Groundwater monitoring is required for the purposes of requisite surveillance in accordance with the Environmental Permitting Regulations 2016. The submission of a groundwater monitoring plan will ensure that groundwater monitoring is based on the site conceptual model and hydrogeological risk assessment.

4) Updated written Environment Management System – improvement condition IC4

Improvement condition IC4 is necessary as based on the information submitted with the application we have identified a number of procedures that do not appear to be in place.

This improvement condition requires the relevant procedures to be written into the Operator's management system, and to be adhered to. The management system will be subject to usual compliance audit in future.

5) Gas Management Plan – Improvement condition IC5

Improvement condition IC5 is necessary as the operator does not appear currently to be applying best available techniques for the management of waste gas arising from their production of hydrocarbons in the event of the steel works being unable to take gas produced from the site.

Gas management is required as the impact of releasing large quantities of uncombusted hydrocarbons leads to a significant environmental impact which can be readily mitigated using available techniques.

We have included improvement condition 4 which requires the operator to submit for written approval a plan identifying their identified method for reducing the impact of gas emissions to atmosphere.

Gas management is necessary to reduce the environmental and human health impacts of emitting natural gas directly to atmosphere.

6) Air emissions monitoring – Improvement condition IC6

Improvement condition 6 is necessary as the site features emissions to air with the potential to cause pollution. We have applied improvement condition 6 to require the operator to undertake appropriate emissions monitoring from [each of] the emission point[s] on the site to understand the current performance of the process / equipment which gives rise to the emission. We will use the results of this monitoring to determine whether the operator's processes and equipment minimises the emission to air to as low as reasonably achievable in line with best available techniques. We expect the Operator to use these monitoring results when responding to IC 5 to ensure they are applying appropriate measures / best available techniques for the management of waste gas arising from their production of hydrocarbon.

Where appropriate, we will use these monitoring results to set appropriate assessment levels or compliance limits for the operator to comply with in future.

We consider this condition necessary as although the volume of each individual emission is comparatively small, the quality of combustion employed in each case can significantly alter the levels of various pollutants ultimately present within the emission. By requiring ongoing emissions monitoring, this condition will ensure that the operator achieves, and then continues to operate their processes and equipment to an acceptable standard, and commensurately reduces their environmental impact to as low a level as is reasonably practical.

7) Site Surface Water Management Plan-IC7

Improvement condition IC7 is required because the operator has indicated that rainwater is not always being dealt with in accordance with requirements necessary to protect the environment from uncontrolled contaminated discharges of site surface water. The development of a plan to show how rainfall is managed on all wellsites to ensure the environment is not compromised, will clarify how the requirements are being met and how the environment is being protected.

8) Site Condition Report Review –IC8

Improvement Condition IC8 is necessary because the operator is required to produce a Site Condition Report where there is a possibility of soil and groundwater contamination from activities that involve the use, production or release of a relevant hazardous substance, as defined in the Industrial Emissions Directive.

The Operator has not provided a Site Condition Report with baseline data to confirm the current state of any soil and/or groundwater contamination, or confirmed that existing soil and groundwater data for the site enables a baseline to be defined for the site.

Decision checklist

Aspect considered	Decision
Receipt of application	
Confidential information	A claim for commercial or industrial confidentiality has not been made.
Consultation	
Consultation	<p>The consultation requirements were identified in accordance with the Environmental Permitting Regulations and our public participation statement. The application was publicised on the GOV.UK website at https://www.gov.uk/government/publications/dn21-1ay-igas-energy-production-limited-environmental-permit-application-advertisement/dn21-1ay-igas-energy-production-limited-environmental-permit-application-advertisement</p> <p>We consulted the following organisations: Local Planning Authority – Bassetlaw District Council Environmental Health England Public Health England Director of Public Health England</p> <p>The comments and our responses are summarised in the consultation section.</p>
Operator	
Control of the facility	We are satisfied that the applicant (now the operator) is the person who will have control over the operation of the facility after the grant of the permit. The decision was taken in accordance with our guidance on legal operator for environmental permits.
The facility	
The regulated facility	<p>We considered the extent and nature of the facilities at the site in accordance with RGN2 'Understanding the meaning of regulated facility', Appendix 2 of RGN 2 'Defining the scope of the installation', Appendix 1 of RGN 2 'Interpretation of Schedule 1', guidance on waste recovery plans and permits.</p> <p>The extent of the facilities are defined in the site plans submitted and in Schedule 7 of the permit. The activities are defined in table S1.1 of the permit.</p>

