



Larne Harbour, Larne

Desktop Study & Preliminary Risk Assessment

Project No: A112794-67

August 21st, 2020




DAERA

Prepared by WYG Environment Planning Transport Ltd



Document control

Document:	Land Contamination Preliminary Risk Assessment
Project:	Larne Harbour, Larne
Client:	DAERA
Job Number:	A112794-67
File Origin:	\\belfast02\data\Projects\A112\A112794\P-03 Execution\11 EP\A112794-67

Revision:	V1.0	
Date:	August 2020	
Prepared by: Vicky Orr pp. 	Checked by: Patrick Higgins 	Approved By: Stuart Martin 
Description of revision:		

Revision:		
Date:		
Prepared by:	Checked by:	Approved By:
Description of revision:		

Revision:		
Date:		
Prepared by:	Checked by:	Approved By:
Description of revision:		



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Executive Summary

Instruction	<p>WYG Environment Planning Transport Ltd was instructed by Construction & Procurement Delivery (CPD) on behalf of Department of Agriculture, Environment and Rural Affairs (DAERA) to undertake a land contamination Preliminary Risk Assessment for the site situated at Larne Harbour, Larne.</p> <p>The objective of the scope of works agreed was to identify any potentially unacceptable environmental risks that may be associated with the site and its future development.</p>
Site Description	<p>The survey area or 'site' comprises a DAERA Portal Office and adjacent, largely disused open Larne Port owned lands measuring approximately 3.0 hectares which are located to the north of Redlands Road, at Larne Harbour, Larne.</p> <p>Site activities include livestock inspections and diesel fuel dispensing at the DAERA site and some storage of materials at the adjacent port owned lands.</p>
Site History	<p>A review of available historical mapping and previous reporting noted that the site was reclaimed from estuarine mud flats in 1913 when an aluminium works to the north was established. The site and surrounding area to the north and west was used as iron oxide ponds and tipping and storage of other wastes from the works until it ceased production in c.1950. Tipping of refuse wastes by the local council is also known to have occurred at the site in the 1960s. Larne Port bought the lands in 1966 and proceeded to infill the remaining ponds with demolition and dredged wastes until 2004 when filling capacity was met. There is also potential for other industrial wastes to have been received at the site. More recent uses have included a transport depot, garage and a department of agriculture livestock inspection site (current DAERA site) established c. 1960.</p> <p>A railway line and lands to the north and east were developed in the mid-1800s. Development at Larne Harbour to the east occurred from the early to mid-1900s.</p>
Environmental Setting	<p>Consultation with the Geological Survey of Northern Ireland (GSNI) suggests the site is likely to be underlain by raised beach deposits in the east and void of superficial deposits over the rest of the site. The drift geology map of Larne (Sheet 21) shows marine and estuarine deposits to be present consisting of estuarial clay overlying silt with peat lenses. These deposits are underlain by glacial till material.</p> <p>These superficial deposits are anticipated to be underlain by the Mercia Mudstone Group of Argillaceous rock, which is classed as having poor productivity through fracture flow.</p> <p>The overall topography of the site is relatively flat; however, the DAERA site has a slight fall in gradient towards the front (south) of the site and the adjacent site area has a split level; with a rise of c.1m in the northern lands along the east west boundary. A slight rise c.0.5-1m of gradient from west to east is also present at the front (southern) section.</p> <p>Larne Lough is situated approximately 110m to the south of the site.</p>
Preliminary Risk Assessment	<p>Following completion of the Desk Top Study and Preliminary Risk Assessment several potential pollutant linkages have been identified at the site, which are detailed at Section 3.0 of the report and are summarised as follows:</p>



	<ul style="list-style-type: none"> • Potential shallow soil and groundwater contamination associated within the current and historical storage of fuels and oils on-site presenting a risk to both the future development and local environmental receptors. • Potentially reduced quality made ground / infilled ground associated with the historical industrial site use and current site development, presenting a potential risk to both future development and local environmental receptors. • Potential ground gas generation from made ground / infilled ground associated with the historical industrial site use, current site developments and natural underlying superficial deposits potentially presenting a risk to future development. • Potential offsite sources of contamination were identified which could present a low risk to the site via onsite shallow groundwater migration.
<p>Conclusion</p>	<p>Consequently, an intrusive investigation and supporting Generic Quantitative Risk Assessment undertaken in line with applicable guidance e.g. CLR11 Model Procedures for the Management of Land Contamination is recommended to further investigate the identified potential pollutant linkages. A recommended scope for the intrusive investigation is provided at Section 4.0 of this report.</p>
<p><i>This sheet is intended to provide a summary only of the initial assessment study of the site in relation to contamination. It does not provide a definitive engineering analysis</i></p>	



1.0 Introduction

1.1 Instruction

WYG Environmental Planning Transport Ltd (WYG) was instructed by Construction & Procurement Delivery (CPD) on behalf of Department of Agriculture Environment and Rural Affairs (DAERA) to undertake a land contamination Preliminary Risk Assessment at lands at Larne Harbour, Larne, Co. Antrim.

1.2 Brief

The work brief was to complete a desk top study and preliminary contaminated risk assessment with a walkover survey of the above referenced property.

General information on the topography, geology, hydrology and hydrogeology and a review of current and historic usage was to be completed to enable potential human and environmental receptors, potential pathways and potential sources to be identified. This would enable a qualitative Preliminary Risk Assessment to be undertaken.

The objective of the scope of works agreed was to identify any potentially unacceptable environmental risk that may be associated with the site and its future development. The proposed plan is for a Point of Entry harbour customs facility with separate Product and Livestock Inspection facilities. The current DAERA Livestock Inspection Facility is to be extended to include additional inspection facility buildings for equine, livestock, small animals, other commercial transport animals and a separate product inspection facility with offices and welfare facilities at both plus associated access road and parking for HGVs (heavy goods vehicles) and standard vehicles. It is proposed to adjust the existing access to the development site to provide a separate entrance to the products inspection facility.

The Proposed Development Plan is presented in Figure 3.

1.3 Legal Context

Part III of the Waste and Contaminated Land (Northern Ireland) Order 1997, the enactment of which is pending, outlines the regulatory regime under which land and water contamination issues in Northern Ireland are assessed and managed. The Order defines contaminated land as:

“any land which appears to a district council in whose district it is situated to be in such a condition, by reason of substances in, on or under the land, that:

- Significant harm is being caused, or there is a significant possibility of such harm being caused; or
- Pollution of waterways or underground strata is being, or is likely to be, caused.”

Inherent in this definition is the requirement for contamination risk assessment to be undertaken on a site-specific basis, as the potential for harm is determined by the site's end use and its specific environmental setting.

1.3.1 Pollutant Linkage Concept

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

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

Each of these elements can exist independently, but they create a risk only where they are linked together, so that a particular contaminant affects a particular receptor through a particular pathway. This kind of linked combination of contaminant–pathway–receptor is described as a **pollutant linkage**.

1.3.2 Conceptual Model

An important thread throughout the overall process of risk assessment is the need to formulate and develop a **conceptual model** for the site, which supports the identification and assessment of pollutant linkages. A conceptual model represents the characteristics of the site in diagrammatic or written form that shows the possible relationships between contaminants, pathways and receptors (pollutant linkages).

1.4 Terms and Conditions

Attention is drawn to the report conditions, included in Appendix A, and the terms and conditions of the engagement as detailed in our accepted proposal.

2.0 Preliminary Risk Assessment (PRA)

An environmental desk study and PRA comprises the gathering of all available relevant documentation relating to the site. The review of identified literature ensures that an initial site-specific conceptual model can be developed which allows for the identification of potential pollutant linkages relevant to the site and the proposed end use.

In order to develop an outline conceptual model and identify plausible pollutant linkages at the site, the following was undertaken:

- A review of current and historical Ordnance Survey maps;
- A review of geological and hydrogeological maps;
- Undertake and record a site visit and walkover (where access is available) including making reference to readily available local information;
- A search of the WYG well / borehole inventory to determine any groundwater abstractions;
- Identification and description of the nearest surface water bodies;
- Collation of any additional data held by the Local Authorities or the Northern Ireland Environment Agency (NIEA) including available contaminated land information;
- Present a preliminary conceptual site model and qualitative risk assessment to determine potential environmental liabilities associated with the site.

