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GEOENVIRONMENTAL CONSULTANCY**

A PHENNA GROUP COMPANY

Envams

KIRKBY BESS

Phase 1 Desk Study

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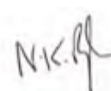
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EXECUTIVE SUMMARY

Card Geotechnics Limited (CGL) was commissioned by Envams Ltd on behalf of Pivoted Power LLP to complete a Phase 1 Geoenvironmental Desk Study to support a planning application for a proposed Battery Energy Storage System (BESS) on Land at Hill View Farm off Cut Lane, Kirkby, Liverpool, L33 3AJ ('the Site'). It is understood the planning boundary includes the proposed BESS site in the north and a proposed cable route. The proposed cable route extends west from the southern boundary of the proposed BESS site along Cut Lane, before extending south along Hewitt's Lane and then west through vegetated land to the south of the existing Kirkby Substation, Coopers Lane, Kirkby, L33 7TT.

The Site has until recently been in use for unregulated soil and aggregate processing by the previous owner, with associated plant and waste storage areas and a storage building in the west. Historical unspecified pits are marked close to the Site and adjacent to the proposed cable route (Hewitts Pits) to the north of the East Lancashire Road (A580). Unspecified pits, ground workings and unspecified "Works" are also recorded at Kirkby Substation, the United Utilities pumping station on Hewitt's Lane, and an historical Scarisbrick Quarry (sandstone) is recorded at the north of Hewitts Lane.

The completed Phase 1 desk study has identified Moderate to Low risks related to potential soil contamination including asbestos containing material (ACM) and ground gas due to current and historical land uses. A ground investigation is recommended to confirm the nature of the ground conditions and to assess the potential for contamination in soil and groundwater and the potential for ground gas.

Copies of utility service plans and a PAS 128 utility survey will be required prior to ground investigations, and it is recommended the ground investigations are completed after any of the current operational activities have ceased on site. It is understood that no buildings are to be demolished as part of these works. However, should this change an asbestos survey of current buildings should be completed prior to demolition to inform appropriate asbestos management. All material intended for off-site disposal must be managed under appropriate Duty of Care by competent waste contractors.

During construction, the adoption of good working practices, environmental controls and appropriate use of personal protection will be required to protect construction workers from exposure to potential contamination during construction. Appropriate measures must be taken for the prevention of surface water run-off and off-site dust migration, and consideration must be given for the potential for ground gas in confined spaces. A watching brief should be maintained during construction and a Discovery Strategy implemented in the event of uncovering unexpected contamination.

Potential geotechnical hazards are presented in a preliminary geotechnical risk register which should be updated throughout the life cycle of the construction project.

The conclusions to this Phase 1 desk study report are subject to the approvals of the regulatory bodies.

1. INTRODUCTION

Card Geotechnics Limited (CGL) has been commissioned by Envams Ltd on behalf of Pivoted Power LLP to complete a Phase 1 Desk Study report for a proposed Battery Energy Storage System (BESS) on Land at Hill View Farm off Cut Lane, Kirkby, Liverpool, L33 3AJ ('the Site'). It is understood this Phase 1 Desk Study report is required to support a planning application to be submitted to Knowsley Metropolitan Borough Council.

The planning application boundary includes the proposed BESS Site and an associated cable route that extends between the proposed BESS Site and the current Kirkby Substation off Coopers Lane (A5208). A Site Location Plan is presented in Figure 1 which shows the area considered to be "the Site" outlined in red. A Site Layout Plan is presented in Figure 2. Proposed Development plans provided by the client are presented in Appendix A.

The aim of this report is to review the Site setting and evaluate potential human health and environmental risks and constraints associated with the Proposed Development. It presents a preliminary conceptual site model (PCSM) and qualitative risk assessment to assist in meeting anticipated planning requirements.

Potential contamination risks, liabilities and development constraints are outlined with recommendations for ground investigation and further assessment if appropriate.

2. SITE LOCATION AND DESCRIPTION

The Site has been separated into two areas to aid description and assessment: the proposed BESS Site and the proposed cable route. These areas are shown on the Site Layout Plan in Figure 2.

Details of the Site have been collated from Ordnance Survey and Google Earth mapping, client information and a Site walkover conducted by a CGL engineer on the 24th August 2023. Details of the Site walkover and photo sheets are included in Appendix B.

