



Notice of variation and consolidation with introductory note

The Environmental Permitting (England & Wales) Regulations 2016

IGas Energy Production Limited
Gainsborough - Beckingham Oilfield
Gainsborough
Lincolnshire
DN21 1AY

Variation application number

EPR/RP3937YT/V002

Permit number

EPR/RP3937YT

Gainsborough - Beckingham Oilfield

Permit number EPR/RP3937YT

Introductory note

This introductory note does not form a part of the permit

Under the Environmental Permitting (England & Wales) Regulations 2016 (Schedule 5, Part 1, paragraph 19) a variation may comprise a consolidated permit reflecting the variations and a notice specifying the variations included in that consolidated permit.

Schedule 1 of the notice specifies the conditions that have been varied and schedule 2 comprises a consolidated permit which reflects the variations being made.

All the conditions of the permit have been varied and are subject to the right of appeal.

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 abstracted groundwater and clean surface water for production support and the discharge of site surface water to ground via soakaway.
3. Permitted area by incorporating previously silent sites. Previous silent sites that are being incorporated into the permitted area include well sites 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 well sites.

The variation removes oil storage activities at the following well sites:

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.

The main features of the installation are as follows.

The Gainsborough-Beckingham Oilfield has 32 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 the Gainsborough 5 wellsite during separation is utilised to generate heat on site, with the surplus piped to the gas supply system based around Gainsborough 1, Gainsborough 2, Gainsborough 27 and Gainsborough 34 well sites. Gas is primarily produced at the Gainsborough 2 and Gainsborough 34 sites, and treatment facilities (heating and odourisation) are present at Gainsborough 27 and 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 a process heater at the 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 re-injection borehole GB5 at Gainsborough 5 wellsite, and boreholes 15, 16 and 17 at Beckingham 8 wellsite. Energy for the sites is sourced from the national grid.

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

The principal releases into the environment comprise:

- (a) Emissions to air of combustion gases from gas generators.
- (b) Emissions to air of gaseous hydrocarbons from separation of volatiles in storage.
- (c) Emissions of gaseous hydrocarbons from the road tanker by displacement on loading.
- (d) Rainwater run-off from hard-core well-site areas to ground through field drains and a soakaway.
- (e) Re-injection of produced water and clean rainwater from the installation and other local installations to the oil bearing reservoir.
- (f) Engineering waste resulting from maintenance work is removed for disposal at a licensed waste disposal facility.

There are no SSSIs within 2 km of this installation or European designated habitats sites within 10 km of this site.

- 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

Site Name / Reference	Site Location (Grid Ref)	Site Size (Hectare)	Description of process and activities	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

The schedules specify the changes made to the permit.

The status log of the permit sets out the permitting history, including any changes to the permit reference number.

Status log of the permit		
Description	Date	Comments
Permit determined EPR/HP3839MZ	21/06/07	Original permit was issued to Star Energy Oil & Gas Limited.
Notice of change of registered office address (EPR/HP3839MZ/V002)	03/01/12	
Variation notice EPR/HP3839MZ	03/02/12	Varied permit issued.

Status log of the permit		
Description	Date	Comments
Full transfer of permit EPR/HP3839MZ (New permit number EPR/MP3531CH)	06/08/12	Full transfer of permit to Island Gas Limited.
Agency variation determined (EPR/MP3531CH/V002)	30/05/13	Agency variation to implement the changes introduced by IED.
Full transfer application EPR/RP3937YT/T001 (full transfer of permit EPR/MP3531CH)	Duly Made 23/08/17	
Transfer determined EPR/RP3937YT	17/10/17	Full transfer of permit to Igas Energy Production Limited is complete.
Variation Application EPR/RP3937YT/V002	Duly made 05/01/18	
Notice of change of registered office address	20/03/18	
Additional information received	20/07/18	Response to information request sent 12/07/18
Additional information received	25/07/18	Revised layout plan for Gainsborough 43
Additional information received	15/08/18	Revised groundwater de-minimis assessment
Additional information received	22/10/18	Further information on Gainsborough 27 site
Additional information received	26/10/18	Revised Non-Technical Summary
Variation determined EPR/RP3937YT/V002 [Billing references: PAS PP3438JK EAWML 404530]	13/03/19	Varied and consolidated permit issued in modern condition format.

Other permits relating to this installation		
Operator	Permit number	Date of issue
Igas Energy Production Limited	EPR/ZB3792DK	13/03/19

End of introductory note.

Notice of variation and consolidation

The Environmental Permitting (England and Wales) Regulations 2016

The Environment Agency in exercise of its powers under regulation 20 of the Environmental Permitting (England and Wales) Regulations 2016 varies and consolidates

Permit number

EPR/RP3937YT

Issued to

IGas Energy Production Limited (“the operator”),

whose registered office is

c/o Womble Bond Dickinson (UK) LLP Level 6

124 - 125 Princess Street

Edinburgh

United Kingdom

EH2 4AD

company registration number **SC298739**

to operate an installation, a mining waste operation and a groundwater activity at

Gainsborough - Beckingham Oilfield

Gainsborough

Lincolnshire

DN21 1AY

to the extent set out in the schedules.

The notice shall take effect from **13/03/2019**

Name	Date
Principal Permitting Team Leader	13/03/2019

Authorised on behalf of the Environment Agency.

Schedule 1

All conditions have been varied by the consolidated permit as a result of an Environment Agency initiated variation, and as a result of the application made by the operator.

Schedule 2 – consolidated permit

Consolidated permit issued as a separate document

Permit

The Environmental Permitting (England and Wales) Regulations 2016

Permit number

EPR/RP3937YT

This is the consolidated permit referred to in the variation and consolidation notice for application EPR/RP3937YT/V002 authorising,

IGas Energy Production Limited (“the operator”),

whose registered office is

c/o Womble Bond Dickinson (UK) LLP Level 6

124 - 125 Princess Street

Edinburgh

United Kingdom

EH2 4AD

company registration number **SC298739**

to operate an installation, a mining waste operation and a groundwater activity at

Gainsborough - Beckingham Oilfield

Gainsborough

Lincolnshire

DN21 1AY

to the extent authorised by and subject to the conditions of this permit.

Name	Date
Principal Permitting Team Leader	13/03/2019

Authorised on behalf of the Environment Agency

Conditions

1 Management

1.1 General management

- 1.1.1 The operator shall manage and operate the activities:
- (a) in accordance with a written management system that identifies and minimises risks of pollution, so far as is practicable, including those risks arising from operations, maintenance, accidents, incidents, non-conformances, closure and those drawn to the attention of the operator as a result of complaints; and
 - (b) using sufficient competent persons and resources.
- 1.1.2 Records demonstrating compliance with condition 1.1.1 shall be maintained.
- 1.1.3 Any person having duties that are or may be affected by the matters set out in this permit shall have convenient access to a copy of the permit.

1.2 Energy efficiency

- 1.2.1 For the following activities referenced in schedule 1, table S1.1, A1 to A4, the operator shall:
- (a) take appropriate measures to ensure that energy is used efficiently in the activities;
 - (b) review and record at least every four years whether there are suitable opportunities to improve the energy efficiency of the activities; and
 - (c) take any further appropriate measures identified by a review.

1.3 Efficient use of raw materials

- 1.3.1 For the following activities referenced in schedule 1, table S1.1, A1 to A4, the operator shall:
- (a) take appropriate measures to ensure that raw materials and water are used efficiently in the activities;
 - (b) maintain records of raw materials and water used in the activities;
 - (c) review and record at least every four years whether there are suitable alternative materials that could reduce environmental impact or opportunities to improve the efficiency of raw material and water use; and
 - (d) take any further appropriate measures identified by a review.

1.4 Avoidance, recovery and disposal of wastes produced by the activities

- 1.4.1 The operator shall take appropriate measures to ensure that:
- (a) the waste hierarchy referred to in Article 4 of the Waste Framework Directive is applied to the generation of waste by the activities;
 - (b) any waste generated by the activities is treated in accordance with the waste hierarchy referred to in Article 4 of the Waste Framework Directive; and
 - (c) where disposal is necessary, this is undertaken in a manner which minimises its impact on the environment.

- 1.4.2 The operator shall review and record at least every four years whether changes to those measures should be made and take any further appropriate measures identified by a review.

2 Operations

2.1 Permitted activities

- 2.1.1 The operator is only authorised to carry out the activities specified in schedule 1 table S1.1 (the “activities”).

2.2 The site

- 2.2.1 The activities shall not extend beyond the site, being the land shown edged in red on the site plan at schedule 7 to this permit.
- 2.2.2 The groundwater activities (A6 to A9) referenced in schedule 1 table S1.1 shall take place at the discharge points marked on the site plans at schedule 7 to this permit.
- 2.2.3 The discharge (A6) shall be made from the wellbores within the Eagle Sandstone Formation of the Pennine Middle Coal Measures and Flood Sandstone of the Millstone Grit as listed in tables S1.1 and S3.3; and the operating techniques that are the subject of conditions prefixed by condition 2.3 shall be applied at the locations, or otherwise described, in schedule 7.

2.3 Operating techniques

- 2.3.1 The activities shall, subject to the conditions of this permit, be operated using the techniques and in the manner described in the documentation specified in schedule 1, table S1.2, unless otherwise agreed in writing by the Environment Agency.
- 2.3.2 If notified by the Environment Agency that the activities are giving rise to pollution, the operator shall submit to the Environment Agency for approval within the period specified, a revision of any plan or other documentation (“plan”) specified in schedule 1, table S1.2 or otherwise required under this permit which identifies and minimises the risks of pollution relevant to that plan, and shall implement the approved revised plan in place of the original from the date of approval, unless otherwise agreed in writing by the Environment Agency.
- 2.3.3 The re-injection borehole system shall comply with the following:
- (a) no re-injection borehole shall extend below the depth specified in table S1.1;
 - (b) the re-injection borehole shall comply with the minimum depth below ground level for un-perforated linings specified in table S1.1;
 - (c) the outlet of the re-injection borehole, including any associated diffusers, shall be within the saturation zone at all times;
 - (d) no part of the re-injection borehole system shall be situated within 10 metres of any watercourse (including any ditch that runs dry for part of the year), or any other surface water;
 - (e) no part of the re-injection borehole system shall be situated within a SPZ 1 or 50 metres of a well or borehole used for any purpose, other than abstraction from that well or borehole for the sole purpose of supplying water to the activity specified in table S1.1 and wells or boreholes used solely for purpose of extracting hydrocarbons
- 2.3.4 The operator shall:
- (a) review the waste management plan at least every five years from the date of initial approval and submit any written revisions to the Environment Agency for approval.

- (b) implement the approved waste management plan from the date of approval, unless otherwise agreed in writing by the Environment Agency
- 2.3.5 The operator shall ensure that where waste produced by the activities is sent to a relevant waste operation, that operation is provided with the following information, prior to the receipt of the waste:
- (a) the nature of the process producing the waste;
 - (b) the composition of the waste;
 - (c) the handling requirements of the waste;
 - (d) the hazardous property associated with the waste, if applicable; and
 - (e) the waste code of the waste.
- 2.3.6 The operator shall ensure that where waste produced by the activities is sent to a landfill site, it meets the waste acceptance criteria for that landfill.

2.4 Improvement programme

- 2.4.1 The operator shall complete the improvements specified in schedule 1 table S1.3 by the date specified in that table unless otherwise agreed in writing by the Environment Agency.
- 2.4.2 Except in the case of an improvement which consists only of a submission to the Environment Agency, the operator shall notify the Environment Agency within 14 days of completion of each improvement.

3 Emissions and monitoring

3.1 Emissions to water, air or land

- 3.1.1 There shall be no point source emissions to water, air or land except from the sources and emission points listed in schedule 3 tables S3.1, S3.2 and S3.3.
- 3.1.2 The limits given in schedule 3 table S3.1 and 3.2 shall not be exceeded.
- 3.1.3 Subject to any other condition of this permit, periodic monitoring shall be carried out at least once every 5 years for groundwater and 10 years for soil, unless such monitoring is based on a systematic appraisal of the risk of contamination.

3.2 Emissions of substances not controlled by emission limits

- 3.2.1 Emissions of substances not controlled by emission limits (excluding odour) shall not cause pollution. The operator shall not be taken to have breached this condition if appropriate measures, including, but not limited to, those specified in any approved emissions management plan, have been taken to prevent or where that is not practicable, to minimise, those emissions.
- 3.2.2 The operator shall:
- (a) if notified by the Environment Agency that the activities are giving rise to pollution, submit to the Environment Agency for approval within the period specified, an emissions management plan which identifies and minimises the risks of pollution from emissions of substances not controlled by emission limits;
 - (b) implement the approved emissions management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.
- 3.2.3 All liquids in containers, whose emission to water or land could cause pollution, shall be provided with secondary containment, unless the operator has used other appropriate measures to prevent or where that is not practicable, to minimise, leakage and spillage from the primary container.

- 3.2.4 The Operator shall take appropriate measures:
- (a) to prevent the input of hazardous substances to groundwater; and
 - (b) where a non-hazardous pollutant is not controlled by an emission limit, to limit the input of such non-hazardous pollutants to groundwater so as to ensure that such inputs do not cause pollution of groundwater.

3.3 Odour

3.3.1 Emissions from the activities shall be free from odour at levels likely to cause pollution outside the site, as perceived by an authorised officer of the Environment Agency, unless the operator has used appropriate measures, including, but not limited to, those specified in any approved odour management plan, to prevent or where that is not practicable to minimise the odour.

3.3.2 The operator shall:

- (a) if notified by the Environment Agency that the activities are giving rise to pollution outside the site due to odour, submit to the Environment Agency for approval within the period specified, an odour management plan which identifies and minimises the risks of pollution from odour;
- (b) implement the approved odour management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

3.4 Noise and vibration

3.4.1 Emissions from the activities shall be free from noise and vibration at levels likely to cause pollution outside the site, as perceived by an authorised officer of the Environment Agency, unless the operator has used appropriate measures, including, but not limited to, those specified in any approved noise and vibration management plan to prevent or where that is not practicable to minimise the noise and vibration.

3.4.2 The operator shall:

- (a) if notified by the Environment Agency that the activities are giving rise to pollution outside the site due to noise and vibration, submit to the Environment Agency for approval within the period specified, a noise and vibration management plan which identifies and minimises the risks of pollution from noise and vibration;
- (b) implement the approved noise and vibration management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

3.5 Monitoring

3.5.1 The operator shall, unless otherwise agreed in writing by the Environment Agency, undertake the monitoring specified in the following tables in schedule 3 to this permit:

- (a) point source emissions specified in tables S3.1, S3.2 and S3.3;
- (b) surface water or groundwater specified in table S3.5;
- (c) process monitoring specified in table S3.6;

3.5.2 The operator shall maintain records of all monitoring required by this permit including records of the taking and analysis of samples, instrument measurements (periodic and continual), calibrations, examinations, tests and surveys and any assessment or evaluation made on the basis of such data.

3.5.3 Monitoring equipment, techniques, personnel and organisations employed for the emissions monitoring programme and the environmental or other monitoring specified in condition 3.5.1 shall have either MCERTS certification or MCERTS accreditation (as appropriate), where available, unless otherwise agreed in writing by the Environment Agency.

- 3.5.4 The operator shall carry out:
- (a) regular calibration, at an appropriate frequency, of systems and equipment provided for carrying out any monitoring and measurements necessary to determine compliance with this permit; and
 - (b) regular checking, at an appropriate frequency, that such systems and equipment are serviceable and correctly used.
- 3.5.5 Permanent means of access shall be provided to enable sampling/monitoring to be carried out in relation to the emission points specified in schedule 3 tables S3.1, S3.2, S3.3, S3.4 and S3.5 unless otherwise agreed in writing by the Environment Agency.
- 3.5.6 If required by the Environment Agency, the operator shall:
- (a) take such samples and conduct such measurements, tests, surveys, analyses and calculations, including environmental measurements and assessments, at such times and using such methods and equipment as the Environment Agency may specify; and
 - (b) keep samples, provide samples, or dispatch samples for tests at a laboratory, as the Environment Agency specifies, and ensure that the samples or residues thereof are collected from the laboratory within three months of receiving written notification that testing and repackaging in accordance with the relevant legislation are complete.
- 3.5.7 The groundwater monitoring plans specified in Table S1.2, Schedule 1 shall be implemented unless otherwise agreed in writing with the Environment Agency.
- 3.5.8 Any revised groundwater monitoring plan should be implemented in place of the original in accordance with the Environment Agency's written approval unless otherwise agreed in writing

3.6 Installation of monitoring boreholes

- 3.6.1 The Operator shall submit for approval to the Environment Agency details of the groundwater monitoring plan within 6 months of permit issue.
- 3.6.2 The monitoring boreholes shall be installed to depths, by methods and according to a design agreed in advance and in writing by the Environment Agency.
- 3.6.3 The following details regarding the monitoring boreholes shall be provided to the Environment Agency within 1 month of installation:
- (a) casings/linings (length, diameter, material, type of grout or filter media and whether slotted or plain);
 - (b) depths and diameters of unlined sections;
 - (c) standing groundwater levels;
 - (d) details of strata encountered during drilling;
 - (e) reference levels in metres above ordnance datum;
 - (f) a location plan at a suitable scale showing the boreholes in relation to the point of discharge;
 - (g) national grid references of the borehole(s) in the form AB 12345 67890;
 - (h) any other information obtained from the borehole(s) relevant to the interpretation of water sample analysis.

4 Information

4.1 Records

- 4.1.1 All records required to be made by schedules 3, 4 and 5 to this permit shall:
- (a) be legible;
 - (b) be made as soon as reasonably practicable;
 - (c) if amended, be amended in such a way that the original and any subsequent amendments remain legible, or are capable of retrieval; and
 - (d) be retained, unless otherwise agreed in writing by the Environment Agency, for at least 6 years from the date when the records were made, or in the case of the following records until permit surrender:
 - (i) off-site environmental effects; and
 - (ii) matters which affect the condition of the land and groundwater.
- 4.1.2 The operator shall maintain convenient access, in either electronic or hard copy, to the records, plans and management system required to be maintained by this permit.

4.2 Reporting

- 4.2.1 The operator shall send all reports and notifications required by the permit to the Environment Agency using the contact details supplied in writing by the Environment Agency.
- 4.2.2 For the following activities referenced in schedule 1, table S1.1 A1 to A4, A report or reports on the performance of the activities over the previous year shall be submitted to the Environment Agency by 31 January (or other date agreed in writing by the Environment Agency) each year. The report(s) shall include as a minimum:
- (a) a review of the results of the monitoring and assessment carried out in accordance with the permit including an interpretive review of that data;
 - (b) the annual production /treatment data set out in schedule 4 table S4.2; and
 - (c) the performance parameters set out in schedule 4 table S4.3 using the forms specified in table S4.4 of that schedule.
- 4.2.3 Within 28 days of the end of the reporting period the operator shall, unless otherwise agreed in writing by the Environment Agency, submit reports of the monitoring and assessment carried out in accordance with the conditions of this permit, as follows:
- (a) in respect of the parameters and emission points specified in schedule 4 table S4.1;
 - (b) for the reporting periods specified in schedule 4 table S4.1 and using the forms specified in schedule 4 table S4.4; and
 - (c) giving the information from such results and assessments as may be required by the forms specified in those tables.
- 4.2.4 The operator shall, unless notice under this condition has been served within the preceding four years, submit to the Environment Agency, within six months of receipt of a written notice, a report assessing whether there are other appropriate measures that could be taken to prevent, or where that is not practicable, to minimise pollution.
- 4.2.5 Within 1 month of the end of each quarter, the operator shall submit to the Environment Agency using the form made available for the purpose, the information specified on the form relating to the site and the waste accepted and removed from it during the previous quarter, if during that quarter the total amount accepted exceeds 100 tonnes of non-hazardous waste or 10 tonnes of hazardous waste.

4.3 Notifications

4.3.1 In the event:

- (a) that the operation of the activities gives rise to an incident or accident which significantly affects or may significantly affect the environment, the operator must immediately—
 - (i) inform the Environment Agency,
 - (ii) take the measures necessary to limit the environmental consequences of such an incident or accident, and
 - (iii) take the measures necessary to prevent further possible incidents or accidents;
- (b) of a breach of any permit condition the operator must immediately—
 - (i) inform the Environment Agency, and
 - (ii) take the measures necessary to ensure that compliance is restored within the shortest possible time;
- (c) of a breach of permit condition which poses an immediate danger to human health or threatens to cause an immediate significant adverse effect on the environment, the operator must immediately suspend the operation of the activities or the relevant part of it until compliance with the permit conditions has been restored.

4.3.2 The information provided under condition 4.3.1 (a)(i), or 4.3.1 (b)(i) where the information relates to the breach of a limit specified in the permit, shall be supported by sending the information listed in schedule 5 to this permit within the time period specified in that schedule.

4.3.3 Where the Environment Agency has requested in writing that it shall be notified when the operator is to undertake monitoring and/or spot sampling, the operator shall inform the Environment Agency when the relevant monitoring and/or spot sampling is to take place. The operator shall provide this information to the Environment Agency at least 14 days before the date the monitoring is to be undertaken.

4.3.4 The Environment Agency shall be notified within 14 days of the occurrence of the following matters, except where such disclosure is prohibited by Stock Exchange rules:

Where the operator is a registered company:

- (a) any change in the operator's trading name, registered name or registered office address; and
- (b) any steps taken with a view to the operator going into administration, entering into a company voluntary arrangement or being wound up.

Where the operator is a corporate body other than a registered company:

- (a) any change in the operator's name or address; and
- (b) any steps taken with a view to the dissolution of the operator.

In any other case:

- (a) the death of any of the named operators (where the operator consists of more than one named individual);
- (b) any change in the operator's name(s) or address(es); and
- (c) any steps taken with a view to the operator, or any one of them, going into bankruptcy, entering into a composition or arrangement with creditors, or, in the case of them being in a partnership, dissolving the partnership.

4.3.5 For the following activities referenced in schedule 1, table S1.1 A1 to A4, where the operator proposes to make a change in the nature or functioning, or an extension of the activities, which may

have consequences for the environment and the change is not otherwise the subject of an application for approval under the Regulations or this permit:

- (a) the Environment Agency shall be notified at least 14 days before making the change; and
- (b) the notification shall contain a description of the proposed change in operation.

4.3.6 The Environment Agency shall be given at least 14 days' notice before implementation of any part of the site closure plan.

4.3.7 Where the operator proposes to make an amendment to the approved waste management plan, which is not otherwise the subject of an application for approval under the Regulations or this permit:

- (a) the Environment Agency shall be notified at least 14 days before implementing the amended waste management plan in place of the original; and
- (b) the notification shall contain a description of the proposed amendment.

4.3.8 Where the operator has entered into a climate change agreement with the Government, the Environment Agency shall be notified within one month of:

- (a) a decision by the Secretary of State not to re-certify the agreement;
- (b) a decision by either the operator or the Secretary of State to terminate the agreement; and
- (c) any subsequent decision by the Secretary of State to re-certify such an agreement.