2.1 Site Details

2.1.1 Site Description

Grid Reference: D 41133 02067

The site, measuring approximately 3.0 hectares, is located at Larne Harbour, with Larne town centre located c.1km to the northwest. Larne Lough shore is approximately 110m to the south of the site at its closest point. A site location plan is included at Figure 1.

The site itself is currently occupied by DAERA Portal Office in the west and mainly open waste lands and storage buildings owned by Larne Port comprising the remaining site area.

The surrounding land-uses are outlined in Table 1 below.

Table 1 - Surrounding Land Use

Boundary	Description
North	The site is bounded to the north by roughly vegetated disused lands, AM Next day lorry delivery service warehouse and a railway line beyond this (c.100m northeast).
South	Redlands Road, P&O freight office and carparking, Larne Care Centre and Larne Harbour and Lough waters.
East	Coastguard Road, old warehousing, residential lands, car parking and Larne Harbour associated lands.
West	A number of commercial warehousing including Haldane & Fisher, row of varying commercial units, McKenzie NI, scrap metal dealer, Circle K petrol filling station c.110m west and an Asda supermarket further west.

2.1.2 Site Walkover

A site walkover was undertaken by a suitably qualified environmental consultant on 14th August 2020. The aim of the survey was to determine the potential contamination sources and inspect ground conditions on site. This was undertaken by:

- Assessing the current site layout;
- Identifying any potential contamination sources on and off site; and,
- Identifying any potential receptors off-site.

The key findings of the walkover are presented in Table 2 below while an annotated site plan is available at Figure 3.

Table 2 - Walkover Findings

Aspect	Description
Current Use of Site	<p>The majority of the site is largely disused, port owned land, with some storage areas. The western rectangular parcel of lands is occupied by DAERA Portal Office.</p> <p>The DAERA site houses an office building with storerooms and an external inspection gantry to the side, at the front of the site and a lairage for livestock containment to the rear with disused offices adjacent, and a straw pen in the northeast corner. Used straw is usually left to rot in the northwest corner of the site that has dense</p>



Aspect	Description
	<p>wild vegetation present. The lairage is washed down weekly and wetted down prior to animals arriving and washed down after they leave. There is a pump and compressor in a room within the lairage for the power hose.</p> <p>A bin store contained in a small concrete building is present at the western site boundary. Two containers are present on site owned by the Rivers Agency and used for storage. A portacabin houses DAERA paperwork.</p> <p>The UST (underground storage tank) and AST (above ground storage tank) present are discussed in the drainage and tanks sections respectively.</p> <p>The adjacent port owned section of the site to the east is divided into three sections, one adjacent to the DAERA site, housing the former lorry repairs garage in the west, and two areas to the north of this. All are largely open and disused.</p> <p>The remains of a lorry repairs garage is thought to have been last in use 7/8 years ago based on anecdotal information provided, and is currently in use as a storage warehouse containing sand bags and chairs. Inspection ramps, a concrete plinth with central drainage and a pump house for power washing remain present but not in use.</p> <p>A number of small stockpiles of gravel and demolition rubble are present in the section to the north of the former garage, along the western boundary. A raised bank is present along the eastern boundary of the northern section of the site. This was overgrown with dense vegetation with tipping of wire mesh, timber, metal and a tyre present.</p> <p>A number of large sea fenders, timber piles and remains of a drilling rig are stored at the northern boundary fencing of the middle section of the port owned land. An empty redundant rusted metal tank was also present in this area. No signs of leaks or spills were observed at it. Former water pipes and a hydrant remain present in this area. Tipped redundant empty old plastic oil tank and old IBC (Intermediate Bulk Containers) that appeared to be full of rainwater were present at the southern boundary of the middle section. No signs of leaks or spills of contaminative substances were observed.</p> <p>A small brick built redundant Electrical Sub-Station was present.</p>
Ground Cover	<p>The western DAERA site is largely concrete covered, in a good state of repair with minor marginal grass landscaping areas. The main site area is rough compacted gravel / former bitmac covered with minor concrete areas and the northern section is rough vegetation covered with peripheral trees and bushes present.</p>
Drainage	<p>The DAERA site is served via sub-surface drainage. Washings from the lairage enter sub-surface drainage channels through a number of grates and gullies in the lairage area at the front of it. Washings are gravity fed into an underground storage tank system at the</p>

Aspect	Description
	<p>western boundary of the site. The tank is thought to be c.3m deep and emptied on demand approximately once a year. It is covered by metal section covers.</p> <p>Signs of sub-surface drainage was observed over the rest of the port owned site with manholes and grates observed.</p>
Topography & Surrounding Lands	<p>The DAERA site has a slight fall in gradient towards the front (south) of the site.</p> <p>The rest of the site is relatively level with a split level; with a rise of c.1m in the northern land along the east west boundary to the rear of the garage site.</p> <p>A slight rise c.0.5-1m of gradient from west to east is also present at the front (southern) section of the site.</p>
Nearest surface water bodies	Larne Harbour and Lough shore is located 100m to the south of the site.
Signs of previous investigations	None noted during site walkover survey.
Site boundary	<p>The majority of the site boundary comprises wire mesh with concrete post fencing, metal wire fencing and a small section of palisade fencing with entrance gate into the port owned land along the front. Trees and bushes / shrubs also line the eastern boundary. The northern boundary is open being part way through the rough grass field.</p> <p>Internal wire mesh fencing divides the DAERA site from the adjacent port owned main site area and also divide the main site area into 3 sections: to the north, middle and south.</p>
Signs of vegetative stress	No obvious signs of vegetative stress were observed during the site walkover.
Evidence of contamination	<p>Moderate staining was observed on the concrete ground, at the diesel fuel tank and dispensing pump, housed in the metal container, at the front of the lairage to the rear of the DAERA site.</p> <p>Light to moderate staining was observed on one area of the concrete floor of the former lorry repairs garage.</p> <p>There is corrugated ACM sheeting present on the roof of the former garage in the port owned site and also on the DAERA lairage building roof.</p>
Evidence of geological features	No evidence of geological features were encountered during the site walkover.
Evidence of tanks currently on-site	A plastic bunded above ground diesel storage tank and pump are present within a metal container at the front of the lairage in the DAERA site. The container, tank and pump sit on the concrete ground that covers the site. The tank holds c.4,230L and was noted as being c.10 years old and filled via a fill point pipe with a

Aspect	Description
	bucket below to catch drips. There is staining on the ground at the tank and pump as noted in the 'Evidence of Contamination' section.
Evidence of tanks historically on-site and potential contamination.	Anecdotal information from site personnel noted that they knew of no USTs to have been present at the former garage site. Although no tanks are present now, it was likely that ASTs were present at the garage site when in operation and some staining was noted on the concrete floor of the former garage building. There may have been an oil tank adjacent to or within the adjacent pump house. A brick base is present external to the side of the garage which may have also housed a tank or boiler.
Surrounding present day contaminative land uses	A railway line is present c.120m to the rear (north) of the site.
Evidence of groundwater	None noted during site walkover.

Site walkover photographs are presented at Appendix B while an annotated site plan is available at Figure 3.

2.2 Site History

Information on the site's history of use was obtained through an inspection of available historical Ordnance Survey maps dating from 1834 to the present day. These historical maps were viewed on the PRONI (Public Records Office of Northern Ireland) Historical Maps web site ¹ and other online sources. Consequently, they are not available for reproduction. Table 3 provides a summary of this information from the historical maps.

