

# Permitting decisions

## Variation to permit

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We have decided to issue the variation for West Firsby Wellsite operated by Europa Oil & Gas Limited.

The variation number is EPR/ EPR/ZP3838RH.

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 a groundwater activity; and
- Oil storage activities.

The variation also aims to:

- Formalise changes to monitoring requirements and compliance limits where we have agreed them in writing, for example as the result of an environmental 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.

## Brief outline of proposed process

### Oil production

The West Firsby wellsite is located approximately 1.66kilometres to the west of Spridlington, Lincolnshire. The wellsite was constructed in the mid 1980's and has a total area of 1.88 hectares. The site is directly underlain by a principal aquifer, the Blisworth Limestone followed by the Rutland Formation comprising mudstone, sandstone, siltstone and limestone. The Lincolnshire Limestone lies beneath these strata and is the main water bearing body in the area. The site is within an SPZ 2 for and Anglian Public Water Supply borehole. The ground water monitoring at the site targets the Lincolnshire Limestone Principal Aquifer as this is main water bearing strata at the site and is connected to the SPZ. The Rutland Formation is a Secondary B Aquifer.

Seven wells have been drilled at the wellsite. These are named WF1, WF2, WF3, WF4, WF5, WF6, andWF9. Two side-tracks have been drilled at the wellsite; a side-track (WF8) has been drilled from WF1 and a side-track (WF7) has been drilled from WF5.The current status of the boreholes on site are shown in the table below.

<b>Borehole name</b>	<b>Borehole UWID</b>	<b>Spudded</b>	<b>Drilling Operator</b>	<b>Wellbore completion and current status</b>
WF1	L46/18-7Z	15 November 1987	Enterprise	Side-track to WF8
WF2	L46/18-8	27 June 1988	Enterprise	Suspended
WF3	L46/18-9	20 August 1988	Enterprise	Water injection
WF4	L46/18-10	9 November 1992	Tullow	Suspended
WF5	L46/18-14	28 August 1995	Tullow	Side-track to WF7
WF6	L46/18-15	28 September 1996	Tullow	Production
WF7	L46/18-17	17 January 2004	Europa Oil & Gas	Production
WF8	L46/18-19	4 March 2005	Europa Oil & Gas	Suspended
WF9	L46/18-20	15 December 2010	Europa Oil & Gas	Production

Crude oil, together with admixed reservoir water, is drawn from the wells by way of a beam pump system. On exiting the well, the crude oil, admixed reservoir water and power fluid are passed through a process heater before separation in one of two three-phase separators. The process heater is a heat exchange system which utilises waste heat from the two operational gas fired engines which drive the fluid pumps. Crude oil flows from the three-phase separators to one of the seven interlinked oil storage tanks where it is stored until removal by a road tanker. Reservoir water is piped from the three-phase separator into one of two separate water storage tanks where it is stored until it is re-injected into the oilfield by way of injection into the on-site water injection well(WF2).

The three operating wells produce approximately 900bbl/day of reservoir water (approximately 52,700m<sup>3</sup>/annum). About 15-18mscf of gas are produced per day. Gas released from the three-phase separators is passed to a scrubbing unit to reduce hydrogen sulphide levels before being utilised as a fuel to run the gas engines that drive the triplex plunger pumps. Gas emitted from the oil and water storage tanks passes through another scrubbing system to reduce hydrogen sulphide levels before flaring. The majority of gas produced by the wells is utilised as fuel. Propane gas is stored on-site for utilisation as a supplementary fuel. Other power requirements for the site are met by electrical power from the grid.

The West Firsby Well site currently produces approximately an average of 57 bbls/day (approximately 3,337m<sup>3</sup>/annum) of crude oil. All produced water is re-injected to the oil bearing strata through a water reinjection well located on site.

### **Radial jetting operations**

Europa proposes to undertake radial jetting operations within the existing West Firsby producing wellbores to improve the flow of petroleum within the targeted reservoirs. Operations at the site may involve radial drilling of extended perforations by hydraulically jetting a hole in the formation using a steel jetting nozzle the size of a lip-stick. The drain holes will be constructed into the oil bearing sandstone reservoir at between 1519 and 1588 metres True Vertical Depth Subsea (TVDSS). Hydraulic fluid enters the nozzle via a flexible hose at high pressure and exits the nozzle through various needle-sized holes, breaking down the formation rock contacted by a combination of surface erosion / poro-elastic tensile cavitation. As the hydraulic fluid needs to pass through these needle-sized holes in the nozzle, there can be no particulates or proppants used. Generally hydraulic fluid that can be used is a clean synthetic brine made-up of 2-3% concentration KCl, or filtered production water; 15% HCl concentration acid (generally for limestones); 12% HCl / 3% HF concentration acid mixture (generally for sandstones) or clean diesel.