4.4 Interpretation

4.4.1 In this permit the expressions listed in schedule 6 shall have the meaning given in that schedule.

4.4.2 In this permit references to reports and notifications mean written reports and notifications, except where reference is made to notification being made "immediately", in which case it may be provided by telephone.

Schedule 1 – Operations

Table S1.1 activities			
Activity reference	Activity listed in Schedule 1 of the EP Regulations	Description of specified activity and WFD Annex I and II operations	Limits of specified activity and waste types
A1	S1.2 A(1)(e)(i): The loading, unloading, handling or storage of, or the physical, chemical or thermal treatment of crude oil.	<p>Production of fluids extracted from the resource formation by beam pump, phase separation and storage of products (crude oil) and waste prior to onward transport.</p> <p>The activity will take place at Gainsborough 5, Gainsborough 34 and Beckingham 1 wellsites.</p>	<p>From receipt of production fluids at the wellhead to the despatch of products (crude oil) and waste.</p> <p>Oil shall be stored in vessels which are of sufficient strength and structural integrity to ensure that it is unlikely to burst or leak in its ordinary use.</p> <p>Any road tanker loading systems must be fully contained and the delivery system shall be fitted with dry break couplings.</p> <p>During loading of road tankers, the road tanker shall be back vented to the bulk storage tank, or routed to a suitable vent treatment system.</p> <p>Provisions shall be made to minimise the emissions of non-methane volatile organic compounds (NMVOC) and methane from the oil storage tank vent.</p> <p>Any water, contaminated with crude oil, which is drained off from the storage vessel and is not being recycled for reinjection must be collected for treatment before disposal.</p> <p>Any water collected in the secondary containment (bund) must be sampled and analysed before release to controlled water. If found to be contaminated with crude oil, it must be collected for treatment before disposal.</p>
Directly Associated Activity			
A2	Storage of additional raw materials.	Raw materials directly associated with the production of crude oil.	From receipt of raw materials to the despatch for use.
A3	Use of produced gas to produce electricity.	Combustion of produced gas in an engine with a rated thermal input of xx MW.	From the receipt of produced gas to the despatch of waste combustion gases.
A4	Pipelines connecting individual sites.	Transport of production fluids between all sites.	From pipe manifold on site exporting production fluids to pipe manifold on site importing production fluids.

Table S1.1 activities		
	Description of activities for waste operations	Limits of activities
A5	<p>The management of extractive waste from production activities, not involving a waste facility.</p> <p>The management of extractive waste generated by well workover.</p> <p>The management of extractive waste generated by well decommissioning.</p>	<p>Permitted waste types shall conform to the description in the approved waste management plan.</p> <p>The activities shall be limited to those described in the approved Waste Management Plan received 16/11/2018.</p> <p>The storage of extractive waste is limited to temporary storage in secure containment as part of the collection and transportation of waste from the site.</p> <p>Drilling additives shall be approved in writing by the Environment Agency prior to use.</p> <p>Well stimulation by hydraulic fracturing is not permitted.</p>
	Description of activity for Groundwater	Limits of specified activity
A6	<p>Re-injection of produced water to ground via boreholes W5 at Gainsborough 5 and W15, W16 and W17 at Beckingham 8 for operations for extraction of hydrocarbons.</p>	<p>The discharge of produced water from extraction of hydrocarbons and treated site surface water into four existing boreholes shall be at the following national grid references, as specified in table S3.3.</p> <ul style="list-style-type: none"> W5 at NGR SK 79528 90565, W15 at NGR SK 78564 90709, W16 at NGR SK 78568 90711 and W17 at NGR SK 78558 90706. The re-injection boreholes W05 at Gainsborough 5 and W15, W16 and W17 and Beckingham 8 shall not extend deeper than 1576 metres below ground level (m bgl), 1024, 1032 and 1036 m bgl respectively. Un-perforated linings shall extend to a minimum depth of 959m bgl in W05, 962m bgl in W15, 973 m bgl in W16 and 967m bgl in W17. The target formation for re-injection is the Eagle Sandstone Formation of the Pennine Middle Coal Measures and Flood Sandstone of the Millstone Grit Group. The discharge shall only be made via perforations in the boreholes which are situated within the Eagle Sandstone Formation and Flood Sandstone Formation. The injection pressure shall not exceed the fracture pressure of the formation. <p>The activity shall be carried out in accordance with the documents specified in Table S1.2. and S1.3</p>
A7	<p>W1: Discharge of treated site surface water to ground via a field drain at the Gainsborough 1 wellsite</p>	<p>Discharge of surface water from site through an oil interceptor to ground via a field drain at NGR SK 83247 90219 (as specified in table S3.3). The discharge shall be monitored as specified in table S3.2</p>
A8	<p>W2: Discharge of treated site surface water to ground via a field drain at the Gainsborough 5 wellsite</p>	<p>Discharge of surface water from site through an oil interceptor to ground via a field drain at NGR SK 81086 89647 (as specified in table S3.3). The discharge shall be monitored as specified in table S3.2</p>
A9	<p>W9: Discharge of site surface water to ground at the Beckingham 37 wellsite</p>	<p>Discharge of surface water from site through to ground via an infiltration system centred on NGR SK75957 89926 (as specified in table S3.3). The discharge shall be monitored as specified in table S3.2</p>

Table S1.2 Operating techniques		
Description	Parts	Date Received
Application	The response to section 2.1 and 2.2 in the Application	06/10/16
Response to request for information issued on 201/12/2007	Response from the applicant dated 18/01/2007 to request for further information.	18/01/07

Table S1.2 Operating techniques		
Description	Parts	Date Received
Amended Regulation 60 Notice response	Technical standards in response to the notice provided under Regulation 60 of Environmental Permitting Regulations	23/11/15
Response to Gap analysis tool	All	26/09/17
Application	Section 3 of the application document(s) provided in response to section 3a – technical standards , Part C3 of the application form	Duly Made 05/01/18
Application	Site location	
Application	Appendix 2 of application documents: Site location maps.	16/11/17
Application	Appendix 3 of application documents : Site layout and emissions plan of	16/11/17
Application	Appendix 4 of application documents : Waste Management Plan	16/11/17
Application	Revised Appendix 9 of application documents : De-minimis assessment Rev 2	15/08/17
Application	Appendix 10 of application documents : Material Safety Data Sheets for : <ul style="list-style-type: none"> • Petroleum Crude Oil • DAE 15%HCL+4 • DAE Barium Sulphate dissolver • DAE Wax dissolver S/D • Produced water • Well wax/alphaltene buster 	26/09/17
Application	Appendix 11 – Hydrogeological Risk Assessment dated September 2017	16/11/17
Secondary and tertiary containment plan as approved under IC1 specified in Table S1.3	All of document.	Date of approval of IC1
Leak detection and repair plan as approved under IC2 specified in Table S1.3	All of document.	Date of approval of IC1
Groundwater Monitoring plan for Gainsborough 5 wellsite as approved under IC3 specified in Table S1.3	All of document	Date of approval of IC3
Groundwater Monitoring plan for Beckingham 8 wellsite as approved under IC3 specified in Table S1.3	All of document	Date of approval of IC3
Written Management System as approved under IC4 specified in Table S1.3	All of document.	Date of approval of IC4
Gas management system improvement plan as approved under IC5 specified in Table S1.3	All of document.	Date of approval of IC5
Site Surface Water Management plan as approved under IC7 specified in Table S1.3	All of document.	Date of approval of IC7

Table S1.3 Improvement programme requirements		
Reference	Requirement	
IC1 Containment	<p>Secondary and tertiary containment plan</p> <p>The operator shall submit a written 'secondary and tertiary containment plan and shall obtain the Environment Agency's written approval to it. The plan shall contain the results of a review conducted, by a competent person, in accordance with the methodology detailed within CIRIA C736 (2014), of the condition and extent of secondary and tertiary containment systems where all polluting liquids and solids are being stored, treated, and/or handled. This review should consider, but is not limited to, the storage vessels, separators, bath heaters, bunds, loading and unloading areas, transfer pipework/pumps, temporary storage areas, and liners underlying the site. The plan must contain dates for the implementation of individual improvement measures necessary for the secondary and tertiary containment systems to adhere to the standards detailed/referenced within CIRIA C736 (2014), or equivalent.</p> <p>The plan shall be implemented in accordance with the Environment Agency's written approval.</p>	13/03/2020
IC2 Leak detection	<p>Leak detection plan</p> <p>The operator shall submit a written 'leak detection and repair plan', and associated procedures and shall obtain the Environment Agency's written approval to it. The plan will consider all activities listed in table S1.1. The plan will identify, measure and reduce emissions of volatile organic compounds and other substances to air, appropriate to their operations and in accordance with European standard EN15446 or an equivalent standard.</p> <p>The plan shall be implemented in accordance with the Environment Agency's written approval.</p>	13/09/2019
IC3 Groundwater activities	<p>Groundwater monitoring plan</p> <p>The operator shall submit a written plan for groundwater monitoring during the operational and post decommissioning phases of the groundwater activities for each site and shall obtain the Environment Agency's written approval to it. The plan will be based on the hydrogeological risk assessment and conceptual site model including, but not limited to:</p> <ul style="list-style-type: none"> i) details of the proposed location; depth; and construction method of the groundwater monitoring boreholes ii) number of groundwater monitoring boreholes to be installed iii) details of the geological formation that monitoring boreholes in (i) are monitoring iv) groundwater sample collection procedures v) details of the proposed monitoring parameters and frequency vi) details of how the data collected will be reviewed and interpreted including setting and reviewing trigger levels vii) details for further investigation if erroneous results are observed <p>The plan shall be implemented in accordance with the Environment Agency's written approval.</p>	13/09/2019

Table S1.3 Improvement programme requirements		
Reference	Requirement	
IC4 Management system	<p>Written Management System</p> <p>The operator shall review and update the written management system (referred to in condition 1.1.1) to ensure the procedures are in place to meet the requirements resulting from the variation of this permit. In particular the review should ensure that the following point(s) is / are included in the management system:</p> <p>Details of the training given to staff on use of spill kits; ensure training records updated accordingly.</p> <p>The procedure to be followed for monitoring the quantity and composition of flow-back water and / or produced water and keeping records of the results.</p> <p>The procedures for testing the impermeable membrane and subsequent remediation measures if required.</p> <p>The monitoring procedures and testing in place to confirm the integrity of the re-injection well(s) for the lifetime of those wells, monitoring frequency, remediation measures (and reporting procedures) should the integrity monitoring results indicate that a well integrity failure has potentially occurred.</p> <p>The procedure for notifying the Environment Agency on each occasion where natural gas is vented uncombusted to atmosphere for safety purposes. Notification to include, but not limited to: reasons for, duration of and quantity of gas vented.</p>	13/06/2019
IC5 Gas Management	<p>Gas management plan</p> <p>The operator shall submit a written gas management improvement plan and shall obtain the Environment Agency's written approval for it.</p> <p>The plan must contain detailed consideration of all available options for the beneficial utilisation of all of the available gas from your activities, including gas that is not already utilised, gas vented from storage vessels and gas vented during the loading and unloading of road and vehicles where relevant.</p> <p>Where such utilisation is not feasible, your plan must consider in detail all available options, both combustion and non-combustion based (including but not necessarily limited to flaring, vapour recovery, scrubbing and adsorption), for the disposal or abatement / mitigation of your waste gas so as to minimise its environmental impacts as far as available techniques allow.</p> <p>The gas management improvement plan shall also refer to the review of emissions undertaken as a result of IC5. If emission limits were not being met, the plan shall including actions that will be taken to ensure that emission limits are met.</p> <p>The plan must contain dates for the implementation of the identified improvement measures.</p> <p>The plan shall be implemented in accordance with the Environment Agency's written approval.</p>	13/09/2020
IC6 Air emissions monitoring	<p>The operator shall monitor point source emissions to air in accordance with table S3.1. The operator shall submit a review of emissions compared to the emission limits in table S3.1 to the Environment Agency and obtain the Environment Agency's written approval of the report.</p>	13/09/2019

Table S1.3 Improvement programme requirements		
Reference	Requirement	
IC7 Surface water	<p>Site Surface Water Management Plan</p> <p>The operator shall submit a written 'site surface water management plan' and shall obtain the Environment Agency's written approval to it. The plan will be based on the understanding from the conceptual site model and environmental risk assessment where the risks to the water environment are clearly detailed. The plan shall include details of how rainwater is managed, collected, stored and treated where necessary prior to discharge or disposal. The plan shall contain dates for the implementation of any improvement measures necessary to ensure that there are no uncontrolled contaminated water discharges to the environment from the site.</p> <p>The plan shall be implemented in accordance with the Environment Agency's written approval.</p>	13/12/2019
IC8 Site Condition Report	<p>Site condition report</p> <p>The operator shall undertake a review of the Site Condition Report (as to ensure Article 22 of the Industrial Emissions Directive is complied with. The review shall include at least the following:</p> <ul style="list-style-type: none"> i) consideration of oil storage areas including oil storage vessels, bunds, loading and unloading areas and other potential sources of contamination as shown in the site location plan ii) reference to any historical spillages, the chemicals involved and locations iii) baseline soil sample results and groundwater data 	13/03/2020

Schedule 2 – Waste types, raw materials and fuels

Non-extractive wastes are not accepted as part of the permitted activities and there are no restrictions on raw materials or fuel under this schedule.

Schedule 3 – Emissions and monitoring

Table S3.1 Point source emissions to air – emission limits and monitoring requirements						
Emission point ref. & location	Source	Parameter	Limit (including unit)	Reference period	Monitoring frequency	Monitoring standard or method
Gainsborough 1 site The following points on site plan 10 in Schedule 7 <ul style="list-style-type: none"> • A1 on gas generator 1; • A2 on gas generator 2; • A3 on gas generator 3; • A7 on gas generator 4 • A8 on gas generator 6 • A9 on gas generator 7 	Gas generators	Oxides of nitrogen	500mg / Nm ³		Annually	As otherwise agreed in writing with the Environment Agency
		Carbon monoxide	1400 mg / Nm ³		Annually	
		Total volatile organic compounds (VOCs)	1000 mg / Nm ³		Annually	
		Engine gas feed flow rate			Continuous	As approved in writing with the Environment Agency
Gainsborough 5 wellsite Points <ul style="list-style-type: none"> • A1 on tank T66; • A2 on tank T67; • A3 on tank T55; • A4 on tank T56; • A5 on tank T60; • A6 on tank T59; • A7 on tank T2; and • A8 on tank T1 on site plan 12 in Schedule 7 	Storage tank vent	Gas vented	-	Monthly	Monthly	Calculation to determine the quantity of gas vented over the reference
		Hydrogen sulphide	5.7 mg/m ³	Monthly	Monthly	As approved in writing with the Environment Agency
Gainsborough 5 wellsite The following points on site plan 12 in Schedule 7 <ul style="list-style-type: none"> • A9 on process bath heater • A10 on hot water heater on site plan 12 in Schedule 7 	A9 -Process water bath heater; A10 hot water heater	Oxides of nitrogen	500mg / Nm ³	Monthly	Annually	As otherwise agreed in writing with the Environment Agency
		Hydrogen sulphide	5.7 mg/m ³	Monthly	Monthly	As approved in writing with the Environment Agency
		Carbon monoxide	1400 mg / Nm ³	Monthly	Annually	As otherwise agreed in writing with the Environment Agency

Emission point ref. & location	Source	Parameter	Limit (including unit)	Reference period	Monitoring frequency	Monitoring standard or method
Gainsborough 34 wellsite Point A1 on site plan 20 in Schedule 7	Storage tank vent	Gas vented	-	Monthly	Monthly	Calculation to determine the quantity of gas vented over the reference
		Hydrogen sulphide	5.7 mg/m ³	Monthly	Monthly	As approved in writing with the Environment Agency
Beckingham 1 wellsite Points A1 and A2 on site plan 29 in Schedule 7	Storage tank vents	Gas vented	-	Monthly	Monthly	Calculation to determine the quantity of gas vented over the reference
		Hydrogen sulphide	5.7 mg/m ³	Monthly	Monthly	As approved in writing with the Environment Agency

Discharge source and discharge point ref. & location	Parameter	Limit (including unit)	Reference Period	Limit of effective range	Monitoring frequency	Compliance Statistic
A7: W1 Discharge of treated surface water to ground via field drain at Gainsborough 1 wellsite.	Volume	5m ³ /day	Total daily volume	N/A	N/A	maximum
	Oil or grease	No visible oil or grease	Instantaneous (Spot sample)	N/A	Daily	N/A - Visual inspection
	Chloride	150 mg/l	Instantaneous (Spot sample)	N/A	Monthly	Maximum
A8: W2 Discharge of treated site surface water to ground via field drain Gainsborough 5 wellsite	Volume	5m ³ /day	Total daily volume	N/A	N/A	maximum
	Oil or grease	No visible oil or grease	Instantaneous (Spot sample)	N/A	Daily	N/A - Visual inspection
	Chloride	150 mg/l	Instantaneous (Spot sample)	N/A	Monthly	Maximum
A6: Discharge of produced water from oil and gas extraction to ground via re-injection wells W5 at Gainsborough 5 wellsite and re-injection wells 15,16 and 17 at Beckingham 8 wellsite	Maximum daily discharge volume	150 m ³ /day	Total daily volume	N/A	Continuous	Maximum
	Maximum rate of discharge	1.75 litres/second	Instantaneous (spot sample)	N/A	N/A	Maximum
	15-minute instantaneous or averaged flow	No limit set. Record as l/s	15 minute	N/A	Continuous	N/A

Table S3.2 Point Source emissions to water (other than sewer) and land – emission limits and monitoring requirements						
Discharge source and discharge point ref. & location	Parameter	Limit (including unit)	Reference Period	Limit of effective range	Monitoring frequency	Compliance Statistic
A9: W9 Discharge of site surface water to ground at Beckingham 37 wellsite.	Volume	5m ³ /day	Total daily volume	N/A	N/A	maximum
	Oil or grease	No visible oil or grease	Instantaneous (Spot sample)	N/A	Daily	N/A Visual inspection
	Chloride	150 mg/l	Instantaneous (Spot sample)	N/A	Monthly	Maximum

Table S3.3 Discharge points			
Effluent name	Discharge Point	Discharge point NGR	Receiving water / environment
Discharge of an admixture of produced water and treated site surface water drainage from oil and gas extraction to re-injection boreholes	Well W5 at Gainsborough 5 wellsite	Surface NGR SK 79528 90565 in a south-easterly direction between NGRs SK81200 89800 and SK75000 89600	Groundwater in the Eagle sandstone formation and Flood Sandstone via injection boreholes
	Well W15 at Beckingham 8 wellsite	Surface NGR SK 78564 90709 in a south-westerly direction between NGRs SK 81200 89800 and SK 75000 89600	
	Well W16 at Beckingham 8 wellsite	Surface NGR SK 78568 90711 in a south-easterly direction between NGRs SK81200 89800 and SK75000 89600	
	Well W17 at Beckingham 8 wellsite	Surface NGR SK 78558 90706 in a south-westerly direction between NGRs SK81200 89800 and SK 75000 89600	
W1 Discharge of treated site surface water to ground via field drain at Gainsborough 1 wellsite	Outlet W1	SK 83247 90219	Groundwater via field drain
Discharge of treated site surface water to ground via field drain from at Gainsborough 5 wellsite	Outlet W2	SK 81086 89647	Groundwater via field drain
Discharge of site surface water from non-process areas to ground at Beckingham 37 wellsite	Outlet W9	SK 75957 89926	Groundwater via soakaway

Effluents and discharge points	Monitoring type	Monitoring point NGR	Monitoring point reference
A6: Discharge of an admixture of produced water and treated site surface water drainage from oil and gas extraction to re-injection boreholes at Well 5 at Gainsborough 5 wellsite; wells W10, W15, W16, and W17 at Beckingham 8 wellsite	Flow monitoring	SK 79528 40565 SK 78564 90709 SK 78568 90711 SK 78558 90706	W5 - Flow monitoring point W15 – Flow monitoring point W16 – Flow monitoring point W17 – Flow monitoring point
A7: W1 Discharge of treated site surface water to ground via field drain at Gainsborough 1 wellsite	Effluent monitoring	SK 83262 90257	W1 - Effluent Monitoring point
A8: W2 Discharge of treated site surface water to ground via field drain at Gainsborough 5 wellsite	Effluent monitoring	SK 81086 89647	W2 - Effluent Monitoring Point
A9: W9 Discharge of site surface water from non-process areas to ground at Beckingham 37 wellsite	Effluent monitoring	SK 75957 89926	W9 - Effluent Monitoring Point

Location or description of point of measurement	Parameter	Monitoring frequency	Monitoring standard or method	Other specifications
Groundwater monitoring locations as specified in Groundwater Monitoring plan in Table S1.2 following approval of IC3 in Table S1.3	As specified in Groundwater Monitoring plan in Table S1.2 following approval of IC3 in Table S1.3.	As specified in Groundwater Monitoring plan in Table S1.2 following approval of IC3 in Table S1.3.	BS ISO 5667-11:2009 and condition 3.5.3	Three borehole volumes must be purged prior to sampling. Samples must be filtered samples. In accordance with Groundwater monitoring plan in Table S1.2.
Surface water monitoring locations as specified in Table S1.2 following approval of IC7 in Table S1.3	As specified in Site Surface Water Monitoring Plan in Table S1.2 following approval of IC7 in Table S1.3	As specified in Site Surface Water Monitoring plan in Table S1.2 following approval of IC7 in Table S1.3	As specified in condition 3.5.3	In accordance with Site Surface Water Monitoring Plan in Table S1.2

Table S3.6 Process monitoring requirements				
Emission point reference or source or description of point of measurement	Parameter	Monitoring frequency	Monitoring standard or method	Other specifications
Gas to oil ratio of production from the installation	Gas to oil ratio	Monthly	As agreed in writing with the Environment Agency	
Gas vented from storage tanks at Gainsborough 5 site Points A1, A2, A3, A4, A5, A6, A7 and A8 on site plan 12 in Schedule 7 Gainsborough 34 site Point A1 on site plan 20 in Schedule 7 Beckingham 1 site Points A1 and A2 on site plan 29 in Schedule 7	Hydrogen sulphide	Monthly or as otherwise agreed in writing with the Environment Agency	Calculation to determine the quantity of gas vented over the reference	
Gas generators at points A1, A2, A3, A7, A8 and A9 at Gainsborough 1 wellsite	Engine gas feed flow rate	Continuous	As approved in writing with the Environment Agency	
Process water bath heater at point A9 and hot water heater at point A10 at Gainsborough 5 wellsite	Hydrogen sulphide	Monthly	As approved in writing with the Environment Agency	
W5, W15, W16, and W17	Well integrity monitoring summary report	As per the updated written management system specified in improvement condition IC4	As per the updated written management system specified in improvement condition IC4	
W5, W15, W16, and W17	Concentration and volume of all process chemicals added to produced water prior to re-injection as defined in the Hydrogeological Risk Assessment	Monthly	N/A	

Schedule 4 – Reporting

Parameters, for which reports shall be made, in accordance with conditions of this permit, are listed below.