Table 3 - Site History

OS Map	Description
1832-1846 PRONI / 1832 Centremaps 10000/10560	The site is located within the estuarine mudflats of Larne Lough with this land not having been reclaimed at this time. Peninsula lands bordering the east of the site are present, extending out to the south into Larne Lough. A roadway is also present bordering the east of the site, appearing to follow a similar path to the present-day Coastguard Road.
1846-1862	Little change has occurred from the previous epoch. A railway line is now present to the north of the site extending across the mudflats

¹ <https://apps2.spatialni.gov.uk/EduSocial/PRONIAApplication/index.html>

OS Map	Description
PRONI / 1857 Centremaps 10000/10560	generally from southeast to northwest and terminating at the coast c.250m east.
1905-1957 PRONI / 10000/10560	At this time the site is located in an area that is marked as Iron Oxide Ponds with these extending also into lands to the west of the site. A tramway runs close to the south of the site bordering the mudflats and Larne Lough. No other development is present over the site area. Increased development has occurred to the east of the site, bordering Coastguard Road with a hotel and what appears to be residential development present. Larne Harbour is marked c.250m east of the site and mudflats remain present c.170m west.
1957-1986 PRONI 10000/10560	A refuse tip is now marked as covering the east of the southern section of the site. Ponds are marked over the rest of the site area and 'Inverview' in the north of the site. The ponds extend further to the west and north of the site with further refuse tip also marked to the west beyond the ponds. The development to the east remains present with further factory and tank development present. Depots and factories are also present c.110m to the northeast, thought likely to be associated with the development of Larne Harbour. The tramway to the south is no longer marked. The railway lines to the north remain present.
August 2001 Google Earth Pro Aerial Imagery	The site appears to have a similar layout to the present day with what appear to be 2 no. additional smaller buildings in the north and some lorries / containers present in the south. No other significant changes are obvious.
May 2009 – December 2010 Google Earth Pro Aerial Imagery	There appears to be greater lorry / container storage in the southern section of the site. The buildings in the north are no longer present. All else remains similar to present day. The adjacent commercial units and warehousing to the west is now present.
July 2011 Google Earth Pro Aerial Imagery	There now appears to be less use of the site with few if any lorries / containers present and what appears to be some green vegetation appearing in the mid and northern areas of the site and some areas of possible tipping within these areas.
April 2012 Google Earth Pro Aerial Imagery	What appear to be tipped areas with darker material that is possibly gravels have become more extensive in the central area of the site. What appear to be a number of containers are present in the east of the southern section of the site.
May 2017 Google Earth Pro Aerial Imagery	The tipped central areas of the site appear to have been somewhat levelled off with gravel having possibly been spread over this area. Green vegetated areas remain in the northern section of the site. A row of long tubular appearing items are now present in the east of the southern section. It is unclear as to what these are.

OS Map	Description
May 2018 – Feb 2020 Google Earth Pro Aerial Imagery	The site appears in its current disused state throughout these more recent images apart from the tipped waste and gravel stockpiles in the west that appear to have increased from January 2019 on.

Anecdotal information from Larne Port personnel informed that the lorry repair garage was operational until c.7/8 years ago. It was also noted that a town tip was present in the area and an historical Aluminium Works was present in the northern area of the site up to the 1950s and a gas bottling works 'Airgas' had been present in the central site area up to the 1980's / 90's. Gas was shipped into Larne Port and pipes into the site.

Further information noted that the port owned section of the site bordering Redland Road was formerly occupied by McBurney's Transport and Fry Transport Lorry Parks up to around c.6 years ago. NI Transport occupied the site up to the 1980's.

The DAERA port office site is thought to have been in operation since the c.1960's.

2.3 Statutory Body Consultees

Information, held by a number of statutory bodies, was requested to help establish:

- Any known pollution incidents at the site
- Previous site usage
- Nearby watercourses and groundwater quality indicators
- Discharge or abstraction consents

Any other information or data, held by statutory bodies, which will aid in the production of a thorough environmental risk assessment (e.g. Information held on the NIEA Land Quality Database, or Northern Ireland Water's (NIW) Geographical Information System (GIS)). The following information was taken from direct consultation with a number of statutory bodies.

2.3.1 Northern Ireland Environment Agency (NIEA), Land Quality Database

The Northern Ireland Environment Agency Waste Management and Contaminated Land section hold a land quality database which contains information on known potential sources of contamination across Northern Ireland. Although by no means complete, the database can provide information on former and current land uses which may result in land contamination. The database search indicated the following:

Nine potentially contaminative land uses were identified from the online search, that are considered to pose a potential risk to the site, within a 300m radius of the site boundary, which are outlined in table 4 overleaf.

Table 4 - NIEA Land Use Database

Site ID	Co Ordinates(X,Y)	Distance	Description
LE070/025	341119, 402047	On-site – (In the south)	1834: Larne Lough 1856: Larne Lough 1904: Reclaimed Land 1930: Iron Oxide Ponds 1986 Paper Mill (Invercorn Paper Mills Ltd.) Description: Pulp and paper manufacturing works. Current Use: Further Reclamation Has Occurred
LE070/023	341322, 402071	c.95m East	1834: Agriculture 1856: Agriculture 1904: Waste Ground 1930: Waste Ground 1986 Petrol Station (McCartney Motors) Description: Road vehicle fuelling, service and repair: garages and filling stations
LE070/016	341375, 402260	c.128m East	1834: Agriculture 1856: Station 1904: Station 1930: Station 1986: Railway Station (Serving Ferry Terminal) IH History: Terminus site (at Larne Harbour) Area of Site >10,000m ² Description: Railway Land
06780:034:00	341400, 402250	c.156m East	IH History: Terminus site (at Larne Harbour) Area of Site >10,000m ² Description: Dockyards and docklands
05604:000:00	341400, 401980	c.164m East	Description: Dockyards and dockland IH History: Larne Harbour Site
LE070/067	341331, 402388	c.193m Northeast	1834: Agriculture 1856: Railway Land 1904: Railway Land 1930: Railway Land 1986: Depot (Haulage Yard) Area of Site >10,000m ² Description: Railway Land

Site ID	Co Ordinates(X,Y)	Distance	Description
LE070/022	341193, 401786	c.207m South	1834: Fort 1856: Fort 1904: Shipbuilding Yard 1930: Docks 1986: Depot (Haulage Yard) IH History: Shipbuilding Yard Area of Site >10,000m2 Description: Dockyards and dockland
05603:000:0 0	341280, 402480	c.242m North	Description: Metal manufacturing, refining and finishing works: non-ferrous metals works (excluding lead works) IH History: Aluminium Works
LE070/024	341491, 402356	c.255m northeast	1834: Agriculture 1856: Agriculture 1904: Harbour Complex 1930: Aluminium Works 1986: Engineering Works (S.T.C. Ltd) Area of Site 1000-5000m2 Description: Engineering Works: mechanical engineering and ordnance works

The potentially contaminative land uses identified above are discussed further at Section 3.1.3 below.

2.3.2 Northern Ireland Environment Agency (NIEA), Water Management Unit

NIEA Water Management unit were contacted with regard to site-specific details on pollution incidents, contaminated land, Industry Pollution (IPC) consents, pollution related complaints and noise and air quality within 500m of the site. Their response confirmed there are no groundwater monitoring points within a 500m radius of the site. The following information is available on consultation with the NIEA online Water Information Viewer²:

Surface Freshwater Quality

Larne Lough North, Coastal Water Body, located c.110m south of the site at its closest point, was given a status in 2015 of Moderate Ecological Potential (MEP) with a target for Good Ecological Potential (GEP) for 2021 and 2027.

The WFD Lakes and Coastal Status 2018 designated Larne Lough North with a MEP and GEP target for 2021 and 2027.

² <https://apps.d.aera-ni.gov.uk/WaterInformationRequest/>

Abstractions

A review of the NIEA WMU abstraction locations confirmed there are no recorded abstraction licences within a 500m radius of the site.

Pollution Incidents

Consultation with the NIEA online WMN Water Information Request Viewer confirms that there are two recorded pollution incidents c.362m east of the site that occurred in 2017 sourcing from Industry with severities of low and medium. These appear to have occurred at Larne Harbour shoreline to the east of the site and as such aren't likely to have impacted the site.

Consented Industrial Discharges

A review of the NIEA WMU revealed three industrial consents within the 500m search radius of the site:

- *Station No.76533 - Site Drainage: Unspecified – 158m west*
- *Station No.65015 - Site Drainage: Unspecified – 336m southwest*
- *Station No.62235 - Site Drainage: Unspecified – 495m west*

2.3.3 Industrial Pollution and Radiochemical Inspectorate/ Waste Licences and Waste Licence Exemptions

The Northern Ireland Environment Agency holds a database which contains information on known Pollution Prevention and Control Installations³ and Waste Licence/ Waste licence exemptions⁴.

Consultation with this information revealed there are two Pollution Prevention and Control Installations within a 500m radius of the site. Details are as follows:

- *IPPC Number: P0317/09A, held by Northern Ireland Water, at Larne WWTW, 4a Coastguard Road, Larne, BT40 1AX for sludge waste.*
- *IPPC Number: PO542/16A – McKenzies Aluminium Ltd, 8 Redlands Crescent, Larne.*

The database search also indicated that a number of Waste Licence Exemptions are held in the area. Details are as follows:

- *Ref ID: WMEX 36/37 - AM Transport Services Limited / AM Next Day – Bounds the site to the northwest – license exemptions are now expired – Were previously for*

³<https://webservices.spatialni.gov.uk/arcgis/rest/services/NIEA/IndustrialPollutionAndRadiochemicalInspectorate/MapServer>

⁴<https://webservices.spatialni.gov.uk/arcgis/rest/services/NIEA/WasteSiteLicenseExemptionsAndSites/MapServer>

discarded electrical and electronic equipment and fluorescent tubes and other mercury containing waste.