A maximum of 6m<sup>3</sup> of hydraulic fluid is used for the radial drilling process for each drain hole constructed. Of this volume, a maximum of 1 m<sup>3</sup> of hydraulic fluid is pumped down the well through the coiled tubing unit and exits the steel jetting nozzle at a high velocity and pressure jetting an approximately 1 inch diameter hole into the producing formation. A maximum 1m<sup>3</sup> of fluid will enter into the oil bearing formation up to 100m from the production borehole. The hydraulic fluid that enters the producing formation will be produced back to the surface when the well is put back into production.

The number of drain holes jetted from a single wellbore may vary considerably (e.g. 2-16) with the borehole trajectory and number of target reservoirs penetrated. However given the modest flow rates expected and high capital expenditures required for rental of a workover rig and expensive equipment, jetting a drain-hole to increase productivity of a well is not likely to be scheduled more than once or twice in a well's lifetime because of the significant capital expenditure required.

### **Routine well maintenance activities**

Acid wash, hot oiling and scale removal will be carried out as part of routine maintenance activities to improve the flow of petroleum within the Beacon Hill Flags and Rough Rock formations. We have reviewed and agreed with assessments that have been provided in the waste management plan and environmental risk assessment, which include details of operations and quantities, that determine that the treatments meet deminimus and will not need extra groundwater permits.

### **Acid Washing**

Acid washing will involve applying Hydrochloric acid (HCl) at 15% concentration with water (i.e. 150kg of HCl with 850kg of water), to the formation through the wellbore. It is anticipated that between 6m<sup>3</sup> to 11m<sup>3</sup> of HCl will be pumped into the formation during the operation, with all spent acid being recovered to surface. The HCl reacts with the calcite through dissolution to produce carbon dioxide (CO<sub>2</sub>), water (H<sub>2</sub>O) and chloride ions (Cl<sup>-</sup>). The chloride ions exist in water and pair to form calcium chloride (CaCl<sub>2</sub>). Calcium chloride (salt) is not a hazardous substance and must therefore be considered as a non-hazardous pollutant.

Whilst the injection of hydrochloric acid is a groundwater activity, it is to be considered de-minimis as once the hydrochloric acid has reacted with the formation the remaining neutral solution is circulated back out of the borehole.

### **Hot oiling**

Hot oiling will be carried out to dissolve or dislodge paraffin precipitates. Hot oil, previously produced from the formation, is pumped from storage tanks onsite, via a mobile hot oil pump, which heats the oil prior to circulating down the well. Hot oil is pumped down the tubing to immediately above the perforations and circulated back to surface, dissolving or dislodging paraffin precipitates.

Paraffin precipitates dissolved or dislodged within the hot oil are diverted from the borehole at surface through the three phase separator and back to the onsite oil storage tanks where it is commingled with the produced oil. Produced oil is subsequently transferred to road tankers and removed from site by a licenced haulier to a permitted refinery for sale.

No hot oil is pumped into the formation and it is all recovered so no waste is generated, therefore, a groundwater activity permit is not required nor does the activity fall to be considered a mining waste activity.

### **Descaling of calcium carbonate CaCO<sub>3</sub> and barium sulphate BaSO<sub>4</sub>.**

Natural scales can form downhole from production waters in the production casing and tubing, due to the lower pressures and temperatures in the wellbore than formation, or from mixing of formation waters when commingling production. Many different types of insoluble scale may form but two common ones found and treated in Europa's operated fields are calcium carbonate CaCO<sub>3</sub>; and barium sulphate BaSO<sub>4</sub>.

These scales often form as continuous coatings on the inside of any production liners, casings or tubings and cause restrictions at any narrow points.