Table S4.1 Reporting of monitoring data			
Parameter	Emission or monitoring point/reference	Reporting period	Period begins
Emissions to air Parameters as required by condition 3.5.1.	Gainsborough 1 wellsite: points A1, A2, A3, A7, A8 and A9 Gainsborough 5 wellsite: points A1, A2, A3, A4, A5, A6, A7, A8, A9, A10 Gainsborough 34 wellsite: Point A1 Beckingham 1 wellsite: Points A1 and A2	Every six months	1 January, 1 July
Process monitoring Parameters as required by condition 3.5.1	Description as indicated in table S3.6	Every 12 months	1 January
Process chemicals in re-injected produced water Parameters as required by condition 3.5.1 and listed in Table S3.6	W5,W15, W16, and W17	Every 6 months	1 January, 1 July
Emissions to groundwater (produced water reinjection: total daily volume and rate of discharge) as required by condition 3.5.2 and as listed in Table S3.2	W5, W15, W16, and W17	Annually	1 January
Emissions to groundwater (discharge to field drain and soakaway) Parameters are required by condition 3.5.1 and listed in Table S3.2	W1, W2, W9	Every 3 months	1 January, 1 April, 1 July, 1 October
Groundwater and surface water monitoring as listed in Table S3.5	Monitoring points as indicated in table S3.5	Every 6 months	1 January, 1 July

Table S4.2: Annual production/treatment	
Parameter	Units
Gas vented	Standard cubic feet
Crude oil production	bbl
Average water cut	% of production
Average Gas to oil Ratio (GOR)	scf gas/bbls oil

Table S4.3 Performance parameters		
Parameter	Frequency of assessment	Units
Water usage	Annually	Tonnes or m ³
Energy usage	Annually	MWh
Total mass release of oxides of sulphur	Annually	Tonnes

Table S4.4 Reporting forms		
Media/parameter	Reporting format	Date of form
Air	Form air 1 or other form as agreed in writing by the Environment Agency	13/03/19
Water and Land	Form water 1 or other form as agreed in writing by the Environment Agency	13/03/19
Water usage	Form water usage 1 or other form as agreed in writing by the Environment Agency	13/03/19
Energy usage	Form energy 1 or other form as agreed in writing by the Environment Agency	13/03/19
Process Chemicals	Form process chemicals 1 or other form as agreed in writing by the Environment Agency	13/03/19
Other performance indicators	Form performance 1 or other form as agreed in writing by the Environment Agency	13/03/19
Produced water reinjection: Total daily volume	WISKI electronic format or some other format agreed in writing by the Environment Agency	13/03/19
Produced water reinjection: 15-minute flow	WISKI electronic format or some other format agreed in writing by the Environment Agency	13/03/19

Schedule 5 – Notification

These pages outline the information that the operator must provide.

Units of measurement used in information supplied under Part A and B requirements shall be appropriate to the circumstances of the emission. Where appropriate, a comparison should be made of actual emissions and authorised emission limits.

If any information is considered commercially confidential, it should be separated from non-confidential information, supplied on a separate sheet and accompanied by an application for commercial confidentiality under the provisions of the EP Regulations.

Part A

Permit Number	
Name of operator	
Location of Facility	
Time and date of the detection	

(a) Notification requirements for 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	
To be notified within 24 hours of detection	
Date and time of the event	
Reference or description of the location of the event	
Description of where any release into the environment took place	
Substances(s) potentially released	
Best estimate of the quantity or rate of release of substances	
Measures taken, or intended to be taken, to stop any emission	
Description of the failure or accident.	

(b) Notification requirements for the breach of a limit	
To be notified within 24 hours of detection unless otherwise specified below	
Emission point reference/ source	
Parameter(s)	
Limit	
Measured value and uncertainty	
Date and time of monitoring	

(b) Notification requirements for the breach of a limit	
To be notified within 24 hours of detection unless otherwise specified below	
Measures taken, or intended to be taken, to stop the emission	

Time periods for notification following detection of a breach of a limit	
Parameter	Notification period

(c) Notification requirements for the detection of any significant adverse environmental effect	
To be notified within 24 hours of detection	
Description of where the effect on the environment was detected	
Substances(s) detected	
Concentrations of substances detected	
Date of monitoring/sampling	

Part B – to be submitted as soon as practicable

Any more accurate information on the matters for notification under Part A.	
Measures taken, or intended to be taken, to prevent a recurrence of the incident	
Measures taken, or intended to be taken, to rectify, limit or prevent any pollution of the environment which has been or may be caused by the emission	
The dates of any unauthorised emissions from the facility in the preceding 24 months.	

Name*	
Post	
Signature	
Date	

* authorised to sign on behalf of the operator

Schedule 6 – Interpretation

“accident” means an accident that may result in pollution.

“application” means the application for this permit, together with any additional information supplied by the operator as part of the application and any response to a notice served under Schedule 5 to the EP Regulations.

“approved waste management plan” means a plan of the type described in Article 5(1) of Directive 2006/21/EC of the European Parliament and of the Council of 15 March 2006 on the management of waste from extractive industries and amending Directive 2004/35/EC, approved as part of the grant or variation of an environmental permit and as revised from time to time.

“authorised officer” means any person authorised by the Environment Agency under section 108(1) of The Environment Act 1995 to exercise, in accordance with the terms of any such authorisation, any power specified in section 108(4) of that Act.

“background concentration” means such concentration of that substance as is present in:

- for emissions to surface water, the surface water quality up-gradient of the site; or
- for emissions to sewer, the surface water quality up-gradient of the sewage treatment works discharge.

Drafting note: only use above definition if condition 3.1.3 used

“Competent Authority” means, in relation to –

- (a) London, the London Fire and Emergency Planning Authority;
- (b) an area where there is a fire and civil defence authority, that authority;
- (c) the Isles of Scilly, the Council of the Isles of Scilly;
- (d) an area in the rest of England, the county council for that area, or where there is no county council for that area, the district council for that area;

“emissions to land” includes emissions to groundwater.

“EP Regulations” means The Environmental Permitting (England and Wales) Regulations 2016 No.1154 and words and expressions used in this permit which are also used in the Regulations have the same meanings as in those Regulations.

“emissions of substances not controlled by emission limits” means emissions of substances to air, water or land from the activities, either from the emission points specified in schedule 3 or from other localised or diffuse sources, which are not controlled by an emission or background concentration limit.

“extractive waste” means waste resulting from the prospecting, extraction, treatment and storage of mineral resources and the working of quarries, excluding waste which does not directly result from these operations.

“groundwater” means all water, which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil.

“Hazardous property” has the meaning in Annex III of the Waste Framework Directive.

“Hazardous waste” has the meaning given in the Hazardous Waste (England and Wales) Regulations 2005 (as amended).

“Industrial Emissions Directive” means Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions

“List of Wastes” means the list of wastes established by Commission Decision 2000/532/EC replacing Decision 94/3/EC establishing a list of wastes pursuant to Article 1(a) of Council Directive 75/442/EEC on waste and Council Decision 94/904/EC establishing a list of hazardous waste pursuant to Article 1(4) of Council Directive 91/689/EEC on hazardous waste, as amended from time to time.

“MCERTS” means the Environment Agency’s Monitoring Certification Scheme.

“mining waste facility” means a waste facility as defined in Article 3(15) of Directive 2006/21/EC of the European Parliament and of the Council of 15 March 2006 on the management of waste from extractive industries and amending Directive 2004/35/EC, where a mining waste operation is carried out.

“quarter” means a calendar year quarter commencing on 1 January, 1 April, 1 July or 1 October.

“recovery” means any of the operations provided for in Annex II to Directive 2008/98/EC of the European Parliament and of the Council on waste.

“Waste code” means the six digit code referable to a type of waste in accordance with the List of Wastes and in relation to hazardous waste, includes the asterisk.

“Waste Framework Directive” or “WFD” means Waste Framework Directive 2008/98/EC of the European Parliament and of the Council on waste

“year” means calendar year ending 31 December.

Where a minimum limit is set for any emission parameter, for example pH, reference to exceeding the limit shall mean that the parameter shall not be less than that limit.

Unless otherwise stated, any references in this permit to concentrations of substances in emissions into air means:

- in relation to emissions from combustion processes, the concentration in dry air at a temperature of 273K, at a pressure of 101.3 KPa and with an oxygen content of 3% dry for liquid and gaseous fuels, 6% dry for solid fuels; and/or
- in relation to emissions from non-combustion sources, the concentration at a temperature of 273K and at a pressure of 101.3 kPa, with no correction for water vapour content.

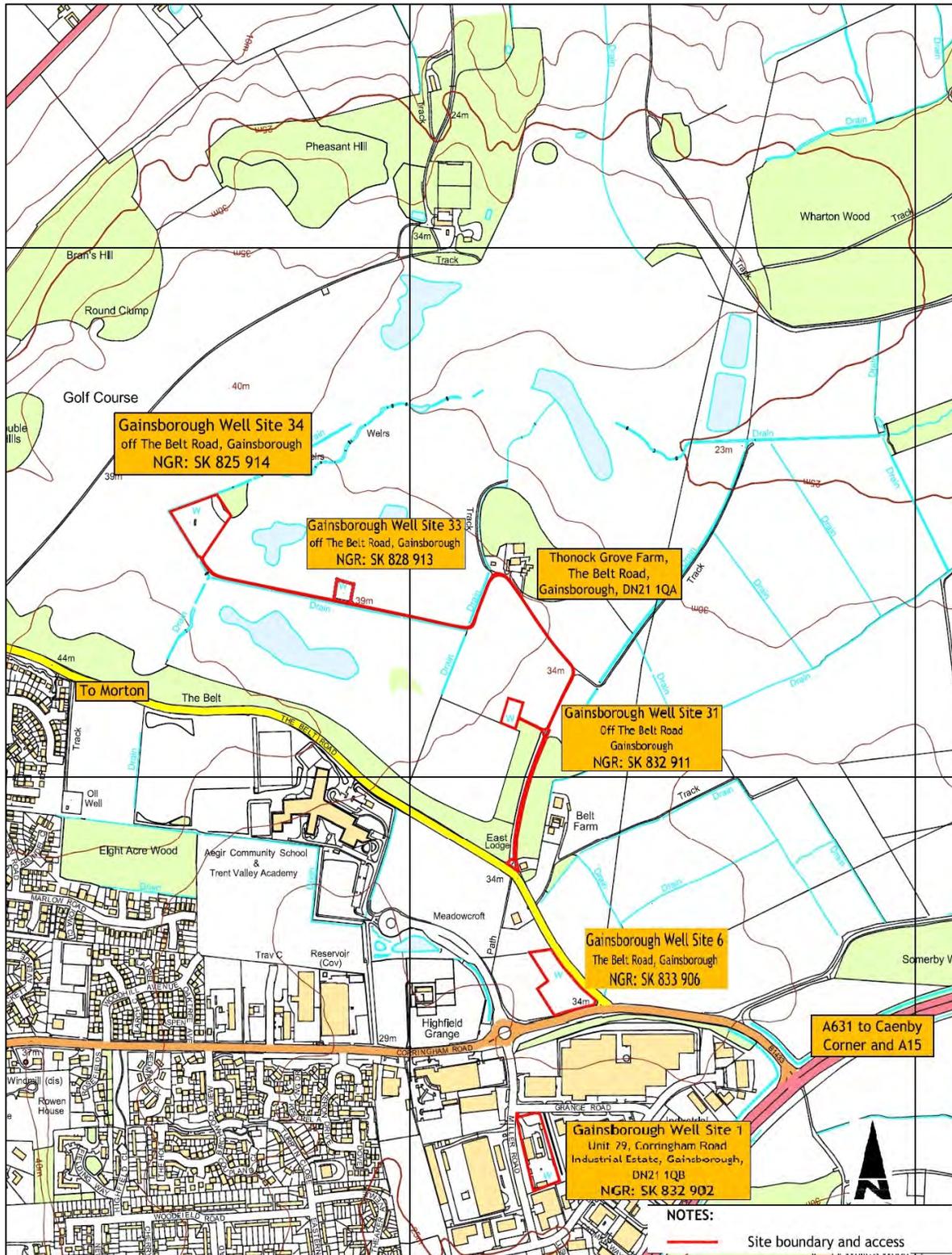
Schedule 7 – Site plan

Table S7.1 List of site maps for Gainsborough - Beckingham Oilfield contained in this schedule

Gainsborough oilfield		
Wellsite	Location site plan	Site layout plan
Gainsborough 1	1	10
Gainsborough 2	2	11
Gainsborough 5	3	12
Gainsborough 6	1	13
Gainsborough 8	3	14
Gainsborough 11	3	15
Gainsborough 14	4	16
Gainsborough 29	4	17
Gainsborough 31	1	18
Gainsborough 33	1	19
Gainsborough 34	1	20
Gainsborough 36	3	21
Gainsborough 37	2	22
Gainsborough 38	2	23
Gainsborough 41	3	24
Gainsborough 43	5	25
Gainsborough 59	3	26
Gainsborough 60	3	27
Lea Road Station	3	28

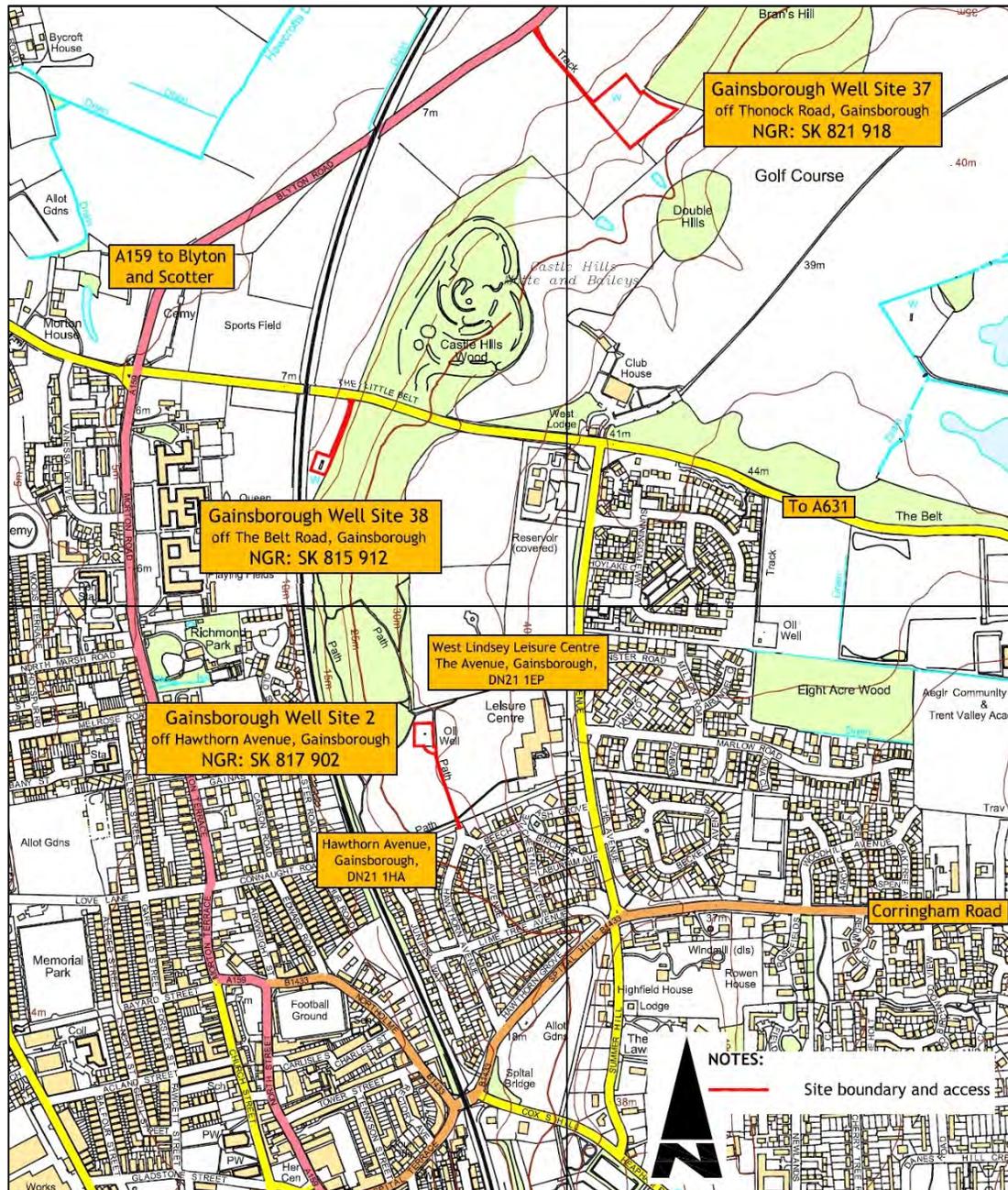
Beckingham oilfield		
Wellsite	Location site plan	Site layout plan
Beckingham 1	6	29
Beckingham 3	6	30
Beckingham 4	6	31
Beckingham 5	6	32
Beckingham 6	6	33
Beckingham 8	6	34
Beckingham 21	7	35
Beckingham 25	7	36
Beckingham 28	8	37
Beckingham 31	7	38
Beckingham 33	7	39
Beckingham 36	7, 9	40
Beckingham 37	9	41

Site plan 1: Location of Gainsborough 1, Gainsborough 6, Gainsborough 31, Gainsborough 33 and Gainsborough 34 wellsites



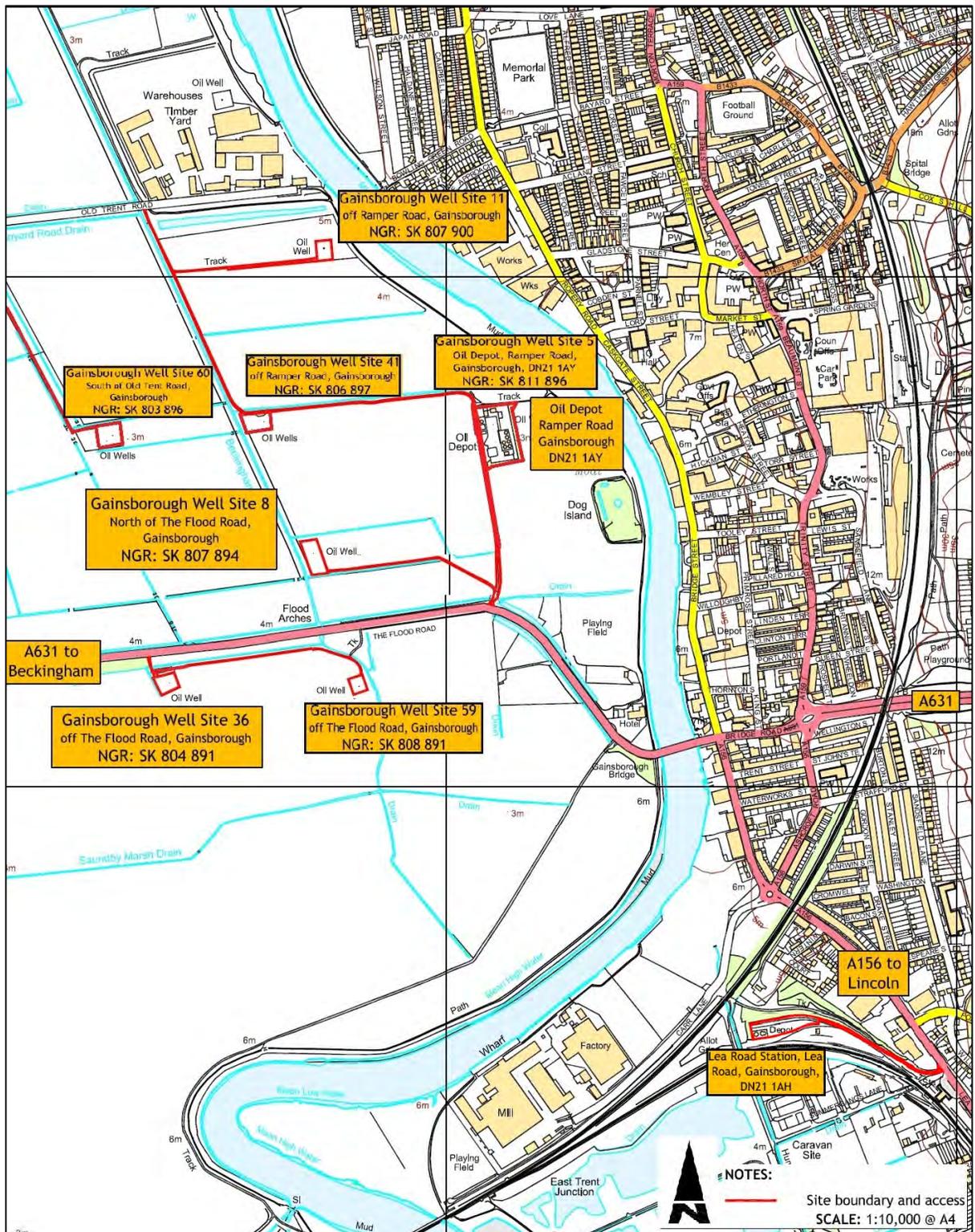
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Site plan 2: Location of Gainsborough 2, Gainsborough 37 and Gainsborough 38 wellsites



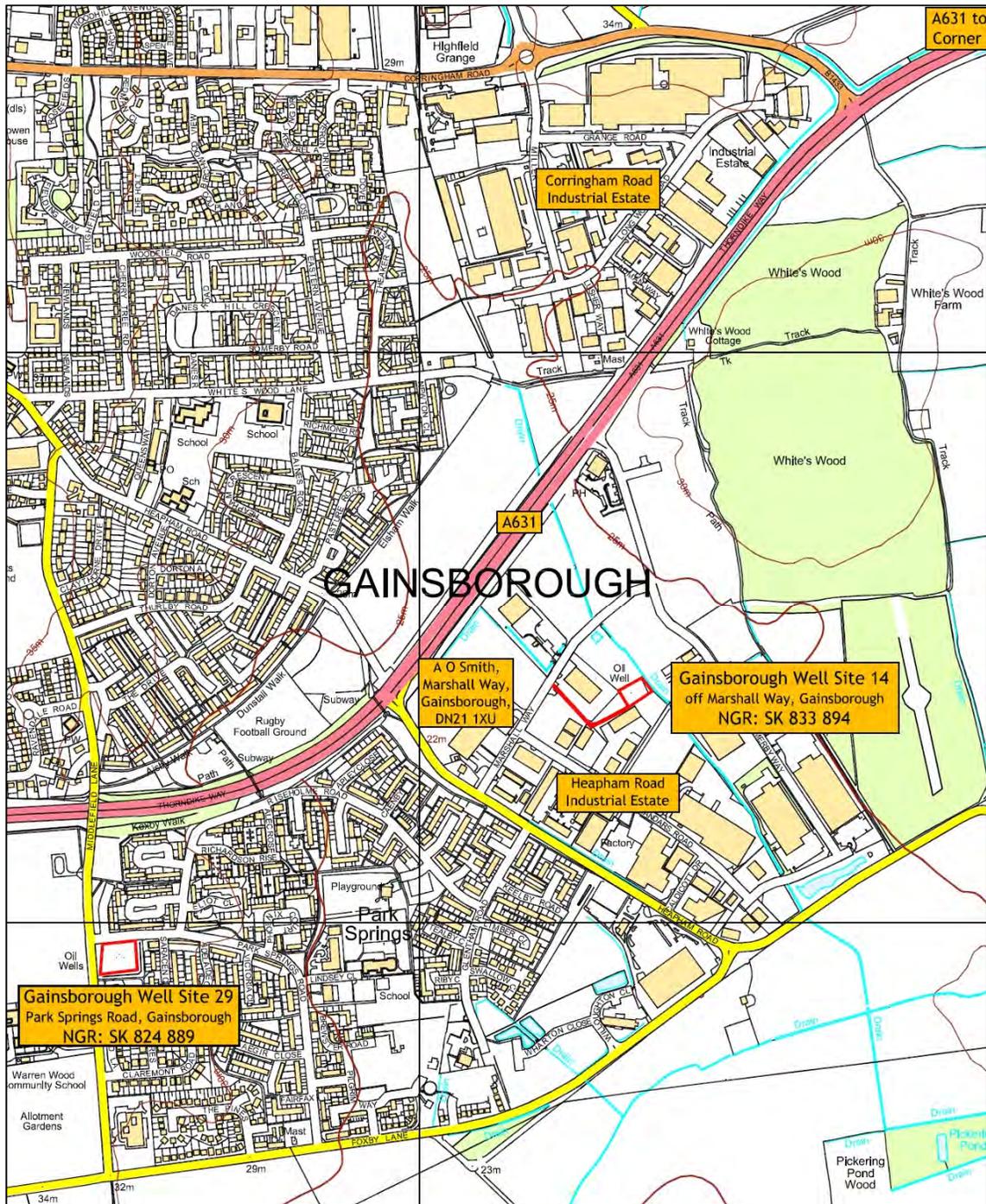
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Site plan 3: Location for Gainsborough 5, Gainsborough 8, Gainsborough 11, Gainsborough 36, Gainsborough 41, Gainsborough 59, Gainsborough 60 and Lea Road Siding.