- Ref ID: WML 36/05 - McKenzie NI Ltd – located c.55m west of the site has an existing waste licence exemption for discarding electrical and electronic equipment, metals, waste metals, slag, alumina and numerous other waste metals.
- Ref ID: WMEX 17/60 - McKenzie NI Ltd. - have an expired waste licence exemption located to the west of the DAERA site, for a list of materials including CFC's, a range of metals and batteries.

2.3.4 Mid and East Antrim Borough Council

Mid and East Antrim Borough Council's Environmental Health Department were contacted with regard to site-specific details on pollution incidents, contaminated land, Industry Pollution (IPC) consents, pollution related complaints and noise and air quality. The Council response is summarised as below: -

- Pollution Incidents (Within 500m) - An Odour and fume complaint was received between 2014-2019. No further information given. Noted as being rectified at time of complaint.
- Contaminated Land – The council noted that there has been obvious previous development within the enquiry site and so site investigation will be required to investigate any sources of contamination.
- PPC Consents – 1 No. Part C Permitted Installation - Permit ID – PL11, Topaz Larne Service Station, Redlands Road, Filling Station. For the unloading of petrol into stationary storage tanks at a service station.
- Air Quality

The site doesn't fall within any Air Quality Management Areas (AQMA).

The site does not fall within a Smoke Control Area.

NO2 diffusion tube monitoring sites are located within the enquiry site.

- LDT06 (Roadside) located at 341246, 401970 recorded 13.2ug/m3 in 2019
- LDT07 (background) located at 341274, 401767 recorded 9.2ug/m3 in 2019
- No noise monitoring is undertaken at the site.
- No Private Water Supplies are located within 1500m of the site.

- Waste / Landfill Sites – The council notes that in preparing the information, the department is currently unable to confirm the location of any historic landfilled areas in the vicinity of the site.

Statutory Body responses are available at Appendix C.

2.4 Utility Responses

2.4.1 British Telecom

British Telecom (BT) was contacted in an effort to determine infrastructure on site and in the immediate site vicinity. Their response confirmed that there is BT infrastructure recorded entering the site at two points from the eastern boundary at the lower (southern) section of the site and the upper (northern) section of the site. It is also shown to enter the DAERA site office building from Redland Road to the south. Cables and junction boxes are present along Redland Road to the south and Coastguard Road to the east.

2.4.2 NIE

NIE was contacted in an effort to determine infrastructure on site and in the immediate site vicinity. NIE records indicate infrastructure within the site and the site vicinity. A double 11kV cable passes through the north of the site from east to west and also passes along Coastguard Road bordering the east. An LV cable passes from Redlands Road through the site to serve the former lorry garage and another cable also passes along the eastern boundary of the site, entering and terminating in the northern section.

2.4.3 Phoenix Natural Gas & Firmus Energy

Phoenix Natural Gas was contacted in an effort to determine existing infrastructure on site and in the immediate vicinity. Their response had not been received at time of reporting.

Firmus Energy does not have any infrastructure at the site or in the vicinity of the site.

Utility responses are available at Appendix D.

2.5 Geology

Details of the geology underlying the site have been obtained from the following sources:

- Geology maps of Northern Ireland, produced by the Geological Survey of Northern Ireland (GSNI);
- Mitchell, W.I. (2004). The Geology of Northern Ireland. HMSO, Belfast;
- The GSNI Website "http://mapapps2.bgs.ac.uk/GSNI_Geoindex/home.html".

- The Hydrogeological Map of Northern Ireland, produced by the DoE Environment and Heritage Service and the British Geological Society;
- A database of known groundwater abstractions held by WYG; and,
- Current and Historical O.S. maps.

2.5.1 **Made Ground**

Made ground is anticipated to be present across the area of the site, the nature and extent of which remains unknown.

Information gained from the previous WYG PRA 2009 report (See Section 2.8) states that: -

Following land reclamation, historical mapping shows the site to have been occupied by iron oxide ponds since the early 1900s with refuse tipping in the east also marked in the mid to late 1900s and further infilling follow this of construction and dredged wastes by the Port of Larne up to 2004.

It is known that up to approximately 5.0m of fill material, of unknown quality, has been used to raise the level of the site during the different phases of development. In WYG's experience, the general fill material known to have been deposited on the site has the potential to contain varying quantities of reworked natural soil, demolition rubble, asbestos, ash, tar and other potentially contaminated materials.

A site investigation undertaken by WYG in 2009, located c.40m west of the site, comprising 4 no. boreholes identified made ground to depths ranging from 1.8m to 3.0mbgl. This made ground comprised varying components of clays, gravels and sands with ash, coal, coke/clinker encountered at one of these boreholes.

2.5.2 **Superficial Geology**

Available geological mapping and the GSNI online GeoIndex shows the superficial geology underlying the extreme east of the site is likely to be composed of raised beach deposits of gravel, sand and silt. The rest of the site is not mapped. Raised marine deposits are mapped close to the northern boundary comprising clay, silt and sand.

The drift geology map of Larne (Drift Geology, 1:50,000 Sheet 21) indicates that the overburden consists mainly of marine and estuarine deposits. These marine and estuarine deposits (tidal mud flat deposits) consist of estuarial clay overlying silt with peat lenses. These deposits are underlain by glacial till material.

A site investigation undertaken by WYG in 2009, located c.40m west of the site, comprising 4 no. boreholes identified superficial deposits underlying the made ground to comprise loose red slightly sandy clayey gravel to 6m at BH01; firm slightly sandy gravel and very soft to soft red

slightly sandy clay to 6m at BH02; firm becoming soft red slightly sandy clay to 6m at BH03 and very soft red slightly sandy slightly gravelly clay to 5.6m and soft grey organic sandy silt with shell fragments (Sleech) to 6.0m at BH06.

Information gained from the previous WYG PRA 2009 report (See Section 2.8) states that: -

A Glover SI undertaken at the Redland Estate in 1994 identified ground make up thicknesses as follows: -

- Fill Material – 2.3 - 4.8m
- Estuarine Deposits 0.9 – 13m+
- Glacial Till 1.6-7.5m+
- Keuper Marl 2.1m+

2.5.3 Solid Geology

Consultation with the GSNI online Geindex revealed that the superficial deposits are likely to be underlain by the Mercia Mudstone Group of Argillaceous Rock.

2.6 Hydrogeology

2.6.1 Groundwater Classification

According to the British Geological Society Geindex site, the site has a bedrock aquifer classification of Bp(f). The bedrock is classed as of poor potential productivity through fracture flow. Small supplies may be possible, but strata are rarely exploited. Negligible regional flow and limited local flows are likely.

Superficial aquifers may be present in the east of the site, close to the eastern boundary associated with the raised beach deposits.

2.6.2 Groundwater Vulnerability

The GSNI Geindex web site indicates the vulnerability of groundwater within the uppermost aquifer and is the standard classification currently used for assessing activities which may impact on groundwater resources. Vulnerability has been primarily determined based upon the assumed permeability and thickness of geological deposits overlying the strata containing the upper, significant water table. Where these deposits are absent, the depth to water table can influence the vulnerability class. Five classes of vulnerability have been mapped as shown in the following table.



Table 5 - Groundwater Vulnerability

Highest				Lowest
Five	Four	Three	Two	One

Class 4 can be further subdivided according to the nature of the pathway:

- 4a — sand and gravel cover (non-aquifer)
- 4b — moderate permeability cover
- 4c — low permeability cover
- 4d — thin soil over bedrock
- **4e — where superficial aquifers are present**

The GSNI website shows that groundwater vulnerability at the site is considered to be category 4e (high vulnerability) in the far east of the site associated with the superficial aquifer present. The rest of the site is classified as category 5 (highest vulnerability) in the area shown in GSNI mapping to be void of superficial deposits.

2.6.3 Groundwater Flow

Groundwater flow within the site area can only be calculated on a site-specific basis, however based upon the site, and surrounding topography, it is anticipated that groundwater flow may be in a broadly south-westerly direction.