For barium sulphate Europa uses BaSOL 2000 or BaSOL 2000 HP from Schlumberger subsidiary MI-SWACO. These are alkaline potassium carbonate buffered poly-carboxylic acid salt solutions, which are strong chelating agents, that isolate and lock-up the scale metallic ions (like barium) within their closed cage-like structures. Thus they effectively remove the metallic ions from solution and stop them from reacting with sulphates or other anions in solution that may precipitate out as solids.

The formic acid reacts with the solid calcium carbonate dissolving it to produce carbon dioxide  $\text{CO}_2$ , water  $\text{H}_2\text{O}$  and formate ions  $\text{HCOO}^-$ . The formate ions exist in water and pair to form calcium formate  $\text{Ca}(\text{HCOO})_2$ , which is also known as food additive E238 in food industry. Once the CAL-Acid has reacted with the formation the remaining neutral solution is circulated back out of the borehole.

Once the BaSOL has reacted with the formation the exhausted solution is circulated back out of the borehole. Whilst the injection of CAL-Acid and BaSOL are groundwater activities they can be considered de-minimis, due to the low volumes proposed and once reacted with the formation the remaining neutral solutions are circulated back out of the borehole.

### **Releases to the environment**

The principal releases to the environment comprise:-

- a) Emissions of gaseous hydrocarbons from the road tanker by displacement on loading.
- b) Combustion of gas emissions from the gas flare
- c) Clean rainwater from hard surfaced work areas is mixed with produced water and is reinjected with reinjection well.
- d) Contaminated waters from the well cellars, bund and other hard surface areas are collected and re-injected to the oil reservoir with produced water via the re-injection well located within the installation.
- e) Oils collected in the 3 stage interceptor are separated out, passed through the slop tanks and held in the oil storage tanks.
- f) Engineering waste resulting from maintenance work is removed for disposal at a licensed waste facility.

## Description of the changes introduced by the variation

This is a normal variation to add the following activities

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-squeeze, hot oil wash, scale removal, radial drilling and well workover operations.
2. A groundwater activity, as defined by the Groundwater Directive and Schedule 22 of the Environmental Permitting (England and Wales) Regulations 2016 as amended, for the reinjection of produced and clean surface water for production support.

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, as amended, relating to the loading, unloading, handling and storage of crude oil.

In order to permit the re-injection of produced water to the ground, an environmental permit for a groundwater activity is required. Where it is proposed to convert a production well to a re-injection well for the re-injection of produced water to ground, an environmental permit for a groundwater activity is required. This permit requires the applicant to have provided a detailed hydrogeological risk assessment, or equivalent document, prior to the commencement of the operations, which the Environment Agency must be satisfied with. The groundwater activity permit will need to be granted prior to the use of the wells for injection purposes and be agreed and issued with a condition that requires the operator to **submit a notification** to the Environment Agency prior to the conversion. The activity must not take place until the operator has received written approval from the Environment Agency of the request for a change contained within the notification.

The operator will need to confirm that the conditions relevant to the groundwater activity on the permit have been complied with prior to the operation of the well for reinjection purposes.

## Key issues of the decision

For clarity a permit subject to the Mining Waste Directive covers the management of extracted waste and not the oil extraction process. 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 well, as part of routine maintenance activities. These will include hot water washing, hot oil washing, wax dissolver treatment and acid treatment.

The purpose of hot water washing and hot oil washing is to remove the build-up of paraffin precipitates. The process involves circulating hot oil or heated produced water 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 water wash and 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 and squeeze is to clean out existing natural fractures in the Rough Rock and Beacon Hill Flats which have been blocked during the production of hydrocarbons. 15% Hydrochloric acid with water is circulated down the well and across the perforated sections of the well. Acid may then be selectively pushed into the near wellbore area. The acid reacts with the minerals in the formation and all spent acid is recovered to the surface. We have considered the acid wash and squeeze treatment as described in the waste management plan and concluded that it meets the groundwater activity exclusion as described in Schedule 22 Paragraph 3.3(b) of the Environmental Permitting Regulations.

### **Radial drilling: Assessment of radial drilling and hydraulic fluids proposed**

Three hydraulic fluids are proposed for the radial jetting process; filtered produced water, 12% Hydrochloric (HCl) and 3% Hydrofluoric acid (HF) mixture and 'clean diesel'.

#### **Filtered produced water**

Produced water is naturally occurring water which results from the exploration and extraction of hydrocarbons and is produced from a well alongside oil and gas.