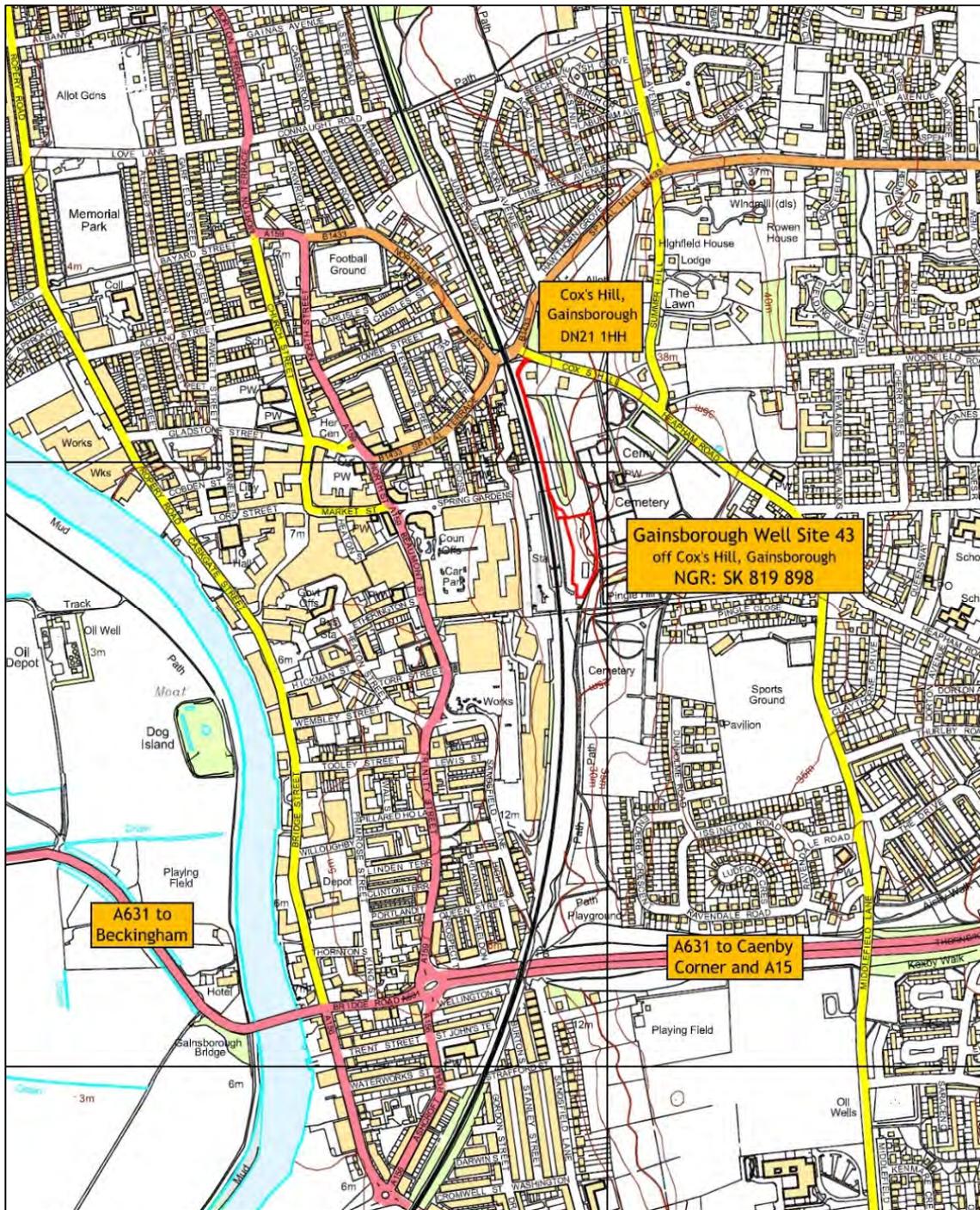
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Site plan 4: Gainsborough 14 and Gainsborough 29 wellsites



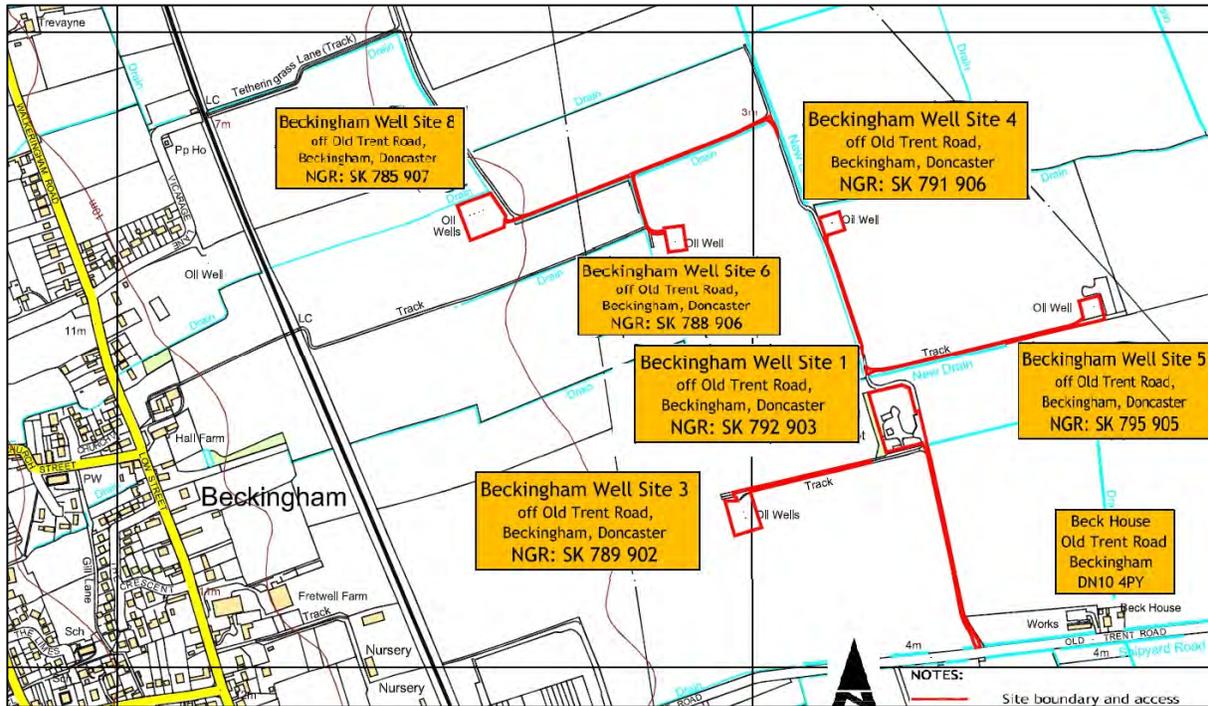
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Site plan 5: Location of Gainsborough 43 wellsite



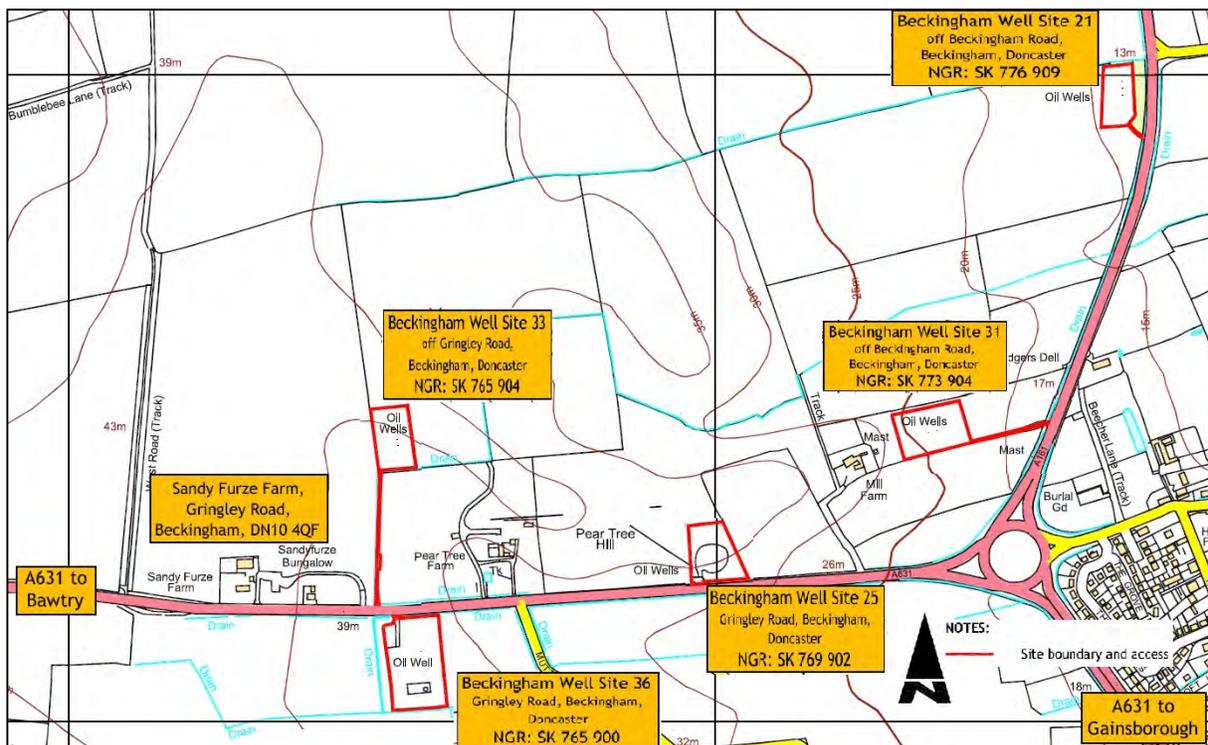
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Site Plan 6: Location of Beckingham 1, Beckingham 3, Beckingham 4, Beckingham 5, Beckingham 6 and Beckingham 8 wellsites



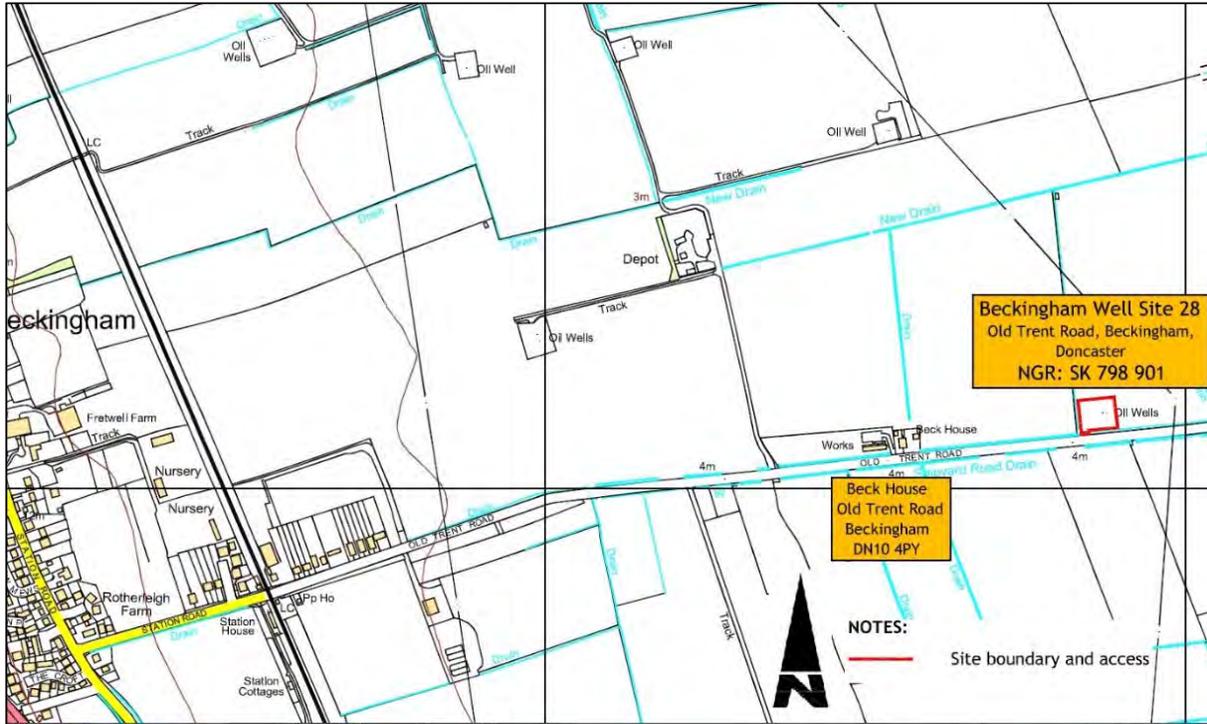
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Site plan 7: Location of Beckingham 21, Beckingham 25, Beckingham 31, Beckingham 33 and Beckingham 36 wellsites



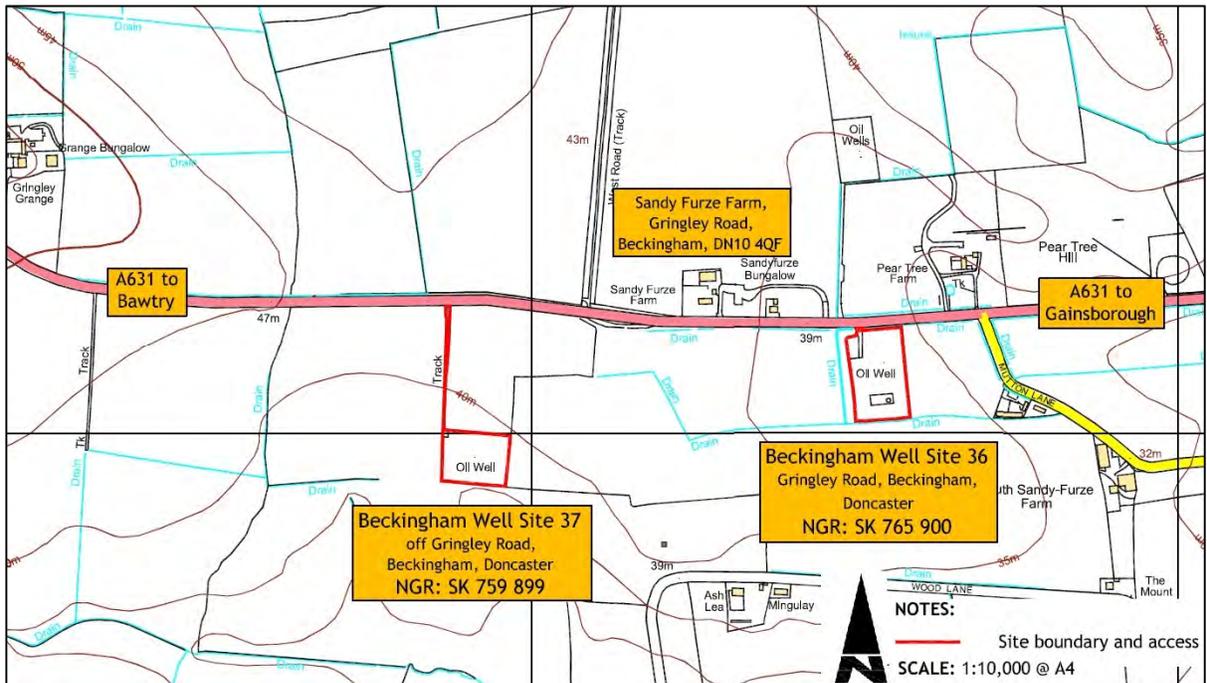
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Site plan 8: Location of Beckingham 28 wellsite



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Site plan 9: Location of Beckingham 36 and Beckingham 37 wellsites

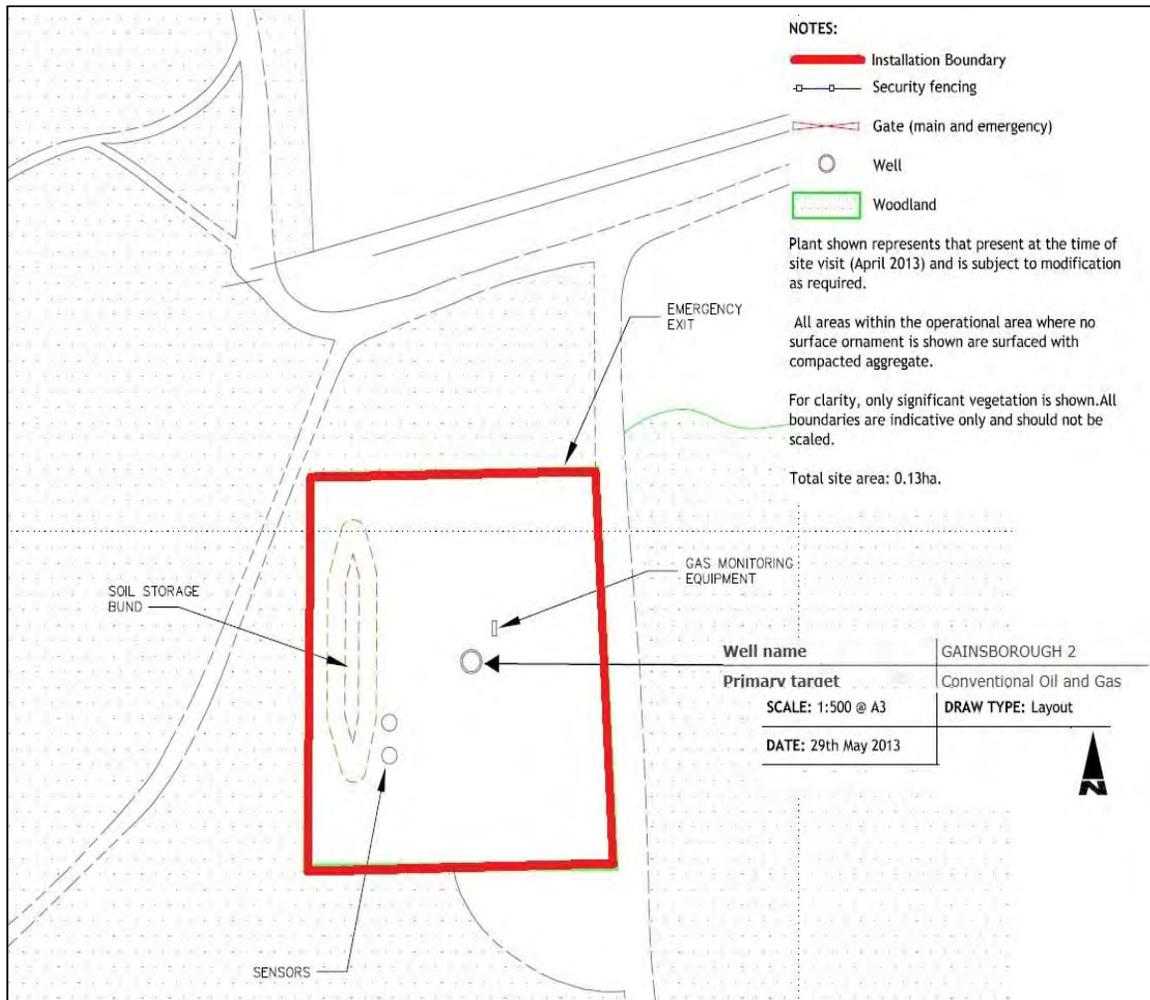


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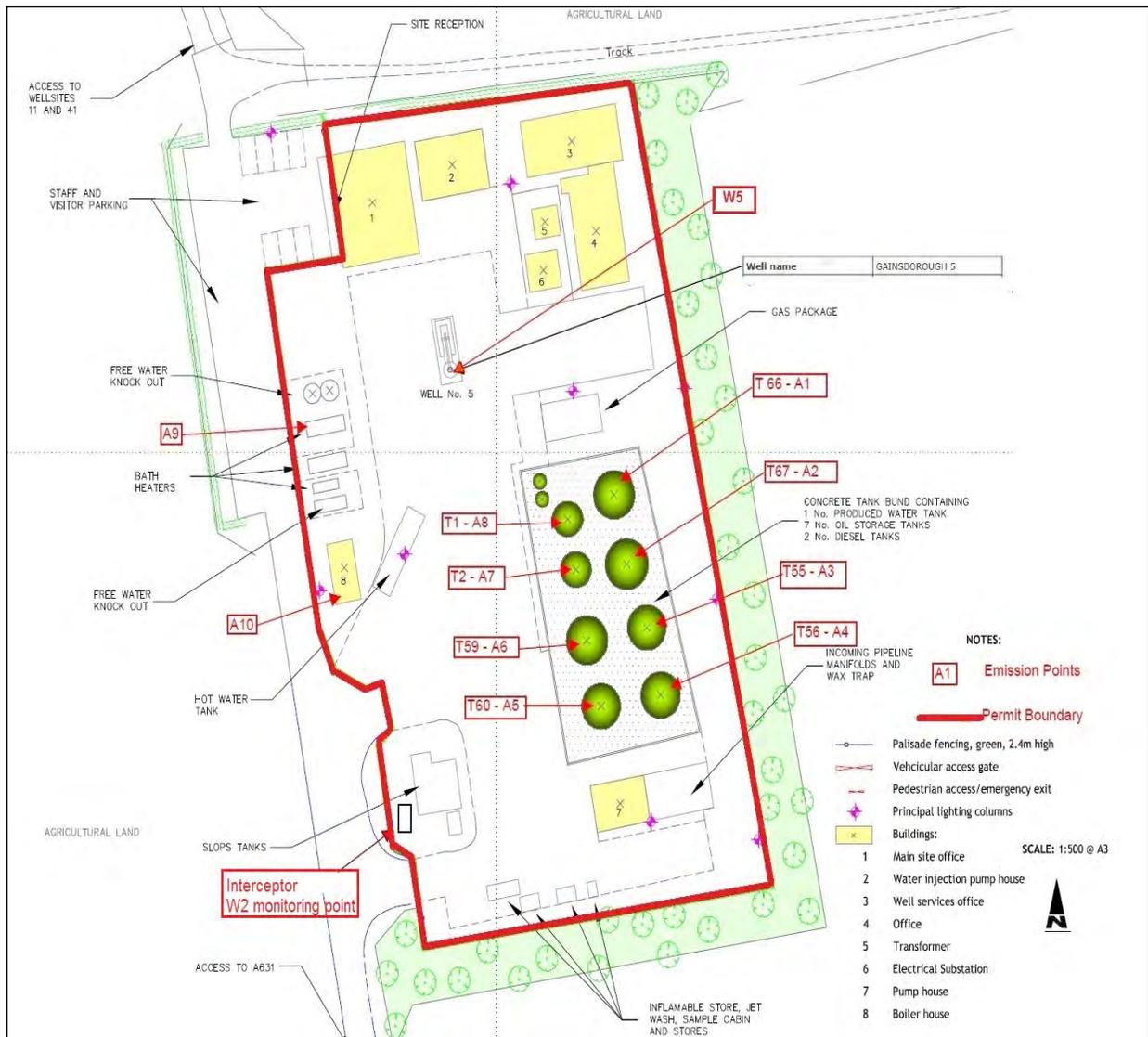
Site plan 10: Site layout plan for Gainsborough 1 wellsite



