



**PHASE 1 LAND CONTAMINATION DESK STUDY
ROCHDALE BESS**

**LAND WEST OF DIG GATE LANE, ROCHDALE
FOR BALANCE POWER PROJECTS LTD**

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1 INTRODUCTION

1.1 General

This report relates to the proposal for the development of a Battery Energy Storage System (BESS), located on Land southeast of Rochdale town centre and immediately north of the M62 motorway (the Site). Arcus Consultancy Services Ltd (Arcus) has been commissioned by Balance Power Projects Limited to prepare a Phase 1 Land Contamination Desk Study for the Site to support a planning application.

1.2 Scope of Work

This desk study report sets out the ground conditions and associated potential development constraints and includes a review of historical, geological and environmental sensitivity mapping. The data acquired during the preliminary research informs an assessment and a preliminary Conceptual Site Model ('CSM'), which sets out the potential risks through the 'Source-Pathway-Receptor' relationship model. The desk study will include consideration of:

- Existing and historical land uses at the Site;
- Existing and historical land uses in the surrounding area;
- Superficial and solid geology;
- Hydrogeological and hydrological conditions;
- Available information from statutory bodies including the Environment Agency ('EA') and British Geological Survey ('BGS'); and
- Potential contamination and geotechnical development constraints.

The conclusions of the study will assist in the identification of any requirements for intrusive ground investigation and Generic Quantitative Risk Assessment ('GQRA').

1.3 Limitations and Assumptions

This assessment has been prepared by Arcus with reasonable skill, care and diligence. Information reported herein is based on the interpretation of publicly available information and references. This has been accepted in good faith as being accurate, valid and current. This report is for the exclusive use of Arcus and Balance Power Projects Ltd (the Applicant). No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from Arcus.

Arcus cannot be held responsible for any circumstances where information sourced and referenced is inaccurate or does not reflect the findings of the Site conditions. Should any additional information become available, Arcus will review this information and where appropriate, revise any existing opinions or conclusions.

It should be noted that asbestos surveys are not within the scope of this report.

2 THE SITE

2.1 Site Location

The Site comprises of approximately 1.4 ha of land approximately 2.5 km southeast of Rochdale town centre, immediately north of the M62 at National Grid Reference (NGR) 391847, 411156. The Site Location Plan is included in Appendix A.

2.2 Site Description

2.2.1 Site

The Site incorporates pastoral grassland with a gradual slope from south to north. A raised embankment adjacent to the M62 provides visual screening from the southernmost boundary. A single track road, 'Dig Gate Lane', runs adjacent to the eastern site boundary, while a public footpath runs adjacent to the western boundary.

2.2.2 Surrounding Area

The M62 motorway runs adjacent to the southern Site boundary, the area to the south of the motorway consists largely of agricultural fields. The area north of the Site largely consists of the Kingsway Business Park, of which the closest developments to the Site are an Asda distribution centre to the northwest of the Site and an Amazon warehouse to the northeast, these are both modern and industrial in appearance.

The Site is on the outskirts of Rochdale, the town centre is approximately 2.5 km to the northwest. Other nearby settlements include Milnrow and Newhey to the east, as well as Shaw and Royton to the south. A proposed Site Layout Plan is included within Appendix A.

2.3 Proposed Development

The Development will consist of the following components, as shown on the Proposed Site Layout Plan (058 - PL - OL164NR - ROCHDALE - PROPOSED PLAN - REV 0):

- 18 containerised battery energy storage modules;
- Inverter & transformers;
- AUX transformers;
- Control and welfare room;
- Storage room;
- Private substation;
- DNO room;
- Security fence boundary (2.4m (h));
- Laydown area;
- Site access and internal service roads; and

2.4 Landscaping, including pond relocation areaPlanning History

The has adjacent site been subject to a recent planning application that required a Contaminated Land Report (CLR). The application is for a gas peaking development adjacent to the Site boundary to the north (Planning Reference – 18/01338/FUL) originally submitted in November 2017 and resubmitted in December 2018. The CLR found no particular constraints to the Proposed Development with regards to ground contamination and it is concluded that the Site would not pose significant risk and that intrusive ground investigation is not deemed to be necessary.

