
Appendix 2.6

MAJOR ACCIDENTS AND DISASTERS REPORT

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Fort Halstead, Sevenoaks

ES Volume III: Appendix 2.6

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1.0 Introduction

- 1.1 The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended) introduced new topics that need to be considered within the scope of an EIA. One such topic is the vulnerability of a project to risks of major accidents and/or disasters.
- 1.2 In the absence of recognised guidance on this subject in the context of EIA, CBRE has reviewed a range of sources providing guidance related to the topic, including:
 - Cabinet Office National Risk Register of Civil Emergencies 2017 Edition;
 - UK Government Emergency Response & Recovery Guidance (October 2013); and
 - International Federation of Red Cross & Red Crescent Societies Disaster and Crisis Management Guidance¹.
- 1.3 A disaster can be defined as "*a sudden, calamitous event that seriously disrupts the functioning of a community or society and causes human, material and economic or environmental losses that exceed the community's society's ability to cope using its own resources. Though often caused by nature, disasters can have human origins*"¹.
- 1.4 An accident can be defined as "*an unfortunate incident that happens unexpectedly and unintentionally, typically resulting in damage or injury*"².
- 1.5 The EIA Regulations 2017 state that the following should be provided with the ES in relation to this topic:

"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."
- 1.6 A comprehensive list of different types of major accidents and disasters have been considered. They have been broadly grouped into two categories:
 - Major Natural Disasters; and
 - Major Accidents & Man-made Disasters
- 1.7 The remainder of this report is structured as follows:
 - Chapter 2: consideration of types of major natural disasters;
 - Chapter 3: consideration of types of major accidents & man-made disasters; and
 - Chapter 4: summary & conclusions.

¹ <http://www.ifrc.org/en/what-we-do/disaster-management/>

² <https://en.oxforddictionaries.com/definition/accident>

2.0 Major Natural Disasters

- 2.1 The following types of major natural disasters have been considered:
- Epidemics;
 - Animal infestation;
 - Earthquakes;
 - Mass movements;
 - Volcanic eruptions;
 - Storms;
 - Droughts;
 - Extreme temperatures;
 - Floods (including storm surges); and
 - Wildfires.
- 2.2 Given the low risk of occurrence in the UK of many types of major natural disaster events, such as major volcanic eruptions, earthquakes, tsunamis or animal infestations, these disasters are not considered relevant to the proposed development and have been scoped out from further consideration. Given that the site is located in an urban area on relatively level topography, wildfires and mass movements have been scoped out from further consideration.
- 2.3 Four types of natural disaster event are however considered to pose a material risk to receptors in the UK and are considered relevant to the proposed development:
- Storms;
 - Extreme temperatures;
 - Flooding; and
 - Droughts
- 2.4 A consideration of the risk posed by these types of natural disaster is provided in the sections below.

STORMS

- 2.5 The National Risk Register of Civil Emergencies (NRR) is the unclassified version of the National Risk Assessment (NRA), a classified assessment of the risks of civil emergencies facing the UK over the next five years. According to the NRR, on a scale of 1 to 5, the likelihood of storms and gales occurring in the UK in the next five years has been given a score of 4.
- 2.6 The most significant storms in recent decades were those of 16 October 1987 and 25 January 1990; the first of which brought down an estimated 15 million trees in the southeast of England. By contrast, the 1990 storm was more extensive and had higher peak wind speeds. The net effect was a much higher death toll but less damage to trees and property.
- 2.7 More recently, on 28 October 2013, a severe storm, which the media named the 'St Jude's Day' storm, travelled across southern England. The timing of the storm meant that trees were still in full leaf and vulnerable to strong winds. The path of the storm was also significant – strong gusts of 70 to 80 mph are rare in southern England, making these areas more vulnerable to the impacts of severe weather. Falling trees were the main cause

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- of disruption, contributing to widespread transport disruption and power outages, with more than 660,000 homes left without power. Four people also died as a result of falling trees.
- 2.8 Under the proposed development, new residents and other site users would be brought to the site that could potentially be affected by any storm occurring in the area.
- 2.9 The proposed development will be required to meet building regulations, ensuring that the proposed building will be capable of withstanding storms. The Met Office also operates a national severe weather warning service to inform the public and emergency responders of forthcoming severe or hazardous weather which would have the potential to cause loss of life or widespread disruption. The 999-emergency response procedure is also in place to allow any site users whose health may be affected by such an event (e.g. through trips and falls) to request an ambulance or other emergency assistance.
- 2.10 On this basis, it is considered that suitable mitigation is already in place in regard to the safety of future site users, such that further assessment of potential risks would be unnecessary.