2.1 Proposed BESS Site, Cut Lane

The proposed BESS Site is located to the north of Cut Lane, Kirkby, L33 3AJ approximately 10 km northeast of Liverpool City Centre. The National Grid Reference and What Three Words for the approximate centre of the Site are:

- NGR: 344585, 397577
- WhatThreeWords: **///unionists.movements.garden**

The proposed BESS Site is bound by agricultural fields to the west, east and north and Cut Lane to the south. Hedgerows interspersed with trees align the majority of the western, southern and eastern Site boundaries.

An access track extends north for approximately 125 m from Cut Lane to the main body of the proposed BESS Site which comprises a roughly rectangular shaped area. This area was operational as an aggregate and soil processing works at the time of the CGL walkover in 2023. Two agricultural fields, also within the Proposed Development boundary, lie to the east and west of the access track. The footprint of the proposed BESS Site covers an area of approximately 3.34ha within the wider site boundary.

A rectangular shaped storage barn of portal frame construction with concrete panelled walls and metal cladding was located within the west of the proposed BESS Site at the time of the CGL walkover. A series of skips used for recycling of materials including metals and plastics were noted, and stockpiled materials including crushed tar/bituminous macadam and building materials including cobbles and paving slabs were observed to the north and east of the barn. The rubble was identified as containing potential asbestos containing material (ACM). Several items of plant including tracked excavators and a tank/bowser were parked at the time of the walkover. Several discarded gas bottles and wheels/tyres were also observed in this area and a tank with unknown contents was also noted.

To the east of the proposed BESS Site, widespread borrow pit and backfilling operations were apparent and appeared to have been operational for some time, although it is understood that these operations have now ceased. The workings appeared to be for sand and/or sandstone deposits, with backfilling of the borrow pit workings utilising both on-site resultant overburden materials and imported soil.

The field to the south of the barn and west of the access track was grassed undeveloped land at the time of the CGL walkover. Land to the east of the access track comprises a grassed field with the southern and eastern field boundaries aligned with hedgerows. A small rectangular disused stable block occupied the north-eastern section of this area.

The topography of the proposed BESS Site is flat at approximately 52m Above Ordnance Datum (AOD).

2.2 Proposed Cable Route

The proposed cable route follows the highway corridor of Cut Lane in a western direction from the proposed BESS Site, prior to extending south along Hewitt's Lane and then west through vegetated land to the south of Knowsley Pumping Station towards the current Kirkby substation off Cooper's Lane.

Cut Lane is a narrow carriageway with grass verges and mature hedge lines. Overhead power lines supported on wooden poles are present on the northern side of the carriageway prior to extending along the southern side. A second set of overhead power lines supported on towers cross in a northeast / southwest orientation.

Hewitt's Lane comprises a narrow carriageway bound by grass verges and adjoining hedge lines interspersed with trees where the canopies locally hang over the road alignment. An overhead power line supported on wooden poles extends along the eastern side of the road prior to crossing to the western side. Further to the south, electricity power lines supported on towers cross the carriageway in a roughly westerly to easterly orientation. Hewitt's Lane Pumping Station lies to the west of Hewitt's Lane at the southern extent of the proposed cable route.

The proposed cable route passes through vegetated land to the west of Hewitt's Lane, to the south of Hewitt's Lane Pumping Station and north of the A580 East Lancashire Road. This area was not accessible to CGL at the time of the walkover, but it was noted to be heavily wooded. Knowsley Brook flows to the west through this area. Further to the west, industrial units and residential housing were noted to lie to the west of the Coopers Lane carriageway (A5208).

2.3 Proposed Development

It is understood that Envams Ltd are supporting a planning application by Pivoted Power LLP for construction of a BESS off Cut Lane, Kirkby. The application boundary includes a cable route between the proposed BESS Site and Kirkby substation which lies off Coopers Lane (A5208). Proposed Development plans provided by the client are presented in Appendix A.

3. HISTORICAL DEVELOPMENT

3.1 Sources of information

The historical development of the Site has been traced from Ordnance Survey maps dating between 1867 and 2023 provided by Groundsure and online digital imagery³. These maps were produced on scales ranging from 1:1,125 to 1:10,560 and are presented in Appendix C. The Site boundary has been refined since the time the Groundsure report was purchased. The historical information summarised in Table 1 and Table 2 below and the distances quoted relate to the updated application Site boundary shown in red on Figure 1 and Figure 2.

3.2 Site History

Details of the Site history are summarised in Table 1 and Table 2 below with approximate distances taken from the Site boundary.