Aspect considered	Decision
The site	
Extent of the site of the facility	<p>The operator has provided plans which we consider are satisfactory, showing the extent of the site of the facility including the discharge points</p> <p>The plan is included in the permit.</p>
Site condition report	<p>The operator has provided a description of the condition of the site, and concluded that it will need updating in order to comply with requirements of Article 22 of the Industrial Emissions Directive. The Operator has not provided a Site Condition Report with baseline data to confirm the current state of any soil and/or groundwater contamination, or confirmed that existing soil and groundwater data for the site enables a baseline to be defined for the site.</p> <p>We have advised the operator what measures they need to take to improve the site condition report.</p> <p>We have imposed Improvement Condition IC9 that makes it a condition for the operator to produce a Site Condition Report where there is a possibility of soil and groundwater contamination from activities that involve the use, production or release of a relevant hazardous substance, as defined in the Industrial Emissions Directive.</p> <p>The decision was taken in accordance with our guidance on site condition reports and baseline reporting under the Industrial Emissions Directive.</p>
Waste management plan	<p>The operator has provided a waste management plan which we consider is satisfactory.</p> <p>We have not approved the plan on Routine Well maintenance titled "Reg 60 Routine Well Maintenance Treatments HSE.RP.199" as it contains proposals for well stimulation by hydraulic fracturing.</p>
Biodiversity, heritage, landscape and nature conservation	<p>We have assessed the application and its potential to affect all known sites of nature conservation, landscape and heritage and/or protected species or habitats identified in the nature conservation screening report as part of the permitting process.</p> <p>We consider that the application will not affect any sites of nature conservation, landscape and heritage, and/or protected species or habitats identified.</p>

Aspect considered	Decision
Environmental risk assessment	
Environmental risk	<p>We have reviewed the operator's assessment of the environmental risk from the facility.</p> <p>There will be no increase in emissions as a result of this variation, and consequently no increase in environmental risk.</p>
Operating techniques	
<p>Operating techniques</p> <p>Water Quality</p>	<p>We have reviewed the Operators Hydrogeological Risk Assessment and the techniques proposed by the operator and compared these with the relevant technical guidance. We consider them to represent appropriate techniques for the facility. The operating techniques that the applicant must use are specified in table S1.2 in the environmental permit.</p> <p>We are satisfied that the risks to groundwater have been adequately assessment and the proposed activities are not likely to have an adverse impact on surface water and groundwater quality.</p> <p>In addition we have imposed condition 3.5.1 which requires the operator to monitor groundwater quality and surface water quality.</p> <p>We have also specified several improvement conditions to ensure the operations meet the requirements of our Onshore Oil and Gas Sector Guidance, August 2016.</p> <p>IC 1 requires the operator to review their site containment in order to demonstrate there is not pollution risk to surface and groundwater</p> <p>IC3 requires the operator to install groundwater monitoring boreholes and provide groundwater monitoring proposals to monitor re-injection activities on site.</p> <p>IC8 requires the operator to review their surface water management and implement any agreed changes.</p>

Aspect considered	Decision
General operating techniques	<p>We have reviewed the techniques used by the operator and compared these with the relevant guidance notes and we consider them to represent appropriate techniques for the facility. The operating techniques that the applicant must use are specified in table S1.2 in the environmental permit. This includes the requirement for the Operator to provide a waste management plan and the information required within this. The waste management plan, including associated documents, has been assessed in accordance with these requirements and is approved subject to conditions. Condition 2.3.1 ensures that the operations are limited to those described in the WMP and in table S1.2. It also ensures that the Operator follows the techniques set out and that any deviation will require our written approval. Any significant changes will require a formal variation of the permit. Where a condition imposes a specific requirement that will take precedence over anything in the plan.</p> <p>In addition have inserted additional improvement conditions as part of the permit review to ensure these operations continue to meet the requirements of our Onshore Oil and Gas Sector Guidance, August 2016.</p>
Odour management	<p>We have considered potential odour emissions from the activity during our determination. We do not consider that the activity will give rise to significant levels of odour. Condition 3.3.1 in the permit requires that emissions from the activities shall be free from odour at levels likely to cause pollution outside the site.</p> <p>We are satisfied that appropriate measures will be in place to manage odour. However, we have included condition 3.3.2 in the permit. This condition enables us to require the Operator to submit a specific odour management plan, should odour become a problem. If a plan be required in the future, once we have assessed this plan as suitable, it will form part of the permit and the Operator must carry out the activity in accordance with the approved techniques.</p>
Noise management	<p>We have considered emissions from noise and vibration during our determination. Condition 3.4 in the permit requires that emissions from the activities shall be free of noise and vibration at levels likely to cause pollution outside the site.</p>

