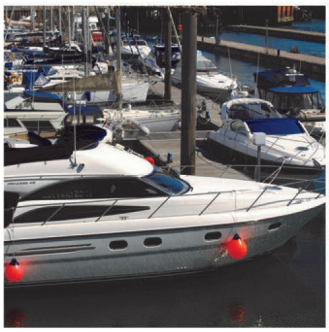
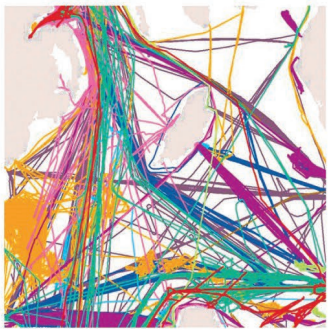
Associated British Ports

Immingham Eastern Ro-Ro Terminal

Preliminary Environmental Information
Chapter 18: Land Use Planning

January 2022





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18.1 Introduction

18.1.1 This chapter provides a preliminary assessment of the potential significant risks of the proposed Immingham Eastern Ro-Ro Terminal (IERRT) on land use planning and human health. This chapter has been prepared by Ian Lines of Kent Energies UK Ltd.

18.1.2 The main objective of the land use planning and human health assessment is to demonstrate that workers and users of the IERRT will not be exposed to unacceptable levels of risk from potential major accidents at the existing major hazard sites, pipelines, and explosives sites in the vicinity (i.e. all those installations whose off-site risks extend over any part of the proposed IERRT). The Health and Safety Executive (HSE) will be responsible for advising whether these risks are at an acceptable level.

18.1.3 Human health is also considered as part of other topic specific assessments, namely Ground Conditions including Land Quality (Chapter 12), Air Quality (Chapter 13), and Airborne Noise and Vibration (Chapter 14). Accidents and disasters are also considered in relation to Commercial and Recreational Navigation (Chapter 10), and Coastal Protection, Flood Defence and Drainage (Chapter 11), including the vulnerability of the project to Climate Change (Chapter 19).

18.1.4 It is noted that Section 4.15, and specifically paragraph 14.15.3, of the National Policy Statement for Ports (NPSfP), produced by Department for Transport (DfT) (2012), requires that:

> *The applicant should therefore consult the local planning authority at preapplication stage to identify whether its proposed site is within the consultation distance of any site with hazardous substances consent and, if so, should consult HSE for its advice on locating the particular development there.*

The proposed development clearly lies within the consultation distances of a number of major hazard sites and pipelines, and so this has been a key factor which has been taken into account in the design. The HSE has also been consulted in order to ensure that its land use planning requirements will be met, as described in the remainder of this chapter.

18.1.5 A number of figures support the assessment of risk for persons at the IERRT and are provided in Volume 2 of this Preliminary Environmental Information Report (PEIR) document. Figures 18.1 to 18.11 show the location of the latest available HSE land use planning zones for all the major hazard sites, pipelines, and explosive sites in the vicinity. These diagrams show the areas where there is increasingly strict control on any proposed new developments in order to ensure that the risks at those developments are acceptable. Figure 18.12 shows the combined HSE land use planning

zones in relation to the layout of the IERRT, which is shown in more detail in Figure 1.3.

18.1.6 It is noted that there will no storage or processing of hazardous substances at the IERRT. As a consequence, the site will not require Hazardous Substances Consent (HSC) nor will it be subject to the Control of Major Accident Hazard (COMAH) Regulations. Hence, the IERRT itself will not pose any significant safety risks to people at other sites in the vicinity and, based on Advice Note 11 Annex G (Planning Inspectorate, 2021), there is no requirement to undertake a risk assessment for any risks associated with the proposed development. It is recognised that there may occasionally be some transit of dangerous substances through the IERRT, but this would only be a temporary presence for a few hours before being loaded onto a vessel. This would not require HSC or trigger the requirements of the COMAH regulations.

18.2 Definition of the study area

18.2.1 The study area for this preliminary assessment includes all the nearby major hazard sites, pipelines, and explosives sites whose land use planning zones may encroach on any part of the IERRT project, as shown in Figures 18.1 to 18.12.

18.2.2 The land use planning Environmental Statement (ES) chapter will, through further desk-based analysis and assessment, refine the study area for the purpose of the impact assessment.

18.3 Assessment methodology

18.3.1 Two complementary approaches have been adopted to assess the level of risk to people at the IERRT and the acceptability of these risks:

- The first approach follows the standard HSE land use planning methodology in which the sensitivity of each part of the development is assessed in relation to its location within the HSE land use planning zones for all the nearby major hazard sites and pipelines. This assessment provides an indication of whether there are any risks which would cause the HSE to advise against the development of the IERRT; and
- The second approach is based on a high-level quantitative estimate of the risks, also based on the HSE land use planning zones and the use of HSE's risk criteria, in order to provide a more detailed understanding of the risks and precisely where they arise.