Table 1. Summary of Proposed BESS Site development

Historical Feature	Area of Site	First Date Mapped	Last Date Mapped	Comments
Track from the adjacent Sandy Lane Farm in the west	Crosses western boundary in the north	1867	2003	The track runs along the edge of the western Site boundary. Cut Lane, Mollys Lane and Hewitt's Lane were all present on the earliest map dated 1867.
Mature Trees	Trees located at the boundaries of adjoining sections of 5 fields	1867	1893	The 1893 map shows the amalgamation of the small fields into a large field of which the plan area of the Site is located within.
Building	South-western section of the site.	2023	2023	Assumed to be the current rectangular storage building/barn. Recorded during the walkover to be of portal frame construction including concrete panelled walls and metal cladding.
Stabling block of timber construction	North-east of the end of the Site access track	Not mapped recorded during the Site walkover		The stabling block was noted during the Site walkover and would appear to have been unused for some time.
Excavation works, regrading of ground levels and stockpiling of soils.	North	<2005 ³	2023	Noted during the Site walkover evidence of infilled ground and stockpiling of soils, bituminous bound materials and aggregates. Historical Google Earth images indicate excavation works started about 2005.
Skips	North	Not mapped recorded during the Site walkover		Noted during the Site walkover within the south-western sector of the Site for temporary storage of recyclable materials such as metals, plastic and building materials.
Operation/storage of plant, bowsers and building materials	North	Not mapped recorded during the Site walkover		Noted during the Site walkover standing plant, stockpiled building materials, discarded gas cylinders
Drain	Adjacent to the Cut Lane Site access road	1960	1993	The drain runs parallel to the southern Site boundary and traverses across the Site entrance.
Overhead power lines	Crosses the north-western corner of the site	1959-1960	2023	The overhead power line crosses the north-western corner of the Site footprint (re-sited further south from the initial alignment prior to 1965). A power line tower is located adjacent to the northern boundary of the Site.

³ Google Earth Imagery

The route of the proposed cable route follows Cut Lane and Hewitt's Lane which are both marked on the earliest historical maps. The area of vegetated land to the west of Hewitt's Lane is recorded to be undeveloped except for Hewitt's Pits which are recorded to the south of the cable route on the earliest available maps until 1938.

Table 2. Pertinent off-site development

Historical Feature	Distance from BESS (Cut Lane) Site	First Date Mapped	Last Date Mapped	Comments
Sandy Lane Farm	~80m west of the BESS Site access corridor	1867	2023	Buildings were present in 1867 but not titled as Sandy Lane Farm until 1925.
Ponds	~50m-250m north, east, north-east and south	1867	1927-1960	Several ponds possibly emanating from sand extraction gradually apparently infilled during the period 1927-1960. Two Ponds are likely to remain within the grounds of nearby Sandy Farm.
Moorcroft pits	~750m south-west	1893	1939	Recorded on maps during the period 1893-1939, the plan area is not clearly defined.
Marl Pits, Sand Pit and Old Sand Pit.	~20m - 300m north-east and east	1867	1893 (marl pits) 1908 smaller sand pit, 1960 larger pit	A smaller sand pit closer to the Cut Lane Site is mapped in 1908 the a larger pit located ~280m to the east of the Cut Lane Site is mapped until 1960. Marl pits are recorded approximately 300m to the north-east and 200m (latterly labelled as a sand pit) to the east of the Cut Lane Site on the 1867 plan.
Sand Pit	~700m south-west	1893	1908	The sand pit is first shown on the 1893 plan, the plan area is much diminished as shown on the 1908 plan.
Union & R.D Bdy	~800m south-west	1867	2023	The Union & R.D Bdy watercourse is subsequently labelled as Parly Div Bdy and Knowsley Brook.
Scarisbrick Quarry	~400m south-west	1892	1955-1956 (disused)	Recorded on historical map dated 1892 recorded as disused by 1907. Final reference 1955-1956.
Knowsley Water Works (St Helens Corporation)	~500m south-west	1892	1955-1956	Recorded on historical map dated 1892. Final reference to a water works 1955-1956. Now a pumping station operated by United Utilities.
Hewitt's Pits	~650m south-west	1892	1938	Recorded on the earliest available maps until 1938.
Gooring's Plantation	~700m south-east	1892	2023	Recorded on the earliest available maps until present day.
Kirkby Industrial Estate	~900m north-west	1955-1956	2023	Recorded under construction on map dated 1955-1956. Renamed Knowsley Industrial Park on map dated 1988.
Residential development south of Tingle Peg Lane	~1000m south-west	1955-1956	2023	Recorded under development on map dated 1955-1956. Prior to development the Site area was the Kitling Pits Plantation.
Kirkby Electricity Substation	~600m south-west	1978-1980	2023	The electricity sub-station is first recorded on the 1978-1980 map.