3 CURRENT AND HISTORICAL LAND USES

3.1 General

Historical Ordnance Survey (OS) maps were obtained from Envirocheck, covering a time period between 1851 and 2022, which are included in Appendix B. Section 3.2 summarises the development changes in time lapse between published historical map extracts at the Site, and a surrounding area within a 250 m buffer.

3.2 Site and Surrounding Area Historical Review

3.2.1 1851 – 1894

The earliest available OS Map of 1851 shows the Site to be occupied predominantly by agricultural land partitioned by field lines. A footpath intersects the northwest of the Site, stretching from east to west. The Site boundary is adjacent to Broadshaw lane which runs from the Broadshaw Farmhouse, immediately west of the Site boundary to the junction with Moor Bank Lane, approximately 245 m north of the Site. Dig Gate Lane is another road that runs from northwest to southeast, where it reaches Dig Gate Farm, it is located approximately 40 m east of the Site at its closest point. A watercourse named Stanney Brook, running north to south, is present approximately 125 m east of the Site at its closest point.

No significant changes took place within 250 m of the Site between 1851 and 1894.

3.2.2 1894 – 1910

No significant changes took place within 250 m of the Site between 1894 and 1910.

3.2.3 1910 – 1956

No significant changes took place within 250 m of the Site between 1910 and 1956.

3.2.4 1956 – 1979

Between 1956 and 1979, the surrounding area was transformed due to the development of the M62, adjacent to the southern Site boundary. In addition to this, Dig Gate Lane has been redeveloped to cross over the motorway via a new bridge. Dig Gate Farm, 200 m southeast of the Site, has been developed with a small number of new buildings in this period.

3.2.5 1979 – 1999

The only notable change to the Site and surrounding areas between 1979 and 1999 is the addition of a pond in the central Site area.

3.2.6 1999 – 2022

There have been minor changes to the Site area in this period, with the addition of 2 small structures in the east of the Site, the easternmost of which is an electrical substation.

The surrounding areas have undergone significant developments. The road layout surrounding the Site has been changed, a new roundabout has been added approximately 40 m northwest of the Site. This connects John Milne Avenue (Formerly Broadshaw Lane), Dig Gate Lane and a new road named James Kearns Avenue.

Kingsway Business Park has been developed north of the Site and 2 buildings are located within 250 m of the Site boundary. Asda distribution centre, 100 m northwest of the Site, and an Amazon warehouse, 90 m northeast of the Site boundary. The areas surrounding

the Amazon warehouse have been landscaped and vegetated, changing the landscape around Dig Gate Lane.

Moor Bank Lane has been removed altogether and replaced with the A6193 dual carriageway which is located further north than the previous road.

4 GEOLOGY AND GROUND CONDITIONS

4.1 General

Published BGS mapping information was obtained from Envirocheck and reviewed to inform the potential underlying ground conditions. This was supported by the findings of the historical mapping review in relation to the possible made ground deposition and review of available historical BGS borehole data.

4.2 Published Geology

The published BGS information includes:

- Artificial Ground and Landslip - 1:50,000
- Superficial Geology - 1:50,000
- Bedrock and Faults - 1:50,000
- BGS GeoIndex - Online Interactive Mapping Service¹

4.2.1 Superficial Soils

The superficial soil mapping shows that the whole Site is underlain by Hummocky Glacial Deposits, described by the BGS as being composed of rock debris, clayey Till, sand and gravel.

Made ground is not recorded at the Site or its surrounding areas on geological mapping and is not anticipated across the majority of the Site. However, it is possible that there may be small areas of made ground in close proximity to the structures and pond present at the Site.

4.2.2 Bedrock Geology

Published geology mapping indicated the bedrock beneath the Site as Pennine Lower Coal Measures Formation, which consists of Mudstone, Siltstone and Sandstone.

There is a fault at rockhead located approximately 70 m east of the Site at its closest point.