Any produced water that enters the formation during the radial drilling process will be into the oil bearing part of the formation. Should any produced water enter groundwater present in the sandstone units, this would be of a similar quality to the groundwater already present in the producing sandstone reservoirs. The filtered produced water used as hydraulic fluid for the radial drilling process will be circulated back out of the well.

Although the filtered produced water will contain hydrocarbons, any potential impact on groundwater in the producing formations will be trivial and would not be discernible against the natural background groundwater quality.

We would consider that the radial jetting drilling using filtered produced water, in this site specific instance, to comply with the groundwater activity exclusion under the EPR 2016 (paragraph 3(3) (b) of Schedule 22) in that any discharge to groundwater that may occur would be of a quantity and concentration so small as to obviate any present or future danger of deterioration in the quality of any receiving groundwater. An environmental permit for a groundwater activity is not required.

## **Hydrochloric and Hydrofluoric Acid**

A maximum of 4m<sup>3</sup> of 12% Hydrochloric and 3% Hydrofluoric acid mixture with water will enter the producing formation during the radial drilling of four drain holes. The acid will react with the minerals (such as crystalline silica, quartz) in the formation and will create a near neutral solution.

The volumes of acid to be used are very low and the acid will react with the formation and fines to produce an inert near neutral solution. There will be no residual product remaining in the reservoir and any groundwater present will be naturally enriched with hydrocarbons and salts. Therefore any potential impact on groundwater would be insignificant and not discernible against the natural background groundwater quality.

We would consider that the radial jetting process using a 12% Hydrochloric and 3% Hydrofluoric acid mixture with water, in this site specific instance, to comply with the groundwater activity exclusion under the EPR 2016 (paragraph 3(3) (b) of Schedule 22) in that any discharge to groundwater that may occur would be of a quantity and concentration so small as to obviate any present or future danger of deterioration in the quality of any receiving groundwater. An environmental permit for a groundwater activity is not required.

## **Diesel**

A maximum of 4m<sup>3</sup> of diesel will enter the oil bearing part of the reservoir during radial drilling of four drain holes. Diesel that enters the reservoir will have a lower density than the crude oil in the producing reservoir. Therefore any diesel oil will naturally 'float' on the denser in-situ oil in the reservoir. The diesel hydraulic fluid will be recovered and circulated back out of the well when the production well is put back onto production.

Although diesel will contain a hazardous substance, it will not discharge into the groundwater bearing part of the reservoir formation. The volumes proposed are very small (maximum of 4m<sup>3</sup> for four drain holes) and any groundwater in the reservoir formation will be naturally enriched in oil related hydrocarbons. Any potential impact on groundwater in reservoir will be trivial. We would consider the activity as present to be of a quantity and concentration so small as to obviate any present or future danger of deterioration in the quality of the receiving groundwater under EPR 2016 (paragraph 3(3) (b) of Schedule 22). An environmental permit for a groundwater activity is not required.

## **Groundwater Activity**

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 Beacon Hill Flags, part of the Millstone Grit Group. The Beacon Hill Flags are approximately 1510m deep and 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.

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 - 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) **Updated written Environment Management System – improvement condition IC3**

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.

## 4) **Gas Management Plan – Improvement condition IC4**

Although gas produced from the site is used at the adjacent steel works, there may be times when outages at the steelworks results in gas not being utilised. 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 5 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.

## 5) **Air emissions monitoring – Improvement condition IC5**

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 the emission point 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 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.

#### **6) Vapour Recovery Plan – Improvement condition IC6**

Improvement condition IC4 is necessary as the operator does not appear to be currently complying with the requirement to capture and recover all hydrocarbon vapours arising from the loading and unloading of liquid hydrocarbons into vehicles.

Vapour recovery is necessary both for safety reasons and also to reduce the environmental impacts of storing, loading, transporting and unloading hydrocarbons.

Improvement condition IC8 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 to ensure the environment is not compromised, will clarify how the requirements are being met and how the environment is being protected.

#### **7) Surface Water Management Plan – Improvement condition IC7**

Improvement condition IC5 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 to ensure the environment is not compromised, will clarify how the requirements are being met and how the environment is being protected.