4. ANTICIPATED GROUND CONDITIONS

4.1 Published Geology

With reference to the British Geological Survey (BGS)⁴ and the Groundsure Report⁵ (presented in Appendix D), the Site is recorded to be underlain by the solid geology of the Chester Formation of the Sherwood Sandstone Group. These strata are described as *reddish brown cross bedded pebbly sandstones and conglomerates*.

The proposed BESS Site and much of the proposed cable route are anticipated to be underlain by superficial deposits comprising Glacial Till described by the BGS as *“a heterogenous mixture of clay, sand, gravel, and boulders varying widely in size and shape”*. The proposed cable route also passes over recorded superficial deposits of the Shirdley Hill Sand Formation, described as *“fine grained sand with peat layers in the lower part”*. Peat deposits are recorded approximately 500 m to the north of the Site.

Areas of unspecified Artificial Ground are recorded off-site to the north of the proposed BESS Site and to the west and south-west of the current Kirkby substation beneath the current Knowsley Industrial Estate. The areas of Artificial Ground are described as *“...an area where the pre-existing (natural or artificial) land surface is raised by artificial deposits. The purpose of the made ground is unspecified”*.

4.1.1 Geological Faults

An inferred geological fault line is recorded approximately 400 m to the east of the proposed BESS site. The bedrock to the east of the fault line is recorded to comprise the Pennine Lower Coal Measures Formation and the Rossendale Formation of the Millstone Grit Group.

4.2 Unpublished Geology

There are no historical BGS boreholes recorded within the Site boundary. BGS borehole SJ49NW26 at Knowsley Water Works and Pumping Station on Hewitt's Lane records red sandstone at a depth of approximately 2.4 m beneath unspecified Made Ground. A copy of this BGS borehole record is presented in Appendix E.

4.3 Hydrogeology and Hydrology

The Environment Agency (EA) has produced an aquifer designation system consistent with the requirements of the Water Framework Directive (WFD)⁶. The WFD designations have been set for

⁴ https://mapapps2.bgs.ac.uk/geoindex/home.html?_ga=2.246731143.2078192920.1669115699-1951522308.1669115699

⁵ Groundsure Enviro + Geo Insight Reports GSIP-2023-13992-15288 Coopers Lane & GSIP-2023-13962-15210 Kirkby.

⁶ Directive 2000/60/EC

superficial and bedrock geologies and are based on the importance of aquifers for potable water supply and their role in supporting surface water bodies and wetland ecosystems. The bedrock of the Chester Formation is classed as a Principal Aquifer⁷. The Shirdley Hill Sand Formation is classified as having a Secondary A status and the Glacial Till has Secondary Undifferentiated Aquifer status⁷. Groundwater is recorded to be at medium to high vulnerability beneath the site.

The proposed cable route passes through a Groundwater Source Protection (Zone 1 and Zone 2) of an active potable water abstraction at Knowsley Water Works operated by United Utilities (Licence No: 2569031016). The proposed BESS Site lies in the total catchment area of this abstraction⁵.

There are no surface water abstractions recorded in the Groundsure report within 500 m of the site⁵.

An historical surface water discharge to Kirkby Brook is recorded at Kirkby Substation which was surrendered in 2013 under the Environmental Permitting Regulations 2010⁵.

Knowsley Brook flows to the west across the path of the proposed cable route as it passes through the vegetated area to the south of Kirkby substation. This surface water body is recorded in the Groundsure report as Croxtech/Knowsley Brook and was awarded Overall Moderate status under the WFD in 2019 with a Fail Chemical rating. An inland river is also recorded at the south west corner of Kirkby substation which is recorded as a drain on historical maps at the location of historical Moorcroft Pits⁵.

Groundwater beneath the Site is classified as part of the Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifers which were awarded a Poor Quantitative and Chemical rating under the WFD in 2019⁵.

Based on the Groundsure report, the majority of the Site is not identified as being at risk of surface water flooding. Locally, areas associated with surface water flooding are identified in the south west corner of the proposed BESS Site, within the grazing field, identified as other neutral grassland, enhanced by the Due Diligence Plan presented in Appendix A, where a 1 in 30 year 0.3 m-1.0 m flood range is identified. Further areas along the cable route, by Knowsley Brook, are identified as Flood Zone 3 with a 1 in 30 year flood depth >1.0 m range recorded. The Raincloud Consulting Ltd. Flood Risk Assessment⁸ states the cable will be underground for the entirety of the route and therefore be unaffected. The Site is recorded to be at low risk of groundwater flooding.

