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Tees CCPP Project

The Tees Combined Cycle Power Plant Project
Land at the Wilton International Site, Teesside

Volume 1 - Chapter 15

Regulations – 6(1)(b) and 8(1)

Applicant: Sembcorp Utilities UK
Date: November 2017

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15.1 INTRODUCTION

15.1.1 *Terms of Reference for this Chapter*

15.1 As stated in *Section 1.6* the Project has sought to voluntarily comply with the 2017 EIA Regulations; specifically in relation to this chapter Paragraph 8 of Schedule 4 which requires:

A description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and/or disasters which are relevant to the project concerned. Relevant information available and obtained through risk assessments pursuant to EU legislation such as Directive 2012/18/EU of the European Parliament and of the Council or Council Directive 2009/71/Euratom or UK environmental assessments may be used for this purpose provided that the requirements of this Directive are met. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies.

15.2 In accordance with above safety assessments have been undertaken for the Project to inform the identification and assessment of major accidents and natural disasters to which the Project may be vulnerable.

15.3 In this context vulnerability is defined as the potential weakness of the Project to the environmental and other risks to which it is exposed. A risk is defined as the consequences of an event; within the context of how likely it is to take place.

15.4 Major accidents or natural disasters are also events or situations that have the potential to affect the Project, causing immediate or delayed serious damage to human health, welfare and/or the environment, and include accidents during construction and operation caused by operational failure or natural hazards.

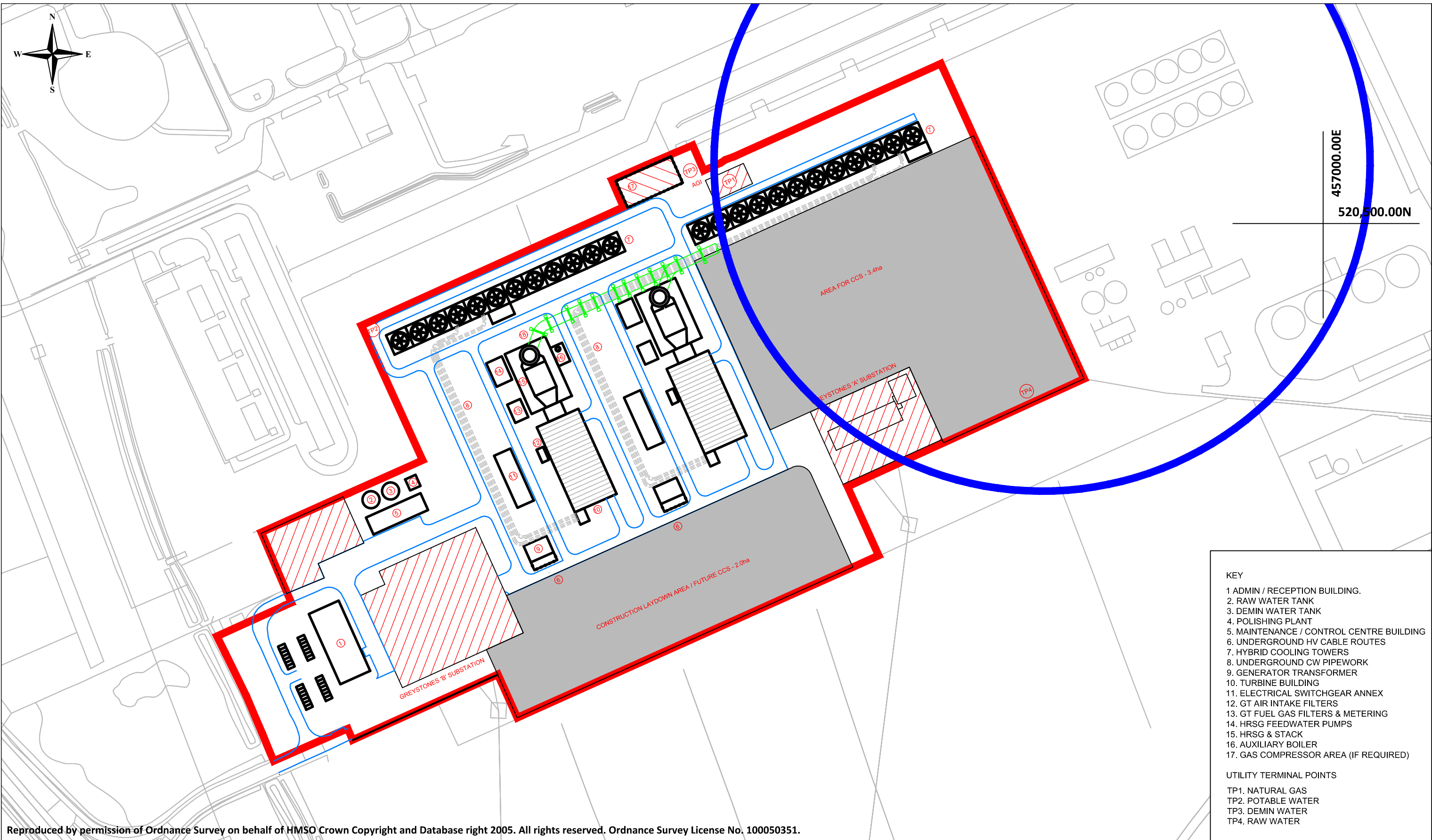
15.1.2 *Basis for the Assessment including the Worst Case Scenario*

15.5 The Project consists of a natural gas fired electricity generating station including up to two gas turbines with a combined potential generation of up to 1,700MWe. The gas turbines will be fuelled by natural gas which is supplied by a pipeline.

15.6 There will be no natural gas storage associated with the Project. The only natural gas present will be that actually in the gas turbines themselves; this quantity of natural gas will be below the limit set by the Control of Major Accidents Hazard Regulations 2015 (as amended) ('COMAH Regulations') for

a lower tier COMAH site. The natural gas is used almost as soon as it comes onto site via the pipeline.