4.2.3 Historical Borehole Information

There are two boreholes within close proximity of the Site boundary according to published mapping, they are both located within 50 m of the western Site boundary, however there is no detailed information given for these boreholes.

The closest borehole with detailed recorded information is approximately 430 m north of the Site. This borehole recorded a thin layer of topsoil followed by a mixture of gravel, sand and boulder clay underlain by sandstone at first, with coal recorded in deeper sections of the borehole.

4.3 Hydrogeology

4.3.1 EA Watercourse and Groundwater Classifications

Published EA information on surface water quality and bedrock aquifers was obtained from Envirocheck and reviewed to provide a preliminary assessment of the hydrogeological conditions. Bedrock aquifers are often used as drinking supplies and also support surface aquatic ecosystems. The designation level awarded by the EA reflects the importance of the aquifer and informs the assessment of surface water quality classifications, aquifer quality classifications and the potential contamination sources associated.

¹ BGS: GeoIndex [Online] Available at: [GeoIndex - British Geological Survey \(bgs.ac.uk\)](https://www.bgs.ac.uk/geoindex/) Accessed 24/10/2022

The nearest surface water feature to Site is the pond in a central area of the Site, there is also a drainage feature approximately 50 m west of the Site and a named watercourse, Stanney Brook, approximately 130 m northeast of the Site.

The bedrock aquifer at the Site and surrounding area is designated as a 'Secondary Aquifer – A' these comprise of permeable layers capable of supporting local water supplies and can provide an important source or base flow to rivers.

The superficial soils underlying the Site are also designated as 'Secondary Aquifer – A' as is most of the surrounding area. There is an area to the northeast of the Site designated as 'Secondary Aquifer – Undifferentiated', where the variable soil characteristics make it impossible to apply either an A or B designation to the aquifer.

According to the Envirocheck report, the groundwater vulnerability is classified as high vulnerability at the Site, as well as the areas surrounding it to the north, west and south. Areas to the east of the Site are defined as low vulnerability. This may be due to the difference in thickness of the superficial soils, the low vulnerability area to the east have thinner recorded layers of superficial soils compared to the high vulnerability area.

4.3.2 Risk of Flooding

According to the UK Government's Flood Map for Planning², the entirety of the Site is located within a "Flood Zone 1", defined as land assessed as having less than a 1:1,000 annual probability of river or sea flooding (< 0.1%).

4.4 Mining and Quarrying

4.4.1 Mining

Based on available online Coal Authority maps, documentary BGS information and preliminary research using the Coal Authority interactive map service³, the Site was noted to lie out with the 'Development High Risk Area' as identified by the Coal Authority. There are no recorded mine entries at the Site.

A Coal Authority Mining Report obtained from Envirocheck details that the Site could potentially be affected by the historic underground mining of 1 coal seam at ≥ 170 m below surface level. This seam was last worked in 1935.

The Coal Authority state that any movement in the ground associated with mining activity at this seam should have stopped by now, therefore the Site is considered to be low risk for development.

The Coal Authority Report is included in Appendix C.

4.4.2 Quarrying

No quarrying activity was noted in close proximity to the Site during the historical review.

4.5 Unexploded Ordnance (UXO)

The site lies within a 'Low Risk' area from WW2 bomb drop and therefore no further work is required.

² Uk Government: Flood Map for Planning [online] Available at: [Flood risk information for this location - Flood map for planning - GOV.UK \(flood-map-for-planning.service.gov.uk\)](https://www.gov.uk/flood-map-for-planning) Accessed: 24/10/2022

³ Coal Authority: Interactive Map [online] Available at: [Interactive Map Viewer | Coal Authority \(bgs.ac.uk\)](https://www.coalauthority.gov.uk/interactive-map-viewer/) Accessed 24/10/2022

5 ENVIRONMENTAL AND ENGINEERING CONSIDERATIONS

5.1 General

Information regarding the environmental considerations for the development Site was obtained from the Envirocheck Report (included in Appendix D). The report includes information covering potentially sensitive land uses/receptors and industrial land uses, geology, hydrology, hydrogeology, discharge consents, pollution incidents and radon risk.

