Application SCR evaluation template

Name of activity, address and NGR	Centrica Killingholme Power Station. Chase Hill Road, North Killingholme, Immingham, North Lincolnshire, DN40 3EH. NGR of the approximate centre of the site is 515413E, 418841N. Environmental Permit Reference EPR/SP3133LY/S007. Section 1.1 A(1)(a) - burning any fuel in an appliance with a rated thermal input of 50MW or more as listed in Part 1 of Schedule 1 of the PPC Regulations. Large Combustion Plants (LCPs) 52, 53 and 54.

Document reference, date and version of application SCR	PPC Permit Application Site Report: Preliminary Report SP3133LY Centrica Killingholme Power Station, Immingham dated November 2005. PPC Permit Application Site Report Centrica Killingholme Power Station, Immingham dated March 2006.

1.0 Site details

Has the applicant provided the following information as required by the application SCR template?

Site plans showing site layout, drainage, surfacing, receptors, sources of emissions/releases and monitoring points.

The Operator provided a Site Condition Report (SCR) at the time the original application was made. Drawings have been provided by the Operator and reviewed and accepted by the Environment Agency at the application stage.

2.0 Condition of the land at permit issue

Has the applicant provided the following information as required by the application SCR template?

a) Environmental setting including geology, hydrogeology and surface waters.
b) Pollution history including:
- pollution incidents that may have affected land
- historical land-uses and associated contaminants
- visual/olfactory evidence of existing contamination
- evidence of damage to existing pollution prevention measures.

c) Evidence of historic contamination (i.e. historical site investigation, assessment, remediation and verification reports (where available).
d) Has the applicant chosen to collect baseline reference data?

The installation is located in an industrialised area to the north-east of North Killingholme and east of East Halton, North Lincolnshire. The site is approximately 420m by 250m and occupies an area of approximately 10.5 hectares. The installation was made up of three combined cycle gas turbines (CCGT) power plant and associated buildings. The installation is bordered to the south by another gas turbine power station beyond which is an oil terminal. Land to the immediate west is undeveloped with residential properties a further 400m away. Open undeveloped land lies to the north. An oil terminal is located approximately 400m to the east. The ground underlying the site is likely to comprise:

Made Ground – of varying thickness and mixed lithologies.
Glacial Till – clay with flint and chalk fragments upto 20m thick.
Highly weathered **Upper Chalk** - over 100m thick in places.

The Glacial Till is classed as an unproductive aquifer with a low leaching potential. The Upper Chalk is classed as a major aquifer. The site and surrounding area is predominantly flat and within the floodplain of the River Humber. A small pond is located in the southern part of the installation and there is a lined retention pond in the main part of site. Land drains in the area take surface water to the Humber Estuary having been relocated to the southern boundary of the power station prior to its development. The Humber Estuary is located 1.4km to the north-east and there is a large surface water feature1.2km to the north-east.

2.0 Condition of the land at permit issue

Has the applicant provided the following information as required by the application SCR template?

Historical maps from 1890 confirm that the site and its immediate surroundings were formerly greenfield with the only development being Chase Hill Farm to the north-east. The map extract from 1968 shows an oil terminal 425m to the east of the installation with large surface water features to the south of this.

By 1974 the oil refinery dominated the landscape with the installation area remaining greenfield until 1992 when the power station was constructed.

At the time of the permit application, no pollution incidents were reported and there was no evidence or records of previous pollution incidents. The application site report concluded that there was the potential for contamination from site activities but this was a low to moderate risk. Baseline data was collected in 2007 as stipulated by the Site Protection and Monitoring Programme (SPMP). A minimum of four soil samples were obtained from each of the boreholes/monitoring wells installed at targeted locations across the site. This included groundwater samples at the water table interface. Baseline shallow groundwater monitoring revealed some minor contamination but the presence of significant ground/groundwater contamination from historical activity has not been identified.

3.0 Permitted activities

Has the applicant provided the following information as required by the application SCR template?	Response (Specify what information is needed from the applicant, if any)
a) Permitted activities **b) Non-permitted activities undertaken at the site**	

The Environment Agency determined that the Installation comprised the scheduled activity Section 1.1 A(1)(a) - burning any fuel in an appliance with a rated thermal input of 50MW or more as listed in Part 1 of Schedule 1 of the PPC Regulations at the time of the original application determination.