⁷ <https://magic.defra.gov.uk/MagicMap.html>

⁸ Raincloud Consulting Ltd. Kirkby BESS Flood Risk Assessment – unpublished, provided by client

The proposed BESS Site is located in Flood Zone 1⁹. The proposed cable route passes within areas recorded in Flood Zone 2 and 3⁹. A Flood Risk Assessment (FRA) will be required as part of the planning application process for development in these areas.

4.4 Ground Hazards

The risks associated with potential geological hazards are summarised in the Groundsure report⁵. Table 4 below summarises the geological hazard potential for the site.

Table 4. Summary of Geological Hazards

<i>Hazard</i>	<i>Risk</i>
Shrink-swell clays	Negligible to Very Low
Landslides	Very Low
Ground Dissolution	Negligible
Compressible Deposits	Negligible
Collapsible Deposits	Very low
Running Sands	Very Low to Low

⁹ <https://flood-map-for-planning.service.gov.uk/>

5. ENVIRONMENTAL SETTINGS

5.1 Environmental Disclosure Report

The Groundsure report (Appendix D) provides information on the environmental setting of the Site and has been used to assist in identifying past industrial processes and potential sources of ground contamination.

A summary of pertinent points is set out below:

-  *Historical Industrial Land Use:* There are no historical industrial land uses recorded at the Site although unspecified pits are marked close to the proposed cable route to the north of the East Lancashire Way (A590) at the approximate location of Hewitts Pits which are marked on historical maps. Nearby historical land uses recorded in the Groundsure report include Kirkby Substation (with unspecified pits, ground workings and Works also noted at this location), Water Works (and unspecified Works) at the United Utilities pumping station on Hewitt's Lane, historical tramway and railway sidings to the west of Coopers Lane, ground workings at the north of Hewitt's Lane at the location of the historical Scarisbrick Quarry, and several unspecified pits to the east, south and west of the proposed BESS Site.
-  *Historical Tanks:* Entries pertaining to historical tanks within 250 m relate to off-site farm land and Knowsley Industrial Estate. There are no records of onsite tanks.
-  *Historical Energy Features:* Entries of historical energy features relate to Kirkby Substation and an associated gas governor compound.
-  *Historical Military Land:* Operational between 1940-1946 approximately 10% of World War 2 (WW2) Ammunition was produced at a Site located within Knowsley Industrial Estate.
-  *High Voltage Underground Cable:* High voltage 275kV electricity cables are recorded crossing the proposed cable route and overhead lines also cross the proposed BESS Site.
-  *Petrol Stations:* There are two recorded petrol stations identified within 500 m of the Site. Only one is active, located off East Lancashire Road.
-  *Landfills and Waste Sites:* There are two historical landfill sites recorded approximately 500 m north of the proposed BESS Site registered to Kirkby Moss. Both landfill licences relate to the disposal of a mixture of wastes including inert, industrial, household and liquid sludge.

-  *Waste Exemptions:* Four waste exemptions are registered at the proposed BESS Site, relating to use of waste in construction. Further research was undertaken using the Public Register for Environmental Information¹⁰ and it was ascertained that a Waste Management licence (WEX266467) was issued to Mr Neil Langton of Hill View Farm, Cut Lane for '*Temporarily treating waste on a small scale to produce aggregate or soil at a place such as a construction or demolition site*' being a screening & blending of building waste operation.
-  *Current Potentially Contaminative Sites:* There are forty-one entries pertaining to current potentially contaminative industrial land uses within 250 m of the Site. On-site listings relate to two electrical features (overhead line towers/pylons). The closest off-site features include overhead line towers, Kirkby Substation, a gas governor, water pumping station, disused Scarisbrick (unspecified) quarry, a telecommunications mast, tanks, a sewage pumping station (including waste storage, processing and disposal) and vehicle repair, packaging and manufacturing businesses.
-  *Control of Major Accident Hazards (COMAH):* The closest COMAH site is registered to Euroлитers, an historical Installation Handling Hazardous Substances (NIHHS) site, within Kirkby Industrial Estate.
-  *Hazardous Storage Sites –* There are no sites within 500 m registered under the Planning (Hazardous Substances) Regulations 2015.
-  *Regulated Explosive Sites:* There are no sites within 500 m registered or licensed by the Health and Safety Executive under the Manufacture and Storage of Explosive Regulations 2005.
-  *Licensed pollutant release sites:* There are five records of licenses permitting the release of pollutants to the environment within Knowsley Industrial Estate. The listings relate to mineral processing, the unloading of petrol at a service station, metal coating, surface cleaning and respraying of vehicles.
-  *Licensed Discharges to Controlled Waters:* Four licences to discharge to controlled waters have been recorded within 500 m of the Site. The closest record pertains to a discharge to Knowsley Brook /a tributary of Knowsley Brook from Kirkby Substation.
-  *Pollution Incidents:* There are six records of substantiated pollution incidents within 500 m of the Site. Three records relate to on-site activities at the proposed BESS Site for incidents