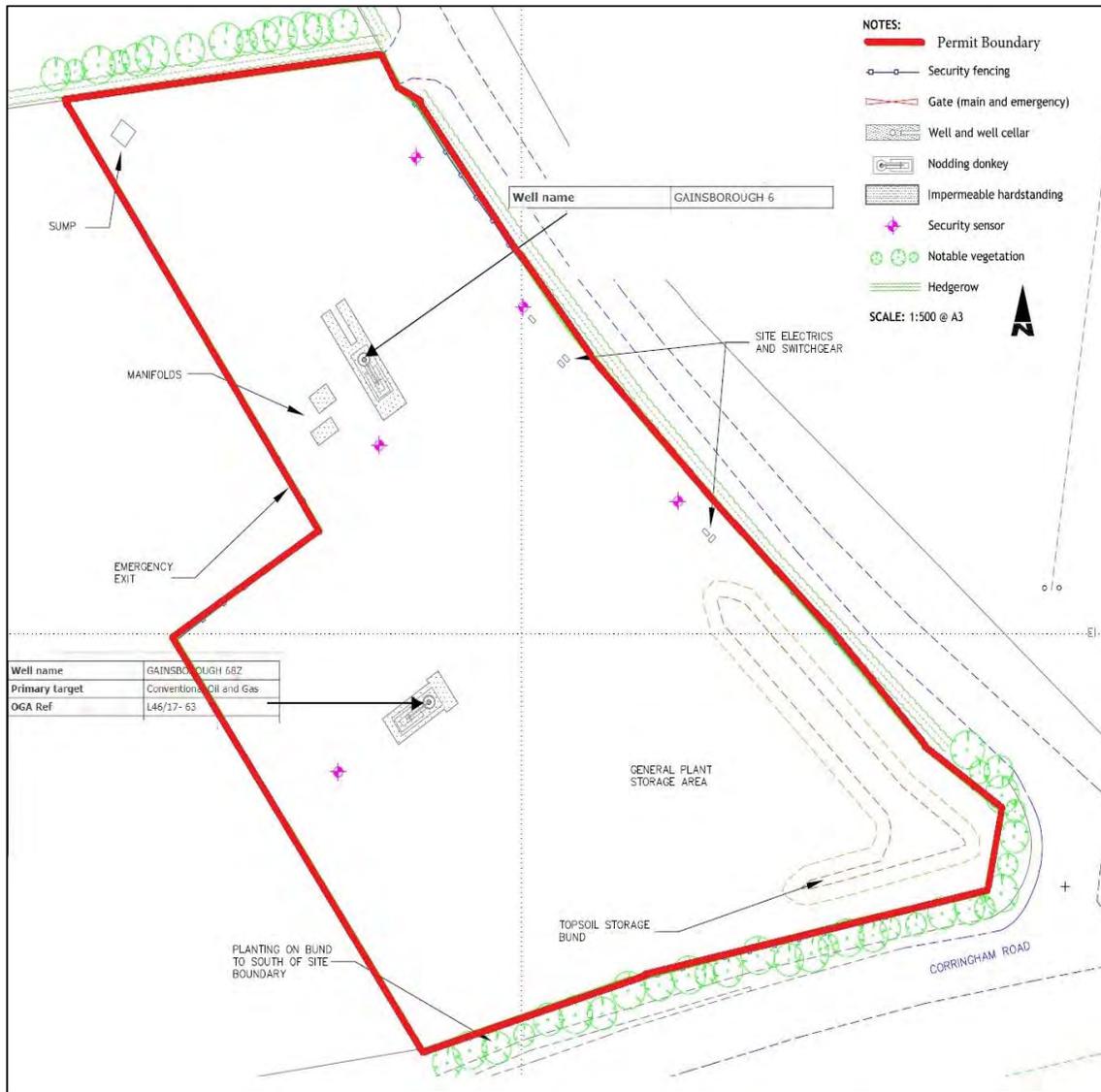
Site plan 11: Site layout plan for Gainsborough 2 wellsite



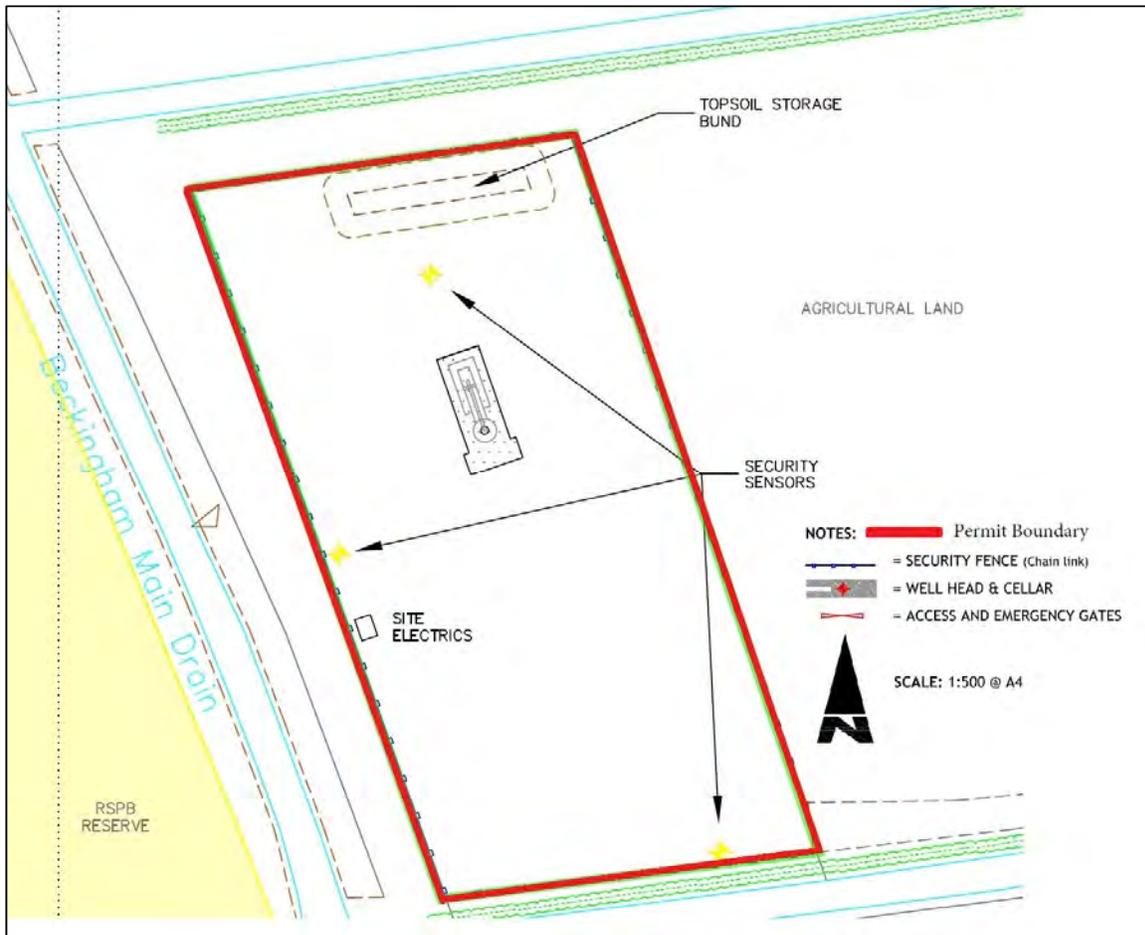
Site plan 12: Site layout plan for Gainsborough 5 wellsite



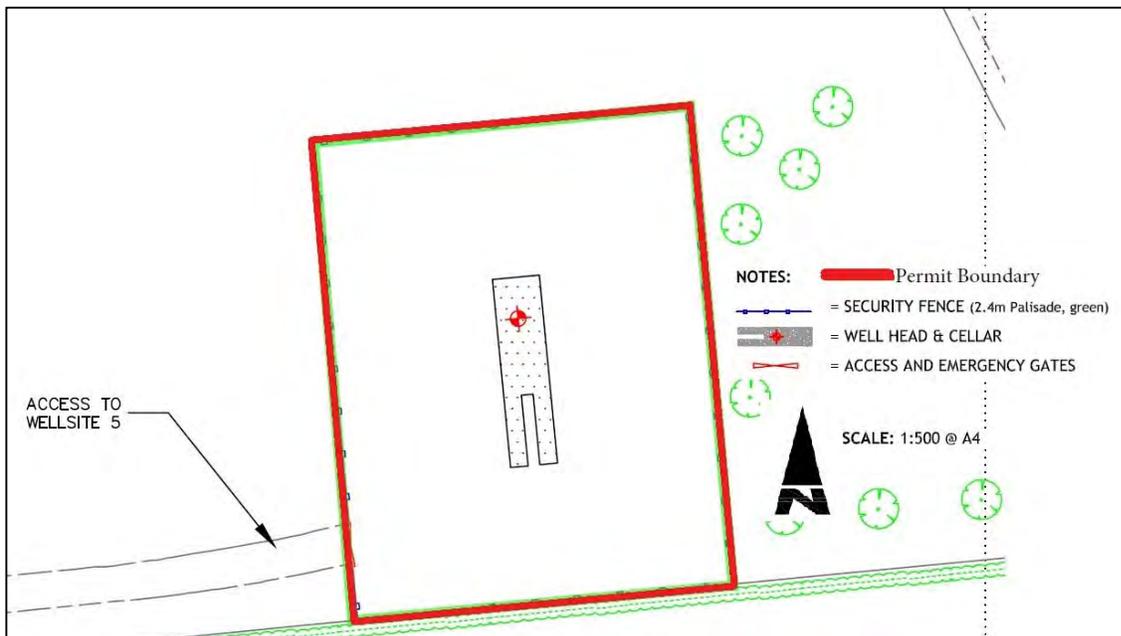
Site plan 13: Layout plan for Gainsborough 6 wellsite



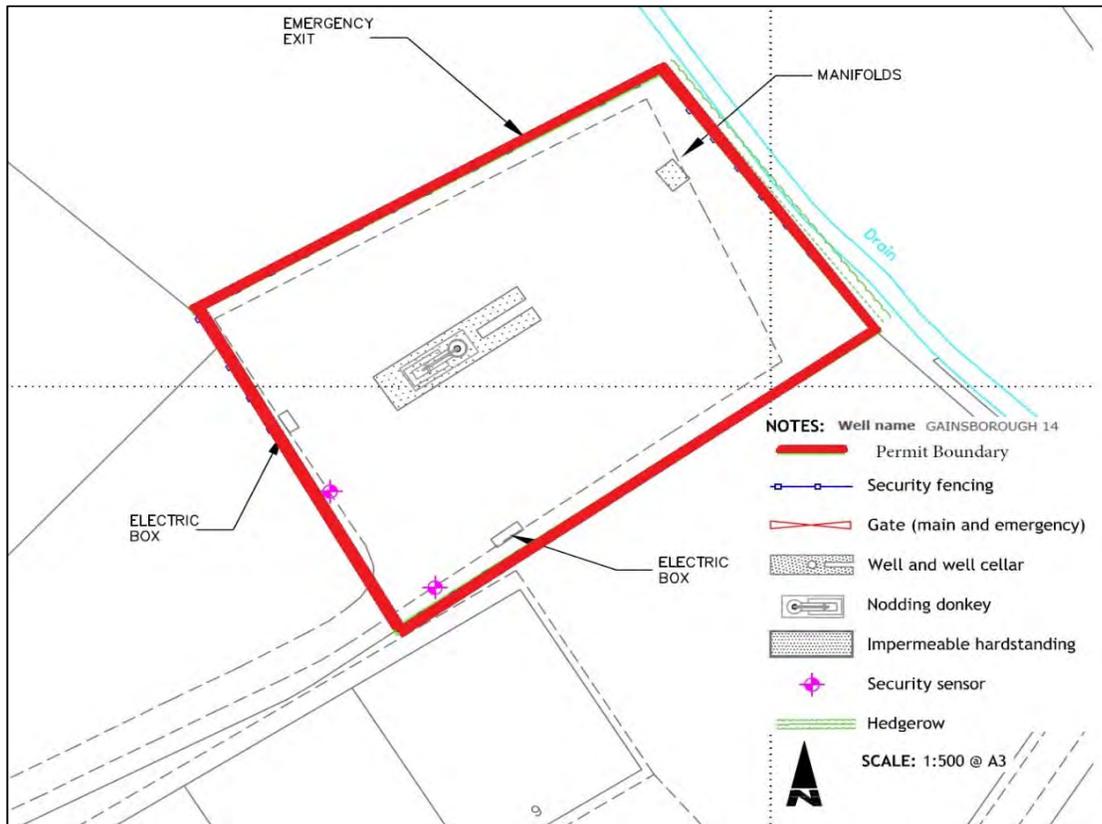
Site plan 14: Site layout plan for Gainsborough 8 wellsite



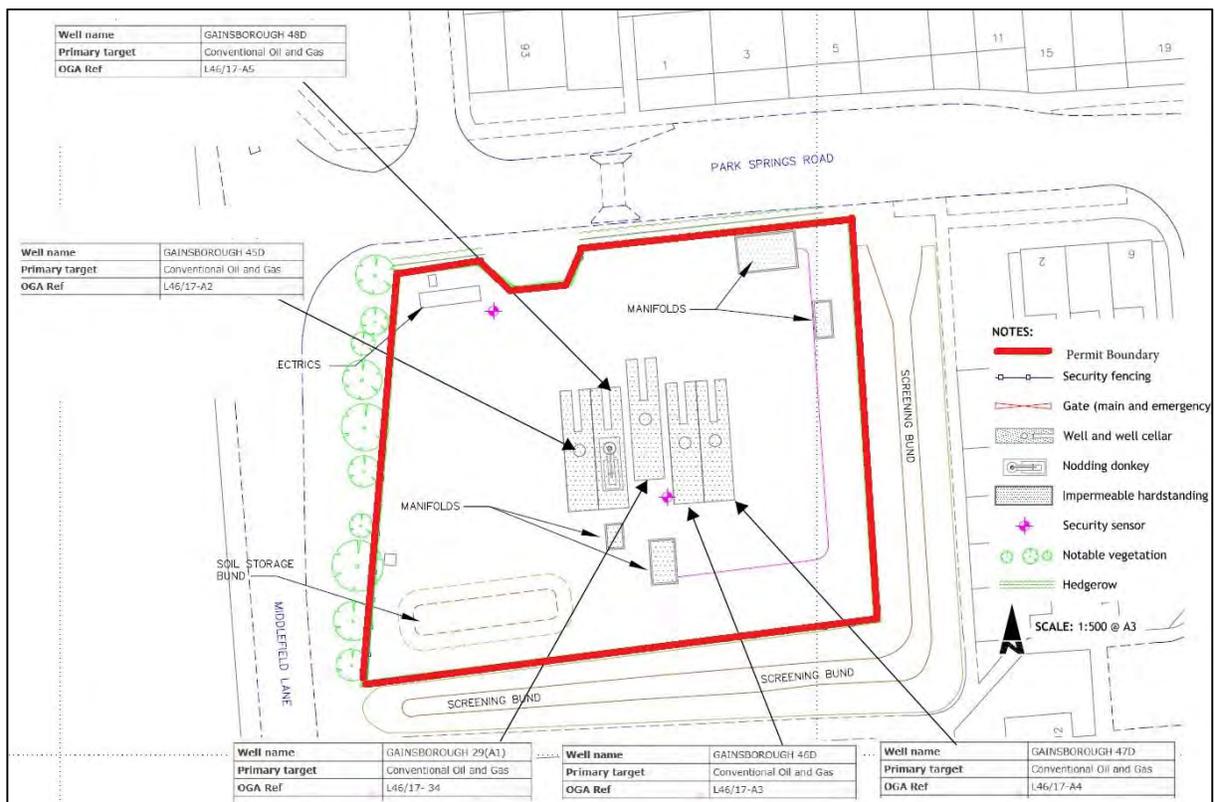
Site plan 15: Site layout plan for Gainsborough 11 wellsite



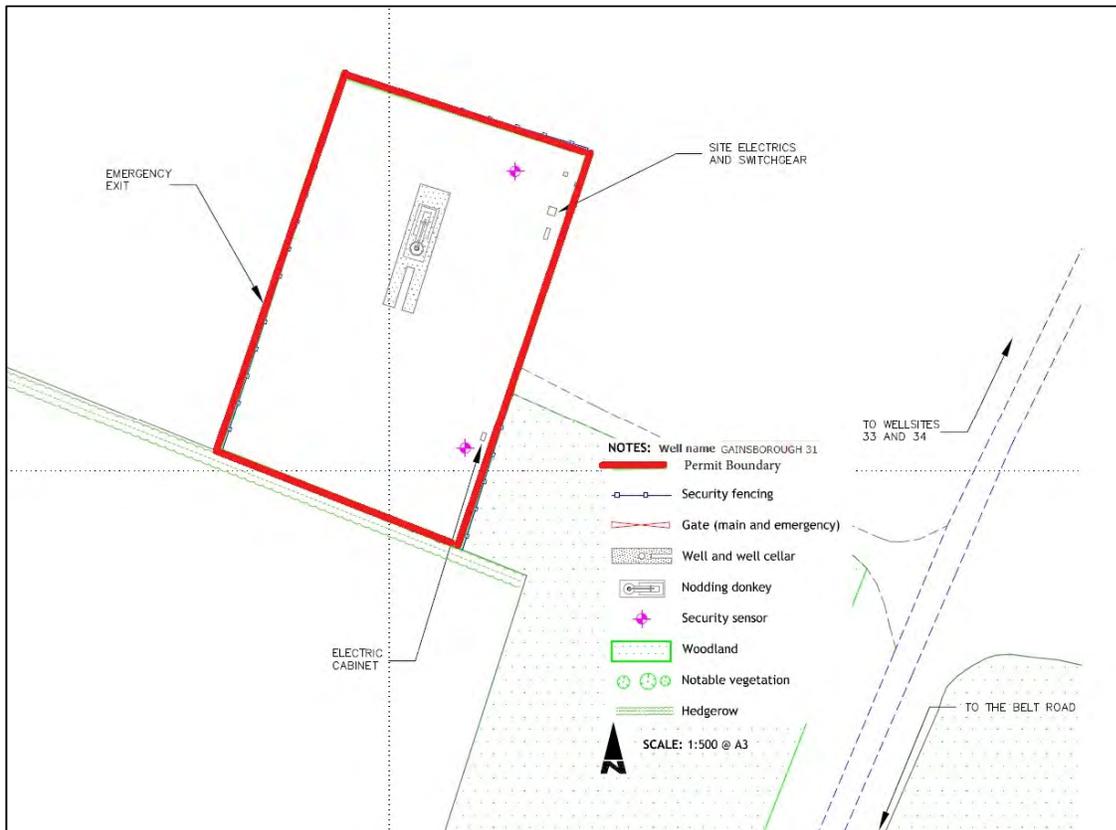
Site plan 16: Site layout plan for Gainsborough 14 wellsite



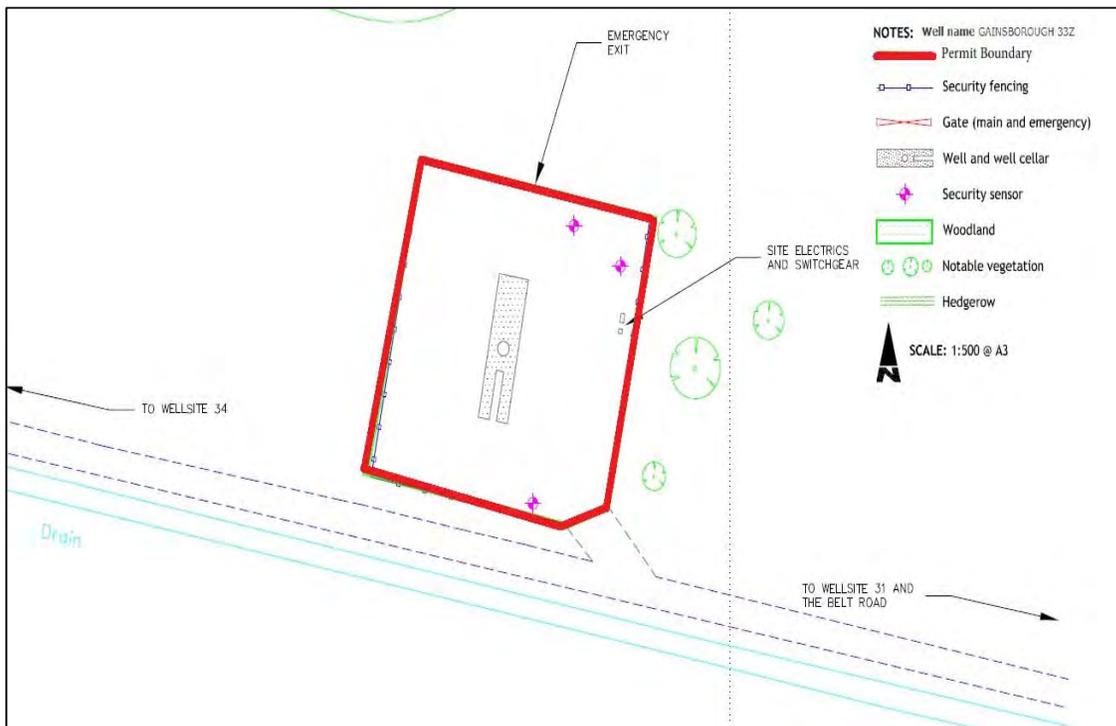
Site plan 17: Site layout plan for Gainsborough 29 wellsite