- 15.7 COMAH does not apply as the natural gas pipeline and associated equipment are not defined as storage under COMAH; only the Pipeline Safety Regulations (1996) apply. The Project will therefore not be a COMAH registered site, and so it will not require a major accident prevention policy or a safety report for the operation of the power station under the COMAH regulations.
- 15.8 However, as the HSE has commented in its response to the Preliminary Environmental Information consultation, the Project Site is within the consultation distance of the adjacent Ensus plant (see *Figure 15.1*). Ensus has been informed of Sembcorp's intention to seek development consent for the Project. The HSE consultation distance for Ensus in relation to the Project is shown in *Figure 15.1*. The blue circle shows the radius of area possibly affected by a major accident at the Ensus facility. The previously demolished GDF power station was in operation on the exact same footprint as the Project site when the Ensus plant was constructed, and so was considered in its original safety case. The Ensus safety case will need updating to include the Project.



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15.9 Additionally the Project is also being designed and its implementation guided by other industry standards and codes, many of which are mandatory. These require infrastructure and systems to be designed so that risks to people and the environment are either eliminated or reduced to levels that are “*as low reasonable practicable*” (ALARP).

15.10 Environmental effects associated with unplanned events that do not meet the definition of major accidents and/or natural disaster (eg minor leaks and spills that may be contained within construction sites are addressed in the topic chapters and not in this section). It is also recognised that the management framework for the Project is not fully defined at this stage; however a presumption of standard practice and regulatory compliance within the adopted management framework has been assumed and will be developed post-appointment of the EPC contractor.

15.1.3 *Consultation*

15.11 Sembcorp has extensively consulted regarding the Project. A Scoping Report was submitted to the Planning Inspectorate and its Scoping Opinion is provided in *Annex B* (document 6.3.2). Sembcorp has also consulted on the Preliminary Environmental Information; responses from the Scoping Opinion and the consultation on the PEIR are provided in *Table 15.1*.

Table 15.1 Consultation Responses

Source	Consultee Comment	Response
Health and Safety Executive Scoping Response	Using Figure 1.2 of the Scoping Report, 'The Project Site', Version A02, dated 15/02/17, showing the indicative site boundary, the development falls within the Inner Zone (IZ) of two of HSE's Consultation Distances, namely Invista Textiles (UK) Limited, PO Box 401, Wilton, TS6 8JH (HSE ref 3735) and Ineos Chlor Limited, PO Box 54 Wilton, TS6 7SD (HSE ref: 4341). The Applicant should make the necessary approaches to these operators.	Invista and Ineos Chlor chemical plants are no longer in operation and have both been demolished.
Health and Safety Executive Scoping Response	At this stage the Scoping Report does not contain any information on the extent and severity of known hazards from the proposed CCPP, with the potential to impact on local populations, and/or the adjacent major hazard installations alluded to above. The loss of fuel gas containment may give rise to vapour gas explosion, jet fire or flash fire. These may in turn escalate to adjacent plant. HSE suggests that the Applicant should provide such information before the project is accepted for examination.	<p>Hazards from loss of containment will be reduced by design. This will be addressed in final design.</p> <p>DCO requirement 30 requires an assessment of the extent and severity of known hazards including those listed to be carried out and approved in consultation with HSE.</p>
Health and Safety Executive Scoping Response	Would hazardous Substances Consent be needed? The presence of hazardous substances on, over or under land at or above set threshold quantities (Controlled Quantities) may require Hazardous Substances Consent (HSC) under Planning (Hazardous Substances) Act 1990 as amended. The substances, alone or when aggregated with others, for which HSC is required, and the associated Controlled Quantities, are set out in the Planning (Hazardous Substances) Regulations 2015. The Developer is advised to consider whether storage of hazardous substances is required and, if so, whether HSC would be required.	There will not be any hazardous substances present in quantities above the threshold level.
Public Health England scoping response	Within the EIA PHE would expect to see information about how the promoter would respond to accidents with potential off-site emissions eg flooding or fires, spills, leaks or releases off-site. Assessment of accidents should: identify all potential hazards in relation to construction, operation and decommissioning; include an assessment of the risks posed; and identify risk management measures and contingency actions that will be employed in the event of an accident in order to mitigate off-site effects.	<p>Flooding is addressed in the FRA (<i>Annex C</i>; document 6.3.3).</p> <p>DCO requirement 31 requires an accident and emergency response plan to be approved.</p>

Source	Consultee Comment	Response
Public Health England scoping response	The EIA should include consideration of the COMAH Regulations (Control of Major Accident Hazards).	COMAH regulations are considered in this chapter but do not apply, see <i>Section 15.1.2</i> above
National Grid scoping response	<p>National Grid Electricity Transmission has high voltage electricity overhead transmission lines, underground cables and high voltage substations which lie within or in close proximity to the proposed site boundary. Statutory electrical safety clearances must be maintained at all times. Any proposed buildings must not be closer than 5.3m to the lowest conductor. National Grid recommends that no permanent structures are built directly beneath overhead lines. These distances are set out in EN 43 – 8 Technical Specification for “overhead line clearances Issue 3 (2004) available at: http://www.nationalgrid.com/uk/LandandDevelopment/DDC/devnearoh1_final/appendixIII/appIII-part2</p> <ul style="list-style-type: none"> • If any changes in ground levels are proposed either beneath or in close proximity to our existing overhead lines then this would serve to reduce the safety clearances for such overhead lines. Safe clearances for existing overhead lines must be maintained in all circumstances. Further guidance on development near electricity transmission overhead lines is available here: http://www.nationalgrid.com/NR/ronlyres/1E990EE5-D068-4DD6-8C9A-4D0B06A1BA79/31436/Developmentnearoverheadlines1.pdf • The relevant guidance in relation to working safely near to existing overhead lines is contained within the Health and Safety Executive’s (www.hse.gov.uk) Guidance Note GS 6 “Avoidance of Danger from Overhead Electric Lines” and all relevant site staff should make sure that they are both aware of and understand this guidance. • Plant, machinery, equipment, buildings or scaffolding should not encroach within 5.3 metres of any of our high voltage conductors when those conductors are under their worse conditions of maximum “sag” and “swing” and overhead line profile (maximum “sag” and “swing”) drawings should be obtained using the contact details above. • If a landscaping scheme is proposed as part of the proposal, we request that only slow and low growing species of trees and shrubs are planted beneath and adjacent to the existing overhead line to reduce the risk of growth to a height which compromises statutory safety clearances. • Drilling or excavation works should not be undertaken if they have the potential to disturb or adversely affect the foundations or “pillars of support” of any existing tower. These foundations always extend beyond the base area of the existing tower and foundation (“pillar of support”) 	All guidance will be adhered to.