5.2 Environmental Considerations and Sensitive/Contaminative Land Uses

5.2.1 Sensitive Land Uses

The Envirocheck Report indicates that none of the following sensitive land uses are located within 250 m of the Site boundary:

- Areas of outstanding natural beauty;
- Environmentally sensitive areas;
- Forest parks;
- Local nature reserves;
- Marine nature reserves;
- National parks;
- National scenic areas;
- Nitrate sensitive areas;
- Ramsar sites;
- Sites of special scientific interest;
- Special areas of conservation;
- Special protection areas;
- World heritage Sites;
- Ancient woodland;
- Areas of unadopted green belt; and
- Nitrate vulnerable zones (NVZ).

The Envirocheck Report indicates these sensitive land uses present within 250 m of the site boundary:

- Areas of adopted green belt.

5.3 Industrial Land Uses (Trade Directory Entries)

The Envirocheck Report indicates that no trade directory entries operate within 250 m of the Site.

5.4 Potential Contaminative Land Uses

There have not been any potentially contaminative land uses within 250 m of the Site.

5.5 Discharge Consents

There have not been any discharge consents within 250 m of the Site.

5.6 Water Abstraction

Published mapping provided by Envirocheck indicates that there is one licenced water abstraction point at the Site (reference: 2569002086). A permit was issued in February 1966 for a well at Broadshaw Farm, in the southwest of the Site. The end date of the permit has not been supplied.

5.7 Pollution Incidents

There is one pollution incident recorded within 250 m of the Site, 133 m to the northwest of the Site. The incident was recorded in November 1992 and is categorised as a pollution incident to controlled waters (reference: 93620060), the pollutant is described as "industrial effluent." The incident is considered to be 'Category 1 – major Incident', the most severe category.

5.8 Registered Landfill/Waste Management/Explosive Sites

The Envirocheck report recorded no Registered Landfill, Waste Management or Explosive Sites within 250 m of the Site. Furthermore, Spatial Data published by the Department for Environment, Food and Rural Affairs (DEFRA) also concluded no historical landfill sites in close proximity to the Site⁴.

An area of potentially infilled land (water) was described as unknown filled ground 188 m west of the Site.

5.9 Radon Gas

According to the UK Radon Map⁵ most of the Site and surrounding areas are situated within a lower probability radon area and less than 1% of homes are estimated to be at or above the radon action level. However, there are some areas to the east of the Site that are at an elevated radon potential, with the maximum radon potential lying between 1-3%.

According to Public Health England (2019)⁶, basic radon protection is required in areas where the potential for homes to exceed the radon action level is 3% or above. As this is not the case for the Site, no radon protective measures are necessary in the construction of new dwellings or extensions.

⁴ DEFRA: DEFRA Spatial Data Download [online] Available at: [Defra Spatial Data Download](#) Accessed 25/10/2022

⁵ UK Government: UK Maps of Radon [online] available at: [UKradon - UK maps of radon](#) Accessed 25/10/2022

⁶ Public Health England: Performance of basic radon protection in new homes (2019) [online] available at: [Performance of basic radon protection in new homes \(publishing.service.gov.uk\)](#) Accessed 25/10/2022

6 CONCEPTUAL SITE MODEL

6.1 Introduction

This assessment has been undertaken in accordance with BS 10175 'Investigation of Potentially Contaminated Sites'⁷ and the desk-based research has supported the development of a preliminary CSM. A CSM represents the potential contaminative 'Source-Pathway-Receptor' linkages which could be a hazard or risk to sensitive receptors at the Site or in the surrounding area.

The desk study assessment established previous uses, ground conditions, and hydrological and hydrogeological environments, taking account of the development Site's end-use.

In the context of land contamination, there are three essential elements to any risk:

- Source contaminant – a substance that is in, on or under the land and has the potential to cause harm or to cause pollution of water environments;
- A pathway – a route or means by which a receptor can be exposed to, or affected by, a contaminant; and
- Receptor – in general terms, something that could be adversely affected by a contaminant, such as people, an ecological system, property, or a water body.