EXTREME TEMPERATURES (LOW TEMPERATURES, HEAVY SNOW AND HEAT WAVES)

- 2.11 There have been a number of recorded occasions of snow covering large areas of the country for over a week. The winter of 2009–10 saw a prolonged spell of cold weather that lasted for approximately a month. During this time, snowfalls of up to 40cm were recorded in parts of north-west England and south and east Scotland. Many other areas experienced snow cover of 10cm or more throughout this period. In Northern Ireland in February 2001, strong north-easterly winds and heavy snow caused travel disruption for up to five days and brought down power lines.
- 2.12 The Met Office uses a range of threshold temperatures, varying by region, to define a heatwave. High temperatures were widespread during August 1990, reaching a record 37.1°C in one part of England. In August 2003, the UK experienced heatwave conditions lasting 10 days and resulting in 2,000 excess deaths. During this heatwave, a record maximum temperature of 38.5°C was recorded at Faversham in Kent. In July 2006, similar conditions occurred, breaking records and resulting in the warmest month on record in the UK.
- 2.13 According to the NRR, on a scale of 1 to 5, the likelihood of either heatwaves or extreme low temperatures with heavy snow occurring in the UK in the next five years has been given a score of 4. The consequences of such an event may include:
- Fatalities and physical casualties, particularly among vulnerable groups (e.g. the elderly);
 - Some evacuation of residents or employees;
 - Damage to property and infrastructure, directly and via land instability (e.g. landslides);
 - Disruption to essential services, particularly transport, energy and communications;
 - Additional pressure on healthcare; and
 - Environmental damage.

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- 2.14 The proposed development would result in new residents and other site users being brought to the site that could potentially be affected by prolonged periods of excessive hot or cold weather should they arise.
 - 2.15 The proposed development will be built to the latest Building Regulations requirements and with consideration of potential temperature highs and lows as part of their typical operation to ensure appropriate thermal comfort. This will include an allowance for climate change. It is therefore considered that an appropriate climate can be maintained within the proposed buildings.
 - 2.16 Cold Weather Alerts and a Heat Health Watch Service are currently provided by Public Health England. The purpose of these services is to provide health advice for the public and healthcare workers in England, according to levels of heat forecast/measured by the Met Office. The 999-emergency response procedure is also in place to allow any site users whose health may be affected by such an event to request an ambulance or other emergency assistance.
 - 2.17 On this basis, it is considered that suitable mitigation is already in place, such that further assessment of potential risks would be unnecessary.

FLOODING

- 2.18 A consideration of flood risk has been included within the scope of the Water Resources and Flood Risk ES chapter, which is provided in Chapter 14, ES Volume II.
- 2.19 According to Environment Agency Flood Map for Planning³, the application site falls within Flood Zone 1, i.e. land having a less than 1 in 1,000 annual probability of fluvial or tidal flooding.
- 2.20 The nearest watercourses to the application site are the River Darent and the Twilton Brook which are approximately 1.5km and 1.1km due east of the application site respectively. The floodplains of both these watercourses are at a level of around 57mAOD, some 120m lower than the lowest point of the application site. At this location these watercourses are not tidal. The application site is therefore concluded to be at negligible risk of fluvial and tidal flooding.
- 2.21 The Environment Agency's Flood Risk from Surface Water mapping⁴ shows the majority of the application site to be at 'very low' risk of surface water flooding. The topographically elevated position of the application site means that there is no catchment draining in to the site from higher ground. Taking into account the relatively permeable bedrock and expected low groundwater table, any overland flows are likely to be negligible and associated only with the developed areas of the application site where existing drainage is absent. There are a number of localised areas within the application site that are shown to be at potentially increased risk of surface water flooding. However, these areas are considered to be associated with existing impermeable areas which are likely to be positively drained. Sevenoaks District Council's Strategic Flood Risk Assessment (SFRA) does not record any previous surface water flooding incidents within the vicinity of the application site. The application site is therefore concluded to be at low risk of surface water 'ponding' / flooding.