18.3.2 It is noted that the vessels themselves will sit beyond the low water mark and therefore they do not fall within the ambit of the Town and Country Planning Act or land use planning protocols and are, therefore, the regulatory responsibility of the Maritime and Coastguard Agency.

Nevertheless, the level of risk at the vessels has still been assessed (see Section 18.9).

Data and information sources

18.3.3 Desk-based studies have been undertaken to understand the existing sources of risk in the vicinity of the IERRT, and to assess the levels of risk to which workers and the public at the proposed development may be exposed. This assessment has been based on the following key data sources:

- HSE's Land Use Planning Methodology (HSE, 2021a);
- Planning Practice Guidance (Hazardous Substances) (MHCLG, 2019);
- Advice Note 11 Annex G (Planning Inspectorate, 2021);
- The latest HSE land use planning zones for all major hazard sites and pipelines in the vicinity; and
- The safeguarding zones for the explosives sites in the vicinity.

18.3.4 In addition to the above, the HSE's publicly available land use planning web application has been consulted.

18.3.5 The HSE's Land Use Planning Team has also been formally consulted to provide detailed pre-application advice (HSE, 2021b), as recommended by the HSE in preliminary discussions.

Determining significance of risks

18.3.6 The significance of risks to people at the IERRT is based primarily on the HSE's published land use planning methodology (HSE, 2021a). This guidance describes how the HSE provides advice to Local Planning Authorities in relation to proposed developments, such as the IERRT, in the vicinity of existing major hazard sites and pipelines.

18.3.7 The quantified estimates of risk have been assessed against the criteria adopted by the HSE, such as those defined in HSE's document Reducing Risk, Protecting People (HSE, 2003), known as R2P2.

18.4 Consultation

18.4.1 Consultation with regard to the outcomes of the formal scoping process and the significance of the risks to persons at the IERRT has been undertaken with the HSE.

18.4.2 The consultation that has been undertaken, along with the outcome of the consultation and how it has influenced the proposals and assessment, are provided in Tables 18.1 and 18.2.

Table 18.1 Summary of consultation to date

Consultee	Reference, Date	Summary of Response	How comments have been addressed in this chapter
HSE	Initial informal consultation with Chris Brookes-Mann of HSE on 20 July 2021.	The HSE acknowledged that major hazard safety issues had been taken into account in the proposed design. The HSE did not identify any significant safety or major hazard issues but recommended obtaining formal pre-application advice from the HSE's Land Use Planning Team.	A meeting with the HSE Land Use Planning Team was arranged and took place on 20 October 2021 (see below).
HSE	Formal consultation with the HSE's Land Use Planning Team led by Stuart Reston on 20 October 2021. and HSE's written report of the meeting provided (see HSE, 2021b)	HSE indicated two main concerns with the proposed development: 1) The presence of drivers in the Development Proximity Zone (DPZ) was not entirely consistent with the HSE's general guidance in SPC 43 (HSE, 2011). However, on balance, the HSE considered that the proposals were acceptable given the specific circumstances (i.e. a relatively small number of workers, briefly present, and spread over a large area). 2) Members of the public present could exceed 100 people in the Middle Zone, which the HSE would have to advise against. It was acknowledged that the dismantled acrylonitrile pipeline and Edward Nicholson Consent (T H Brown Ltd) should not be relevant, although their status should be confirmed.	The concerns of HSE are acknowledged. Regarding the two specific concerns: 1) The time that drivers spend within the DPZ will be minimised – drivers will not take rest breaks in this area and there will be no associated structures or rest/recreational areas within the DPZ. 2) The maximum number of members of the public present (waiting to board) at the IERRT at any one time will be limited to no more than 100. Associated British Ports (ABP) is also seeking to expedite the revocation of the consent for the Edward Nicholson (T H Brown Ltd) site (which no longer exists, the tenant having vacated the site). The demolished acrylonitrile pipeline was formally denotified on 9 December 2021.

Table 18.2 Responses to Scoping Opinion comments relating to land use planning and human health

Consultee	Scoping Opinion Reference	Comment	Response
Planning Inspectorate (PINS)	Table ID 4.14.1	The Inspectorate notes that the Health and Safety Executive (HSE) consultation identifies that the Proposed Development lies within multiple consultation zones of major accident hazard sites and major accident hazard pipelines. The ES should include an assessment of these matters or the information referred to demonstrating agreement with the relevant consultation bodies and the absence of an likely significant effect.	The risks from nearby major hazard sites and pipelines are considered in this Chapter 18 in terms of the implications for people at the proposed development. Agreement has been reached with the HSE regarding the proposed development (see Table 18.1).
PINS	Table ID 4.14.2	Risks to workers during construction will be managed by the requirements of the Health and Safety at Work Act and Construction (Design and Management) Regulations. This is expected to ensure that any temporary construction buildings are located in low risk areas. The Inspectorate is content to scope out this matter on this basis.	Agreed that these matters are scoped out.
PINS	Table ID 4.14.3	The Scoping Report seeks to scope out consideration of other risks to human health other than those arising from major accidents etc. from this chapter of the ES on the grounds that other risks to human health will be considered elsewhere in the ES. The Inspectorate agrees with this approach but advises that the other relevant sections of the ES should be clearly signposted in this chapter.	Agreed that these matters are scoped out of Chapter 18. Other relevant sections are signposted in the introduction to this chapter (Section 18.1).