Directly Associated Activities at the site included heat recovery steam generators, diesel tanks (3,450 litres, 2,000 litres, 1,690 litres as well as a mobile tank of 1,000 litres), steam turbine, diesel powered fire pumps, surface water and process effluent drainage, waste handling and storage, standby diesel generator and a water treatment plant.

3.0(a) Environmental Risk Assessment

The H1 environmental risk assessment should identify elements that could impact on land and waters, cross- referenced back to documents and plans provided as part of the wider permit application.

The Environment Agency reviewed the Operator's environmental risk assessment (H1) including the potential for environmental impact from emissions to air and water. The H1 was reviewed at the time of the original permit determination and accepted as satisfactory. An Improvement Programme was set within the original permit to ensure that the identified required improvements were undertaken over specified timescales at the installation.

3.0(b) Will the pollution prevention measures protect land and groundwater?

Are the activities likely to result in pollution of land?

It was concluded that there was little likelihood of pollution arising from the operation of the installation provided that it was operated and maintained correctly. There were no direct discharges of hazardous substances or non-hazardous pollutants to groundwater from the site. To ensure the continued effectiveness of pollution prevention measures to protect the land the Operator was required to implement and operate under a SPMP. This was prepared by consultants RSK in February 2007 and adopted by the site in April 2007. The site was divided into three separate zones based on activities and the potential for contaminated land comprising:

- Zone 1: oil storage – lube, fuel, waste, engineering, hydraulic, emergency diesel. Fire pumps
- Zone 2: water treatment chemicals
- Zone 3: all remaining site uses.

Surface water protection features included a closed surface water collection system across the site comprising drainage pipes that feed into a site treatment works. This comprised an oil-water separator, effluent neutralisation pit, purge pit and Klargestor tank.

The only significant underground structures were the condenser basement, the purge pit, pump house and the dock for the main cooling water system and cooling water make up pump house. This pump house was remote from the site and connected via underground pipework (see plan at end of the document). The cooling water intake and outfall culverts extended into the Humber Estuary. The plant thermal insulation was understood to be free of asbestos and the transformer oil on site contained no PCBs. There were no landfill sites or lagoons within the installation site boundary.

For dangerous and/or hazardous substances only, are the pollution prevention measures for the relevant activities to a standard that is likely to prevent pollution of land?

The site specific Environmental Management System included operational procedures covering aspects of the generation process and associated activities undertaken across the wider site. All station procedures were regularly reviewed and audited in line with the stations normal self regulation practice. Processes were designed and measures taken to avoid pollution risk which could result from the operations on site.

There were no underground storage tanks containing hazardous materials present at the installation and no underground service pipes carrying hazardous material with the potential exception of oily water. There was a 3,450 litre diesel tank for the standby diesel generator housed within a shipping container located over loose chippings as well as a further 1,690 litre diesel tank located within the Oil Store in a bunded tank within a bund.

Discharges of mercury and cadmium were associated with the water treatment plant chemicals used on site. Controls were in place in the permit to ensure that discharges as a result of the impurities of the raw materials were controlled by keeping impurity levels to a minimum in the commercially produced product.

Application SCR decision summary	**Tick relevant decision**
Sufficient information has been supplied to describe the condition of the site at permit issue	Yes.
Pollution of land and water is unlikely	Yes.
Date and name of reviewers: **Liz Ebbs (NPS, 02/03/2017)** **Jim Branson (GWCL, 25/01/2017)**	

Operational phase SCR evaluation template

4.0 Changes to the activities	
Have there been any changes to the following during the operation of the site?	**Response (Specify what information is needed from the applicant, if any)**
a) Activity boundaries **b) Permitted activities** **c) "Hazardous pollutants" used or produced.**	
The permitted activity and land being surrendered remained as detailed within Environmental Permit EPR/SP3133LY until the cessation of generation at the site of the scheduled activity S1.1 A(1)(a) – burning any fuel in an appliance with a rated thermal input of 50MW or more. Associated historic activities undertaken within the permit surrender area included operation of a steam turbine, a heat recovery steam generator, cooling towers, gas filters, a 400kV banking compound, workshop, stores, maintenance depot, storage for acids, oils, fuels, alkalis, a water treatment plant, a retention pond and a flocculation plant.	

