◆ Geology, Soils, Land Contamination and Hydrogeology

INTRODUCTION

1. Intermodal Logistics Park North Ltd. ('the Applicant') is promoting proposals for a new strategic rail freight interchange (SRFI) and associated development on land to the east of Newton-le-Willows, in the jurisdictions of St Helens, Wigan and Warrington Councils. An SRFI is a large multi-purpose freight interchange and distribution centre linked into both the rail and trunk road systems. SRFIs reduce the cost of moving freight by rail and encourage the transfer of freight from road to rail, thereby reducing carbon emissions and contributing to the UK's target to achieve net zero by 2050.

2. Under the Planning Act 2008, the proposals qualify as a Nationally Significant Infrastructure Project (NSIP). Accordingly, an application for a Development Consent Order (DCO) is to be made to the Planning Inspectorate (PINS), which will examine the DCO application on behalf of the Secretary of State (SoS) for Transport.

3. Before making a DCO application, an Environmental Impact Assessment (EIA) of the Proposed Development will be undertaken in accordance with the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 ('the EIA Regulations'). EIA is a process that provides the decision maker with sufficient information about the likely environmental effects of a project and is used to improve the environmental design of a development proposal. The first stage of this process was the submission of a request for a formal scoping opinion under Regulation 10 of the EIA Regulations.

4. The Applicant submitted an EIA Scoping Report to the Planning Inspectorate in October 2024. This outlined the work undertaken to date and sought advice from the Inspectorate on the likely significant effects of the Proposed Development and the topics that needed to be assessed as part of the Environmental Impact Assessment (EIA). A Scoping Opinion was received in December 2024 and this will be used to inform the EIA process for the Proposed Development. A summary of the main comments received and how the Applicant intends to address these are set out in the table below.

Table 1 Scoping Opinion comments and responses

Inspectorate's Comments	Applicant's Response
The Inspectorate considers that that there is potential for significant effects on soils and agricultural land from the Proposed	The Applicant notes this comment, an Agricultural Land Report will support the ES

Inspectorate's Comments	Applicant's Response
Development. This matter cannot therefore be scoped out of the assessment at this stage.	on this matter.
The Inspectorate does not agree to scope construction effects out at this stage, given that it is not clear what effects this matter would include and how it would affect the different receptors.	The Applicant notes this comment.
The Inspectorate agrees that risk of unexploded ordnance can be scoped out of the assessment to be confirmed with evidence in the ES.	The Applicant notes this comment.
The Inspectorate considers given the location of the Proposed Development that significant effects related to mining are unlikely to occur, so this can be scoped out.	The Applicant notes this comment.
The Inspectorate notes the recommendation of the Environment Agency that a 500m study area should be applied, and the ES should take account of the study areas for other relevant assessments.	The Applicant notes this comment.
Receptors should include source protection zones, drinking water safeguard zones, groundwater abstractions and confirm if locally or regionally designated geological sites could be affected by the Proposed Development. These should be assigned a sensitivity and an assessment provided, where significant effects are likely to occur.	The Phase 1 assessment did not identify any sensitive geological sites; this will be an Appendix in the ES. The scoping includes source protection zones, drinking water safeguard zones, groundwater abstractions collectively under 'Principal Aquifers for public water supply' in Table 14.1 as very high sensitivity and will be assessed.
The assessment of effects from changes to the hydrogeological regime should consider the potential of the Proposed Development to affect regional groundwater flow regimes during construction and operation, in addition	The Applicant notes this comment.

Inspectorate's Comments	Applicant's Response
to effects on Highfield Moss SSSI.	
Potential effects on groundwater, source protection zones and potable water supplies from potential sources of contamination during operation, including from possible battery storage, should be scoped into the assessment.	The Applicant notes this comment.

5. This topic paper identifies the existing ground conditions and associated development constraints, by evaluating the geology at the DCO Site and potential for soil, gas and water contamination and the potential effects on ground conditions during both the construction and operational phase.

6. A range of potential impacts associated with the construction and operation of the Proposed Development have been considered, including ground contamination, minerals, SSSIs, ground improvement, earthworks, foundation solutions, slope stability and associated geotechnical issues.