Consultee	Scoping Opinion Reference	Comment	Response
HSE	Appendix 2 HSE response	Regulation 5(4) of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 requires the assessment of significant effects to include, where relevant, the expected significant effects arising from the proposed development's vulnerability to major accidents. HSE's role on Nationally Significant Infrastructure Projects (NSIPs) is summarised in the following Advice Note 11 Annex on the Planning Inspectorate's website - Annex G – The Health and Safety Executive. This document includes consideration of risk assessments on page 3.	The risks from nearby major hazard sites and pipelines are considered in this Chapter 18 in terms of the implications for people at the proposed development. Hazardous Substances Consent is not required for the proposed development. There is no requirement to undertake risk assessments based on Annex G.
UK Health Security Agency	UK Health Security Agency response	We request that the ES clarifies whether the application will require the installation or redirection of electric substations or transmission lines and if necessary, the proposer should confirm either that the proposed development does not impact any receptors from potential sources of Electric Magnetic Fields (EMF); or ensure that an adequate assessment of the possible impacts is undertaken and included in the ES.	It is not anticipated that the proposed development will impact any receptors from potential sources of EMF. Further assessment will be undertaken for the ES as necessary.

18.5 Implications of policy legislation and guidance

18.5.1 The HSE is a consultation body, for the purposes of the Infrastructure Planning (Environmental Impact Assessment (EIA)) Regulations 2017. The HSE is, therefore, a statutory consultee for all NSIPs in England.

18.5.2 The EIA Regulations (Schedule 4) requires (where relevant) an ES to include - "*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*".

18.5.3 When an applicant requests an EIA Scoping Opinion from PINS in relation to a proposed EIA development, the HSE will be consulted and will provide their advice. This advice will be used by PINS to inform the Scoping Opinion which in turn will be used by the applicant to prepare their ES.

18.5.4 The HSE is also a statutory consultee in accordance with section 42 of the Planning Act 2008, providing public safety advice in respect of proposed NSIPs.

18.5.5 The two main considerations for HSE are:

- Does the proposed development have the potential to cause a major accident (e.g. does the development require a HSC, and in this context, will it be within the scope of the COMAH Regulations and if not, could the development impact on a COMAH site)?; and
- Is the proposed development vulnerable to potential major accidents (e.g. is it within a Consultation Distance (CD) around a major hazard site or pipeline)? It is noted that the CD corresponds to the HSE Outer Zone used for land use planning (see Section 18.8).

18.5.6 The IERRT will not handle significant quantities of any hazardous substances, so will not have the potential to be the cause a major accident nor will its operations impact on nearby COMAH sites. The main concern is that the proposed development will lie within the consultation zone of a number of major hazard sites and pipelines, and hence there is a potential risk to safety for those at the proposed development site.

18.5.7 When the HSE prepares its statutory advice on NSIPs, as well as providing their views on the above considerations, the HSE will also highlight the following as appropriate:

- Whether the proposed development is on an existing major hazard site and as such could have significant consequences for major accident hazards;
- The need to consider if an application should be made to the Hazardous Substances Authority (HSA) for a HSC and/or whether extant HSC(s) need to be varied; and
- If there is a facility near to the proposed development where a licence exists under either the Explosive Regulations 2014 or the Dangerous Goods in Harbours Regulations (DGHAR) 2016.

18.5.8 It is incumbent upon the applicant to identify and address all responses including those from statutory consultees in their Consultation Report to be submitted with each NSIP application – as well as taking those responses into account in the formulation of the ES. When this interchange and recognition of responses has not taken place, and the HSE NSIP team has had no other direct contact with the promoter of the Project, the HSE will contact the applicant to satisfy themselves that any outstanding issues have been addressed. This interaction will clarify if a Relevant Representation is required.

18.5.9 The HSE then uses the same criteria to ensure a consistent review of all relevant documentation under section 56 of the Planning Act 2008. However, HSE only raises a Relevant Representation if they have outstanding concerns which require further scrutiny at the Examination stage of the process.

18.5.10 HSE may also choose to participate in the Examination when there have been unresolved issues, usually around those sites constrained by current consultation zones.

18.5.11 As the proposed development is not within the scope of the COMAH Regulations, the safety concerns related to any work activity will be addressed under the Health and Safety at Work (HSW), etc Act 1974 and its relevant statutory provisions. In particular, this consideration should be discharged under a management of HSW Regulations requirement to prepare a suitable and sufficient risk assessment (http://www.hse.gov.uk/risk/index.htm) for proposed activities, identifying hazards and taking appropriate measures to manage and control the risks.