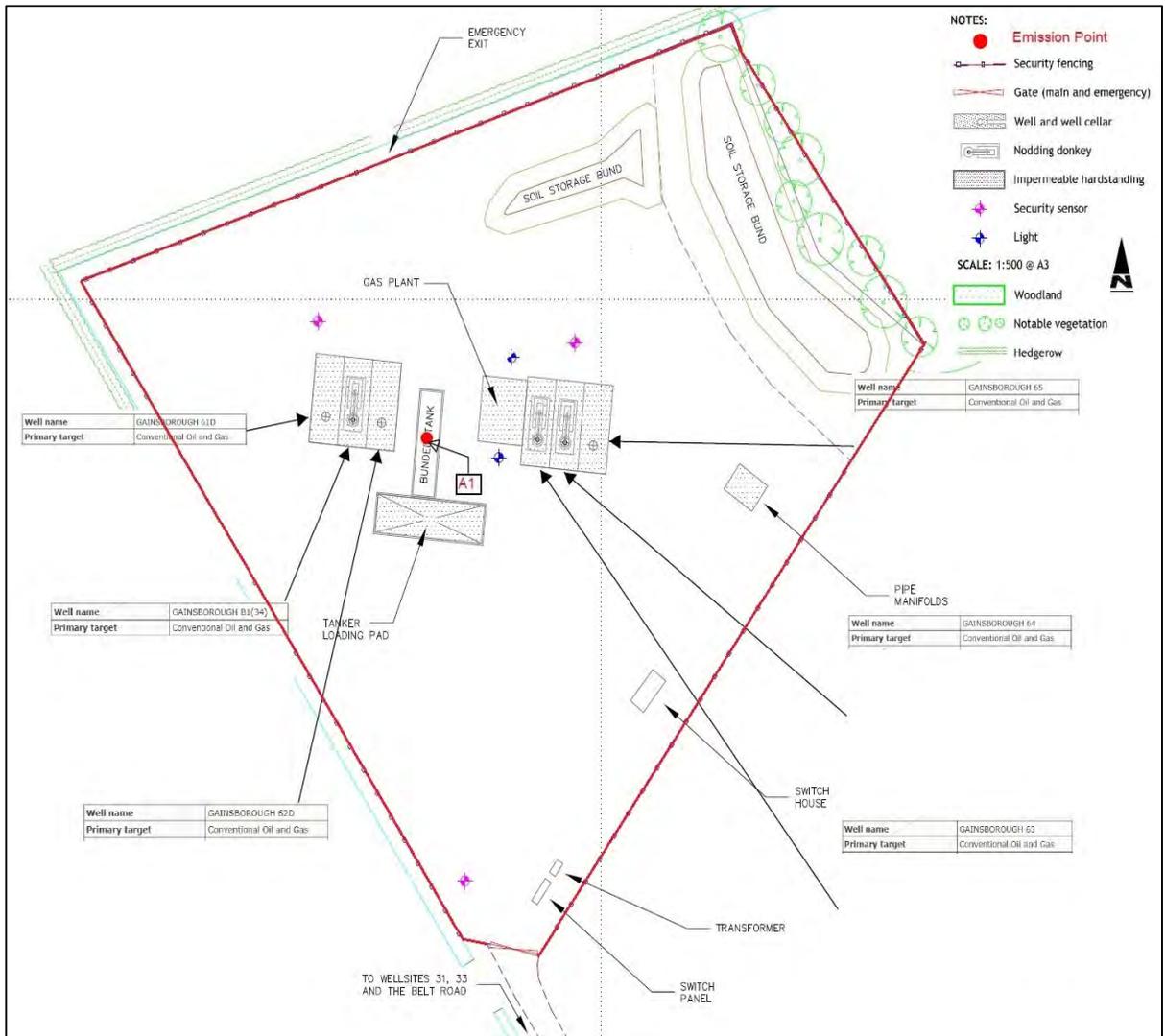
Site plan 18: Site layout plan for Gainsborough 31 wellsite



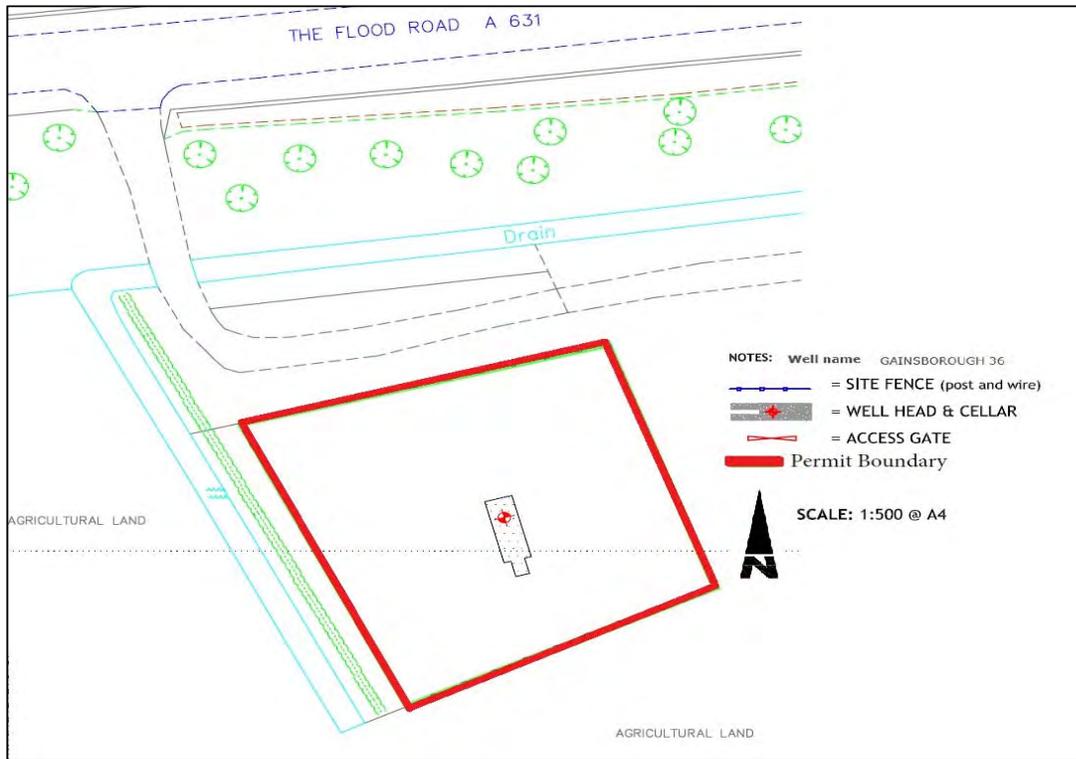
Site plan 19: Site layout plan for Gainsborough 33 wellsite



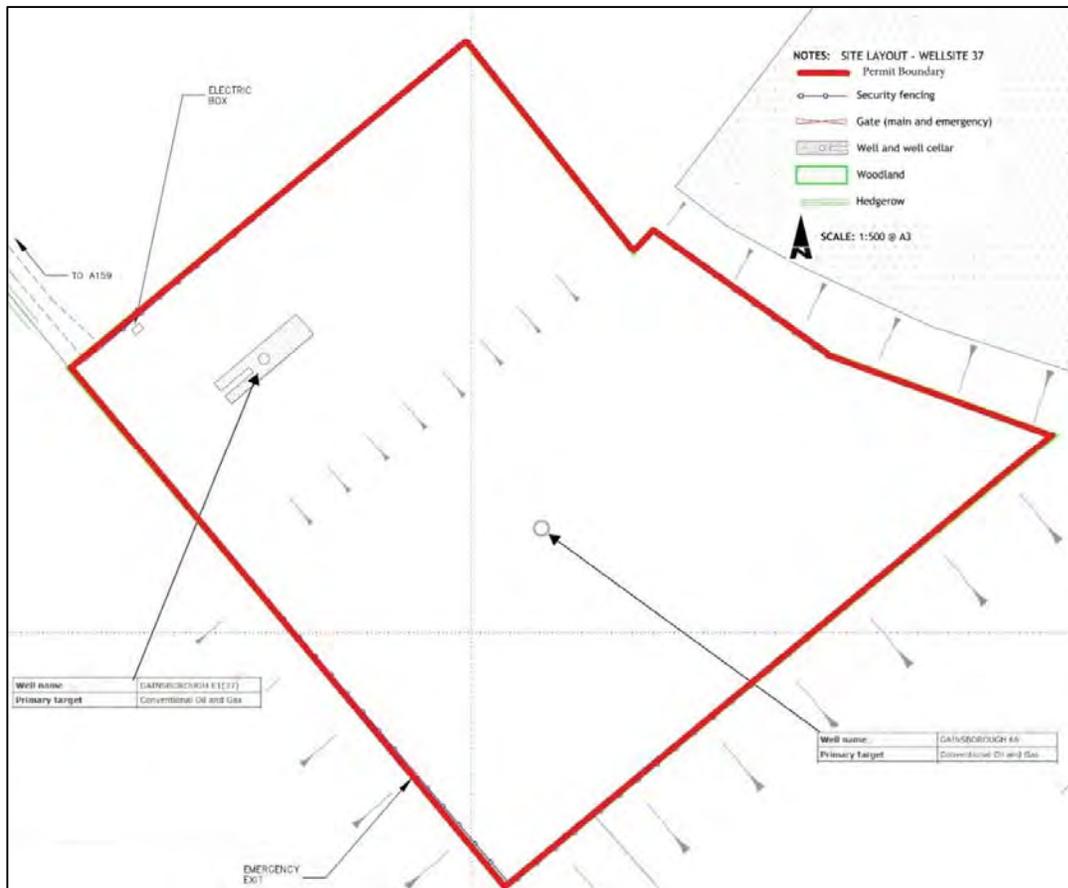
Site plan 20: Site layout plan for Gainsborough 34 wellsite



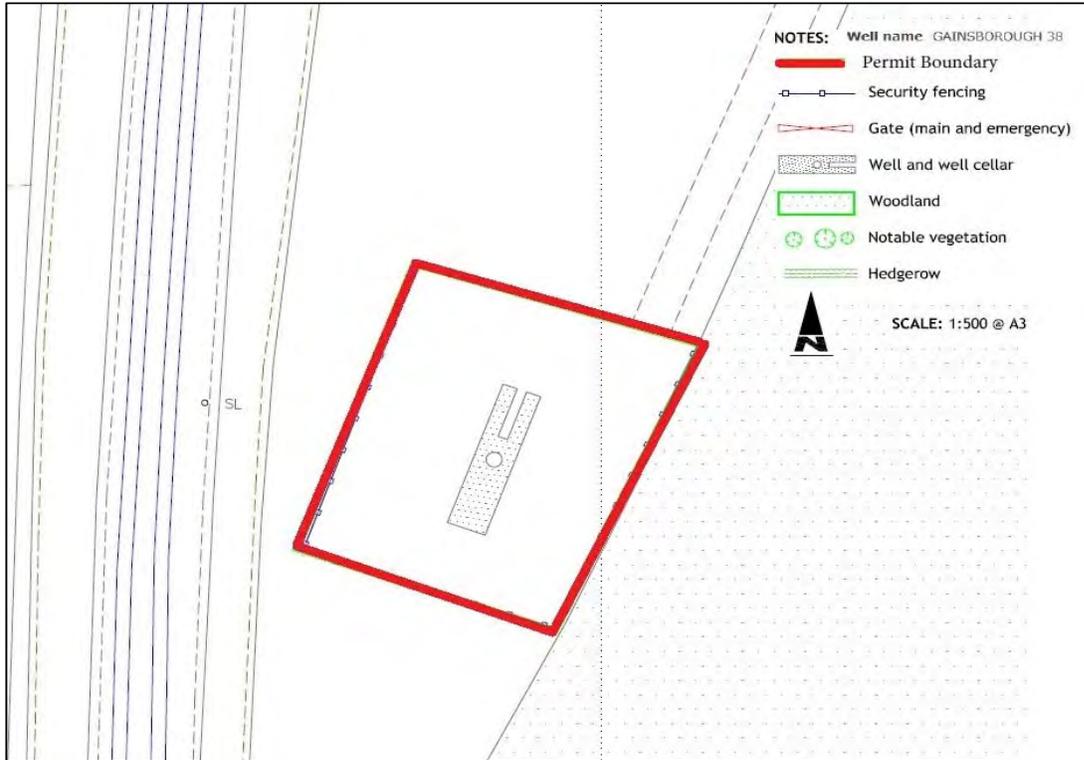
Site plan 21: Site layout plan for Gainsborough 36 wellsite



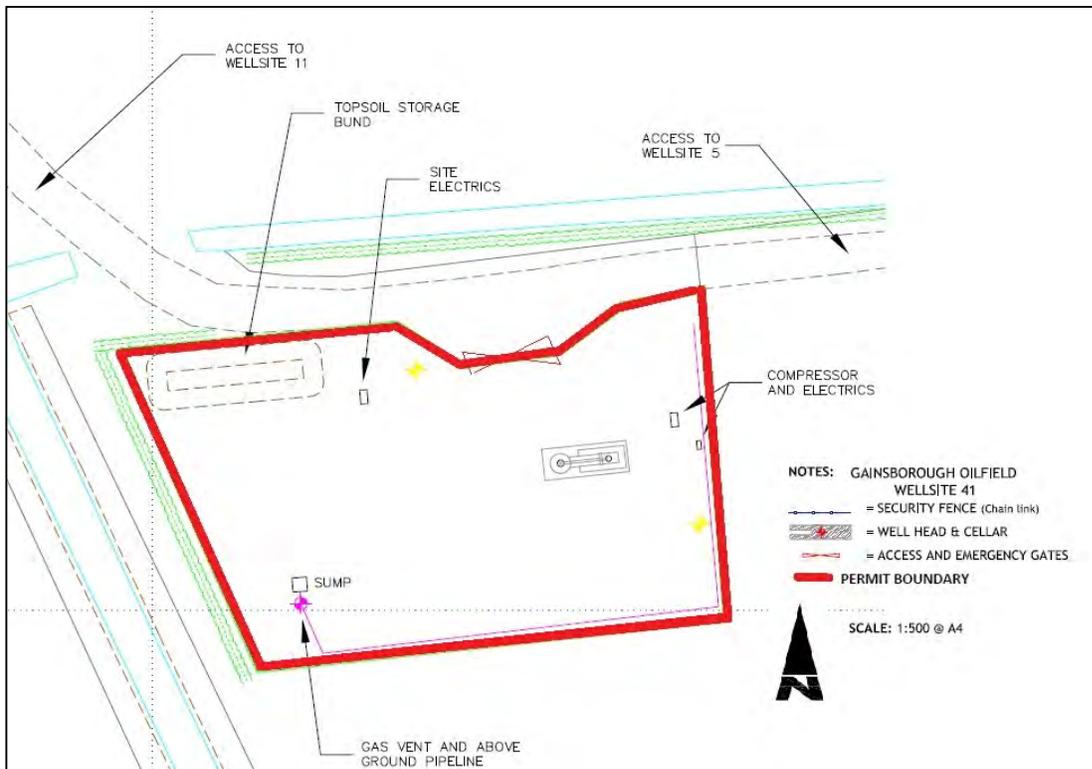
Site plan 22: Site layout plan for Gainsborough 37 wellsite



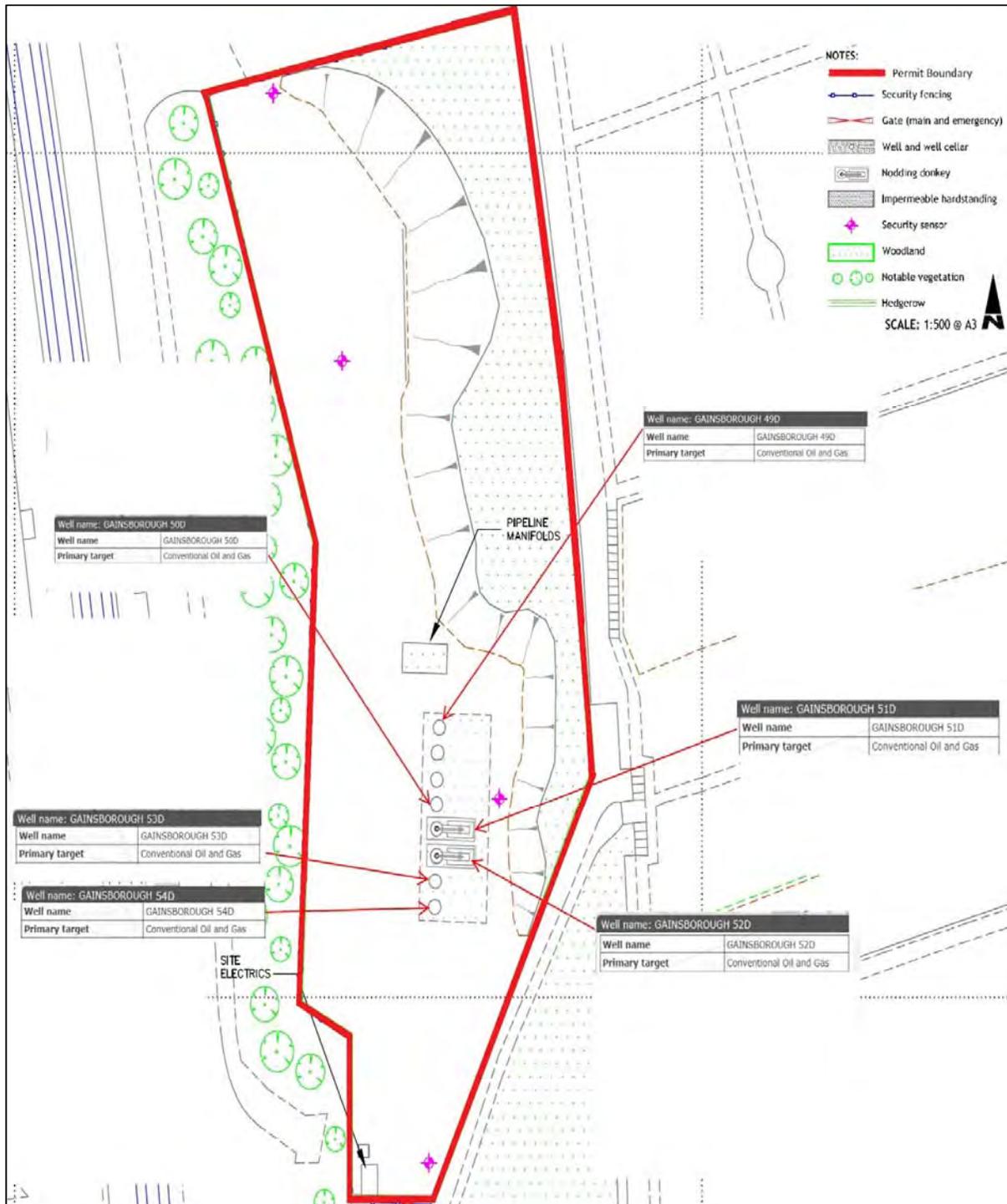
Site plan 23: Site layout plan for Gainsborough 38 wellsite



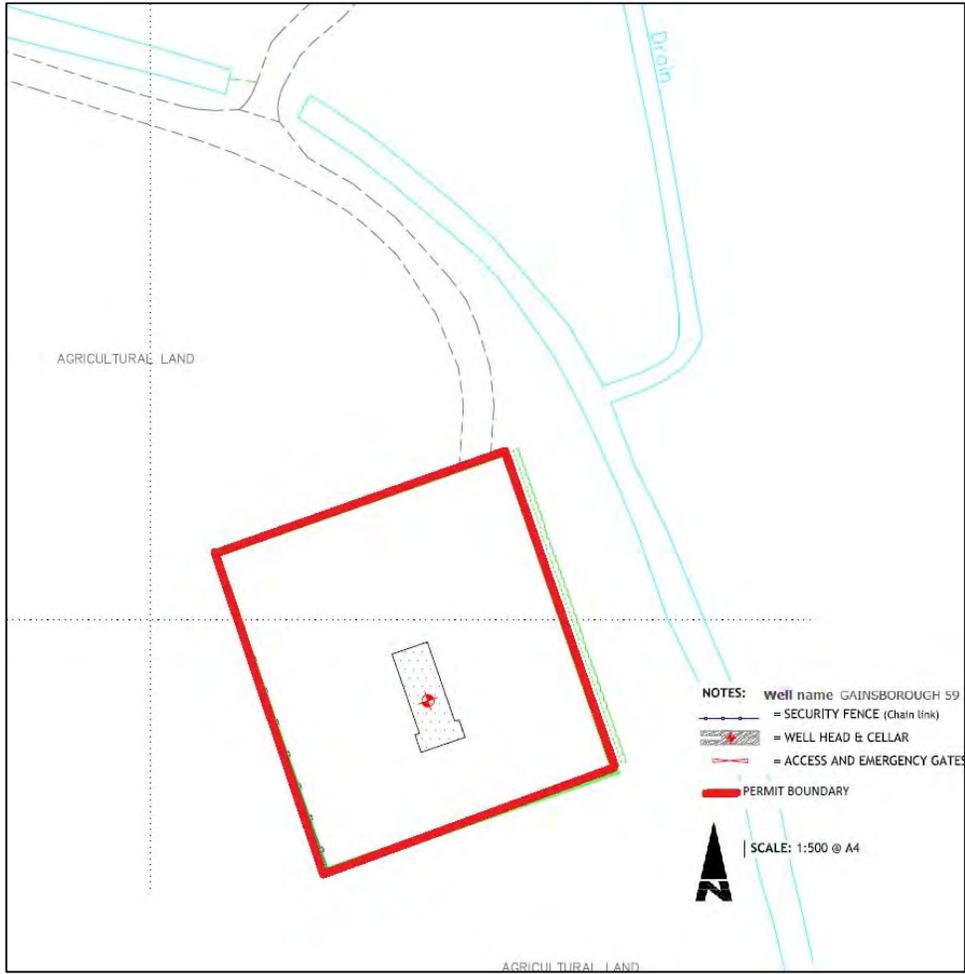
Site plan 24 : Site layout plan for Gainsborough 41 wellsite