Aspect considered	Decision
	<p>We have included condition 3.4.2 in the permit. This condition enables us to require the Operator to submit a specific noise and vibration management plan, should noise and vibration become a problem. If a plan be required in the future, once we have assessed this plan as suitable, it will form part of the permit and the Operator must carry out the activity in accordance with the approved techniques.</p>
Permit conditions	
Use of conditions other than those from the template	Based on the information in the application, we consider that we do not need to impose conditions other than those in our permit template.
Updating permit conditions during consolidation	We have updated permit conditions to those in the current generic permit template as part of permit consolidation. The conditions will provide the same level of protection as those in the previous permit(s).
Changes to the permit conditions due to an Environment Agency initiated variation	<p>We have varied the permit as stated in the variation notice.</p> <p>This variation is required as the Environment Agency has a duty, under the Environmental Permitting (England and Wales) Regulations 2016, regulation 34(1), to periodically review permits. As a result of that review we have identified a number of necessary changes we must make to the permit to reflect current legislation and best practice. These changes principally relate to the improvement programme specified in condition 2.4 of the permit</p>
Improvement programme	<p>Based on the information on the application, we consider that we need to impose an improvement programme.</p> <p>We have imposed an improvement programme for reasons outlined above under “key issues” section.</p>

Aspect considered	Decision
Emission limits	<p>We have considered emissions to air during the determination of the application. Fugitive emissions associated with the proposed activities will be at insignificant levels which are unlikely to cause negative impact on nearby receptors.</p> <p>The Operator has provided environmental risk assessments and consideration in the WMP for the management of waste gas and we have found these to be satisfactory. Acidification and Toxic Contamination could occur from the potential release of H₂S into the atmosphere during venting. ELVs equivalent parameters have been set for the Hydrogen sulphide in Schedule 3 of the permit.</p> <p>Hydrogen Sulphide</p> <p>We have also required the operator to monitor emissions to air, and if trends shown an increase in emissions, then the Environment Agency will require the operator to implement a plan to manage emissions.</p> <p>It is considered that the numeric and descriptive limits described below will prevent significant deterioration of receiving waters. We have imposed these limits because either a relevant environmental quality or operational standard requires this.</p> <p>Discharge limits for the discharge of site surface water from non process areas to ground through field drains and soakaway at GB1, GB05 and BK37 have been set for the following parameters in Schedule 3, Table S3.2 of the permit:</p> <ul style="list-style-type: none"> • Chloride – 150 milligrams per litre (mg/l) (maximum) • Visible oil or grease (no significant trace present) <p>The limit for Chloride has been set below the Drinking Water Standard. The descriptive limit for no visible oil or grease is to ensure that the oil interceptors is working to its design specification. The discharge limits have been set to prevent any impact on underlying groundwater.</p>
Monitoring	<p>We have decided that monitoring should be carried out for the parameters listed in the permit, using the methods detailed and to the frequencies specified. Condition 3.5 of the permit requires the Operator to monitor emissions to air from the oil gas vent.</p>

Aspect considered	Decision
	<p>We also require monitoring of rate and volume of produced water reinjected along with concentrations and volumes of chemicals added to the produced water prior to reinjection. The discharge of treated site surface water to ground via field drains and soakaway is also required to be monitored for chloride and oil and grease.</p> <p>In addition following approval of the groundwater monitoring and the surface water management plan under IC3 and IC8, we will also require additional groundwater and surface water monitoring under S3.5 under the permit.</p> <p>The Operator will keep records of the data collected, which must be submitted to the Environment Agency on a regular basis.</p> <p>We made these decisions in accordance with the requirements of our Onshore Oil and Gas Sector Guidance, August 2016 and the Groundwater Directive and to baseline report required under the Industrial Emissions Directive.</p> <p>Based on the information in the application we are satisfied that the operator's techniques, personnel and equipment have either MCERTS certification or MCERTS accreditation as appropriate.</p>
Reporting	<p>We have specified reporting in the permit.</p> <p>The reports will enable information on trends to be assessed and interventions to be carried out when required.</p> <p>We made these decisions in accordance with the requirements of our Onshore Oil and Gas Sector Guidance, August 2016 and the Groundwater Directive and to baseline report required under the Industrial Emissions Directive.</p>
Operator competence	
Management system	<p>There is no known reason to consider that the operator will not have the management system to enable it to comply with the permit conditions.</p> <p>The decision was taken in accordance with the guidance on operator competence and how to develop a management system for environmental permits.</p>
Relevant convictions	<p>The Case Management System and National Enforcement Database have been checked to ensure that all relevant convictions have been declared.</p>