18.6 Preliminary description of the existing environment

18.6.1 The existing baseline environment involves all the current major hazard sites, pipelines and explosives sites where major accidents could impact on the area of the proposed development. Current major hazard sites and pipelines in the vicinity include:

- Phillips 66 Ltd – Immingham Pipeline Centre;
- Phillips 66 Ltd – Immingham Propylene Storage;
- Exolum (West) – previously Inter Terminal (West);
- Exolum (East) – previously Inter Terminal (East);
- ABP Immingham Bulk Park;
- Immingham Fertiliser Terminal;
- Associated British Ports Shed 2 and 3;
- Associated Petroleum Terminals (Immingham) Ltd;
- Origin Fertilisers;
- Tronox Pigment UK Ltd;
- ABP Port of Immingham Explosives Licenced Site; and
- Cadent Gas Ltd Pipeline.

18.6.2 All of these sites have Consent under the Planning (Hazardous Substances) Regulations and the pipelines have been notified under the Pipeline Safety Regulations.

18.6.3 It is noted that an HSC currently exists in the name of Edward Nicholson (T H Brown Ltd) for a site just west of the Associated Petroleum Terminals (Immingham) Ltd. This relates to an old 1992 deemed Consent, but the site as an operation no longer exists and ABP are, therefore, in the process of revoking the HSC, as discussed with the HSE.

18.6.4 It is also noted that there was until very recently a notification for an acrylonitrile pipeline in the area, originally notified by Simon Storage, which became Immingham Storage Ltd, which later became Inter Terminals and is now Exolum. It has been confirmed (by Inter Terminals / Exolum) that this pipeline has been demolished. The HSE confirmed on 9 December 2021 that this pipeline has now been formally denotified and so the HSE zones no longer apply.

18.6.5 Some of the sites and pipelines identified in the above list currently present varying degrees of major hazard risk to workers in the area where the IERRT will be located. The risks from each hazard are assessed in Sections 18.8 and 18.9.

18.7 Future baseline environment

18.7.1 The future baseline environment will still involve all the same major hazard sites, pipelines and explosives sites where major accidents could impact on the area of the proposed development.

18.7.2 It is not expected that there will be any significant changes at any of the nearby major hazard sites, pipelines, and explosives sites, and so the future baseline that would exist without the proposed development is expected to be similar to the current baseline.

18.7.3 The issue which will be considered in Sections 18.8 and 18.9 is, therefore, simply whether the existing major hazard sites in the vicinity would pose an unacceptable risk to people at the IERRT.

18.7.4 The proposed development involves the following elements:

- Marine infrastructure (including approach jetty, linkspan bridge, floating pontoons, finger piers);
- Parking and storage areas for unaccompanied freight (Ro-Ro trailers left by their drivers at the port and moved onto and off the vessel using specialised tractor units);
- Waiting areas for accompanied freight (cabs and trailers driven onto and off the vessel by lorry drivers who will remain on board during the passage);
- Waiting areas for occupied passenger vehicles;
- Terminal building with basic facilities for lorry drivers and passengers;
- Office, workshop, and gatehouse; and
- Internal bridge over ABP operated railway/road and access roads.

18.7.5 The IERRT will handle in the region of 880,000 cargo units per year, with approximately 72% being unaccompanied freight and 28 % being accompanied freight. Excluding lorry drivers embarking or dropping off cargo trailers at the terminal, the workforce is expected to consist of:

- 26 tractor/tug drivers;
- 2 mechanics;

- 5 clerks;
- 2 to 4 managers; and
- a small number of Border Force staff.

18.7.6 Any passenger use of the IERRT will be limited to ensure that there are no more than 100 members of the public present (waiting to board) at any one time (passengers would be for accompanied vehicles only – there would be no foot passengers). Disembarking passengers will immediately drive off the port after a passport check. The intention is that the disembarking passengers would use a 'quick exit' lane that avoids the need to drive through the DPZ. The north/south extent of East Riverside Road will be kept in place for emergency access to the new jetty and for the very occasional abnormal load but passengers will be routed around the DPZ, not through it.

18.8 Application of standard HSE land use planning methodology

18.8.1 The current HSE land use planning zones for each of the existing major hazard sites in the vicinity are presented in Figures 18.1 to 18.10, as follows:

- Figure 18.1 - Phillips 66 Ltd – Immingham Pipeline Centre;
- Figure 18.2 - Phillips 66 Ltd – Immingham Propylene Storage;
- Figure 18.3 - Exolum (West) [Previously Inter Terminal (West)];
- Figure 18.4 - Exolum (East) [Previously Inter Terminal (East)];
- Figure 18.5 - ABP Immingham Bulk Park;
- Figure 18.6 - Immingham Fertiliser Terminal;
- Figure 18.7 - ABP Port of Immingham Explosives Licenced Site;
- Figure 18.8 - Associated Petroleum Terminals (Immingham) Ltd;
- Figure 18.9 - Origin Fertilisers; and
- Figure 18.10 - Tronox Pigment UK Ltd and Other Sites in the Vicinity.

