Appendix 11A: Flood Risk Assessment

Eggborough CCGT Project

The Eggborough CCGT (Generating Station) Order
Land within and adjacent to the Eggborough Power Station site, Goole, East Yorkshire DN14 0BS

Appendix 11A Flood Risk Assessment

The Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure)

Regulations 2009 (as amended)

Regulations – 5(2)(e)

Applicant: Eggborough Power Limited
Date: May 2017

DOCUMENT HISTORY

Author	Jo Somerton, AECOM		
Signed		**Date**	April 2017
Approved By	Kirsty Cobb, AECOM		
Signed		**Date**	April 2017
Document Owner	AECOM		

ACRONYMS

Abbreviation	Description
AGI	Above Ground Installation
AOD	Above Ordnance Datum
bgl	below ground level
BGS	British Geological Survey
CCGT	Combined Cycle Gas Turbine
CCR	Carbon Capture Readiness
CCS	Carbon Capture and Storage
CEMP	Construction Environmental Management Plan
CRT	Canals and River Trust
DCO	Development Consent Order
EA	Environment Agency
EPH	Energetický A Prumyslový Holding
EPL	Eggborough Power Limited
FRA	Flood Risk Assessment
GW	Gigawatts
ha	Hectare
HRSG	heat recovery steam generator
IDBs	Internal Drainage Boards
km	Kilometre
m	metres
MW	Megawatts
NPPF	National Planning Policy Framework
NPPG	National Planning Policy Guidance
NPS	National Policy Statement
NSIP	Nationally Significant Infrastructure Project
NYCC	North Yorkshire County Council
OCGT	Open Cycle Gas Turbines
OS	Ordnance Survey
PIG	Pipe Inline Gauging
PFRA	Preliminary Flood Risk Assessment
PINS	Planning Inspectorate

Abbreviation	Description
SDC	Selby District Council
SFRA	Strategic Flood Risk Assessment
SoS	Secretary of State

CONTENTS

TABLES

ANNEXES

1.0 INTRODUCTION

1.1 Background

1.1.1 This Flood Risk Assessment (FRA) has been prepared on behalf of Eggborough Power Limited (EPL) (the Applicant) in relation to a proposed application (the Application) to be made to the Secretary of State (SoS) under Section 37 of the Planning Act 2008, seeking an 'Order' granting Development Consent (a Development Consent Order, or DCO) for a combined cycle gas turbine (CCGT) power station and associated development, near Eggborough, North Yorkshire and within the administrative boundary of Selby District Council (SDC).

1.2 The Applicant

1.2.1 EPL owns and operates the existing 2 GW coal-fired power station at Eggborough, including most of the land required for the Proposed Development.

1.2.2 The Applicant was acquired by EP UK Investments Ltd (EP UK) in late 2014; a subsidiary of Energetický A Prumyslový Holding (EPH). EPH owns and operated assets in the Czech Republic, Slovak Republic, Germany, Italy, Hungary, Poland and the United Kingdom.

1.3 The Proposed Development

1.3.1 The Proposed Development comprises a gas-fired power station which will generate up to 2.5 gigawatts (GW) of electrical output, including a combined cycle gas turbine (CCGT) power station and a 'fast response' gas-fired peaking plant of up to 299 MW electrical output. Subject to the necessary consents, construction is anticipated to start in early 2019 and be completed in 2022.

1.3.2 The Proposed Development will be located largely within the existing coal-fired power station site (and associated land within the ownership of EPL), with additional land required for the Proposed Gas Connection. The Application Site ('the Site') extends to approximately 102.5 hectares (ha).

1.3.3 The Proposed Development will provide vital new energy infrastructure required to ensure security of supply. CCGT, alongside renewables, will form part of a diverse energy mix that will replace ageing coal and nuclear power stations which are due to close over the next five to ten years (including the existing coal-fired power station).

1.4 The Purpose and Structure of this Document

1.4.1 As the Proposed Development comprises an area in excess of one hectare (ha), a Flood Risk Assessment (FRA) is required to accompany any planning or DCO application for the development of the Site, as per the requirements of the National Planning Policy Framework (NPPF) (DCLG, 2012).

1.4.2 The aim of this study is to undertake an FRA that is appropriate to the nature and scale of the Proposed Development, which will meet the necessary requirements of current planning guidance, NPPF, and which will be sufficient to support the DCO application for the Proposed Development. In order to meet this aim the following scope of services was undertaken:

- consultation with and obtaining data from North Yorkshire County Council (NYCC) and SDC;
- consultation with and obtaining data from the Environment Agency (EA) with regard to the Proposed Development, the flood risks posed to the Site and the necessary measures that would be required to protect the Site from flooding;

- review of publicly available data to determine the flood risks associated with the River Aire, ordinary watercourses, watercourses under the jurisdiction of Internal Drainage Boards (IDBs) and surrounding areas, giving consideration to all sources of flooding including groundwater, artificial sources, surface water runoff/ overland flow and drainage; and
- review of the Proposed Development design in light of the identified flood risks and identification of measures, where necessary, that would manage any residual flood risk to the Site to acceptable levels.

1.5 Data Sources / References

1.5.1 The baseline conditions for the Site have been established through a desk study and via consultation with the EA and other key statutory consultees. This information has been utilised to inform the assessment made within the FRA. Data collected during the course of this assessment is described in Table 1.1.

Table 1.1: Sources of data

Purpose	Data source	Comments
Identification of hydrological features	1: 25,000 Ordnance Survey (OS) mapping.	Identifies the position of the site and local hydrological features.
Identification of existing flood risk	Topographical survey of the Site.	Provides existing site levels.
	EA Indicative Flood Zone Map (internet).	Identifies fluvial/ tidal inundation extents and historical flooding
	EA Flood Inundation Mapping (internet).	Provides information on the risk of flooding from reservoirs (artificial sources).
	SDC Strategic Flood Risk Assessment (SFRA) (AECOM, 2015) NYCC Preliminary Flood Risk Assessment (PFRA) (Jacobs, 2011)	Assesses flood risk across the study area. Includes flood risk from fluvial/ tidal sources, sewers, overland flow and groundwater.
	Consultation with the EA	Historical flood records, modelled flood water levels and associated data for the River Aire.
	Consultation with IDBs	Historical flood records and IDB requirements for works adjacent to or within a watercourse and surface water management. (Annex 4)
	British Geological Survey records.	Provides details of geology and hydrogeology in the vicinity of the site.
	PFRA including public sewer record (Yorkshire Water) details.	Identifies the local drainage system near the site
Identification of historical flooding	EA	Gives details of historical flooding.
	SFRAs and PFRAs.	

Purpose	Data source	Comments
Details of the Proposed Development	Indicative concept layout drawings	Provides layout of the Proposed Development.
Surface water drainage	OS Mapping;	Identifies existing site drainage, public drainage system near the site and details of existing surface water runoff from the Site.
	SFRA.	
	Outline drainage strategy for the Site	Conceptual drainage strategy outlining how surface water will be managed at the Site.

2.0 SITE DESCRIPTION

2.1 Site Location

2.1.1 The Proposed Development Site ('the Site') comprises for the most part land within the boundary of the existing coal-fired power station site at Eggborough, North Yorkshire, DN14 0BS, within the administrative areas of SDC. The location of the Site is shown in Annex 1.

2.1.2 The Site (the proposed limits of the land to which any DCO would apply) extends to circa 102.5 ha in area. The full extent of the Site is defined by the proposed DCO Site boundary, shown in Annex 1.

2.2 Proposed Power Plant Site

2.2.1 The Proposed Power Plant Site currently comprises the existing coal-fired power station's main coal stockyard and associated rail loop. The Proposed Power Plant Site also includes a small areas to the north-east of the existing rail loop (see Figure 3.2 (Annex 1)). This land is all within EPL's land ownership.

2.2.2 Vegetation within the Proposed Power Plant Site is limited to a small area of trees at the north-east corner of the area, with the majority of the Proposed Power Plant Site comprising hardstanding, buildings/ structures associated with coal handling and bare ground. There are areas of tree planting around the Power Plant Site boundaries that help to screen the Site from off-site neighbours.

2.2.3 The Proposed Power Plant Site is bounded:

- to the north and north-west by the existing coal-fired power station buildings and structures;
- to the east and south by an earth embankment with existing tree planting (within the existing coal-fired power station site) and agricultural fields beyond (some of which, i.e. those immediately to the south and north-east of the existing coal-fired power station, are in the ownership of EPL);
- to the south-west by the Saint Gobain glass factory; and
- to the west by an agricultural field (Tranmore Farm, which is within the ownership of EPL).

2.2.4 Existing structures within the footprint of development within the Proposed Power Plant Site will be removed at the start of construction, including the majority of the railway loop and the coal handling equipment. Rail access into the Site will be retained to facilitate delivery of construction materials by rail if feasible.

2.3 Proposed Cooling Water Connections

2.3.1 The Proposed Cooling Water Connections will be via the existing coal-fired power station's abstraction and discharge points on the River Aire to the north of the Proposed Power Plant Site.

2.3.2 The abstraction point is located upstream of the weir at Chapel Haddlesey (non tidal) and the outfall point is located within the tidal section of the River at a meander known as Eggborough Ings (see Figure 3.2 (Annex 1)).

2.3.3 The existing pipework connecting the abstraction and discharge points to the current coal-fired power station is more than 50 years old and consequently will need to be replaced or upgraded for the Proposed Development. Where possible, the new water pipeline from the Proposed Power Plant Site will broadly follow the route of the existing pipework, through an agricultural field north

of Wand Lane. The pipeline will need to connect to the Proposed Power Plant Site, so the final section of the route immediately north of Wand Lane and into the Proposed Power Plant Site will follow the same route as the Proposed Gas Connection (described in Section 2.7 below), crossing Wand Lane east of Hensall Gate. Parts of this route fall outside EPL's land ownership.

2.3.4 Some works will be required within the River Aire to enable the abstraction point (and potentially also the discharge point) to meet ongoing legislative requirements (including the Eels (England and Wales) Regulations 2009) and also to replace and maintain the condition of the existing infrastructure. The Site includes the sections of the River within which temporary cofferdams will be required for parts of the construction phase.

2.4 Proposed Borehole and Towns Main Water Connections

2.4.1 Raw water supply will be abstracted from existing boreholes within the existing Eggborough Power Station Golf Course and/ or near the A19/ A645 Weeland Road roundabout (both within EPL's land ownership). As a back-up, towns main water will also be supplied to the Site as it is for the existing coal-fired power station.

2.4.2 The new pipework required to link these to the Proposed Power Plant Site will be routed through the existing coal-fired power station to the Proposed Power Plant Site on land within EPL's ownership, following the route of the existing pipelines where possible (see Figure 3.2 (Annex 1)).

2.5 Proposed Surface Water Discharge Connection

2.5.1 Surface water from the Proposed Power Plant Site, the Proposed Construction Laydown area and Proposed CCR Land will be attenuated within these areas and discharged at an agreed maximum rate to Hensall Dyke in the south-east of the Proposed Power Plant Site, to the west of Hazel Old Lane.

2.6 Proposed Electricity Connection

2.6.1 The Proposed Development will connect to the existing National Grid 400 kV sub station to the north-west of the Proposed Power Plant Site via below ground cables (see Figure 3.2 (Annex 1)). The cables will run on land all within EPL's ownership. The existing National Grid sub station is owned (via a lease from EPL) by National Grid. A new sub station may be required within the Proposed Power Plant Site as part of this connection.

2.7 Proposed Gas Connection

2.7.1 The gas supply for the Proposed Development will be via a new connection to the National Grid Transmission gas network (Feeder 29) approximately 3.1 km to the north of the existing coal-fired power station site (note the pipeline length is longer, as it is not a straight line).

2.7.2 The Proposed Gas Connection route will connect to Feeder 29 at a new Above Ground Installation (AGI) to the south-west of Burn to the west of West Lane, which will require a new access off West Lane.

2.7.3 From the AGI site the Proposed Gas Connection pipeline will be routed south-east across agricultural fields, crossing beneath the A19 south of the East Coast Main Line and north of Burn Lodge Farm, before heading south through agricultural land. The gas pipeline will cross Millfield Road to the east of Chapel Haddlesey, then cross more agricultural land (avoiding the archaeological feature at Hall Garths) heading south-west to cross beneath the River Aire at Eggborough Ings, to the west of the cooling water outfall point. The gas pipeline will then head

south-west and south across another agricultural field, to the east of the cooling water connection pipelines, before crossing Wand Lane to the east of Hensall Gate and reaching the Proposed Power Plant Site via a corridor alongside the internal access road. The total pipeline length is approximately 4.7 km from the Proposed Power Plant Site to the Proposed AGI location.

2.7.4 Land within EPL ownership, which currently comprises an access track to the existing cooling water connection, is included within the Site for temporary and permanent access to the Proposed Cooling Water and Gas Connections north of Wand Lane.

2.7.5 The land required for the Proposed Gas Connection AGI and gas pipeline is not within EPL's ownership, with the exception of a small section of land north of Wand Lane and the land within the existing coal-fired power station site.

2.8 Proposed Rail and Access Works

2.8.1 The Proposed Rail and Access Works area is located to the west of the Proposed Power Plant Site, where the existing Tranmore Lane entrance and rail access into the Site are located.

2.9 Proposed Construction Laydown Area

2.9.1 The construction laydown area including contractors' compounds will be located within the existing coal-fired power station site to the north of the Proposed Power Plant Site (see Figure 3.2 (Annex 1)), on land within EPL's ownership. This land currently comprises a large lagoon for back-up cooling water storage for the existing coal-fired power station, temporary offices, strategic (emergency) coal stockyard, access roads and open storage areas.

2.9.2 The existing Yorkshire Water waste water treatment works and Air Liquide air separation unit to the north are outside the Site boundary.

2.10 Proposed Carbon Capture and Storage Readiness Land

2.10.1 Some of the land required for CCGT construction laydown (and wholly within EPL's ownership) will be reserved following the completion of construction for a potential future carbon capture plant, as required by the CCR obligations for new generating stations. The footprint required for this facility has been determined based on Department for Energy and Climate Change (DECC) (now Department for Business, Energy and Industrial Strategy (BEIS)) guidance as amended by the Imperial College paper on space requirements for CCS (Imperial College Consultants/ Florin and Fennell, 2010), and this has been reported in the Carbon Capture Readiness Report (Application Document Ref. No. 5.8), which accompanies the DCO application. This land will remain in EPL's ownership and be managed such that it can be cleared and free to accommodate a carbon capture plant within two years of the capture equipment being required to be installed, as required by the DECC CCR Guidance (DECC, 2010). Requirements in Schedule 2 to the draft DCO (Application Document Ref. No. 2.1) secure the retention of the Proposed CCR Land.

2.11 Retained Landscaping areas

2.11.1 The Site includes existing areas of established landscaping which are to be retained and managed as part of the Proposed Development. These are located on earth embankments around the southern and eastern boundaries of the existing coal-fired power station, and to the north of Wand Lane.

2.12 The Surrounding Area

2.12.1 The area surrounding the existing coal-fired power station is generally rural, characterised by arable fields bounded by hedgerows, punctuated by a network of B and C roads and interspersed with small villages and farms. This is intersected north-south by the A19 (which lies to the west of the existing coal-fired power station) and by the East Coast Main Line (to the east of the existing coal-fired power station), and intersected east-west by the A645, Goole to Knottingley railway line, Knottingley and Goole Canal, and M62 (which all lie to the south of the existing coal-fired power station), and by the River Aire (to the north of the existing coal-fired power station).

2.12.2 The River Aire flows in a roughly north-west, south-east direction. At its closest point it is located approximately 650 m north/ north-east of the Proposed Construction Laydown Area and approximately 1.1 km north/ north-east of the Proposed Power Plant Site, at a meander known as Eggborough Ings. The Proposed Gas Connection passes under the River at this point, and the cooling water abstraction and outfall points are located on the River to the west and east respectively.

2.12.3 The village of Eggborough is located west of the A19, approximately 750 m south-west of the Proposed Power Plant Site, on the opposite side of the A19 to the existing A19/A645 Weeland Road borehole.

2.12.4 Gallows Hill is located approximately 500 m to the east of the Proposed Power Plant Site and the neighbouring village of Hensall is located approximately 950 m to the east/ south-east of the Proposed Power Plant Site (approximately 700 m to the east/ south-east of the Proposed Construction Laydown area).

2.12.5 Chapel Haddlesey is located on the opposite bank of the River Aire to the existing cooling water abstraction point and the westernmost property in Chapel Haddlesey is located approximately 80 m to the west of the Proposed Gas Connection corridor.

2.12.6 The village of Burn is located approximately 600 m to the north-east of the Proposed Gas Connection corridor and approximately 750 m east/ north-east of the Proposed AGI.

2.12.7 There are a number of other industrial developments in the vicinity of the existing coal-fired power station site, including Saint Gobain glass and insulation factory to the south-west, a car auctioning centre and several light industrial units on the west side of the A19 to the west and south-west.

2.12.8 Eggborough Power Station Golf Course, Sports and Social Club, cricket ground and model steam railway are located to the west of the existing coal-fired power station.

2.12.9 Given the Site's location, the nature and scale of the Proposed Development and the character of the surrounding area, no transboundary effects are predicted to arise from the Proposed Development that would affect any other European Economic Area state. No further consideration is therefore made in this ES to transboundary effects.

2.13 Topography

2.13.1 Based on available topographic data from surveys and LiDAR (presented in Annex 2) the existing coal-fired power station site appears to be fairly flat with the highest areas being in the south-central portions, approximately 12.5 metres Above Ordnance Datum (mAOD). The existing coal-fired power station site generally slopes from the centre towards the existing coal-fired power station site boundaries with the exception of the southern boundary, which features a large embankment. The lowest areas are generally in the north-east of the existing coal-fired power station site with levels between approximately 7.0 and 8.0 mAOD.

2.13.2 Ground levels along the Proposed Gas Connection corridor are generally level with ground levels falling to approximately 6 mAOD in the vicinity of Manor Cottages, to the south- east of Chapel Haddlesey. Further north and to the north-west, ground levels slightly increase with levels between approximately 6.0 and 7 mAOD.

2.14 Surface Water Features

River Aire

2.14.1 The River Aire (Main River) flows from north-west to south-east and is located to the north of the existing power station. At its closest point the River Aire is located approximately 650 m north/ north-east of the Proposed Construction Laydown Area and approximately 1.1 km north/ north-east of the Proposed Power Plant Site, at a meander known as Eggborough Ings. The Proposed Cooling Water Connections are located in the River Aire (at the existing coal-fired power station cooling water abstraction and discharge points). Cooling water used by the existing coal-fired power station is drawn from the Aire via a pumphouse in Chapel Haddlesey and discharged back to the River via an outfall approximately 1 km downstream of the abstraction point.

2.14.2 The tidal extent of the River Aire is located at Chapel Haddlesey, which is approximately 1.2 km north of the existing coal-fired power station site. There is a large weir between the cooling water abstraction and discharge points, and this coincides with the tidal limit of the River. A hydro-electric power scheme is currently being installed at the weir.

Ings and Tetherings Drain

2.14.3 Ings and Tetherings Drain (Ordinary Watercourse) is located approximately 360 m to the north of the Proposed Construction Laydown. The watercourse flows from north-west to south-east through Eggborough Ings, situated on land between the existing coal-fired power station site and the River Aire. Ings and Tetherings Drain is a tributary of the River Aire and falls under the jurisdiction of the Danvm Drainage Commissioners. The drain forms a confluence, via a pumped discharge, with the River Aire.

Hensall Dyke

2.14.4 Hensall Dyke is located immediately to the south-east of the Proposed Power Plant Site, within the Site boundary. Historically, Hensall Dyke is believed to have flowed through the existing coal-fired power station site and been the point of natural drainage for much of the existing coal-fired power station site prior to development. A walkover survey identified an existing pipe/ culvert present beneath the coal stockyard embankment that has been sealed to prevent surface water leaving the existing coal-fired power station site. Downstream of the existing coal-fired power station, Hensall Dyke flows to the south-east towards the village of Hensall. The watercourse then turns north, becoming Beck Drain downstream of Hensall and forms a confluence with Ings and Tetherings Drain approximately 780 m east of the Proposed Construction Laydown area.

Minor Watercourses/ Drainage Ditches

2.14.5 Drainage channels are frequent within arable land in the Proposed Gas Connection corridor, the majority of which are ephemeral in nature. These drainage features are mostly associated with field boundaries.

2.14.6 Drainage channels are also present within the existing coal-fired power station site, including butyl lined drains adjacent to hard standing areas and concrete lined drains around coal store areas. These were dry at the time of the ecological survey.

Other Surface Water Features

2.14.7 Six ponds/ other areas of standing water (excluding wet ditches/ drains) were identified within the Site boundary including a large man-made, butyl lined lagoon, 1.3 ha in size, a man-made pond, concrete tanks and channels associated with the existing coal-fired power station cooling water system, and a small ornamental pond.

2.14.8 Six further ponds/ standing water bodies are visible on OS maps/ aerial imagery within a 250 m radius of the Site.

Canals

2.14.9 There are two canals located in the wider vicinity of the Site. The Selby Canal is located approximately 800 m to the west of the Proposed Cooling Water Connection abstraction point, and approximately 300 m west of the Proposed AGI.

2.14.10 The Calder Navigation (canal) is located approximately 1 km to the south of the Proposed Borehole Water Connection point at the A19/ A645 Weeland Road junction.

3.0 DEVELOPMENT PROPOSALS

3.1 The Proposed Development

3.1.1 The Proposed Development comprises a gas-fired power station (also referred to as a power plant or generating station) which will have a gross output capacity of up to 2,500 megawatts (MW), including a Combined Cycle Gas Turbine (CCGT) Power Station and a 'fast response' gas-fired peaking plant of up to 299 MW gross output capacity.

3.1.2 The design of the Proposed Development incorporates a degree of flexibility in the dimensions and configuration of buildings to allow for the selection of the preferred technology and contractor.

3.1.3 It is envisaged that the Proposed Development will have a design and operational life of at least 25 years and so eventual decommissioning of the CCGT is currently anticipated to commence after 2047.

3.1.4 The Proposed Development will comprise:

3.1.5 The Proposed Development will comprise a gas-fired power station with gross electrical output capacity of up to 2,500 MW and associated buildings, structures and plant, including:

- a CCGT plant (Work No. 1A) comprising –
  - up to three CCGT units,
  - turbine hall buildings for gas turbines and steam turbines,
  - heat recovery steam generators (HRSG),
  - gas turbine air intake filters,
  - co-located emissions stacks,
  - transformers,
  - deaerator and feed water pump buildings,
  - nitrogen oxide emissions control equipment and chemical storage,
  - chemical sampling/ dosing plants,
  - demineralised water treatment plant including storage tanks,
  - gas reception facility including gas supply pipeline connection works, gas receiving area, gas compression equipment and building, pipeline internal gauge (PIG) launcher for pipe inspection, emergency shutdown valves, gas vents and gas metering, dehydration and pressure reduction equipment,
  - auxiliary boilers with associated emissions stacks
  - standby diesel generators, and
  - continuous emissions monitoring system (CEMS);
- up to three banks of cooling towers for the CCGT plant, cooling water pumps, plant and buildings, and cooling water dosing and sampling plant and buildings (Work No. 1C);
- a peaking plant and a black start plant with a combined gross output capacity of the peaking plant and black start plant of up to 299 MW (Work No. 1B) comprising –
  - a peaking plant housed in a dedicated building, comprising either up to two open cycle gas turbines or up to ten gas-fired reciprocating engines and associated emissions stack(s),
  - a black start plant housed in a building, comprising either one open cycle gas turbine or up to three reciprocating gas engines with associated emissions stack(s),
  - diesel generators for black start plant start up prior to gas-firing,
  - gas turbine air intake filters,
  - CEMS, and
  - transformers;

- in connection with the CCGT units, peaking plant, black start plant and cooling infrastructure will be:
  - administration and control buildings;
  - diesel fuel storage tanks and unloading area;
  - pipework, pipe runs and pipe racks;
  - an electrical sub station, electrical equipment, buildings and enclosures to connect to the existing on-site National Grid 400 kV sub station;
  - auxiliary plant, buildings, enclosures and structures;
  - workshop and stores buildings;
  - fire fighting equipment, building and distribution pipework;
  - fire and raw water storage tanks;
  - fire water retention basin;
  - chemical storage facilities;
  - lubrication oils and grease storage facilities;
  - permanent plant laydown area for operation and maintenance activities;
  - closed circuit cooling water plant and buildings;
  - waste water treatment plant and building; and
  - mechanical, electrical, gas, telecommunications and water networks, pipework, cables, racks, infrastructure, instrumentation and utilities.
- temporary construction laydown area (Work No. 2A) comprising hardstanding, laydown and open storage areas, backfilling of the lagoon, contractor compounds and construction staff welfare facilities, gatehouse and weighbridge, vehicle parking and cycle storage facilities, internal roads and pedestrian and cycle routes, security fencing and gates, external lighting including lighting columns, and closed circuit television (CCTV) cameras and columns;
- and carbon capture readiness (CCR) reserve space (Work No. 2B)
- electrical connection works (Work No. 3) comprising up to 400 kV underground electrical cables and control systems cables to and from the existing National Grid sub station (Work No. 3A) and works within the National Grid sub station including underground and overground cables, connections to the existing busbars and upgraded or replacement equipment (Work No. 3B);
- cooling water connection works (Work No. 4), comprising works to the existing cooling water supply and discharge pipelines and abstraction (intake) and discharge (outfall) structures, including, as necessary, upgraded or replacement pipelines, plant, buildings, enclosures and structures and underground electrical supply cables, transformers and control systems cables;
- groundwater and towns water supply connection works (Work No. 5), including works to the existing towns water pipelines and groundwater boreholes and pipelines, replacement and new pipelines, plant, buildings, enclosures and structures and underground electrical supply cables, transformers and control systems cables;
- gas supply pipeline connection works (Work No. 6) for the transport of natural gas to the Proposed Power Plant Site, comprising an underground high pressure steel pipeline of up to 1,000 mm (nominal bore) in diameter and approximately 4.6 km in length, including cathodic protection posts, marker posts and underground electrical supply cables, transformers and control systems cables;
- an Above Ground Installation (AGI) west of Burn village (Work No. 7) connecting the gas supply pipeline (Work No. 6) to the National Transmission System (NTS) Feeder 29 pipeline, comprising:
  - a compound for National Grid's apparatus comprising an offtake connection from the NTS, above and below ground valves, flanges and pipework, an above or below ground remotely operated valve (ROV), an above or below ground ROV bypass, an above or below ground pressurisation bridle, instrumentation and electrical kiosks, and telemetry equipment kiosks and communications equipment (Work No. 7A);

  - a compound for EPL's apparatus including above and below ground valves, flanges and pipework, an above or below ground isolation valve, an above or below ground PIG launching facility, instrumentation and electrical kiosks, and telemetry equipment kiosks and communications equipment (Work No. 7B);
  - access works, vehicle parking, electrical and telecommunications connections, surface water drainage, security fencing and gates, CCTV cameras and columns and perimeter landscaping in connection with both of the above compounds;
- retained landscaping comprising (Work No. 8):
  - soft landscaping including planting;
  - biodiversity enhancement measures; and
  - security fencing, gates, boundary treatment and other means of enclosure;
- surface water drainage connection to Hensall Dyke, comprising works to install, repair or replace drainage pipes, and works to Hensall Dyke (Work No. 9);
- vehicular, pedestrian and cycle access works and rail infrastructure including alterations to or replacement of the existing private rail line , installation of new rail lines and crossover points and ancillary equipment (Work No. 10);
- in connection with the Proposed Development as described above (Work No. 1 to 7 and 9 to 10):
  - surface water drainage systems, storm water attenuation systems including storage basins, oil/ water separators, and including channelling and culverting and works to existing drainage systems;
  - electrical, gas, potable water supply, foul water drainage and telecommunications infrastructure connections and works, and works to alter the position of such services and utilities connections;
  - hardstanding and hard landscaping;
  - soft landscaping including embankments and planting;
  - biodiversity enhancement measures;
  - security fencing, gates, boundary treatment and other means of enclosure;
  - external lighting, including lighting columns;
  - gatehouses and weighbridges;
  - CCTV cameras and columns and other security measures;
  - site establishment and preparation works including site clearance (including vegetation removal, demolition of existing buildings and structures), earthworks (including soil stripping and storage and site levelling) and excavations, the creation of temporary construction access points, the alteration of the position of services and utilities, and works for the protection of buildings and land;
  - temporary construction laydown areas and contractor facilities including materials and plant storage and laydown areas, generators; concrete batching facilities, vehicle parking facilities, pedestrian and cycle routes and facilities, offices and staff welfare facilities, security fencing and gates, external lighting, roadways and haul routes, wheel wash facilities, and signage;
  - vehicle parking and cycle storage facilities;
  - accesses, roads and pedestrian and cycle routes.

3.1.6 The gas supply for the Proposed Development will be via a new c. 4.7 km underground pipeline connection to the National Grid transmission gas network (proposed to connect to Feeder 29) approximately 3.1 km to the north of the existing coal-fired power station site. The preferred route for the gas connection has been determined following the identification of technical and environmental constraints and appraisal of three potential route corridors (which were themselves derived from a similar initial exercise).

3.1.7 Cooling water will be abstracted from the River Aire at the existing abstraction point on the south side of the River at Chapel Haddlesey, and discharged at the existing discharge point on the south

side of the River at Eggborough Ings. The existing pipework and associated infrastructure in the River is likely to need to be upgraded or replaced as part of the Proposed Development, due to the age and condition of it. Additional works will also be required at the abstraction point (and potentially at the discharge point) to fulfil the obligations of the Eels (England and Wales) Regulations 2009, which may require the installation of an eel screen.

3.1.8 The proposed works to the existing cooling water abstraction and discharge points will require works within the channel of the River Aire. Cofferdams are proposed to enable 'dry working' within the watercourse channel. The temporary use of cofferdams (proposed for two periods of approximately three months at the abstraction point and one period of approximately three to six months at the discharge point) during the construction phase will be restricted where possible to times of the year when the probability of high return period flood events occurring are lower (during summer months) and the cofferdams will be installed and removed outside of the main salmonid migratory season (October to December).

3.1.9 The volume of cooling water required for the Proposed Development will be less than half of the abstraction currently allowed by the existing coal-fired power station's abstraction licence due to the increased efficiency of the CCGT plant compared to the existing coal-fired power station.

3.1.10 Raw water will be abstracted from the existing groundwater boreholes that are currently used by the existing coal-fired power station. There are two existing boreholes, one within the golf course area and one near the A19/ A645 Weeland Road junction.

3.1.11 Electricity generated by the Proposed Development will be exported to the National Grid via the existing National Grid 400 kV sub station at the existing coal-fired power station. Additional below ground cables will be installed between the CCGT and the existing sub station.

3.1.12 Land must be set aside for future carbon capture and compression equipment in order to meet the requirements set out in the EU Directive on the geological storage of carbon dioxide 2009/31/EC (European Commission, 2009) for the Proposed Development to be Carbon Capture Ready. Carbon capture plant will not form part of the DCO application, since its deployment is currently not viable in the UK, but an area of land has been allocated for it, which will be retained by the Applicant as required. The area set aside for CCR will initially be used for construction laydown for the Proposed Development.

3.1.13 There will be up to three access points to the Proposed Power Plant Site for vehicles during construction and operation: the existing access from Wand Lane, known as Hensall Gate entrance; the existing main power station entrance from the A19; and the existing access from the A19 via Tranmore Lane (south of the main entrance). Additional access points will be used for the Proposed Surface Water Connection to Hensall Dyke (via he existing access from Hazel Old Lane), Proposed Cooling Water abstraction and discharge points (via the existing accesses from the A19 and Wand Lane), the Proposed Gas Connection and AGI (via West Lane, the A19 south of Burn Lodge Farm, Whitings Lane, Fox Lane, Millfield Road and Wand Lane).

3.1.14 Indicative concept layout plans are presented in Annex 3.

4.0 PLANNING POLICY

4.1 National Policy

4.1.1 The NPPF (DCLG, 2012) outlines the Government's economic, environmental and social planning policies for England. The NPPF is a succinct planning document which sets out the Government's vision of sustainable development, which should be interpreted and applied locally to meet local aspirations. The NPPF sets out 12 planning principles as guidance for local councils for the creation of their local plan; the following principle is directly applicable to the flood risk:

> *"10. Meeting the challenge of climate change, flooding and coastal change – support the transition to a low carbon future in a changing climate taking full account of (inter alia) flood risk and coastal change*."

4.1.2 The National Planning Practice Guidance (NPPG) (DCLG, 2014) provides additional information for local planning authorities on development in areas at risk of flooding to ensure the effective implementation of the policies in the NPPF.

4.1.3 With respect to flood risk, local planning authorities should ensure that they:

- prevent both new and existing development from contributing to or being put at unacceptable risk from flooding;
- ensure one or more Sustainable Drainage Systems (SuDS) techniques, covering the whole range of sustainable approaches to surface drainage management, are incorporated into new developments; and
- ensure new development is planned to avoid increased vulnerability to impacts arising from climate change.

4.1.4 Local Planning Authorities (LPAs) should only consider development in flood risk areas to be appropriate where, informed by a site-specific flood risk assessment following the Sequential Test (and if required the Exception Test), it can be demonstrated that:

- within the site, the most vulnerable development is located in areas of lowest flood risk unless there are overriding reasons to prefer a different location;
- development is appropriately flood resilient and resistant, including safe access and escape routes where required, and that any residual risk can be safely managed;
- priority is given to the use of SuDS; and
- residual risks that remain after applying the sequential approach can be safely managed.

4.1.5 A number of National Policy Statements (NPS) for energy Infrastructure were designated by the Secretary of State (SoS) under the Planning Act 2008 on 19th July 2011 (DECC 2011a – 2011d). NPS EN-2, NPS EN-4 and NPS EN-5 together with the Overarching NPS for Energy (EN-1), provides the primary basis for decisions on applications for 'nationally significant fossil fuel and gas supply infrastructure'.

4.1.6 EN-1 states that "*applications for energy projects of 1 hectare or greater in Flood Zone 1 and all proposals for energy projects located in Flood Zones 2 and 3 in should be accompanied by a NPPF compliant flood risk assessment*".

4.1.7 In determining an application for development consent, the Planning Inspectorate and SoS should be satisfied that where relevant:

- the application is supported by an appropriate FRA;

- the Sequential Test has been applied as part of site selection;
- a sequential approach has been applied at the site level to minimise risk by directing the most vulnerable uses to areas of lowest flood risk;
- the proposal is in line with the relevant national and local flood risk management strategy;
- priority has been given to the use of SuDs; and
- in flood risk areas the project is appropriately flood resilient and resistant, including safe access and escape routes where required, and that any residual risk can be safely managed over the lifetime of the development.

4.1.8 The Proposed Development will comply with the requirements of the NPPF and EN-1.

4.2 Local Development Documents

4.2.1 The Site lies entirely within the administrative areas of SDC and NYCC. The local development plan for the area, which EN-1 confirms may be 'important and relevant', currently comprises the following documents:

- The 'saved' policies of the North Yorkshire Waste Local Plan (NYCC, 2006) – adopted 2006;
- The 'saved' policies of the North Yorkshire Minerals Local Plan (NYCC, 1997) – adopted 1997;
- The Selby District Core Strategy Local Plan (SDC, 2013) – adopted October 2013.

4.2.2 The majority of the 'saved' policies of the North Yorkshire Waste Local Plan relate to waste management facilities (defined in the Plan as "Facilities associated with the processing and disposals of waste materials") and are not therefore considered relevant to the Project as it is not a waste management proposal.

4.2.3 None of the 'Saved' policies contained in the North Yorkshire Minerals Local Plan are considered to be of relevance to the Proposed Development.

4.2.4 The SDC's Local Plan Core Strategy was adopted on 22 October 2013 and forms the statutory guidance for land use and planning and defines the spatial vision for Selby and the surrounding area for the period to 2027.

4.2.5 Policy SP15 states that SDC will "*Ensure that development in areas of flood risk is avoided wherever possible through the application of the sequential test and exception test; and ensure that where development must be located within areas of flood risk that it can be made safe without increasing flood risk*".

4.2.6 The policy also states that development should support sustainable flood management measures such as water storage areas and schemes promoted through local surface water management plans to provide protection from flooding; and biodiversity and amenity improvements. Developments should also incorporate water-efficient design and sustainable drainage systems which promote groundwater recharge.

4.2.7 In terms of emerging documents:

- SDC is preparing a 'Sites and Policies Local Plan' to deliver the strategic vision outlined in the Core Strategy, which is intended to supersede the remaining saved policies in the Selby District Local Plan; and
- NYCC is currently preparing a Joint Minerals and Waste Plan.

4.2.8 These documents are in the early stages of preparation and have not been considered further for the purposes of the FRA.

4.3 Development and Flood Risk Vulnerability

4.3.1 With regard to Table 2 of the NPPG (DCLG, 2014), the Proposed Development falls within "*electricity generation power stations and grid and primary substations*" and therefore would be classed as an 'Essential Infrastructure' development.

4.3.2 Table 4.1 shows the classification of flood risk vulnerability and flood zone compatibility according to Table 3 of the NPPG. Based on the classification that the Proposed Development is considered an 'Essential Infrastructure' development, and as the Site is located across all four flood zones, the NPPF indicates that those areas of the Proposed Development located within Flood Zones 3a and 3b are required to pass the Exception Test.

Table 4.1: Flood risk vulnerability and flood zone compatibility

Flood risk vulnerability classification	Essential infrastructure	Water compatible	Highly vulnerable	More vulnerable	Less vulnerable
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	✓	Exception Test required	✓	✓
Zone 3a	Exception Test required	✓	×	Exception Test required	✓
Zone 3b 'Functional Flood plain'	Exception Test required	✓	×	×	×

Key
✓ Development is appropriate.
× Development should not be permitted

4.4 Sequential and Exception Test

4.4.1 As set out in the NPPF, the aim of the Sequential Test is to steer new development to areas with the lowest probability of flooding.

4.4.2 The ES sets out the consideration of alternative sites and alternative locations within the Eggborough Power Station site (see Chapter 6: Need, Alternative and Design Evolution in ES Volume I). The Eggborough Power Station site has been selected by EPL for the development of a CCGT generating station, as opposed to other potentially available sites for various reasons, including :

- the site has a long history of power generation;
- the existing coal-fired power station is facing closure and future redevelopment of the existing coal-fired power station site would potentially allow retention of some of the existing workforce in similar employment;
- the Site has excellent grid, water and transport links and is a brownfield site which is considered more attractive to redevelop than a greenfield one for large scale power generation;

- the Site is largely in the freehold ownership of EPL; and
- the risk of flooding at the Proposed Power Plant Site is considered to be low (see Section 5).

4.4.3 A number of options available in relation to the specific location of plant within the existing coal-fired power station and in relation to the layout of the plant within the selected power plant site were considered and evaluated at the feasibility stage. The feasibility stage determined that there is no better alternative site in the local area for the Proposed Development.

4.4.4 The Proposed Development is considered appropriate within the EA designated Flood Zones for the Site (Table 4.1). Sequential allocation of land use within the Site includes the main CCGT development (the Proposed Power Plant itself) and a large area of the Proposed Construction Laydown area/ CCR Land being located in Flood Zone 1, and a small area of the Proposed Gas Connection corridor and the AGI in Flood Zone 2 to the north and north-west of the River Aire. The remainder of the Site, located in Flood Zone 3a and 3b will be used for part of the Proposed Construction Laydown, Proposed Gas Connection and other utility connections and access. These areas of the Site will be most at risk of flooding during the temporary, short-term construction phase, but after construction there will be no permanent, new above ground structures for the Proposed Development located in Flood Zone 3a and 3b.

4.4.5 The existing coal-fired power station site is referred to in the SDC Core Strategy document which states "*the economy of the District remains varied, although with two major coal-fired power stations at Drax and Eggborough, the energy sector is especially prominent and this is expected to continue in the light of national policy statements*".

4.4.6 Policy SP13 in the Core Strategy Document sets out the policy on the scale and distribution of economic growth. The policy notes

> "*The energy sector will continue to be important to the economy of the District. Drax and Eggborough Power Stations are both major employers which contribute to national energy infrastructure as well as the local economy. They also have the potential for future development of renewable and low carbon energy. Both locations have the advantage of a direct connection to the National Grid. It is recognised that there is a need for further investment in energy infrastructure in line with national policy as a prominent contributor to economic prosperity. Supporting the energy sector will assist in reinvigorating, expanding, and modernising the District's economy*".

4.4.7 As well as discussing the role in employment and the local economy, the Core Strategy discusses greenhouse gas emissions and recognises the significant contribution to emissions from the existing coal-fired power station. It states,

> *"Government energy policy has highlighted security of supply issues arising from planned closures of a number of older coal-fired and nuclear power stations in the period to 2020, requiring greater reliance on continuing use of fossil fuelled generating plants and new investment in renewable and low carbon forms of energy generation. The policy recognises that energy is vital to economic prosperity and social well-being and so it is important to ensure the country has secure and affordable energy".*

4.4.8 Eggborough Power Station plays a vital role in providing energy as part of a diverse and secure energy mix (in addition to its economic role supporting local jobs and services). As such the Government's aim to reduce carbon emissions through the promotion of 'clean coal technologies', such as carbon capture and storage (CCS) is noted as a key issue for Selby within the Core Strategy, both over the plan period and beyond. The Strategy states "*while it should be recognised that CCS is a developing technology and not currently applicable on a commercial scale, clean coal*

technologies/CCS will be generally supported in line with national policy, where appropriate alongside other lower carbon schemes and environmental improvement schemes at the District's power stations".