While each of these elements can exist independently, risk exists only in the scenario where there is a pollutant linkage.

6.2 Potential Contamination Source

The historical map review provides an understanding of historical uses and allows an assessment of possible processes to be identified. The historical review indicates that the Site has been occupied by agricultural land consistently throughout the timeline starting from 1851 until the present day. The presence of a pond and two small buildings within the Site boundary indicate that there is a possibility of made ground at the Site.

Vigilance should be maintained for potential unrecorded contamination sources during any future assessments and intrusive site works.

Table 6.1 summarises the potential contamination sources that could be present on Site associated with current and historical uses.

Table 6.1: Potential Contamination Risks - Site and Surrounding Area

Source	Potential Risk	Potential Contaminants and/or Considerations
Made ground soils in immediate vicinity associated with historical developments relating to the M62 to the south of the Site and Kingsway Business Park to the north.	Potential for lateral migration of contaminants in groundwater.	Metals, polyaromatic hydrocarbons (PAH), total petroleum hydrocarbons (TPH), pH, sulphates, asbestos and solvents. Generation of ground gas including, carbon dioxide, methane, hydrogen sulphide and depleted oxygen.
Farming and Agricultural activities at the Site	Potential for risk to Site personnel and the inhalation of particles.	Pesticides/Agricultural Chemicals
Potential made ground soils and materials associated with the	Potential for risk to Site personnel, end users, construction materials, groundwater from contaminated	Metals and metal compounds, waste oil (polyaromatic hydrocarbons (PAH)), total

⁷ BSI: BS 10175:2011+A2:2017 Investigation of potentially contaminated sites

demolition/removal of the two structures on site.	made ground soils locally beneath the existing structures. Potential for vertical and lateral migration of contaminants in groundwater.	petroleum hydrocarbons (TPH), Organic and Inorganic Compounds, pH, sulphates, asbestos and solvents. Generation of ground gas including, carbon dioxide, methane, hydrogen sulphide and depleted oxygen.
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6.3 Potential Pathways

On the basis of the proposed battery storage/energy management end-use, the following potential pathways are considered for the newly constructed areas:

- Dermal contact - skin contact with soils, dust or water (Site personnel);
- Ingestion - ingestion of soils, dust, water (Site personnel);
- Inhalation - inhalation of soil, dust, vapours, both indoor and outdoor (Site Personnel and End-User);
- Leaching of contaminants - mobilisation of contamination through leaching of contaminants from soils to underlying groundwater (Water environment);
- Degradation of materials - attack and corrosion of buried structures and services (Construction Materials); and
- Ground gas migration - generation of ground gases from soils or rock leading to asphyxiation, explosion and/or fire (Site End-Users).

6.4 Potential Receptors

Potential receptors associated with the proposed development include:

- Site users - construction phase site personnel, end user - site visitors/infrastructure occupants;
- Water environment - Underlying groundwater aquifer; and
- Construction materials - buried structures and services, future concrete foundations water supply pipes.

Table 7.1 in Section 7 presents a tabulated representation of the potential source-pathway-receptor pollutant linkages at the Site.

6.5 Geotechnical Considerations

The preliminary research of available BGS mapping and the historical review have determined that the presence of made ground (associated with historical development) is not likely. However, it is possible that there may be small areas of made ground adjacent to both small buildings in the east of the Site.

The Envirocheck Report has indicated that the Site is within a zone of low hazard from ground dissolution. The risk of collapsible ground, compressible ground, landslide, shrinking or swelling clay, and running sand was very low.

6.6 Mining

In the Coal Authority Report obtained from Envirocheck, historic mining activity at a depth ≥ 170 m is recorded as taking place until 1935. It is stated within the report that any ground movement resulting from this mining activity should have stopped by now. The Site is not considered to be within a 'Development High Risk' area according to the Coal Authority's published mapping, there are also no recorded mine entries at the Site.

7 RISK ASSESSMENT

7.1 General

This desk study includes a preliminary qualitative contamination risk assessment carried out for the Site using the findings of the desk study.