Aspect considered	Decision
	No relevant convictions were found. The operator satisfies the criteria in our guidance on operator competence.
Financial competence	There is no known reason to consider that the operator will not be financially able to comply with the permit conditions.
Financial provision	We are satisfied that the waste from the site has properly been characterised as non-hazardous waste. By virtue of paragraph 9(3) of Schedule 20 to the Environmental Permitting (England and Wales) Regulations 2016 the requirements mentioned in Article 2(3) of the MWD are waived. These requirements include the need for a financial guarantee for non-hazardous waste, unless deposited in a Category A facility. So no financial guarantee can be required in respect of the fluid left in the target formation.

Aspect considered	Decision
Growth Duty	
<p>Section 108 Deregulation Act 2015 – Growth duty</p>	<p>We have considered our duty to have regard to the desirability of promoting economic growth set out in section 108(1) of the Deregulation Act 2015 and the guidance issued under section 110 of that Act in deciding whether to grant this permit.</p> <p>Paragraph 1.3 of the guidance says:</p> <p>“The primary role of regulators, in delivering regulation, is to achieve the regulatory outcomes for which they are responsible. For a number of regulators, these regulatory outcomes include an explicit reference to development or growth. The growth duty establishes economic growth as a factor that all specified regulators should have regard to, alongside the delivery of the protections set out in the relevant legislation.”</p> <p>We have addressed the legislative requirements and environmental standards to be set for this operation in the body of the decision document above. The guidance is clear at paragraph 1.5 that the growth duty does not legitimise non-compliance and its purpose is not to achieve or pursue economic growth at the expense of necessary protections.</p> <p>We consider the requirements and standards we have set in this permit are reasonable and necessary to avoid a risk of an unacceptable level of pollution. This also promotes growth amongst legitimate operators because the standards applied to the operator are consistent across businesses in this sector and have been set to achieve the required legislative standards.</p>

Consultation and web publicising

The following summarises the responses to consultation with other organisations, our notice on GOV.UK for the public, and the way in which we have considered these in the determination process.

The application was publicised on the GOV.UK website at <https://www.gov.uk/government/publications/dn21-1ay-igas-energy-production-limited-environmental-permit-application-advertisement/dn21-1ay-igas-energy-production-limited-environmental-permit-application-advertisement> because of the high levels of public interest in the onshore Oil and Gas Sector. The application itself is NOT high public interest.

We consulted the following organisations:

- Local Planning Authority – Bassetlaw District Council
- Environmental Health England
- Public Health England
- Director of Public Health
- Mineral Planning Authority- Lincolnshire County Council

1) Consultation Responses from Statutory and Non-Statutory Bodies

Only Public Health England made recommendations summarised below

Response received from Public Health England (PHE)
Brief summary of issue raised : Emissions to air
PHE noted that main emissions of potential concern are emissions to air of products of combustion from heaters and gas generators, fugitive emissions to air of Volatile Organic Compounds (VOCs) from stored oil, and fugitive emissions to water. They recommended that the Environment Agency (EA) should ensure the applicant's 2011 H1 risk assessment remains valid.
Summary of actions taken/ how this has been covered
We have set condition 3.2.2 which empowers us to require the Operator to submit for our approval an emissions management plan in the event that we perceive that emissions from the site are causing pollution beyond the permitted site. We have also imposed condition 3.5.1. requiring the Operator to monitor emissions from the site. We have also imposed improvement condition IC5 requiring the operator to provide a gas management plan based on an analysis of gas emissions from points specified in Schedule 3 of the permit.

Brief summary of issue raised: Emissions to water

PHE also noted that the applicant's gap analysis indicates some areas where improvements may be necessary to meet sector guidance. PHE also noted that there were differences between the number of sites identified within the non-technical summary and waste management plan. PHE recommended that the Environment Agency should clarify differences between the number of sites identified within the non-technical summary and waste management plan and that the sites covered by the permit are compliant with sector guidance.