¹⁰ <https://www.gov.uk/guidance/access-the-public-register-for-environmental-information>

connected to the release of construction, demolition materials and wastes, commercial and metal wastes.

5.2 Environmental Designations

Acornfield Plantation Local Nature Reserve (LNR) is located off-site approximately 500 m to the west of the proposed BESS Site. There are no other sites with a statutory environmental designation within 1 km of the Site.

The Site is identified as lying within a Nitrate Vulnerable Zone (NVZ). Hewitt's Lane and land to the north of Cut Lane is recorded as Green Belt. Land immediately to the west of Kirkby substation is included within the Priority Habitat Inventory as '*Deciduous Woodland*'⁵.

The Site is entirely located in land that is designated Grade 1 Agricultural Land described as: '*Excellent quality agricultural land. Land with no or very minor limitations to agricultural use. A very wide range of agricultural and horticultural crops can be grown and commonly includes top fruit, soft fruit, salad crops and winter harvested vegetables. Yields are high and less variable than on land of lower quality*'.

5.3 Archaeology, Heritage Sites and Protected Monuments

The Site is not located within 250 m of World Heritage Sites, Scheduled Ancient Monuments or Listed Buildings.

5.4 Radon

The Groundsure report states that less than 1% of properties have radon levels at or above the Action Level and Radon protection measures are not required.

5.5 Mining, Quarrying and Infilled Land Activities

With reference to the Groundsure Report, the Site is not located within 500 m of recorded underground mine workings (coal and non-coal mining including brine, gypsum and tin). There are no records of ground cavities or sinkholes within a radius of 500 m.

There is one record of surface mineral workings at the proposed BESS Site related to sand extraction. Three off-site unspecified pits are also recorded within 250 m of the proposed BESS Site.

Scarisbrick Quarry (sandstone) is identified as a surface mineral working 100 m south west of the proposed BESS Site off Hewitt's Lane. Unspecified ground workings are also recorded at Kirkby Substation and an unspecified heap is recorded at the United Utilities pumping station. The historical Hewitts Pits are also recorded as unspecified pits.

Borrow pit operations were ongoing at the proposed BESS Site at the time of the CGL walkover in 2023, although it is understood that these operations have now ceased. With reference to the Google Earth website, excavation appears to have begun between 2005 and 2011. Prior to the earliest borrow pit operations a pond existed off-site close to the eastern boundary of the proposed BESS Site and was subsequently shown to have been infilled as part of earthworks evident after 2005³.

5.5.1 Coal Authority

With reference to The Coal Authority interactive map¹¹, the Site is located outside of the Coal Authority reporting area.

5.6 UXO Risk

Given the former presence of an historical WW2 ammunitions factory within Knowsley Industrial Estate a visit was made to the Zetica website¹² to check the category of risk from unexploded ordnance (UXO). The Site is recorded to be located in a low risk area.

5.7 Regulatory Enquiries

The Planning Department, Local Land Changes, Building Control, Environmental Information Regulations Department, Environmental and Pollution Department and the Flood Risk Management Department at the Metropolitan Borough of Knowsley Council were contacted on 18th September 2023 to request information available for the Site. Responses, presented in Appendix F, relate to a previous site boundary which has since been refined by the client; however the information is presented to inform the preliminary risk assessment herein.

A response was received from the Knowsley Council planning officer on 19th September 2023 confirming that a planning application had been submitted by Pelagic Energy on 23rd July 2023 for a proposed Battery Storage Facility on land to the south of Kirkby Substation reference 23/02008/FUL. A copy of the Planning Statement is included within Appendix F.

The response from Knowsley Council confirmed the need to consult with Merseyside Fire and Rescue in accordance with guidance issued by the National Fire Chiefs Council (NFCC) to develop an appropriate Emergency Response Plan in the event of a battery fire. No further information was provided by Knowsley Council without submission of a fee based preapplication request which was not pursued.