18.8.2 All of the figures show the Outer (blue), Middle (green) and Inner (red) HSE land use planning zones, which correspond to areas where there are increasingly strict controls on any proposed development. Figures 18.3, 18.4 and 18.8 also show an orange hatched DPZ where the controls on development are even stricter than for the Inner Zone (see HSE, 2011). Figure 18.10 shows the HSE zones for Tronox Pigment UK Ltd, which just reach the eastern part of the IERRT, and a number of other sites in the vicinity. It is noted that the HSE zones shown for Origin Fertilisers in Figure 18.9 are out of date, and have changed slightly in extent, as shown in Figure 18.10 which is current.

18.8.3 Installations which hold explosives licences may also have land use planning constraints around them based on safeguarding zones. ABP hold such an Explosives licence for the Port of Immingham. Safeguarding Zones are generally defined in Table 18.3.

Table 18.3 Description of explosives safeguarding zones

Colour	Description
Red	Extent of licensed site
Black	Extent of ownership where this extends beyond the red line
Green	Envelope of Class B (public traffic route) distances (SD1)
Yellow	Envelope of Class D (inhabited building) distances (SD2)
Purple	Envelope of Class E (buildings of vulnerable construction) distances (SD3)
Blue	Envelope of reference zone boundaries (if reduced distances apply to one or more buildings)

18.8.4 Figure 18.11 shows the current Safeguarding Plan zones for the Port of Immingham, based on the current ABP explosives licence, including the Green, Yellow and Purple (SD1, SD2 and SD3) zones. None of these Safeguarding Distances (SDs) extend far enough east to encroach on the IERRT. It can be concluded, therefore, that these zones have no safety implications for land use planning for the proposed development.

18.8.5 There are also two major hazard pipelines in the vicinity. The first is a high-pressure natural gas pipeline operated by Cadent Gas Ltd (known as the Thornton Curtis/Ciba Geigy gas pipeline), with HSE Inner, Middle and Outer zones distances of 17 m, 65 m, and 75 m from the pipeline, respectively. The second is an acrylonitrile pipeline running from Immingham to Grimsby, originally notified by Simon Storage (now Exolum), with HSE Inner, Middle and Outer zones of 240 m, 525 m, and 560 m from the pipeline, respectively. However, it is known that this acrylonitrile pipeline has been demolished and was formally denotified on 9 December 2021.

18.8.6 The HSE land use planning zones for all the above major hazard sites, pipelines and explosives sites have been combined in a single diagram in Figure 18.12 (provided by the HSE). It is noted that this diagram still includes the denotified acrylonitrile pipeline, and also the HSE zones centred just west of Exolum East at Immingham Dock which are associated with a Consent in the name of Edward Nicholson (T H Brown Ltd), which is in the process of being revoked (the site no longer exists, but a deemed consent was granted in 1992). The zones in Figure 18.12 can be used to assess the IERRT using the HSE's land use planning methodology, as described below. It is noted from Figure 18.12 that most of the proposed development site lies within the HSE Inner Zone, with a small part lying within the DPZ and a small part within the HSE Middle Zone.

18.8.7 The HSE's land use planning methodology characterises all proposed developments, or parts of a development, as having one of nine Development Types, each of which is considered to have a Sensitivity Level of 1 to 4.

- Level 1 - Based on normal working population;
- Level 2 - Based on the general public (at home and involved in normal activities);

- Level 3 - Based on vulnerable members of the public (children, those with mobility difficulties or those unable to recognise physical danger); and
- Level 4 - Large examples of Level 3 and very large outdoor examples of Level 2.

18.8.8 The HSE calculates safety zones around major hazard installations known as Land Use Planning (LUP) zones. The location of any proposed development within these HSE LUP zones is determined and HSE's guidance is then based on the decision matrix shown in Table 18.4.

Table 18.4 HSE decision matrix for land use planning

Level of Sensitivity	Development in Inner Zone	Development in Middle Zone	Development in Outer Zone
1	DAA	DAA	DAA
2	AA	DAA	DAA
3	AA	AA	DAA
4	AA	AA	AA
DAA	Do not Advise Against development		
AA	Advise Against development		

18.8.9 The HSE's land use planning methodology characterises the majority of the IERRT area as a 'Workplace', i.e. Development Type 1.1, which is considered to be Sensitivity Level 1. Whilst the majority of the proposed development lies within the red Inner Zone in Figure 18.11, the HSE decision matrix indicates that such Sensitivity Level 1 developments are not advised against in this area.