7. This topic paper has been compiled by appropriately qualified, experienced, and competent experts. The author of this topic paper is Richard Robinson BSc MCIWEM, a Geo-Environmental Consultant with 21 years of industry experience in the UK. This topic paper has been reviewed by Chris Rhodes BSc MSc (13 years of relevant UK experience) and approved by Tim Hull BSc MSc CGeol FGS SiLC SQP (24 years of relevant UK experience). The Author and reviewers have been involved in multiple DCO projects including Hinckley SRFI, Oxfordshire SRFI, and Prosiect Maen Hir.

RELEVANT LAW, POLICY AND GUIDANCE

8. The DCO application will be determined pursuant to the Planning Act 2008 and relevant regulations, the National Networks National Policy Statement ('NPSNN', adopted 2024) and the National Planning Policy Framework (NPPF). Relevant local planning policy are material considerations.

9. The laws, policies and guidance relevant to this subject are set out below which will be adopted in the production of the Geology, Soils, Land Contamination and Hydrogeology Chapter.

National Policy

- National Policy Statement for National Networks (NPSNN) (2024) – the document states that where necessary, land contamination and instability should be considered in respect of new development and that the Secretary of State should be satisfied that development consent can be granted taking full account of environmental effects. This

will require close cooperation with the Environment Agency (EA) and/or the pollution control authority, and other relevant bodies;

- National Planning Policy Framework (NPPF) (2024) – prevents new and existing development from contributing to, being put at unacceptable risk from pollution or land instability and promotes remediating and mitigating derelict, contaminated and unstable land. It also promotes the conservation and enhancement of the natural environment including benefits of best and most versatile agricultural land.

National Legislation

- Environmental Protection Act 1990 – Part IIA of the EPA describes a regulatory role for Local Authorities in dealing with contaminated land.

- Environment Act 1995 – Contaminated Land Regulations. This creates a system whereby Local Authorities must identify and if necessary, arrange for the remediation of contaminated sites.

- Land Contamination Risk Management is the guidance that the EA expect to be followed in managing risks on sites affected by contamination.

- Construction (Design & Management) Regulations 2015 requires clients to make suitable arrangements for managing a project to ensure that the construction work can be carried out, so far as reasonably practicable, without risks to the health and safety of any person affected by the project.

Local Policy

- St Helens Local Plan up to 2037 – relevant policies are:

  - Policy LPC06: Biodiversity and Geological Conservation, is to ensure the protection and enhancement of St Helen's biodiversity and geological assets and interests;

  - Policy LPC14: Minerals, which seeks to provides a steady and adequate supply of minerals to contribute towards local, regional, and national needs; and

  - Policy LPD01: Ensuring Quality Development, by minimising and mitigating to acceptable levels any effects that the development may have on amongst other things, land and water pollution as well as ensuring that any contamination or ground stability issues that exist would be remediated to an appropriate standard.

- Wigan Council Adopted Core Strategy – Policy CP 17 Environmental Protection Sections 3 and 5 indicate that it will help maintain, enhance and protect the environment by tackling land contamination and land stability issues by promoting the appropriate re-use of sites, supporting the identification of contamination and stability issues and requiring appropriate remediation. It will also ensure that new development does not give rise to the pollution of any watercourse, groundwater or moss land, or result in the transfer of contaminated run-off to surface water sewers.

- Warrington Borough Council Local Plan 2021/22 to 2038/39 – relevant policies are:
  - Policy ENV3: Safeguarding of Minerals Resources, which aims to protect sand, gravel and shallow coal resources and sandstone and brickclay workings within the Minerals Safeguarding Areas from permanent sterilisation;
  - Policy ENV8: Environmental and Amenity Protection – The Council requires that all development is located and designed so as note to result in a harmful or cumulative impact on the natural environment. Additionally, development proposals should demonstrate that environmental risks have been evaluated, and appropriate measures taken to minimise risks of adverse impacts of land and water quality during construction and operation.