Source	Consultee Comment	Response
	<p>drawings can be obtained using the contact details above</p> <p>Ground levels above our cables must not be altered in any way. Any alterations to the depth of our cables will subsequently alter the rating of the circuit and can compromise the reliability, efficiency and safety of our electricity network and requires consultation with National Grid prior to any such changes in both level and construction being implemented.</p>	
Local community response	Having thought about the relative locations of the proposed power station and the village, I feel the walls along the edge(s) closest to the village and school should be composed of blast absorbing materials to protect the village in the event of an accident or other devastating event.	Initial technical assessments have evaluated that there would be no-off plot effects for foreseeable major accidents. The gas pipelines are in the northern area of the plot, furthest away from residential areas. The gas turbines are installed within enclosures, which are in a building. These physical barriers will prevent any offsite impact from the very low possibility of an explosive incident.
HSE PEIR Consultation Response	<p>Will the land fall within any of the HSE's consultation distances? Using Figure 1.2 of the Preliminary Environmental Information Report, 'The Project Site', Version A01 dated 26/04/17. Showing the indicative site boundary, the site falls within a number of HSE's Consultation Distances:</p> <p>Invista Textiles (UK) Limited Ineos Chlor Limited Ensus UK Limited Lotte Chemicals UK Limited SABIC UK Petrochemicals</p> <p>The Applicant should take particular note of Ensus UK Limited and Invista Textiles (K) Limited, as part of the indicative site boundary falls within the Inner Zone of these Consultation distances. The Applicant should make the necessary approaches to these operators.</p>	<p>Invista Textiles Ltd and Ineos Chlor Limited no longer have plants on site, they have been demolished.</p> <p>The project has contacted Ensus in relation to the project and briefed them on the development. Lotte and Sabic have</p>

Source	Consultee Comment	Response
		also both been contacted in relation to the project.
HSE PEIR Consultation Response	At this stage the Preliminary Environment Information Report does not contain any information on the extent and severity of known hazards from the proposed CCPP, with the potential to impact on local populations, and/or the adjacent major hazard installations alluded to above. The loss of fuel gas containment may give rise to vapour gas explosion, jet fire or flash fire. These may in turn escalate to adjacent plant. HSE suggests that the Applicant should provide such information before the project is accepted for examination.	The main hazard would be a loss of containment of natural gas; appropriate industry standards will be employed in the design to ensure any risk is minimised. See also DCO requirement 30.
HSE PEIR Consultation Response	Would hazardous Substances Consent be needed? The Developer is advised to consider whether storage of hazardous substances is required and, if so, whether HSC would be required.	Hazardous substances will not be stored at levels above the threshold levels.
National Grid PEIR Consultation Response	National Grid Electricity Transmission has high voltage electricity overhead transmission lines, underground cables and high voltage substations which lie within or in close proximity to the proposed site boundary. The overhead lines, cables and substations form an essential part of the electricity transmission network in England and Wales and include the following: <ul style="list-style-type: none"> • Statutory electrical safety clearances must be maintained at all times. Any proposed buildings must not be closer than 5.3m to the lowest conductor. National Grid recommends that no permanent structures are built directly beneath overhead lines. These distances are set out in EN 43 - 8 Technical Specification for "overhead line clearances Issue 3 (2004) available at: http://www.nationalgrid.com/uk/LandandDevelopment/DDC/devnearohl_final/appendixIII/ppIII-part2 • If any changes in ground levels are proposed either beneath or in close proximity to our existing overhead lines then this would serve to reduce the safety clearances for such overhead lines. Safe clearances for existing overhead lines must be maintained in all circumstances. • Further guidance on development near electricity transmission overhead lines is available here: http://www.nationalgrid.com/NR/rdonlyres/1E990EE5-D068-4DD6-8C9A-4D0B06A1BA79/31436/Developmentnearoverheadlines1.pdf 	All guidance will be fully complied with.