2.7 Hydrology

2.7.1 Watercourses

The nearest observable surface waterbody is Larne Lough North situated approximately 110m to the south of the site at its closest point and c.280m to the east.

2.7.2 Flood Risk

Consultation Flood Maps NI’s: Flood Hazard and Risk Map NI, shows no river water (fluvial) or sea (tidal) flooding to be present at the site. Present day surface water flooding extent mapping shows small minor areas to be present in the west (DAERA site) and close to the northern boundary of the site with a flood risk of 3.33% AEP (1 in 30 chance or greater in any given year) with no damage value recorded.

No historical flooding events have been recorded at the site or in the vicinity of the site. Flood mapping is included at Appendix C.

2.7.3 Surface Water Drainage

Surface cover at the site varies, with hardstanding across the DAERA port inspection site and in areas of the port owned site surrounding the former garage, being served by a sub-surface drainage network. It is therefore assumed that water/rainwater in these areas is managed by the local municipal storm/foul sewer network. However, surface waters in the vegetated northern areas and large gravel covered areas of the site will percolate and infiltrate into sub-surface soils.

2.8 Summary of Previous Reports

2.8.1 Previous WYG Report – Preliminary Risk Assessment – Phase 1 Contamination Desk Study, Redland Estate, Port of Larne, January 2006, Report No. A027680

A preliminary Risk Assessment (PRA) was undertaken in 2006 for the development of the whole Redlands Estate area which incorporates the site area in its southeast corner. A summary of the findings of this report, in relation to the current study site, are presented as follows.

Site History & Ground Conditions

Historically the Redlands Estate area stretching from the lagoon pond to the west to Coastguard Road to the east. It was originally Larne Lough mudflats reclaimed for use as iron oxide ponds for an aluminium works. The North British Aluminium Company was established on lands to the north of the Redlands Estate in 1913 and used the Redlands Estate for disposal of its by-products. These by-products included solid clinker and ash from furnaces and sandy waste from the bauxite milling process, and also 'red mud' iron oxides and other residential metals. The Redlands settlement ponds were created in the east of the site (at the subject site) soon after the works was established to store these by-products. It was also noted from the Bovis Report (1994) that other local industries used the remaining mudflat areas (west of the subject site) for effluent discharge including gas works, dye works, paper mill and public sewage works. In 1941 the settlement ponds were extended to the west for increased aluminium production. It is understood the factory closed in c.1950.

After this time the resulting red mud sediment was extracted for use by the British Portland Cement Company in concrete production up to 1973, leaving a network of banded depressions across the whole Redlands Estate area. Over time, these voids have been infilled with a combination of domestic refuse, demolition wastes, dredged materials from the harbour and possibly industrial materials from local industries such as gas works.

The Bovis report (1994) estimated a remaining thickness of red muds of 3.0m bgl in the east of the site (at the subject site) however Glover SI identified depths of 1.4m-2.5m in the east.

Domestic waste tipping in the southeast (the subject site) is noted by Larne Borough Council as having been filled and covered by the 1965 survey. Further filling at the site between 1966 and 1968 is thought to comprise dredging and demolition wastes.

The Port of Larne bought the site from 1966 and filled the remaining ponds with construction waste and dredged materials from the harbour until 2004 when capacity was reached and current ground levels established. The previous refuse tip areas were also capped.

Port of Larne then leased the site area to Northern Ireland Carriers Depot for parking and storage of trailer with a workshop for vehicle servicing also present and a large above ground unbunded oil storage tanks present. The Department of Agriculture constructed a livestock inspection site (current DAERA site) in the late 1960s to the west of the carrier depot.

Groundwater was encountered during previous investigations at depths ranging between 1.0m and 2.1m bgl.

Ground gas was considered potentially present in the southeast (subject site area) and west due to decomposition of domestic waste and also from potential peat deposits within the superficial alluvium.

Conclusion & Recommendations

This PRA identified several potential pollutant linkages that will require further investigation and risk assessment prior to future site development. The site was classified as being a Moderate to High risk. Pollutant linkages relate to interaction between construction workers/site end users and near surface contamination in the made ground and shallow groundwater, potential migration of gas from domestic refuse fill and natural peat deposits to buildings and migration of contaminated groundwater to Larne Lough.

It was recommended that a detailed contamination investigation was undertaken in line with CLR 11 prior to proceeding with redevelopment of the site. The investigation should be designed to address the uncertainties in the preliminary conceptual model undertaken as part of this report.

2.8.2 Previous WYG Report – Preliminary and Generic Quantitative Risk Assessment – Unit 5, Port of Larne Park, Redland Road, Larne, June 2009, Report No. A054474-2

A Preliminary and Generic Quantitative Risk Assessment (GQRA) was undertaken for the redevelopment of a small parcel of land located (0.35 ha) c.40m to the west of the subject

site. The following summarises the findings of this report. Geological information gained has been used in Section 2.5 of this report.

Site Works Undertaken and Findings

A total of 4 no. boreholes were drilled to a maximum depth of 6m with all installed for further groundwater and gas monitoring. A total of 11 no. soil samples and 3 no. groundwater samples were retrieved for further analysis of a wide range of organic and inorganic parameters. A total of 4 no. ground gas monitoring rounds were undertaken.

The soil samples were analysed for metals, organics, speciated polycyclic aromatic hydrocarbons (PAH), speciated total petroleum hydrocarbons (TPH), phenol, BTEX/MTBE, VOCs, SVOCs, inorganics and asbestos. They were screened against commercial TSVs. They did not identify any elevated contaminants in relation to the proposed commercial development. However elevated concentrations of a number of metals were identified; iron (concentrations ranging from 37,000 to 310,000mg/kg), titanium (concentrations ranging from 530 to 20,000mg/kg) and aluminium (concentrations ranging from 31,000 to 66,000mg/kg) were recorded.

Groundwater samples retrieved from BH1, BH2 and BH4 were analysed for metals, organics, speciated polycyclic aromatic hydrocarbons (PAH), speciated total petroleum hydrocarbons (TPH), phenols, BTEX/MTBE, VOCs, SVOCs and inorganics. Elevated PAHs (most significantly fluoranthene) were recorded. Leachate analysis carried out on BH4, 1.0m soil sample measured potential phenol concentrations (total phenol <370ug/l).

Ground gas monitoring undertaken identified elevated gas concentrations at BH01 (max. 8.3% carbon dioxide) and BH04 (max. 18.5% methane and 3.0% carbon dioxide) thought to be associated with the made ground identified at both and sleasech at BH04. A resulting classification of Characteristic Situation 2 (CS2) according to CIRIA C665 and Wilson and Card methodologies was identified at the site. It was recommended that gas protection measures be implemented into the proposed development.

Ground gas monitoring undertaken identified elevated gas concentrations at BH01 (max. 8.3% carbon dioxide) and BH04 (max. 18.5% methane and 3.0% carbon dioxide) thought to be associated with the made ground identified at both and sleasech at BH04. A resulting classification of Characteristic Situation 2 (CS2) according to CIRIA C665 and Wilson and Card methodologies was identified at the site.

Conclusion and Recommendations

Due to the site being proposed as a commercial development and largely covered with building and hard standing, pollutant linkages were mitigated through this ground encapsulation.



Elevated Metals in Soils

It was recommended that any proposed future areas of soft landscaping at the site be encapsulated with 100mm of clean material to sever pollutant linkages and prevent direct contact between source and receptors i.e. contaminated soils and human health.

It was also recommended that a waste classification be carried out, if any soils are to be excavated at the site, in line with appropriate guidance and legislation.

Elevated Ground Gas

It was recommended that gas protection measures be implemented into the proposed development in line with CIRIA C665, Wilson and Card site classification as Characteristic Situation 2.

Proposed Piling Works

Consideration was recommended to be given to the EA guidance document 'Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination: Guidance on Pollution Prevention' National Groundwater & Contaminated Land Centre Report NC/99/73, 2001, with regard to proposed piling works at the site.

3.0 Preliminary Conceptual Model

For a risk of pollution or environmental harm to occur as a result of ground contamination, all of the following elements must be present:

- A source, i.e. a substance that is capable of causing pollution or harm;
- A receptor (or target), i.e. something which could be adversely affected by the contaminant; and
- A pathway, i.e. a route by which the contaminant can reach the receptor.