5.0 Measures taken to protect land
Has the applicant provided evidence from records collated during the lifetime of the permit, to show that the pollution prevention measures have worked?
A BS EN ISO14001 accredited system was in place on site throughout the life of the permit to control and manage the operations. The system was aimed at managing the operations and procedures such that there should not be any deterioration of the ground and groundwater quality during the lifetime of the Environmental Permit. Scheduled daily inspections were undertaken by site operatives with issues or concerns raised as a 'defect'. These were then prioritised by site management and rectified according to perceived severity. Incidents which occurred during the lifetime of the Environmental Permit and which may have led to deterioration in the site were logged and managed in accordance with the requirements of the site Environmental Permit. Records were maintained together with information on any investigation. This ensured that there was a coherent record of the state of the site throughout the period of the Environmental Permit. SPMP review audits confirmed that the infrastructure containment monitoring programme had been adhered to and demonstrated the system to be sufficiently robust to manage, service and repair the containment infrastructure, where deemed necessary. The report concluded that the installation was considered to present a very low risk of future contamination to soil and groundwater due to the prevention measures in place. Physical containment infrastructure was in place at the installation over the course of its operation and was sufficient to prevent and control potential losses of hazardous materials from site operations. It comprised primary (fuel tanks or containers), secondary (bunding) and tertiary (surface water drainage system with interceptor) containment systems. Infrastructure monitoring activities were undertaken including all aspects relating to the storage and use of bulk hazardous materials and secondary containment. A site closure plan was prepared and submitted to the Environment Agency in December 2008 in response to an improvement condition specified in the site Environmental Permit.

6.0 Pollution incidents that may have impacted on land and their remediation
Has the applicant provided evidence to show that any pollution incidents which have taken place during the life of the permit and which may have impacted on land or water have been investigated and remediated (where necessary)?
Two recorded pollution incidents exist for the lifetime of the permit: ➢ sulphuric acid leak from the acid dosing injector and subsequently entered internal process drains ➢ two leaks in the cooling water system underground pipework caused as a result of corrosion. After investigation, it was concluded that there was no immediate impact to ground/groundwater and therefore no remediation activities were required during the stations operation. To mitigate the impact of spills Centrica established a management system which comprised standards, processes and procedures for spill prevention and actions to be taken in the event of a spill. Measures included regular inspection and any repair to tanks, bunds, pipework, storage on hardstanding away from drains and watercourses, emergency alarms and shut offs, staff training and spill kits.

7.0 Soil gas and water quality monitoring (where relevant)
Where soil gas and/or water quality monitoring has been undertaken, does this demonstrate that there has been no change in the condition of the land? Has any change that has occurred been investigated and remediated?
No soil gas or surface water quality monitoring was required as part of the Installations SPMP Design.

8.0 Decommissioning and removal of pollution risk

Has the applicant demonstrated that decommissioning works have been undertaken and that all pollution risks associated with the site have been removed? Has any contamination of land that has occurred during these activities been investigated and remediated?

The following reports have been submitted by the Operator as part of the full surrender application and surrender process:

- 'Centrica Energy Killingholme Power Station Site Closure Plan. Ref: 2016/KPSSCP' dated July 2016.
- 'Killingholme Power Station Site Condition Report in Support of Environmental Permit No. EPR/SP3133LY Surrender. Ref: GCU127044' by Geosyntec Consultants Ltd dated August 2016.
- 'Killingholme Power Station Application to Surrender Permit EPR/SP3133LY for Centrica KPS Ltd' dated November 2016.

The Installation ceased operation in 2016 and is scheduled for sale and subsequent demolition. All scheduled activities on site have ceased and all associated process effluent discharges and emissions to air have also ceased. Killingholme Power Station is licenced (4/29/09*T/0132) by the Environment Agency to abstract water from the River Humber for industrial cooling and backwashing. Whilst the decommissioning and closure phases are under way this abstraction licence will be retained for future use.

Water and Drainage Management:
The cooling water system has been decommissioned. The only discharge is surface water run-off and treated effluent from the Klargester into the Humber Estuary. The relevant emission limits and monitoring requirements for flow, chlorine, temperature and pH will remain in place for the Humber Estuary (emission point W1). Currently the release point to the Lindsay Land Drain (W2) remains sealed and there is no discharge via this route.