4.4.9 The Proposed Development is therefore consistent with Local Development Documents providing wider sustainability benefits to the SDC area in terms of employment, emissions to air and potential use of CCS technologies.

5.0 FLOOD RISK ASSESSMENT

5.1 Introduction

5.1.1 The NPPF requires that all potential sources of flooding that could affect proposed developments are considered within a FRA. This includes flooding from rivers and the sea, directly from rainfall on the ground surface, rising groundwater, overwhelmed sewers and drainage systems, from reservoirs, canals and lakes and other artificial sources.

5.1.2 The FRA considers the existing flood risk within the Site from on and off site sources, and potential for the Proposed Development to affect flood risk off site.

5.2 Fluvial and Tidal Risk

5.2.1 The EA Flood Map identifies that the majority of the parts of the Site within the existing coal-fired power station site (including the Proposed Power Plant Site and the Proposed Construction Laydown area) are located within Flood Zone 1 (low risk) with a small area, located to the south-east of the Proposed Construction Laydown area, located within Flood Zone 3 (high risk).

5.2.2 The Proposed Gas Connection corridor is located predominantly within Flood Zone 3a and Flood Zone 3b, with small pockets of land located within Flood Zone 2 interspersed along the pipeline route. The EA flood zone map is presented in Annex 4.

5.2.3 The definition of flood zones according to the NPPG (DCLG, 2014) are summarised in Table 5.1 below.

Table 5.1: Flood zone definitions

Flood Zone	Definition
Zone 1	Land that has a low probability of flooding (less than 1 in 1,000 annual probability of river or sea flooding (<0.1%))
Zone 2	Land that has a medium probability of flooding (between 1 in 100 and 1 in 1,000 annual probability of river flooding (0.1-1%), or between 1 in 200 and 1 in 1,000 annual probability of sea flooding (0.1-0.5%)
Zone 3a	Land that has a high probability of flooding (1 in 100 year or greater annual probability of river flooding (>1%), or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%)
Zone 3b 'functional floodplain'	Land where water has to flow or be stored in times of flood i.e. land which would flood with an annual probability of 1 in 20 (5%) or greater in any one year, or is designed to flood in an extreme (0.1%) flood

River Aire

5.2.4 The River Aire, at its closest point, is located approximately 650 m north/ north-east of the Proposed Construction Laydown Area and approximately 1.1 km north/ north-east of the Proposed Power Plant Site and is tidal in this location.

5.2.5 The tidal extent of the River Aire is located at Chapel Haddlesey, which is approximately 1.2 km north of the existing coal-fired power station site and is denoted by the presence of a large weir.

Although a high astronomical tide may not be sufficient on its own to cause flooding, when it coincides with a fluvial event or storm surge, river levels can be raised locally resulting in overtopping and subsequent inundation

Flooding History

5.2.6 Historical flood maps provided by the EA presented in Annex 4 show flooding from the River Aire occurred in 1978, 1982, 1995, 2000 (Autumn), 2002 (February), 2007 and 2015 (December). The mapped flood extents for each historical event show the Site was not subjected to flooding during these flood events. It is noted that land on both sides of the River Aire was inundated during the flood events. During the Autumn 2000 flood event, flood levels reached 6.91 mAOD along Wand Lane adjacent to the Site. It is understood that this level may have been exceeded by the December 2015 flood event; however, as yet, recorded flood levels associated with this event are not available.

5.2.7 The SDC SFRA does not contain any additional historical records of fluvial/ tidal flood events that have affected the Site.

Modelled Flood Water Levels

5.2.8 The EA has provided modelled flood levels for the River Aire from the Lower River Aire Modelling – Knostrop Weir to confluence with River Ouse - Lower Model Update study (produced by Atkins in 2008) and from the Lower Aire Strategy Model 2012. It is noted that the EA is still in the process of gaining full approval for the Lower Aire Strategy.

5.2.9 The EA is currently updating the model for the areas at risk from tidal flooding in the Lower Aire as part of the Upper Humber Modelling study, which was expected to be completed in Summer 2016, and will include the 1 in 1000 year scenario as well as breach analyses, depth, velocity and hazard data. At the time of writing this FRA, this data was unavailable.

5.2.10 The EA will also be updating hydraulic modelling for this area in their upcoming Lower Aire Study, however the deliverables from this study are not expected until the end of 2016/ early 2017.

5.2.11 This assessment is therefore based on the modelled flood levels for the River Aire and supporting information obtained via the data consultation request (20th September 2016) presented in Annex 4.

5.2.12 Table 5.2 presents the modelled flood water levels for the nodes nearest to the Site for a range of return period events. An associated map showing the location of the model node points is presented in Annex 4.

5.2.13 The levels presented in Table 5.2 suggest that the fluvial flood levels are generally higher than the tidal flood levels along the Lower Aire in this location. For the purposes of this study, and as a worst case scenario, the fluvial flood levels will be used to inform the assessment of fluvial/ tidal flood risk to the Site.

5.2.14 The climate change scenarios in the 2008 model are represented by a 1% (1 in 100 year) peak water level for the 2025 and 2115 Climate Change Scenario (+10% Flow combined with a 0.5% (1 in 200 year) tidal event). There are no results currently available from the 2008 study for the 0.1% (1 in 1000 year) scenario.

Table 5.2: Modelled flood water levels for the River Aire

Node Label	2008 Modelled Flood Water Levels (m AOD)					2012 Modelled Flood Water Levels (m AOD)					
	1% Fluvial	0.5% Fluvial	2025 1% Fluvial 200Yr Tidal	2047 1% Fluvial 200Yr Tidal*	2115 1% Fluvial 200Yr Tidal	1% Fluvial	1% +cc Fluvial	0.5% Fluvial	1% Tidal	1% + cc Tidal	0.5% Tidal
02670600342D	8.269	8.298	8.300	8.354	8.522	8.153	8.239	8.234	5.972	6.309	5.982
2670600074	8.119	8.144	8.146	8.191	8.330	8.005	8.109	8.102	5.962	6.300	5.972
2670600005	8.140	8.166	8.167	8.214	8.361	8.024	8.127	8.120	5.959	6.297	5.968
2670504891	7.990	8.013	8.014	8.055	8.183	7.869	7.996	7.989	5.942	6.278	5.953
2670504622	7.923	7.943	7.945	7.983	8.099	7.801	7.940	7.932	5.939	6.274	5.948
2670504401	7.879	7.898	-	-	-	7.756	7.905	7.895	5.936	6.268	5.946
2670504202	7.931	7.952	7.953	7.994	8.121	7.805	7.951	7.941	5.933	6.268	5.943
2670504005	7.920	7.941	-	-	-	7.719	7.881	7.870	5.931	6.266	5.941
2670503741	7.885	7.906	-	-	-	7.682	7.853	7.842	5.927	6.263	5.937
2670503513	7.786	7.812	7.822	7.860	7.977	7.633	7.816	7.803	5.923	6.259	5.933
2670503275	7.778	7.805	-	-	-	7.623	7.814	7.800	5.919	6.257	5.930
2670502986	7.775	7.803	7.812	7.852	7.975	7.617	7.814	7.800	5.915	6.253	5.925
2670502795	7.760	7.790	-	-	-	7.601	7.805	7.790	5.912	6.250	5.921
02670502329B	7.666	7.707	7.717	7.760	7.893	7.502	7.740	7.720	5.905	6.242	5.915
2670501988	7.532	7.590	7.602	7.655	7.818	7.358	7.646	7.620	5.897	6.233	5.907
2670501718	7.462	7.531	-	-	-	7.323	7.636	7.608	5.891	6.227	5.901
2670501499	7.424	7.501	-	-	-	7.288	7.628	7.594	5.888	6.223	5.898
2670501345	7.401	7.484	7.500	7.569	7.784	7.267	7.628	7.600	5.886	6.221	5.896
2670501158	7.368	7.462	-	-	-	7.235	7.630	7.600	5.883	6.217	5.893
2670500980	7.342	7.447	7.407	7.497	7.775	7.210	7.620	7.590	5.881	6.214	5.891
2670500736	7.304	7.425	-	-	-	7.173	7.606	7.574	5.588	6.210	5.887
2670500511	7.246	7.386	7.407	7.484	7.723	7.118	7.536	7.502	5.874	6.205	5.883
02670500058C	7.123	7.221	7.232	7.266	7.371	6.999	7.161	7.149	5.868	6.195	5.877

* Year 2047 climate change levels have been interpolated from the 2025 and 2115 level data.

Existing Coal-Fired Power Station Site

5.2.15 The EA Flood Map for Planning (Annex 4) shows a small section of the existing coal-fired power station site as being located in Flood Zone 3 with water overtopping Wand Lane to the south-east of the Yorkshire Water waste water treatment works. This area of the Site correlates with model nodes 2670501988 to 2670500511. Based on the modelled water levels (Table 5.2) the flood water level for a 1% AEP event is 7.532 mAOD (based on the 2008 model) and 7.538 mAOD (based on the 2012 model).

5.2.16 The topographic survey, presented in Annex 2, shows road levels along Wand Lane in this area no lower than 7.82 mAOD and existing ground levels within the Proposed Construction Laydown area/ CCR Land approximately 11.6 mAOD to in excess of 13 mAOD in some areas. When ground levels are compared to the modelled flood water levels it is considered that flooding would not occur within the Site at this location.

5.2.17 Further inspection of the topographic survey suggests that there are two low spots along Wand Lane. The first is located at the junction of Wand Lane and Ings Lane to the east of the Yorkshire Water waste water treatment works with a ground level of approximately 7.45 mAOD. Flood levels in this area (taken from node 2670501718) are 7.462 mAOD (based on the 2008 model) and 7.323 m AOD (based on the 2012 model). Based on the 2012 modelled flood data overtopping of Wand Lane would not occur, however, when road levels are compared with the 2008 flood level, flood water would overtop the road.

5.2.18 The second is located to the north east of the car park with a ground level of approximately 7.53 mAOD. Flood levels in this area (taken from node 2670503275) are 7.778 mAOD (based on the 2008 model) and 7.623 mAOD (based on the 2012 model), both above the ground level of Wand Lane.

5.2.19 If flood water were to enter the Site at these locations, flood water would be routed along the northern area of the Site including the vegetated areas along the drainage ditch where ground levels fall down from the road towards the Site and will be prevented from flowing west by the access road to the car park with an elevation of approximately 7.93 mAOD. Ground levels within the sewage treatment works are generally 8 mAOD and ground levels within the cooling tower area located at 9 mAOD and above.

5.2.20 Ground levels within the existing coal-fired power station site, in general, increase from north to south reaching a minimum ground level of 8 mAOD, with the 8 mAOD contour clearly seen on OS mapping and the topographic survey. Flood water would not affect the Site to the south of this contour and would not reach the Proposed Power Plant Site or the CCR Land. The northern extent of the Proposed Construction Laydown area, below this 8 mAOD contour would be flooded.

5.2.21 Based on the above information it is considered that the Flood Zone 3 flood extent, as shown on the EA flood zone map (Annex 4) is not in the correct location and should be shifted north to reflect the identified low spots on Wand Lane and the location of the 8 mAOD contour. It is also considered that the flood zone would be less extensive than that shown on the EA map, with the flood zone confined to the north/ north-east of the Site, predominantly outside of the permanent above ground development boundary (the Proposed Power Plant Site). The EA has confirmed agreement on this point in a letter dated 17th February 2017 (comments on PEI Report).

Proposed Gas Connection Corridor

5.2.22 The location of the Proposed Gas Connection corridor is predominantly within Flood Zone 3a and 3b with small areas of the route located within Flood Zone 2, including the location of the AGI, adjacent to West Lane.

5.2.23 Modelled flood levels show that the 1% AEP flood level along the Proposed Gas Connection corridor will range from approximately 8.27 mAOD (2008 data) to the north-east, in the location of the AGI adjacent to West Lane and the abstraction point at Chapel Haddlesey, to 7.92 mAOD where the Proposed Gas Connection corridor crosses the River Aire.

Flood Defences

5.2.24 Flood defences along the stretch of the River Aire to the north/ north-east of the Site comprise embankments and are maintained by the EA. The EA regularly inspects flood defences to make sure they are fit for purpose. In October 2016, the EA considered all of the defences in the area to be in "good condition" (Grade 2) or "fair" (Grade 3) on a scale of 1 (very good) to 5 (very poor).

5.2.25 Table 5.3 presents the asset defence information for the flood defences associated with the study area. The location of the flood defences in relation to the Site is presented in Annex 4.

Table 5.3: Asset defence information

Asset I.D	Description	Design standard of protection (years)	Actual condition rating	Actual downstream crest level (mAOD)	Actual upstream crest level (mAOD)
27286	Embankment	50	3	7.027	7.428
73107	Embankment	50	2	6.928	7.003
52893	Embankment	50	2	7.336	7.635
50794	Embankment	50	3	6.944	6.761
27111	Embankment	50	3	6.761	6.901
73495	Embankment	50	3	6.845	6.469
146608	Embankment	50	3	7.222	8.463
27206	Embankment	50	3	8.384	8.618

5.2.26 Since the Site is afforded protection from defences up to, and including, the 2% AEP (1 in 50 year) flood event, the primary risk from fluvial and tidal sources is considered to be from overtopping of the flood defences during higher return period events.

Risk of Flooding

5.2.27 Based on this assessment, the risk of flooding to the majority of the existing coal-fired power station site, including the location of the Proposed Power Plant Site, the CCR Land and the southern area of the associated Proposed Construction Laydown area, is considered to be low. The risk of flooding to the northern part of the Proposed Construction Laydown area and areas located to the north of the wider existing coal-fired power station site (existing cooling towers, car park etc.) is assessed as high.

5.2.28 Based on the above information the location of the Proposed Gas Connection corridor is considered to be at high risk of flooding from fluvial/ tidal sources, whilst the area of the Proposed AGI is considered to be at low to medium risk.

Minor Watercourses/ Drainage Ditches

5.2.29 Section 2.6 provides a summary of the minor watercourses and drainage ditches in the study area with the main watercourses noted as follows; Ings and Tetherings Drain and Hensall Dyke, located to the north and south-east of the Proposed Power Plant Site respectively. There are also a number of drainage ditches and un-named minor watercourses along the route of the Proposed Gas Connection corridor. The minor watercourses fall under the jurisdiction of the Selby IDB (land to the north of the River Aire, including the Proposed Gas Connection corridor) and the Danvm Drainage Commissioners (land to the south of the River Aire including the existing coal-fired power station site).

5.2.30 Danvm Drainage Commissioners has confirmed there have been no historical flood events from their assets in this area or known surface water flooding problems.

Flood Levels

5.2.31 There are no modelled flood water levels for any of the identified minor watercourses or drainage ditches. Given the ephemeral nature of some of the drainage ditches, it is likely that the risk of flooding is low with the ditches only holding water during higher return period storm events or when the River Aire is in flood.

5.2.32 Water levels within the Ings and Tetherings Drain and Hensall Dyke are, to some extent, controlled by a pumped discharge to the River Aire and therefore are unlikely to flood during lower return period events. During higher return period events, it is likely that the predominant source of flooding would be the River Aire, as discussed above.

5.2.33 The Flood Zone 2 and Flood Zone 3 extent associated with Hensall Dyke are located downstream (east) of the Site. If a flood event occurred along this watercourse, independent of the River Aire being in flood, it is unlikely, due to local topography, that flood water would reach the Site.

5.2.34 It is possible that some of the minor watercourses and drainage ditches could flood at higher return period events, however, it is considered that this flooding would be highly localised to the watercourse/ drainage ditch where it passes through the Proposed Gas Connection corridor and would only be considered a risk during the construction phase of the Proposed Development.

Flood Defences

5.2.35 A flood defence embankment is located along the east bank of Hensall Dyke (downstream of Hensall) and along the southern bank of the Ings and Tetherings Drain (from Gallows Hill to Heck Ings). In October 2016, the EA considered the defence to be in “good condition” (Grade 2) on a scale of 1 (very good) to 5 (very poor) providing a standard of defence up the 1 in 50 year flood event.

5.2.36 There are no other formal flood defences identified within the study area.

Risk of Flooding

5.2.37 Based on the above information it is considered that the risk of flooding from minor watercourses and drainage ditches within the study area is low. There may be some fluvial flooding along the Proposed Gas Connection corridor at higher return period events; however, during these events fluvial flood risk in the area will be predominantly from the River Aire.

5.3 Artificial Waterbodies

Reservoirs

5.3.1 Reservoir flooding may occur as a result of the capacity of a reservoir facility being exceeded and/ or as a result of dam or embankment failure. The latter can happen suddenly resulting in rapidly flowing, deep water that can cause significant threat to life and major property damage

5.3.2 The EA's Flood Risk from Reservoirs Mapping shows that the majority of the Site is located within an area at residual risk of flooding from a large reservoir should a structural failure or breaches of the reservoir occur. The Reservoir Act 1975 defines a large reservoir as one that holds over 25,000 cubic metres (m^3) of water although under the Flood and Water Management Act this has been reduced to 10,000 m^3.

5.3.3 Much of the surrounding areas between Knottingley, Selby and Goole are also shown as being at risk of flooding from reservoirs despite there being no major reservoirs in this area. The source of this flooding is believed to be the combined effect of upstream reservoirs discharging excessive volumes of water into the rivers and watercourses to which they are connected, creating a cumulative effect, and smaller local reservoirs exacerbating this. It is considered that the potential impact of all reservoirs flooding at the same time is not a realistic scenario.

5.3.4 The SDC FRA states there have been no recorded incidents of reservoir flooding within Selby District.

5.3.5 Reservoir flooding is extremely unlikely to happen. All large reservoirs must be inspected and supervised by reservoir panel engineers on a yearly basis. As the enforcement authority for the Reservoirs Act 1975 in England, the EA is responsible for ensuring that reservoirs are inspected regularly and essential safety work is carried out.

5.3.6 NYCC is responsible for working with members of the Local Resilience Forum (LRF) to develop emergency plans for all forms of flooding, including reservoir flooding, and ensuring communities are well prepared.

Canals

5.3.7 Canal flooding may occur as a result of their capacities being exceeded and/or as a result of raised embankment failure. The latter can happen suddenly resulting in rapidly flowing, deep water that can cause significant threat to life and major property damage.

5.3.8 Canal embankment failure has been known to happen occasionally but the impact is not considered to be as extensive as a failure of a reservoir dam as studies have shown that maximum discharges are limited to the volume held within the canal cross section between two locks. This residual risk is managed by the Canals and River Trust (CRT) who perform monthly towpath side inspections and other inspections at no more than quarterly intervals.

5.3.9 Canals are considered to be controlled water bodies so flood risk is deemed to be minimal unless overtopped in storm conditions. There is, however, a residual risk of structural failure.

5.3.10 As reported in the SDC SFRA the CRT has recorded one incident of flooding from the Aire and Calder Navigation at Ferrybridge Lock on 26th June 2007, approximately 9 km to the west of the Site. There are no recorded incidents of canal flooding for the Selby Canal to the north-west of the Site.

Other Sources

5.3.11 There is an artificial lagoon currently located within the Site. It is assumed that this lagoon is part of a 'managed' system and it is not believed that this poses a flood risk to the Proposed Development.

5.3.12 Based on the available data it is considered that the Site is at low risk of flooding from artificial waterbodies.

5.4 Groundwater Flooding

5.4.1 Groundwater flooding can occur when groundwater levels rise above ground surface levels. The underlying geology has a major influence on where this type of flooding takes place; it is most likely to occur in low-lying areas underlain by permeable rocks (aquifers).

Geology

Superficial Geology

5.4.2 A review of the Groundsure reports (Appendix 12B, ES Volume III), British Geological Survey (BGS) 1:50,000 solid and drift geology sheet 79 for Goole, existing site investigation records and publically available BGS borehole records indicates the following superficial deposits may be present beneath the Site:

1. alluvium – recent alluvium, present in a narrow corridor along the River Aire (extending approximately 1.2 km north-east to approximately Millfield Road);
2. Lacustrine beach deposits – shingle, sand, silt and clay, present at the north-western corner of the Proposed Power Plant Site;
3. Breighton sand formation – dominantly yellow, slightly clayey sand to silty, which appears to be absent beneath the Proposed Power Plant Site, but present in a 250 m corridor immediately north-east of Wand Lane and a 300 m band from approximately Millfield Road to Fox Lane;
4. Hemingbrough glacio-lacustrine deposits shown to underlie the south-eastern corner of the Proposed Power Plant Site and areas of the Site between approximately Fox Lane and West Lane ; and
5. glacial till – typically sandy and gravelly clays, with cobbles and boulders. The geological map indicates that these deposits may encroach onto the extreme south-western corner of the Proposed Power Plant Site.

5.4.3 Given much of the Proposed Power Plant Site is occupied by the coal stockyard for the existing coal-fired power station, the presence of made ground is also anticipated.

5.4.4 Further details on the geology are found within Chapter 12: Geology, Hydrogeology and Land Contamination.

Bedrock Geology

5.4.5 The geological map and Groundsure reports (Appendix 12B, ES Volume III) indicate that the Site (including both Proposed Power Plant Site and Proposed Cooling Water and Gas Connections) is underlain by Sherwood Sandstone.

Hydrogeology

5.4.6 The Environment Agency aquifer classifications for the identified superficial deposits underlying the site, as detailed above, is summarised in Table 5.4 below.

Table 5.4: Summary of EA aquifer classifications

Formation	EA aquifer classification	Aquifer definition
Superficial deposits		
Lacustrine Beach Deposits	Secondary A Aquifer	Defined by the EA as '*permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers*'.
Alluvium	Secondary A Aquifer	
Breighton Sand	Secondary A Aquifer	
Glacial Till (clay)	Secondary Undifferentiated Aquifer	Defined by the EA as '*an aquifer where it has not been possible to attribute either category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type.*'
Hemingbrough Formation	Unproductive Strata	Defined by the EA as '*rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow'.*
Bedrock		
Sherwood Sandstone	Principal Aquifer	Defined by the EA as '*layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale. In most cases, principal aquifers are aquifers previously designated as major aquifer'.*

5.4.7 Soils at the Site (except those associated with glacial till and glaciolacustrine deposits) are classified as having a high leaching potential, meaning that they may readily transmit liquid discharges and pollutants.

5.4.8 The entire Site, with the exception of the southern Proposed Borehole Water Connection and the northern end of the Proposed Gas Connection, is located in a groundwater Source Protection Zone (SPZ) 3 (total catchment).

Groundwater Levels

5.4.9 In December 2001, Exploration Associates (Exploration Associates, 2001) were commissioned to conduct a site investigation in order to help better understand the ground conditions at the site of the proposed flue gas desulphurisation (FGD) plant (land to the north-east of the coal stockyard i.e. the Proposed Construction Laydown area). Groundwater strikes were encountered at approximately 9.0 – 15.6 m below ground level (bgl) during drilling, with a standing water level of 1.7 m bgl recorded during post-fieldwork monitoring

5.4.10 Strata Surveys' ground investigation in 2012 (Strata Surveys Limited, 2012) focussed on the coal stockyard area. Groundwater monitoring wells were installed in six locations, which returned standing elevations of 4.1 – 9.0 m bgl in June/ July 2012. Monitoring of groundwater wells installed within the area for the proposed Power Plant Site suggests that the depth to groundwater in this area may be approximately 7 m to 8 m bgl.

5.4.11 Given the short periods for which groundwater level data is available it is expected that fluctuations in groundwater levels over a longer period of time would occur with seasonality likely having an effect.

5.4.12 Geosyntec (Geosyntec, 2016) has undertaken regular groundwater monitoring as part of Eggborough Power Station's Site protection and Monitoring Programme (SPMP) since 2008 in line with the requirements of the Environmental Permit to identify potential changes in groundwater quality as a result of the permitted operations. Groundwater flow direction is inferred to be radial towards the south and west from a high point in the northern-central part of the existing coal-fired power station site.

Groundwater Flood Risk

5.4.13 The EA's dataset Areas Susceptible to Groundwater Flooding (AStGWF) indicates where groundwater may emerge due to certain geological and hydrogeological conditions. This information is shown as a proportion of 1 km grid squares where there is potential for groundwater emergence.

5.4.14 The mapping indicates that the majority of the Site is located in an area with <25% susceptibility to groundwater flooding. The eastern area of the existing coal-fired power station site and land located to the north, between the existing power station and the River Aire is located within an area >=25% to <50% susceptibility to groundwater flooding.

5.4.15 The NYCC PFRA states there is no substantial evidence of direct groundwater flooding in the majority of North Yorkshire and there are no historical records of groundwater flooding noted in the SDC SFRA.

5.4.16 The existing coal-fired power station site is currently largely covered by hardstanding, which reduces infiltration and the likelihood of localised groundwater reaching the surface and causing flooding.

5.4.17 Based on this information the Site is considered to be at low risk of groundwater flooding. It is noted, however, that groundwater may be encountered during the construction phase but mitigation will be in place to manage groundwater emergence should it occur (see Section 7 – Flood Risk Management Measures).

5.5 Surface Water Flooding (Overland Flow)

5.5.1 Overland flow results from rainfall that fails to infiltrate the surface and travels over the ground surface; this is exacerbated where the permeability of the ground is low due to the type of soil and geology (such as clayey soils) or urban development with impermeable surfaces.

5.5.2 The SFRA reports the NYCC Highway Authority has recorded six historic flooding events in Selby District. These records include historical surface water flooding in Eggborough which occurred in 2013 and was located in the village of Eggborough, to the south west of the Site, rather than the Site itself.

5.5.3 The SFRA also lists historic flood records from Highways England showing historic flood records impacting the M62, to the south of the Site, in 2004, 2005, 2012, 2013, 2014 and 2015; however the source of flooding has not been confirmed.

5.5.4 The Environment Agency has undertaken modelling of surface water flood risk at a national scale and produced mapping identifying those areas at risk of surface water flooding during three annual probability events: 3.3% AEP (1 in 30 chance of flooding in any one year), 1% AEP and 0.1% AEP. The latest version of the mapping is referred to as the uFMfSW and the extents are available on the Environment Agency website, and are referred to as 'Risk of Flooding from Surface Water'. Mapping for the Site is presented in Annex 4.

5.5.5 The map shows that the majority of the Site is considered to be at 'very low' risk of flooding from surface water. The EA defines 'very low risk' as an area that has a chance of flooding that is less than a 0.1% AEP in any given year.

5.5.6 Areas of 'medium' and 'high' risk of surface water flooding are shown on the Flood Maps to be located in isolated areas throughout the Site e.g. within the Proposed Power Plant Site, and beyond the Site boundary. However, there are no identified flow routes through the Site and these isolated areas of surface water flooding are considered to be a consequence of surface water ponding in areas of low topography.

5.5.7 In light of the above information with regards surface water flooding, the risk of flooding from surface water is considered to be low.

5.6 Drainage Infrastructure

5.6.1 Sewer and surface water flooding are often interconnected; insufficient drainage capacity in the sewer network can result in extensive surface water flooding and, by the same rationale, large volumes of surface water can overload the public sewers, causing the sewer network to back up, surcharge and ultimately flood.

5.6.2 The existing Eggborough Power Station site drainage system collects surface water and pumps it to a concrete ash reservoir, where it is mixed with other process water and used to transport Pulverised Fuel Ash (PFA) to Gale Common. Within this drainage system there are three separate catchments associated with internal access roads, each connected to an oil interceptor prior to the connection to the ash reservoir. There are also separate catchments for the coal stockyard and existing contractor's hardstanding areas (in the vicinity of Hensall Gate), which also connect to the ash reservoir. The existing drainage catchments across the existing coal-fired power station site are broadly summarised as follows:

- the north-west part of the existing coal-fired power station site, including the area around the northern part of the National Grid 400 kV sub station and turbine hall, drain via pipes, drains and gullies to an oil interceptor located to the south-west of the existing cooling towers before reaching the ash reservoir;
- the central north-east part of the existing coal-fired power station site, including the flue gas desulphurisation plant to the east of the main power station buildings (turbine hall and boiler house) drains via pipes, drains and gullies to an oil interceptor located to the south-east of the existing cooling towers before reaching the ash reservoir;
- the west and southern parts of the existing coal-fired power station site, including the southern part of the National Grid 400 kV sub station and turbine hall, drain via pipes, drains and gullies to an oil interceptor located to the north-west of the existing rail loop;

- the coal stockyard in the south of the existing coal-fired power station site has a perimeter drain which drains to a sump at the south-east of the coal stockyard, from where it is pumped to the ash reservoir;
- the easternmost parts of the existing coal-fired power station site including the emergency coal stockyard to the north-east of the rail loop and gravelled storage/ laydown areas drain via a combination of soakaways (although localised flooding is known to have occurred here) and a drainage system that is pumped to the ash reservoir.

5.6.3 There are additional minor drainage mechanisms including apparent soakaway drainage around the existing cooling towers and some seepage through the embankment at the south-east of the existing coal-fired power station site to an existing drainage ditch a short distance outside of the existing coal-fired power station area.

5.6.4 The majority of land located within the route of the Proposed Gas Connection corridor comprises arable land and surface water drains naturally to ground via infiltration (with the assistance of land drains – see further description of these below). Surface water from local roads is assumed to drain to existing highway drainage infrastructure.

5.6.5 There is a residual risk of flooding to isolated areas of the Site from the existing drainage infrastructure should it become blocked or obstructed or the routine maintenance regime is not followed, however, this risk is considered to be low.

5.6.6 There are no historical records of sewer flooding within the Site boundary or in close proximity of the Site in either the SDC SFRA or NYCC PFRA.

5.6.7 As part of the SDC SFRA Yorkshire Water provided an extract from their DG5 Flood Register for the SDC area on the total number of properties at a 1 in 30 year risk of sewer flooding based on historic flooding over the previous 10 years. Due to data protection requirements the data was not provided at individual property level; rather the register comprised the number of properties within 4 digit postcode areas that are at risk of sewer flooding either internally or externally.

5.6.8 Mapping of the DG5 postcode areas, undertaken as part of the SFRA, shows the Site is located in an area with between 6 – 8 records of external sewer flooding during the documented period. It is noted that the Site is not located in an area as being at a higher risk of sewer flooding.

5.6.9 Drainage infrastructure is likely to be present along the Proposed Gas Connection corridor but given the rural location the risk of flooding is considered to be low along the Proposed Gas Connection corridor.

5.6.10 On the basis of the available records and information, the Site is considered to be at low risk of flooding from drainage infrastructure.

5.7 Summary of Flood Risk

5.7.1 Table 5.5 summarises the flood risk from each relevant source.

Table 5.5: Summary of Flood Risk from Assessed Sources

Source	Description	Flood Risk	
Fluvial/ Tidal	River Aire	Majority of the existing coal-fired power station site, including the location of the	Low

Source	Description	Flood Risk	
		Proposed Power Plant Site, the CCR Land and the southern area of the associated Proposed Construction Laydown area	
		Northern part of the Proposed Construction Laydown area and areas located to the north of the wider existing coal-fired power station site (existing cooling towers, car park etc.)	High
		Proposed Gas Connection corridor	High
		Proposed AGI	Medium
	Minor Watercourses and Ditches	Low	
Artificial Sources	Reservoirs	Low	
	Canals	Low	
Groundwater		Low	
Surface Water (Overland Flow)		Low	
Drainage Infrastructure		Low	

6.0 CLIMATE CHANGE

6.1 Context

6.1.1 The NPPF requires site specific FRAs accompanying planning applications to assess the risk of all sources of flooding to and from a development and to demonstrate how these flood risks will be managed so that the development remains safe throughout its lifetime, taking climate change into account.

6.1.2 The EA published updated climate change guidance in February 2016 (EA, 2016). EA climate change guidance for the NPPF indicates that climate change is likely to have an impact on river flows, sea levels, rainfall intensity, wave height and wind speed.

6.2 Peak River Flow Allowances by River Basin District

6.2.1 The peak river flow allowances show the anticipated changes to peak flow by river basin district. The range of climate change allowances is based on percentiles. A percentile is a measure used in statistics to describe the proportion of possible scenarios that fall below an allowance level. The 50th percentile is the point at which half of the possible scenarios for peak flows fall below it and half fall above it.

- central allowance is based on the 50th percentile;
- higher central is based on the 70th percentile;
- upper end is based on the 90th percentile.

6.2.2 If the central allowance is 30%, scientific evidence suggests that it is just as likely that the increase in peak river flow will be more than 30% as less than 30%.

6.2.3 At the higher central allowance, 70% of the possible scenarios fall below this value. So, if the higher allowance is 40%, then current scientific evidence suggests that there is a 70% chance that peak flows will increase by less than this value, but there remains a 30% chance that peak flows will increase by more.

6.2.4 The Proposed Development lies within the Humber River Basin District. Table 6.1 shows the climate change allowances for the Humber River Basin District.

Table 6.1: Climate change allowance for the Humber River Basin District

Allowance category	Total potential change anticipated for '2020s' (2015 to 2039)	Total potential change anticipated for '2050s' (2040 to 2069)	Total potential change anticipated for '2080s' (2070 to 2115)
Upper end	20%	30%	50%
Higher central	15%	20%	30%
Central	10%	15%	20%

Peak River Flow Allowances for Different Assessments

6.2.5 For FRAs, the "flood risk vulnerability classification" for the type of development and the "flood zone" should be used to decide which peak river flow allowances (allowance category) to use based on the lifetime of the Proposed Development. Table 6.2 shows the peak river flow for the different flood risk vulnerability classifications for each flood zone.

Table 6.2: Peak river flow allowances based on flood risk vulnerability classification and flood zone

Flood Zone 2
• Essential infrastructure – use the higher central and upper end to assess a range of allowances • Highly vulnerable – use the higher central and upper end to assess a range of allowances • More vulnerable – use the central and higher central to assess a range of allowances • Less vulnerable – use the central allowance • Water compatible – use none of the allowances
Flood Zone 3a
• Essential infrastructure – use the upper end allowance • Highly vulnerable – development should not be permitted • More vulnerable – use the higher central and upper end to assess a range of allowances • Less vulnerable – use the central and higher central to assess a range of allowances • Water compatible – use the central allowance
Flood Zone 3b
• Essential infrastructure – use the upper end allowance • Highly vulnerable – development should not be permitted • More vulnerable – development should not be permitted • Less vulnerable – development should not be permitted • Water compatible – use the central allowance
If (exceptionally) development is considered appropriate when not in accordance with flood zone vulnerability categories, then it would be appropriate to use the upper end allowance.

Peak River Flow Allowances for the Proposed Development

6.2.6 Table 6.2 (replicated from the EA guidance) implies that for sites located in Flood Zone 1, it is not necessary to apply peak river flow allowances to account for future climate change, however, given the proximity of the River Aire and the mapped historical flood extents for recent flood events (Annex 4) this assessment takes into account the impacts of climate change on peak river flow in the River Aire and the minor watercourses within the study area.

6.2.7 It is assumed that the lifetime of the Proposed Development for river flow assessment purposes is 28 years (based on the estimated construction period and operational lifetime of the Proposed Development) the peak river flow climate change allowances for the lifetime of the Proposed Development should be assessed as shown in Table 6.3.

Table 6.3: Peak river flow allowances for Proposed Development

Proposed Development	
River Basin District	Humber
Flood Zone	1
Flood risk vulnerability classification	Essential Infrastructure
Lifetime of development	28 years
Climate change allowance to be assessed	Higher central - 20% Upper End - 30%

6.3 Peak Rainfall Intensity Allowance

6.3.1 Increased rainfall affects river levels and land and urban drainage systems. Table 6.4 shows anticipated changes in extreme rainfall intensity in small and urban catchments. FRAs and SFRAs should assess both the central and upper end allowances to understand the range of impact.

Table 6.4: Peak rainfall intensity allowance

Applies across all of England	Total potential change anticipated for 2010 to 2039	Total potential change anticipated for 2040 to 2059	Total potential change anticipated for 2060 to 2115
Upper end	10%	20%	40%
Central	5%	10%	20%

6.4 Impact of Climate Change on Flooding Sources

Fluvial and Tidal Flooding

6.4.1 The effect of climate change on peak river levels and consequently on flood levels within the River Aire, which are affected by the tidal level and the river level, is presented in Table 5.2. The worst case climate change scenarios from the 2008 Lower River Aire Modelling – Knostrop Weir to confluence with River Ouse - Lower Model Update study are represented by a 1% (1 in 100 year) peak fluvial water level + 10% for the 2025 and 2115 Climate Change Scenario (+10% Flow) combined with a 0.5% (1 in 200 year) tidal event).

6.4.2 The lifetime of the Proposed Development (based on the estimated construction period and operational lifetime of the Proposed Development) is approximately 28 years, with construction expected to start in 2019. For this assessment the climate change scenario is considered for the Year 2047.

6.4.3 Table 5.2 shows the estimated climate change flood water level for the year 2047, interpolated from the year 2025 and year 2115 data provided by the EA. This data shows the climate change flood water for the nodes associated with the Proposed Power Plant Site and Proposed Construction Laydown/ CCR area (Nodes 2670501988 to 2670500511) is 7.655 mAOD. At this level, flood water would overtop the low point in Wand Lane, to the north east of the Yorkshire Water waste water treatment works as the existing scenario, with water flooding land to the north located below the 8 m contour.

6.4.4 Climate change flood water levels for the low point located to the north-east of the existing contractors car park near Hensall Gate (taken from node 2670503275) is approximately 7.86 mAOD. Again, as the existing situation, water would flood the land to the north located below the 8 mAOD contour.

6.4.5 It is proposed that minimum ground levels within the Site are set no lower than 7.9 mAOD to mitigate this increase in flood level due to climate change. It is also recommended that the 8 mAOD contour is retained through the northern area of the Proposed Construction Laydown area/ CCR Land.

6.4.6 The risk of fluvial/ tidal flooding to the Site is not likely to increase due to climate change. However, if a flood event did occur, the impact of climate change would result in an increase in the depth of floodwater across the areas of the site affected by flooding from this source.

Groundwater

6.4.7 The predicted increase in the wetness of winters and the intensity of storm events as a result of climate change could impact the groundwater level fluctuations at the Site and possibly increase the level of the water table. As the likelihood of groundwater emergence under the climate change scenario is likely to increase, the potential for groundwater flooding to impact the development will also increase.

6.4.8 Post-development the Proposed Power Plant Site will be largely covered by hardstanding, which reduces infiltration and the likelihood of localised groundwater reaching the surface and causing flooding.

6.4.9 On the basis of the above, it is not anticipated that the risk from groundwater sources, which is currently considered to be low, would increase significantly to the point that it would increase the risk to the Proposed Development.

Drainage Infrastructure

6.4.10 It is difficult to predict precisely the impact of climate change on sewer flooding; however, the anticipated increase in rainfall intensity may cause greater volumes of rainfall to enter the surface water sewer network during storm events. This may require the upgrading of existing infrastructure to maintain the same level of service and for new infrastructure to be designed with greater capacities.

6.4.11 The outline drainage strategy for the Proposed Development (presented in Annex 5 and summarised in Section 8) proposes surface water from the Site is drained via infiltration and attenuation methods, with the latter discharging to watercourse.

6.4.12 AECOM does not anticipate that the risk from the wider drainage infrastructure, which is currently assessed as low, would increase significantly to the point that it would pose a risk either to or from the Proposed Development, particularly as the detailed design of the drainage system has not yet taken place.

Surface Water Runoff Generation and Overland Flow

6.4.13 Climate change must be taken into account when considering surface water runoff generated by development sites. This is usually represented by increasing the peak rainfall intensities. An increase in rainfall intensity will increase runoff rates and volumes and therefore the design of the drainage system associated with the Proposed Development will need to take this into account in accordance with the guidance of the NPPF, the EA and the SFRA.

6.4.14 Peak runoff from the Proposed Development will be attenuated up to the 3.33% AEP (1 in 30 year) rainfall event plus a minimum of 30% climate change. Surface water runoff generated by higher return period storms (up to and including the 1% AEP with an allowance for climate change) will be retained within the site boundary, in accordance with the NPPF and EA guidance. Section 8 and

Annex 5 outline how surface water runoff will be managed onsite taking into account the requirements for climate change.

7.0 FLOOD RISK MANAGEMENT MEASURES

7.1 General

7.1.1 As discussed under Section 5.2 and Section 6.4, the majority of the Proposed Gas Connection corridor and the northern area of the Proposed Construction Laydown area will be at high risk of flooding from fluvial/ tidal sources during construction, operation and decommissioning. General mitigation measures to protect the Proposed Development are discussed below.

Construction

7.1.2 The proposed crossings of the River Aire and the Ings and Tetherings Drain lie within Flood Zone 3b – Functional Floodplain and the northern section of the construction laydown area (below the 8 m contour)is located in Flood Zone 3.