If one of these elements is missing, there can be no significant risk. If all are present then the magnitude of the risk is a function of the magnitude and mobility of the source, the sensitivity of the receptor and the nature of the migration pathway.

A detailed conceptual model of the site is developed in this section to identify sources, pathways and receptors and thus identify plausible pollutant linkages.

3.1 Potential Contamination Sources

3.1.1 Current Land Use

The site currently comprises of an operation DAERA Port Inspection Facility that adjoins a large area of mainly open gravel covered disused ground. The former lorry repairs garage infrastructure remains present.

One large diesel oil tank and pump, c.10 years old, is present within a metal container, at the DAERA site to the front of the lairage building, with moderate staining observed on the concrete ground by the pump and tanks.

Staining was also noted on the concrete floor of the former lorry repairs garage to the east.

It is therefore anticipated that there is the potential for spills and leaks to have resulted from the storage of fuels and oils, potentially impacting shallow soils and groundwater in these areas.

3.1.2 Historic Land Use

A review of historical mapping and past reports undertaken indicate the site has undergone significant development from its original state as mud flats bordering the north of Larne Lough. This has included its use as waste by-products storage and iron oxide settlement ponds by the aluminium company at the start of the 1900s until c.1950 and significant domestic waste tipping in the east of the site in the 1960s. Further infilling of ponded areas with construction rubble and dredged materials by the Port of Larne was undertaken from 1966 to 2004 when

capacity was reached. There is also the potential for industrial wastes from local industries such as gas works to have been tipped into the ponds during the sites history. Depths of remaining infilled material as noted as being up to 5m. Anecdotal information from Larne Port personal also noted that a gas bottling plant 'Airgas' had been present at the site up to the c.1980's/90's. The NIEA land use data base also identified a pulp and paper manufacturing works to be present in the south of the site (Invercorn Paper Mill) in 1986.

As such there is the potential for a wide varied of organic and inorganic contaminants to be present in the ground at the site and to impacted shallow soils and groundwater; specifically, metals and hydrocarbons associated with the historic infilling.

The following 'DoE Industry Profile (1995) should be consulted for full details on contaminants associated with the historical industrial works and practices undertaken at the site: -

- Metal manufacturing refining and finishing works non-ferrous metals works (excluding lead works)
- Waste recycling, treatment and disposal sites – landfills and other waste treatment or waste disposal sites.
- Animal and animal processing works.

There is also the potential for ground gas to be present at the site sourcing from the decomposition of domestic refuse tipping and from the superficial deposits of estuarine alluvium (sleech) and possible peat present underlying the site.

More recent usage of the site as lorry transport depots with an associated repairs garage work shop, with historically noted large oil tank present, also has the potential for spills and leaks to have resulted from the storage of fuels and oils, potentially impacting shallow soils and groundwater, mainly in the area of this garage.

3.1.3 **Adjacent Land Use**

The subject site is set within the larger former Redland Estate and as such the iron oxide ponds and associated aluminium works by-products dumping and other infilling including refuse tipping, as mentioned above, also occurring over a large area bordering the west and north of the site. As such there is the potential for impacted groundwater with a wide range of organic and inorganic contaminated, associated with the historical infilling, to migrate and impact the site. These land uses also present a potentially significant source for ground gas generation which could pose a risk via lateral migration.

Presently the surrounding area houses commercial and light industrial land use. No significantly contaminative industrial land use is noted in the surrounding area.

Railway lands are present c.100m northeast at their closest point with a terminus station site present at Larne Harbour c.130m east. A petrol filling station is present c.110m west of the site. The historical aluminium works was present c.250m north of the site. Larne Harbour and associated industries depots, tanks and factories were historically located c.250m east and c.110m northeast of the site. A tramway historically ran close to the south of the site up to the mid-1900s. A petrol station is located c.95m east. A ship building yard and more recent haulage yard is present at the docks c.>200m south of the site.

It is considered that the industries and land uses surrounding the site to the west, south and east are located down hydraulic gradient and at some distance from the site and as such are not likely to pose a risk to the site. The historical aluminium works and associated lands and railway lands north of the site, may pose a risk to the site through reduced quality groundwater migration on site. The 'DoE Industry Profile (1995) for railway land should be additionally consulted for full details on contaminants associated with this off-site land use along with that previously stated for the metal works.

3.2 Risk Pathways

Pathways are the means by which a contaminant can reach a receptor. Active pathways are primarily dependent on the physical characteristics of the site and the surrounding area between source and receptor.

The nature of the site surface affects the potential for surface waters to infiltrate and penetrate the subsurface. The potential for infiltration will in turn affect the potential for leachate generation from potentially impacted vadose (unsaturated) zone soils.

WYG has been provided with proposed development plans for the site (See Figure 3). It is understood this report is to facilitate the development of a Point of Entry NI Inspection Facility with a number of proposed inspection buildings, 2 no. office blocks and welfare facilities and associated roadways and parking. Ground cover across the site appears entirely hardstanding surrounding the proposed buildings. As such, no significant risk is posed to future site users through the direct exposure pathways, from potentially contaminated shallow soils / made ground and ground water (if present) at the site. If soft landscaping areas are proposed, however it will require revision.

There is the potential for the presence of reduced quality made ground / infilled materials, which may pose a risk primarily to construction workers via direct (dermal contact, ingestion and inhalation of fugitive dusts) contact pathways. Indirect exposure pathways (vapour ingress) may also be applicable for those contaminant types which present a potential risk via this pathway e.g. lighter end hydrocarbons associated with fuel and/or chemical storage.



Infilled materials and natural sub-soils also have the potential to act as a source for ground gas dependant on nature and extent of materials. Exposure to ground gas can be via service entries to buildings and confined spaces or voids beneath.

In regard to water receptors, geological mapping from the GSNI has identified that the site is located in an area that may be underlain by superficial aquifers in the east. The anticipated superficial deposits, considered to be composed of raised beach deposits in the east of the site, comprising gravel, sand and silt, with underlying estuarine clay alluvium across the site, with silt and peat lenses and glacial tills, in turn, underlying this. The alluvial but to a greater extent the glacial deposits, where present, may be capable of affording some retardation to lateral and vertical groundwater movement, offering some protection to the anticipated underlying Mercia Mudstone bedrock aquifer. The higher groundwater vulnerability rating of 4e in the east of the site is associated with the raised beach deposits and potential for contaminant migration within superficial aquifers.

Larne Lough is situated approximately 110m to the south of the site at its nearest point and is considered to be a potentially sensitive receptor via offsite shallow groundwater/groundwater migration.

The key environmental pathways and exposure routes by which potentially contaminative substances can reach receptors are considered to be:

Direct

- Dermal contact
- Ingestion
- Inhalation of fugitive dusts
- Inhalation of vapours

Indirect

- Leaching of potential contaminants from soil to groundwater;
- Offsite migration, local surface waters;
- Vapour migration associated with the potential presence of volatile contaminants in soils and/or groundwater; and
- Ground gas generation potentially impacting future development and site users.

3.3 Receptors

Receptors are defined by their potential for being adversely affected by a contaminant and can be grouped into those that impact human health, and those that affect environmental targets, including controlled waters and sensitive ecological sites.

Following completion of the Desk Top Study and Preliminary Risk Assessment the human health receptors identified are:

- Future site users
- Construction workers.

Environmental receptors identified include:

- Shallow groundwater
- Bedrock Aquifer (Mercia Mudstone)
- Local surface waters – Larne Lough

3.4 Conceptual Site Model

Following completion of the Desk Top Study and Preliminary Risk Assessment several potential pollutant linkages have been identified at the site, which are summarised in Table 6 below.