Source	Consultee Comment	Response
	<ul style="list-style-type: none"> <li data-bbox="667 188 1778 316">• The relevant guidance in relation to working safely near to existing overhead lines is contained within the Health and Safety Executive’s (www.hse.gov.uk) Guidance Note GS 6 “Avoidance of Danger from Overhead Electric Lines” and all relevant site staff should make sure that they are both aware of and understand this guidance. <li data-bbox="667 354 1778 481">• Plant, machinery, equipment, buildings or scaffolding should not encroach within 5.3 metres of any of our high voltage conductors when those conductors are under their worse conditions of maximum “sag” and “swing” and overhead line profile (maximum “sag” and “swing”) drawings should be obtained using the contact details above. <li data-bbox="667 520 1778 616">• If a landscaping scheme is proposed as part of the proposal, we request that only slow and low growing species of trees and shrubs are planted beneath and adjacent to the existing overhead line to reduce the risk of growth to a height which compromises statutory safety clearances. <li data-bbox="667 654 1778 766">• Ground levels above our cables must not be altered in any way. Any alterations to the depth of our cables will subsequently alter the rating of the circuit and can compromise the reliability, efficiency and safety of our electricity network and requires consultation with National Grid prior to any such changes in both level and construction being implemented 	

15.1.4 *Policy and Legislation Context*

The Health and Safety at Work etc. Act 1974 (HSWA) ⁽¹⁾

15.12 The HSWA places general duties on employers, people in control of premises, manufacturers and employees and regulations under this Act contain more detailed provisions. The Act provides the framework for the regulation of industrial health and safety in the UK. The overriding principle is that foreseeable risks to persons shall be reduced so far as is reasonably practicable and that adequate evidence shall be produced to demonstrate that this has been done.

EU Regulation 402/2013 on the Common Safety Method on Risk Evaluation and Assessment (CSM-RA) ⁽²⁾ (as amended by EU Regulation 2015/1136).

15.13 This EU Regulation describes the methods required to be used to assess compliance with safety levels and safety requirements.

Directive 2012/18/EU

15.14 Directive 2012/18/EU of the European Parliament and the Council of 4 July 2012 concerns the control of major-accident hazards involving dangerous substances.

15.15 The directive lays down the rules for the prevention of major accidents which might result from certain industrial activities and the limitation of their consequences for human health and the environment.

15.16 Major accidents can have consequences beyond frontiers, and the ecological and economic costs of an accident are borne not only by the establishment affected, but also by the Member States concerned. It is therefore necessary to establish and apply safety and risk-reduction measures to prevent possible accidents, to reduce the risk of accidents occurring and to minimise the effects if they do occur, thereby making it possible to ensure a high level of protection throughout the Union.

15.17 Operators should have a general obligation to take all necessary measures to prevent major accidents, to mitigate their consequences and to take recovery measures. Where dangerous substances are present in establishments above certain quantities the operator should provide the competent authority with sufficient information to enable it to identify the establishment, the dangerous substances present and the potential dangers.

15.18 The operator should also draw up and, where required by national law, send to the competent authority a major- accident prevention policy (MAPP) setting

(1) Health and Safety at Work etc. Act 1974. SI 1974 c.37. Her Majesty's Stationary Office, London

(2) Commission Implementing Regulation (EU) No 402/2013 of 30 April 2013 on the common safety method for risk evaluation and assessment and repealing Regulation (EC) No 352/2009. Official Journal of the European Union.

out the operator's overall approach and measures, including appropriate safety management systems, for controlling major- accident hazards.

- 15.19 In order to reduce the risk of domino effects, where establishments are sited in such a way or so close together as to increase the likelihood of major accidents, or aggravate their consequences, operators should cooperate in the exchange of appropriate information and in informing the public, including neighbouring establishments that could be affected.
- 15.20 In order to demonstrate that all that is necessary has been done to prevent major accidents, and to prepare emergency plans and response measures, the operator should, in the case of establishments where dangerous substances are present in significant quantities, provide the competent authority with information in the form of a safety report.
- 15.21 The risk of a 'Major Accident' ⁽¹⁾ could be increased by the probability of natural disasters associated with the location of the establishment. This should be considered during the preparation of major-accident scenarios.

The Control of Major Accident Hazards Regulations 2015 (COMAH)

- 15.22 COMAH Regulations 2015 and subsequent amendments included within the Health and Safety (Miscellaneous Amendments and Revocation) Regulations 2017 seek to prevent major accidents involving dangerous substances and limit the consequences to people and the environment of any accidents which do occur.
- 15.23 The COMAH Regulations 2015 implement the majority of the Seveso III Directive (2012/18/EU) in Great Britain (Northern Ireland produces its own regulations).
- 15.24 The land-use planning requirements from the Directive are implemented through planning legislation.

Construction (Design and Management) (CDM) 2015 Regulations ⁽²⁾

- 15.25 These regulations place specific duties on clients, designers and contractors, so that health and safety is taken into account throughout the life of a construction project from its inception to its subsequent final demolition and removal. Under CDM regulations, designers have to avoid foreseeable risks so far as reasonably practicable by: eliminating hazards from the construction, cleaning, maintenance, and proposed use and demolition of a structure; reducing risks from any remaining hazard; and giving collective safety measures priority over individual measures.

(1) 'Major Accident' is defined in the UK by the COMAH Regulation 2015; see section 15.3.

(2) The Construction (Design and Management) Regulations 2015. SI 2015 No. 51. Her Majesty's Stationary Office, London

15.2 ASSESSMENT METHODOLOGY

15.2.1 *Definition of Terms Used within this Chapter*

15.26 The definition of a major accident used in this assessment is contained in the Control of Major Hazards Accident Regulations 2015 (COMAH) which define a "major accident" as an occurrence such as a major emission, fire, or explosion resulting from uncontrolled developments in the course of the operation of any establishment, and leading to serious danger to human health or the environment (whether immediate or delayed) inside or outside the establishment, and involving one or more dangerous substances ⁽¹⁾. The terms which define a major accident are as follows ⁽²⁾:

- Injury to persons and damage to property:
 - a death;
 - six persons injured within the establishment and hospitalised for at least 24 hours;
 - one person outside the establishment hospitalised for at least 24 hours;
 - a dwelling outside the establishment damaged and unusable as a result of the accident;
 - the evacuation or confinement of persons for more than 2 hours where the value (persons × hours) is at least 500; or
 - the interruption of drinking water, electricity, gas or telephone services for more than 2 hours where the value (persons × hours) is at least 1,000.