18.8.10 It is noted that members of the public may also use the IERRT. They would not be present within the Inner Zone area for long, therefore, such minor transport routes are not advised against in the Inner Zone. However, there could be larger numbers of members of the public present for some time in the Passenger/Accompanied Loads parking area whilst waiting for a ferry. The lanes for this Passenger/Accompanied Loads parking area are deliberately located in the Middle Zone where the risks are lower. This would be considered Development Type 2.5 'Outdoor use by public', which is Sensitivity Level 2, which is not advised against in the Middle Zone. However, if there could be more than 100 members of the public present at any one time then it would be characterised as Sensitivity Level 3, which would be advised against in the Middle Zone. The current intention is, therefore, to limit the maximum number of members of the public to no more than 100 in the waiting area of the Terminal at any one time.

18.8.11 It is noted that Figure 18.12 shows that part of the IERRT lies within the DPZ. Whilst only a relatively small number of workers would be present for short periods in this area, it is recognised that the HSE guidance in SPC 43 (HSE, 2011) indicates that the level of occupancy would exceed the limits in the guidance. This has, therefore, been discussed with the HSE who have indicated that, in this specific case, they consider the situation to be

acceptable because of the relatively small number of people involved, all of whom would be workers, only being present for short periods of time and spread over a relatively large area. It is emphasised that worker time in this area would be minimised – there would be no rest areas and no drivers spending time or sleeping in vehicles.

18.8.12 In summary, the plans for the IERRT are compliant with the requirements defined in HSE's land use planning methodology, and in pre-application discussions with the HSE, and hence it is understood that HSE will not advise against the proposed development on the grounds of safety.

18.9 Preliminary Assessment of Risk

18.9.1 Whilst the land use planning assessment in Section 18.8 demonstrates that the IERRT would not be advised against by the HSE, which has been confirmed in consultation with the HSE, the assessment does not provide an assessment of any risks to which people may be exposed. This section, therefore, provides a preliminary quantitative assessment of the risks.

18.9.2 The level of risk at each part of the IERRT has been estimated based on the HSE land use planning zones for the sites and pipelines in the vicinity, as shown in Figures 18.1 to 18.11. It is noted that the Inner, Middle and Outer zones typically correspond to individual risk levels of 10, 1 and 0.3 chances per million (cpm). However, it is noted that the zones for flammable and explosive hazards are set on a hazard basis, and so these risk values are only approximations, and that for sites with a DPZ the risk within the DPZ could be significantly higher (taken as 100 cpm).

18.9.3 As the risk levels are based on the HSE LUP zone diagrams, the risks associated with each hazard are defined as the annual risk of receiving a dangerous dose or worse for a typical member of a residential population (i.e. in a house) who is present for 100 % of the time. The risk of fatality would typically be about a factor of 3 lower, depending on the hazard. The risk to people outdoors (e.g. from toxic risks) could be slightly higher, but if people are only present for a short time, then the risks would be correspondingly lower. All risks are quoted in units of cpm (chances per million), i.e. the probability of occurrence per million years.

18.9.4 It is emphasised that the risks in Table 18.5 are subject to some uncertainty, and that risks may vary significantly across an area. Therefore, the values above are only intended to provide reasonable preliminary estimates for the purposes of the simple risk assessment in this PEIR. The values in the final row titled 'Estimated true total risk' include some allowance for the uncertainties.

18.9.5 The risk at the North Trailer Park is dominated by the risk of Buncefield type explosions associated with the storage of petrol at the Exolum (East) and the Associated Petroleum Terminals (Immingham) Ltd sites. There will also be a risk from major pool fires from these sites and a risk from toxic vapours in the event of a major spill or fire at Exolum (East).

Table 18.5 Estimated levels of risk (cpm) at parts of the Immingham Eastern Ro-Ro Terminal

Major Hazard	North Trailer Park	Central HGV Park	South Trailer/ HGV Park	New Road to Ferries (max)	Passenger/ Accompanied Loads Waiting Lanes	Moored Ferries
Phillips 66 Ltd – Immingham Pipeline Centre	0	0	0	0	0	0
Phillips 66 Ltd – Immingham Propylene Storage	0	0	0	0	0	0
Exolum (West)	0.3	0.2	0.2	0.3	0.1	0.5
Exolum (East)	100	10	5	100	2	10
ABP Immingham Bulk Park	5	1	0.5	5	0.5	0.3
Immingham Fertiliser Terminal	0.3	0.3	30	5	0.5	0.3
ABP Shed 2 and 3	0.1	0.1	0.1	0.1	0.1	0.1
Associated Petroleum Terminals (Immingham) Ltd	30	0.1	0	100	0	0.3
Origin Fertilisers	3	30	30	30	8	0.1
Tronox Pigment UK Ltd	0.3	0.2	0.1	0.3	0.1	0.3
Cadent Gas Ltd Pipeline	0	0	0	0	0	0
Explosives sites	0	0	0	0	0	0
Total of risks above	139.0	41.9	65.9	240.7	11.3	11.9
Estimated true total risk	**150**	**50**	**80**	**250**	**15**	**15**

18.9.6 The risk at the South Trailer/Heavy Goods Vehicle (HGV) Park appears to be dominated by the risk of toxic combustion products (e.g. nitrogen dioxide) in the event of a major fire at Origin Fertilisers or at the Immingham Fertiliser Terminal. There may also be some explosion risk from these sites.