Summary of actions taken/ how this has been covered

We sought for clarification on the number of permitted sites. Schedule 7 of the permit shows all well sites that form the permitted area covered by this permit. We have also imposed improvement conditions IC1 and IC7 requiring the operator to produce and implement a plan for secondary and tertiary containment and a plan for surface water management. These plans will reduce the likelihood of any uncontrolled polluting discharges to the environment.

Brief summary of issue raised: Accident management plan

PHE also recommended that the Environment Agency should ensure that the applicant's accident management plans are robust and sufficient mitigation is in place to ensure that accidents and incidents do not adversely affect public health.

Summary of actions taken/ how this has been covered

We have assessed the pollution mitigation measures in the Waste Management Plan and Risk Assessment and we are satisfied that they are appropriate.

However the applicant recognises the need to have internal procedures in place in case of pollution and these will form part of the management system required under condition 1.1.1 of the permit. We check the adequacy of these as part of our compliance work.

We are satisfied we have sufficient information to determine the application.

In determining the permit, we have taken into account of the requirements of Mining Waste Directive 2006/21/EC. Article 6 of the Directive requires provision of a major accident prevention plan for Category A waste facilities. The permit does not authorise a waste facility and therefore there is no Category A waste facility which require the Applicant to submit an Accident Prevention and Management Plan.

The permit has condition 4.3.1 which require the Operator to notify us immediately in the event of any malfunction, breakdown or failure of equipment or techniques, accident, or emission of a substance not controlled by an emission limit which has caused, is causing or may cause significant pollution.

2) Consultation Responses from Members of the Public and Community Organisations

3 responses were formally received from the public.

We can only consider comments which pertain to the management of the extractive waste arising from the exploration for oil and gas and well testing, including flaring of gas regulated under the Industrial Emission Directive which is what the Application relates to. For consultation comments that relate to matters beyond our regulatory control see section 3 below.

Summaries of the consultation responses and how we have addressed them are as follows:

i) Noise pollution

Concerns have been raised that the activities will cause noise pollution.

We are satisfied that the conditions of the permit adequately control the risk of pollution from noise.

The permitted facilities have been in operation for many years and reports on noise have yet been received. Condition 3.4 of the permit controls noise and vibration and requires that emissions are minimised and, if the activities give rise to pollution due to noise or vibration outside the site, a noise and vibration management plan is submitted to the Agency for approval and implemented.

ii) Point source emissions

Concerns have been raised on how point source emissions from venting would be controlled.

Gas management is necessary to reduce the environmental and human health impacts of emitting natural gas directly to atmosphere.

We recognise that emissions of gas from the site needs to be controlled and we have included monitoring conditions in the permit requiring the Operator to monitor the quantities of oxides of nitrogen, carbon monoxide, and total volatile organic compounds emitted. The operator is required to provide half yearly reports.

Gas management is required as the impact of releasing large quantities of uncombusted hydrocarbons leads to a significant environmental impact which can be readily mitigated using available techniques.

We have included improvement condition 4 which requires the operator to submit for written approval a plan identifying their identified method for reducing the impact of gas emissions to atmosphere.

iii) **Inadequate consultation**

Concerns were made that the Environment Agency must conduct much fuller and more comprehensive public engagement by way of regular face to face meetings.

We carried out consultation on the Application taking into account the Environmental Permitting Regulations and our statutory Public Participation Statement and the requirements of Article 8 of the Mining Waste Directive (MWD).

We advertised the Application by a notice placed on our website, which contained all the information required by the regulations, including making the application documents available online. We also stated where copies of the application could be viewed by anyone interested.

We have discretion as to whether to carry out “minded to” consultation on draft permits for sites or public engagements. We normally do so for sites of High Public Interest. The decision to do so is not solely based on the number of responses we receive as part of our standard 4 weeks consultation. It is also based on complexity of activity and the overall environmental risk associated with the application. This site has been in existence for many years and is not classified as high public interest and we have decided that a “minded to” consultation is not warranted as the site itself is not a site of high Public Interest.

3) Other matters outside the scope of this permit Application that the public have commented on which may be more relevant to Applications for other permissions.

a) Vehicle access to the site and traffic movements:

These are relevant considerations for the grant of planning permission, but do not form part of the Environmental Permit decision making process except where there are established high background concentrations contributing to poor air quality and where the increased level of traffic might be significant in these limited circumstances. This is not the case for the locations covered.

b) Climate change and energy policy

Policy is made by the Government and the policy on exploitation of Shale Gas is no different to that of any other fossil fuel. The policy states “We aim to maximise the economic recovery of oil and gas from the UK’s oil and gas reserves, taking full account of environmental, social and economic objectives”.