## Decision checklist

Aspect considered	Decision
<b>Receipt of application</b>	
Confidential information	A claim for commercial or industrial confidentiality has not been made.
Identifying confidential information	We have not identified information provided as part of the application that we consider to be confidential.
<b>Consultation</b>	
Consultation	<p>The consultation requirements were identified in accordance with the Environmental Permitting Regulations and our public participation statement.</p> <p>The application was publicised on the GOV.UK website because of the high levels of public interest in the onshore Oil and Gas Sector. The application itself is NOT high public interest.</p> <p>We consulted the following organisations:</p> <p>Local Authority, Environmental Protection- North Lincolnshire Council</p> <p>Food Standards Agency</p> <p>Health and Safety Executive</p> <p>Mineral Planning Authority-North Lincolnshire Council</p>
<b>Operator</b>	
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.
<b>The facility</b>	
The regulated facility	<p>We considered the extent and nature of the facility 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 facility defined in the site plan and in the permit. The activities are defined in table S1.1 of the permit.</p>
<b>The site</b>	
Extent of the site of the facility	The operator has provided plans which we consider are satisfactory, showing the extent of the site of the facility including emission and discharge points. The plans are included in the permit.

Aspect considered	Decision
Site condition report	<p>The operator has provided a description of the condition of the site, which we consider is satisfactory. The decision was taken in accordance with our guidance on site condition reports and baseline reporting under the Industrial Emissions Directive.</p> <p>We have included Site Condition Report's Appendix 2 on Groundwater Quality Monitoring Plan and Appendix 3 - Flare Analysis Report as part of the approved operating techniques specified under condition 2.3.1 of the permit.</p>
Waste management plan	<p>The operator has provided a waste management plan which we consider is satisfactory.</p>
Biodiversity, heritage, landscape and nature conservation	<p>The application is not within the relevant distance criteria of a site of heritage, landscape or nature conservation, and/or protected species or habitat.</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>
<b>Environmental risk assessment</b>	
Environmental risk	<p>We have reviewed the operator's assessment of the environmental risk from the facility.</p> <p>The operator's risk assessment is satisfactory.</p> <p>There will be no increase in emissions as a result of this variation, and consequently no increase in environmental risk.</p>
<b>Operating techniques</b>	
Operating techniques Water Quality	<p>We have reviewed the Operator's Hydrological Risk Assessment which is contained in Appendix 5 of the Site Condition Report and the operating techniques proposed by the operator. We have compared these with the relevant technical guidance and we consider them to represent appropriate techniques for the facility. We are satisfied that the risks to groundwater have adequately been assessed and the proposed activities are not likely to have an adverse impact on the hydrological features in this area.</p> <p>To the extent that it might lead to a discharge of pollutants to groundwater (a "groundwater activity" under the EPR 2016), the Permit is subject to the requirements of Schedule 22, which delivers the requirements of EU Directives relating to pollution of groundwater. The Permit will require the taking of all necessary measures to prevent the input of any hazardous substances to groundwater, and to limit the input of non- hazardous pollutants into groundwater so as to ensure such pollutants do not cause pollution, and satisfy the requirements of paragraph 6 of Schedule 22 and Article 6(1) Groundwater Daughter Directive. The operating techniques that the applicant must use are specified in table S1.2 in the environmental permit.</p> <p>In addition we have imposed condition 3.5.1 which requires the operator to monitor groundwater quality.</p> <p>IC7 requires the operator 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> <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>
<b>Permit conditions</b>	
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. We have also updated permit conditions to make reference to the most modern legislation. The conditions will provide the same level of protection as those in the previous permit(s).

Aspect considered	Decision
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 your 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 outline in “key issues” above.</p>
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.</p> <p>We have also required the operator to monitor emissions to air, and if trends show an increase in emissions, then the Environment Agency will require the operator to implement a plan to</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 gas flaring and changes in groundwater quality attributable to reinjection of produced water.</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>

Aspect considered	Decision
<b>Operator competence</b>	
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> <p>No relevant convictions were found. The operator satisfies the criteria in our guidance on operator competence.</p>
Financial competence	<p>There is no known reason to consider that the operator will not be financially able to comply with the permit conditions.</p>
Financial provision	<p>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.</p>
<b>Growth Duty</b>	
Section 108 Deregulation Act 2015 – Growth duty	<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>