Guidance and Best Practice

- British Standards Institution (BSI): BS 10175:2011+A2:2017, (2017), Investigation of Potentially Contaminated Sites, Code of Practice;
- British Standards Institution (BSI): BS 5930:2015+A1:2020, (2020), Code of Practice for Ground Investigations;
- British Standards Institution (BSI): BS 8485:2015+A1:2019, (2019), Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings;
- British Standards Institution (BSI): BS 8576:2013, (2013), Guidance on Investigations for Ground Gas – Permanent Gases and Volatile Organic Compounds (VOCs);
- Construction Industry Research and Information Association (CIRIA) Report C665, (2007), Assessing Risk Posed by Hazardous Ground Gases to Buildings;
- Construction Industry Research and Information Association (CIRIA) Report C811, (2023), Environmental Good Practice on Site 5th Edition;
- Contaminated Land: Applications in Real Environments (CL:AIRE) Definition of Waste: Development Industry Code of Practice Version 2, (2011);
- Environment Agency Science Report SC050021/SR2, (2009), Human Health Toxicological Assessment of Contaminants in Soil;
- Environment Agency Science Report SC050021/SR4, (2009), CLEA Software (Version 1.06) Handbook; and
- Environment Agency, The Environment Agency's approach to groundwater protection February 2018 Version 1.2.
- Ministry of Agriculture, Fisheries and Food (MAFF), Agricultural Land Classification of England and Wales: Revised guidelines and criteria for grading the quality of agricultural land, October 1988

SITE DESCRIPTION

Site location

10. The DCO Site is located on the eastern extent of Newton-le-Willows in a flat, agricultural landscape. The DCO Site is located within the local authority areas of St Helens Borough Council, within the Liverpool City Region Combined Authority; Wigan Council, within the Greater Manchester Combined Authority; and Warrington Borough Council.

11. The DCO Site is split broadly in two sections:

- the Main Site – land to the east of the M6 motorway, to the south of the Chat Moss Line and to the west of Winwick Lane incorporating the triangular parcel of land located to the west of Parkside Road and to the north of the Chat Moss Line; and

- the Western Rail Chord – land to the west of the M6 motorway, which bisects the DCO Site in a northwest southeast orientation, and to the east of the West Coast Mainline.

12. The majority of the land contained within the Main Site is bound to the north by the Chat Moss Line (Liverpool-Manchester railway line), to the west by the M6 motorway and to the southeast by Winwick Lane (A579). The Main Site south of the Chat Moss Line is approximately 198 hectares in size. The Highfield Moss Site of Special Scientific Interest (SSSI) is also adjacent to the north of the DCO Site, which is described in more detail below. A number of other uses exist at the Main Site currently, including:

- Kenyon Hall Airfield, which is a small airfield used by the Lancashire Aero Club for recreational flying of small propeller planes;

- Warrington Model Flying Club, which is a model club for radio controlled model aircraft; and

- Highfield Farm, which is comprised of two agricultural/residential buildings set within a curtilage surrounded by agricultural fields.

13. The majority of the Main Site is comprised of agricultural fields used for arable crops, with some small patches of woodland in the east. There are also several residential properties, farmsteads and a commercial yard within the Main Site. Parkside Road (A573) runs through the DCO Site to the south before passing over the M6 where it provides access to Parkside Link Road West.

14. The triangular parcel of land located to the north of the Chat Moss Line and to the east of Parkside Road also forms part of the Main Site.

15. The Western Rail Chord of the DCO Site is approximately 12 hectares in size and is bordered to the west by the West Coast Mainline railway, to the north by the Chat Moss Line and to the east by the Parkside West Development. The Western Rail Chord is comprised of safeguarded land for the rail-turn head to enable trains to be serviced to and from the North and the East.

16. The Western Rail Chord is comprised of scrub land and areas of woodland which are set within

the context of an area of redevelopment with commercial uses proposed, which is known as Parkside West, and is currently being promoted through the Town and Country Planning Act process.

Baseline environment

17. The Phase 1 Geo-environmental assessment report has been used to inform the below. The Phase I Geo-Environmental Assessment was prepared in accordance with BS 10175:2011+A2:2017 to examine the likelihood of the presence of land contamination, its nature, the potential risk to the Proposed Development and what measures are required to ensure the site is 'suitable for use'. The assessment comprised desk-based research, including review of historical mapping, environmental databases obtained from Groundsure, on site information and complemented by a site walkover survey.

Site History

18. The DCO Site has remained largely undeveloped throughout its mapped history, comprising fields and some residential buildings. Several ponds are recorded on historical maps but not on recent mapping, suggesting potential infilling. The depth and nature of any infill will be confirmed through ground investigation. The surroundings were predominantly agricultural, with some industrial processes and sandstone quarrying including Southworth Quarry to the south east and the former Parkside Colliery encroaching slightly into the western boundary.