7.1.3 With the likelihood that the River Aire will flood during the duration of the construction works, despite it being a relatively short term phase, the emphasis is placed on managing and mitigating the risks to the proposed temporary works as well as not increasing the flood risk elsewhere.

7.1.4 During construction, pollution prevention guidelines and IDB byelaws will be followed by the Contractor.

7.1.5 The proposed works involve new crossings of the River Aire, Ings and Tetherings Drain and other smaller local watercourses. Formal consent is required from the EA for any development adjacent to or within a watercourse and from the relevant IDB for works located within the IDB byelaw distance.

7.1.6 The Proposed Gas Connection crossing of the River Aire is to be by directional drilling, and there must be a minimum clearance of 1 m below hard bed level. Any proposed works to the watercourses may require Land Drainage Consent and may also require additional Water Framework Directive (WFD) Assessment.

7.1.7 A Construction Environmental Management Plan (CEMP) will incorporate measures to prevent an increase in flood risk during the construction works. Examples of such measures include:

- topsoil and other construction materials will be stored outside of the 1 in 100 year floodplain extent wherever possible and only moved to the temporary works/ cofferdam areas immediately prior to use;
- connectivity will be maintained between the floodplain and the River Aire, with no changes in ground levels within the floodplain;
- the Proposed Construction Laydown area site office and supervisor will be notified of any potential flood occurring by use of the Floodline Warnings Direct service;
- the Contractor will be required to produce a Flood Risk Management Action Plan/ Method Statement which will provide details of the response to an impending flood and include:
    - a 24 hour availability and ability to mobilise staff in the event of a flood warning;
    - the removal of all plant, machinery and material capable of being mobilised in a flood for the duration of any holiday close down period;
    - details of the evacuation and site closedown procedures; and

- arrangements for removing any potentially hazardous material and anything capable of becoming entrained in floodwaters, from the temporary works/ cofferdam areas.

7.1.8 If perched groundwater is encountered during establishment of core foundations and the crossing of the River Aire via tunnelling methods, dewatering may be required. The most appropriate methods to dewater excavations will be selected, for example, prior to dewatering the perimeter of the excavation could be enclosed with either sheet-pile or a diaphragm wall.

Operation

7.1.9 The following measures will be considered to ensure the operation of the Proposed Development is maintained during times of inundation and enable swift recovery following a flood event:

- finished ground levels will not be lower than 7.9 mAOD in the Proposed Power Plant Site to mitigate the increase in flood level due to climate change. It is also recommended that the 8 m contour is retained through the northern area of the Proposed Construction Laydown area and CCR Land;
- site drainage and landscape design will follow such guidance as CIRIA C635 (CIRIA, 2006), to minimise the risk from exceedance flows and any overland flow entering the Proposed Development buildings;
- adequate containment of storage areas, to ensure that material does not wash away and cause pollution and damage to infrastructure; and
- adoption of flood proofing and resilience measures to minimise damage to buildings and the timescales for the resulting clean-up operation. Examples of such measures include wet-proofing by raising electrical wiring above flood levels, galvanised and stainless steel fixings, solid concrete floors and water resistant wall coatings and plasters.

7.1.10 EPL will subscribe to the Environment Agency's Flood Alert Service in the area.

7.1.11 As a precaution, flood resilience measures will be incorporated into the Proposed Development to minimise the amount of damage and reduce the recovery time in the unlikely case of the Site becoming inundated. During construction the opportunity will be taken to adopt flood resilient design techniques for the terrestrial elements of the Proposed Development. The following resilient measures have been identified as possible options for inclusion at this site, subject to final design:

- placement of main plant and flood sensitive equipment above the River Aire 1 in 100 year flood level plus an allowance for climate change (7.65 mAOD);
- finished floor level raised 300 mm above adjacent ground levels, where possible;
- adequate containment of storage areas to ensure material does not wash away and cause pollution;
- flood proofing including the use of flood resistant building materials, use of water resistant coatings, use of galvanised and stainless steel fixings and raising electrical sockets and switches;
- implementation of a Surface Water Management Strategy; and
- oil interceptors will be based on guidance within PPG3 (Environment Agency) and are likely to be Class 1 Full Retention systems.

7.1.12 During the operational phase of the Proposed Development, the Proposed Power Plant Site will be operational and manned 24 hours, 7 days per week. Although the Proposed Power Plant Site is at low risk of flooding, a system will be put in place to safeguard the workers at the Site including;

- inclusion in the existing coal-fired power station's emergency response procedures including the recommendation of at least one Flood Warden for the Proposed Power Plant Site; and
- as a precaution, the AGI, located in Flood Zone 2, should not be visited for maintenance work when a flood warning is in effect on the River Aire.

Decommissioning

7.1.13 A detailed Decommissioning Environmental Management Plan will be prepared to identify required measures to prevent pollution during this phase of the development, based on the detailed decommissioning plan.

7.1.14 The mitigation measures for decommissioning will be similar to those identified above for construction.

7.1.15 During the decommissioning phase all watercourse crossings and the gas pipeline will be left in situ; however, all connections and access points will be sealed.

8.0 SURFACE WATER MANAGEMENT

8.1 Introduction

8.1.1 The NPPF states developments should not increase the risk of flooding to the site and elsewhere. Accordingly, it is necessary to assess the surface water runoff for the existing site and compare this with the post development scenario.

8.1.2 The majority of surface water runoff generated within the existing coal-fired power station site is currently collected, passed through three oil interceptors and used for pumping ash slurry to Gale Common ash lagoons to the south of the M62. When the existing coal-fired power station ceases to operate, there will be no requirement for water to create ash slurry and an alternative strategy is to be implemented for the management of surface water runoff.

8.1.3 An Outline Drainage Strategy for the construction and operational phases of the Proposed Development has been prepared (Annex 5). The Outline Drainage Strategy has been broken down spatially with the Proposed Power Plant Site and the Proposed Construction Laydown/ CCR Land considered largely independently of each other. The drainage strategy for the operational phase is summarised below.

8.2 Proposed Drainage Strategy

8.2.1 Surface water from both the Proposed Power Plant Site and the Proposed Construction Laydown/ CCR Land is to be drained according to the hierarchy of drainage, produced as part of the PPG; which states that the preferred methods of drainage are, in order, infiltration, discharge to a watercourse, and discharge to a sewer. Sustainable drainage principles (SuDS) will also need to be applied as applicable.

8.2.2 The Proposed Power Plant Site can be effectively drained to Hensall Dyke to the south-east, via a culvert beneath and embankment surrounding this part of the Site. Discharge rates to Hensall Dyke will be limited to 1.4 l/s/ha therefore surface water attenuation storage will be required within the Site boundary. It is proposed that this be located throughout the Proposed Power Plant Site in the otherwise unused space between the buildings with a focus on the south-east of the Proposed Power Plant Site as the site topography will encourage positive drainage in this direction. Use can be made of the existing concrete channel, although converting this to a grassed swale may offer a better long term solution. Infiltration drainage may also be viable and this would reduce the required storage volume.

8.2.3 The Proposed Construction Laydown/ CCR Land is constrained by a lack of existing drainage, a requirement for open space and a likelihood of heavy loads. An attenuation or infiltration SuDS asset is proposed in the south-eastern corner of the Proposed Construction Laydown area. This will prevent material storage and on-site work in this area. This area could also drain out of the Site to the south to Hensall Dyke. Infiltration drainage may also be viable and this would reduce the volume of storage required.

8.2.4 Although the discharge of surface water to Hensall Dyke has been agreed in principle with Danvm Drainage Commissioners, if for any reason a consent to discharge of surface water runoff to Hensall Dyke is not granted, the alternative solution would be to discharge surface water to the River Aire with the cooling water discharge.

8.2.5 Separate drainage networks are recommended for the roof and hardstanding areas such that roof water is not passed through an oil interceptor. The two networks will combine prior to discharge to the proposed outfall.

8.2.6 Design of the surface water network will be based on the following design rainfall return periods and criteria:

- discharge from the Site into any of the local watercourses is to be limited to greenfield runoff rates. SDC identify this to be 1.4 l/s/ha (SDC Planning Committee, (2016)) and this is the discharge rate required by the local IBD;
- no surcharging of the network for a 1 in 2 year return period. Peak discharge rate restricted to equivalent greenfield rate (BS EN 752:2008 Table NA.6 / Sewers for Adoption, site gradient <1%);
- no flooding of the network for a 1 in 30 year return period. Peak discharge rate restricted to equivalent greenfield rate (BS EN 752:2008 Cl. NA.4.1.2/ Sewers for Adoption); and
- no flooding off site for a 1 in 100 year return period. Peak discharge rate restricted to equivalent greenfield rate. Any flooding to be assessed to determine overland flow routes.

8.2.7 The Site will be assessed during detailed design to consider the risk posed by any flooding up to and beyond the 1% AEP. Any flooding shall be diverted away from critical infrastructure or access routes and retained on the Site wherever possible.

8.3 Surface Water Storage Volumes

8.3.1 As part of the drainage strategy, provisional storage volume requirements for the Proposed Development have been calculated.

8.3.2 The proposed network will be designed to limit the discharge to the receiving water body to the existing greenfield run-off rates for a 3.33% AEP storm event. A passive flow control device such as an orifice plate or vortex flow control is anticipated.

8.3.3 As set out in Annex 5, based on the preliminary proposed catchment areas and allowable discharge rates, an attenuation storage volume was estimated, based on a 3.33% AEP storm event with a 30% climate change allowance, in Microdrainage Windes using the Quick Storage Estimate function. The required storage volumes for each site, allowing for a 30% increase for climate change and, as a worst case scenario, no infiltration, are shown in Table 8.1 below.

Table 8.1: Estimated minimum and maximum storage attenuation volumes

Site	Impermeable area (ha)	Greenfield runoff rate (l/s) based on 1.4 l/s/ha	Minimum volume (m^3)	Maximum volume (m^3)
Proposed Power Plant Site	33	46.2	13,700	19,300
Proposed Construction Laydown/ CCR Land	8	11.2	5,500	7,200

8.3.4 Attenuation storage will be provided via a combination of above and below ground techniques including, underground storage tanks and oversized pipes, attenuation ponds, and swales. Alternative source control methods will be explored during detailed design to reduce and distribute the attenuation requirement.

8.3.5 The surface water drainage design will be subject to further assessment (detailed design stage), which will be undertaken after the granting of Development Consent.

8.4 Pollution Prevention and Control

8.4.1 The design of oil interceptors shall be based on the guidance contained in PPG3 (EA, year unknown). Based on the Site use and proposed receiving water body, these will be Class 1 Full Retention systems. Provision shall be made where appropriate to prevent silt and debris from entering the drainage system in accordance with Building Regulations 2010.

8.4.2 Foul flows and effluent arising from the Proposed Development operation will be kept separate from the surface drainage network and managed through the installation Environmental Permit. Measures will be taken to ensure accidental flows such as fuel/ chemical spillages and fire control do not enter the surface water network. Such measures may include isolation points such as penstocks, or source control measures such as booms or absorbent systems.

8.4.3 During construction, the Contractor will adhere to EA pollution prevention guidelines, for example by locating stockpiles and storage areas in Flood Zone 1 wherever possible to reduce the risk of pollution in the event of flooding on Site.

9.0 OFF-SITE IMPACTS AND RESIDUAL RISK

9.1 Off-Site Impacts

9.1.1 Flood flow paths to the northern section of the Site will be maintained throughout construction, operation and decommissioning of the Proposed Development.

9.1.2 The use of cofferdams within the channel of the River Aire (to enable 'dry working' for the upgrading and/ or replacement of the cooling water abstraction and discharge infrastructure) has the potential to temporarily increase flood risk to the local area upstream of the works by temporarily reducing channel capacity.

9.1.3 It is currently proposed that the use of cofferdams at the abstraction point will be restricted to two periods of approximately three months with approximately six months intervening period (rather than leaving the cofferdam in place approximately 12 months). This will significantly reduce the time that channel capacities will be reduced, minimising potential impacts on increased water levels as a result.

9.1.4 For practical reasons, the use of cofferdams is also most likely to occur during the summer months when the probability of a high return period flood event occurring is low.

9.1.5 It is likely that any impact on flood water levels would occur during lower return period flood events when the water levels remain in bank and therefore would not increase flooding to the local area. Should water levels increase to the point that the cofferdam is overtopped the decrease in channel capacity is not considered an issue as the extent of the functional floodplain is such that it is unlikely flood levels would be affected by the use of cofferdams.

9.1.6 Further work will be undertaken during the detailed design phase when further details of the cofferdam installations (design, timing etc.) are known, in order to design and use the cofferdams in such a way that the impacts on flood risk off-site will be minimal over the short time periods the cofferdams are in use.

9.1.7 The majority of surface water currently generated on the existing coal-fired power station site is used to transport PFA to Gale Common via a pumped rising main and is thus removed from the existing coal-fired power station site. Following development of the Proposed Development, this will no longer occur and surface water will be managed on site with discharge to Hensall Dyke (or the River Aire if necessary). This would result in an increase in surface water entering the watercourse when compared to the existing scenario however; conversely, this method would re-instate historic methods of surface water drainage present from before the existing coal-fired power station was built.

9.1.8 The outline drainage strategy (outlined in Section 8) provides storage for up to and including the 3.33% AEP storm event with a minimum 30% allowance for climate change. Surface water from return period events up to and including the 1% AEP storm would be managed on site to ensure that the Proposed Development will not increase flood risk elsewhere.

9.1.9 Surface water will be attenuated on-site before discharging at greenfield runoff rate to Hensall Dyke (or the River Aire if necessary). Detailed design will be undertaken in consultation with the EA and the IDB to ensure that flood risk will not increase along the watercourse.

9.1.10 It is considered that the Proposed Development will result in minimal off-site impacts. Consultation with the EA and IDB will be undertaken to seek confirmation of this.

9.2 Residual Risk

9.2.1 Exceedance of design events for fluvial/ tidal associated flood risk is always possible at the site and to the surrounding area. However, the mitigation methods outlined in Section 7 should ensure that the development and workforce remains safe.

9.2.2 Failure, blockage and exceedance of design events for the drainage system are a potential risk to the Proposed Development and the surrounding area. Regular maintenance of the drainage system should be undertaken to ensure that the system continues to perform as designed.

9.2.3 An appropriate 'body' to adopt the SuDS features once operational will need to be identified. It will be the responsibility of the 'SuDS adoption body' to make sure that the SuDS features are regularly inspected and maintained to ensure their design standard is not compromised over the lifetime of the Proposed Development.

9.2.4 There also remains the risk of surface water flooding in the event of a storm in excess of the 'design storm'. To manage the risk from exceedance flows, the drainage design will follow CIRIA C635 (CIRIA, 2006) to provide flow paths such that any overland flow is directed away from impacting any surrounding development.

10.0 CONCLUSION

10.1.1 The conclusions regarding flood risk to and from the Proposed Development are summarised below.

- The Proposed Power Plant Site, CCR Land and the southern area of the Proposed Construction Laydown area is located in Flood Zone 1 and is deemed at low risk of flooding from fluvial/ tidal sources.
- The Proposed Gas Connection corridor is located predominantly in Flood Zones 3a and 3b and is therefore deemed at high risk of flooding from fluvial/ tidal sources (but only below-ground infrastructure will be installed in these areas, so potential impacts relate to construction only).
- The northern part of the Proposed Construction Laydown area is also located in Flood Zone 3 and is therefore at high risk of flooding from fluvial/ tidal sources.
- The proposed works represent 'Essential Infrastructure' and are therefore appropriate to Flood Zones 3a and 3b subject to satisfying the Exception Test.
- The proposed works satisfy the two parts of the Exception Test; they will have wider sustainability benefits for the local community and will also be safe, taking account of the vulnerability of users and will not increase the risk of flooding.
- The site is located in the vicinity of a number of watercourses and drainage ditches managed by the Selby IDB and Danvm Drainage Commission. It is considered that flood risk to the study area from these watercourse drainage catchments is low. During high return period storm events, the predominant flood risk to the area is from the River Aire.
- The impact of climate change is unlikely to increase the extent of fluvial/ tidal flooding to the north of the existing coal-fired power station site, however, flood depths are likely to increase. It is recommended that the 8 mAOD contour that runs through the northern section of the existing coal-fired power station site is retained to contain flood water to areas considered to flood under the existing scenario;
- The EA's map showing the risk of flooding from reservoirs in the event of a failure identifies the majority of the Site is located within an area identified as being at risk. Reservoir flooding is extremely unlikely to happen. All large reservoirs must be inspected and supervised by reservoir panel engineers on a yearly basis. For this reason the risk of flooding from reservoirs to the site is considered to be low.
- The risk of flooding from the Selby Canal and the Aire and Calder Navigation is considered to be low.
- The risk of flooding from groundwater and sewer sources is considered to be low.
- The proposed works involve new crossings of the River Aire, Ings and Tetherings Drain and other smaller local watercourses. Formal consent is required from the EA for any development adjacent to or within a watercourse, from the relevant IDB for works located within the IDB byelaw distance and from the MMO for works in the tidal part of the river.
- As a precaution, flood resilience and resistance measures for managing the residual flood risk to the Proposed Development will be adopted. For example, placement of main plant and flood sensitive equipment above the River Aire 1 in 100 year flood level plus an allowance for climate change (7.65 mAOD); finished floor level raised 300 mm above adjacent ground levels where possible; adequate containment of storage areas to ensure material does not wash away and cause pollution etc.

- EPL will subscribe to the EA's FWD Service and a Flood Risk Management Action Plan/ Method Statement will be created for the Site for the construction phase. The plan will detail the procedures for site occupants to undertake in the event that a flood warning is issued, including the details of appropriate evacuation routes from the Site.
- In order to comply with the requirements of the local, regional and national planning policy, the surface water runoff from the Proposed Development will be restricted to approximately 1.4 l/s/ha (the existing greenfield runoff rate) for all storm events up to and including the 33.3% AEP event with a 30% allowance for climate change.
- To meet this requirement the Proposed Development requires an attenuation volume of between approximately 25,400 m^3 and 34,600 m^3. This volume will accommodate surface water runoff for a 33.3% AEP storm event with a 30% allowance for climate change.
- Surface water generated by higher return period storms, up to and including the 1% AEP with a 30% allowance for climate change, will be retained and managed within the site boundary.
- It is likely surface water attenuation will be provided by a combination of underground tanks, oversized pipes and above ground attenuation features. Additional SuDS measures suitable for the facility will be assessed at the detailed drainage design stage.
- Surface water runoff from the Proposed Power Plant Site is proposed to discharge to Hensall Dyke (or the River Aire if necessary). Located to the south-east of the Proposed Power Plant Site, it is considered this strategy will restore the previous historical drainage path present from before the existing coal-fired power station was constructed.
- Further works at the detailed design phase undertaken in consultation with the local IDB will ensure the proposed surface water discharge, previously used to transport PFA to Gale Common, will not increase flood risk downstream of the Site;
- It is considered that any off site impacts as a result of the Proposed Development (predominantly as a consequence of the temporary use of cofferdams within the River Aire channel) in relation to flood risk will be minimal and restricted to the construction period only.

10.1.2 This FRA serves to demonstrate that the Proposed Development will remain safe during its lifetime and will not increase flood risk elsewhere and is, therefore, considered to be acceptable in flood risk terms.

11.0 REFERENCES

CIRIA (2006) *Designing for Exceedance in Urban Drainage – Good Practice (C635)*, May 2006

Department for Communities and Local Government (DCLG) (2012) *National Planning Policy Framework*. The National Archives. London.

DCLG (2014) *Planning Practice Guidance – Flood Zone and Flood Risk Tables* [Online] Available from: http://planningguidance.communities.gov.uk/blog/guidance/flood-risk-and-coastal-change/flood-zone-and-flood-risk-tables/table-1-flood-zones/ [Accessed 29/07/16].

DECC (2011a) *Overarching National Policy Statement (NPS) for Energy: EN-1.* The Stationery Office, London.

DECC (2011b) *National Policy Statement for Fossil Fuel Generating Infrastructure: EN-2.* The Stationary Office, London.

DECC (2011c) *National Policy Statement for Gas Supply Infrastructure and Gas and Oil Pipelines: EN-4.* The Stationary Office, London.

DECC (2011d) *National Policy Statement for Electricity Networks Infrastructure EN-5.* The Stationary Office, London.

Environment Agency (unknown) *Pollution Prevention Guidelines 3 Use and Design of Oil Separators in Surface Water Drainage Systems*

Environment Agency (2016b) *Groundwater source protection zones* [Online] Available from: http://apps.environment-agency.gov.uk/wiyby/37833.aspx [Accessed 19/07/16].

Environment Agency (2016c) *What's in Your Backyard?* [Online] Available from: http://apps.environment-agency.gov.uk/wiyby/ [Accessed 29/07/16].

Environment Agency (2016) *Environment Agency Interactive Maps*. . [Accessed November 2016]. Available from https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances

European Commission (2009) EU Carbon Capture Storage (CCS) Directive 2009/31/EC.

Exploration Associates (2001) Eggborough Power Station FGD – Factual Report on Ground Investigation. December 2001.

Geosyntec (2016) Eggborough Power Station Site Protection and Monitoring Programme – Annual Report 2015. 4th January 2016.

HM Government (2010) *The Building Regulations 2010 Approved Document H Drainage and Waste Disposal (Part H3) 2002 edition incorporating 2010 amendments*

North Yorkshire County Council (NYCC) (1997) *North Yorkshire Minerals Local Plan*.

NYCC (2006) *North Yorkshire Waste Local Plan*.

Selby District Council (2005) *Selby District Local Plan.*

Selby District Council (2013) *Selby District Core Strategy Local Plan.*

Selby District Council Planning Committee (2016) Agenda Item 7.3 Proposal for demolition of existing dwelling and erection of a new dwelling, section 2.19 recommendation 06. Minutes of Selby District Council Planning Committee meeting, 8th June 2016, Council Chamber, Selby

Strata Surveys Limited (2012) Ground Investigation Report - Factual Report on a Ground Investigation at Eggborough Power Station, Pontefract. 8th August 2012

ANNEX 1: FIGURES

N

The Site

LEGEND

DCO Application Site

2 0 2 4 6 8 10 km

Project Title: EGGBOROUGH CCGT DCO	Client: EGGBOROUGH POWER LTD	AECOM Scott House Alençon Link, Basingstoke Hampshire, RG21 7PP Telephone (01256) 310200 Fax (01256) 310201 www.aecom.com
Drawing Title: SITE LOCATION PLAN	Drawn: JW; Checked: AK; Approved: AC Date: 11/05/2017; Scale @ A3: 1:200,000; Purpose of Issue: Environmental Statement	
	Drawing Number: FIGURE 1.1; Rev: 01	

File Name:\\ba-wip-004\4400 - Management Services\5004 - Information Systems\60506766_Eggborough_CCGT_DCO\02_Maps\DCO Application\General Figures\Figure 1_1_Site_Location_Plan.mxd

N

Fir Tree Farm
Landing Road
Tunnel Wood
Gateforth Landing
Burn Hall Farm
Top House Farm
Hollins Farm
Brick Kiln Lane
Tom's Wood
Lund Tunnel
West Lane
Gateforth Grange
Paperhouse Lane (Track)
Paper House Farm
Blossom Hill
Burn Lane
Burn Lodge Farm
Burn Lane Farm
Stocking Green Farm
Sewage Works
ESEY CP
Lodge Farm
Bankside Farm
Bridge Farm
West Haddlesey
PO
Sch
Lock
Pipe Line
Croft Farm
Fox Lane
MS
Chapel Haddlesey
CHAPEL HADDLESEY CP
Ings Lane (Track)
West Haddlesey Ings
Weir
NTL
Lock (dis)
River Aire
Haddlesey Manor
East View
East Haddlesey
Eastfield House Farm
Temple Drain
Chapel Haddlesey Ings
Roall Ings
Old Hee
Goose Holmes
Hall Garths
Goose Hill Reach
Long Marsh
Roall Hall
A19
Eggborough Ings
Temple Manor
Roall Manor Farm
Roall Lane
Temple Reach
The Holmes
NGTON CP
Pit (dis)
Works
Ings Lane
Hensall
Ings and Tetherings Drain
Sea Bank
Tranmore Farm
Sewage Works
Eggborough Power Station
Gallows Hill
HENSALL CP
Beck Drain
Myrtle Grange Farm
Hut Green
Works
Hensall
Manor Farm
Sand Pit
Crow Wood
Weeland Road
Springfield
Pit (dis)
West Common

200 0 200 400 600 800 1000 m

LEGEND

DCO Application Site

Project Title: EGGBOROUGH CCGT DCO	Client: EGGBOROUGH POWER LTD		AECOM Scott House Alençon Link, Basingstoke Hampshire, RG21 7PP Telephone (01256) 310200 Fax (01256) 310201 www.aecom.com
Drawing Title: THE SITE BOUNDARY	Drawn: JW	Checked: AK	Approved: AC
	Date: 11/05/2017	Scale @ A3: 1:15,000	Purpose of Issue: Environmental Statement
	Drawing Number: FIGURE 3.1		Rev: 01

File Name:\\ba-wip-004\4400 - Management Services\5004 - Information Systems\60506766_Eggborough_CCGT_DCO\02_Maps\DCO Application\General Figures\Figure 3_1_The_Site_Boundary.mxd

Proposed AGI
West Lane Access
Burn Lodge Farm Access (Construction Only)
Whitings Lane Access
Fox Lane Access
Cooling Water Abstraction Point
Existing Access to Cooling Water Abstraction Point
Millfield Road Access
Cooling Water Discharge Point
Existing Wand Lane Access
Additional Wand Lane Access (Construction Only)
Existing National Grid Sub Station
Existing Main Entrance (dis)
Existing Hensall Gate Entrance
Existing Tranmore Lane Entrance
Existing Access to Hensall Dyke Surface Water Discharge Point

HADDLESEY CP
CHAPEL HADDLESEY CP
KELLINGTON CP
HENSALL

Tom's Wood
Lund Tunnel
West Lane
Top House Farm
Hollins Farm
Brick Kiln Lane
Gateforth Grange
Paper House Farm
Paperhouse Lane (Track)
Royd's Road
Burn Lodge Farm
Blossom Hill
Lodge Farm
Fox Lane
West Haddlesey
Bankside Farm
Bridge Farm
Pipe Line
Lock
Marsh Lane
Ings Lane (Track)
West Haddlesey Ings
Croft Farm
Chapel Haddlesey
Weir
River Aire
Haddlesey Manor
East Haddlesey
East View
Hall Garths
Chapel Haddlesey Ings
Roall Ings
Old Hee
Goose Holmes
Long Marsh
Goose Hill Reach
Roall Hall
Roall Plantation
Roall Manor Farm
Roall Lane
Eggborough Ings
Temple Reach
Ings Lane
Tranmore Farm
Eggborough Power Station
Sewage Works
Gallows Hill
Beck Drain
Works
Crow Wood
Weeland Road
Springfield Farm
Mount Pleasant Farm
Pit (dis)
West Common
Hensall
Manor Farm
Pits (dis)

N

200 0 200 400 600 800 1000 m

LEGEND

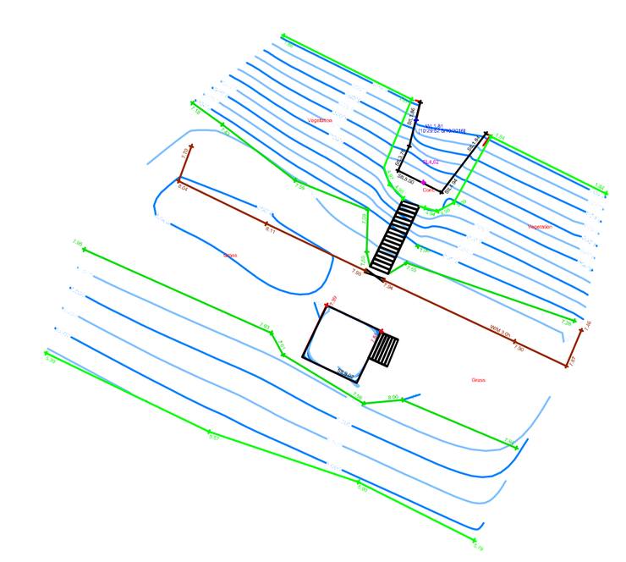
- DCO Application Site
- Cooling Water Abstraction and Discharge Points
- Potential Access Point
- Proposed Electricity Connection
- Proposed Borehole and Towns Main Water Connections
- Proposed Carbon Capture Readiness (CCR) Land
- Proposed Construction Laydown
- Proposed Cooling Water Connections
- Proposed Gas Connection and AGI
- Proposed Power Plant Site
- Proposed Rail and Access Works
- Proposed Surface Water Discharge Connection
- Retained Landscaping Area

Project Title	EGGBOROUGH CCGT DCO
Drawing Title	PARTS OF THE SITE
Client	EGGBOROUGH POWER LTD
Drawn	JW
Checked	AK
Approved	KC
Date	18/05/2017
Scale @ A3	1:15,000
Purpose of Issue	Environmental Statement
Drawing Number	FIGURE 3.2
Rev	01

AECOM
Scott House
Alençon Link, Basingstoke
Hampshire, RG21 7PP
Telephone (01256) 310200
Fax (01256) 310201
www.aecom.com

File Name:K:\5004 - Information Systems\60506766_Eggborough_CCGT_DCO\02_Maps\DCO Application\Chapter 3\Figure 3_2_Parts_of_the_Site.mxd

ANNEX 2: TOPOGRAPHIC DATA



Notes:

The Contractor is to check and verify all building and site dimensions, levels and sewer invert levels at connection points before work starts. The Contractor is to comply in all respects with current Building Legislation, British Standard Specifications, Building Regulations, Construction (Design & Management) Regulations, Party Wall Act, etc. whether or not specifically stated on this drawing. This drawing must be read with and checked against any structural, geotechnical or other specialist documentation provided.

This drawing is not intended to show details of foundations, ground conditions or ground contaminants. Each area of ground relied upon to support any structure depicted (including drainage) must be investigated by the Contractor. A suitable method of foundation should be provided allowing for existing ground conditions. Any suspect or fluid ground, contaminates on or within the ground, should be further investigated by a suitable expert. Any earthwork constructions shown indicate typical slopes for guidance only & should be further investigated by a suitable expert.

Where existing trees are to be retained they should be subject to a full Arboricultural inspection for safety. All trees are to be planted so as to ensure they are a minimum of 5 metres from buildings and 3 metres from drainage and services. A suitable method of foundation is to be provided to accommodate the proposed tree planting. All tree types are provided as a guide only and a full Arboricultural survey to be conducted to determine the exact tree types should be completed.

Sketch proposals are for illustrative purposes only & as such are subject to detailed site investigation including ground conditions/contaminants, drainage, design & planning/density negotiations. Sketch proposals may be based upon enlargements of OS sheets & visual estimations of existing site features, accuracy will therefore need to be verified by survey. Sketch proposals have not been considered in respect of CDM Regulations.

Survey carried out to client specification and in accordance with RICS publication:
SURVEYS OF LAND , BUILDING & UTILITY SERVICES AT SCALES 1:500 & LARGER, 3rd EDITION.

Utility Services Location Note:

This survey has been carried out using a combination of observation and detection using electrolocation and ground probing radar equipment. Connections between reference points such as manholes are assumed to be straight unless bends are indicated. The accuracy is limited to the tolerances normally expected from the equipment used.

The following indications of completeness and accuracy are for guidance only:

In areas where there is a large concentration of services, the completeness will be between 80% and 90%. This will be reduced where there are obstructions at ground level.

Positional accuracy will vary with depth and pipe / duct material; an accuracy of +/- 150 mm is achievable in normal circumstances but this will be reduced for plastic pipes.

Existing information from historical plans is likely to be unreliable and is shown for guidance only.

Excavations in the area should be carried out with care and in accordance with HSG 47. No absolute guarantee of accuracy should be inferred from these plans.

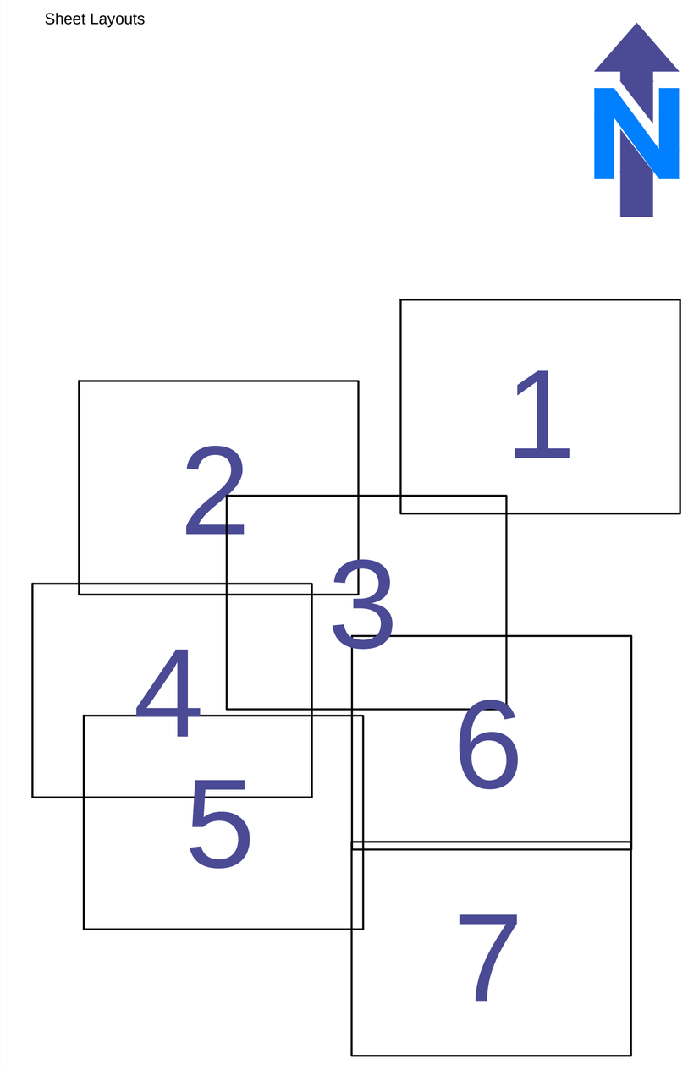
The following text is an extract from Surveys of Land, Buildings and Utility Surveys at scales of 1:500 and Larger, 3rd Edition

"Electronic tracing is a reliable, method of locating buried services. ***On Heavy, built up sites 85% completeness is probably all that can be expected.*** *Plan accuracies of +/- 150mm may be achieved but this figure will depend on the depth of the service below ground level.* ***Where similar services run in close proximity, separation may be impossible. Successful tracing of non-metallic pipes may be limited.*** *Existing record information showing underground services is often incomplete and of doubtful accuracy. It should be regarded only as an indication and cannot be guaranteed"*

Standard Abbreviations

ACO	LINEAR DRAINAGE CHANNEL	GP	GUIDE POST	Shlt	SHELTER
AV	AIR VALVE	GPR	GROUND PROBING RADAR	Si	SPUN IRON
A/R	ASSUMED ROUTE	Grl	GRILLE COVER	SL	SOFFIT LEVEL
BB	BELISH BEACON	GV	GAS VALVE COVER	Slt	SILT LEVEL
BdL	BED LEVEL	Hrl	HAND RAIL	SMP	SETTLEMENT MONITORING Pnt
BH	BOREHOLE	IC	INSPECTION COVER	SP	SIGN POST
Bol	BOLLARD	IL	INVERT LEVEL	SPt	SAMPLING POINT
BP	BOUNDARY POST	I/R	IRON RAILING FENCE	SS	STRUCTURE POINT
B Pvg	BLOCK PAVING	KO	KERB OUTLET	ST	STAND PIPE / SUPPLY TAP
BRck	BICYCLE RACK	Lby	LIFEBUOY	Sti	STILE
BS	BUS STOP	Lck	LOCK GATE	STL	STRUCTURE TOP LEVEL
BT	BRITISH TELECOM COVER	Ldr	LADDER	Stone Pvg	STONE PAVING SLABS
BW	BRICK WALL	LOR	LOSS OF REFLECTION (gpr)	STP	STAND PIPE
BWF	BARBED WIRE FENCE	LOS	LOSS OF SIGNAL (eml)	StPO	STAY POST
CAP	CABLE WINDING MACHINE	LP	LAMP POST	Stu	STUMP
Cat	CATENARY LEVEL	Mcy	MACHINERY	StW	STAYWIRE
CATV	CABLE TV COVER	MH	MANHOLE	SV	STOP VALVE
CB	CONTROL BOX	MgP	MOORING POST	SW	STONE WALL
C/B	CLOSE BOARDED FENCE	Mkr	MARKER POST	Tac	TACTILE PAVING
CD	CHAMBER DEPTH	MP	MILE POST	TBM	TEMPORARY BENCH MARK
Cgd	CATTLE GRID	MS	MILESTONE	TBol	BOLLARD (Dept' Transport)
Ci	CAST IRON	MU	ELECTRIC MOTOR	TCB	TELEPHONE CALL BOX
CIP	CABLE INLET POINT	NP	NAME PLATE	TCP	TELEPHONE CALL POST
CL	COVER LEVEL	OSA	OUTSIDE SURVEY AREA	TEL	TELECOM COVER
C/L	CHAIN LINK FENCE	OSBM	OS BENCH MARK	ThL	THRESHOLD LEVEL
Conc	CONCRETE	OGC	OVERGROUND CONDUIT	TL	TRAFFIC SIGNAL POST
Conc Pvg	CONCRETE PAVING	OHca	OVERHEAD CABLE Unidentified	TM	TICKET MACHINE
CP	CATCHPIT	OHC	OVERHEAD CONDUIT	ToV	TOP OF VALVE LEVEL
CpL	COPING LEVEL	OHE	OVERHEAD ELECTRIC	TP	TELEGRAPH POLE
Cpsn	CAPSTAN	OHG	OVERHEAD GANTRY	Tpt	TRIAL PIT
CR	CRANE / HOIST	OHStruct	OVERHEAD STRUCTURE	Tr	TROUGH
Cul	CULVERT	OHT	OVERHEAD TELECOMS	UTL	UNABLE TO LOCATE
CW	CONCRETE WALL	P	POST	UTR	UNABLE TO RAISE
Di	DUCTILE IRON	PB	POST BOX	UTS	UNABLE TO SURVEY
(dilap)	DILAPIDATED	PC	SECURITY CAMERA	UTT	UNABLE TO TRACE (utilities)
(dis)	DISUSED	Pcg	PEDESTRIAN CROSSING	VC	VITRIFIED CLAY
DPC	DAMP PROOF COURSE	P/F	PANEL FENCE	VDP	VEHICLE DETECTION PAD
DS	DIRECTION SIGN	PP	PETROL PUMP	VP	VENT PIPE
DSW	DRYSTONE WALL	P/R	POST & RAIL FENCE	VW	VALVE WHEEL
EIC	ELECTRICITY COVER	Psk	PENSTOCK	WB	WEIGH BRIDGE
EL	EAVES LEVEL	PV	VERTICAL PIPE	WG	WATER GAUGE
EOT	END OF TRACE (utility)	Pyl	PYLON	WL	WATER LEVEL
EP	ELECTRICITY POLE	PZ	PIEZOMETER	WM	WATER METER
ER	EARTH ROD	RE	RODDING EYE	W/M	WIRE MESH FENCE
ESP	ELECTRICITY SUPPLY POINT	RG	RAIN GAUGE	WO	WASHOUT COVER
ESW	ELECTRICITY SWITCH BOX	RL	RIDGE LEVEL	WS	WIND SOCK POLE
FB	FOOTBRIDGE	RMP	RESRVOIR MONITORING Pnt	WSR	WATER LEVEL SENSOR
FL	FLOOR LEVEL	RP	REFLECTOR POST		
FFL	FINISHED FLOOR LEVEL	RS	ROAD SIGN		
Flgt	FLOOR LIGHT	RSP	RAILWAY SIGNAL POST		
FH	FIRE HYDRANT	RW	RETAINING WALL		
FS	FLAG STAFF	RWP	RAN WATER PIPE		
G	GULLY	Sap	SAPLING		
GIS	GAS INLET POINT	SB	SIGN BOARD		

Sheet Layouts



Grid:
National Grid
By GPS Observations
to the OS Active Network
OSTN15

Datum:
Ordnance Datum
By GPS Observations
to the OS Active Network
OSGM15

Revision:	Amendments:	Date:	Name:
-	-	-	-
-	-	-	-
-	-	-	-
A	ORIGINAL ISSUE	Oct'16	DS

RPS

THE SURVEY ASSOCIATION
AFFILIATE MEMBER

Stafford - Clevedon - Irlam - Warrington - Edinburgh
T: 0800 917 8227 E: rps.survey@rpsgroup.com www.rpsgroup.com
Red Deer House, Dunston Business Village, Stafford Road, Dunston, Staffordshire, ST18 9AB

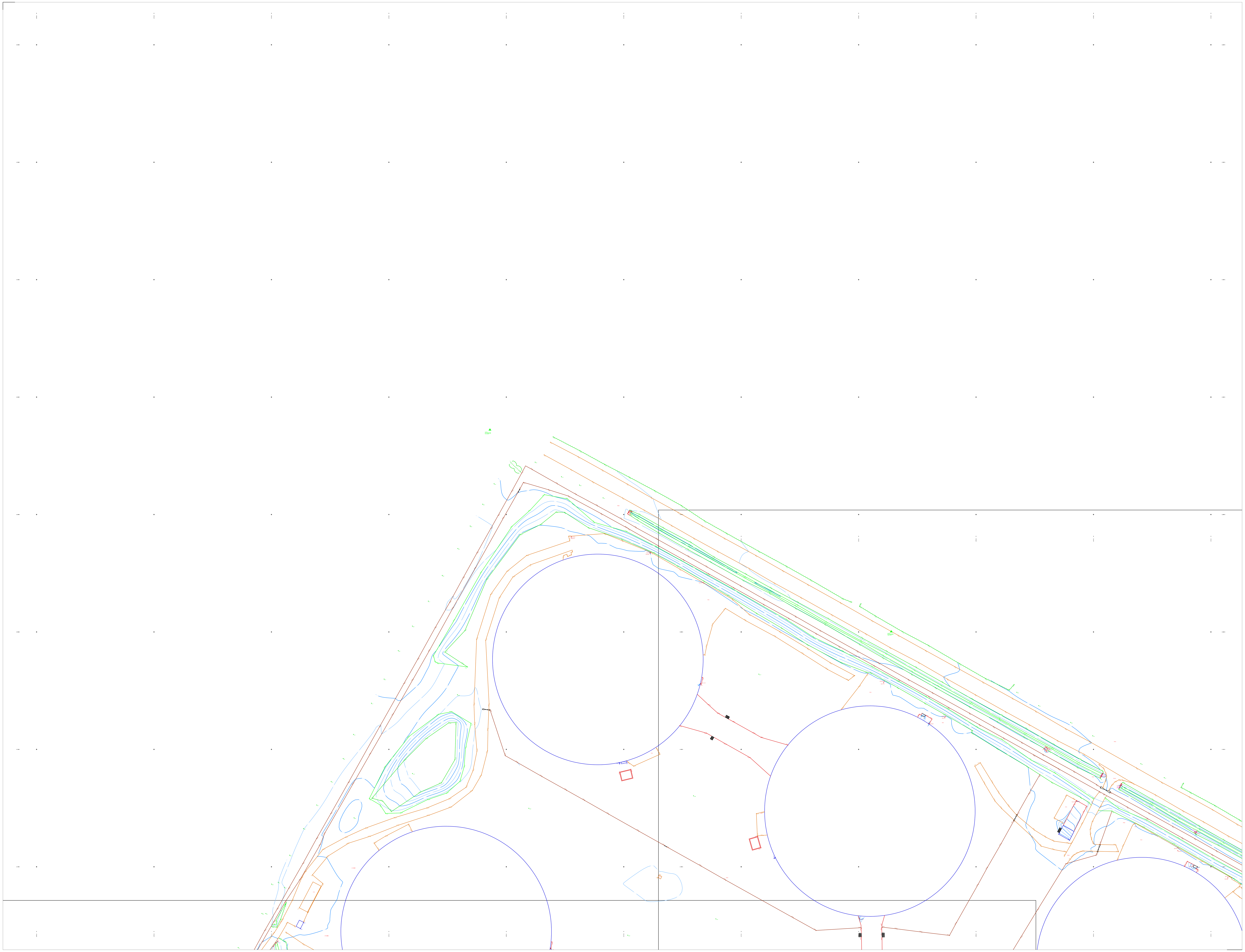
CLIENT:
RPS Planning & Development
2420 The Quadrant, Aztec West
Almondsbury
Bristol, BS32 4AQ

PROJECT:
Eggborough Power Station

TITLE:
Topographical Survey

Drawn: DS/JS	Checked: CA
Date: October 2016	Scale: 1:500 @ A0
Drg No: UAJ3274_A	Sheet: 1 of 7

GEOMATICS



Notes:

© This drawing and the building works depicted are the copyright of RPS and may not be reproduced or amended except by written permission. No liability will be accepted for amendments made by other persons.