Water Treatment and Boiler Dosing Chemicals, Miscellaneous Chemical Smalls:
All bulk chemical storage tanks have been drained, decontaminated, flushed and cleaned. The chemicals have been removed from site for disposal or reuse and recovery elsewhere. All IBCs have been removed from site and returned to the suppliers. The laboratory and maintenance buildings may contain minimal amounts of laboratory chemicals which will remain on site and be subsequently removed during the demolition phase.

Fuel and Transformer Oils:
A small quantity of fuel oil remained on site for use in the diesel fire pump. The storage tank was protected by bunding as described in the SPMP.

Batteries:
A total of 628 large 2V lead acid batteries were held on site for emergency purposes. These were disconnected prior to the sale of the site and removed during demolition.

Asbestos:
As the site will be sold intact and not demolished prior to sale, exposure of asbestos is not anticipated and ownership and responsibility will be transferred to the new owner. An asbestos register has been completed following an independent asbestos survey/inspection and is held on site.

Fire Systems:
As the gas supply to site has been disconnected the fire risk on site is reduced and therefore a number of fire systems have been isolated comprising the dry powder, gas suppression, dry deluge and carbon dioxide systems. The wet sprinkler and the foam extinguisher systems have remained charged to protect the site from residual fire risk. In the event of a fire, fire water and foam run-off is held in the retention pond and purge pit to prevent uncontrolled release from site.

9.0 Reference data and remediation (where relevant)

Has the applicant provided details of any surrender reference data that they have collected and any remediation that they have undertaken?

An independent Environmental Permit SCR was carried out in support of the permit surrender to demonstrate the land is in a satisfactory condition and environmental receptors have been protected throughout the operational phase of the permit. In accordance with Environment Agency guidance an initial baseline survey was carried out at the permit application stage in 2006 and operational phase management and reviews maintained during the permit lifetime.

A comparison of the initial baseline (2007) and surrender (2016) groundwater monitoring survey and data has been used to evaluate any deterioration of the condition of the land beneath Killingholme Power Station over the course of its operational life whilst under environmental permitting regulation. All site wide groundwater monitoring wells were utilised and were distributed in key locations up and down the site hydraulic gradient to collect comparable data with reference to the original baseline data. This was as per the original potential contaminants of concern identified in the 2005 RSK Application Site Report and groundwater sampling was duplicated as per the baseline assessment.

Soil gas/vapour and surface water investigations were not considered relevant as well as no further environmental monitoring of soil or groundwater during the lifetime of the permit. Pre permit surrender monitoring was undertaken in June 2016 to prepare for the permit surrender and included hydraulic gradients and flow data.

In summary, this comparison does not show significant differences between the initial 2007 baseline data and the 2016 surrender survey. This confirms that the ground and groundwater quality beneath and directly down hydraulic gradient of the site has not deteriorated as a result of the permitted activity and is in a satisfactory condition. The following key points for the report are noted:

- the shallow groundwater flow regime at the baseline condition in 2007 was influenced slightly by the waste water collection pit. Shallow groundwater elevation data collected during the 2016 monitoring round shows shallow groundwater has returned to a general flow to the south-east
- no free product (LNAPL or DNAPL) was detected within any of the existing monitoring wells across the site
- the hydrochemistry of shallow groundwater remained broadly similar between monitoring rounds
- with regards to TPH, PAH, sulphate and chloride analyses results, these were typically at similar or lower concentrations than recorded during the baseline monitoring.

Further details of this assessment are provided in the associated Site Condition Report and its appendices. Additional recent groundwater monitoring performed at the Centrica Killingholme Site that demonstrates that the permitted activities on the site have not impacted on the background quality.

10.0a and 10b Statement of site condition

Has the applicant provided a statement, backed up with evidence, confirming that the permitted activities have ceased, decommissioning works are complete and that pollution risk has been removed and that the land and waters at the site are in a satisfactory state?