- Immediate damage to the environment:
 - permanent or long-term damage to terrestrial habitats:
 - 0.5 hectares or more of a habitat of environmental or conservation importance protected by legislation; or
 - 10 or more hectares of more widespread habitat, including agricultural land.
 - significant or long-term damage to freshwater and marine habitats:
 - 10 km or more of river or canal;
 - 1 hectare or more of a lake or pond;
 - 2 hectares or more of delta; or
 - 2 hectares or more of a coastline or open sea; or
 - significant damage to an aquifer or underground water: 1 hectare or more.

- Damage to property.
 - damage to property in the establishment, to the value of at least EUR 2,000,000; or
 - damage to property outside the establishment, to the value of at least EUR 500,000.

(1) Regulation 2 of the Control of Major Hazards Accident Regulations 2015

(2) Paragraph 2 of Schedule 5 of the Control of Major Hazards Accident Regulations 2015

15.27 Key terms which are used through this assessment are set out in *Table 15.2*.

Table 15.2 *Assessment Terminology*

Term	Definition
Major Accident	The COMAH 2015 regulations define a 'major accident' as an occurrence such as a major emission, fire, or explosion resulting from uncontrolled developments in the course of the operation of any establishment, and leading to serious danger to human health or the environment (whether immediate or delayed) inside or outside the establishment, and involving one or more dangerous substances.
Natural disaster	A naturally occurring event such as extreme weather (storm, flooding) or a ground-related hazard event (subsidence, landslide, earthquake) with the potential to cause an event or situation that meets the definition of major accident above.
Risk	The likelihood of an impact occurring combined with the effect or consequence(s) of the impact on a receptor(s) if it does occur.
Risk event	An identified unplanned event which is considered relevant to the Project and has the potential to be a major accident or natural disaster subject to the identification of its potential to result in a significant adverse effect on an environmental receptor.
Serious damage	Serious damage includes the loss of life, permanent injury and temporary or permanent damage / destruction of an environmental receptor.
Vulnerability	In the context of environmental risk assessment the terms refers to the 'exposure and resilience' of the Project to the risk of a major accident or natural disaster.

15.28 The assessment of 'significant adverse effects' includes consideration of all factors identified in the Paragraph 4 of Schedule 4 of the 2017 EIA Regulations (see *Table 1.2*).

15.29 Drawing from this context, for the Project, a significant adverse effect is considered to mean the loss of life or permanent injury, and/or permanent or long lasting damage to an environmental receptor. The significance of this effect takes into account the extent, severity and duration of harm and the importance and sensitivity of the receptor.

15.2.2 *Study Area*

15.30 The study area is made up of the main Project Site including road access. The following were adopted in the risk assessment to identify potential major accidents sources:

- COMAH facilities within the Wilton International Site;
- transmission (gas and electrical) potential at risk due to Project activities; and
- natural features with the potential to create risks within 1 km (chiefly hydrological (flood risk) and geological (seismic activity, unstable ground conditions, contamination).

15.2.3 *Method of Assessment*

15.31 The purpose of this chapter is to identify risks to the environment which could result from major accidents or natural disasters. These have been considered during the construction and operational (including maintenance) phases of the Project. Risks during the decommissioning phase would be similar to the construction phase, but would be subject to the controls / regulations in place at the time of decommissioning.

15.32 To systematically identify potential risks, pathways for adverse effects to occur and suitable controls (for identified risks), the following methodology was adopted based on accepted technical risk assessment methods which allow the identification of risks, pathways, sensitive receptors and if required barriers / controls to mitigation risk to an acceptable level (typically referred to 'as low as reasonably practicable' or ALARP). In summary the following method was adopted:

15.33 A review was undertaken of baseline conditions to identify existing facilities or natural features or scenarios (such as flooding) which could lead to a major accident or hazard in combination with the Project. These were screened to identify risks requiring detailed consideration and to screen out those with an insignificant risk.

15.34 The screening process considered whether the risk source then had a pathway and receptor to result in significant effects.

- The source is the original cause of the risk/hazard, which has the potential to cause harm (for example a gas leak to ignite, causing an explosion with associated primary and secondary effects).
- The pathway is the route by which the source can reach the receptor (for example via a HGV accident leading to loss of life or a spill to a water source).
- The receptor is the specific component of the environment that could be adversely affected, if the source reaches it (for example a water course).

15.35 Risk events which do not have all three components were screened out of further assessment.

15.36 The assessment then considered what activities could result in an adverse impact during construction / operation and what barriers or embedded mitigation are in place to prevent the source pathway receptor effect from occurring. Finally the assessment sought to identify any 'escalation factors' which could compromise the integrity of embedded mitigation and therefore any significant residual risks and accordingly the need for further mitigation / monitoring.

15.2.4 *Assessing Significance of Effect*

15.37 In the context of this chapter, typical methods employed within EIA to defined significance are not applicable. By definition a major accident or disaster would be significant. Accordingly any risks that could result in a major accident without suitable mitigation, management or regulatory controls in place will be assessed as significant.

15.3 *BASELINE CONDITIONS*

15.3.1 *Introduction*

15.38 The baseline assessment sought to identify features within the existing environment that could be sources for major accidents and hazards comprising:

- local features external to the Project that contribute a potential source of hazard to the Project;
- infrastructure and the built environment; and
- baseline major accident and natural disaster risks (that exist with or without the Project).

15.39 The wider ES topic baselines have been used to consider sensitive receptors at risk from major accidents or disasters from the Project for instance:

- members of the public and local communities;
- the natural environment, including ecosystems, land and soil quality, air quality, surface and groundwater resources and landscape; and
- the historic environment, including archaeology and built heritage.