The Contractor is to check and verify all building and site dimensions, levels and sewer invert levels at connection points before work starts. The Contractor is to comply in all respects with current Building Legislation, British Standard Specifications, Building Regulations, Construction (Design & Management) Regulations, Party Wall Act, etc. whether or not specifically stated on this drawing. This drawing must be read with and checked against any structural, geotechnical or other specialist documentation provided.

This drawing is not intended to show details of foundations, ground conditions or ground contaminants. Each area of ground relied upon to support any structure depicted (including drainage) must be investigated by the Contractor. A suitable method of foundation should be provided allowing for existing ground conditions. Any suspect or fluid ground, contaminates on or within the ground, should be further investigated by a suitable expert. Any earthwork constructions shown indicate typical slopes for guidance only & should be further investigated by a suitable expert.

Where existing trees are to be retained they should be subject to a full Arboricultural inspection for safety. All trees are to be planted so as to ensure they are a minimum of 5 metres from buildings and 3 metres from drainage and services. A suitable method of foundation is to be provided to accommodate the proposed tree planting. All tree types are provided as a guide only and a full Arboricultural survey to be conducted to determine the exact tree types should be completed.

Sketch proposals are for illustrative purposes only & as such are subject to detailed site investigation including ground conditions/contaminants, drainage, design & planning/density negotiations. Sketch proposals may be based upon enlargements of OS sheets & visual estimations of existing site features, accuracy will therefore need to be verified by survey. Sketch proposals have not been considered in respect of CDM Regulations.

Survey carried out to client specification and in accordance with RICS publication:
SURVEYS OF LAND , BUILDING & UTILITY SERVICES AT SCALES 1:500 & LARGER, 3rd EDITION.

Utility Services Location Note:

This survey has been carried out using a combination of observation and detection using electrolocation and ground probing radar equipment. Connections between reference points such as manholes are assumed to be straight unless bends are indicated. The accuracy is limited to the tolerances normally expected from the equipment used.

The following indications of completeness and accuracy are for guidance only:

In areas where there is a large concentration of services, the completeness will be between 80% and 90%. This will be reduced where there are obstructions at ground level.

Positional accuracy will vary with depth and pipe / duct material; an accuracy of +/- 150 mm is achievable in normal circumstances but this will be reduced for plastic pipes.

Existing information from historical plans is likely to be unreliable and is shown for guidance only.

Excavations in the area should be carried out with care and in accordance with HSG 47. No absolute guarantee of accuracy should be inferred from these plans.

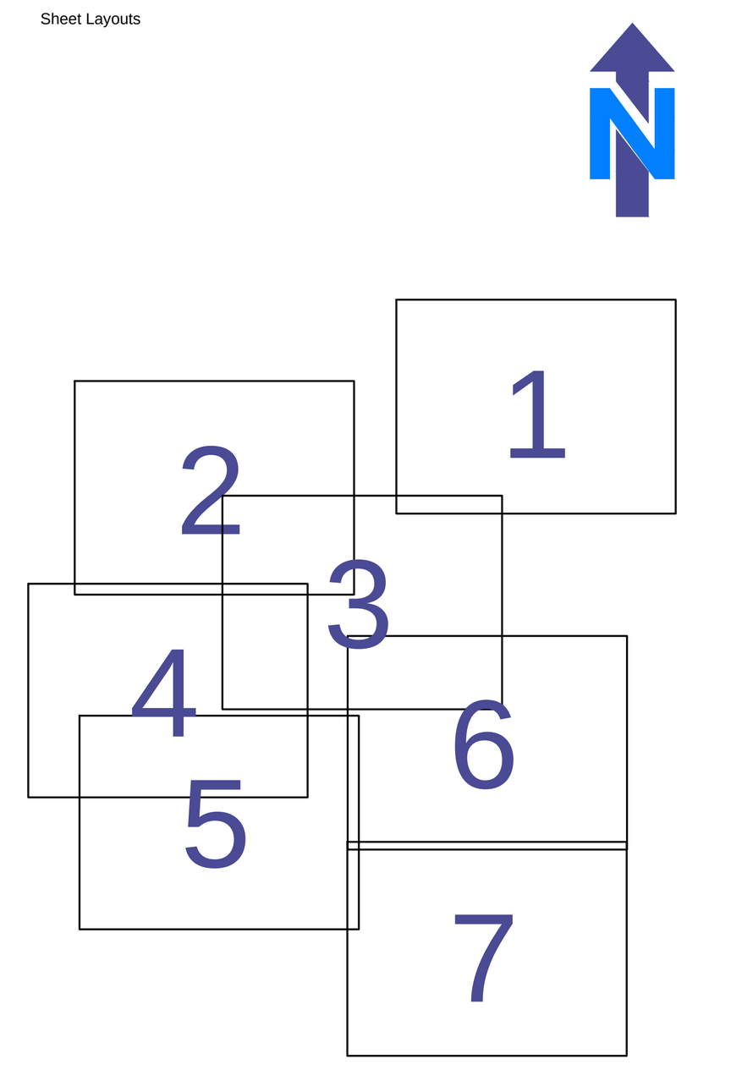
The following text is an extract from Surveys of Land, Buildings and Utility Surveys at scales of 1:500 and Larger, 3rd Edition

"Electronic tracing is a reliable, method of locating buried services. ***On Heavy, built up sites 85% completeness is probably all that can be expected.*** *Plan accuracies of +/- 150mm may be achieved but this figure will depend on the depth of the service below ground level.* ***Where similar services run in close proximity, separation may be impossible. Successful tracing of non-metallic pipes may be limited.*** *Existing record information showing underground services is often incomplete and of doubtful accuracy. It should be regarded only as an indication and cannot be guaranteed"*

Standard Abbreviations

ACO	LINEAR DRAINAGE CHANNEL	GP	GUIDE POST	Shlt	SHELTER
AV	AIR VALVE	GPR	GROUND PROBING RADAR	Si	SPUN IRON
A/R	ASSUMED ROUTE	Grl	GRILLE COVER	SL	SOFFIT LEVEL
BB	BELISH BEACON	GV	GAS VALVE COVER	Slt	SILT LEVEL
BdL	BED LEVEL	Hrl	HAND RAIL	SMP	SETTLEMENT MONITORING Pnt
BH	BOREHOLE	IC	INSPECTION COVER	SP	SIGN POST
Bol	BOLLARD	IL	INVERT LEVEL	SPt	SAMPLING POINT
BP	BOUNDARY POST	I/R	IRON RAILING FENCE	SS	STRUCTURE POINT
B Pvg	BLOCK PAVING	KO	KERB OUTLET	ST	STAND PIPE / SUPPLY TAP
BRck	BICYCLE RACK	Lby	LIFEBUOY	Sti	STILE
BS	BUS STOP	Lck	LOCK GATE	STL	STRUCTURE TOP LEVEL
BT	BRITISH TELECOM COVER	Ldr	LADDER	Stone Pvg	STONE PAVING SLABS
BW	BRICK WALL	LOR	LOSS OF REFLECTION (gpr)	STP	STAND PIPE
BWF	BARBED WIRE FENCE	LOS	LOSS OF SIGNAL (eml)	StPO	STAY POST
CAP	CABLE WINDING MACHINE	LP	LAMP POST	Stu	STUMP
Cat	CATENARY LEVEL	Mcy	MACHINERY	StW	STAYWIRE
CATV	CABLE TV COVER	MH	MANHOLE	SV	STOP VALVE
CB	CONTROL BOX	MgP	MOORING POST	SW	STONE WALL
C/B	CLOSE BOARDED FENCE	Mkr	MARKER POST	Tac	TACTILE PAVING
CD	CHAMBER DEPTH	MP	MILE POST	TBM	TEMPORARY BENCH MARK
Cgd	CATTLE GRID	MS	MILESTONE	TBol	BOLLARD (Dept' Transport)
Ci	CAST IRON	MU	ELECTRIC MOTOR	TCB	TELEPHONE CALL BOX
CIP	CABLE INLET POINT	NP	NAME PLATE	TCP	TELEPHONE CALL POST
CL	COVER LEVEL	OSA	OUTSIDE SURVEY AREA	TEL	TELECOM COVER
C/L	CHAIN LINK FENCE	OSBM	OS BENCH MARK	ThL	THRESHOLD LEVEL
Conc	CONCRETE	OGC	OVERGROUND CONDUIT	TL	TRAFFIC SIGNAL POST
Conc Pvg	CONCRETE PAVING	OHca	OVERHEAD CABLE Unidentified	TM	TICKET MACHINE
CP	CATCHPIT	OHC	OVERHEAD CONDUIT	ToV	TOP OF VALVE LEVEL
CpL	COPING LEVEL	OHE	OVERHEAD ELECTRIC	TP	TELEGRAPH POLE
Cpsn	CAPSTAN	OHG	OVERHEAD GANTRY	Tpt	TRIAL PIT
CR	CRANE / HOIST	OHStruct	OVERHEAD STRUCTURE	Tr	TROUGH
Cul	CULVERT	OHT	OVERHEAD TELECOMS	UTL	UNABLE TO LOCATE
CW	CONCRETE WALL	P	POST	UTR	UNABLE TO RAISE
Di	DUCTILE IRON	PB	POST BOX	UTS	UNABLE TO SURVEY
(dilap)	DILAPIDATED	PC	SECURITY CAMERA	UTT	UNABLE TO TRACE (utilities)
(dis)	DISUSED	Pcg	PEDESTRIAN CROSSING	VC	VITRIFIED CLAY
DPC	DAMP PROOF COURSE	P/F	PANEL FENCE	VDP	VEHICLE DETECTION PAD
DS	DIRECTION SIGN	PP	PETROL PUMP	VP	VENT PIPE
DSW	DRYSTONE WALL	P/R	POST & RAIL FENCE	VW	VALVE WHEEL
EIC	ELECTRICITY COVER	Psk	PENSTOCK	WB	WEIGH BRIDGE
EL	EAVES LEVEL	PV	VERTICAL PIPE	WG	WATER GAUGE
EOT	END OF TRACE (utility)	Pyl	PYLON	WL	WATER LEVEL
EP	ELECTRICITY POLE	PZ	PIEZOMETER	WM	WATER METER
ER	EARTH ROD	RE	RODDING EYE	W/M	WIRE MESH FENCE
ESP	ELECTRICITY SUPPLY POINT	RG	RAIN GAUGE	WO	WASHOUT COVER
ESW	ELECTRICITY SWITCH BOX	RL	RIDGE LEVEL	WS	WIND SOCK POLE
FB	FOOTBRIDGE	RMP	RESRVOIR MONITORING Pnt	WSR	WATER LEVEL SENSOR
FL	FLOOR LEVEL	RP	REFLECTOR POST		
FFL	FINISHED FLOOR LEVEL	RS	ROAD SIGN		
Flgt	FLOOR LIGHT	RSP	RAILWAY SIGNAL POST		
FH	FIRE HYDRANT	RW	RETAINING WALL		
FS	FLAG STAFF	RWP	RAN WATER PIPE		
G	GULLY	Sap	SAPLING		
GIS	GAS INLET POINT	SB	SIGN BOARD		

Sheet Layouts



Grid:	Datum:
National Grid By GPS Observations to the OS Active Network OSTN15	Ordnance Datum By GPS Observations to the OS Active Network OSGM15

Revision:	Amendments:	Date:	Name:
-	-	-	-
-	-	-	-
-	-	-	-
A	ORIGINAL ISSUE	Oct'16	DS

RPS

THE SURVEY ASSOCIATION AFFILIATE MEMBER

Stafford - Clevedon - Irlam - Warrington - Edinburgh
T: 0800 917 8227 E: rps.survey@rpsgroup.com www.rpsgroup.com
Red Deer House, Dunston Business Village, Stafford Road, Dunston, Staffordshire, ST18 9AB

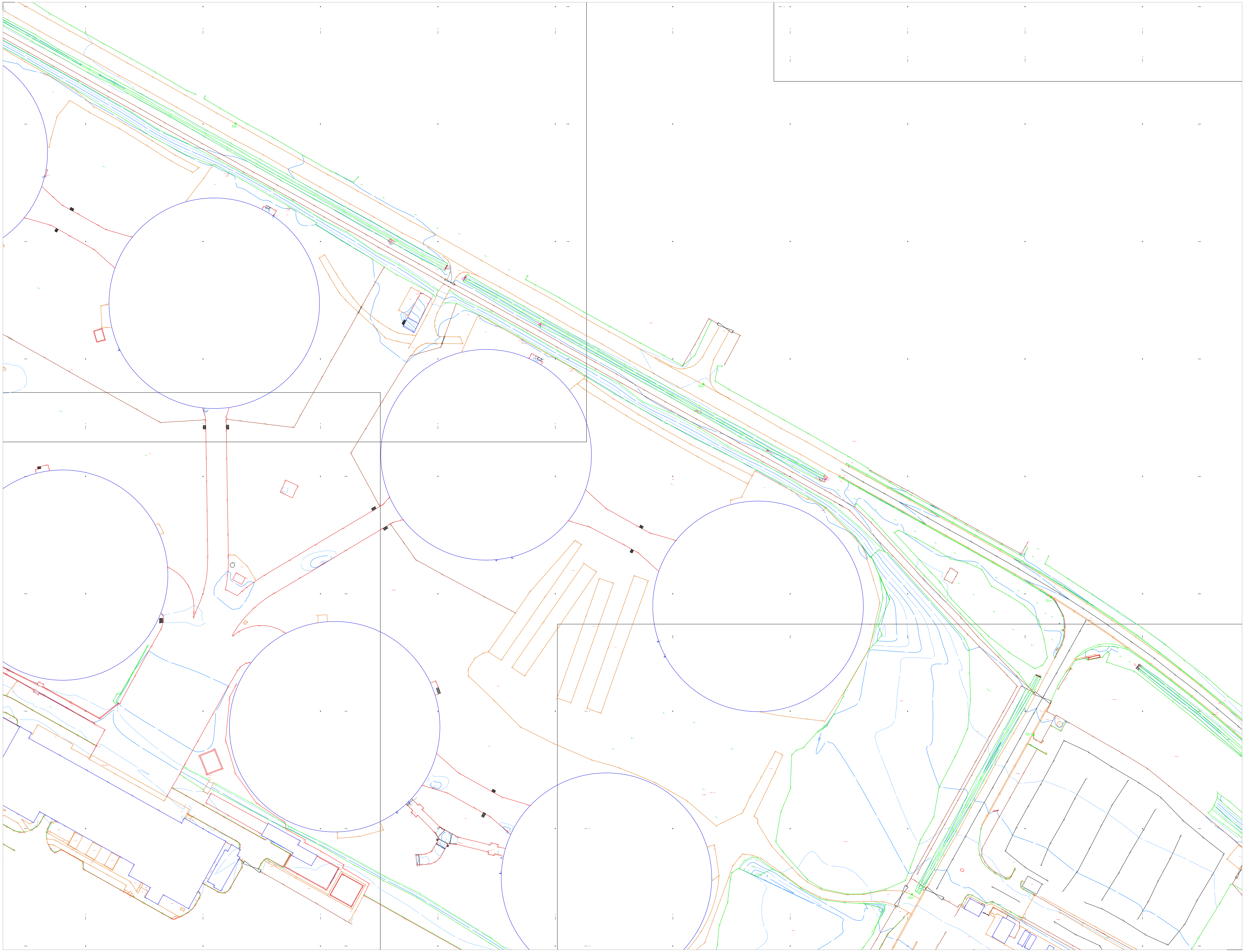
CLIENT:
RPS Planning & Development
2420 The Quadrant, Aztec West
Almondsbury
Bristol, BS32 4AQ

PROJECT:
Eggborough Power Station

TITLE:
Topographical Survey

Drawn:	DS/JS	Checked:	CA
Date:	October 2016	Scale:	1:500 @ A0
Drg No:	UAJ3274_A	Sheet:	2 of 7

GEOMATICS



Notes:

The Contractor is to check and verify all building and site dimensions, levels and sewer invert levels at connection points before work starts. The Contractor is to comply in all respects with current Building Legislation, British Standard Specifications, Building Regulations, Construction (Design & Management) Regulations, Party Wall Act, etc. whether or not specifically stated on this drawing. This drawing must be read with and checked against any structural, geotechnical or other specialist documentation provided.

This drawing is not intended to show details of foundations, ground conditions or ground contaminants. Each area of ground relied upon to support any structure depicted (including drainage) must be investigated by the Contractor. A suitable method of foundation should be provided allowing for existing ground conditions. Any suspect or fluid ground, contaminates on or within the ground, should be further investigated by a suitable expert. Any earthwork constructions shown indicate typical slopes for guidance only & should be further investigated by a suitable expert.

Where existing trees are to be retained they should be subject to a full Arboricultural inspection for safety. All trees are to be planted so as to ensure they are a minimum of 5 metres from buildings and 3 metres from drainage and services. A suitable method of foundation is to be provided to accommodate the proposed tree planting. All tree types are provided as a guide only and a full Arboricultural survey to be conducted to determine the exact tree types should be completed.

Sketch proposals are for illustrative purposes only & as such are subject to detailed site investigation including ground conditions/contaminants, drainage, design & planning/density negotiations. Sketch proposals may be based upon enlargements of OS sheets & visual estimations of existing site features, accuracy will therefore need to be verified by survey. Sketch proposals have not been considered in respect of CDM Regulations.

Survey carried out to client specification and in accordance with RICS publication:
SURVEYS OF LAND , BUILDING & UTILITY SERVICES AT SCALES 1:500 & LARGER, 3rd EDITION.

Utility Services Location Note:

This survey has been carried out using a combination of observation and detection using electrolocation and ground probing radar equipment. Connections between reference points such as manholes are assumed to be straight unless bends are indicated. The accuracy is limited to the tolerances normally expected from the equipment used.

The following indications of completeness and accuracy are for guidance only:

In areas where there is a large concentration of services, the completeness will be between 80% and 90%. This will be reduced where there are obstructions at ground level.

Positional accuracy will vary with depth and pipe / duct material; an accuracy of +/- 150 mm is achievable in normal circumstances but this will be reduced for plastic pipes.

Existing information from historical plans is likely to be unreliable and is shown for guidance only.

Excavations in the area should be carried out with care and in accordance with HSG 47. No absolute guarantee of accuracy should be inferred from these plans.

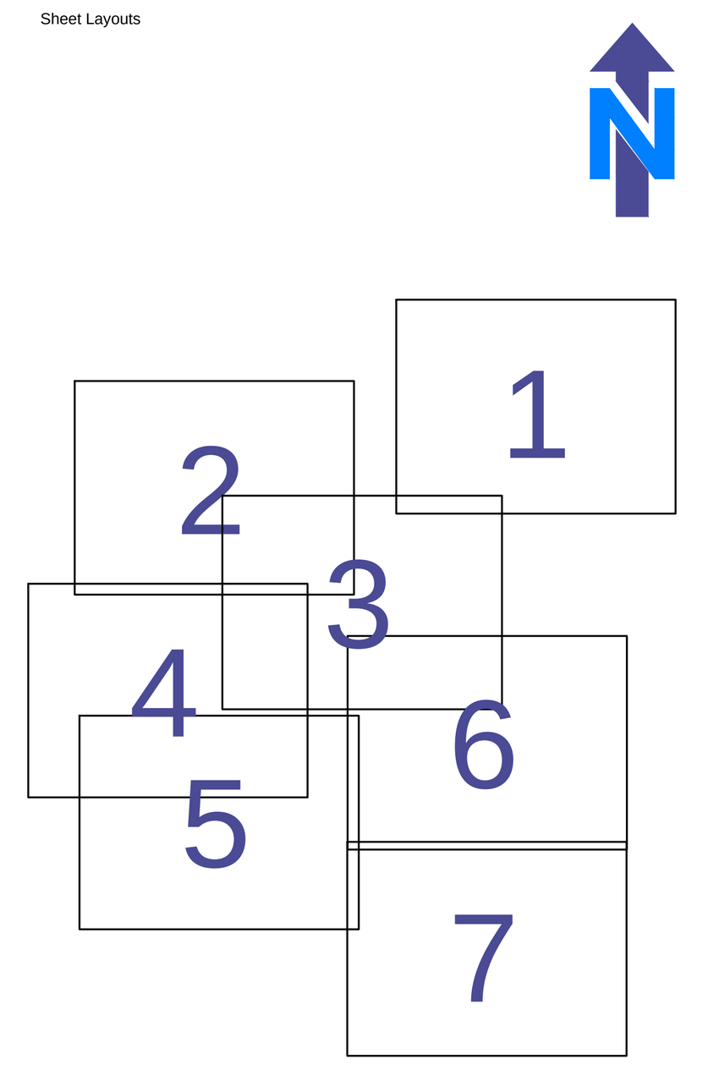
The following text is an extract from Surveys of Land, Buildings and Utility Surveys at scales of 1:500 and Larger, 3rd Edition

"Electronic tracing is a reliable, method of locating buried services. ***On Heavy, built up sites 85% completeness is probably all that can be expected.*** *Plan accuracies of +/- 150mm may be achieved but this figure will depend on the depth of the service below ground level.* ***Where similar services run in close proximity, separation may be impossible. Successful tracing of non-metallic pipes may be limited.*** *Existing record information showing underground services is often incomplete and of doubtful accuracy. It should be regarded only as an indication and cannot be guaranteed"*

Standard Abbreviations

ACO	LINEAR DRAINAGE CHANNEL	GP	GUIDE POST	Shlt	SHELTER
AV	AIR VALVE	GPR	GROUND PROBING RADAR	Si	SPUN IRON
A/R	ASSUMED ROUTE	Grl	GRILLE COVER	SL	SOFFIT LEVEL
BB	BELISH BEACON	GV	GAS VALVE COVER	Slt	SILT LEVEL
BdL	BED LEVEL	Hrl	HAND RAIL	SMP	SETTLEMENT MONITORING Pnt
BH	BOREHOLE	IC	INSPECTION COVER	SP	SIGN POST
Bol	BOLLARD	IL	INVERT LEVEL	SPt	SAMPLING POINT
BP	BOUNDARY POST	I/R	IRON RAILING FENCE	SS	STRUCTURE POINT
B Pvg	BLOCK PAVING	KO	KERB OUTLET	ST	STAND PIPE / SUPPLY TAP
BRck	BICYCLE RACK	Lby	LIFEBUOY	Sti	STILE
BS	BUS STOP	Lck	LOCK GATE	STL	STRUCTURE TOP LEVEL
BT	BRITISH TELECOM COVER	Ldr	LADDER	Stone Pvg	STONE PAVING SLABS
BW	BRICK WALL	LOR	LOSS OF REFLECTION (gpr)	STP	STAND PIPE
BWF	BARBED WIRE FENCE	LOS	LOSS OF SIGNAL (eml)	StPO	STAY POST
CAP	CABLE WINDING MACHINE	LP	LAMP POST	Stu	STUMP
Cat	CATENARY LEVEL	Mcy	MACHINERY	StW	STAYWIRE
CATV	CABLE TV COVER	MH	MANHOLE	SV	STOP VALVE
CB	CONTROL BOX	MgP	MOORING POST	SW	STONE WALL
C/B	CLOSE BOARDED FENCE	Mkr	MARKER POST	Tac	TACTILE PAVING
CD	CHAMBER DEPTH	MP	MILE POST	TBM	TEMPORARY BENCH MARK
Cgd	CATTLE GRID	MS	MILESTONE	TBol	BOLLARD (Dept' Transport)
Ci	CAST IRON	MU	ELECTRIC MOTOR	TCB	TELEPHONE CALL BOX
CIP	CABLE INLET POINT	NP	NAME PLATE	TCP	TELEPHONE CALL POST
CL	COVER LEVEL	OSA	OUTSIDE SURVEY AREA	TEL	TELECOM COVER
C/L	CHAIN LINK FENCE	OSBM	OS BENCH MARK	ThL	THRESHOLD LEVEL
Conc	CONCRETE	OGC	OVERGROUND CONDUIT	TL	TRAFFIC SIGNAL POST
Conc Pvg	CONCRETE PAVING	OHca	OVERHEAD CABLE Unidentified	TM	TICKET MACHINE
CP	CATCHPIT	OHC	OVERHEAD CONDUIT	ToV	TOP OF VALVE LEVEL
CpL	COPING LEVEL	OHE	OVERHEAD ELECTRIC	TP	TELEGRAPH POLE
Cpsn	CAPSTAN	OHG	OVERHEAD GANTRY	Tpt	TRIAL PIT
CR	CRANE / HOIST	OHStruct	OVERHEAD STRUCTURE	Tr	TROUGH
Cul	CULVERT	OHT	OVERHEAD TELECOMS	UTL	UNABLE TO LOCATE
CW	CONCRETE WALL	P	POST	UTR	UNABLE TO RAISE
Di	DUCTILE IRON	PB	POST BOX	UTS	UNABLE TO SURVEY
(dilap)	DILAPIDATED	PC	SECURITY CAMERA	UTT	UNABLE TO TRACE (utilities)
(dis)	DISUSED	Pcg	PEDESTRIAN CROSSING	VC	VITRIFIED CLAY
DPC	DAMP PROOF COURSE	P/F	PANEL FENCE	VDP	VEHICLE DETECTION PAD
DS	DIRECTION SIGN	PP	PETROL PUMP	VP	VENT PIPE
DSW	DRYSTONE WALL	P/R	POST & RAIL FENCE	VW	VALVE WHEEL
EIC	ELECTRICITY COVER	Psk	PENSTOCK	WB	WEIGH BRIDGE
EL	EAVES LEVEL	PV	VERTICAL PIPE	WG	WATER GAUGE
EOT	END OF TRACE (utility)	Pyl	PYLON	WL	WATER LEVEL
EP	ELECTRICITY POLE	PZ	PIEZOMETER	WM	WATER METER
ER	EARTH ROD	RE	RODDING EYE	W/M	WIRE MESH FENCE
ESP	ELECTRICITY SUPPLY POINT	RG	RAIN GAUGE	WO	WASHOUT COVER
ESW	ELECTRICITY SWITCH BOX	RL	RIDGE LEVEL	WS	WIND SOCK POLE
FB	FOOTBRIDGE	RMP	RESRVOIR MONITORING Pnt	WSR	WATER LEVEL SENSOR
FL	FLOOR LEVEL	RP	REFLECTOR POST		
FFL	FINISHED FLOOR LEVEL	RS	ROAD SIGN		
Flgt	FLOOR LIGHT	RSP	RAILWAY SIGNAL POST		
FH	FIRE HYDRANT	RW	RETAINING WALL		
FS	FLAG STAFF	RWP	RAN WATER PIPE		
G	GULLY	Sap	SAPLING		
GIS	GAS INLET POINT	SB	SIGN BOARD		

Sheet Layouts



Grid:
National Grid
By GPS Observations
to the OS Active Network
OSTN15

Datum:
Ordnance Datum
By GPS Observations
to the OS Active Network
OSGM15

Revision:	Amendments:	Date:	Name:
-	-	-	-
-	-	-	-
-	-	-	-
A	ORIGINAL ISSUE	Oct'16	DS

RPS

THE SURVEY ASSOCIATION AFFILIATE MEMBER

Stafford - Clevedon - Irlam - Warrington - Edinburgh
T: 0800 917 8227 E: rps.survey@rpsgroup.com www.rpsgroup.com
Red Deer House, Dunston Business Village, Stafford Road, Dunston, Staffordshire, ST18 9AB

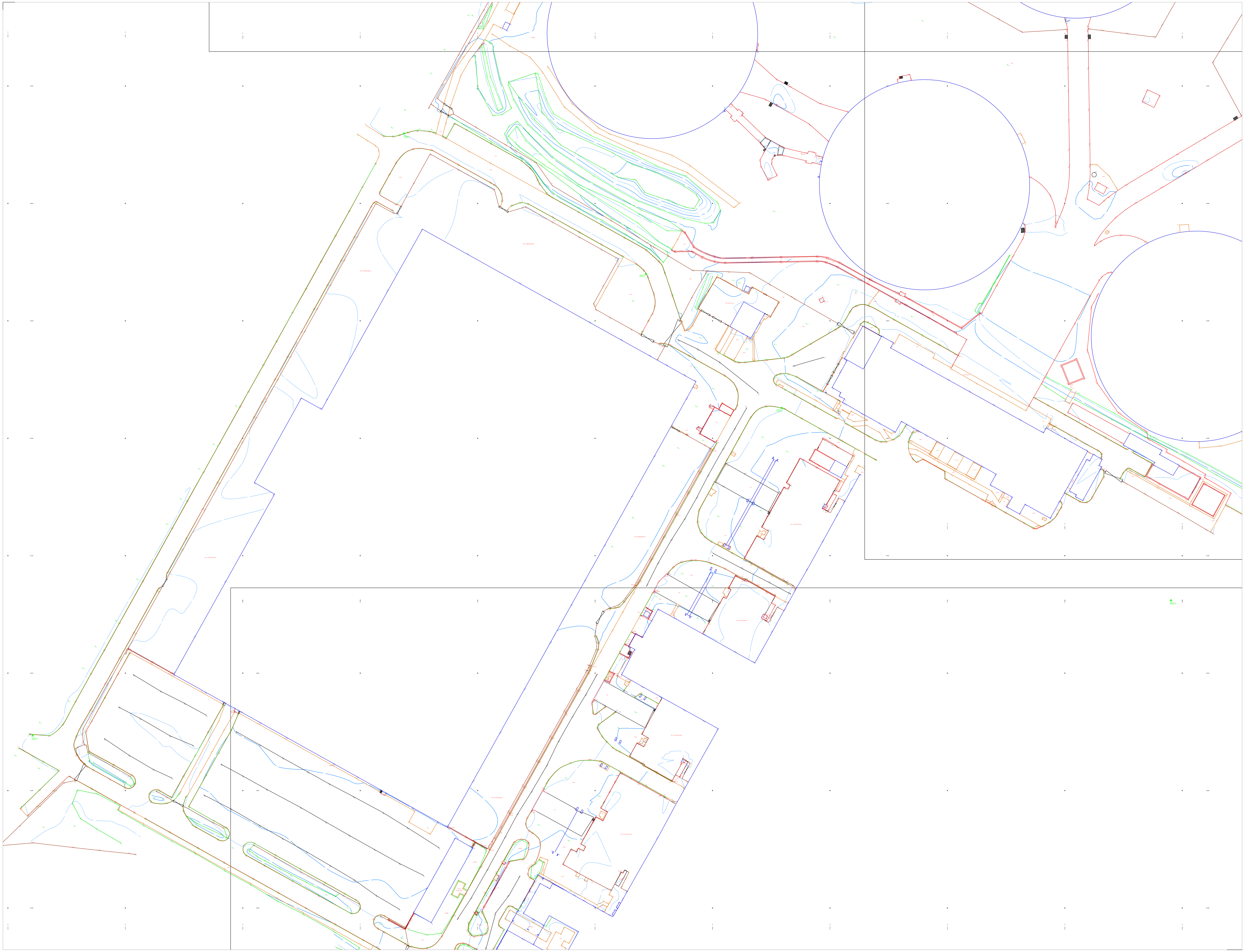
CLIENT:
RPS Planning & Development
2420 The Quadrant, Aztec West
Almondsbury
Bristol, BS32 4AQ

PROJECT:
Eggborough Power Station

TITLE:
Topographical Survey

Drawn:	DS/JS	Checked:	CA
Date:	October 2016	Scale:	1:500 @ A0
Drg No:	UAJ3274_A	Sheet:	3 of 7

GEOMATICS



Notes:

The Contractor is to check and verify all building and site dimensions, levels and sewer invert levels at connection points before work starts. The Contractor is to comply in all respects with current Building Legislation, British Standard Specifications, Building Regulations, Construction (Design & Management) Regulations, Party Wall Act, etc. whether or not specifically stated on this drawing. This drawing must be read with and checked against any structural, geotechnical or other specialist documentation provided.

This drawing is not intended to show details of foundations, ground conditions or ground contaminants. Each area of ground relied upon to support any structure depicted (including drainage) must be investigated by the Contractor. A suitable method of foundation should be provided allowing for existing ground conditions. Any suspect or fluid ground, contaminates on or within the ground, should be further investigated by a suitable expert. Any earthwork constructions shown indicate typical slopes for guidance only & should be further investigated by a suitable expert.

Where existing trees are to be retained they should be subject to a full Arboricultural inspection for safety. All trees are to be planted so as to ensure they are a minimum of 5 metres from buildings and 3 metres from drainage and services. A suitable method of foundation is to be provided to accommodate the proposed tree planting. All tree types are provided as a guide only and a full Arboricultural survey to be conducted to determine the exact tree types should be completed.

Sketch proposals are for illustrative purposes only & as such are subject to detailed site investigation including ground conditions/contaminants, drainage, design & planning/density negotiations. Sketch proposals may be based upon enlargements of OS sheets & visual estimations of existing site features, accuracy will therefore need to be verified by survey. Sketch proposals have not been considered in respect of CDM Regulations.

Survey carried out to client specification and in accordance with RICS publication:
SURVEYS OF LAND , BUILDING & UTILITY SERVICES AT SCALES 1:500 & LARGER, 3rd EDITION.

Utility Services Location Note:

This survey has been carried out using a combination of observation and detection using electrolocation and ground probing radar equipment. Connections between reference points such as manholes are assumed to be straight unless bends are indicated. The accuracy is limited to the tolerances normally expected from the equipment used.

The following indications of completeness and accuracy are for guidance only:

In areas where there is a large concentration of services, the completeness will be between 80% and 90%. This will be reduced where there are obstructions at ground level.

Positional accuracy will vary with depth and pipe / duct material; an accuracy of +/- 150 mm is achievable in normal circumstances but this will be reduced for plastic pipes.

Existing information from historical plans is likely to be unreliable and is shown for guidance only.

Excavations in the area should be carried out with care and in accordance with HSG 47. No absolute guarantee of accuracy should be inferred from these plans.