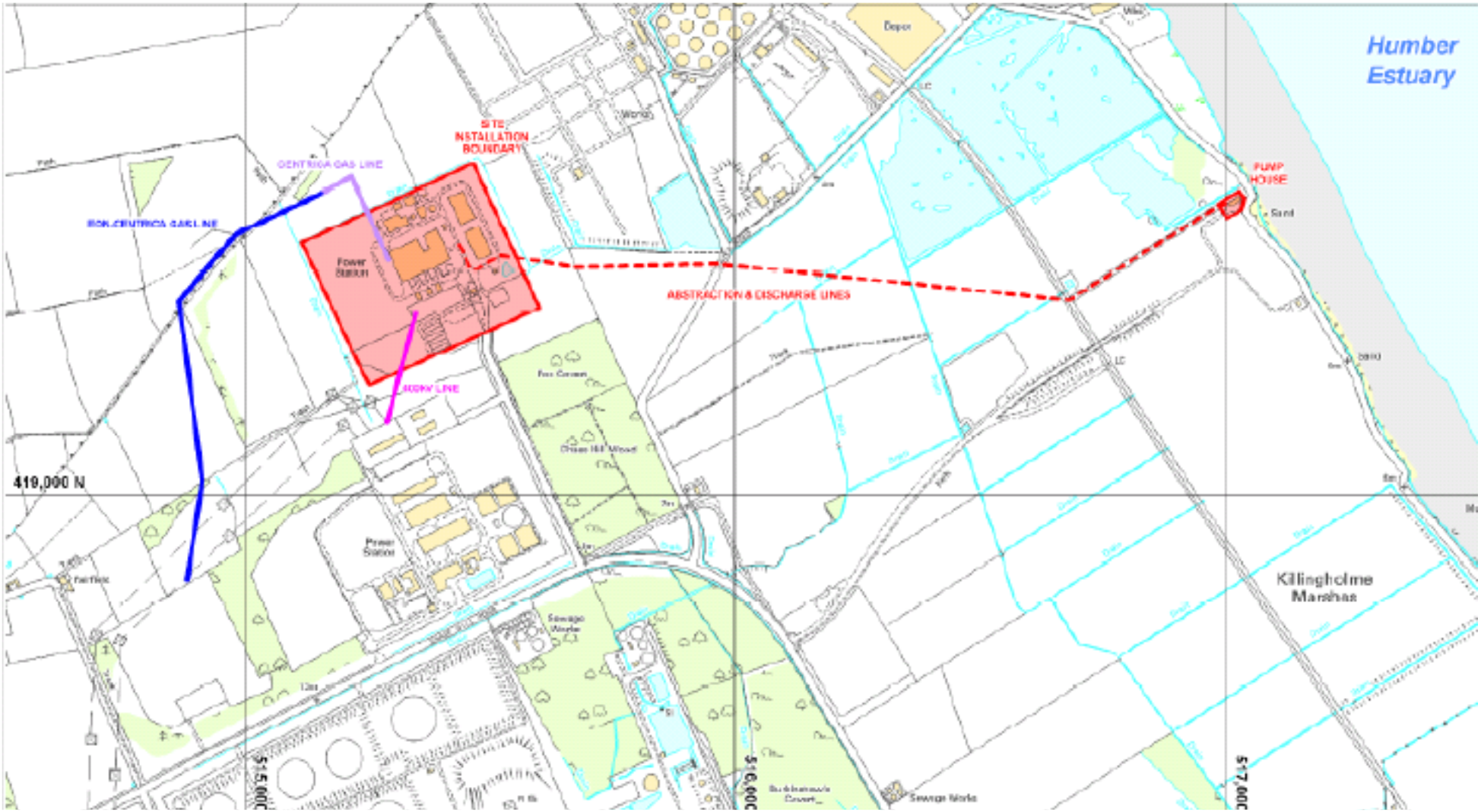
The on site transformers (which contained insulating oil) were removed from site after the sale of the power station for sale/re-use during demolition works. Lubricating and hydraulic oils within the gas and steam turbines as well as within oil storage tanks were removed after the sale of the power station during the demolition works.

With none of the hydraulic, lubricating and transformer oils remaining on the Centrica Killingholme site, the pollution risk has been removed from site and it has been demonstrated that no pollution was caused. There was no need for additional testing as no spillages occurred during the demolition works and there was no visual/olfactory evidence of contamination.

The Environment Agency confirms that the Centrica Killingholme Power Station site been returned to a satisfactory state.

Surrender SCR decision summary	Tick relevant decision
Sufficient information has been supplied to show that pollution risk has been removed and that the site is in a satisfactory state – accept the application to surrender the permit; or	X
Date and name of reviewers: **Liz Ebbs (NPS, 05/09/2017)** **Jim Branson (GWCL, 04/09/2017)** **Kirsty Hobbs (NPS, 11/09/2017)**	

Installation Site Boundary



Site Layout Plan