Table 6 - Conceptual Site Model

On-site Contaminant	Pathway	Receptor
Current and historical on-site storage of fuels and oils associated with site activities as a DAERA Portal Office & the former adjacent lorry repair garage.	<ul style="list-style-type: none"> ➤ Dermal contact ➤ Ingestion ➤ Inhalation of fugitive dusts ➤ Inhalation of vapours 	<ul style="list-style-type: none"> ➤ Future site users ➤ Construction workers
	<ul style="list-style-type: none"> ➤ Migration through soils and leaching to shallow/deeper ground water and off-site migration. 	<ul style="list-style-type: none"> ➤ On-site and off-site shallow/deep groundwater ➤ Local surface waters –Larne Lough
	<ul style="list-style-type: none"> ➤ Dermal contact ➤ Ingestion ➤ Inhalation of fugitive dusts ➤ Inhalation of vapours 	<ul style="list-style-type: none"> ➤ Future site users ➤ Construction workers

On-site Contaminant	Pathway	Receptor
<p>Potentially reduced quality made ground / infilled materials (potentially containing a range of organic/inorganic contaminants including asbestos containing materials and/or fibres, refuse wastes and red muds / iron oxides) associated with the industrial history of the site.</p>	<ul style="list-style-type: none"> ➤ Migration through soils and leaching to shallow/deeper ground water and off-site migration. 	<ul style="list-style-type: none"> ➤ On-site and off-site shallow/deep groundwater ➤ Local surface waters – Larne Lough
<p>Potential ground gas generated from reduced quality made ground / infilled ground / refuse wastes and possible underlying organic subsoils.</p>	<ul style="list-style-type: none"> ➤ Ingress into buildings ➤ Inhalation of gases 	<ul style="list-style-type: none"> ➤ Future site users
Off-site Sources	Pathway	Receptor
<p>Adjacent, historical contaminative land uses. i.e. the historical aluminium works and railway lands to the north. Potential ground gas generated from reduced quality made ground / infilled ground / refuse wastes and possible underlying organic subsoils.</p>	<ul style="list-style-type: none"> ➤ Migration of impacted shallow/deeper ground water - on-site – volatilisation to indoor air. 	<ul style="list-style-type: none"> ➤ Future site users ➤ On-site and off-site shallow/deeper groundwater ➤ Local surface waters – Larne Lough
	<ul style="list-style-type: none"> ➤ Ingress into buildings ➤ Inhalation of gases 	<ul style="list-style-type: none"> ➤ Future site users

4.0 Conclusions and Recommendations

Following completion of the Desktop Study and Preliminary Risk Assessment the risk associated with a future proposed commercial Port Inspection development is considered **moderate**.

This is largely due to the industrial history of the site and surrounding area and the tipping of domestic refuse that has been undertaken at the site and also the identified leaks of diesel oil at the DAERA site and potential hydrocarbon impacted grounds at the garage site. There is the potential for made ground / infilled ground and shallow soils to contain a range of organic/inorganic contaminants that may in turn impact shallow and deeper groundwater. There is also the potential for these materials to provide a source of ground gas as well as a risk from potential ground gas originating from underlying natural estuarine deposits.

In order to further assess the identified potential pollutant linkage detailed within the developed Conceptual Site Model (CSM), it was recommended that a site investigation be undertaken to investigate the potential pollutant linkage (PPLs) identified, details of which are supplied below.

A number of recommendations have been presented below to inform the investigation and future development.

4.1 Recommended Scope of Investigation

The site investigation would be undertaken according to British Standard BS 10175:2011 and should comprise targeted boreholes advanced to a depth of 6m bgl (or to deeper depth to fully characterise made ground extent if required) and the collection of representative soil and groundwater samples for laboratory analysis.

Considering the potential sources of contamination, the laboratory analysis of the soil and groundwater samples is likely to include but are not limited to:

- Asbestos screen in soils
- Heavy metals;
- Hydrocarbons (TPHCWG incl. BTEX & MTBE) and polycyclic aromatic hydrocarbons (PAHs);
- Phenols
- PCBs (polychlorinated biphenyls);

- VOC`s/ SVOCs;
- Inorganic compounds, including cyanide and sulphates; and
- WAC (waste acceptance criteria) testing.

To support groundwater and ground gas monitoring, all boreholes should be installed as permanent monitoring wells using HDPE slotted pipes and flush covers. Initially, two rounds of groundwater monitoring are recommended to be undertaken adopting low flow purging and sampling techniques. Four rounds of ground gas monitoring should be undertaken to inform a ground gas risk assessment according to relevant best practice and guidance, including CIRIA C665 'Assessing risks posed by hazardous ground gases to buildings' and BS8485:2015 'Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings'. Where significant ground gas is observed this monitoring programme should be extended as set out in the referred to guidance.

A proposed combined geotechnical and geo-environmental borehole location plan will be developed prior to commencement reflective of specific development considerations. The following combined geotechnical and geo-environmental borehole rationale has been developed following completion of this PRA and the PSSR Geotechnical Preliminary Sources Study Report (PSSR) (Desk top Study), Larne Harbour (August 2020, WYG).

Table 7 - Combined Geo-technical and Geo-environmental Investigation Rationale

Borehole	Rational
BH01-BH05	Five cable percussive boreholes in conjunction with the contaminated land assessment, should be advanced to give coverage of the proposed development to inform the strength profile of the superficial deposits. The boreholes should be advanced to 30.0m below ground level by rotary follow on (if required) to prove competent founding bedrock. Rotary follow on is proposed at BH01, BH03 and BH05.
WS01-05	Progression of 5 no. window samples boreholes to characterise soils and groundwater conditions and to facilitate ground gas monitoring. Environmental testing of soils and groundwater to be undertaken.
TP01-TP12	At regular intervals along any proposed access routes with DCP's in each trail pit at 0.5m and 1.0m bgl.
PLT01-PLT05	Plate load tests (5 No.) at 0.5m and 1.0m bgl within the footprints of propose buildings.

4.1.1 Waste Classification of arisings proposed for offsite disposal

Should there be a requirement for the removal of the soil/wastes from site during redevelopment it is recommended that representative soils samples are collected and be analysed for WAC (waste acceptance criteria) testing (total WAC). The analysis should be considered in conjunction with the above suite of contaminants to determine soil waste classification and inform landfill acceptance.

Where applicable a waste classification should be carried out in line with applicable Guidance (WM3 Technical Note, 2018⁵) order to classify any soils to be removed from site in order to determine appropriate disposal options (including transportation) in accordance with the relevant EU and National Waste legislation including the following;

- The Hazardous Waste Regulations (Northern Ireland) 2005, which apply to the classification and transportation of waste;
- The Landfill Regulations (Northern Ireland) 2003, which apply to the landfilling of wastes; and
- The Landfill (Amendment) Regulations (Northern Ireland) 2006.

4.2 Removal of AST`s (above ground storage tanks)

Where AST`s are considered for offsite removal the following provides an outline of works recommended to be undertaken in line with PPG2 guidance document Above Ground Storage Tanks PPG2.

This should include the following:

- Tanks should be drained fully, and the decommissioning materials recycled or disposed of to an appropriate facility under relevant Duty of Care;
- Pipe work and infrastructure associated with the tank should be traced, removed and disposed of accordingly and surrounding area inspected for visual evidence of contamination; and,
- Following removal of the tank, a visual inspection of area for evidence of contamination should be undertaken.

4.3 Healthy and Safety of Construction Workers

The risks posed to construction workers through short term exposure to potentially reduced

⁵ *Technical Guidance WM3: Waste Classification - Guidance on the classification and assessment of waste*

quality or soil can be minimised through adherence to the following relevant health and safety regulations / guidance:

- Management of Health and Safety at Work Regulations (NI) 1999;
- Construction (Health, Safety and Welfare) Regulations (NI) 1999;
- 'Protection of workers and the General Public during the Development of Contaminated Land' published by HSE (1991); and,
- 'A Guide to Safe Working on Contaminated Sites, R132' published by CIRIA (1996).