The proposed development will comprise containerised batteries, synchronous condensers and associated electrical infrastructure.

The risk assessment has been carried out in line with current UK guidance adopting the Source-Pathway-Receptor assessment principle based on a conceptual Site model developed for the Site and is presented in Section 7.5. This details the potential connectivity between potential sources, pathways and receptors. A pathway must be present for the source to provide any risk to any given receptor. The magnitude of any such risk is assessed by considering the vulnerability of the receptor and the possible impact of the source.

7.2 Identification of Hazards

It is proposed that construction of the electrical infrastructure will cover much of the site including access and turning areas. The proposed infrastructure will involve excavation for foundation and utility/services work. The existing pond at the Site will be relocated towards the eastern Site boundary, soft landscape areas will be developed in the areas surrounding the infrastructure development.

On this basis, risk from contamination for construction personnel, ecology (flora/fauna), construction materials, and end-users must be considered.

7.3 Identification of Pollutant Linkage

The potential receptors and exposure pathways considered are summarised below.

- **Site users/construction personnel** – Dermal contact with contaminated soil, inhalation of dust, vapours or ground gas, and ingestion of asbestos particles during any future demolition works and ground works;
- **Site end-users** – Inhalation of vapours or ground gas, accumulation and explosion of any ground generating gas within confined spaces;
- **Ecological Receptors** – Planting, Flora and Fauna;
- **Adjacent land-users** – Inhalation of dust or vapours during construction works;
- **Water environment** – Leaching of contaminants from soil to underlying groundwater via lateral or vertical migration through drift deposits;
- **Construction materials** – Degradation of construction materials due to aggressive contaminants within soil or groundwater; and
- **Water supply pipes** – Corrosion and permeation into water supply.

7.4 Risk Assessment

The risks identified as having potential to effect receptors have been assessed through a preliminary qualitative risk assessment based on the guidance provided in CIRIA Report C552, "Contaminated Land Risk Assessment – a guide to good practice"⁸ as shown in Tables 7.1 and 7.2 below.

⁸ CIRIA: C552 – Contaminated Land Risk Assessment – a guide to good practice, 2001.

Table 7.1 Risk Classification Matrix

Likelihood	High Likelihood	Very High	High	Moderate	Moderate/Low
	Likely	High	Moderate	Moderate/Low	Low
	Low Likelihood	Moderate	Moderate/Low	Low	Very Low
	Unlikely	Moderate/Low	Low	Very Low	Very Low
		Severe	Medium	Mild	Minor
Consequence					

Table 7.2 – Risk Classification Definition

Risk Classification	Definition
Very High	Avoid project development at these locations.
High	Harm is likely to arise to a designated receptor from an identified hazard. Realisation of the risk is likely to present a substantial liability. Urgent investigation (if not undertaken already) is required and remedial works may be necessary in the short term and are likely over the longer term.
Moderate	It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that such harm would be severe, or if any harm were to occur it is more likely that the harm would be relatively mild. Investigation (if not already undertaken) is normally required to clarify the risk and to determine the potential liability. Some remedial works may be required in the longer term.
Moderate/Low	
Low	It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild.
Very Low	There is a low possibility that harm could arise to a receptor. In the event of such harm being realised it is not likely to be severe.

Section 7.5 summarises the possible source-pathway-receptor relationships and estimates the consequence and probability of the risks posed.

It is considered unlikely that construction personnel could be exposed to soil or groundwater contamination during excavations or construction at the Site where concentrations of contaminants exceed generic assessment criteria with the consequence of risk being assessed as Medium, therefore risk of contamination to site personnel is classified as **Low**.

Risk to Site end-users being exposed to soil contamination is classified as **Low** given the majority of the site area will be covered by hardstanding and the soft landscape areas will only be accessed for maintenance purposes.

No made ground is anticipated on site therefore leaching to underlying groundwater (if present) is not likely. While the bedrock is identified as a 'Secondary Superficial Aquifer' of

High vulnerability that may have significance for water supply or river base flow, the risk posed to the water environment is considered **Low**.