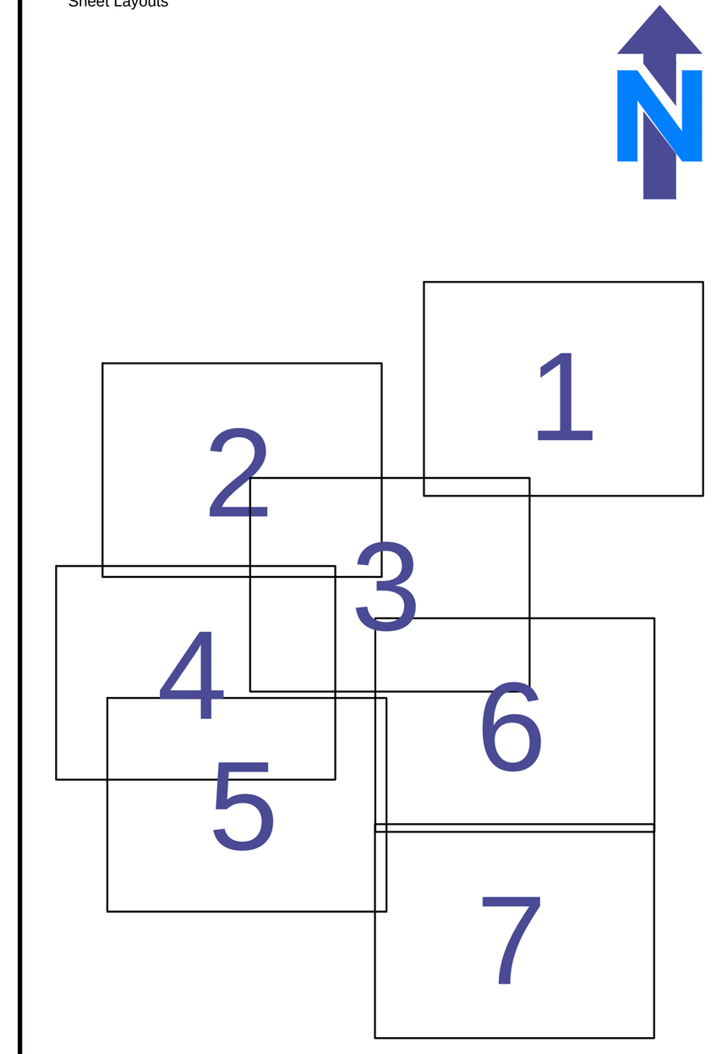
The following text is an extract from Surveys of Land, Buildings and Utility Surveys at scales of 1:500 and Larger, 3rd Edition

"Electronic tracing is a reliable, method of locating buried services. ***On Heavy, built up sites 85% completeness is probably all that can be expected.*** *Plan accuracies of +/- 150mm may be achieved but this figure will depend on the depth of the service below ground level.* ***Where similar services run in close proximity, separation may be impossible. Successful tracing of non-metallic pipes may be limited.*** *Existing record information showing underground services is often incomplete and of doubtful accuracy. It should be regarded only as an indication and cannot be guaranteed"*

Standard Abbreviations

ACO	LINEAR DRAINAGE CHANNEL	GP	GUIDE POST	Shlt	SHELTER
AV	AIR VALVE	GPR	GROUND PROBING RADAR	Si	SPUN IRON
A/R	ASSUMED ROUTE	Grl	GRILLE COVER	SL	SOFFIT LEVEL
BB	BELISH BEACON	GV	GAS VALVE COVER	Slt	SILT LEVEL
BdL	BED LEVEL	Hrl	HAND RAIL	SMP	SETTLEMENT MONITORING Pnt
BH	BOREHOLE	IC	INSPECTION COVER	SP	SIGN POST
Bol	BOLLARD	IL	INVERT LEVEL	SPt	SAMPLING POINT
BP	BOUNDARY POST	I/R	IRON RAILING FENCE	SS	STRUCTURE POINT
B Pvg	BLOCK PAVING	KO	KERB OUTLET	ST	STAND PIPE / SUPPLY TAP
BRck	BICYCLE RACK	Lby	LIFEBUOY	Sti	STILE
BS	BUS STOP	Lck	LOCK GATE	STL	STRUCTURE TOP LEVEL
BT	BRITISH TELECOM COVER	Ldr	LADDER	Stone Pvg	STONE PAVING SLABS
BW	BRICK WALL	LOR	LOSS OF REFLECTION (gpr)	STP	STAND PIPE
BWF	BARBED WIRE FENCE	LOS	LOSS OF SIGNAL (eml)	StPO	STAY POST
CAP	CABLE WINDING MACHINE	LP	LAMP POST	Stu	STUMP
Cat	CATENARY LEVEL	Mcy	MACHINERY	StW	STAYWIRE
CATV	CABLE TV COVER	MH	MANHOLE	SV	STOP VALVE
CB	CONTROL BOX	MgP	MOORING POST	SW	STONE WALL
C/B	CLOSE BOARDED FENCE	Mkr	MARKER POST	Tac	TACTILE PAVING
CD	CHAMBER DEPTH	MP	MILE POST	TBM	TEMPORARY BENCH MARK
Cgd	CATTLE GRID	MS	MILESTONE	TBol	BOLLARD (Dept' Transport)
Ci	CAST IRON	MU	ELECTRIC MOTOR	TCB	TELEPHONE CALL BOX
CIP	CABLE INLET POINT	NP	NAME PLATE	TCP	TELEPHONE CALL POST
CL	COVER LEVEL	OSA	OUTSIDE SURVEY AREA	TEL	TELECOM COVER
C/L	CHAIN LINK FENCE	OSBM	OS BENCH MARK	ThL	THRESHOLD LEVEL
Conc	CONCRETE	OGC	OVERGROUND CONDUIT	TL	TRAFFIC SIGNAL POST
Conc Pvg	CONCRETE PAVING	OHca	OVERHEAD CABLE Unidentified	TM	TICKET MACHINE
CP	CATCHPIT	OHC	OVERHEAD CONDUIT	ToV	TOP OF VALVE LEVEL
CpL	COPING LEVEL	OHE	OVERHEAD ELECTRIC	TP	TELEGRAPH POLE
Cpsn	CAPSTAN	OHG	OVERHEAD GANTRY	Tpt	TRIAL PIT
CR	CRANE / HOIST	OHStruct	OVERHEAD STRUCTURE	Tr	TROUGH
Cul	CULVERT	OHT	OVERHEAD TELECOMS	UTL	UNABLE TO LOCATE
CW	CONCRETE WALL	P	POST	UTR	UNABLE TO RAISE
Di	DUCTILE IRON	PB	POST BOX	UTS	UNABLE TO SURVEY
(dilap)	DILAPIDATED	PC	SECURITY CAMERA	UTT	UNABLE TO TRACE (utilities)
(dis)	DISUSED	Pcg	PEDESTRIAN CROSSING	VC	VITRIFIED CLAY
DPC	DAMP PROOF COURSE	P/F	PANEL FENCE	VDP	VEHICLE DETECTION PAD
DS	DIRECTION SIGN	PP	PETROL PUMP	VP	VENT PIPE
DSW	DRYSTONE WALL	P/R	POST & RAIL FENCE	VW	VALVE WHEEL
EIC	ELECTRICITY COVER	Psk	PENSTOCK	WB	WEIGH BRIDGE
EL	EAVES LEVEL	PV	VERTICAL PIPE	WG	WATER GAUGE
EOT	END OF TRACE (utility)	Pyl	PYLON	WL	WATER LEVEL
EP	ELECTRICITY POLE	PZ	PIEZOMETER	WM	WATER METER
ER	EARTH ROD	RE	RODDING EYE	W/M	WIRE MESH FENCE
ESP	ELECTRICITY SUPPLY POINT	RG	RAIN GAUGE	WO	WASHOUT COVER
ESW	ELECTRICITY SWITCH BOX	RL	RIDGE LEVEL	WS	WIND SOCK POLE
FB	FOOTBRIDGE	RMP	RESRVOIR MONITORING Pnt	WSR	WATER LEVEL SENSOR
FL	FLOOR LEVEL	RP	REFLECTOR POST		
FFL	FINISHED FLOOR LEVEL	RS	ROAD SIGN		
Flgt	FLOOR LIGHT	RSP	RAILWAY SIGNAL POST		
FH	FIRE HYDRANT	RW	RETAINING WALL		
FS	FLAG STAFF	RWP	RAN WATER PIPE		
G	GULLY	Sap	SAPLING		
GIS	GAS INLET POINT	SB	SIGN BOARD		

Sheet Layouts



Grid:	Datum:
National Grid By GPS Observations to the OS Active Network OSTN15	Ordnance Datum By GPS Observations to the OS Active Network OSGM15

Revision:	Amendments:	Date:	Name:
-	-	-	-
-	-	-	-
-	-	-	-
A	ORIGINAL ISSUE	Oct'16	DS

RPS

THE SURVEY ASSOCIATION AFFILIATE MEMBER

Stafford - Clevedon - Irlam - Warrington - Edinburgh
T: 0800 917 8227 E: rps.survey@rpsgroup.com www.rpsgroup.com
Red Deer House, Dunston Business Village, Stafford Road, Dunston, Staffordshire, ST18 9AB

CLIENT:
RPS Planning & Development
2420 The Quadrant, Aztec West
Almondsbury
Bristol, BS32 4AQ

PROJECT:
Eggborough Power Station

TITLE:
Topographical Survey

Drawn: DS/JS	Checked: CA
Date: October 2016	Scale: 1:500 @ A0
Drg No: UAJ3274_A	Sheet: 4 of 7

GEOMATICS

Notes:

© This drawing and the building works depicted are the copyright of RPS and may not be reproduced or amended except by written permission. No liability will be accepted for amendments made by other persons.

The Contractor is to check and verify all building and site dimensions, levels and sewer invert levels at connection points before work starts. The Contractor is to comply in all respects with current Building Legislation, British Standard Specifications, Building Regulations, Construction (Design & Management) Regulations, Party Wall Act, etc. whether or not specifically stated on this drawing. This drawing must be read with and checked against any structural, geotechnical or other specialist documentation provided.

This drawing is not intended to show details of foundations, ground conditions or ground contaminants. Each area of ground relied upon to support any structure depicted (including drainage) must be investigated by the Contractor. A suitable method of foundation should be provided allowing for existing ground conditions. Any suspect or fluid ground, contaminates on or within the ground, should be further investigated by a suitable expert. Any earthwork constructions shown indicate typical slopes for guidance only & should be further investigated by a suitable expert.

Where existing trees are to be retained they should be subject to a full Arboricultural inspection for safety. All trees are to be planted so as to ensure they are a minimum of 5 metres from buildings and 3 metres from drainage and services. A suitable method of foundation is to be provided to accommodate the proposed tree planting. All tree types are provided as a guide only and a full Arboricultural survey to be conducted to determine the exact tree types should be completed.

Sketch proposals are for illustrative purposes only & as such are subject to detailed site investigation including ground conditions/contaminants, drainage, design & planning/density negotiations. Sketch proposals may be based upon enlargements of OS sheets & visual estimations of existing site features, accuracy will therefore need to be verified by survey. Sketch proposals have not been considered in respect of CDM Regulations.

Survey carried out to client specification and in accordance with RICS publication:
SURVEYS OF LAND , BUILDING & UTILITY SERVICES AT SCALES 1:500 & LARGER, 3rd EDITION.

Utility Services Location Note:

This survey has been carried out using a combination of observation and detection using electrolocation and ground probing radar equipment. Connections between reference points such as manholes are assumed to be straight unless bends are indicated. The accuracy is limited to the tolerances normally expected from the equipment used.

The following indications of completeness and accuracy are for guidance only:

In areas where there is a large concentration of services, the completeness will be between 80% and 90%. This will be reduced where there are obstructions at ground level.

Positional accuracy will vary with depth and pipe / duct material; an accuracy of +/- 150 mm is achievable in normal circumstances but this will be reduced for plastic pipes.

Existing information from historical plans is likely to be unreliable and is shown for guidance only.

Excavations in the area should be carried out with care and in accordance with HSG 47. No absolute guarantee of accuracy should be inferred from these plans.

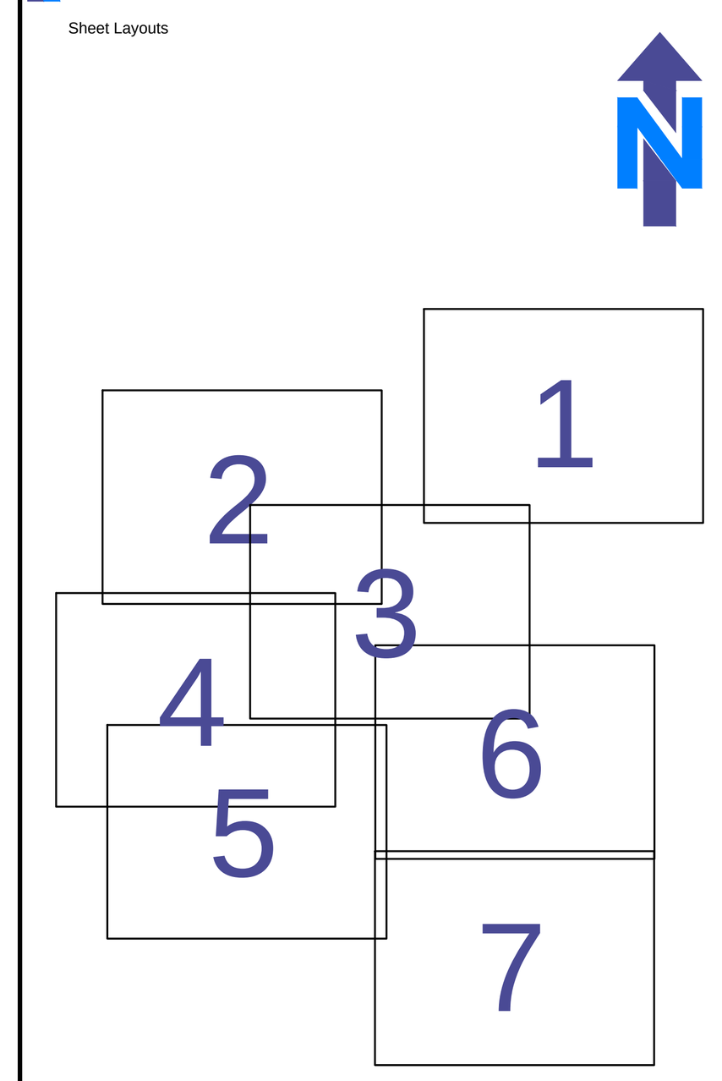
The following text is an extract from Surveys of Land, Buildings and Utility Surveys at scales of 1:500 and Larger, 3rd Edition

"Electronic tracing is a reliable, method of locating buried services. ***On Heavy, built up sites 85% completeness is probably all that can be expected.*** *Plan accuracies of +/- 150mm may be achieved but this figure will depend on the depth of the service below ground level.* ***Where similar services run in close proximity, separation may be impossible. Successful tracing of non-metallic pipes may be limited.*** *Existing record information showing underground services is often incomplete and of doubtful accuracy. It should be regarded only as an indication and cannot be guaranteed"*

Standard Abbreviations

ACO	LINEAR DRAINAGE CHANNEL	GP	GUIDE POST	Shlt	SHELTER
AV	AIR VALVE	GPR	GROUND PROBING RADAR	Si	SPUN IRON
A/R	ASSUMED ROUTE	Grl	GRILLE COVER	SL	SOFFIT LEVEL
BB	BELISH BEACON	GV	GAS VALVE COVER	Slt	SILT LEVEL
BdL	BED LEVEL	Hrl	HAND RAIL	SMP	SETTLEMENT MONITORING Pnt
BH	BOREHOLE	IC	INSPECTION COVER	SP	SIGN POST
Bol	BOLLARD	IL	INVERT LEVEL	SPt	SAMPLING POINT
BP	BOUNDARY POST	I/R	IRON RAILING FENCE	SS	STRUCTURE POINT
B Pvg	BLOCK PAVING	KO	KERB OUTLET	ST	STAND PIPE / SUPPLY TAP
BRck	BICYCLE RACK	Lby	LIFEBUOY	Sti	STILE
BS	BUS STOP	Lck	LOCK GATE	STL	STRUCTURE TOP LEVEL
BT	BRITISH TELECOM COVER	Ldr	LADDER	Stone Pvg	STONE PAVING SLABS
BW	BRICK WALL	LOR	LOSS OF REFLECTION (gpr)	STP	STAND PIPE
BWF	BARBED WIRE FENCE	LOS	LOSS OF SIGNAL (eml)	StPO	STAY POST
CAP	CABLE WINDING MACHINE	LP	LAMP POST	Stu	STUMP
Cat	CATENARY LEVEL	Mcy	MACHINERY	StW	STAYWIRE
CATV	CABLE TV COVER	MH	MANHOLE	SV	STOP VALVE
CB	CONTROL BOX	MgP	MOORING POST	SW	STONE WALL
C/B	CLOSE BOARDED FENCE	Mkr	MARKER POST	Tac	TACTILE PAVING
CD	CHAMBER DEPTH	MP	MILE POST	TBM	TEMPORARY BENCH MARK
Cgd	CATTLE GRID	MS	MILESTONE	TBol	BOLLARD (Dept' Transport)
Ci	CAST IRON	MU	ELECTRIC MOTOR	TCB	TELEPHONE CALL BOX
CIP	CABLE INLET POINT	NP	NAME PLATE	TCP	TELEPHONE CALL POST
CL	COVER LEVEL	OSA	OUTSIDE SURVEY AREA	TEL	TELECOM COVER
C/L	CHAIN LINK FENCE	OSBM	OS BENCH MARK	ThL	THRESHOLD LEVEL
Conc	CONCRETE	OGC	OVERGROUND CONDUIT	TL	TRAFFIC SIGNAL POST
Conc Pvg	CONCRETE PAVING	OHca	OVERHEAD CABLE Unidentified	TM	TICKET MACHINE
CP	CATCHPIT	OHC	OVERHEAD CONDUIT	ToV	TOP OF VALVE LEVEL
CpL	COPING LEVEL	OHE	OVERHEAD ELECTRIC	TP	TELEGRAPH POLE
Cpsn	CAPSTAN	OHG	OVERHEAD GANTRY	Tpt	TRIAL PIT
CR	CRANE / HOIST	OHStruct	OVERHEAD STRUCTURE	Tr	TROUGH
Cul	CULVERT	OHT	OVERHEAD TELECOMS	UTL	UNABLE TO LOCATE
CW	CONCRETE WALL	P	POST	UTR	UNABLE TO RAISE
Di	DUCTILE IRON	PB	POST BOX	UTS	UNABLE TO SURVEY
(dilap)	DILAPIDATED	PC	SECURITY CAMERA	UTT	UNABLE TO TRACE (utilities)
(dis)	DISUSED	Pcg	PEDESTRIAN CROSSING	VC	VITRIFIED CLAY
DPC	DAMP PROOF COURSE	P/F	PANEL FENCE	VDP	VEHICLE DETECTION PAD
DS	DIRECTION SIGN	PP	PETROL PUMP	VP	VENT PIPE
DSW	DRYSTONE WALL	P/R	POST & RAIL FENCE	VW	VALVE WHEEL
EIC	ELECTRICITY COVER	Psk	PENSTOCK	WB	WEIGH BRIDGE
EL	EAVES LEVEL	PV	VERTICAL PIPE	WG	WATER GAUGE
EOT	END OF TRACE (utility)	Pyl	PYLON	WL	WATER LEVEL
EP	ELECTRICITY POLE	PZ	PIEZOMETER	WM	WATER METER
ER	EARTH ROD	RE	RODDING EYE	W/M	WIRE MESH FENCE
ESP	ELECTRICITY SUPPLY POINT	RG	RAIN GAUGE	WO	WASHOUT COVER
ESW	ELECTRICITY SWITCH BOX	RL	RIDGE LEVEL	WS	WIND SOCK POLE
FB	FOOTBRIDGE	RMP	RESRVOIR MONITORING Pnt	WSR	WATER LEVEL SENSOR
FL	FLOOR LEVEL	RP	REFLECTOR POST		
FFL	FINISHED FLOOR LEVEL	RS	ROAD SIGN		
Flgt	FLOOR LIGHT	RSP	RAILWAY SIGNAL POST		
FH	FIRE HYDRANT	RW	RETAINING WALL		
FS	FLAG STAFF	RWP	RAN WATER PIPE		
G	GULLY	Sap	SAPLING		
GIS	GAS INLET POINT	SB	SIGN BOARD		

Sheet Layouts



Grid:
National Grid
By GPS Observations
to the OS Active Network
OSTN15

Datum:
Ordnance Datum
By GPS Observations
to the OS Active Network
OSGM15

Revision:	Amendments:	Date:	Name:
-	-	-	-
-	-	-	-
-	-	-	-
A	ORIGINAL ISSUE	Oct'16	DS

RPS

THE SURVEY ASSOCIATION
AFFILIATE MEMBER

Stafford - Clevedon - Irlam - Warrington - Edinburgh
T: 0800 917 8227 E: rps.survey@rpsgroup.com www.rpsgroup.com
Red Deer House, Dunston Business Village, Stafford Road, Dunston, Staffordshire, ST18 9AB

CLIENT:
RPS Planning & Development
2420 The Quadrant, Aztec West
Almondsbury
Bristol, BS32 4AQ

PROJECT:
Eggborough Power Station

TITLE:
Topographical Survey

Drawn: DS/JS	Checked: CA
Date: October 2016	Scale: 1:500 @ A0
Drg No: UAJ3274_A	Sheet: 5 of 7

GEOMATICS

Notes:

© This drawing and the building works depicted are the copyright of RPS and may not be reproduced or amended except by written permission. No liability will be accepted for amendments made by other persons.

The Contractor is to check and verify all building and site dimensions, levels and sewer invert levels at connection points before work starts. The Contractor is to comply in all respects with current Building Legislation, British Standard Specifications, Building Regulations, Construction (Design & Management) Regulations, Party Wall Act, etc. whether or not specifically stated on this drawing. This drawing must be read with and checked against any structural, geotechnical or other specialist documentation provided.

This drawing is not intended to show details of foundations, ground conditions or ground contaminants. Each area of ground relied upon to support any structure depicted (including drainage) must be investigated by the Contractor. A suitable method of foundation should be provided allowing for existing ground conditions. Any suspect or fluid ground, contaminates on or within the ground, should be further investigated by a suitable expert. Any earthwork constructions shown indicate typical slopes for guidance only & should be further investigated by a suitable expert.

Where existing trees are to be retained they should be subject to a full Arboricultural inspection for safety. All trees are to be planted so as to ensure they are a minimum of 5 metres from buildings and 3 metres from drainage and services. A suitable method of foundation is to be provided to accommodate the proposed tree planting. All tree types are provided as a guide only and a full Arboricultural survey to be conducted to determine the exact tree types should be completed.

Sketch proposals are for illustrative purposes only & as such are subject to detailed site investigation including ground conditions/contaminants, drainage, design & planning/density negotiations. Sketch proposals may be based upon enlargements of OS sheets & visual estimations of existing site features, accuracy will therefore need to be verified by survey. Sketch proposals have not been considered in respect of CDM Regulations.

Survey carried out to client specification and in accordance with RICS publication:
SURVEYS OF LAND , BUILDING & UTILITY SERVICES AT SCALES 1:500 & LARGER, 3rd EDITION.

Utility Services Location Note:

This survey has been carried out using a combination of observation and detection using electrolocation and ground probing radar equipment. Connections between reference points such as manholes are assumed to be straight unless bends are indicated. The accuracy is limited to the tolerances normally expected from the equipment used.

The following indications of completeness and accuracy are for guidance only:

In areas where there is a large concentration of services, the completeness will be between 80% and 90%. This will be reduced where there are obstructions at ground level.

Positional accuracy will vary with depth and pipe / duct material; an accuracy of +/- 150 mm is achievable in normal circumstances but this will be reduced for plastic pipes.

Existing information from historical plans is likely to be unreliable and is shown for guidance only.

Excavations in the area should be carried out with care and in accordance with HSG 47. No absolute guarantee of accuracy should be inferred from these plans.

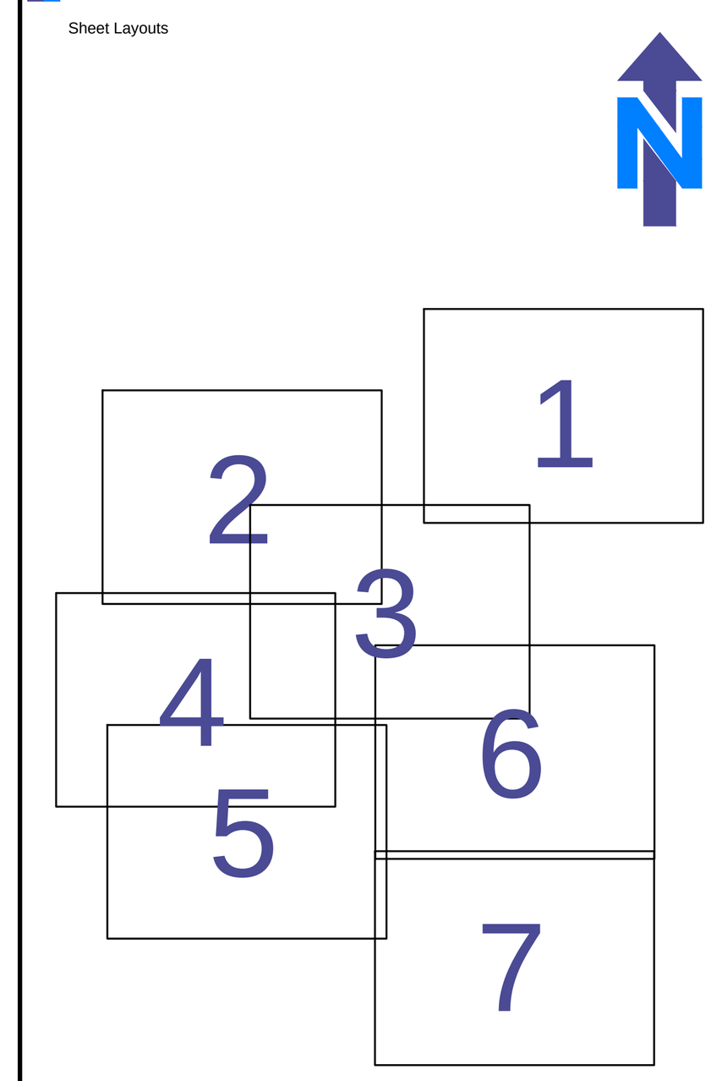
The following text is an extract from Surveys of Land, Buildings and Utility Surveys at scales of 1:500 and Larger, 3rd Edition

"Electronic tracing is a reliable, method of locating buried services. ***On Heavy, built up sites 85% completeness is probably all that can be expected.*** *Plan accuracies of +/- 150mm may be achieved but this figure will depend on the depth of the service below ground level.* ***Where similar services run in close proximity, separation may be impossible. Successful tracing of non-metallic pipes may be limited.*** *Existing record information showing underground services is often incomplete and of doubtful accuracy. It should be regarded only as an indication and cannot be guaranteed"*

Standard Abbreviations

ACO	LINEAR DRAINAGE CHANNEL	GP	GUIDE POST	Shlt	SHELTER
AV	AIR VALVE	GPR	GROUND PROBING RADAR	Si	SPUN IRON
A/R	ASSUMED ROUTE	Grl	GRILLE COVER	SL	SOFFIT LEVEL
BB	BELISH BEACON	GV	GAS VALVE COVER	Slt	SILT LEVEL
BdL	BED LEVEL	Hrl	HAND RAIL	SMP	SETTLEMENT MONITORING Pnt
BH	BOREHOLE	IC	INSPECTION COVER	SP	SIGN POST
Bol	BOLLARD	IL	INVERT LEVEL	SPt	SAMPLING POINT
BP	BOUNDARY POST	I/R	IRON RAILING FENCE	SS	STRUCTURE POINT
B Pvg	BLOCK PAVING	KO	KERB OUTLET	ST	STAND PIPE / SUPPLY TAP
BRck	BICYCLE RACK	Lby	LIFEBUOY	Sti	STILE
BS	BUS STOP	Lck	LOCK GATE	STL	STRUCTURE TOP LEVEL
BT	BRITISH TELECOM COVER	Ldr	LADDER	Stone Pvg	STONE PAVING SLABS
BW	BRICK WALL	LOR	LOSS OF REFLECTION (gpr)	STP	STAND PIPE
BWF	BARBED WIRE FENCE	LOS	LOSS OF SIGNAL (eml)	StPO	STAY POST
CAP	CABLE WINDING MACHINE	LP	LAMP POST	Stu	STUMP
Cat	CATENARY LEVEL	Mcy	MACHINERY	StW	STAYWIRE
CATV	CABLE TV COVER	MH	MANHOLE	SV	STOP VALVE
CB	CONTROL BOX	MgP	MOORING POST	SW	STONE WALL
C/B	CLOSE BOARDED FENCE	Mkr	MARKER POST	Tac	TACTILE PAVING
CD	CHAMBER DEPTH	MP	MILE POST	TBM	TEMPORARY BENCH MARK
Cgd	CATTLE GRID	MS	MILESTONE	TBol	BOLLARD (Dept' Transport)
Ci	CAST IRON	MU	ELECTRIC MOTOR	TCB	TELEPHONE CALL BOX
CIP	CABLE INLET POINT	NP	NAME PLATE	TCP	TELEPHONE CALL POST
CL	COVER LEVEL	OSA	OUTSIDE SURVEY AREA	TEL	TELECOM COVER
C/L	CHAIN LINK FENCE	OSBM	OS BENCH MARK	ThL	THRESHOLD LEVEL
Conc	CONCRETE	OGC	OVERGROUND CONDUIT	TL	TRAFFIC SIGNAL POST
Conc Pvg	CONCRETE PAVING	OHca	OVERHEAD CABLE Unidentified	TM	TICKET MACHINE
CP	CATCHPIT	OHC	OVERHEAD CONDUIT	ToV	TOP OF VALVE LEVEL
CpL	COPING LEVEL	OHE	OVERHEAD ELECTRIC	TP	TELEGRAPH POLE
Cpsn	CAPSTAN	OHG	OVERHEAD GANTRY	Tpt	TRIAL PIT
CR	CRANE / HOIST	OHStruct	OVERHEAD STRUCTURE	Tr	TROUGH
Cul	CULVERT	OHT	OVERHEAD TELECOMS	UTL	UNABLE TO LOCATE
CW	CONCRETE WALL	P	POST	UTR	UNABLE TO RAISE
Di	DUCTILE IRON	PB	POST BOX	UTS	UNABLE TO SURVEY
(dilap)	DILAPIDATED	PC	SECURITY CAMERA	UTT	UNABLE TO TRACE (utilities)
(dis)	DISUSED	Pcg	PEDESTRIAN CROSSING	VC	VITRIFIED CLAY
DPC	DAMP PROOF COURSE	P/F	PANEL FENCE	VDP	VEHICLE DETECTION PAD
DS	DIRECTION SIGN	PP	PETROL PUMP	VP	VENT PIPE
DSW	DRYSTONE WALL	P/R	POST & RAIL FENCE	VW	VALVE WHEEL
EIC	ELECTRICITY COVER	Psk	PENSTOCK	WB	WEIGH BRIDGE
EL	EAVES LEVEL	PV	VERTICAL PIPE	WG	WATER GAUGE
EOT	END OF TRACE (utility)	Pyl	PYLON	WL	WATER LEVEL
EP	ELECTRICITY POLE	PZ	PIEZOMETER	WM	WATER METER
ER	EARTH ROD	RE	RODDING EYE	W/M	WIRE MESH FENCE
ESP	ELECTRICITY SUPPLY POINT	RG	RAIN GAUGE	WO	WASHOUT COVER
ESW	ELECTRICITY SWITCH BOX	RL	RIDGE LEVEL	WS	WIND SOCK POLE
FB	FOOTBRIDGE	RMP	RESRVOIR MONITORING Pnt	WSR	WATER LEVEL SENSOR
FL	FLOOR LEVEL	RP	REFLECTOR POST		
FFL	FINISHED FLOOR LEVEL	RS	ROAD SIGN		
Flgt	FLOOR LIGHT	RSP	RAILWAY SIGNAL POST		
FH	FIRE HYDRANT	RW	RETAINING WALL		
FS	FLAG STAFF	RWP	RAN WATER PIPE		
G	GULLY	Sap	SAPLING		
GIS	GAS INLET POINT	SB	SIGN BOARD		

Sheet Layouts



Grid:
National Grid
By GPS Observations
to the OS Active Network
OSTN15

Datum:
Ordnance Datum
By GPS Observations
to the OS Active Network
OSGM15

Revision:	Amendments:	Date:	Name:
-	-	-	-
-	-	-	-
-	-	-	-
A	ORIGINAL ISSUE	Oct'16	DS

RPS

THE SURVEY ASSOCIATION
AFFILIATE MEMBER

Stafford - Clevedon - Irlam - Warrington - Edinburgh
T: 0800 917 8227 E: rps.survey@rpsgroup.com www.rpsgroup.com
Red Deer House, Dunston Business Village, Stafford Road, Dunston, Staffordshire, ST18 9AB

CLIENT:
RPS Planning & Development
2420 The Quadrant, Aztec West
Almondsbury
Bristol, BS32 4AQ

PROJECT:
Eggborough Power Station

TITLE:
Topographical Survey

Drawn:	DS/JS	Checked:	CA
Date:	October 2016	Scale:	1:500 @ A0
Drg No:	UAJ3274_A	Sheet:	6 of 7

GEOMATICS

Notes:

© This drawing and the building works depicted are the copyright of RPS and may not be reproduced or amended except by written permission. No liability will be accepted for amendments made by other persons.

The Contractor is to check and verify all building and site dimensions, levels and sewer invert levels at connection points before work starts. The Contractor is to comply in all respects with current Building Legislation, British Standard Specifications, Building Regulations, Construction (Design & Management) Regulations, Party Wall Act, etc. whether or not specifically stated on this drawing. This drawing must be read with and checked against any structural, geotechnical or other specialist documentation provided.

This drawing is not intended to show details of foundations, ground conditions or ground contaminants. Each area of ground relied upon to support any structure depicted (including drainage) must be investigated by the Contractor. A suitable method of foundation should be provided allowing for existing ground conditions. Any suspect or fluid ground, contaminates on or within the ground, should be further investigated by a suitable expert. Any earthwork constructions shown indicate typical slopes for guidance only & should be further investigated by a suitable expert.

Where existing trees are to be retained they should be subject to a full Arboricultural inspection for safety. All trees are to be planted so as to ensure they are a minimum of 5 metres from buildings and 3 metres from drainage and services. A suitable method of foundation is to be provided to accommodate the proposed tree planting. All tree types are provided as a guide only and a full Arboricultural survey to be conducted to determine the exact tree types should be completed.

Sketch proposals are for illustrative purposes only & as such are subject to detailed site investigation including ground conditions/contaminants, drainage, design & planning/density negotiations. Sketch proposals may be based upon enlargements of OS sheets & visual estimations of existing site features, accuracy will therefore need to be verified by survey. Sketch proposals have not been considered in respect of CDM Regulations.

Survey carried out to client specification and in accordance with RICS publication:
SURVEYS OF LAND , BUILDING & UTILITY SERVICES AT SCALES 1:500 & LARGER, 3rd EDITION.

Utility Services Location Note:

This survey has been carried out using a combination of observation and detection using electrolocation and ground probing radar equipment. Connections between reference points such as manholes are assumed to be straight unless bends are indicated. The accuracy is limited to the tolerances normally expected from the equipment used.

The following indications of completeness and accuracy are for guidance only:

In areas where there is a large concentration of services, the completeness will be between 80% and 90%. This will be reduced where there are obstructions at ground level.

Positional accuracy will vary with depth and pipe / duct material; an accuracy of +/- 150 mm is achievable in normal circumstances but this will be reduced for plastic pipes.

Existing information from historical plans is likely to be unreliable and is shown for guidance only.

Excavations in the area should be carried out with care and in accordance with HSG 47. No absolute guarantee of accuracy should be inferred from these plans.

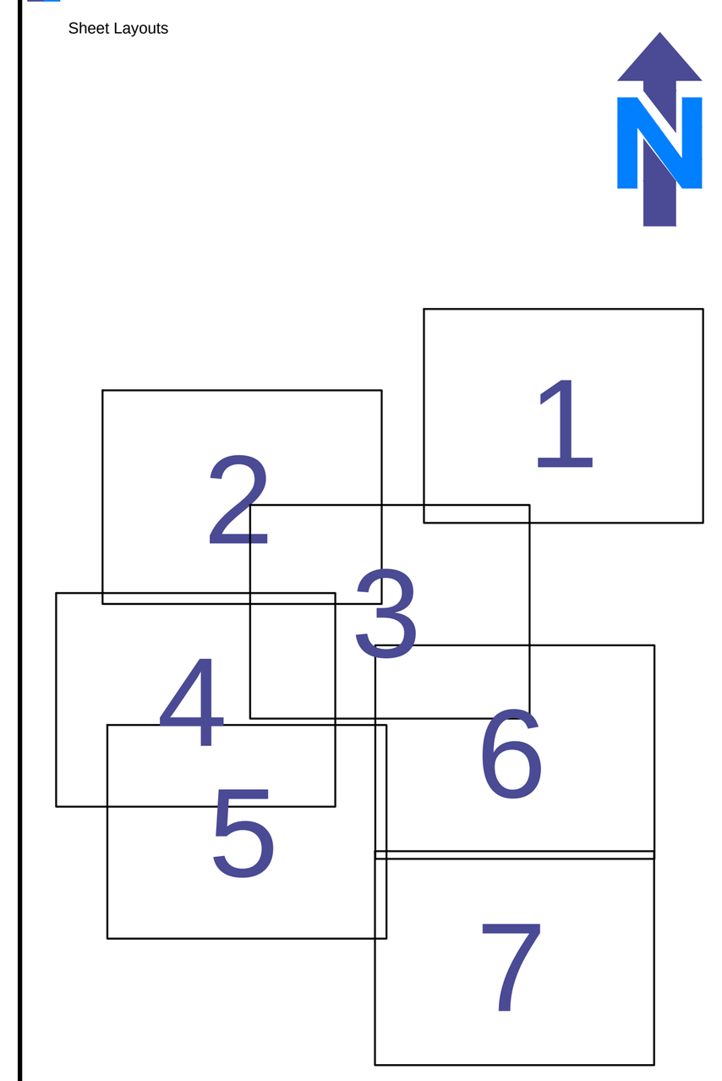
The following text is an extract from Surveys of Land, Buildings and Utility Surveys at scales of 1:500 and Larger, 3rd Edition

"Electronic tracing is a reliable, method of locating buried services. ***On Heavy, built up sites 85% completeness is probably all that can be expected.*** *Plan accuracies of +/- 150mm may be achieved but this figure will depend on the depth of the service below ground level.* ***Where similar services run in close proximity, separation may be impossible. Successful tracing of non-metallic pipes may be limited.*** *Existing record information showing underground services is often incomplete and of doubtful accuracy. It should be regarded only as an indication and cannot be guaranteed"*

Standard Abbreviations

ACO	LINEAR DRAINAGE CHANNEL	GP	GUIDE POST	Shlt	SHELTER
AV	AIR VALVE	GPR	GROUND PROBING RADAR	Si	SPUN IRON
A/R	ASSUMED ROUTE	Grl	GRILLE COVER	SL	SOFFIT LEVEL
BB	BELISH BEACON	GV	GAS VALVE COVER	Slt	SILT LEVEL
BdL	BED LEVEL	Hrl	HAND RAIL	SMP	SETTLEMENT MONITORING Pnt
BH	BOREHOLE	IC	INSPECTION COVER	SP	SIGN POST
Bol	BOLLARD	IL	INVERT LEVEL	SPt	SAMPLING POINT
BP	BOUNDARY POST	I/R	IRON RAILING FENCE	SS	STRUCTURE POINT
B Pvg	BLOCK PAVING	KO	KERB OUTLET	ST	STAND PIPE / SUPPLY TAP
BRck	BICYCLE RACK	Lby	LIFEBUOY	Sti	STILE
BS	BUS STOP	Lck	LOCK GATE	STL	STRUCTURE TOP LEVEL
BT	BRITISH TELECOM COVER	Ldr	LADDER	Stone Pvg	STONE PAVING SLABS
BW	BRICK WALL	LOR	LOSS OF REFLECTION (gpr)	STP	STAND PIPE
BWF	BARBED WIRE FENCE	LOS	LOSS OF SIGNAL (eml)	StPO	STAY POST
CAP	CABLE WINDING MACHINE	LP	LAMP POST	Stu	STUMP
Cat	CATENARY LEVEL	Mcy	MACHINERY	StW	STAYWIRE
CATV	CABLE TV COVER	MH	MANHOLE	SV	STOP VALVE
CB	CONTROL BOX	MgP	MOORING POST	SW	STONE WALL
C/B	CLOSE BOARDED FENCE	Mkr	MARKER POST	Tac	TACTILE PAVING
CD	CHAMBER DEPTH	MP	MILE POST	TBM	TEMPORARY BENCH MARK
Cgd	CATTLE GRID	MS	MILESTONE	TBol	BOLLARD (Dept' Transport)
Ci	CAST IRON	MU	ELECTRIC MOTOR	TCB	TELEPHONE CALL BOX
CIP	CABLE INLET POINT	NP	NAME PLATE	TCP	TELEPHONE CALL POST
CL	COVER LEVEL	OSA	OUTSIDE SURVEY AREA	TEL	TELECOM COVER
C/L	CHAIN LINK FENCE	OSBM	OS BENCH MARK	ThL	THRESHOLD LEVEL
Conc	CONCRETE	OGC	OVERGROUND CONDUIT	TL	TRAFFIC SIGNAL POST
Conc Pvg	CONCRETE PAVING	OHca	OVERHEAD CABLE Unidentified	TM	TICKET MACHINE
CP	CATCHPIT	OHC	OVERHEAD CONDUIT	ToV	TOP OF VALVE LEVEL
CpL	COPING LEVEL	OHE	OVERHEAD ELECTRIC	TP	TELEGRAPH POLE
Cpsn	CAPSTAN	OHG	OVERHEAD GANTRY	Tpt	TRIAL PIT
CR	CRANE / HOIST	OHStruct	OVERHEAD STRUCTURE	Tr	TROUGH
Cul	CULVERT	OHT	OVERHEAD TELECOMS	UTL	UNABLE TO LOCATE
CW	CONCRETE WALL	P	POST	UTR	UNABLE TO RAISE
Di	DUCTILE IRON	PB	POST BOX	UTS	UNABLE TO SURVEY
(dilap)	DILAPIDATED	PC	SECURITY CAMERA	UTT	UNABLE TO TRACE (utilities)
(dis)	DISUSED	Pcg	PEDESTRIAN CROSSING	VC	VITRIFIED CLAY
DPC	DAMP PROOF COURSE	P/F	PANEL FENCE	VDP	VEHICLE DETECTION PAD
DS	DIRECTION SIGN	PP	PETROL PUMP	VP	VENT PIPE
DSW	DRYSTONE WALL	P/R	POST & RAIL FENCE	VW	VALVE WHEEL
EIC	ELECTRICITY COVER	Psk	PENSTOCK	WB	WEIGH BRIDGE
EL	EAVES LEVEL	PV	VERTICAL PIPE	WG	WATER GAUGE
EOT	END OF TRACE (utility)	Pyl	PYLON	WL	WATER LEVEL
EP	ELECTRICITY POLE	PZ	PIEZOMETER	WM	WATER METER
ER	EARTH ROD	RE	RODDING EYE	W/M	WIRE MESH FENCE
ESP	ELECTRICITY SUPPLY POINT	RG	RAIN GAUGE	WO	WASHOUT COVER
ESW	ELECTRICITY SWITCH BOX	RL	RIDGE LEVEL	WS	WIND SOCK POLE
FB	FOOTBRIDGE	RMP	RESRVOIR MONITORING Pnt	WSR	WATER LEVEL SENSOR
FL	FLOOR LEVEL	RP	REFLECTOR POST		
FFL	FINISHED FLOOR LEVEL	RS	ROAD SIGN		
Flgt	FLOOR LIGHT	RSP	RAILWAY SIGNAL POST		
FH	FIRE HYDRANT	RW	RETAINING WALL		
FS	FLAG STAFF	RWP	RAN WATER PIPE		
G	GULLY	Sap	SAPLING		
GIS	GAS INLET POINT	SB	SIGN BOARD		

Sheet Layouts



Grid:	Datum:
National Grid By GPS Observations to the OS Active Network OSTN15	Ordnance Datum By GPS Observations to the OS Active Network OSGM15