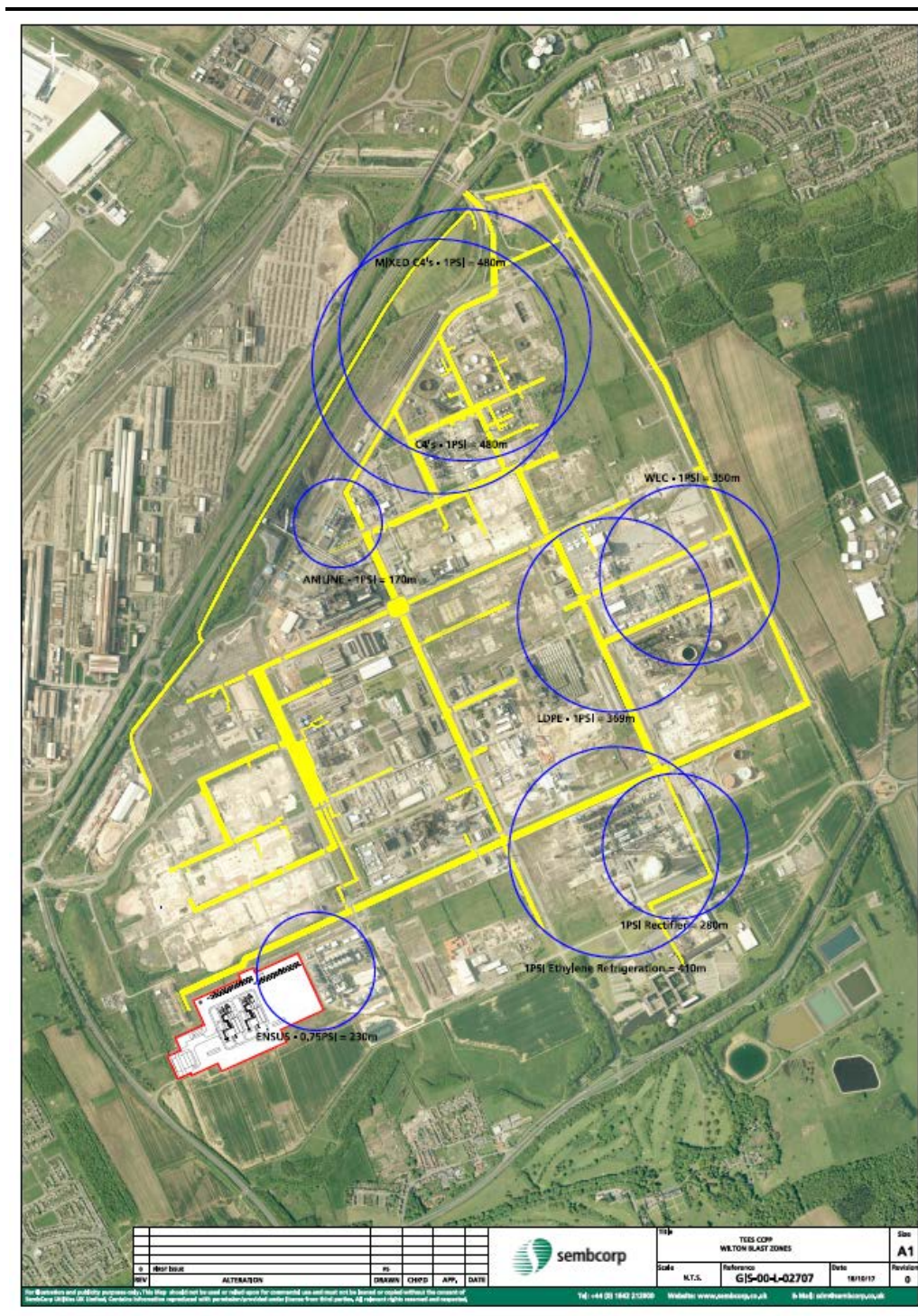
15.40 To summarise, the main risk sources identified have been divided into the following categories:

- Existing infrastructure and facilities (on both how they may impact the Project and how the Project may impact them); and
- Wider natural disaster and hazard risks – for instance flood risk.

15.3.2 *Existing Infrastructure and Facilities*

15.41 There are a number of sites registered under the Control of Major Accident Hazards (COMAH) Regulations in proximity to the Project Site. The closest COMAH registered site is Ensus; their consultation zone is shown in *Figure 15.1*. Additionally other COMAH facilities have been identified and their consultation zones are shown in *Figure 15.2* below although these are all outside of the study area.

Figure 15.2 COMAH Facilities Consultation Zones Identified in the Study Area



15.42

Other infrastructure features which had been identified as in close proximity to, or having the potential (a pathway) to interact with construction and operation of the Project includes:

- road infrastructure;
- other industry in close proximity to the Project site;
- oil and electricity transmission and substation infrastructure; and

- previously developed land with the potential for the presence of contaminants.

15.43 The site is accessed from the A1053 Greystone Road, which forms part of the strategic trunk road network. The A1053 connects to the A174 to the south and A66 Tees Dock Road to the north. The A174 provides a link to the A19 to the south which in turn links to the A1(M). These roads have the capacity to absorb heavy good vehicles (HGV) traffic associated with the construction of the Project based on modelling undertaken (see *Chapter 10 Traffic and Travel*). These roads (subject to appropriate consultation and agreement) also have the capacity to accommodate abnormal loads required during construction.

15.44 As operational traffic is limited, as detailed in *Chapter 10*, it is not considered further. During construction, risks arise from additional HGV and light vehicular traffic on local roads and theoretically there is a marginally increased risk of accident with potential impacts on other road users and environmental receptors.

As mentioned and illustrated in *Chapter 5 Project Description*, the Project Site benefits from two gas pipelines which the Project will utilise when operational. Potential identified risks from these utilities arise from damage to them during construction, loss of containment and combustion of any fugitive gas.