³ <https://flood-map-for-planning.service.gov.uk/>

⁴ <https://flood-warning-information.service.gov.uk/long-term-flood-risk/map>

- 2.22 The application site is underlain by a layer of clay estimated to be between circa 0m and 12m in thickness. Upper, middle and lower chalk formations, classified as Principal Aquifers, are located beneath the clay. Due to the impermeable nature of clay, it is likely to act as an aquiclude and prevent groundwater from the aquifer from rising to the surface. Kent County Council's Preliminary Flood Risk Assessment (PFRA) indicates that the application site is located in a 'negligible' groundwater flood risk area. Furthermore, groundwater has not been encountered at the application site during previous Site Investigations. Mapping contained within Kent County Council's Surface Water Management Plan (SWMP) shows that no groundwater flooding has occurred at or in the vicinity of the application site, with the closest recorded incident being approximately 4.6km to the southeast of the application site where ground levels are much lower. The risk of groundwater flooding to the application site is therefore concluded to be low.
- 2.23 According to Thames Water and Kent County Council's SWMP, the majority of the application site falls within a postcode area that has been subject to between one and three occurrences of sewer flooding. The south-eastern area of the application site is shown to be in a postcode that has had seven to eight recorded incidents of sewer flooding. However, previous consultation with Thames Water has confirmed that there is no public sewerage infrastructure present within the application site and therefore these recorded flood events are assumed to have occurred at locations outside the application site boundary. The risk of flooding to the application site from surcharged sewers is therefore considered to be low.
- 2.24 Reference to the Environment Agency's Flood Risk from Reservoirs mapping⁴ indicates that the application site will not be subject to flooding as a result of reservoir failure in the area. There are no other significant artificial bodies of water within close proximity to the application site and the risk of flooding from infrastructure failure is therefore considered low.
- 2.25 On this basis, the application site is considered to be subject to a low risk of flooding from all sources.
- 2.26 Given the low risk of flooding posed to the application site, proposed construction activities, such as the mounding of materials and placement of other structures, and proposed operational activities, such as the placement of proposed structures and buildings, are not expected to result in any changes to the risk of flooding at the site or in the surrounding area.

DROUGHTS

- 2.27 According to the NRR, on a scale of 1 to 5, the likelihood of droughts occurring in the next five years in the UK has been given a score of 3. Climate change may increase the risk of droughts but not necessarily lead to a more frequent use of restrictions on water. Planning for periodic restrictions on non-essential water use is an integral part of water companies resource management. Over the past 40 years, England has experienced five long-duration drought events and two short-duration events. During the 2010–12 drought, despite some parts of south-east and eastern England recording their lowest 18-month rainfall in at least 100 years, its impact extended only as far as the inconvenience for 20 million domestic customers of a temporary hosepipe ban. The environment and agriculture sectors were also temporarily affected by this drought.
- 2.28 Given the uses proposed, particularly the residential elements, the proposed development will result in a long-term demand for water. It is intended that the designs will respond to these requirements with a considered strategy to reduce water consumption, which would also include a consideration of climate change.

- 2.29 However, it is not considered that the potential effects of drought would be of particular detriment to the proposed development, nor that the scheme would result in an increase in the risk of drought conditions at the site or in the surrounding area, or in a substantial increased demand for potable water that could not be managed through the design development (a negligible effect on potable water demand has been assessed in the Water Resources and Flood Risk ES chapter (Chapter 14, ES Volume II)).
- 2.30 This disaster/accident type has therefore not been considered further the EIA. However, it has been responded to within the Sustainability Statement and the Design and Access Statement, as appropriate. These documents have been submitted alongside the planning application.

3.0 Major Accidents & Man-Made Disasters

- 3.1 The following types of major accidents/man-made disasters have been considered:
- Transport accidents;
 - Industrial accidents;
 - Electricity, gas, water supply or sewerage system failures;
 - Urban fires;
 - Famine / food insecurity;
 - Displaced populations;
 - Complex emergencies;
 - Terrorist incidents;
 - Cyber-attacks; and
 - Public disorder.
- 3.2 Given the nature of the proposals and the location of the site, cyber-attacks, famine, food insecurity, displaced populations and complex emergencies are not considered relevant to the scheme and are proposed to be scoped out of further consideration as a result.
- 3.3 The nature of the proposals and the setting of the site are such that accidents related to air, boat and rail transport are not considered relevant to the proposals.
- 3.4 In regard to electricity, gas, water supply or sewerage system failures, the utilities design for the proposed development is currently being considered and progressed. In consultation with all the respective utilities providers, existing and future capacity/demand is being considered, and appropriate measures implemented to ensure that the proposed development is sufficiently serviced. In addition to this, a consideration of resilience to potential systems failure will also be incorporated as appropriate. In addition, the utilities providers already have in place procedures to allow users to report a failure in supply of a particular utility so that repairs and continuation of supply can be enabled. On this basis, it is considered that suitable mitigation is already in place, such that further assessment of potential risks within the EIA would be a reiteration and hence unnecessary. For this reason, this disaster/accident type is proposed to be scoped out of further consideration.
- 3.5 In regard to urban fires, the proposed development will be designed in accordance with the latest Building Regulations requirements, as well as the requirements of relevant fire safety guidance. Neither the location of the site, or the uses proposed would suggest that the development would be subject to a heightened risk of terrorist attack or public disorder.
- 3.6 As already highlighted, the 999-emergency response procedure is also in place to allow the general public to report urban fires, terrorist attacks, public disorder and other types of major accidents disasters to the emergency services, who would attend site and act to resolve the incident. As such, it is considered that suitable mitigation is already in place for these types of accident/disaster, such that further assessment of potential risks would be unnecessary, and, on this basis, they have also been scoped out of the EIA.
- 3.7 Given the number of vehicle trips expected to be generated by the proposals, there is considered to the potential for effects on the vehicle accident baseline on the local network. The application site includes some operational light industrial uses. While Defence Science and Technology Laboratory (DSTL) will leave the site under the proposals, and are responsible for decommissioning their installation, QinetiQ's operations will continue onsite. Risks associated with QinetiQ's operations, as well as vehicle accidents, are discussed in more detail in the sections below.