¹¹ <https://mapapps2.bgs.ac.uk/coalauthority/home.html>

¹² <https://zeticauxo.com/downloads-and-resources/risk-maps/>

6. PRELIMINARY RISK ASSESSMENT

6.1 Introduction

Historical contamination of land may present harm to human health and the environment. Current UK legislation stipulates that the risk associated with potential land contamination is assessed and remediated, if necessary. Under the Town and Country Planning Act 1990 (as amended), potential land contamination is a "material planning consideration" together with the National Planning Policy Framework 2023, which means that a planning authority must consider contamination when they prepare development plans or consider individual applications for planning permission. It is the responsibility of the developer to carry out remediation where it is required and satisfy the Local Authority that the remediation has been carried out as agreed.

Additionally, Part 2A of the Environmental Protection Act 1990 requires that a significant source-pathway-receptor linkage must exist to determine a site as Contaminated Land. This means that there has to be a contaminant present, a receptor that could be harmed by this contaminant, and a pathway linking the two. Part 2A deals with the contamination risk from a site in its current use, however, the planning system requires that the proposed use is considered. Where remediation is carried out under the planning system, it should be ensured that the site is in such a condition that it would still not meet the definition of Contaminated Land under Part 2A.

6.2 Preliminary Conceptual Site Model

A preliminary conceptual model has been compiled for the Site with respect to the Proposed Development to identify potential sources of contamination and associated potential contaminant linkages. This model is used to inform the need for further investigation at the Site.

6.2.1 Potential Sources

Potential contamination sources can include both current and historical activities on Site and in the surrounding area. Potential sources at the Site are anticipated to be limited to the following.

Proposed BESS Site

Current and Previous land use – The Site has recently been operational as an aggregate and soil processing works. During the site walkover borrow pit areas were in the process of being backfilled, although it is understood that these operations have now ceased. It is assumed backfill materials include overburden and imported spoil however the nature and content of these materials is unknown.

The material did not appear to be placed as an engineered fill. An historical pond is recorded on historical maps within the eastern area of excavation and backfilling operations.

Stockpiles of soil and bituminous bound materials were noted during the walkover as well as waste materials held in uncovered skips including metal, plastic, polythene, tyres and building rubble. Various items of plant and machinery were noted on Site, including tracked excavators, a bulldozer, an earthworks scraper and bowzers. A tank with unknown contents was also noted in this area. The use of plant and potential storage of fuel and refuelling may have led to contamination due to leakage and spillage. Building rubble has potential for containing asbestos containing material (ACM).

Agricultural/Pastoral field uses – agricultural and pastoral fields surround the Site. There is a potential for run off of nitrates and phosphates from the use of fertilizers, weedkillers and pesticides.

Off-site Sources

Electricity Substation (Kirkby Substation) - Potential contaminants associated with electrical equipment include hydrocarbons, polychlorinated biphenyls (PCB) and other organic contaminants. However, the substation is anticipated to be well maintained and above ground tanks are likely to be bunded and located over hardstanding. It is assumed dedicated interceptors are present and maintained to protect drainage systems. This potential off-site source is therefore not considered to impact upon the Proposed Development and is not considered further within the qualitative risk assessment below.

Infilled Ground – A study of historical maps has confirmed the presence of old sand/marl pits within 250 m of the proposed BESS Site. Should organic matter have been included within backfilling materials there is the potential for production of ground gas migration within underlying granular soils.

6.2.2 Potential Pathways

Potential pathways that may be present at the Site include:

Ingestion - contaminated soils and dust could be ingested by Site occupants.

Inhalation – contaminated soils, dust and fibres could be inhaled by Site occupants as well as gas and vapours.

Dermal contact – dermal contact with contaminated soils or groundwater can result in the permeation of contaminants through the skin.

Direct contact – direct contact with contaminated soils or groundwater can result in the permeation of contaminants into building materials.

Root uptake – uptake of phytotoxic contaminants such as copper, nickel and zinc by plants and vegetation.

Lateral and vertical migration – leaching from potential contamination in the soils may impact groundwater which may migrate laterally to cause pollution of surface water features. Ground gas may migrate laterally and vertically through permeable geological strata. Contamination may migrate via drainage and service conduits.

6.2.3 Potential Receptors

Based on the proposed end use of the Site, the main receptors at the Site are considered to be:

Construction workers – could be affected by potential contamination within soils and groundwater during ground works and ground gas. Such persons are likely to be in close contact with potentially contaminated materials, which may include asbestos.