15.45 Similarly the Project Site is in close proximity to National Grid transmission infrastructure and overhead lines. Identified risks in this regard relate to loss of control of construction vehicles and workers breaching exclusion zones and hence facing exposure to high voltage. Guidance from National Grid will be adhered to and is standard industrial practice.

15.3.3 *Wider Existing Natural Disaster and Hazard Risks*

15.46 Major accident and disaster risks relevant to the baseline in the absence of the Project include extreme weather events, associated flooding, road traffic collisions and rail accidents. Baseline 'without project' conditions are described in the relevant chapters for Traffic and Transport (*Chapter 10; Document 6.2.10*) and Ground Conditions, Water Resources and Flooding (*Chapter 6; Document 6.2.6*).

15.47 Review of the Environment Agency flood risk maps, as illustrated in *Figure 1.3* of the Flood Risk Assessment (*Annex C; Document 6.3.3*), indicates that the whole of the Project Site is located within the low risk Flood Zone 1. The Project is therefore not considered to be at risk from fluvial flooding. The site is located 3.8 km from the Tees Estuary and over 5 km from the North Sea coast. As the site is approximately 16 m above ordnance datum, and outside of the Tidal Flood Zone, the Project Site and surrounding land is not in an area deemed to be at risk of tidal flooding. Based on this review flood risk is not considered further.

15.48 The Project Site is not affected by significant geological hazards (for instance seismic risk) within the context of this assessment. However, former industrial activities which have taken place on the main Project site (and area of land subject to highways improvement externally) may have affected surface materials / soils and ground water and hence risks arising from contamination are considered. There is no evidence of a coal mine in or near the study area and no active mineral extraction within 1,000 m of the site. As such, risks associated with subsidence for example have not been considered further. Based on this review and the information in the Site Condition Report (*Annex D3; Document 6.3.6*) ground conditions are not considered further.

15.4 *ASSESSMENT OF POTENTIAL EFFECTS*

15.4.1 *Safety and Risk Management Framework - Embedded Mitigation*

Operational Safety and Risk Management Framework Overview

15.49 It is important to consider the risks not only in the context of the Project but also within the context that Sembcorp has established systems to operate the site already (which could be considered to form part of the baseline). The management framework for the Project will be defined by a number of mechanisms, including DCO requirements as well as standard operational procedures for fire prevention and response and accident and emergency response. These will serve to control identified risks including those arising from major accidents and natural disasters. Sembcorp is a specialised industrial site management company who, subject to the granting of the DCO, will go on to manage contractors building the facility. Sembcorp's role in ensuring a safe facility is to set the terms of reference for the construction contractor. Statutory compliance and adherence to common industry good practice is considered as an appropriate minimum standard.

15.50 As part of its wider management responsibilities for the Wilton International Site, one of the most important control procedures Sembcorp operates to is its Major Accident Prevention Policies (MAPP) for pipelines owned and operated for and by Sembcorp Utilities on Teesside.

15.51 Sembcorp operates three gas pipelines, mainly on the Teesside Wilton International site, but one system connects the Wilton and North Tees sites via a Tunnel under the River Tees.

15.52 The MAPP considers the major hazards from the owned / operated gas pipelines, such as a serious loss of containment of flammable gas resulting in the primary hazards of fire, explosion and fumes leading to a secondary toxic release and secondary effects on other nearby systems from the effects of fire or explosion.

15.53 The MAPP also includes:

- Safety Management System;
- Risk Assessment;
- Risk Prevention; and
- Mitigation.

15.54 Sembcorp also has a Fuel Gas Systems Safety Case, which covers the operation of the Wilton Fuel Gas System, Risk Assessments, Management Systems, and the arrangements to ensure the safe operation of the gas system.

15.55 Subject to the granting of the DCO, and before the new Project is commissioned, these two documents, the MAPP and FGSC, will be reviewed and revised as necessary to include the fuel supply to the Tees CCPP power station.

Construction Management Framework

15.56 The Project involves the management of the construction for a number of distinct development components of the plant, all with specific regulatory / design requirements. Sembcorp (the 'client' in CDM terminology), and its Project Manager(s) will establish roles, responsibilities, authorities and accountabilities in advance of the construction phase and these will be embedded within the construction contract performance requirements. All works will be carried out in accordance with the articles of and requirements attached to any granted DCO and applicable law.

15.57 The construction period will have the greatest level of interaction with the identified baseline risk sources. This is as a result of third party infrastructure requiring connection to the Project. It is currently expected that all works of third party infrastructure will either be undertaken and contracted directly by the statutory undertaker or undertaken by approved contractors to a standard appropriate for the statutory undertaker. The works required are not uncommon activities and it is understood that the owners of the infrastructure will have effective management controls and processes which will have to be adopted when implementing the Project.

15.58 It is also recognised that the construction phase will be running concurrently with existing Wilton International site operations. The contractors appointed to implement the construction will be required to adapt to this environment and maintain a safe environment. Active risk management is considered to be a standard industry approach, as is implementing construction projects within an operational site.

15.4.2 Assessment of Construction and Operational Phase Effects

15.59 Major accidents and natural disasters to which the Project may be vulnerable during construction and operation and the outcomes of the assessment are summarised in *Table 15.3* (Construction) and *Table 15.4* (Operation).