VEHICLE ACCIDENTS

- 3.8 Vehicle accident risks have been assessed in the Transportation ES chapter (Chapter 10, ES Volume II). The future baseline accident numbers for the three junctions located close to the site that have been assessed range from 5 to 13 accidents per year. The anticipated change in accident risk for the three junctions, as a result of the proposed development, ranges from -0.55% to +7.5%. Effects have been assessed as Negligible Adverse in all cases.

QINETIQ'S OPERATIONS

- 3.9 Under the proposals, the current area in the south-western part of the site is to be retained by QinetiQ for its continuing and future operations. QinetiQ is one of the world's leading defence technology and security companies.
- 3.10 QinetiQ's future operations will continue to focus on the research, analysis and trace testing of energetic material for commercial manufacturing and the Ministry of Defence. All of QinetiQ's operations will be Health and Safety Executive (HSE) compliant. All analysis and testing of trace energetic material would be undertaken internally within the buildings and bunkers and any detonations are expected to be infrequent. Such incidents are unlikely, and are defined at worst for the purposes of this report to be no more than approximately five events a week. If analysis and testing for large volumes of material need to take place, this will happen at another QinetiQ site. The amount of energetic material stored on the site will be considerably condensed to the existing conditions and moved to the site as and when required. Stock management of the material will be thoroughly controlled and specific to the project being carried out at the time.
- 3.11 The QinetiQ operations will be secured by a new security fence around the perimeter of the operations. The new security fence will extend around the QinetiQ area to the north of the escarpment and woodland joining the existing part of the security fence to the south. The security fence will be built in accordance with BS1722:2006 and comprise a concrete or metal post and wired mesh fence with extra high security up to a maximum of 3m above ground level. The main entrance to the QinetiQ area will only be lit to allow those entering and leaving the site to be visible. No public access will be allowed in the QinetiQ area beyond the security fence.
- 3.12 QinetiQ deal with several explosive and flammable substances. These are transported, stored and used at locations across the site daily. This creates the potential for an unplanned explosion or fire. Some of the materials used are classified as hazardous. They are stored and handled under carefully licenced conditions, strictly regulated and carefully controlled conditions. QinetiQ at MOD Fort Halstead is subject to the Control of Major Accident Hazards (COMAH) Regulations 2015. The COMAH Regulations are enforced by the competent authorities, mostly by the Health & Safety Executive (HSE) and the Environment Agency (EA). The main intention of the regulations is to prevent and mitigate the effects of major accidents involving dangerous substances which can potentially cause serious harm or injury to people and/ or damage to the environment.
- 3.13 QinetiQ co-operate fully with the HSE and the EA to minimise any risk to employees, neighbours and the environment. QinetiQ is required to fulfil specific obligations including informing people living and working in the nearby area about the potential hazards associated with site activities and what to do in the unlikely event of an emergency. QinetiQ have developed well established emergency procedures for dealing with any major accident on the Fort Halstead site. These procedures are contained within the COMAH On-Site Emergency Plan.

- 3.14 The site is supervised 24 hours a day, all year round and QinetiQ employees are trained to manage emergencies. In the event of an emergency, QinetiQ is responsible for liaising with the emergency services to minimise the impact of the incident.
- 3.15 Given that the risks associated with these operations are already regulated via the COMAH Regulations, further assessment of potential risks within the EIA would be a reiteration and hence unnecessary.

4.0 Summary

- 4.1 A comprehensive list of different types of major accidents and disasters have been considered in this document. As reported in Chapters 2 and 3, all types of major accident/disaster are either considered to have no significant residual effects as a result of the proposals or are already controlled under a separate regulatory regime making any further assessment of potential risks within the EIA unnecessary.