Further Legislation	
Schedule 22 to the EPR 2016 – Water Framework and Groundwater Daughter Directives	To the extent that it might lead to a discharge of pollutants to groundwater (a “groundwater activity” under the EPR 2016), the Permit is subject to the requirements of Schedule 22, which delivers the requirements of EU Directives relating to pollution of groundwater. The Permit will require the taking of all necessary measures to prevent the input of any hazardous substances to groundwater, and to limit the input of non- hazardous pollutants into groundwater so as to ensure such pollutants do not cause pollution, and satisfy the requirements of paragraph 6 of Schedule 22 and Article 6(1) Groundwater Daughter Directive.
Water Environment (Water Framework Directive) (England and Wales) Regulations 2003	Consideration has been given to whether any additional requirements should be imposed in terms of the Environment Agency’s duty under regulation 3 to secure compliance with the requirements of the Water Framework Directive through (inter alia) environmental permits, but we consider that existing conditions are sufficient in this regard, and no other appropriate requirements have been identified.

## Consultation

The application was publicised on the GOV.UK website 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 Authority, Environmental Protection- Lincolnshire County Council
- Food Standards Agency
- Health and Safety Executive
- Mineral Planning Authority- Lincolnshire County Council

No objections were received from the all the Statutory consultees whom we consulted nor members of the public.

## Representations from individual members of the public

There were 12 objections raised against the application. Issues of concerns raised in the objections are outlined in the section below.

### **i) Use of acids**

Most of the comments raised concerns against the use of hydrochloric acid and calcium chloride for acid wash which is done as part of routine well maintenance.

The volumes of acid to be used are very low and the acid will react with the formation and fines to produce an inert near neutral solution. There will be no residual product remaining in the reservoir and any groundwater present will be naturally enriched with hydrocarbons and salts. Therefore any potential impact on groundwater would be insignificant and not discernible against the natural background groundwater quality.

We have published on our website a titled [Use of acid at oil and gas exploration and production sites](#) which outlines the rationale for our approval for proposed use of acid for acid wash. There were concerns that the proposed variation will allow for hydraulic fracturing. Is this application for well-treatment or well-stimulation?

### **ii) Concern on well stimulation involving use of hydraulic fracturing**

There were concerns that the proposed variation will result in the operator carrying out hydraulic fracturing activities in the area.

We do not directly regulate the mining activity we regulate the waste that is generated from mining. The permit is for the management of extractive waste from prospecting for mineral resources, including the flaring of gas. In determining the permit we need to be satisfied that the waste is managed in accordance with the regulations.

However the operator is limited to managing waste, including by flaring gas, from the specified activities set out in the permit and waste management plan. In other words, they cannot go beyond the activities that we have specified in the permit. Table S1.1 of the permit, as read with condition 2.1.1, specifically prohibits well stimulation through hydraulic fracturing. Should the operator wish to proceed to using further prospecting and/or extraction techniques other than those approved under this permit, they will need to apply for a variation of the permit which will be considered in the usual way.

### **iii) Regulatory powers of Environment Agency**

There were concerns that the Environment Agency does not have the jurisdiction to suspend or close down non-compliant operations for good.

The Environment Agency is responsible for enforcing laws that protect the environment.

Our regulatory powers, role and processes are outlined in [Environment Agency enforcement and sanctions policy - GOV.UK](#) which is published on .GOV.uk website.

#### **iv) Inadequate consultation**

Some of the comments have raised concerns that the consultation has been inadequate due to lack of public awareness and that we should have consulted more widely on the application.

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 telling people where and when they could see a copy of the Application.

We placed a paper copy of the Application and all other documents relevant to our determination on our Public Register. Anyone wishing to see these documents could do so and arrange for copies to be made.

In the interest of fairness we considered and took into account all comments that we received on this application, even those received well after the end of the public consultation period.

We have discretion as to whether to carry out “minded to” consultation on draft permits for sites. 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 is not classified as high public interest and we have decided that a “minded to” consultation is not warranted as the site is not a site of high Public Interest issues.

#### **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) 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”.

##### **b) Industry Self-Regulation**

Conventional gas and oil drilling has been regulated for a long time and there is a lot of established knowledge on those activities. Additionally the Regulations are enforced by the Environment Agency, the Health and Safety Executive and DECC.

The waste management activities proposed for this site are well established and the risk management measures in place are commonly used across a variety of industries.