18.9.7 The risks for people waiting in the Passenger/Accompanied Loads waiting area are the lowest on site, and are dominated by the risk of toxic combustion products (e.g. nitrogen dioxide) in the event of a major fire at Origin Fertilisers. There may also be some explosion risk from this site.

18.9.8 The risk for persons aboard the moored ferries is dominated by similar events to those described above for the North Trailer Park, although the risk is at a lower level. In reality, persons aboard a large steel vessel are likely to be at a lower level of risk than those presented in the table above because of the protection offered by the vessel structure to any fire/explosion events.

18.9.9 The levels of risk predicted in Table 18.5 can be compared with the typical risk criteria described by the HSE in R2P2 (HSE, 2003), which in terms of the risk of fatality for an individual can be summarised as shown in Table 18.6.

Table 18.6 HSE Individual risk criteria

Risk	Description
1000 cpm	Maximum individual risk for workers
100 cpm	Maximum individual risk for a member of the public
1 cpm	A level of individual risk below which risks are considered to be broadly acceptable for workers or the public

18.9.10 Situations where the risks are between the maximum and broadly acceptable levels should only be considered acceptable if they have been reduced to a level which is As Low As Reasonably Practicable (ALARP). It is noted that risk criteria used for land use planning (HSE, 1989a; 1989b) in relation to proposed new developments are slightly more complex than those quoted above from R2P2, and this is reflected in the HSE land use planning methodology (HSE, 2021a).

18.9.11 The location where workers are at greatest risk is the North Trailer Park. A worker would only be present in this area for a small fraction of the year and so their risk of fatality would be at least an order of magnitude less than the value in Table 18.5. Whilst this still represents a significant risk, it lies in the ALARP region where it can be considered acceptable if there are no further reasonably practicable measures which can be put in place to reduce the risks any further.

18.9.12 The location where significant numbers of members of the public could be present for a significant time is at the Passenger/Accompanied Loads waiting area lanes. Even a regular traveller spending 3 hours waiting in this area 100 times per year would only have an occupancy of less than 4 %, implying that the individual risk of fatality is well under 1 cpm.

18.9.13 Whilst the level of individual risk to workers and passengers at the IERRT is relatively low compared with HSE risk criteria, even for the most exposed individuals, it is recognised that there are also ‘societal risk’ concerns which take account of the number of people who may be affected in major accidents. The HSE (Carter, 1995) has developed methodologies for assessing these societal risks, including the Scaled Risk Integral (SRI), which is a simple measure which takes account of the number of people, the risk, the occupancy level, and the area of a development.

18.9.14 The SRI is calculated as:

$$SRI = P\ R\ T / A$$

Where: P = population factor, calculated using $P = (n + n^2)/2$

n = number of persons at the development (adjusted for population type)

R = average estimated level of individual risk of receiving a dangerous dose or worse (cpm)

A = area of development (hectares)

T = occupation factor - proportion of time for which people are present

18.9.15 The HSE criteria used for interpreting the SRI value, based on HSE (1999), are presented in Table 18.7.

Table 18.7 HSE SRI criteria

SRI value	Description	Action
2,500	Significant risk	Presumption against if exceeded
35,000	Substantial risk	Incompatible if exceeded
500,000	Very high risk	Consider relevant call-in procedure if exceeded
750,000	Intolerable risk	Initiate relevant call-in procedure if exceeded

18.9.16 The value of the SRI is largely defined by the number of members of the public present. This is because the factor n is typically reduced by a factor of 4 for workers (as they are regarded as being less 'sensitive' than typical members of the public), and the n term is squared in the SRI calculation. Hence, a reasonable estimate of the SRI for the overall IERRT can be derived by simply considering the members of the public. Considering each parameter in the SRI calculation:

n = 100 (the maximum number of members of the public likely to present at any one time in the waiting area, e.g. immediately before boarding takes place)

R = 15 cpm (average risk at Passenger/Accompanied Loads waiting area – see Table 18.5)

A = 38.4 ha (approximate site area, not including area of jetty or ferries)

T = 3 x 3/(24 x 7) = 0.054 (based on assuming that significant numbers of members of the public (i.e. n = 100) are present at the IERRT on 3 days per week, and people are present for a total of 3 hours)

Hence, $SRI = (100 + 100^2)/2 \times 15 \times 0.054 / 38.4 =$ **107**

18.9.17 Based on Table 18.7, this result is well below the SRI value that is considered to be 'significant', and so would not normally be advised against. It is noted that even if the calculation were made more sophisticated, to take account of the workers on site and drivers for accompanied and unaccompanied loads, the associated SRI would still be significantly lower than the value calculated above for the public (as workers are considered to have a less significant populations type for the purposes of the SRI). Hence, it is reasonable to conclude that the societal risks are not sufficiently significant to be a concern.