The construction materials proposed for use in the development could come into contact with aggressive ground conditions, such as elevated pH or sulphates, or contamination from historical developments. Given the varied industrial usage around the Site, it is considered that the risk posed to building materials on Site can be classified as **Low**.

Ground contamination can be detrimental to water supply pipes by corroding at joints which can lead to contaminants entering the water supply systems ultimately affecting Site end-users. Given the Site and the surrounding adjacent industrial land, the risk posed to water supply pipes is considered **Low** without mitigation.

7.5 Preliminary Conceptual Site model

Potential Receptor	Potential Source	Potential Pathway	Consequence of Risk	Likelihood of Risk	Level of Risk (without Mitigation)	Potential Mitigation
Site Personnel	Made ground/contaminated soils and/or groundwater contamination.	Direct dermal contact/ingestion/inhalation of soil/water/dust and vapours. Exposure to ground generating gases such as carbon dioxide, hydrogen sulphide, methane or depleted oxygen.	Medium	Unlikely	Low	It may be beneficial for any ground investigations being undertaken to determine ground conditions on the Site include some basic contamination testing (ph/sulphates), although no made ground soils are considered likely, the presence of would be determined by ground investigations During construction: - Site personnel should wear PPE appropriate for the work task this may include hand protection.
Site End-User	Made ground/contaminated soils and/or groundwater contamination.	Made ground or contaminated soil (associated with historical industrial land use) and/or groundwater contamination. Direct dermal contact/ingestion/inhalation of soil/water/dust and vapours.	Medium	Unlikely	Low	
Adjacent Land User	Soil Dust	Inhalation of soil dust/particles during construction.	Medium	Unlikely	Low	No contaminated soils are anticipated on site, however, control of soil dust particles during construction will be managed through methods as outlined in a realted Construction Environmental Management Plan (CEMP).
Water Environment	Contamination in groundwater from contaminated soils.	Vertical or lateral migration of contaminants to groundwater within made ground and/or underlying natural soils.	Medium	Unlikely	Low	
Construction Materials	Elevated contamination aggressive/corrosive to proposed construction materials.	Exposure to elevated pH and/or sulphates or other corrosive contaminants through soil infiltration to buried concrete.	Medium	Unlikely	Low	It may be necessary to undertake pH and Sulphate testing as part of ground investigations to inform the specification of construction materials. No made ground is anticipated on site therefore the risk to construction materials is Low.

Water Supply Pipes	Elevated contamination aggressive/corrosive to proposed construction materials.	Exposure to elevated pH and/or sulphates or other permeating/corrosive contaminants through soil infiltration to laid water supply pipes.	Medium	Unlikely	Low	It may be necessary to undertake pH and Sulphate testing as part of ground investigations to inform the specification of water supply pipes. No made ground is anticipated on site therefore the risk to water supply pipes is Low. Ground investigations to be undertaken to determine ground conditions on the Site.
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8 RISK CLASSIFICATION, MITIGATION AND CONCLUSION

8.1 Risk Classifications and Mitigation

From the findings of this desk study, it is considered that the risk from the presence of contamination on the Site is **Low** without mitigation.

8.2 Conclusions

The Site has not had any significant potentially contaminative uses in the last 150 years. Based on the desk study carried out for the proposed future end use, it is anticipated that the Site would not pose a significant risk.

Presently, there are two small structures located in the west of the Site. Whilst it is not anticipated that the development of these structures, or their current uses, would have resulted in significant contamination due care should be taken during the removal of any structures.

The risk posed to all receptors at the Site and surrounding areas is generally considered to be **low**.

Ground investigation works are not deemed necessary to support the planning application due to the **low** risk to potential receptors. Intrusive investigations, such as trial pits and boreholes, may be required to obtain detailed geotechnical information at the Site to support construction.

The risk from coal mining activities at the Site is considered to be low as the only coal seam previously worked at the Site is located at a depth of ≥ 170 m and therefore does not require any further consideration.

9 REFERENCES

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