Revision:	Amendments:	Date:	Name:
-	-	-	-
-	-	-	-
-	-	-	-
A	ORIGINAL ISSUE	Oct'16	DS

RPS

THE SURVEY ASSOCIATION
AFFILIATE MEMBER

Stafford - Clevedon - Irlam - Warrington - Edinburgh
T: 0800 917 8227 E: rps.survey@rpsgroup.com www.rpsgroup.com
Red Deer House, Dunston Business Village, Stafford Road, Dunston, Staffordshire, ST18 9AB

CLIENT:
RPS Planning & Development
2420 The Quadrant, Aztec West
Almondsbury
Bristol, BS32 4AQ

PROJECT:
Eggborough Power Station

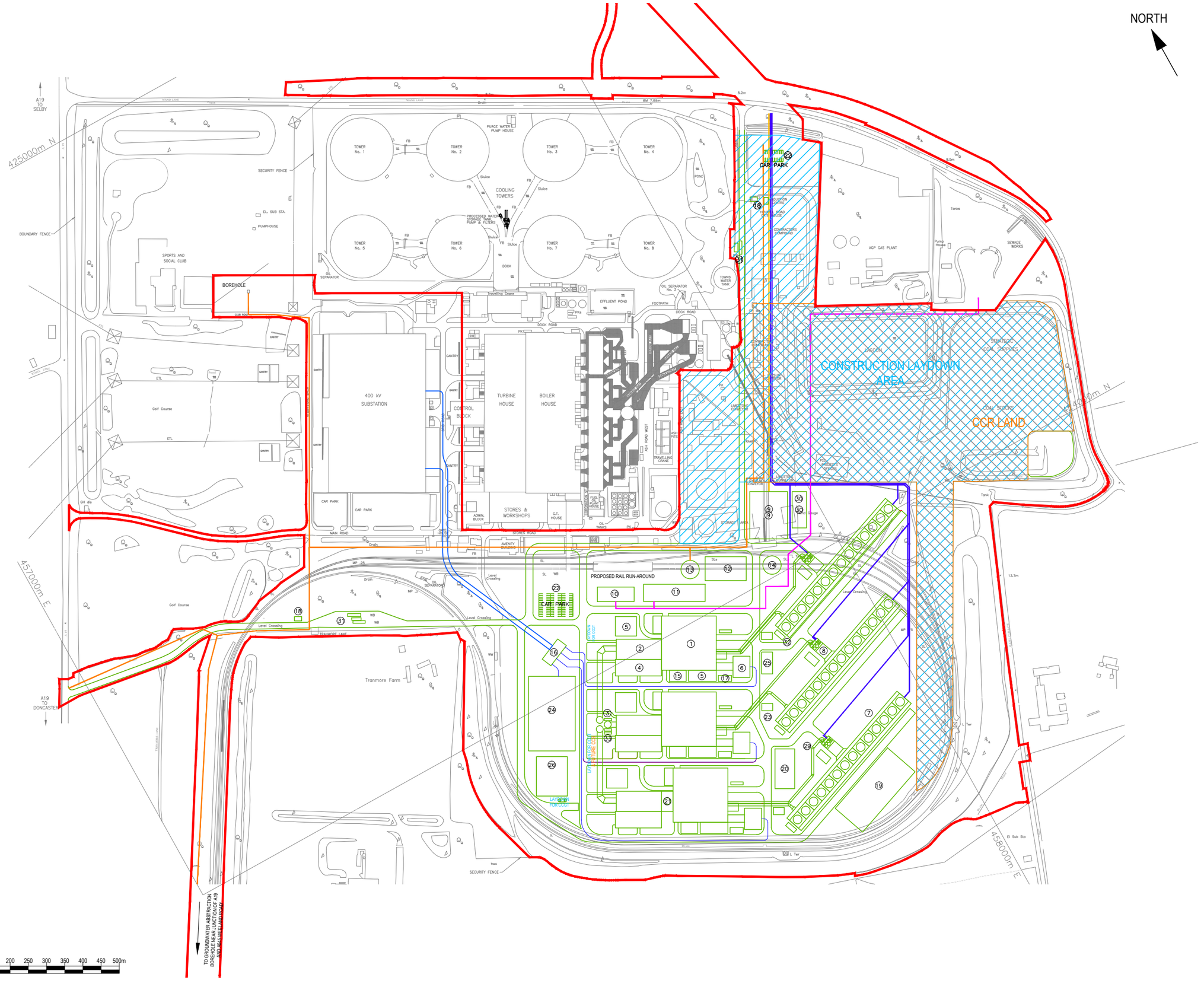
TITLE:
Topographical Survey

Drawn:	DS/JS	Checked:	CA
Date:	October 2016	Scale:	1:500 @ A0
Drg No:	UAJ3274_A	Sheet:	7 of 7

GEOMATICS

ANNEX 3: PROPOSED DEVELOPMENT PLANS

ISO A3 297mm x 420mm



THIS DRAWING IS TO BE USED ONLY FOR THE PURPOSE OF ISSUE THAT IT WAS ISSUED FOR AND IS SUBJECT TO AMENDMENT

LEGEND

	PLANT DESCRIPTION
1	TURBINE HALL
2	HEAT RECOVERY STEAM GENERATOR
3	STACK
4	FEEDWATER PUMP BUILDING
5	ELECTRICAL BUILDING
6	GENERATOR TRANSFORMER
7	HYBRID COOLING TOWERS
8	COOLING WATER PUMPS
9	GAS RECEIVING AREA
10	WORKSHOP & STORES
11	ELECTRICAL, CONTROL ROOM & ADMIN BUILDING
12	WATER TREATMENT PLANT, FIRE PUMPS & LABORATORY
13	RAW & FIRE WATER TANK
14	DEMINERALISED WATER TANKS
15	AIR INTAKE FILTER
16	GAS-INSULATED SUB STATION
17	DIESEL GENERATORS
18	GATEHOUSE
19	SURFACE WATER ATTENUATION SYSTEM (INDICATIVE LOCATION)
20	WASTE WATER TREATMENT PLANT
21	UNUSED
22	CAR PARKING
23	CLOSED CIRCUIT COOLING WATER COOLERS
24	PEAKING PLANT
25	AUXILIARY BOILER
26	BLACK START FACILITY
27	UNUSED
28	UNUSED
29	COOLING WATER DOSING
30	GAS COMPRESSORS
31	WEIGHBRIDGE
32	COOLING WATER ELECTRICAL MODULE
33	CONTINUOUS EMISSIONS MONITORING SYSTEM CONTAINER

KEY

- FOUL DRAINAGE TO WASTE WATER TREATMENT WORKS
- COOLING WATER (MAKE-UP & BLOWDOWN)
- GAS SUPPLY LINE
- TOWNS WATER & BOREHOLE WATER
- UNDERGROUND CABLE
- CONSTRUCTION LAYDOWN AREA
- CARBON CAPTURE READINESS (CCR) LAND

Drawing based drawing 2095-037 R3 supplied by:

FICHTNER
CONSULTING ENGINEERS LIMITED
Kingsgate, Wellington Road North,
Stockport, Cheshire, SK4 1LW, UK
Tel. 0161 476 0032
Website: www.fichtner.co.uk

Purpose of Issue
ENVIRONMENTAL STATEMENT

Client
EGGBOROUGH POWER LTD

Project Title
EGGBOROUGH CCGT DCO

Drawing Title
INDICATIVE CONCEPT LAYOUT (3 SINGLE SHAFT) FOR THE PROPOSED DEVELOPMENT WITHIN THE EXISTING COAL-FIRED POWER STATION SITE

Drawn	Checked	Approved	Date
GB	JW	KC	22/05/2017

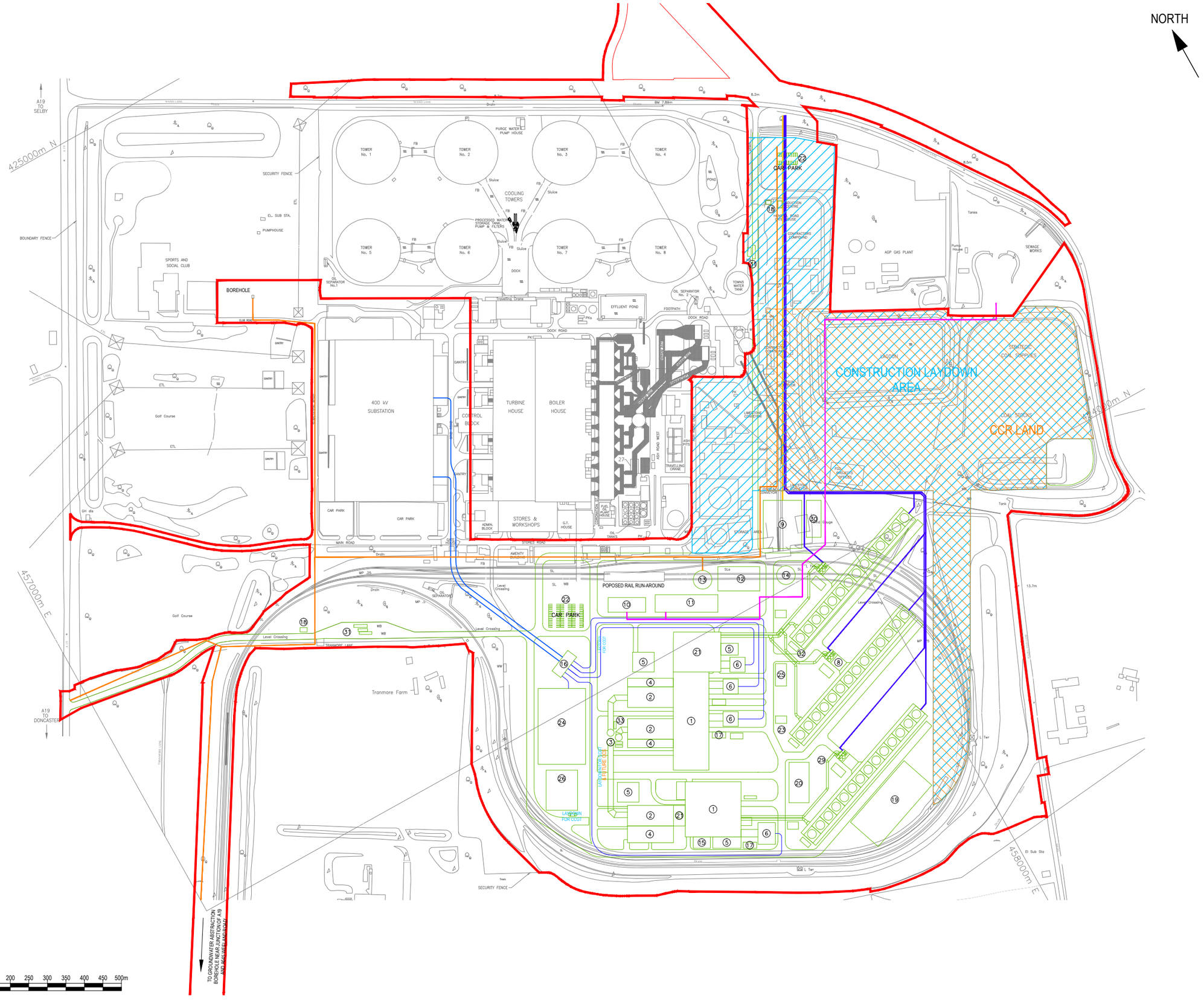
AECOM Internal Project No.	Scale @ A3
60506766	1:5000

AECOM
Scott House
Alencon Link, Basingstoke
Hampshire, RG21 7PP
Telephone (01256) 310200
Fax (01256) 310201
www.aecom.com

Drawing Number	Rev
FIGURE 4.1a	01

Filename: K:\NEWPROJE\60506766 - EGGBOROUGH CCGT\CAD\FIGURES\FIGURE 4.1A.DWG Last saved by: GARETH.BLOOMER Last Plotted: 2017-05-22

ISO A3 297mm x 420mm



THIS DRAWING IS TO BE USED ONLY FOR THE PURPOSE OF ISSUE THAT IT WAS ISSUED FOR AND IS SUBJECT TO AMENDMENT

LEGEND

	PLANT DESCRIPTION
1	TURBINE HALL
2	HEAT RECOVERY STEAM GENERATOR
3	STACK
4	FEEDWATER PUMP BUILDING
5	ELECTRICAL BUILDING
6	GENERATOR TRANSFORMER
7	HYBRID COOLING TOWERS
8	COOLING WATER PUMPS
9	GAS RECEIVING AREA
10	WORKSHOP & STORES
11	ELECTRICAL, CONTROL ROOM & ADMIN BUILDING
12	WATER TREATMENT PLANT, FIRE PUMPS & LABORATORY
13	RAW & FIRE WATER TANK
14	DEMINERALISED WATER TANKS
15	AIR INTAKE FILTER
16	GAS-INSULATED SUB STATION
17	DIESEL GENERATORS
18	GATEHOUSE
19	SURFACE WATER ATTENUATION SYSTEM (INDICATIVE LOCATION)
20	WASTE WATER TREATMENT PLANT
21	UNUSED
22	CAR PARKING
23	CLOSED CIRCUIT COOLING WATER COOLERS
24	PEAKING PLANT
25	AUXILIARY BOILER
26	BLACK START FACILITY
27	UNUSED
28	UNUSED
29	COOLING WATER DOSING
30	GAS COMPRESSORS
31	WEIGHBRIDGE
32	COOLING WATER ELECTRICAL MODULE
33	CONTINUOUS EMISSIONS MONITORING SYSTEM CONTAINER

KEY

- FOUL DRAINAGE TO WASTE WATER TREATMENT WORKS
- COOLING WATER (MAKE-UP & BLOWDOWN)
- GAS SUPPLY LINE
- TOWNS WATER & BOREHOLE WATER
- UNDERGROUND CABLE
- CONSTRUCTION LAYDOWN AREA
- CARBON CAPTURE READINESS (CCR) LAND

Drawing based drawing 2095-038 R2 supplied by:

FICHTNER
CONSULTING ENGINEERS LIMITED
Kingsgate, Wellington Road North,
Stockport, Cheshire, SK4 1LW, UK
Tel. 0161 476 0032
Website: www.fichtner.co.uk

Purpose of Issue
ENVIRONMENTAL STATEMENT

Client
EGGBOROUGH POWER LTD

Project Title
EGGBOROUGH CCGT DCO

Drawing Title
INDICATIVE CONCEPT LAYOUT (MULTI SHAFT + SINGLE SHAFT) FOR THE PROPOSED DEVELOPMENT WITHIN THE EXISTING COAL-FIRED POWER STATION SITE

Drawn	Checked	Approved	Date
GB	JW	KC	17/05/2017

AECOM Internal Project No.	Scale @ A3
60506766	1:5000

AECOM
Scott House
Alencon Link, Basingstoke
Hampshire, RG21 7PP
Telephone (01256) 310200
Fax (01256) 310201
www.aecom.com

Drawing Number	Rev
FIGURE 4.1b	01

Filename: K:\NEWPROJE\60506766 - EGGBOROUGH CCGT\CAD\FIGURES\FIGURE 4.1B.DWG Last saved by: GARETH.BLOOMER Last Plotted: 2017-05-22

ANNEX 4: CONSULTATIONS

PLANNING APPLICATION CONSULTEE RESPONSE

Reference	MALT001/Eggborough/Danvm
Consultant	Joanne Somerton (Senior Flood Risk Consultant)
Proposal	Eggborough CCGT Project – Proposed Development
Address	Land within and adjacent to the Eggborough Power Station site, Goole
Date of Reply	15 November 2016
Engineer to the Board/Officer	Paul Jones (Shire Group of IDB's)
On behalf of	Danvm Drainage Commissioners

Shire Group of IDBs

Epsom House
Chase Park Redhouse Interchange
Doncaster
South Yorkshire
DN6 7FE

To aid your Environmental Impact Assessment and your Flood Risk Assessment:-

There are no current nearby abstractions or discharges close to the site and no known pollution events. There have been no historical flood events in this area or known surface water flooding problems.

The IDB as a Consultee give the following comments/recommendations:

Our current guidelines for any increase in surface water discharge are as follows:-

If the surface water were to be disposed of via a soakaway system, the IDB would have no objection in principle but would advise that the ground conditions in this area may not be suitable for soakaway drainage. It is therefore essential that percolation tests are undertaken to establish if the ground conditions are suitable for soakaway drainage throughout the year.

If surface water is to be directed to a mains sewer system the IDB would again have no objection in principle, providing that the Water Authority are satisfied that the existing system will accept this additional flow.

If the surface water is to be discharged to any watercourse within the Drainage District, Consent from the IDB would be required in addition to Planning Permission, and would be restricted to 1.4 litres per second per hectare or greenfield runoff.

No obstructions within 7 metres of the edge of a watercourse are permitted without Consent from the IDB.

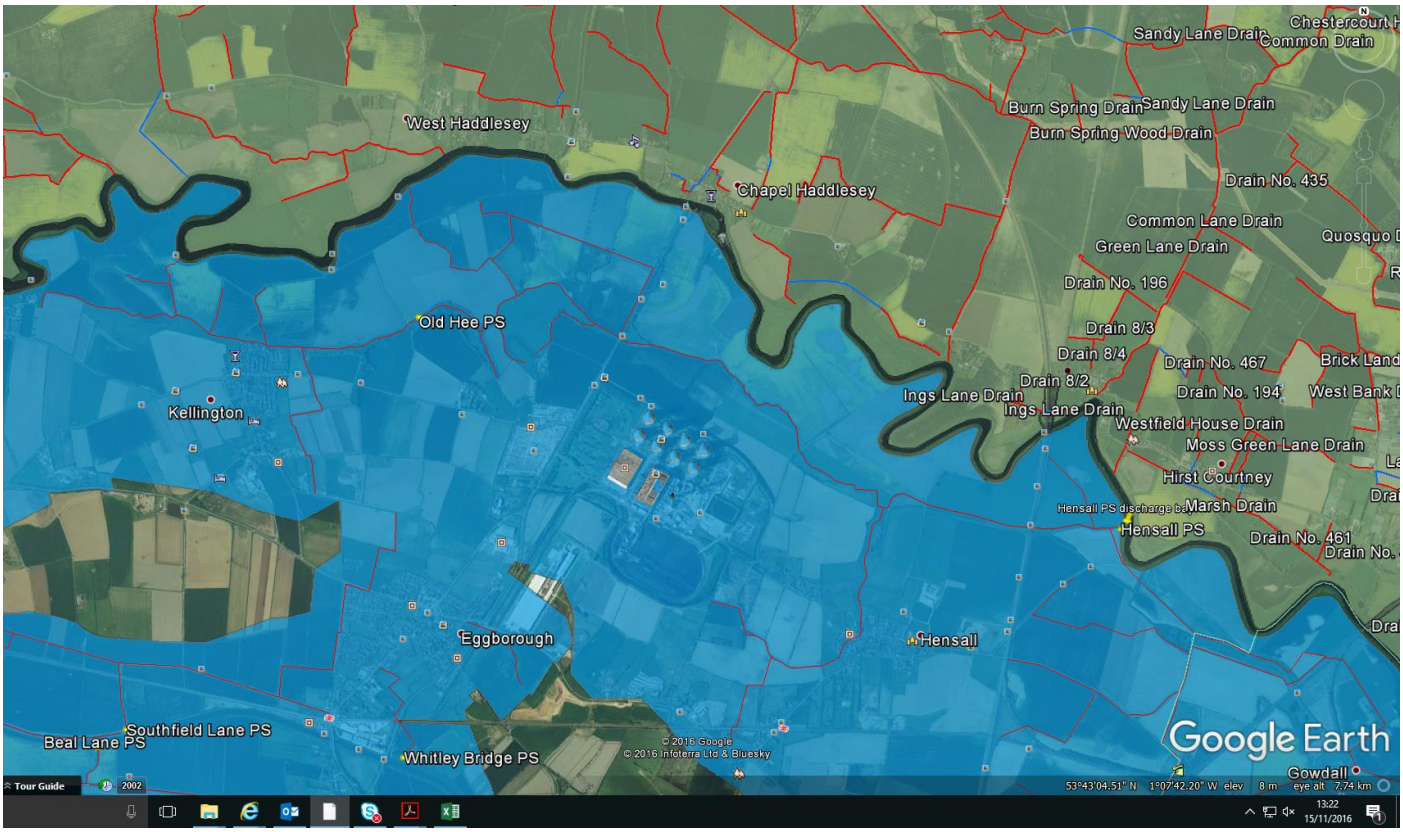
Advice/recommendations:

SHOULD Consent be required from the IDB as described above then we would advise that this should be made a CONDITION of any Planning DECISION.

ANY surface water discharge into ANY watercourses in, on, under or near the site requires CONSENT from the Drainage Board.

For further pre-application advice & consent form visit:
www.shiregroup-idbs.gov.uk, Select "Selby Area IDB"
For direct enquiries e-mail: planning@shiregroup-idbs.gov.uk

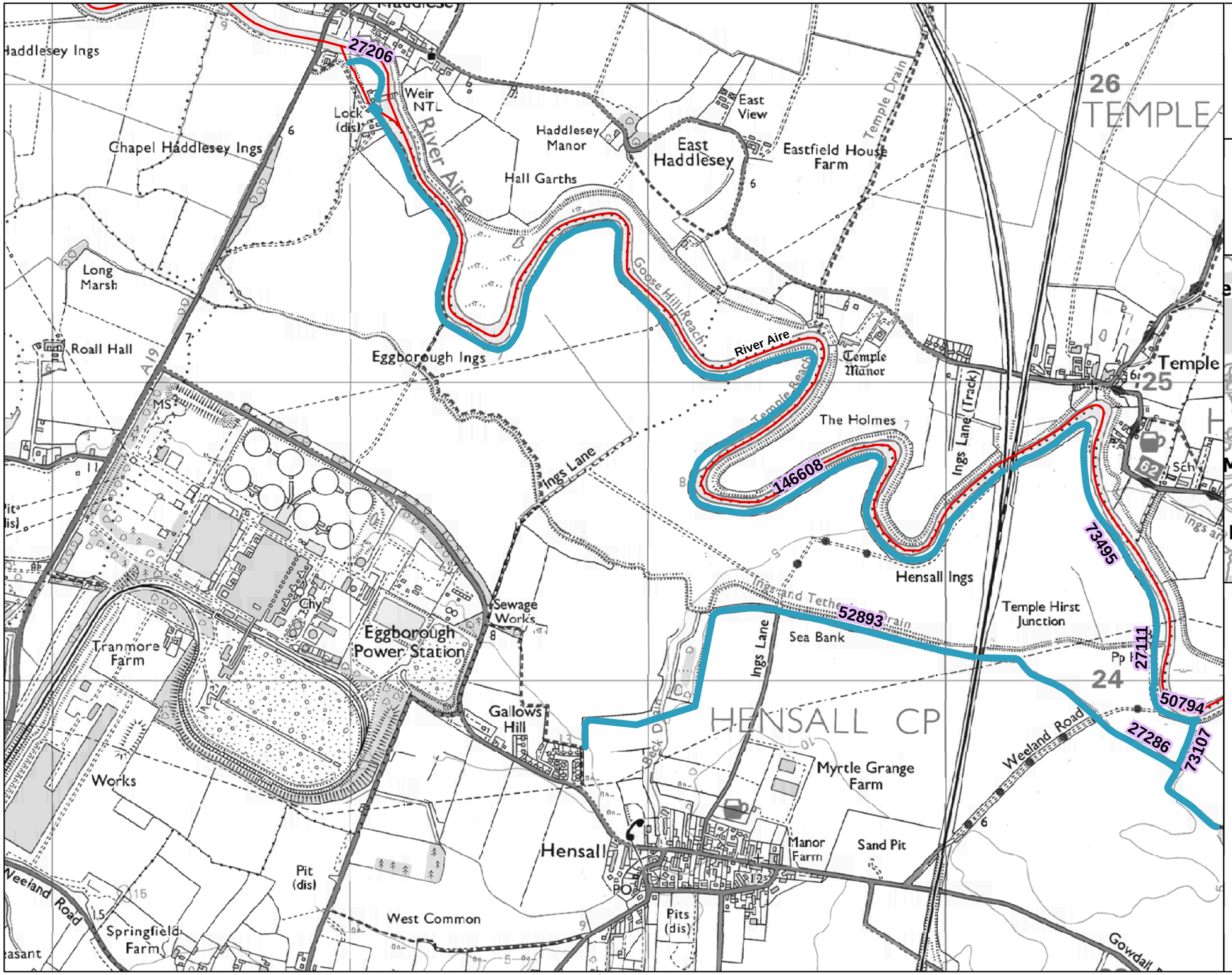
Mapping Information of the Area showing IDB watercourses



Asset Defence Information
RFI: 24535

Asset ID	Asset Type	AIMS Subtype	Asset Maintainer	Description	Design Standard of Protection (yrs)	Actual condition rating	ACTUAL Downstream crest level	ACTUAL Upstream crest level
27286	Defence	Embankment	environment_agency	EMBANKMENT	50	3	7.027	7.428
73107	Defence	Embankment	environment_agency	EMBANKMENT	50	2	6.928	7.003
52893	Defence	Embankment	environment_agency	EMBANKMENT	50	2	7.336	7.635
50794	Defence	Embankment	environment_agency	EMBANKMENT	50	3	6.944	6.761
27111	Defence	Embankment	environment_agency	EMBANKMENT	50	3	6.761	6.901
73495	Defence	Embankment	environment_agency	EMBANKMENT	50	3	6.845	6.469
146608	Defence	Embankment	environment_agency	EMBANKMENT	50	3	7.222	8.463
27206	Defence	Embankment	environment_agency	EMBANKMENT	50	3	8.384	8.618

Asset Defence Map, Eggborough, North Yorkshire. Date Created: 12/10/16 RFI: 24535



Environment Agency

www.environment-agency.gov.uk

Scale: 1:13,000

when reproduced @ A3

N
W E
S

LEGEND

- EMBANKMENT
- Main River

Contact Us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 08708 506 506 (Mon-Fri 8-6). Email: enquiries@environment-agency.gov.uk

Flood History Information: RFI: 24535

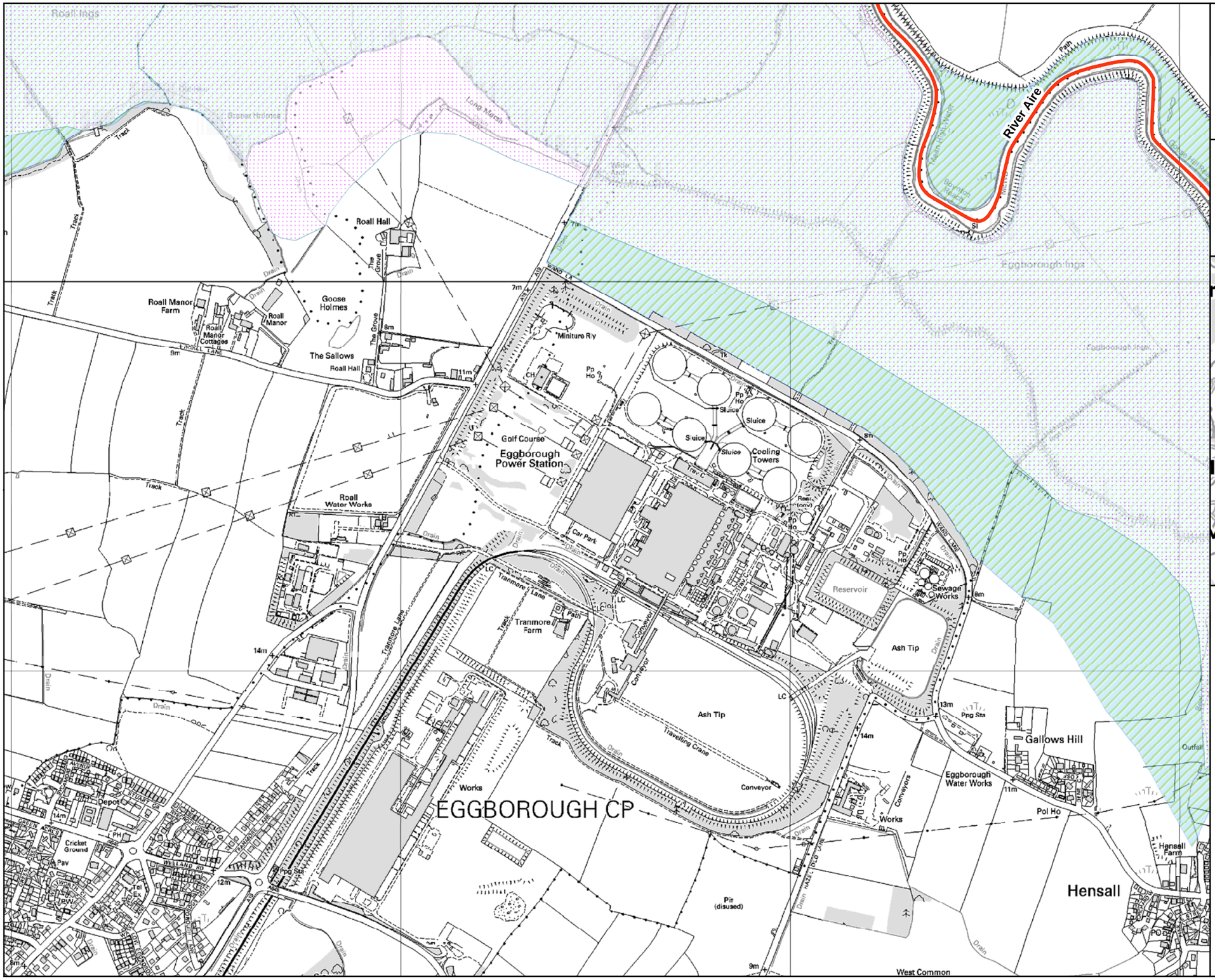
Name	Comments	Start Date	End Date	Source Of Boundary	Source Of Flooding	Cause Of Flooding
123 February 1995 - Lower Aire West Haddlesey Ings	Start and End dates do not relate to dates of flooding	01/02/1995	28/02/1995	Aerial Photography	Main river	Other
123 February 1995 - Lower Aire	Start and End dates do not relate to dates of flooding	01/02/1995	28/02/1995	Aerial Photography	Main river	Other
123 January 1982 - Lower Aire Eggborough Ings	Extent digitised from Yorkshire Water Authority Report on Flooding (01/82) - Fig 3.5	03/01/1982	31/01/1982	Surveyed Agency	Main river	Other
123 Autumn 2000	River Aire. Knottingley (Farm)	30/10/2000	15/12/2000	Surveyed- consultants	Main river	Unknown
123 January 1982 - Lower Aire Roall Ings	Extent digitised from Yorkshire Water Authority Report on Flooding (01/82) - Fig 3.5	03/01/1982	31/01/1982	Surveyed Agency	Main river	Other
123 February 1995 - Lower Aire	Start and End dates do not relate to dates of flooding	01/02/1995	28/02/1995	Aerial Photography	Main river	Other
123 January 1982 - Lower Aire Hensall Ings	Extent digitised from Yorkshire Water Authority Report on	03/01/1982	31/01/1982	Surveyed Agency	Main river	Other

	Flooding (01/82) - Fig 3.5					
123 January 1982 - Lower Aire West Haddlesey Ings	Extent digitised from Yorkshire Water Authority Report on Flooding (01/82) - Fig 3.5	03/01/1982	31/01/1982	Surveyed Agency	Main river	Other
123 March 1981	Roall to Hensall Ings Washland	22/03/1981	25/03/1981	Surveyed Agency	Main river	Other
123 March 1982	Chapple Haddlesey Ings - Flooding from local drainage	14/03/1982	14/03/1982	Surveyed Agency	Main river	Other
123 March 1982	Eggborough Ings - Flooding from local drainage	14/03/1982	14/03/1982	Surveyed Agency	Main river	Other
123 March 1982	Hensall Ings - Flooding from Ings and Tetherings Drain	14/03/1982	14/03/1982	Surveyed Agency	Main river	Other
123 December 1978 - Lower AIre Washlands	Washland operation	01/12/1978	31/12/1978	Surveyed Agency	Main river	Other
123 December 1978 - Lower AIre Washlands	Washland Operation	01/12/1978	31/12/1978	Surveyed Agency	Main river	Other

123 December 1978 - Lower AIre Washlands	Washland Operation	01/12/1978	31/12/1978	Surveyed Agency	Main river	Other
123 December 1978 - Lower AIre Washlands	Washland Operation	01/12/1978	31/12/1978	Surveyed Agency	Main river	Other
Lower Aire.	Washland Operation.	10/02/2002	13/02/2002	Aerial Photography	Main river	Other
Lower Aire Kellington Ings	Washland Operation	10/02/2002	13/02/2002	Aerial Photography	Main river	Other
Lower AIre. Eggborough Ings	Washland Operation.	10/02/2002	13/02/2002	Aerial Photography	Main river	Other
123 February 1995 - Lower Aire Eggborough Ings	Washland operation. Start and End dates do not relate to dates of flooding	01/02/1995	28/02/1995	Aerial Photography	Main river	Other
June 2007 Flood Event (Ridings Area)	Fluvial Flooding River Aire and Tributaries	25/06/2007	26/06/2007	Aerial photography	Other	Unknown
June 2007 Surface Water Flooding Yorkshire	Surface water flooding recorded from Aerial Photography. Multiple sources of flooding with	15/06/2007	25/06/2007	Aerial photography	Unknown	Unknown

	respect to NFCDD pulldown.					
December 2015 Flood Event	Aerial photography flown on 27, 28 and 30 Dec 2015	25/12/2015	29/12/2015	Public	Main river	Channel Capacity Exceeded- no raised defences
December 2015 Flood Event	Comments made by EA staff at Riccall Depot suggested that this area flooded.	25/12/2015	29/12/2015	Public	Main river	Channel Capacity Exceeded- no raised defences
December 2015 Flood Event	This area was reported to the NFU as having flooded.	25/12/2015	29/12/2015	Aerial photography	Main river	Channel Capacity Exceeded- no raised defences
December 2015 Flood Event	This area was reported to the NFU as having flooded.	25/12/2015	29/12/2015	Public	Main river	Channel Capacity Exceeded- no raised defences
December 2015 Flood Event	This area was reported to the NFU as having flooded	25/12/2015	29/12/2015	Public	Main river	Channel Capacity Exceeded- no raised defences

Flood History Map 1. Eggborough RFI: 24535 Date Created: 12/10/16



Environment Agency

www.environment-agency.gov.uk

Scale: 1:10,000

when reproduced @ A3

N W E S

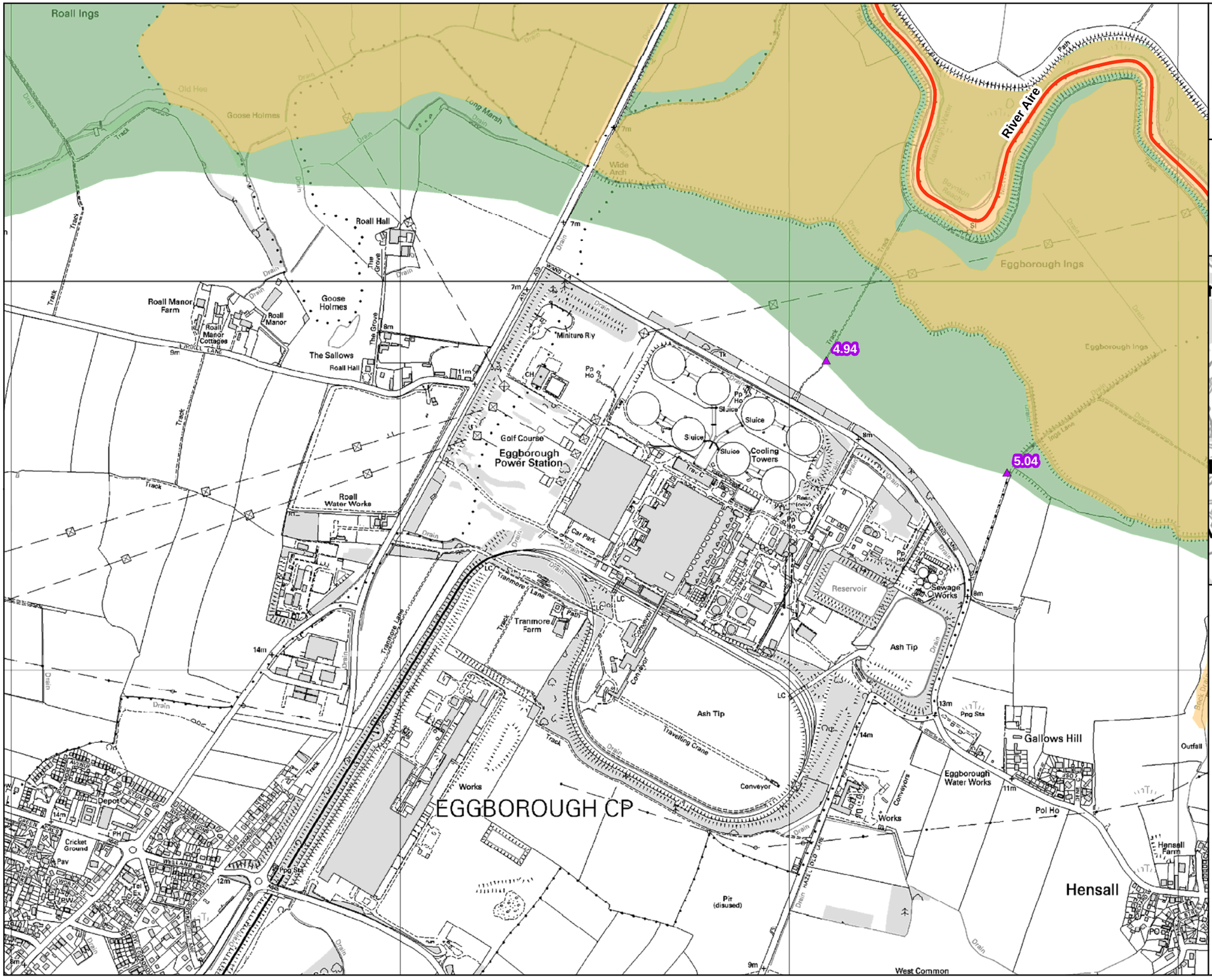
Historical Flood Extents and Levels

LEGEND

- Main River
- 1982 Flood Event Flood Extent
- River Aire 1978 Flood Event Flood Extent

Contact Us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 08708 506 506 (Mon-Fri 8-6). Email: enquiries@environment-agency.gov.uk

Flood History Map 2. Eggborough RFI: 24535 Date Created: 12/10/16



Environment Agency

www.environment-agency.gov.uk

Scale: 1:10,000

when reproduced @ A3

N W E S

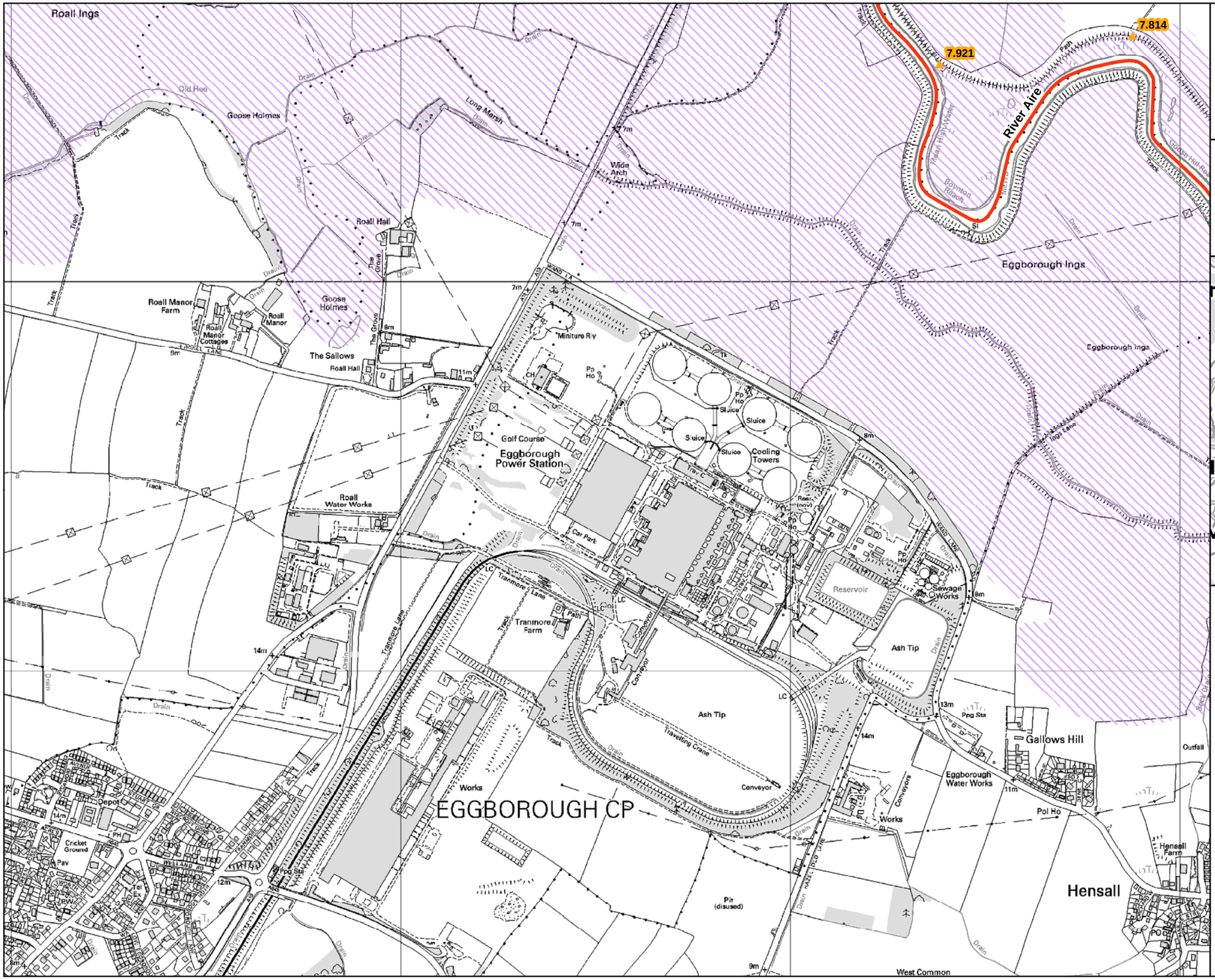
Historical Flood Extents and Levels

LEGEND

- Main River
- Feb 2002 Flood Event Flood Level (m)
- 1995 Flood Event Flood Extent
- Feb 2002 Flood Event Extent