Future sites users - considered to be at risk from possible contamination and ground gas associated with identified sources on Site. However, future users are likely to be limited to visitors and maintenance staff for infrequent and short duration visits.

Off-site Users – At potential risk from the migration of wind blown dust, gas/vapour and contaminants in groundwater that have migrated away from site. The nearest off-site human receptors are residential approximately 200 m from the proposed BESS Site at Sandy Lane Farm. The potential for off-site migration following redevelopment is considered to be low. Mitigation to prevent off-site migration during construction will be required using appropriate mitigation and health and safety management and risk assessment.

Controlled waters – A Principal Aquifer underlies the Site and a potable water abstraction is recorded at the United Utility pumping station off Hewitt's Lane. Groundwater vulnerability is high due to variable ground cover by superficial deposits. Superficial deposits are classified as a Secondary A Aquifer.

Controlled waters – surface waters are potentially at risk from leaching of contaminants from soils.

Buildings and infrastructure – could be at risk from aggressive ground conditions and, due to the depth of infilled ground at the proposed BESS Site, there is a risk of ground gas which could cause fire or explosion.

Plants and vegetation – Potentially at risk from phototoxic contaminants such as copper, nickel and zinc.

6.3 Preliminary Qualitative Risk Assessment

A preliminary qualitative risk assessment has been undertaken based on the conceptual ground model and potential contaminant linkages that may exist at the Site in accordance with Land Contamination Risk Management Guidance (LCRM)¹³ (which replaced Contaminated Land Report (CLR) 11¹⁴).

Using criteria broadly based on those presented in CIRIA Report C552¹⁵, the magnitude of the risk associated with potential contaminant linkages has been assessed in a preliminary qualitative risk assessment. The preliminary qualitative risk assessment and methodology are presented in Appendix G.

Based on the desk study information, it is considered that contamination related risks at the Site are Moderate to Low. Further investigation is required with respect to potential contamination within soils and groundwater and the potential for ground gas.

6.4 Geotechnical Constraints

Based upon the desk study data presented herein, an assessment of potential geotechnical hazards has been undertaken and a geotechnical risk register has been produced. The risks identified are site specific however the mitigation measures have been generalised and will require refinement throughout the development of the project, specifically following ground investigation and prior to detailed design.

Where additional risks are identified these should be included within a revision of the geotechnical risk register. The geotechnical risk register is presented in Appendix H.

¹³ Environment Agency (2020). *Land Contamination Risk Management (LCRM)*.

¹⁴ Environment Agency (2004). *Model Procedures for the Management of Land Contamination (CLR11)*.

¹⁵ CIRIA (2001) Contaminated Land Risk Assessment. A guide to good practice. C552.

7. CONCLUSIONS AND RECOMMENDATIONS

The proposed BESS Site is recorded as agricultural land until about 2005 when borrow pit operations are recorded for sand and sandstone deposits. There is evidence of the importation of soils and aggregates associated with a licence (WEX266467) for '*Temporarily treating waste on a small scale to produce aggregate or soil at a place such as a construction or demolition site*'. The proposed BESS Site is associated with depths of made ground up to 6 m as noted during a site walkover undertaken by CGL in September 2023.

The proposed cable route runs predominantly along existing highway corridors; however, the western most section passes through undeveloped wooded land to the north of the East Lancashire (A580) Carriageway, which is associated with historical surface workings, Hewitt's Pits.

A conceptual site model and qualitative risk assessment have been developed for the Site. It is considered that contamination risks are Moderate to Low from identified potential sources of contamination and a ground investigation is recommended to investigate ground conditions and assess the potential for contamination in soils and groundwater and for the presence of ground gas.

Copies of utility service plans and a PAS 128 utility survey will be required prior to investigation for the avoidance of underground services. It would be preferable to complete the investigation following cessation of the current Site operations. It is understood that no buildings are to be demolished as part of these works. However, should this change an asbestos survey of buildings should be completed prior to demolition to inform appropriate asbestos management. All material intended for off-site disposal must be managed under appropriate Duty of Care by competent waste contractors.

During construction, the adoption of good working practices, environmental controls and appropriate use of personal protection will be required to protect construction workers from exposure to contamination. Appropriate measures must also be taken for the prevention of surface water run-off and off-site dust migration and consideration must be given for the potential for ground gas in confined spaces. A watching brief should be maintained during construction and a Discovery Strategy implemented in the event of uncovering unexpected contamination.

The conclusions to this report are subject to the approvals of the regulatory bodies.