Geology, Hydrology and Hydrogeology

19. The superficial deposits on the Main Site include Devensian Till in the central area, Glaciofluvial Ice Contact deposits in the far north and Lacustrine Deposits in the north east. An area in the centre has no superficial deposits. Peat is mapped within Highfield Moss SSSI (immediately north), which has the potential to extend onto the DCO Site. The bedrock across most of the DCO Site is the Chester Formation (sandstone), with the Kinnerton Sandstone Formation, Manchester Marls Formation, and Collyhurst Sandstone Formation in the west, and dip beneath the Chester Formation across the DCO Site.

20. The Western Rail Chord is mapped as superficial Devensian Till, with some areas having no superficial deposits, and Chester Formation bedrock across most of the area. The eastern boundary is underlain by bedrock of the Manchester Marls Formation.

21. Significant Made Ground is not mapped but may be locally present in the vicinity of roads, farms, potentially infilled ponds or pits and railways.

22. The EA classifies the Devensian Till as an Undifferentiated Secondary Aquifer, the Glaciofluvial Ice Contact deposits and Glaciofluvial deposits as Secondary A Aquifers, the Chester Formation and Collyhurst Sandstone Formation as a Principal Aquifers, the Manchester Marls Formation as a Secondary B Aquifer and the Kinnerton Sandstone Formation as a Secondary A Aquifer. Most of the DCO Site is within EA Groundwater Source Protection Zone 3, with a small area in the west in Zone 2. BGS Borehole records in the area around the DCO Site suggest groundwater in the Chester Formation to be at an elevation of between 0.0m AOD and 6.0m AOD, which is circa 30 to 35m below the surface of the DCO Site.

23. There is a watercourse in the north east of the DCO Site bordering Highfield Moss and another flowing northward from the Chat Moss Line railway along the northern boundary.

Ground Gases and Radon

24. BGS risk maps confirm that the DCO site is in an area where between 1 and 3% of sites are affected by radon gas for which no radon gas protection is required .

25. Potential sources of hazardous ground gas present on the DCO Site include Lacustrine deposits, Peat deposits, localised Made Ground and the former waste site to the south east.

Mining and Minerals Safeguarding

26. The DCO Site is in a Coal Authority reporting area but not a Development High Risk Area.

27. Part of the eastern area of the DCO Site is defined as a Mineral Safeguarding Area (MSA) for sand and gravel in the Wigan Local Plan and part of the south is defined as a MSA in the Warrington Local Plan. The DCO Site is within an Oil and Gas licencing area.

Sensitive Land Uses

28. Highfield Moss SSSI is located immediately north of the DCO Site. It is understood that the SSSI may be sensitive to hydrogeological changes with the geology at the SSSI mapped as Peat.

Agricultural Land Classification

29. Provisional agricultural land classification information published by Natural England indicates that the agricultural land classification at the DCO Site is a combination of non-agricultural land (predominantly central areas) and Grade 3. Grade 3 land could be classified as either Grade 3a, which is classed as Best and Most Versatile (BMV) agricultural land or Grade 3b which is not. To date, a recent ALC survey has covered central areas of the Main Site, with areas of BMV agricultural land identified.

DEVELOPMENT DESCRIPTION

30. The Proposed Development is a Strategic Rail Freight Interchange (SRFI) and associated development comprising:

- provision of a rail terminal serving up to 16 trains per day, including ancillary development such as container storage, cranes for the loading and unloading of shipping containers, Heavy Goods Vehicle (HGV) parking, rail control building and staff facilities;
- a rail turn-back facility within the Western Rail Chord;
- up to c.767,000 square metres (m^2) (gross internal area) of warehousing and ancillary buildings with a total footprint of c.590,000m^2 and up to c.177,050m^2 of mezzanine floorspace, subject to ongoing design and market assessment, comprising a mixture of units with the potential to be rail-connected, rail served and additional units;

- new road infrastructure and works to existing road infrastructure;
- provision of overnight lorry parking for users of the SRFI;
- new energy centre and electricity substations, including central battery storage and potential provision of central Combined Heat and Power (CHP) units to augment the grid supply in the case of demand exceeding instantaneous firm and variable supplies;
- provision of photovoltaics and battery storage on site;
- strategic landscaping and open space, including alterations to public rights of way and the creation of new ecological enhancement areas;
- demolition of existing on-site structures (including existing residential dwellings / farmsteads and commercial premises);
- potential relocation of the Huskisson Memorial; and
- earthworks to regrade the DCO Site to provide appropriate access, connections to the railway, development plots and landscape zones.