Contact Us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 08708 506 506 (Mon-Fri 8-6). Email: enquiries@environment-agency.gov.uk

Flood History Map 4. Eggborough RFI: 24535 Date Created: 12/10/16



Environment Agency

www.environment-agency.gov.uk

Scale: 1:10,000

when reproduced @ A3

N W E S

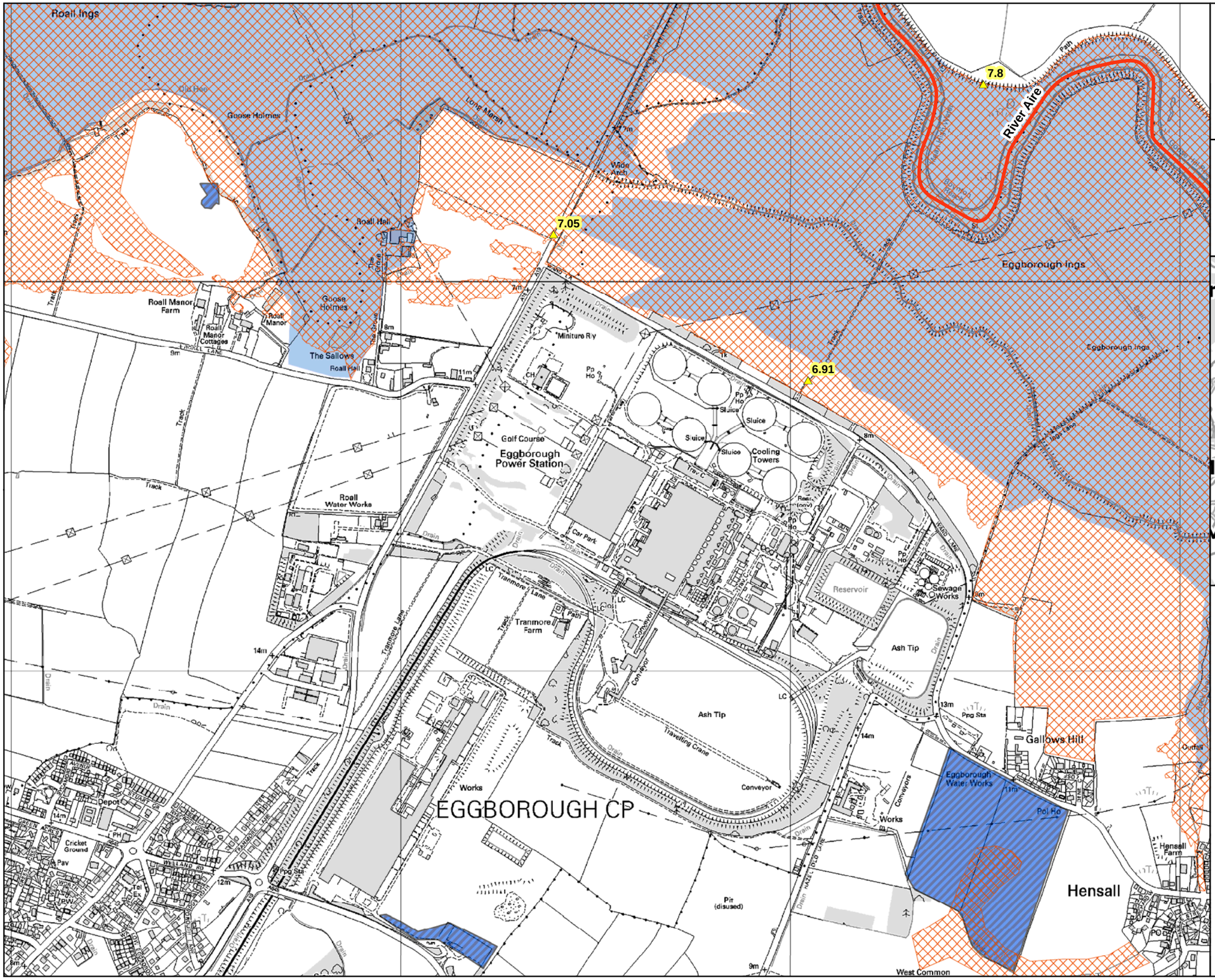
Historical Flood Extents and Levels

LEGEND

- Main River
- Dec 2015 Flood Levels (m)
- Dec 2015 Flood Extents - DRAFT

Contact Us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 08708 506 506 (Mon-Fri 8-6). Email: enquiries@environment-agency.gov.uk

Flood History Map 3. Eggborough RFI: 24535 Date Created: 12/10/16



Environment Agency

www.environment-agency.gov.uk

Scale: 1:10,000

when reproduced @ A3

N W E S

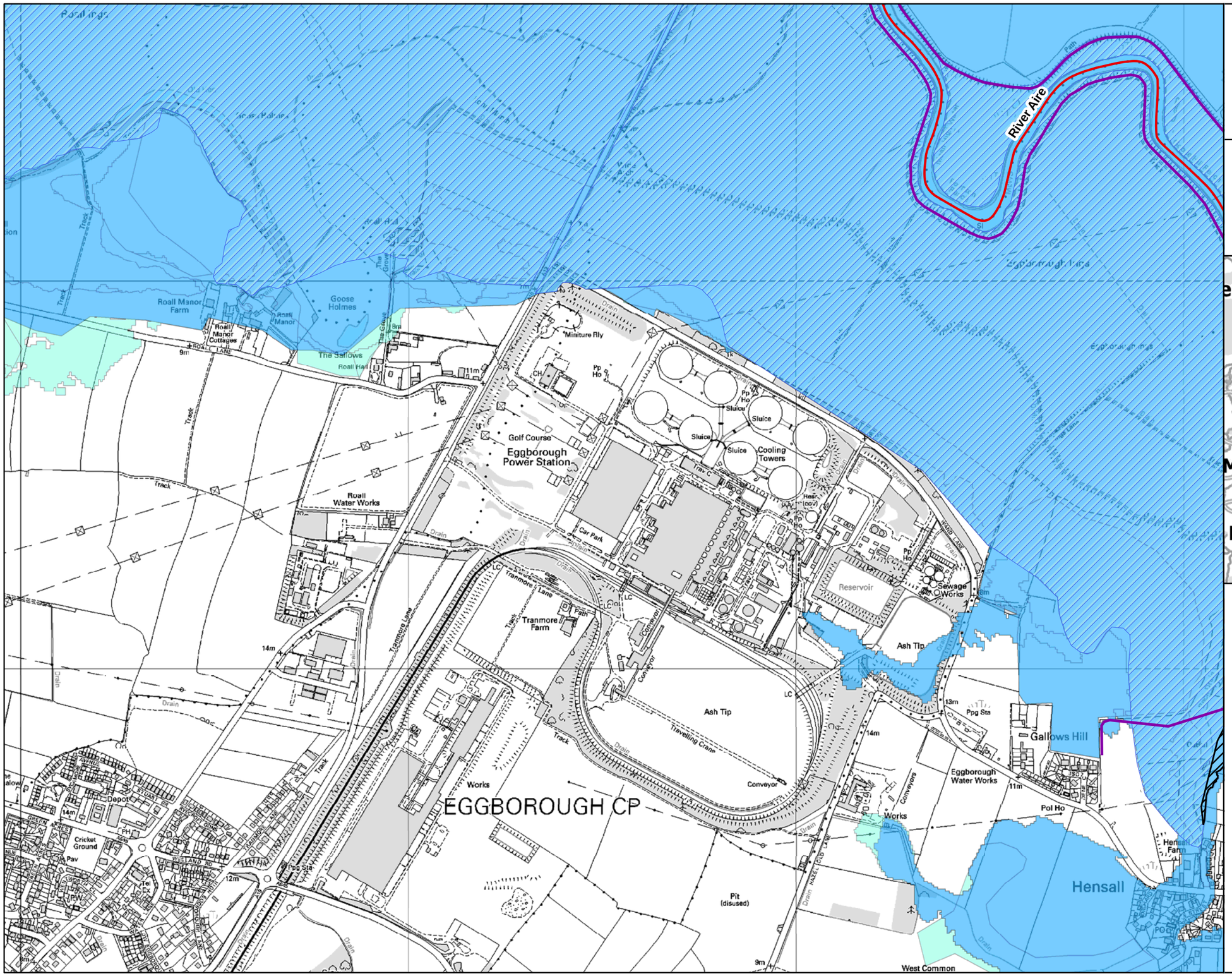
Historical Flood Extents and Levels

LEGEND

- Main River
- Autumn 2000 Flood Event Flood Level (m)
- Autumn 2000 Flood Event Flood Extent
- 2007 Flood Event Surface Water Flood Extent
- 2007 Flood Events Flood Extent

Contact Us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 08708 506 506 (Mon-Fri 8-6). Email: enquiries@environment-agency.gov.uk

Flood Map for Planning, Eggborough, North Yorkshire. Date Created: 12/10/16 RFI: 24535



Environment Agency

www.environment-agency.gov.uk

Scale: 1:10,000

N W E S

when reproduced @ A3

LEGEND

- Node Point Locations_point
- Main River
- Flood Storage Areas
- Flood Zone 3 (FZ3)
- Flood Zone 2 (FZ2)
- Areas Benefitting From Flood Defences
- Flood Map Flood Defences

Contact Us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 08708 506 506 (Mon-Fri 8-6). Email: enquiries@environment-agency.gov.uk

Node Point Information

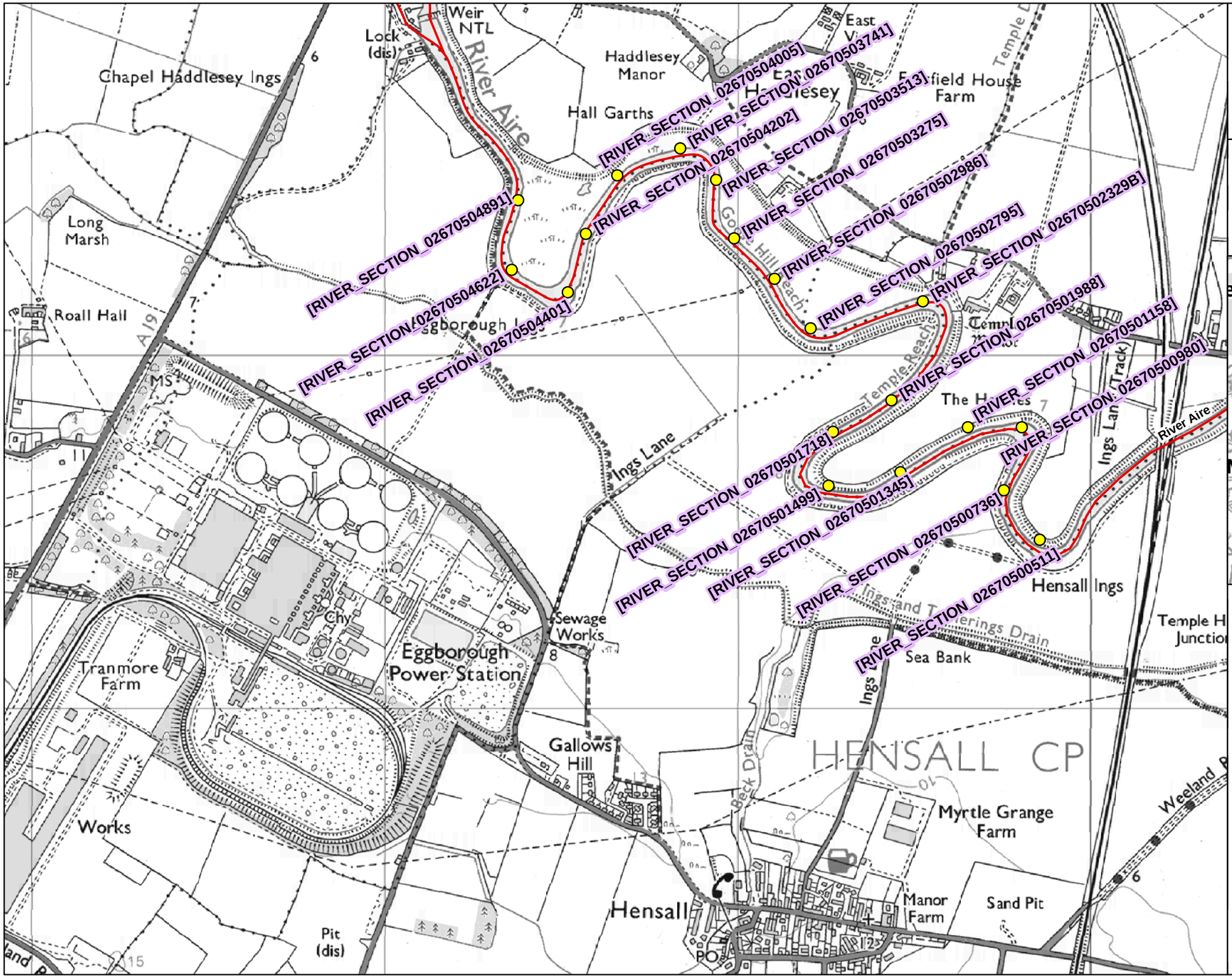
RFI: 24535

Lower Aire 2008 Model

DEFENDED	10% Annual Chance		4% Annual Chance		2% Annual Chance		1% Annual Chance		0.5% Annual Chance	
Node Label	Max Flow	Max Stage	Max Flow	Max Stage	Max Flow	Max Stage	Max Flow	Max Stage	Max Flow	Max Stage
2670500511	329.954	7.179	332.862	7.196	343.289	7.219	355.4	7.246	359.674	7.386
2670500736	330.062	7.232	333.21	7.249	344.021	7.275	356.775	7.304	361.405	7.425
2670500980	330.059	7.267	333.268	7.285	344.395	7.312	357.869	7.342	362.883	7.447
2670501158	330.132	7.291	333.601	7.31	345.182	7.338	359.338	7.368	364.721	7.462
2670501345	330.129	7.321	333.628	7.34	345.331	7.37	359.989	7.401	365.687	7.484
2670501499	330.127	7.341	333.64	7.36	345.331	7.391	360.009	7.424	365.749	7.501
2670501718	330.124	7.374	333.656	7.394	345.39	7.427	360.224	7.462	366.063	7.531
2670501988	330.121	7.436	333.674	7.457	345.391	7.493	360.232	7.532	366.066	7.59
02670502329B	330.117	7.555	333.694	7.578	345.407	7.62	360.406	7.666	366.379	7.707
2670502795	329.503	7.638	333.471	7.661	345.277	7.708	360.016	7.76	365.505	7.79
2670502986	329.496	7.651	333.505	7.675	345.291	7.723	360.089	7.775	365.667	7.803
2670503275	329.489	7.655	333.536	7.679	345.304	7.727	360.117	7.778	365.748	7.805
2670503513	329.486	7.663	333.551	7.687	345.31	7.735	360.124	7.786	365.747	7.812
2670503741	329.48	7.75	333.579	7.775	345.323	7.828	360.137	7.885	365.746	7.906
2670504005	329.47	7.782	333.708	7.808	345.966	7.861	362.172	7.92	368.458	7.941
2670504202	329.46	7.793	333.835	7.819	346.027	7.872	362.928	7.931	369.88	7.952
2670504401	329.454	7.751	333.927	7.775	346.044	7.825	362.94	7.879	369.921	7.898
2670504622	329.452	7.79	334.03	7.814	346.053	7.866	362.961	7.923	369.958	7.943
2670504891	329.449	7.849	334.021	7.875	346.06	7.93	362.967	7.99	369.958	8.013

UNDEFENDED	**1% (100yr)**	
Label	Max Flow	Max Stage
2670500511	320.06	7.296
2670500736	318.932	7.351
2670500980	319.136	7.385
2670501158	319.29	7.408
2670501345	190.474	7.49
2670501499	164.834	7.513
2670501718	164.241	7.512
2670501988	168.097	7.52
02670502329B	173.47	7.524
2670502795	190.206	7.526
2670502986	204.392	7.526
2670503275	205.649	7.527
2670503513	205.853	7.527
2670503741	214.171	7.535
2670504005	251.497	7.543
2670504202	282.475	7.543
2670504401	272.943	7.522
2670504622	287.85	7.54
2670504891	370.951	7.545

Node Point Map, Eggborough, North Yorkshire. Date Created: 12/10/16 RFI: 24535



Environment Agency

www.environment-agency.gov.uk

Scale: 1:11,000

when reproduced @ A3

N
W E
S

LEGEND

- Node Point Locations_point selection selection
- Main River

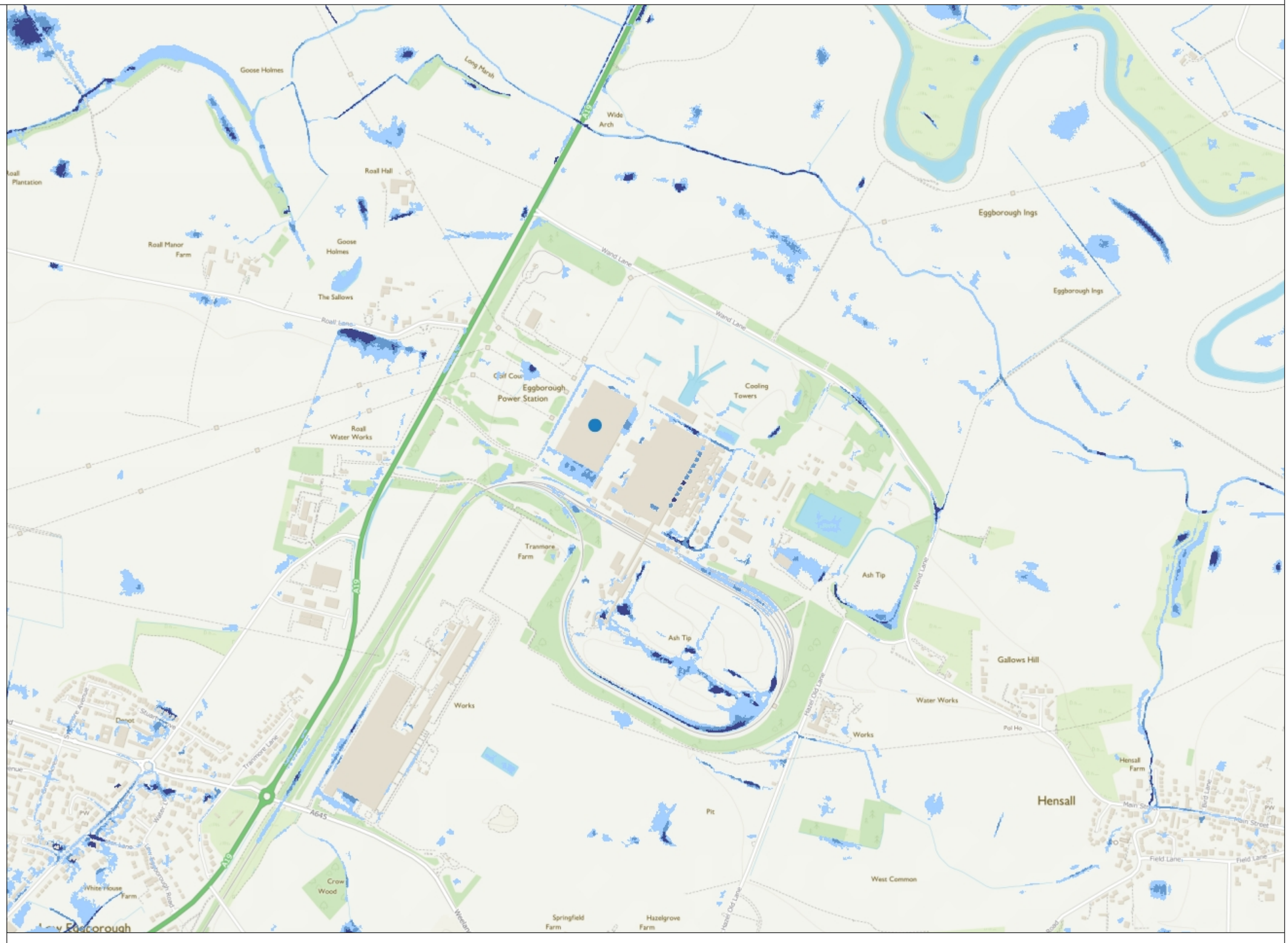
Contact Us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 08708 506 506 (Mon-Fri 8-6). Email: enquiries@environment-agency.gov.uk

Risk of Flooding by Surface Water for Eggborough Power Station

Environment Agency

Legend

- Flood Extent 1 in 30
- Flood Extent 1 in 100
- Flood Extent 1 in 1000



0 100 200 300

Metres

N W E S

Risk of Flooding by Surface Water for Eggborough Power Station

Environment Agency

Legend

- Flood Extent 1 in 30
- Flood Extent 1 in 100
- Flood Extent 1 in 1000

0 60 120 180

Metres

N W E S

ANNEX 5: OUTLINE DRAINAGE STRATEGY

Introduction

This Outline Drainage Strategy provides guidance and information with regards to the effective and safe drainage of surface water from the Proposed Development Site.

The Outline Drainage Strategy aims to present a preliminary high level strategy and has been prepared based on information available at the time of writing. As the detailed design of the Proposed Development is prepared, changes may alter the runoff flow paths or drainage characteristics of the Site, and in turn will impact impacting the efficacy of any drainage strategy. It is therefore important that the Outline Drainage Strategy is understood to be an initial concept that can be changed to best meet the needs of the Proposed Development, approving bodies and other stakeholders. The final drainage design will be the subject of a Requirement in the draft DCO.

The first part of this strategy relates to the areas of the Site that lie within the existing coal-fired power station site. The drainage strategy for areas of the Site outside the existing coal-fired power station site (namely the Proposed Cooling Water and Gas Connections) is discussed at the end of the document.

Drainage Strategy Overview

Existing Drainage Network

The existing Eggborough Power Station site drainage system collects surface water and pumps it to a concrete ash reservoir, where it is mixed with other process water and used to transport PFA to Gale Common. Within this drainage system there are three separate catchments associated with internal access roads, each connected to an oil interceptor prior to the connection to the ash reservoir. There are also separate catchments for the coal stockyard and existing contractor's hardstanding areas (in the vicinity of Hensall Gate), which also connect to the ash reservoir. The existing drainage catchments across the existing coal-fired power station site are broadly summarised as follows:

- the north-west part of the existing coal-fired power station site, including the area around the northern part of the National Grid 400 kV sub station and turbine hall, drain via pipes, drains and gullies to an oil interceptor located to the south-west of the existing cooling towers before reaching the ash reservoir;
- the central north-east part of the existing coal-fired power station site, including the flue gas desulphurisation plant to the east of the main existing coal-fired power station buildings (turbine hall and boiler house) drains via pipes, drains and gullies to an oil interceptor located to the south-east of the existing cooling towers before reaching the ash reservoir;
- the west and southern parts of the existing coal-fired power station site, including the southern part of the National Grid 400 kV sub station and turbine hall, drain via pipes, drains and gullies to an oil interceptor located to the north-west of the existing rail loop;
- the coal stockyard in the south of the existing coal-fired power station site has a perimeter drain which drains to a sump at the south-east of the coal stockyard, from where it is pumped to the ash reservoir;

- the easternmost parts of the existing coal-fired power station site including the emergency coal stockyard to the north-east of the rail loop and gravelled storage/ laydown areas drain via a combination of soakaways (although localised flooding is known to have occurred here) and a drainage system that is pumped to the ash reservoir.

All drainage that reaches the ash reservoir is pumped to Gale Common in the form of ash slurry for treatment and disposal. However, under special circumstances, the drainage water can be pumped from the ash reservoir to the effluent pond located at the north-eastern part of the existing coal-fired power station.

A schematic sketch of the effective drainage network is provided in Plate 1, below.

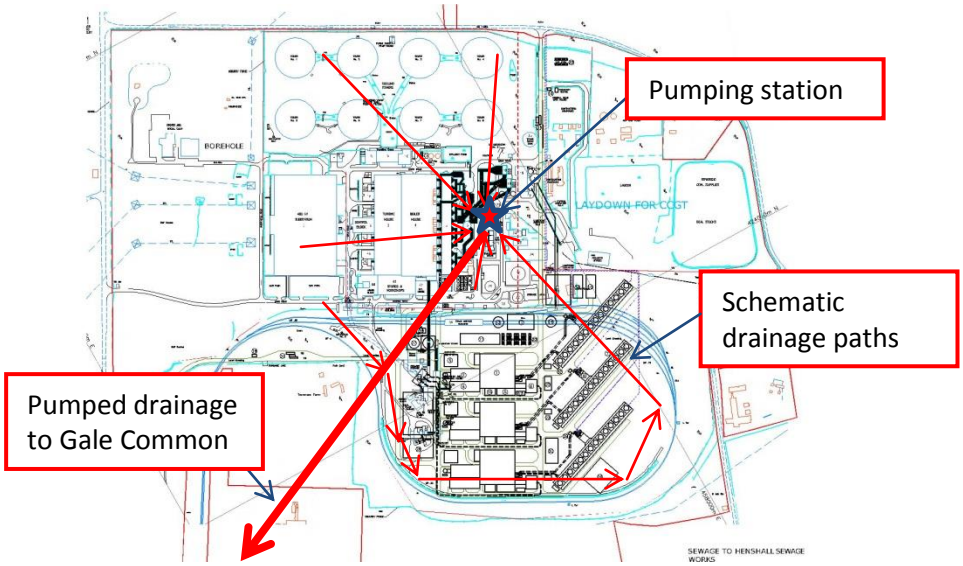


Plate 1: Eggborough power plant existing drainage network schematic sketch

Drainage Proposals Introduction

The outline drainage strategy for the Proposed Development considers construction and operation. The drainage strategy also separates the Site into two distinct areas, which are considered largely independently of each other – broadly the Proposed CCGT Area and the Proposed Construction Laydown area (which includes the CCR land). The division of the Site is shown in Plate 2. It should be noted that a small part of the Proposed CCGT Construction Laydown area, as well as the existing National Grid sub station area are included in the Proposed Power Plant Site for drainage purposes.

The drainage strategy for the Existing Coal-Fired Power Plant Area shown on Plate 2 is not considered in this document as the land falls outside the Site.

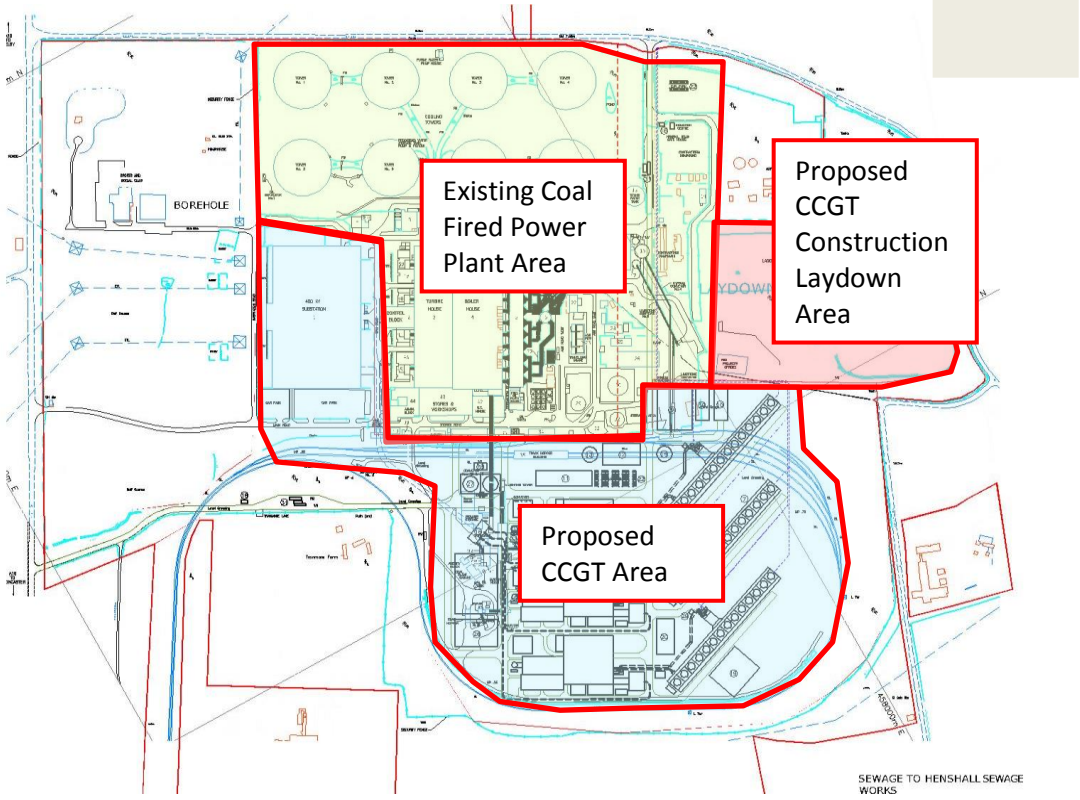


Plate 2: Division of existing coal-fired power station site for the purpose of drainage

Outline Drainage Strategy for the Proposed Development

As the timescales for demolition of the existing coal-fired power station (aside from the structures located within the Site which will be demolished as part of the construction phase of the Proposed Development) are unknown, the drainage strategy for the Proposed CCGT Area and Proposed CCGT Construction Laydown area is intended to be completely independent from the remainder of the existing coal-fired power station site.

Surface water on the Site will be drained according to the hierarchy of drainage, defined as part of the National Planning Policy Framework's Planning Practice Guidance, which states that the preferred methods of drainage are, in order, infiltration, discharge to a watercourse, and discharge to a sewer. Sustainable drainage principles (SuDS) will also be applied as applicable.

There are three watercourses local to the Eggborough Power Station site. These are the River Aire, Ings and Tetherings Drain (an IDB operated land drain between the River Aire and the existing coal-fired power station site) and Hensall Dyke (a second IDB operated land drain to the south-east of the site which flowed through part of the existing coal-fired power station site prior to its development). Watercourse discharge consents must be obtained from the operators of each watercourse that is to be discharged into. An agreement in principle to the discharge of surface water runoff from the Proposed Power Plant Site and Proposed Construction Laydown area to Hensall Dyke has been confirmed through consultation with the IDB (Danvm Drainage Commissioners).

The drainage strategy will effectively manage the risk of flooding from pluvial sources, and the risk from fluvial sources is generally considered to be low due to the presence of existing riverside embankments and elevated land at Wand Lane which separates the majority of the existing coal-fired power station site from the area of Flood Zone 3 immediately to the north of Wand Lane. Localised defences in the form of raised bunds could be provided if necessary to protect the small area in the northern part of the site that falls within Flood Zone 3, subject to agreement with the Environment Agency.

SuDS

The use of SuDS is considered in all development phases and is favoured over conventional sewer based drainage where practicable. The CIRIA SuDS manual defines SuDS as being drainage systems *"designed to maximise the opportunities and benefits we can secure from surface water management"*. SuDS include drainage infrastructure that is considered sustainable. In general this consists of drainage systems that offer an alternative to direct channelling, including attenuation and infiltration systems as well as infrastructure that passively improves water quality.

SuDS must be 'adopted' after their installation, meaning that an organisation or body must accept responsibility for their operation and maintenance. It is assumed that EPL would accept this responsibility..

Key Constraints and Assumptions

The drainage strategy that is to be adopted will have to consider a number of constraints which limit or alter the efficacy of options that may otherwise be preferable. The key constraints and assumptions are summarised below.

- The drainage network will be designed to prevent flooding during a 1 in 30 year + climate change (CC) storm event with appropriate surface water management up to a 1 in 100 year + CC to limit ponding to non-critical areas of the Site.
- Discharge from the Site into any of the local watercourses is to be limited to greenfield runoff rates. Selby District Council identify this to be 1.4 l/s/ha (Selby District Council Planning Committee, 2016) and the local IDB has confirmed that this is likely to be a requirement of the consent to discharge to Hensall Dyke. Although the existing coal-fired power station site is classified as brownfield, the maximum allowable discharge will likely be the greenfield rate as currently all surface water on the existing coal-fired power station site is used to transport PFA to Gale Common, meaning that the effective impact of the existing coal-fired power station site on the drainage of the surrounding area is non-existent. As such, even discharge at the greenfield rate would represent an increase in impact from the existing coal-fired power station site, although the IDB's pumping station for this catchment (Hensall Pumping Station) was designed and commissioned before the current coal-fired power station drainage system (pumping to Gale Common) was implemented so Hensall Pumping Station would have been designed to accommodate runoff from the existing coal-fired power station site (and hydraulic modelling undertaken by Danvm Drainage Commissioners has confirmed that the proposed surface water discharge can be accommodated within the Hensall Pumping Station catchment).
- The footprint of drainage infrastructure is to be kept to a minimum, particularly outside the Proposed CCGT Area to avoid conflict with any future uses of the wider existing coal-fired

power station site following decommissioning and demolition of the existing coal-fired power station.

- The drainage network for the CCGT plant and associated infrastructure such as the National Grid sub station should be kept independent from the rest of the existing coal-fired power station site.
- Potential contamination of the ground from pollutants such as oils and sulphate leachates from the stored coal will limit the potential for infiltration-based drainage initially. Any contamination will be appropriately mitigated during re-development and accordingly infiltration could be a viable option for the Proposed CCGT Area, provided that the geotechnical conditions allow it (i.e. depending on infiltration rates).
- Actively pumped drainage is to be avoided in the long term, if possible, to reduce operational costs and because of potential flood risk implications within the Site if the pumps were to fail.
- Surrounding agricultural land that is owned by EPL could be used as part of the surface water management strategy if a robust case that it is preferable to alternatives can be made. However, at this stage no such use of the land is proposed.
- It is assumed that decommissioning of the existing coal-fired power station will involve the removal of all above ground structures and some below ground structures, but the currently impermeable ground will remain impermeable and existing roads will be retained.
- In calculations of attenuation volumes it has been conservatively assumed that all land within the Proposed CCGT Area and Proposed CCGT Construction Laydown Area is impermeable with the exception of the area around the existing lagoon, unless otherwise stated. This has resulted in a worst case scenario for required storage volumes.
- All attenuation volumes have been calculated using the quick storage estimate function within MicroDrainage Source Control tool, to provide initial concept values.

Proposed CCGT Area Outline Drainage Strategy

Overview

The Proposed CCGT Area is to be constructed on the site of the existing coal stockyard in the south of the Site. The drainage catchment area is approximately 33 hectares. Topographic data shows that this area currently slopes towards the south-east with a low point ridge running approximately north-west to south-east through the centre. It is believed that ground levels in this area have dropped as a result of mining subsidence which may be ongoing. There is a large embankment which encloses the coal stockyard on the west, south and east, in a horseshoe shape. The embankment has a concrete drainage channel at its toe on the inner face.

A portion of the Proposed CCGT Construction Laydown Area extends into the existing coal stockyard (at its eastern end). This has been included in the Proposed CCGT Area for drainage purposes and as such is included in the area estimate given above.

Construction Proposal

The area in which the CCGT plant is to be built has significantly less infrastructure to be removed than the area of the existing coal-fired power station (to the north); however there are some assets to be removed as well as land decontamination and pre-construction works to prepare the Site for construction. Currently the drain located at the south of the coal stockyard collects the surface water from the area. It is possible that the base level of the coal stockyard, located below the coal carpet, may be beneath the drain invert level, and there is some evidence that ponding

occurs towards the south-eastern edge of the coal stockyard, at the low point. Currently the surface water is pumped from the south-eastern edge of the coal stockyard to the ash reservoir but the ash slurry pumps are to be decommissioned shortly after closure of the existing coal-fired power station requiring changes to the existing managed surface water drainage system. An alternative strategy is therefore required in advance of the ash slurry pumps being decommissioned to avoid the risk of flooding on site during construction of the Proposed Development.

Attenuation will be encouraged in a formalised surface water storage system which then discharges via the existing (but currently unused) pipe beneath the embankment to Hensall Dyke, the local watercourse to the south-east of the coal stockyard. Prior to the construction of the existing coal-fired power station, this was the historic drainage method for the area, and surface water was discharged to Hensall Dyke at the start of the existing coal-fired power station's operation prior to the implementation of the pumped system for ash transport. This option would likely require a greater upfront cost, but would be more operationally practical and have a greater flexibility for integration with the drainage network for the completed CCGT development.

Hensall Dyke is operated by the local IDB and as such the discharge rate is expected to be limited to 1.4 l/s/ha during a 1 in 30 year event. To ensure this is not exceeded the proposed attenuation will need to be adequately sized. For a 1 in 30 year storm the required storage volume is between 22,700 m^3 and 29,700 m^3. If the design event is reduced to a 1 in 10 year event during this temporary phase then the required volume would be between 16,500 m^3 and 23,000 m^3. The use of infiltration-based drainage where appropriate and feasible could reduce the estimated required storage volume but the volume of water that could be infiltrated will depend on the infiltration rate and ground permeability/ suitability of soils.Protection against ongoing contamination from oil and fuel spills and any other pollutants which may be present on site will also be required. This could be in the form of an oil interceptor downstream of the attenuation or through site management techniques to separate potential sources of contamination from the receiving watercourse.

If it is impractical to initially size the attenuation pond for a 1 in 30 year flood event then additional temporary measures can be implemented such as use of drainage channels for storage and surface water management techniques including manipulation of levels and slopes across the area.

The drainage that is currently provided to the National Grid sub station connects to the existing coal-fired power station drainage network within the existing coal-fired power plant area. It is proposed that the existing sub station's drainage should be integrated with the CCGT plant area's drainage as they are to operate together as part of the proposed CCGT development. The easiest way to integrate the drainage of the existing sub station and the CCGT plant area will be to redirect the existing sub station drainage to the proposed drainage at the CCGT plant area. This has been included in the storage volume calculations discussed above.

Operation Proposal

A key assumption for the permanent drainage strategy for this area is that it should be independent of the wider existing coal-fired power station, so that its implementation can be delivered without dependence on the timing of decommissioning, demolition and/or re-development of the wider existing coal-fired power station site.

The Proposed CCGT Area is to be a compactly developed site but there will however, still be 'dead space' between the Proposed Power Plant buildings, roads and cooling towers. For the purpose of this outline drainage strategy it has been assumed that the empty spaces will all be permeable and that they will represent 30% of the total area of the Proposed CCGT Area. It is proposed that these empty spaces around and between the buildings and infrastructure are used for a series of small to medium sized SuDS. It is proposed that the total attenuation volume of these SuDS is that required to provide 1 in 30 year storage volumes in combination with the attenuation pond described below. These SuDS may be in the form of ponds, swales or soakaways.

The required volume for attenuation, if infiltration is not used, is estimated to be between 13,700 m^3 and 19,300 m^3 for a 1 in 30 year storm event, assuming 30% permeability across the area (see calculations at the end of this Annex). This may be reduced to if infiltration methods are also employed. Space for surface water storage and attenuation has been allowed in the indicative layouts for the Proposed Development.

Detailing the exact location for the above proposed SuDS is outside the scope of this high level strategy and not appropriate until the detailed design for the Proposed Development has been completed; however areas that initially appear particularly well suited for SuDS include the spaces between the three banks of cooling towers, empty space to the east of the turbine halls and the southern area which currently comprises the concrete drainage channel and railway line to the south. A sketch of the potential layout is shown in Plate 3.

The storage and attenuation pond will be connected to Hensall Dyke as described for the construction phase. This has been agreed in principle with Danvm Drainage Commissioners. If for any reason a consent to discharge surface water runoff to Hensall Dyke is not granted by the IDB, the alternative solution would be to discharge surface water via the cooling water discharge connection to the River Aire.