18.10 Mitigation measures

18.10.1 The key mitigation measure that has been incorporated in the design of the IERRT to reduce the risks to people at the proposed development is simply to minimise the numbers who may be present in the areas of highest risk.

18.10.2 The area of highest risk is within the DPZ, and so only small numbers of workers would enter this area for a short period of time.

18.10.3 The largest numbers of people at the proposed development would be those waiting to board in the Passenger/Accompanied Loads waiting lanes/area, so this has been located in the area of lowest risk. In addition, it has been agreed that the maximum number of members of the public who may be present in the waiting area of the Terminal will not exceed 100 at any one time. This is to comply with a key concern raised by HSE.

18.11 Limitations

18.11.1 The assessment has been undertaken based on the following assumptions:

- The land use planning zone assessments undertaken by the HSE for all the major hazard sites and pipelines in the vicinity provide a reasonable assessment of the levels of risk in their vicinity; and
- All the major hazard sites and pipelines in the vicinity are operated in a manner which ensures that the risks from those facilities have been reduced to a level which is ALARP.

18.11.2 It is not envisaged that the limitations outlined above are significant in terms of the overall conclusions relating to safety and health, and hence the ES will not require any significant additional assessment.

18.12 Preliminary conclusions on safety and health

18.12.1 The risks to people at the IERRT from potential major accidents at major hazard sites, pipelines and explosives sites in the vicinity have been assessed. The approach that has been used is based on that adopted by the HSE for land use planning, with some additional quantitative risk analysis to provide a better understanding of the risks.

18.12.2 The assessment using the HSE methodology shows that, for most of the IERRT, the levels of risk are sufficiently low that HSE would not normally advise against the development on the grounds of safety. A possible exception related to the small number of workers within the DPZ, but this has been discussed with HSE who have advised that it is acceptable, in view of the small number of people (all workers), only present for a short time and spread over a large area. The assessment also emphasised the importance of there not being more than 100 members of the public present at any one time in the waiting area of the Terminal – which was a condition highlighted by the HSE in pre-application discussions.

18.12.3 As part of the pre-application consultation with HSE, the HSE have indicated that there is no reason why they would advise against the IERRT development on the grounds of safety, provided that there are no more than 100 members of the public present at any one time in the waiting area of the Terminal.

18.12.4 The design and layout of the IERRT has been deliberately arranged in order to minimise major accident hazard risks as far as possible, by reducing the number of people in high-risk areas and ensuring that any areas with potentially significant numbers of members of the public are located in areas of the lowest risk.

18.13 References

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18.14 Abbreviations/Acronyms

Acronym	Definition
AA	Advise Against
ABP	Associated British Ports
ALARP	As Low As Reasonably Practicable
CD	Consultation Distance (equivalent to HSE Outer Zone)
COMAH	Control of Major Accident Hazards
cpm	Chances per million (years)
DAA	Don't Advise Against
DfT	Department for Transport
DGHAR	Dangerous Goods in Harbours Regulations
DPZ	Development Proximity Zone
EIA	Environmental Impact Assessment
EMF	Electric Magnetic Fields
ES	Environment Statement
HGV	Heavy Goods Vehicle
HSA	Hazardous Substances Authority
HSC	Hazardous Substances Consent
HSE	Health and Safety Executive
HSW	Health and Safety at Work
ID	Identification
IERRT	Immingham Eastern Ro-Ro Terminal
LUP	Land Use Planning
MHCLG	Ministry of Housing, Communities and Local Government
NPSfP	National Policy Statement for Ports
NSIP	Nationally Significant Infrastructure Projects
PEIR	Preliminary Environmental Information Report
PINS	Planning Inspectorate
R2P2	Reducing Risk, Protecting People (HSE document)
Ro-Ro	Roll On-Roll Off
SD	Safeguarding Distance
SRI	Scaled Risk Integral

18.15 Glossary

Term	Definition
Consultation Distance	The area around a major hazard site or pipeline within which a local authority is required to seek the advice of the HSE for proposed new developments. It corresponds to the HSE Outer land use planning zone
Dangerous substance	A substance which presents flammable, toxic, or explosive hazards to people, or which is dangerous to the environment
Hazard	A substance, operation or piece of equipment which has the potential to cause harm to people or the environment
Individual risk	The likelihood of a specified level of harm occurring for a specified individual within a specified period of time
Land use planning	The approach used to ensure that proposed developments are not located in areas where the risks to people would be unacceptable
Major accident	An accident resulting in significant harm to people or the environment
Major hazard pipeline	A pipeline carrying a dangerous substance which could lead to harm to people or the environment
Major hazard site	An installation where the presence of one or more dangerous substances could lead to harm to people or the environment
Quantified risk assessment	A numerical assessment of the risks to people based on an assessment of the consequences/severity and likelihood of major accidents
Risk	The likelihood of a specified level of harm occurring within a specified period of time
Societal risk	The relationship between frequency and the number of people suffering from a specified level of harm in a given population from the realisation of specified hazards

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