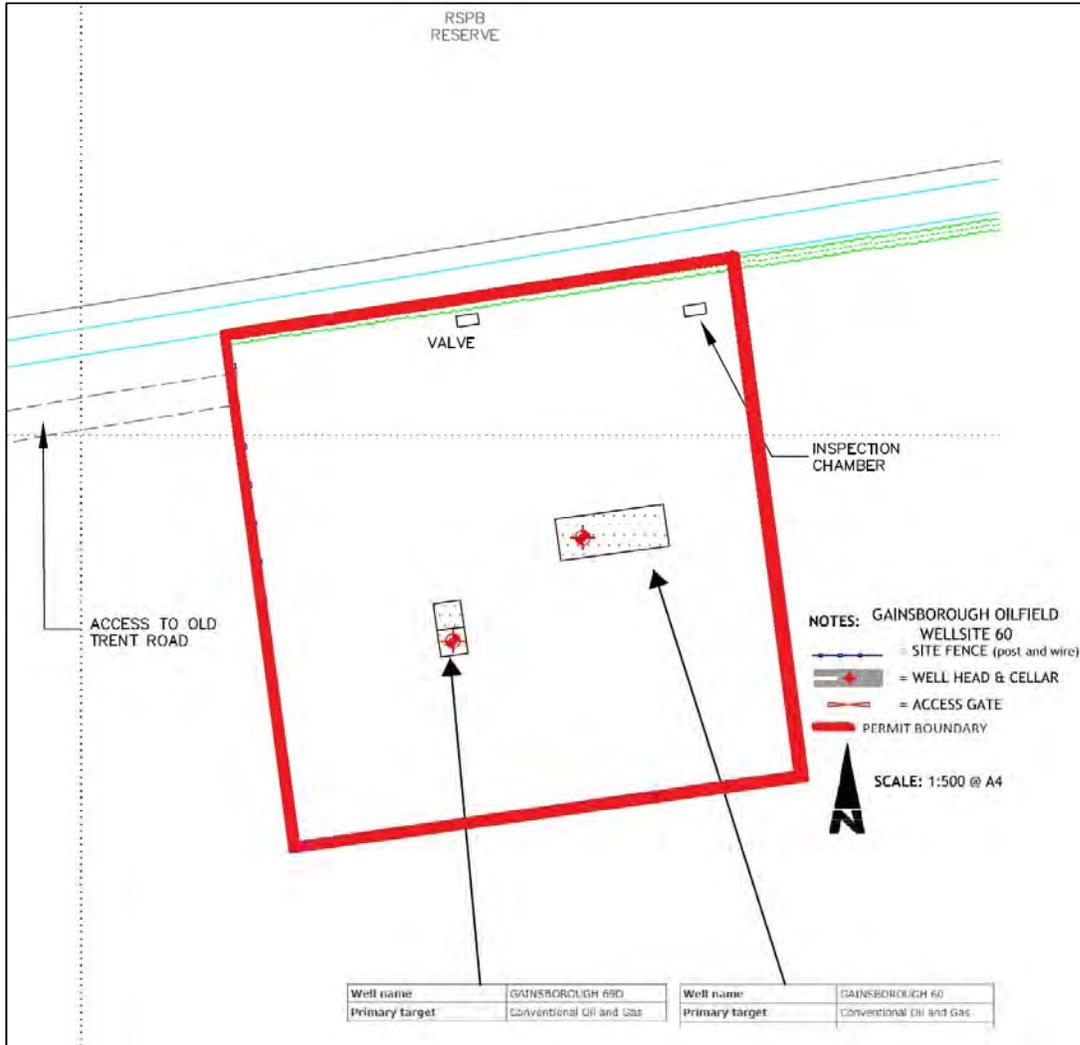
Site plan 25: Layout plan for Gainsborough 43 Wellsite



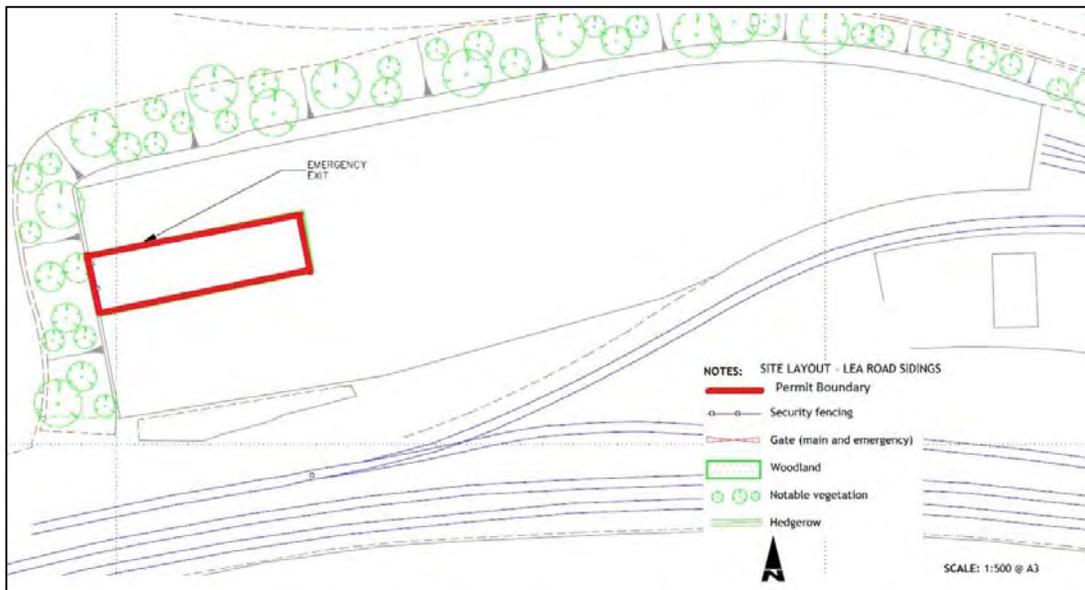
Site plan 26: Site layout plan for Gainsborough 59 wellsite



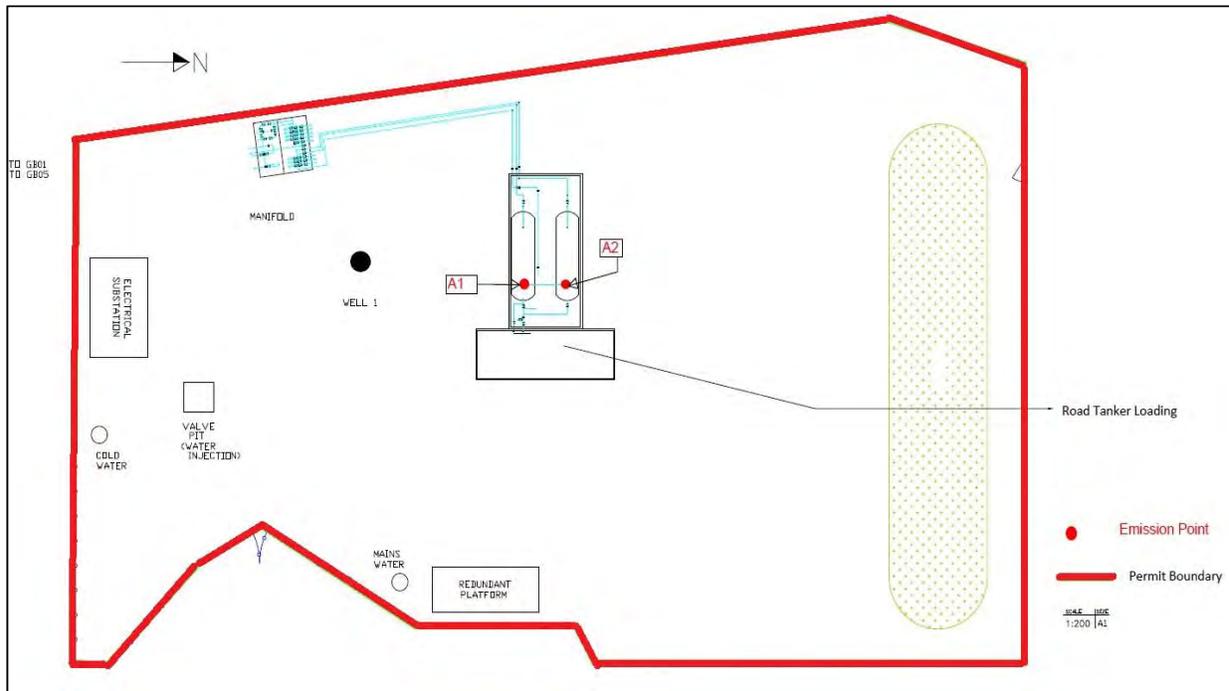
Site plan 27: Site layout plan for Gainsborough 60 wellsite



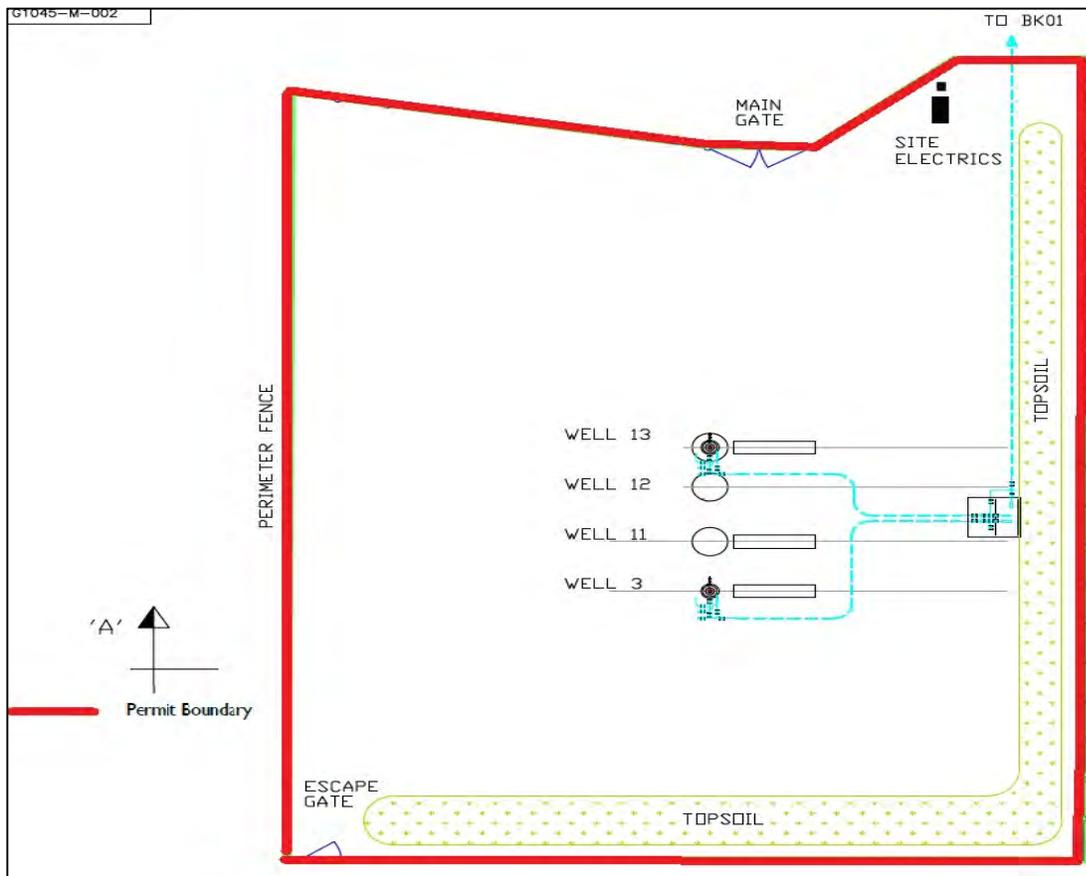
Site plan 28 : Layout plan for Gainsborough Lead road Sidings



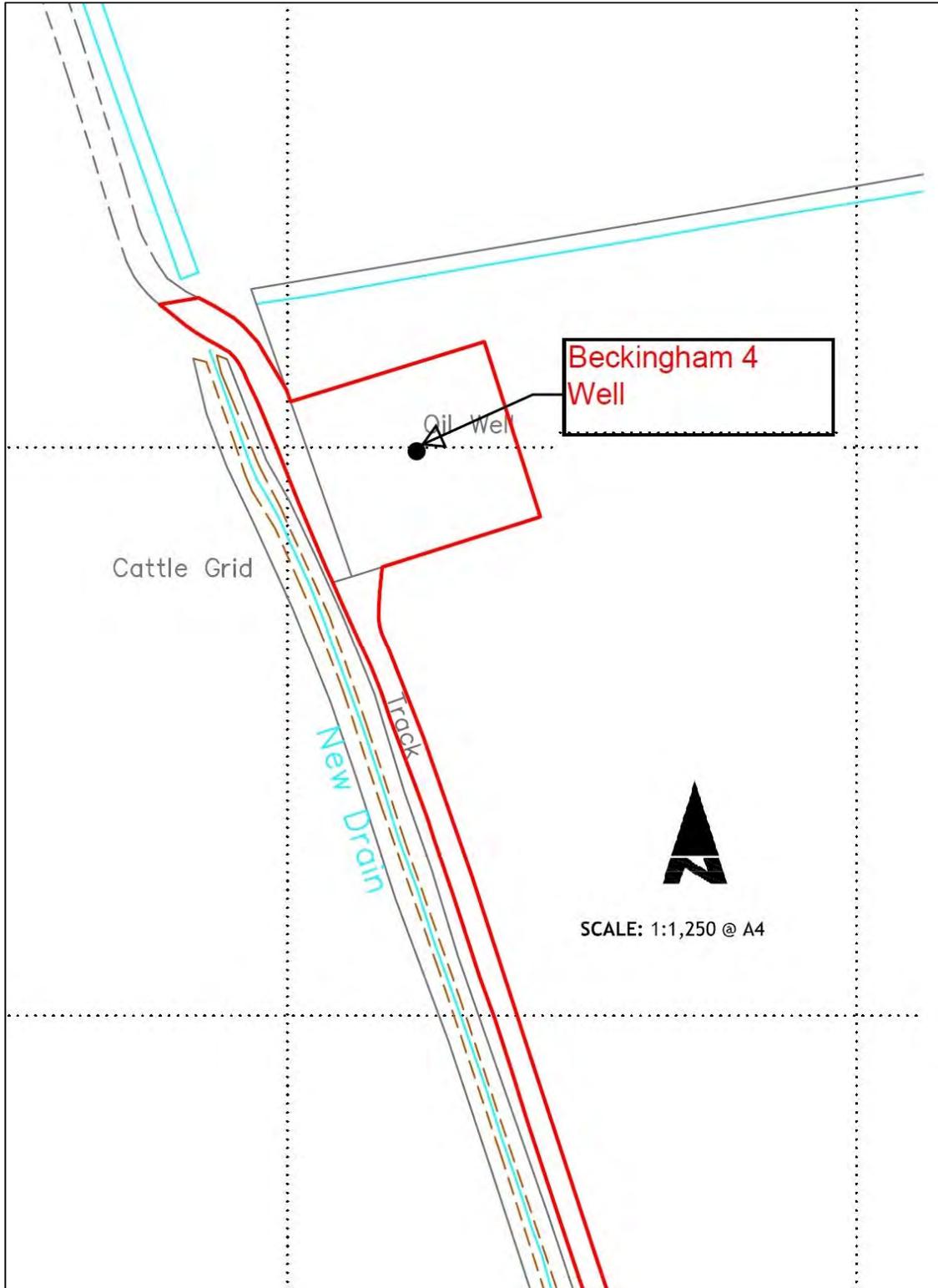
Site plan 29: Site layout of Beckingham 1 wellsite



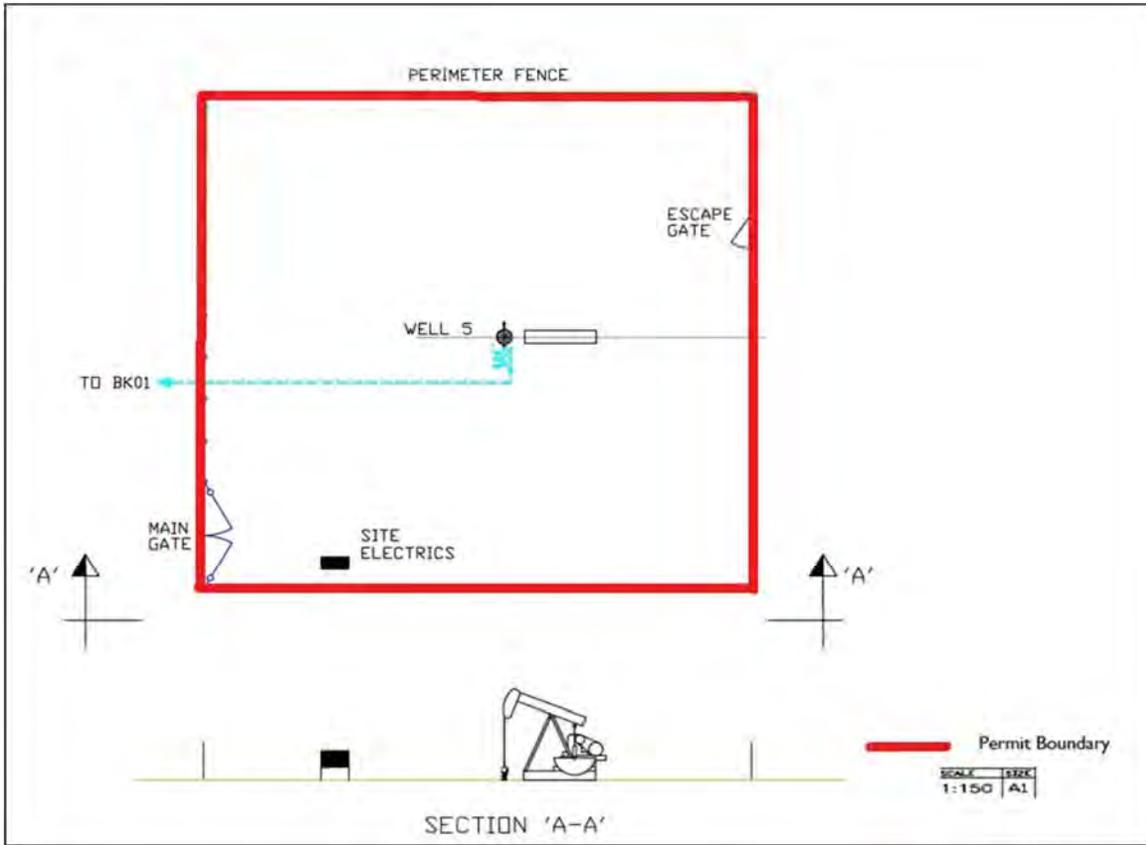
Site plan 30: Site layout plan for Beckingham 3



Site plan 31: Site layout plan for Beckingham 4



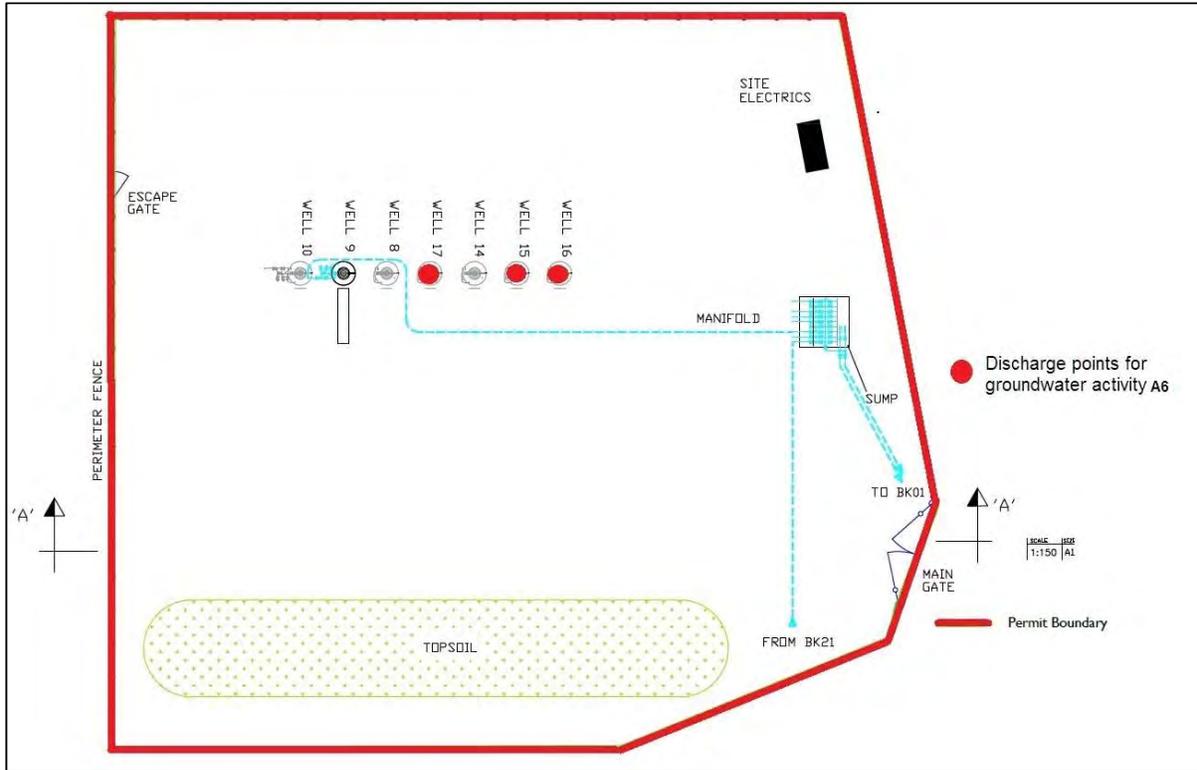
Site plan 32: Site layout plan for Beckingham 5 wellsite