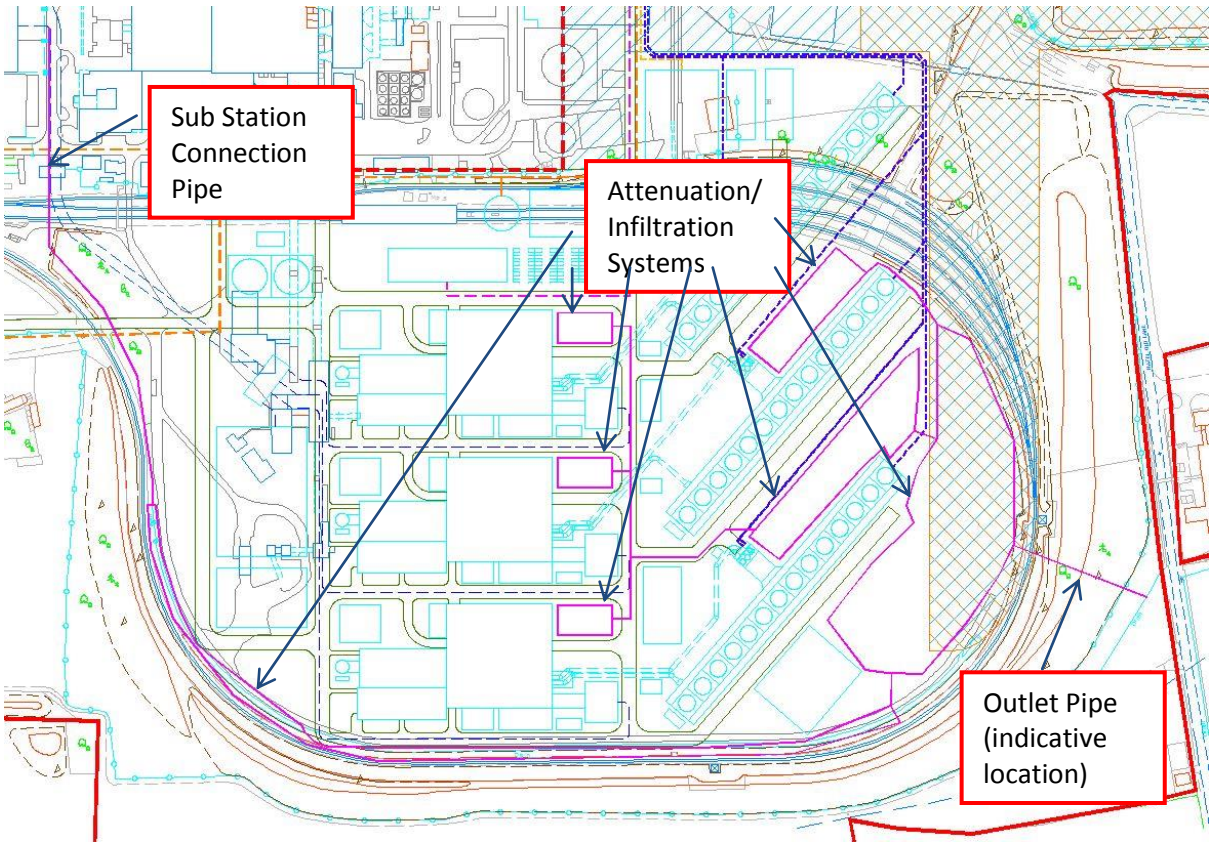


Plate 3: Sketch of Proposed Strategy for Proposed CCGT Area

Proposed CCGT Construction Laydown Area

Overview

The Proposed CCGT Construction Laydown Area comprises the eastern portion of the Site and is approximately 8 hectares in area. This is almost entirely hardstanding, with the exception of the existing lagoon, and as such is assumed to be impermeable. Topographic data shows the area to be largely flat with a low point at the northern site boundary and a second low point at the far eastern side, south of the Yorkshire Water waste water treatment works. The portion of the Proposed Construction Laydown area that extends into the coal stockyard is considered to be drained as part of the Proposed CCGT Area and as such has been considered in the previous section above. This portion of the Proposed CCGT Construction Laydown Area has not been included in the area estimation above.

It has been assumed that the existing lagoon will be drained and levelled to match the surrounding area.

Construction Proposal

The Proposed CCGT Construction Laydown Area is to be used for general site activity including management, movement and storage of plant and materials during the construction of the

proposed CCGT development. Accordingly large ponds, swales and other above ground attenuation methods are considered to be undesirable, unless they can be demonstrated to be superior options and are positioned to be as out of the way of the works as possible.

The area offers clear opportunities for the use of four drainage paths; drainage via the northern low point to the River Aire, drainage via the south-eastern low point to Hensall Dyke, drainage to the existing coal fired power plant existing network (as long as it remains in operation), and drainage via infiltration. As there is no effective drainage strategy in place for this area, all of the above options would require upfront work.

It has been assumed that there is a limit on allowable discharge to watercourses of 1.4 l/s/ha. Attenuation will be required to prevent exceedance of this discharge limit. The attenuation systems will, unless drainage is connected to the existing coal-fired power station drainage network, need to be provided within the Proposed CCGT Construction Laydown area. The method through which this may be provided is constrained, as detailed above, by the use of this area for construction laydown.

The required attenuation volume for protection against a 1 in 30 year flood event without infiltration has been estimated as being between 5,500 m^3 and 7,200 m^3. This would require a 2 m deep square tank or pond of dimensions between 52 m x 52 m and 60 m x 60 m. If the design event is reduced to a 1 in 10 year storm then the required storage volume is estimated at between 4,000 m^3 and 5,570 m^3, or a 2 m deep square tank or pond of dimensions between 45 m x 45 m and 53 m x 53 m.

The best location for an infiltration and attenuation area is at the south-east corner of the Proposed CCGT Construction Laydown Area. It is considered that below ground attenuation is not appropriate in this location due to the possibility of accidental overloading of the structure, as such above ground solutions are preferred. This is likely to be in the form of either a pond or a swale that is sized to meet the storage requirements. This area could drain out of the Site to the south to Hensall Dyke (via the Proposed CCGT Area connection beneath the embankment or a separate direct connection running between the embankment and Hazel Old Lane). Infiltration drainage may also be acceptable assuming any risk of contamination is appropriately managed and mitigated. If infiltration drainage is used then there would be potential to reduce the volume of storage required.

A sketch showing the potential arrangement of drainage infrastructure is given in Plate 4. Note the indicative size of the attenuation area is based on the required storage for a 1 in 30 year flood event.

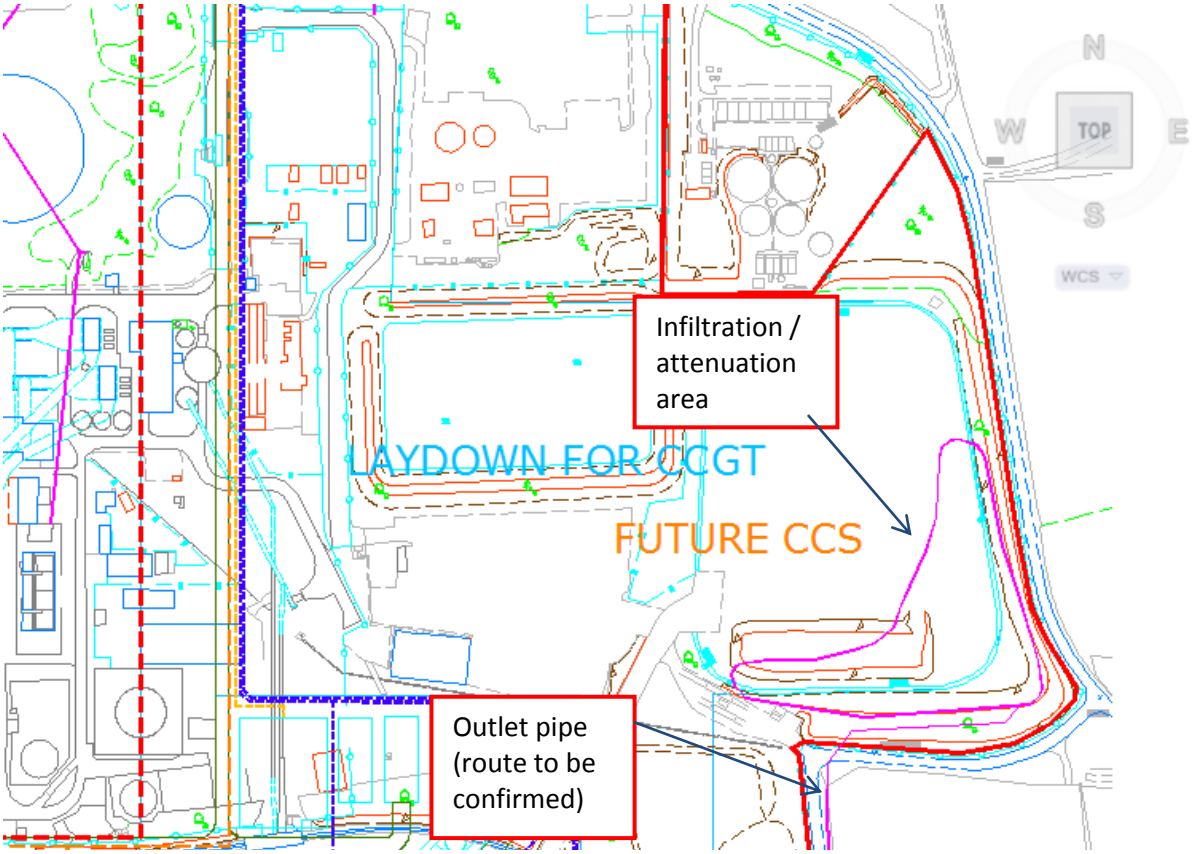


Plate 4: Sketch of proposed drainage solution for the Proposed CCGT Construction Laydown Area during construction

Measures to prevent contamination of surface water will be required. Above ground storage such as ponds and swales should offer water quality benefits over underground storage, but measures will still be required to provide management of contamination risk and oil interceptors where they are appropriate.

Flood defences of an appropriate level could be installed along part of the northern site boundary to protect against the risk of fluvial flooding from the north via low points on Wand Lane, or the risk of flooding could be accepted and appropriate measures to manage the site and staff in the event of a flood be implemented. (

Operation Proposal

The storage and attenuation pond proposed in the south-east of the area is included as part of the Indicative Landscape and Biodiversity Strategy for the Proposed Development (see Application Document Ref. No. 5.10).

Proposed Cooling Water and Gas Connections

The areas of land outside the existing coal-fired power station that are required for the Proposed Cooling Water and Gas Connections generally comprise agricultural land and farm access tracks, together with highways (Wand Lane, Millfield Road, A19 and West Lane), the existing cooling water abstraction pump compound, Ings and Tetherings Drain and other minor drains and ditches. The River Aire and A19 will be crossed by trenchless techniques.

The majority of the agricultural land within the Site is located in Flood Zones 2 and 3. The majority of this land is required for below ground pipelines, so although short term impacts on infiltration rates and existing land drains may occur during construction, land drains will be reinstated after construction and drainage will be returned to its current condition. Construction methods to avoid an increase in flood risk during the construction works are set out in the Flood Risk Assessment, which this Strategy supports.

No alterations to existing highway drainage or drainage at the cooling water abstraction compound are proposed, and Ings and Tetherings Drain and other minor drains and ditches will be reinstated to their pre-construction condition.

The Above Ground Installation (AGI) site at the northern end of the Proposed Gas Connection corridor will introduce small areas of impermeable surface (access roads and hardstanding, kiosks, etc) which is proposed to be drained via infiltration within the AGI site.

Conclusion

The Outline Drainage Strategy has been divided into three sections based on location – the Proposed CCGT Area, the Proposed CCGT Construction Laydown Area, and the Proposed Cooling Water and Gas Connections.

The Proposed CCGT Area can be effectively drained to Hensall Dyke to the south-east of the Site. This will require drainage infrastructure to either pass under the embankment which partially encircles the existing coal stockyard or to go around it. As discharge rates are expected to be be limited to 1.4 l/s/ha attenuation will be required. It is proposed that this be located throughout the Proposed CCGT Area in the otherwise unused space between the buildings with a focus on the south-east of the area as the site topography will encourage drainage in this direction. Use can be made of an existing concrete channel, although converting this to a grassed swale may offer a better long term solution. Infiltration drainage may be viable for parts of the Proposed CCGT Area and this would reduce the required storage volume.

Agreement in principle for the proposed surface water discharge to Hensall Dyke has been reached with Danvm Drainage Commissioners. If for any reason a discharge consent is not granted by the IDB, the alternative solution is to discharge surface water via the cooling water discharge to the River Aire.

Drainage for the Proposed CCGT Construction Laydown Area is constrained by a lack of existing drainage, a requirement for open space, and a likelihood of heavy loads during construction. An attenuation or infiltration SuDS asset is proposed in the south-eastern corner of the area.

Drainage for the majority of the Proposed Cooling Water and Gas Connections will return to existing conditions following construction. The only new area of impermeable surface will be at the Proposed AGI site, which will be drained via infiltration within the AGI site.

Summary

Surface water is to be managed so that ponding does not occur at during a 1 in 30 year event. This is to be designed with climate change in mind so that at the end of the existing Proposed Development's life span the standard of protection is not below this. At higher return period events surface water is to be managed through on site slopes and levels so that localised ponding occurs in non-critical areas only.

Two surface water storage and attenuation ponds are proposed, one for the Proposed CCGT Area and one for the Proposed CCGT Construction Laydown Area. Both are proposed to discharge to Hensall Dyke to the south-east of the Site (or the River Aire, if necessary). The required storage volumes could also be reduced through the use of infiltration drainage where practical..

References

Ballard et al. (2015). *The SuDS Manual.* London: CIRIA. Pg 6.

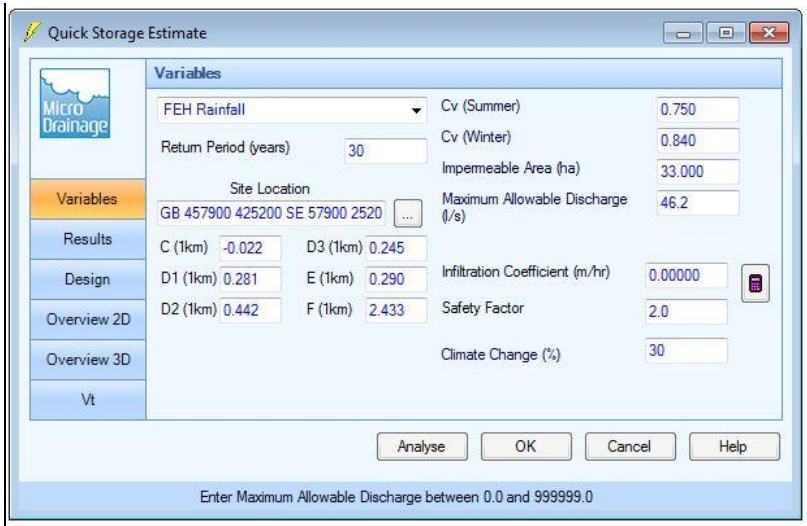
Environment Agency website available at - http://maps.environment-agency.gov.uk/wiyby/wiybyController?topic=floodmap&layerGroups=default&lang=_e&ep=map&scale=10&x=451553.06250000005&y=422946.6145833332

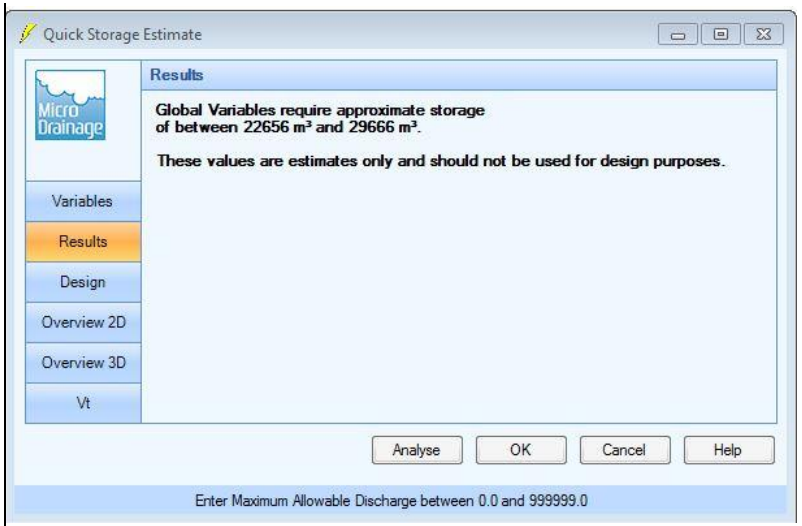
Flood Warning Information Service website available at - https://flood-warning-information.service.gov.uk/long-term-flood-risk/map?easting=457532.54&northing=424462.55&address=200001022810

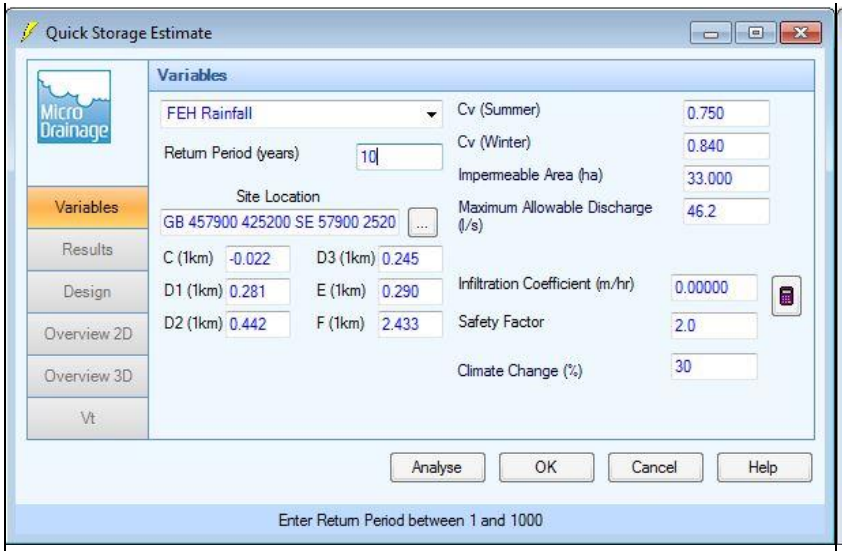
Selby District Council Planning Committee (2016) *Agenda Item 7.3 Proposal for demolition of existing dwelling and erection of a new dwelling, section 2.19 recommendation 06.* Minutes of Selby District Council Planning Committee meeting, 8th June 2016, Council Chamber, Selby.

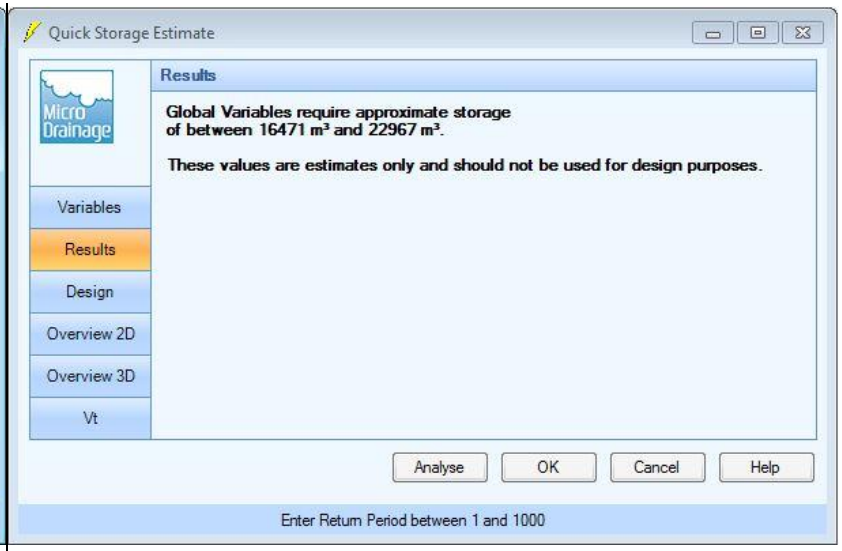
Storage Volume Calculations

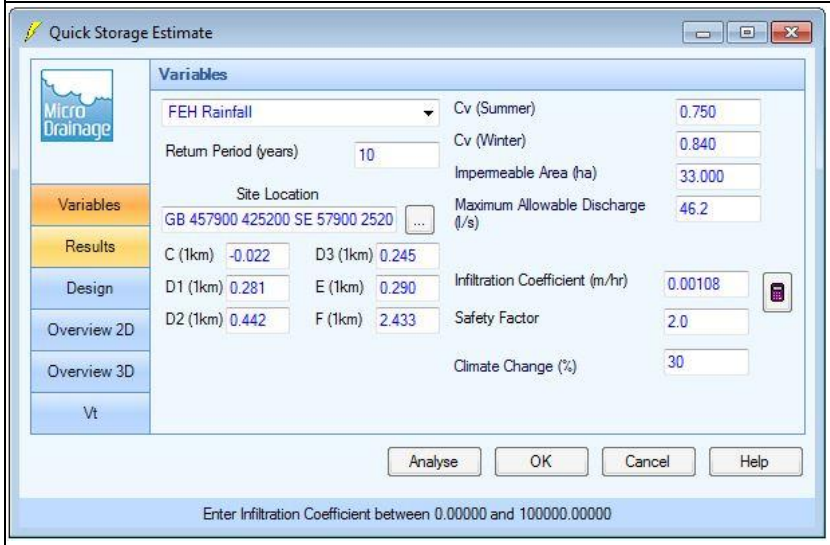
Storage volume calculations for Proposed Power Plant Site

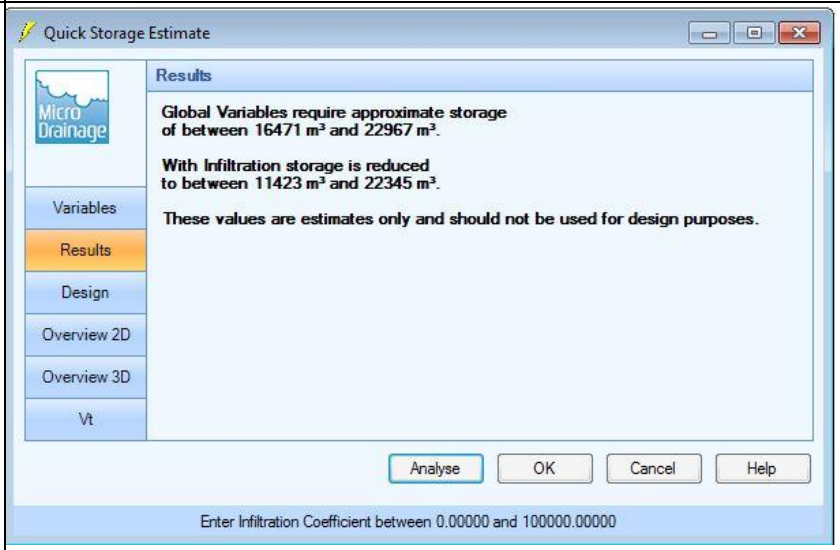


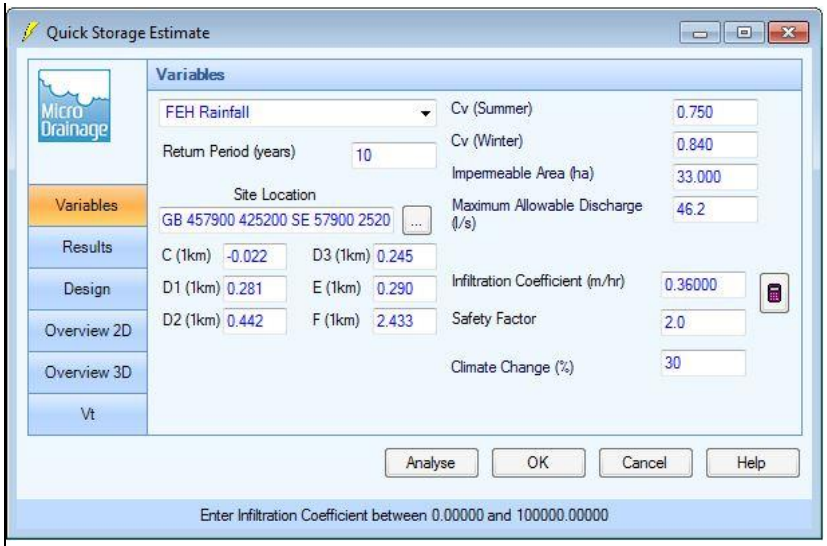


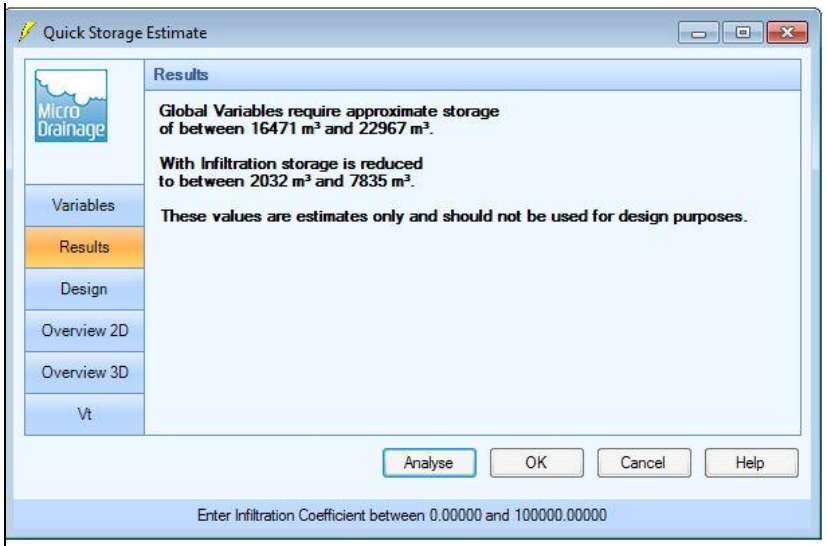

Quick Storage Estimate
Micro Drainage
Variables
Results
Design
Overview 2D
Overview 3D
Vt
FEH Rainfall
Return Period (years) 10
Site Location
GB 457900 425200 SE 57900 2520
C (1km) -0.022
D1 (1km) 0.281
D2 (1km) 0.442
D3 (1km) 0.245
E (1km) 0.290
F (1km) 2.433
Cv (Summer) 0.750
Cv (Winter) 0.840
Impermeable Area (ha) 33.000
Maximum Allowable Discharge (l/s) 46.2
Infiltration Coefficient (m/hr) 0.00000
Safety Factor 2.0
Climate Change (%) 30
Analyse
OK
Cancel
Help
Enter Return Period between 1 and 1000

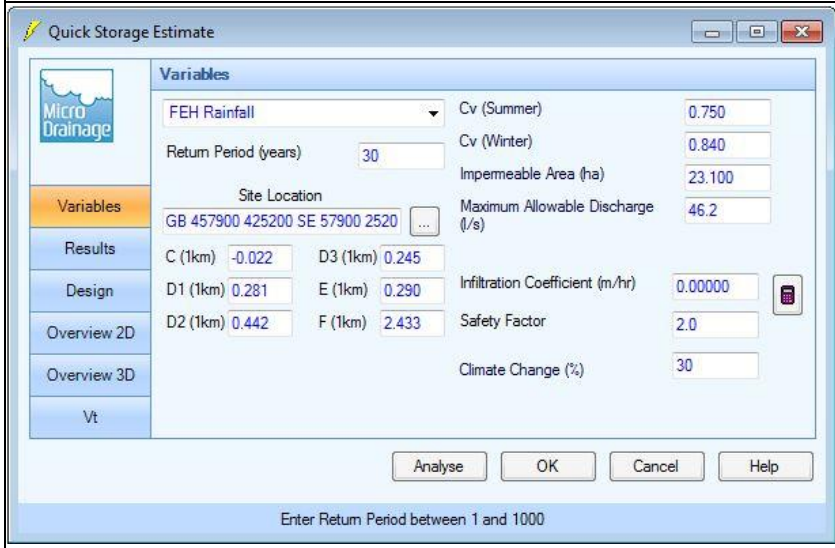

Quick Storage Estimate
Micro Drainage
Results
Variables
Results
Design
Overview 2D
Overview 3D
Vt
Global Variables require approximate storage of between 16471 m³ and 22967 m³.
These values are estimates only and should not be used for design purposes.
Analyse
OK
Cancel
Help
Enter Return Period between 1 and 1000

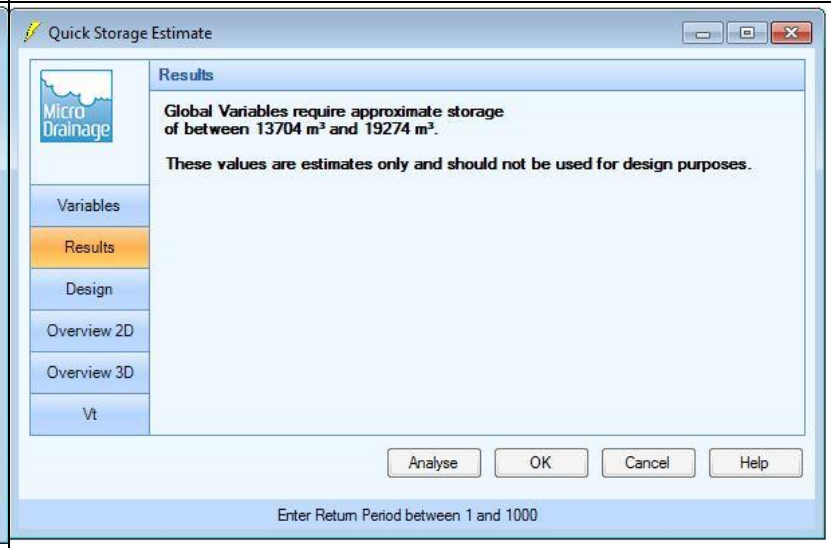

Quick Storage Estimate
Micro Drainage
Variables
Results
Design
Overview 2D
Overview 3D
Vt
FEH Rainfall
Return Period (years) 10
Site Location
GB 457900 425200 SE 57900 2520
C (1km) -0.022
D1 (1km) 0.281
D2 (1km) 0.442
D3 (1km) 0.245
E (1km) 0.290
F (1km) 2.433
Cv (Summer) 0.750
Cv (Winter) 0.840
Impermeable Area (ha) 33.000
Maximum Allowable Discharge (l/s) 46.2
Infiltration Coefficient (m/hr) 0.00108
Safety Factor 2.0
Climate Change (%) 30
Analyse
OK
Cancel
Help
Enter Infiltration Coefficient between 0.00000 and 100000.00000

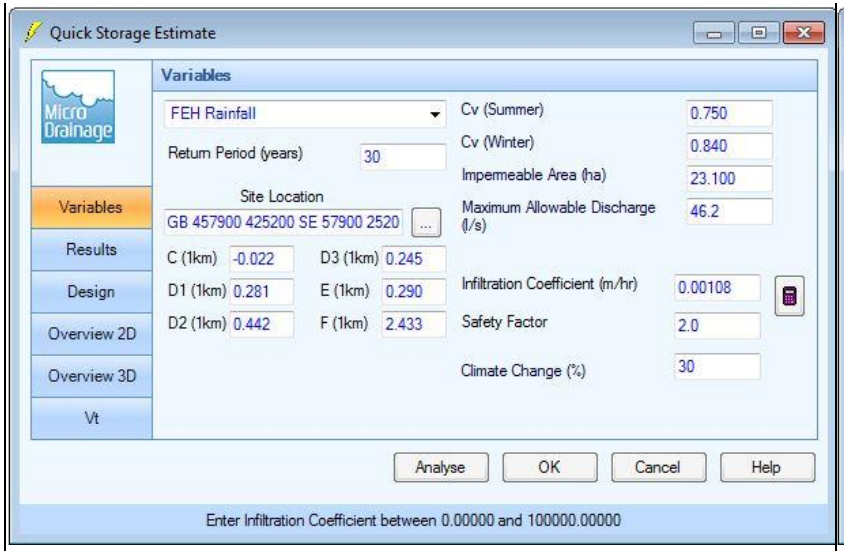

Quick Storage Estimate
Micro Drainage
Results
Variables
Results
Design
Overview 2D
Overview 3D
Vt
Global Variables require approximate storage of between 16471 m³ and 22967 m³.
With Infiltration storage is reduced to between 11423 m³ and 22345 m³.
These values are estimates only and should not be used for design purposes.
Analyse
OK
Cancel
Help
Enter Infiltration Coefficient between 0.00000 and 100000.00000

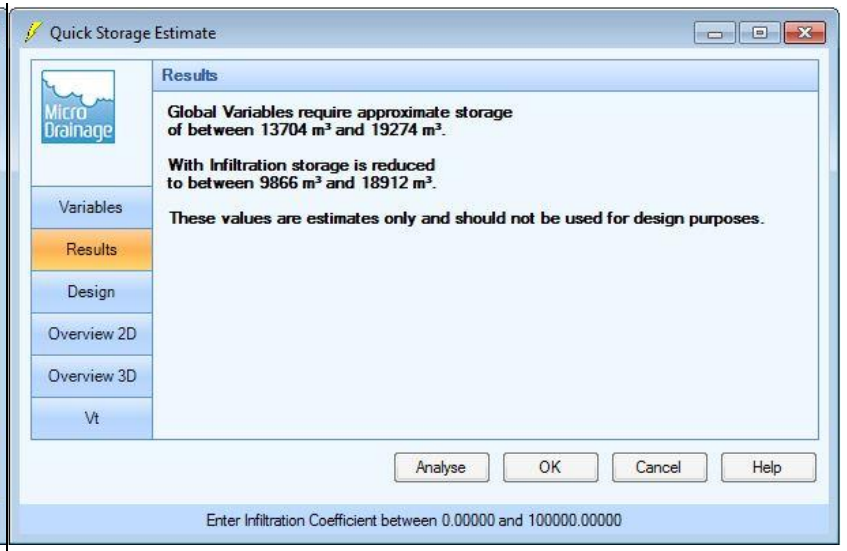

Quick Storage Estimate
Micro Drainage
Variables
Results
Design
Overview 2D
Overview 3D
Vt
FEH Rainfall
Return Period (years) 10
Site Location
GB 457900 425200 SE 57900 2520
C (1km) -0.022
D1 (1km) 0.281
D2 (1km) 0.442
D3 (1km) 0.245
E (1km) 0.290
F (1km) 2.433
Cv (Summer) 0.750
Cv (Winter) 0.840
Impermeable Area (ha) 33.000
Maximum Allowable Discharge (l/s) 46.2
Infiltration Coefficient (m/hr) 0.36000
Safety Factor 2.0
Climate Change (%) 30
Analyse
OK
Cancel
Help
Enter Infiltration Coefficient between 0.00000 and 100000.00000

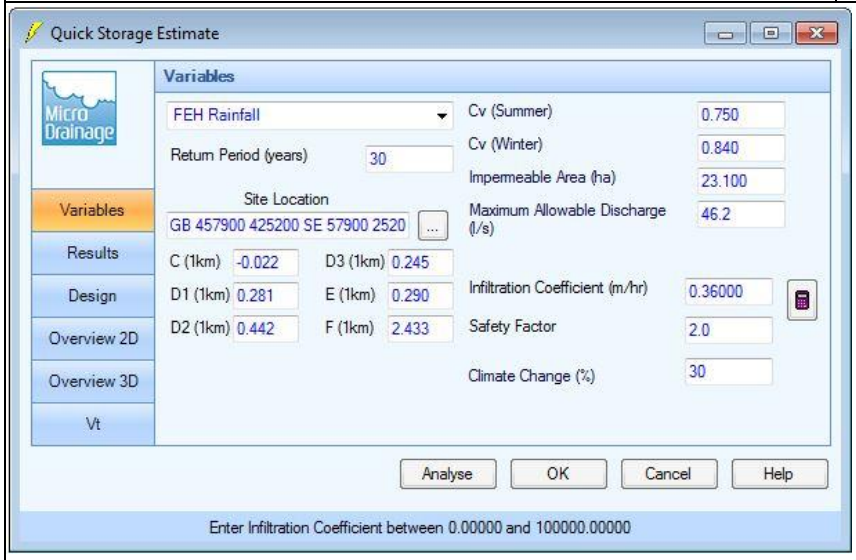

Quick Storage Estimate
Micro Drainage
Variables
Results
Design
Overview 2D
Overview 3D
Vt
Global Variables require approximate storage of between 16471 m³ and 22967 m³.
With Infiltration storage is reduced to between 2032 m³ and 7835 m³.
These values are estimates only and should not be used for design purposes.
Analyse
OK
Cancel
Help
Enter Infiltration Coefficient between 0.00000 and 100000.00000

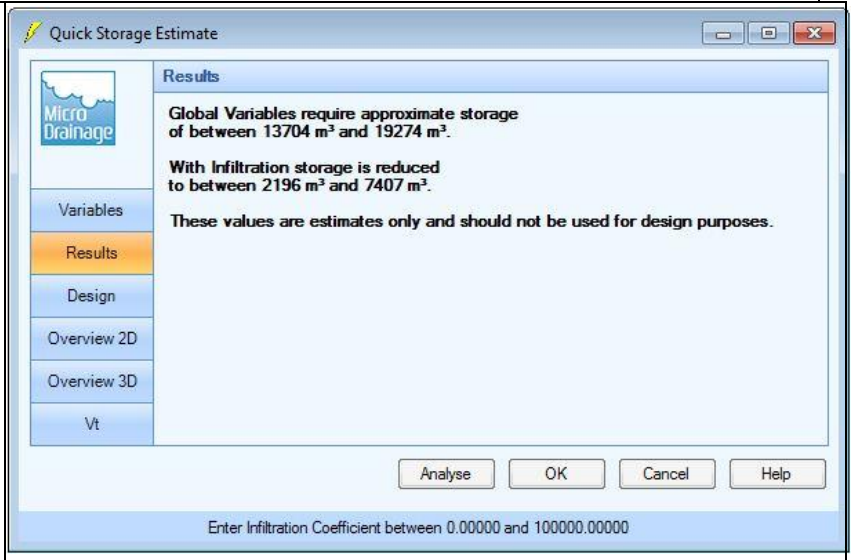

Quick Storage Estimate
Micro Drainage
Variables
Results
Design
Overview 2D
Overview 3D
Vt
FEH Rainfall
Return Period (years) 30
Site Location
GB 457900 425200 SE 57900 2520
C (1km) -0.022
D1 (1km) 0.281
D2 (1km) 0.442
D3 (1km) 0.245
E (1km) 0.290
F (1km) 2.433
Cv (Summer) 0.750
Cv (Winter) 0.840
Impermeable Area (ha) 23.100
Maximum Allowable Discharge (l/s) 46.2
Infiltration Coefficient (m/hr) 0.00000
Safety Factor 2.0
Climate Change (%) 30
Analyse
OK
Cancel
Help
Enter Return Period between 1 and 1000


Quick Storage Estimate
Micro Drainage
Variables
Results
Design
Overview 2D
Overview 3D
Vt
Global Variables require approximate storage of between 13704 m³ and 19274 m³.
These values are estimates only and should not be used for design purposes.
Analyse
OK
Cancel
Help
Enter Return Period between 1 and 1000


Quick Storage Estimate
Variables
FEH Rainfall
Return Period (years) 30
Site Location
GB 457900 425200 SE 57900 2520
C (1km) -0.022
D1 (1km) 0.281
D2 (1km) 0.442
D3 (1km) 0.245
E (1km) 0.290
F (1km) 2.433
Cv (Summer) 0.750
Cv (Winter) 0.840
Impermeable Area (ha) 23.100
Maximum Allowable Discharge (l/s) 46.2
Infiltration Coefficient (m/hr) 0.00108
Safety Factor 2.0
Climate Change (%) 30
Variables
Results
Design
Overview 2D
Overview 3D
Vt
Analyse
OK
Cancel
Help
Enter Infiltration Coefficient between 0.00000 and 100000.00000


Quick Storage Estimate
Results
Global Variables require approximate storage of between 13704 m³ and 19274 m³.
With Infiltration storage is reduced to between 9866 m³ and 18912 m³.
These values are estimates only and should not be used for design purposes.
Variables
Results
Design
Overview 2D
Overview 3D
Vt
Analyse
OK
Cancel
Help
Enter Infiltration Coefficient between 0.00000 and 100000.00000


Quick Storage Estimate
Variables
FEH Rainfall
Return Period (years) 30
Site Location
GB 457900 425200 SE 57900 2520
C (1km) -0.022
D1 (1km) 0.281
D2 (1km) 0.442
D3 (1km) 0.245
E (1km) 0.290
F (1km) 2.433
Cv (Summer) 0.750
Cv (Winter) 0.840
Impermeable Area (ha) 23.100
Maximum Allowable Discharge (l/s) 46.2
Infiltration Coefficient (m/hr) 0.36000
Safety Factor 2.0
Climate Change (%) 30
Variables
Results
Design
Overview 2D
Overview 3D
Vt
Analyse
OK
Cancel
Help
Enter Infiltration Coefficient between 0.00000 and 100000.00000


Quick Storage Estimate
Results
Global Variables require approximate storage of between 13704 m³ and 19274 m³.
With Infiltration storage is reduced to between 2196 m³ and 7407 m³.
These values are estimates only and should not be used for design purposes.
Variables
Results
Design
Overview 2D
Overview 3D
Vt
Analyse
OK
Cancel
Help
Enter Infiltration Coefficient between 0.00000 and 100000.00000

Storage volume calculations for the Construction Laydown and CCR Area