OUR APPROACH TO THE ASSESSMENT

31. The methodology for the assessment of contamination is described below. For contamination to present a significant potential effect a link must first be established within the Conceptual Site Model (CSM). The likelihood must be demonstrated with an identifiable source (on-site or off-site), receptor and viable pathway. Potential contamination sources have been identified from an assessment of:

- current DCO Site uses and activities;
- review of historical mapping for former uses;
- review of regulatory permits, consents and authorisations contained within the Groundsure report for the DCO Site reproduced, such as landfills, environmental permits, pollution controls;
- review of mining and ground instability risk ratings from BGS and Mining Remediation Authority records;
- site visit to assess evidence of contamination; and
- chemical laboratory analysis of soils samples recovered from the DCO Site.

32. Pathways will be specific to the receptor type. For example, they could include:

- ingestion, inhalation, dermal contact for human health receptors;
- infiltration and contaminant migration through permeable strata such as the unsaturated zone for groundwater;

- a secondary pathway from groundwater contamination to surface water;
- migration of ground gases and vapours such as permanent gases, landfill gas and volatile hydrocarbons into buildings; and
- direct contact and uptake by plants.

33. Other ground related issues considered include ground instability issues or other ground related development constraints such as worked ground or mining, unexploded ordnance (UXO) and loss of mineral resource.

34. For potential loss of minerals resource and other ground and ground stability related effects, the identification of receptors is based on relevant guidance and the professional judgement of a qualified technical specialist who has undertaken a desk study for the DCO Site, has visited the DCO Site and its surroundings, and reviewed ground investigation data and published records and mapping (e.g. BGS maps). In some cases, even without quantified information, it is reasonable to assume that some potential receptors will not experience significant effects. This is sometimes the result of tried and trusted mitigation measures that have been incorporated into the scheme, which might reasonably be expected to be effective.

35. The geographical area included in this assessment is a 500m radius from the DCO Site boundary. This has been requested by the EA and is considered a reasonable distance based on standard practice and professional judgment to which contamination sources can migrate and potentially cause impact to the DCO Site. There is no defined radius in the guidance or British Standard.

36. The effect significance of agricultural land is based on the glossary of the NPPF which classifies agricultural land on a scale of 1 to 5 with “Best and most versatile (BMV) agricultural land” being land in grades 1, 2 and 3a of the Agricultural Land Classification (ALC), with Grade 1 being the most versatile.

LIKELY MAIN EFFECTS OF THE PROPOSALS

Receptors

37. The following receptors have been identified from the baseline information that will need to be considered in the EIA:

Human Health:

- future DCO Site users (commercial);
- neighbouring public (residential/commercial);
- construction workers; and
- intrusive maintenance workers.

Controlled Waters:

- groundwater (Principal Aquifer, Secondary A, B and Undifferentiated Aquifers, active groundwater abstraction point, Groundwater Source Protection Zones, Drinking Water Safeguarding Zone, WFD Groundwater Body); and
- surface water (Unnamed inland river) including proposed water courses.

Ecology:

- flora and fauna on the DCO Site and along water courses; and
- Highfield Moss SSSI located immediately north of the DCO Site.

Property:

- Underground utilities;
- Building structures; and
- Chat Moss Line Railway Embankment.

Geology:

- Soil and rock resource;
- Agricultural land.

Pathways

38. The pathways identified that could lead to an effect on the identified receptors are:

Human Health:

- dermal contact with soil or dust;
- incidental ingestion of soil and/or dust;
- inhalation of dust and/or fibres;
- inhalation of vapours; and
- migration and accumulation of ground gas in enclosed spaces leading to inhalation or explosion.

Controlled Waters:

- leaching of soil contaminants;
- vertical and lateral migration; and

- surface run-off.

Ecology:

- lateral migration; and
- uptake and accumulation.