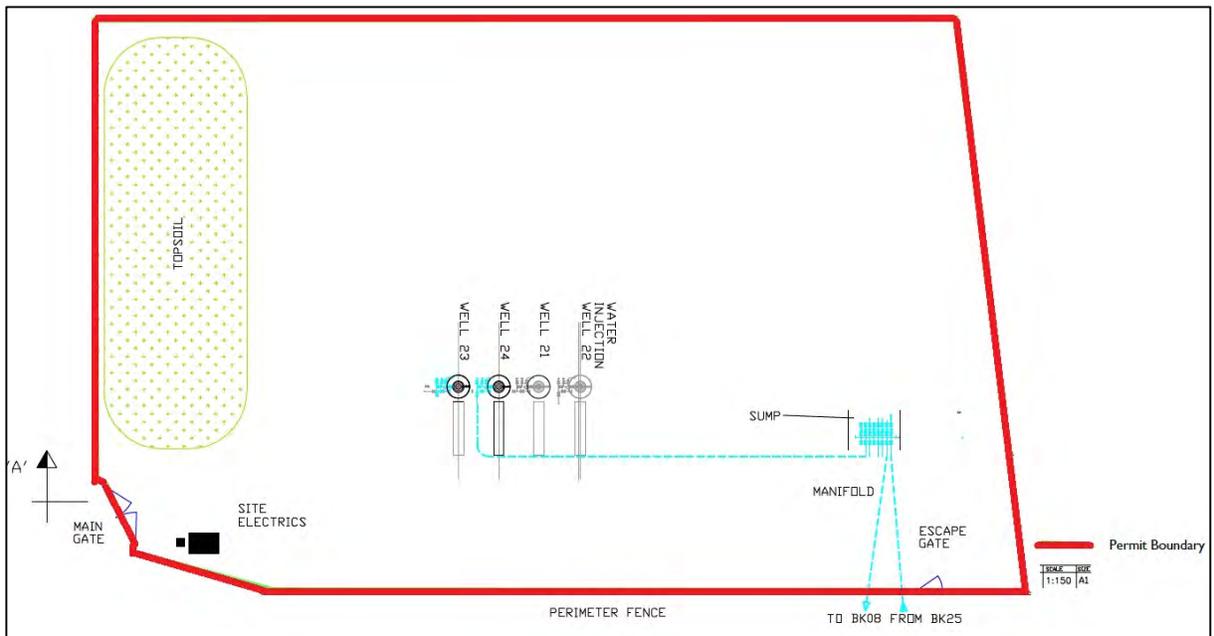
Site plan 33: Site layout plan for Beckingham 6 wellsite



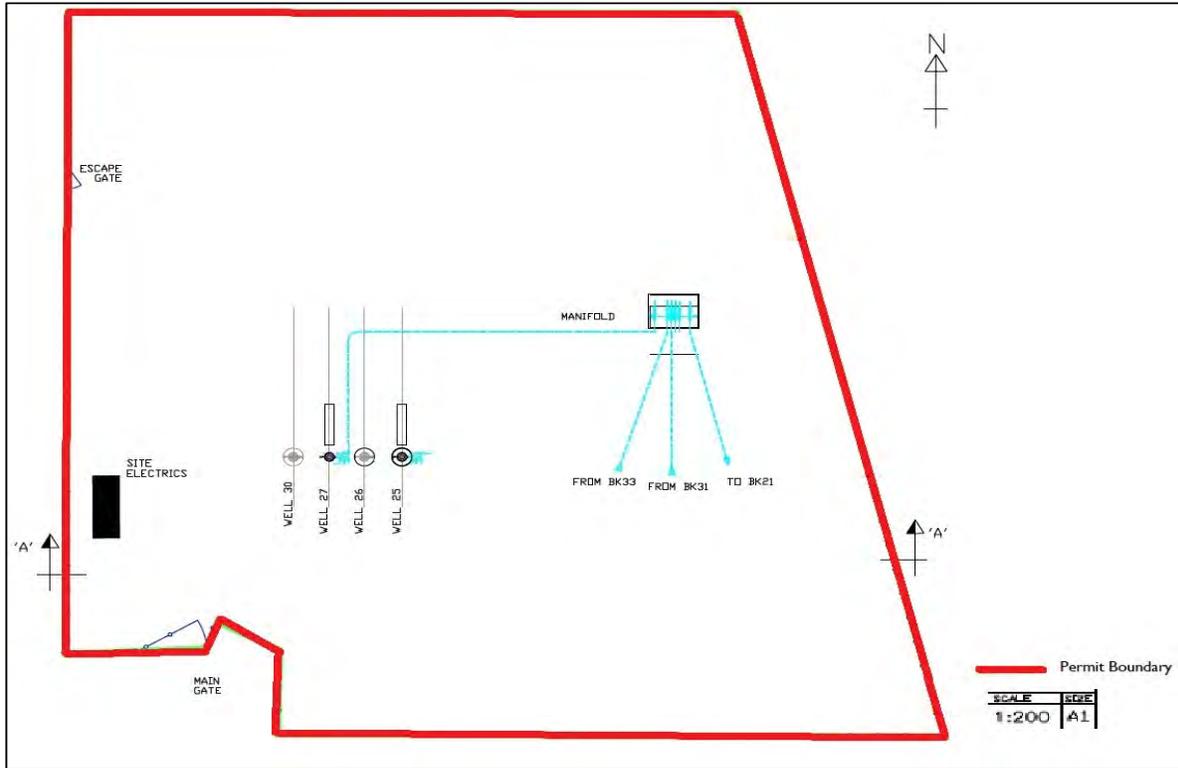
Site plan 34: Site layout plan for Beckingham 8 wellsite



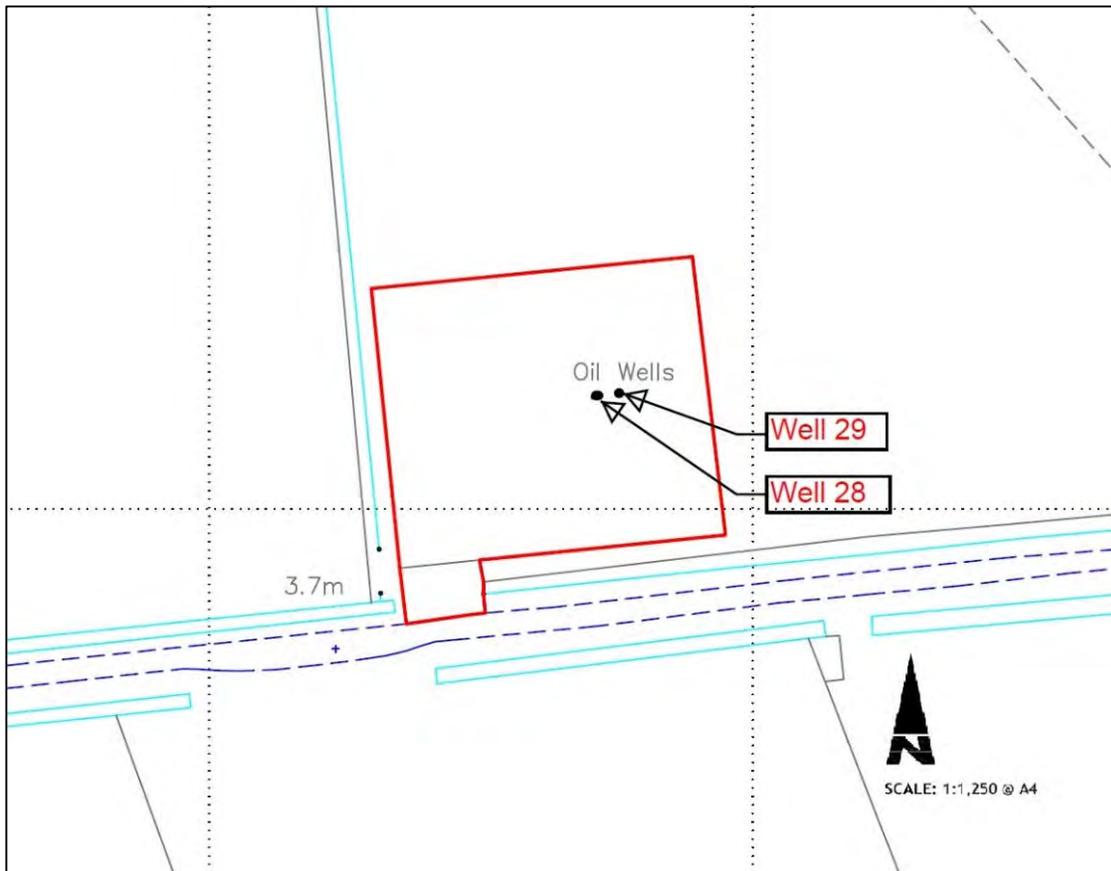
Site plan 35: Site layout plan for Beckingham 21 wellsite



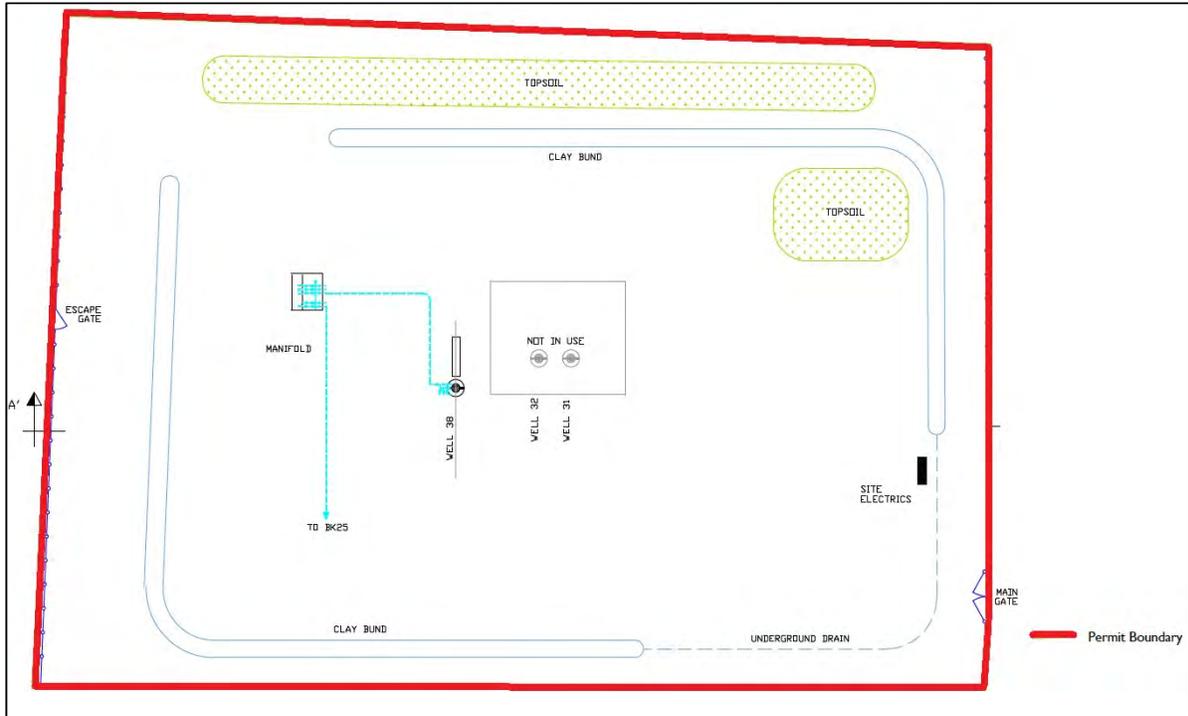
Site plan 36: Site layout plan for Beckingham 25 wellsite



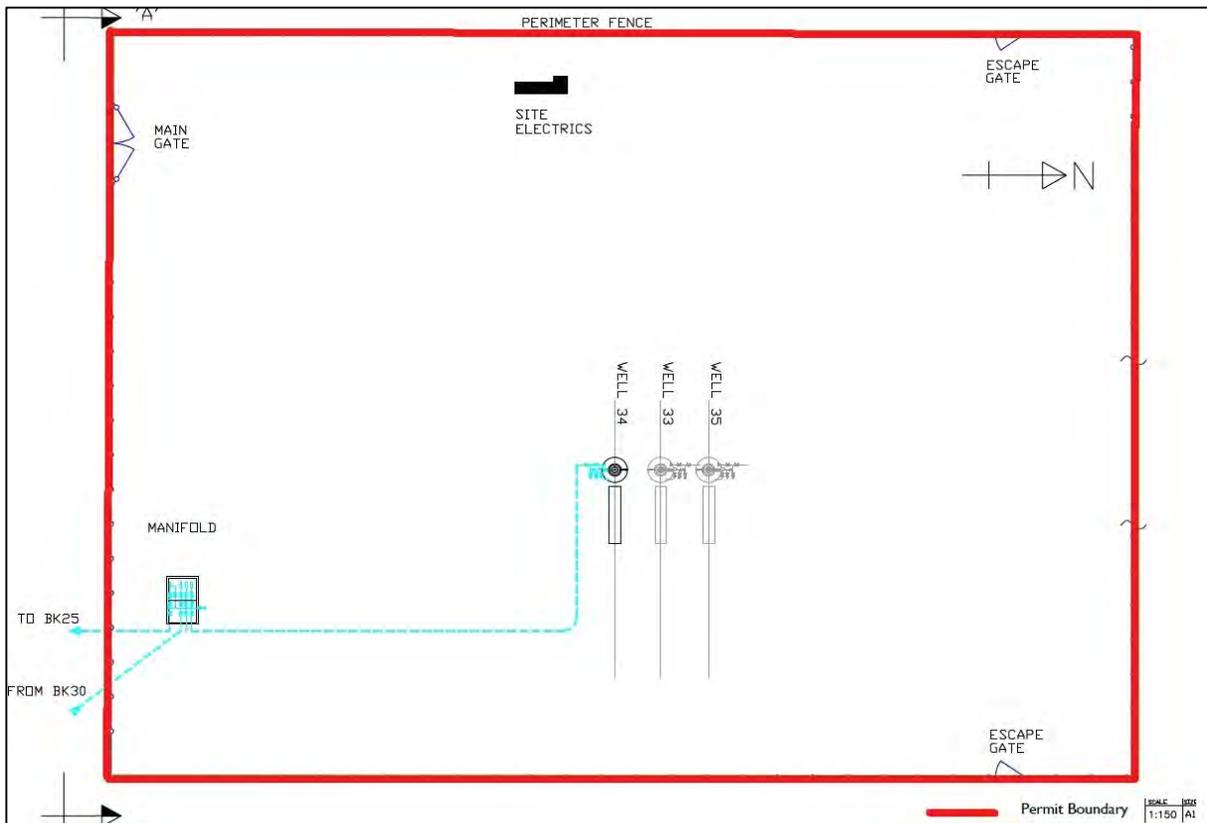
Site plan 37: Site layout plan for Beckingham 28 wellsite



Site plan 38: Site layout plan for Beckingham 31 wellsite



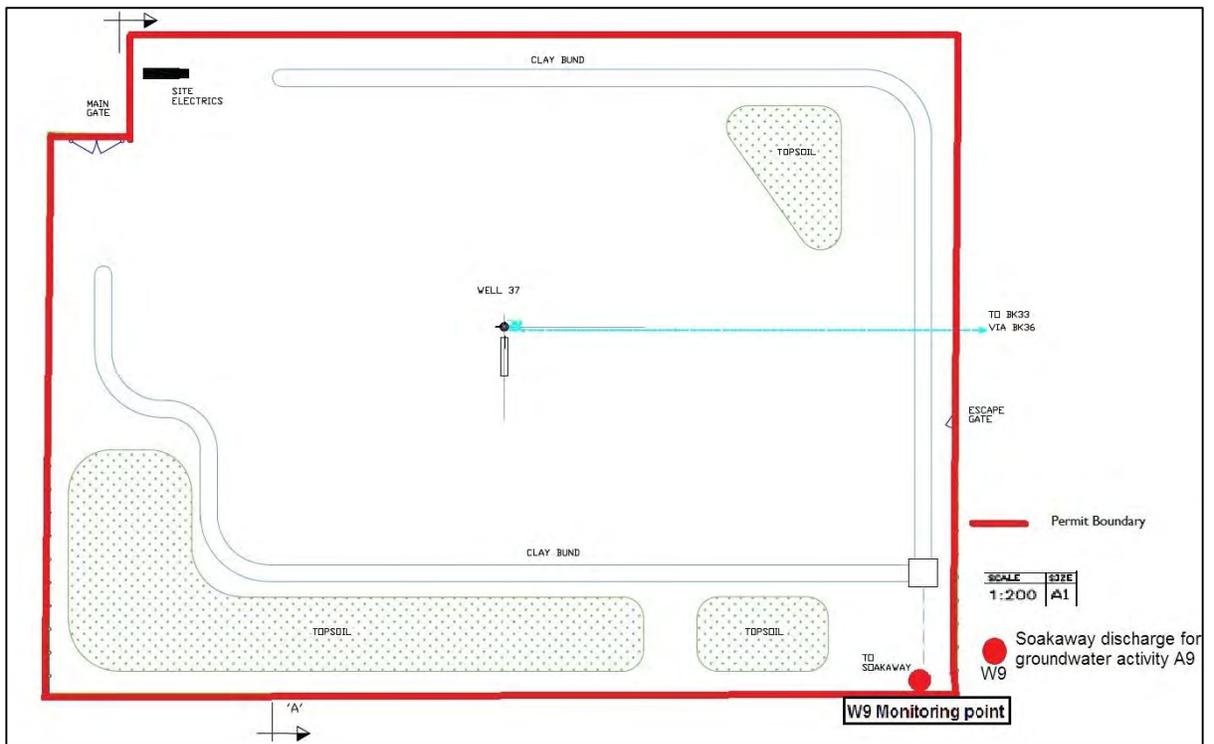
Site plan 39: Site layout plan for Beckingham 33 wellsite



Site plan 40: Site layout plan for Beckingham 36 wellsite



Site plan 41: Site layout plan for Beckingham 37 wellsite



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END OF PERMIT

Reporting Forms

Permit Number: **EPR/RP3937YT** **Operator:** **Igas Energy Production Limited**
Facility: **Gainsborough-** **Form Number:** **Air1 / DD/MM/YY**
 Beckingham Oilfield

Reporting of emissions to air for the period from **DD/MM/YYYY to **DD/MM/YYYY****

Emission Point	Substance / Parameter	Emission Limit Value	Reference Period	Result ^[1]	Test Method ^[2]	Sample Date and Times ^[3]	Uncertainty ^[4]

1. The result given is the maximum value (or the minimum value in the case of a limit that is expressed as a minimum) obtained during the reporting period, expressed in the same terms as the emission limit value. Where the emission limit value is expressed as a range, the result is given as the 'minimum – maximum' measured values.
2. Where an internationally recognised standard test method is used the reference number is given. Where another method that has been formally agreed with the Environment Agency is used, then the appropriate identifier is given. In other cases the principal technique is stated, for example gas chromatography.
3. For non-continuous measurements the date and time of the sample that produced the result is given. For continuous measurements the percentage of the process operating time covered by the result is given.
4. The uncertainty associated with the quoted result at the 95% confidence interval, unless otherwise stated.

Signed Date.....

(Authorised to sign as representative of Operator)

Permit Number: EPR/RP3937YT Operator: Igas Energy Production Limited
Facility: Gainsborough- Form Number: Water1 / DD/MM/YY
Beckingham Oilfield

Reporting of emissions to water (other than to sewer) and land for the period from DD/MM/YYYY to DD/MM/YYYY

Emission Point	Substance / Parameter	Emission Limit Value	Reference Period	Result ^[1]	Test Method ^[2]	Sample Date and Times ^[3]	Uncertainty ^[4]

1. The result given is the maximum value (or the minimum value in the case of a limit that is expressed as a minimum) obtained during the reporting period, expressed in the same terms as the emission limit value. Where the emission limit value is expressed as a range, the result is given as the 'minimum – maximum' measured values.
2. Where an internationally recognised standard test method is used the reference number is given. Where another method that has been formally agreed with the Environment Agency is used, then the appropriate identifier is given. In other cases the principal technique is stated, for example gas chromatography.
3. For non-continuous measurements the date and time of the sample that produced the result is given. For continuous measurements the percentage of the process operating time covered by the result is given.
4. The uncertainty associated with the quoted result at the 95% confidence interval, unless otherwise stated.

Signed

Date.....

(Authorised to sign as representative of Operator)

Permit Number: **EPR/RP3937YT** **Operator:** **Igas Energy Production Limited**
Facility: **Gainsborough-Beckingham Oilfield** **Form Number:** **WaterUsage1 / DD/MM/YY**

Reporting of Water Usage for the year

Water Source	Usage (m³/year)	Specific Usage (m³/unit output)
Mains water		
Site borehole		
River abstraction		
TOTAL WATER USAGE		

Operator's comments:

Signed

Date.....

(authorised to sign as representative of Operator)

Permit Number: **EPR/RP3937YT** **Operator:** **Igas Energy Production Limited**
Facility: **Gainsborough-Beckingham Oilfield** **Form Number:** **Energy1 / DD/MM/YY**

Reporting of Energy Usage for the year

Energy Source	Energy Usage		Specific Usage (MWh/unit output)
	Quantity	Primary Energy (MWh)	
Electricity *	MWh		
Natural Gas	MWh		
Gas Oil	tonnes		
Recovered Fuel Oil	tonnes		
TOTAL	-		

* Conversion factor for delivered electricity to primary energy = 2.4

Operator's comments:

Signed

Date.....

(Authorised to sign as representative of Operator)

Permit Number: **EPR/RP3937YT** **Operator:** **Igas Energy Production Limited**
Facility: **Gainsborough-Beckingham Oilfield** **Form Number:** **Performance1 / DD/MM/YY**

Reporting of other performance indicators for the period DD/MM/YYYY to DD/MM/YYYY

Parameter	Units

Operator's comments:

Signed Date.....

(Authorised to sign as representative of Operator)

Permit Number: **EPR/RP3937YT** **Operator:** **Igas Energy Production Limited**
Facility: **Gainsborough-Beckingham Oilfield** **Form Number:** **Groundwater1 / DD/MM/YY**

Reporting of groundwater monitoring for the period from DD/MM/YYYY to DD/MM/YYYY

Monitoring Point	Substance / Parameter	Trigger level	Reference Period	Result ^[1]	Test Method ^[2]	Sample Date and Times ^[3]	Uncertainty ^[4]

1. The result given is the maximum value (or the minimum value in the case of a limit that is expressed as a minimum) obtained during the reporting period, expressed in the same terms as the emission limit value. Where the emission limit value is expressed as a range, the result is given as the 'minimum – maximum' measured values.
2. Where an internationally recognised standard test method is used the reference number is given. Where another method that has been formally agreed with the Environment Agency is used, then the appropriate identifier is given. In other cases the principal technique is stated, for example gas chromatography.
3. For non-continuous measurements the date and time of the sample that produced the result is given. For continuous measurements the percentage of the process operating time covered by the result is given.
4. The uncertainty associated with the quoted result at the 95% confidence interval, unless otherwise stated.

Signed

Date.....

(Authorised to sign as representative of Operator)

Permit Number: **EPR/RP3937YT** **Operator:** **Igas Energy Production Limited**
Facility: **Gainsborough-Beckingham Oilfield** **Form Number:** **Groundwater1 / DD/MM/YY**

Reporting of process chemicals for the period DD/MM/YYYY to DD/MM/YYYY

Parameter	Units
Concentration and volume of all process chemicals added to produced water prior to reinjection as defined in the Hydrogeological Risk Assessment in table S1.2.	

Operator's comments:

Signed

Date.....

(Authorised to sign as representative of Operator)