- 15.60 All risk events identified have been considered, but only those which could affect a receptor and have the potential to be a major accident have been scoped in.
- 15.61 The table also includes the management and mitigation measures embedded in the Project to reduce these risks to as low as reasonably practicable. In all cases, compliance with legal and regulatory requirements is assumed.
- 15.62 CCGT power plants are a mature technology with well understood safety management systems integral to the design. The most significant hazard associated with the operation of gas turbines would be a loss of containment of natural gas and a subsequent explosion. To prevent this, the gas turbines are designed with industry standard gas shutdown system. To mitigate the risk of gas accumulation and ignition, forced ventilation and a hazardous gas protection system are provided as integral elements of the gas turbine enclosure. Small leaks (the most common leak events) are diluted below the lower explosive limit by airflow from the forced ventilation system. Forced ventilation is also monitored by sensors. In the event airflow is lost, automated control action is taken to shut down the gas system.
- 15.63 In the event that there is a larger gas leak that exceeds the lower explosive limit, it would be detected by installed gas detectors that provide early gas detection and would automatically shut down the gas system, before there was a risk of explosion.

Table 15.3 Potential Major Hazards during Construction

Risk	Hazard Source	Consequence	Embedded Mitigation	Additional mitigation measures to reduce risk further
Additional HGV traffic on road network	Additional HGV traffic mixing with other road users	Injury or fatality to a member of the public	HGV traffic managed by final CTMP which has been agreed with the Highways Agency and R&CBC Transport	
Ground contamination	Construction personnel and waterways	Injuries to site construction personnel and pollution to waterways	Site Condition Report on demolished power station identifies no contamination issues.	Survey to be carried out prior to construction work commences. DCO requirement 10: if contamination is encountered during construction then investigation and assessment will be carried out and a scheme agreed on how it should be addressed.
Flood Risk	Construction materials and equipment	Release of contaminants onto land outside of the Project	Proposed Development is in a low flood risk area, zone 1.	To be considered in final CEMP
Overturning of Crane/ dropped load		Injuries or fatalities to site construction personnel	Competent contractors to be employed. CDM regulations to be adhered to.	
Gas transmission pipelines	Pipeline rupture	Potential for fire / explosion affecting neighbouring property and or members of the public, infrastructure and with secondary environmental impacts.	Maintenance of an easement zone for the pipeline (s). Effective demarcation of the pipelines on and in the vicinity of the site will be in place throughout construction. All contracting parties on site will be informed of the pipe line.	Line will only contain gas during commissioning.

Risk	Hazard Source	Consequence	Embedded Mitigation	Additional mitigation measures to reduce risk further
Electrical transmission infrastructure and sub stations		Injuries or fatalities to site construction personnel	Guidance provided by National Grid to be adhered to.	

Table 15.4 Potential Major Hazards during Operation

Risk	Hazard Source	Consequence	Embedded Mitigation	Additional mitigation measures to reduce risk further
Flood Risk	Materials on site	Release of contaminants onto land outside of the Project	Design to consider flood risk, and to include SUDs.	
Large gas leak	Explosion or gas fire	Injury or fatality to a member of the operations team or member of the public	GT design to include automated protective controls that shut gas system down when sensors detect elevated gas levels.	
Small gas leak causing gas accumulation	Explosion or gas fire	Injury or fatality to a member of the operations team or member of the public	GT design to include forced ventilation system to dilute below lower explosive limit by airflow, and appropriate setpoints and locations of hazardous gas detectors based on forced ventilation. Forced ventilation monitored by sensors. In the event airflow is lost, the gas system is automatically shut down.	
Affected by nearby COMAH plants.	Operational personnel	Injury or fatality to member of operations personnel	Ensus is only COMAH plant within consultation zone. Previous power station plant was in operation when Ensus was constructed.	COMAH case for Ensus will need to re-consider adjacent power complex. Ensus has been notified of this requirement.

15.4.3 *Assessment of Decommissioning Phase Effects*

15.64 The design life will be in the order of 25+ years (approximately). Once the plant has reached the end of its design life, it is entirely feasible that it could be re-provided in a modern form. Should that occur it would be subject to its own assessment of effects at the relevant time.

15.65 Predicting the baseline so far into the future to enable a meaningful assessment of the sensitivity of the environment, and the significance of effects from the decommissioning of the Project is extremely difficult.

15.66 When and if the Project is decommissioned, the appropriate environmental assessments will be undertaken to identify any significant environmental effects and propose suitable mitigation methods. Notwithstanding this, it is reasonable to assume that the effects and risks will be similar to, or less than, those experienced during the construction phase.

15.67 It is considered that it is improbable that natural risks would have greater significance at that stage. The flood risk assessment considers and allows for climate change and the geological risk is also expected to be as it is for baseline, if not improved following the application of remediation measures if necessary.

15.4.4 *Cumulative Effects*

Intra-Project Effects

15.68 This assessment has by its very nature implicitly considered integrations between components of the Project as is necessary to assess the worst case scenario and hence no further assessment of this aspect is proposed.

Cumulative Assessment: Inter-Project Effects

15.69 Cumulative risks with other projects are not considered to escalate the likelihood of major accidents or impact of natural disasters at or on the Project. The principle risks identified and assessed are within the Project site boundary. Other projects may cumulatively increase the use of highways, and therefore the possibility of a road traffic accident, but the management and control of the risk of accidents within this context is controlled by the highways authorities.

15.5 *MITIGATION AND MONITORING*

15.70 The mitigation measures required to manage the potential major accident or natural disaster risks are either integrated into the design of the Project or considered to be a regulatory or industry standard practice requirement and thus considered 'embedded' mitigation. There are some recommendations to further manage risks principally related to allowing a dynamic risk

management framework and maintaining effective dialogue with appropriate third parties.

15.71 The effective management and monitoring of risks is best done through a systematic hazard identification and review process. Sembcorp will maintain an effective compliance and peer review process for the site operations that come forward to effectively track and monitor potential major hazard risks from the operations within the Project.

15.6 *CONCLUSIONS*

15.72 Given the embedded mitigation and management procedures it is considered that the likely risks associated with risk events occurring will be managed to be as low as reasonably practicable (ALARP). Accordingly, it is considered that there will not be any likely significant environmental effects arising from the vulnerability of the Project to major accidents and natural disasters.