Property:

- direct contact; and
- accumulation and explosion of gas.

Geology:

- Loss of agricultural land;
- physical effects during construction; and
- sterilisation of mineral resources within Mineral Safeguarded Areas in accordance with Wigan and Warrington local policy maps.

39. UXO has been identified as a low risk based on Zetica data and no further mitigation is needed.

PROPOSED APPROACH TO MITIGATION

40. In line with standard best good practice, a Construction Environmental Management Plan (CEMP) will provide the framework for managing environmental impacts during the construction phase of the Proposed Development, including the control of impacts arising from groundwork related activities including the safe management of any contaminated soils that may be encountered across the DCO Site and minimising/mitigating against any negative impacts that may arise during earthworks or construction activities. The contents of the CEMP will be informed by the results of the assessments to be undertaken.

41. The cut/fill earthworks strategy will aim to achieve a balance at the DCO Site. If this cannot be achieved, the timescales for the Proposed Development allow receiver sites to be found as the construction progresses to avoid disposal of any surplus material to landfill. Re-use of soil materials would be facilitated under a Material Management Plan (MMP) under the CL:AIRE Definition of Waste Code of Practice (DoWCoP) prepared prior to development commencing. The CL:AIRE DoWCoP is used to demonstrate that excavated soils that are re-used meet the criteria for:

- protection of human health and protection of the environment;
- suitable for use without further treatment;
- quantity of use; and

- certainty of use.

42. Fill materials will be placed to an end-product specification to avoid differential settlement issues and additional reinforcement is likely to provide support where any structures span over cut and fill areas. Cut and fill slopes will be suitably designed to achieve global stability and ensure health and safety of any workers and the public is ensured.

43. Works at, or near to, existing rail and road structures will be subject to detailed geotechnical design and assessment approval in accordance with Highways England Design Manual for Roads and Bridges CD 622 in the case of the National Highways and to Network Rail Standards. Slopes will require detailed assessment and appropriate design, retaining and temporary shoring.

44. Additional mitigation measures to prevent, reduce and/or offset likely effects which would not be avoided through the above design include:

- design of the earthworks strategy to minimise impact on Highfield Moss SSSI resulting from changes to the hydrogeological regime;
- amendments or designs to minimise impact on controlled waters from the operational phase of the development, notably battery storage;
- remediation of soils and/or groundwater or implementation of mitigation, such as clean soil cover through the submission and approval of a Remediation Strategy/Remediation Design Statement;
- use of MMP to manage reuse of potentially contaminated soils; and
- installation of any required gas protection measures in proposed buildings.

NEXT STEPS

45. Further work is programmed to advise on the mitigation of effects on geology, soils, land contamination and hydrogeology. This will include ground investigation to identify potentially significant contamination sources and installation of gas and groundwater monitoring wells.

46. Assessment of ground gases at the DCO Site will allow the requirement for hazardous ground gas protection measures in future buildings. An assessment of the hydrogeological regime in the region will be undertaken and any hydrogeological impacts on the Highfield Moss SSSI will be assessed through groundwater monitoring. The actual impacts on ecology will be assessed in the Ecology and Hydrology Chapters of the ES.

47. A Minerals Assessment is required to assess the loss of mineral resource due to the location of the DCO Site within Mineral Safeguarding Areas as defined in the Wigan and Warrington Local Plans. The hydrogeological assessment including required ground investigations and monitoring to inform impact on Highfield Moss SSSI will be dictated by the requirements of Natural England and the project ecologist (Tyler Grange). Meetings are already arranged to progress this. Contaminated Land Team at Wigan Council, Warrington Council, St Helens Council, as well as the EA have been contacted with initial findings and scope proposals to

inform the ES Chapter; we await responses on this at this time.

48. An ALC assessment will be undertaken to cover remaining areas of the DCO Site, which as yet, have not been assessed, to identify the extents that are BMV.

49. This topic paper forms part of the material available for the informal consultation that is taking place between 27 January 2025 and 21 March 2025. Should you wish to comment on this paper or any other matters related to the Proposed Development you can respond to the informal consultation via:

- ILP North website – *www.tritaxbigbox.co.uk/our-spaces/intermodal-logistics-park-north*
- Email *ilpnorth@consultationonline.co.uk*
- Freepost ILP North
- 01744 802043