The health and safety implications of working with potentially contaminated groundwater and soils should be fully considered prior to the commencement of any works through the development of an appropriate health and safety plan. It is considered that the measures adopted to minimise the exposure of construction workers to contaminants should include the following as a minimum:

1. Provision should be made for washing and toilet facilities; clean and dirty collection, laundering and storage facilities for protective clothing; and wash facility for footwear.
2. Provision of Personal protective equipment (PPE) as a minimum PPE should include the following:
 - Headwear
 - Footwear
 - Disposable overalls/impermeable outer garments
 - Gloves

4.4 Unexpected Contamination

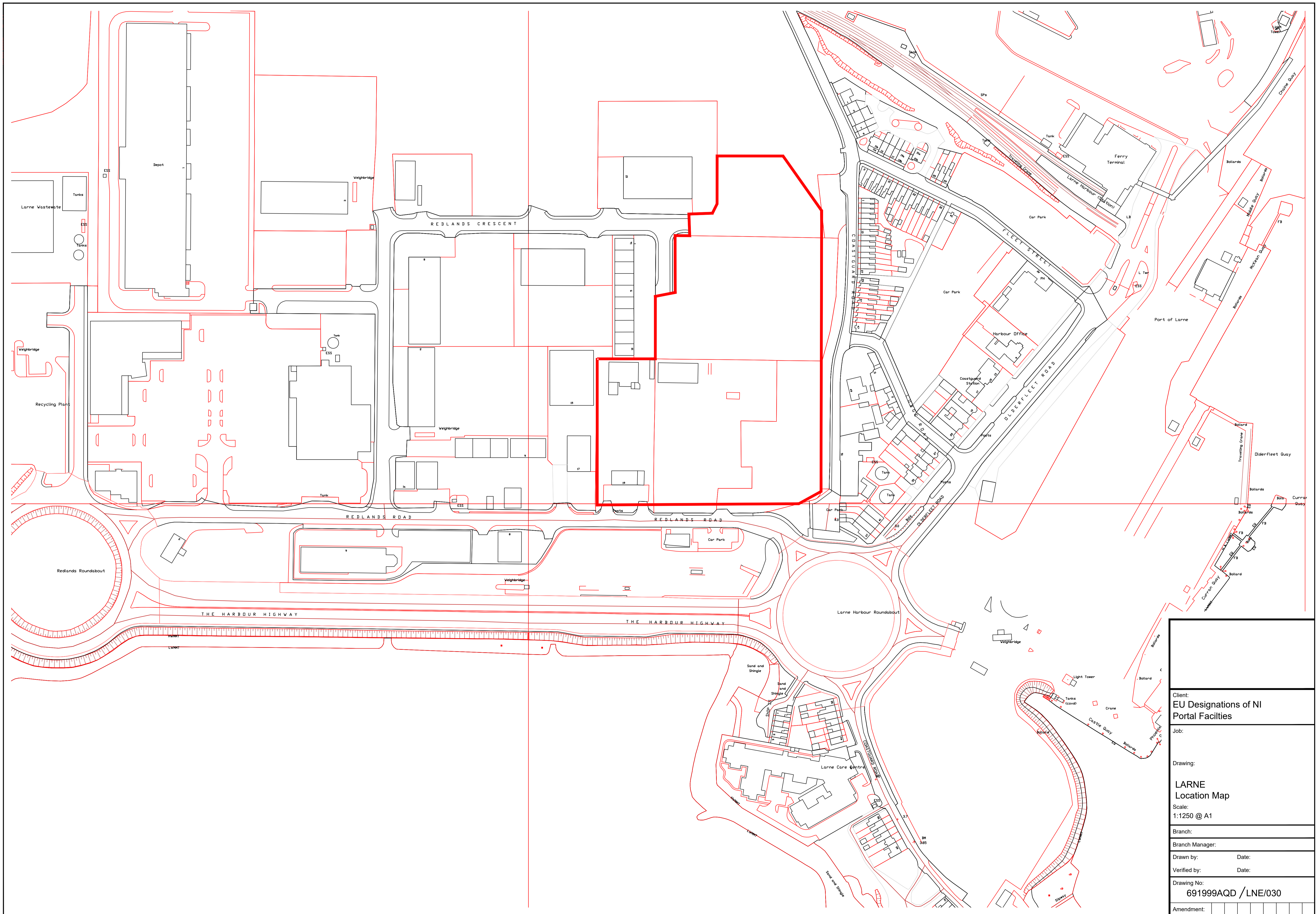
Should any unexpected materials be encountered during earth works, site operations should stop until the materials have been identified. Examples of such materials include buried barrels or containers, soil or water with an unusual colour or odour, and other evidence of contamination, for example iridescent sheens (like oil or diesel) on soil or water. With the knowledge of the former industrial and infilled history of the site, there is as increased potential for unexpected contaminants to be encountered.



Figures



Figure 1 - Site Location Plan



Client:
**EU Designations of NI
 Portal Facilities**

Job:

Drawing:

**LARNE
 Location Map**
 Scale:
 1:1250 @ A1

Branch:

Branch Manager:

Drawn by: Date:
 Verified by: Date:

Drawing No:
691999AQD / LNE/030
 Amendment:



Figure 2 - Annotated Site Plan

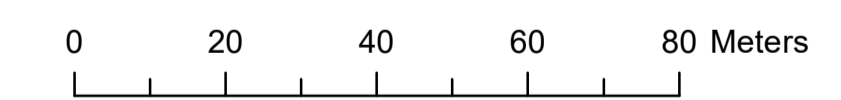
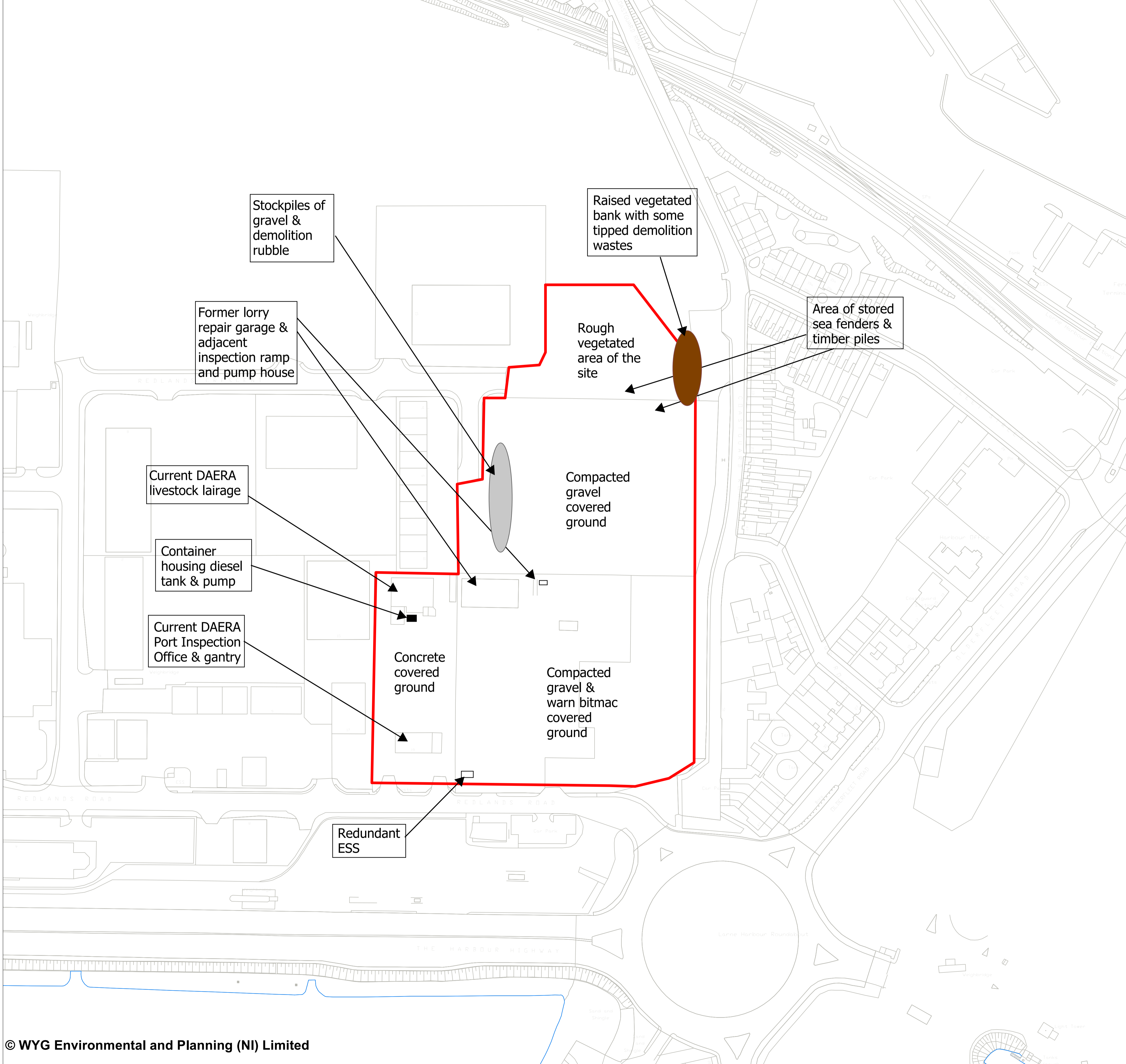
Larne Brexit Port: Annotated Plan

Larne Harbour

DAERA c/o CPD



 Site Boundary



Scale: 1:1,000 @A1

20 August 2020

NGR: 341,157 E / 402,134 N

© Crown Copyright All rights reserved. Licence number:

Notes:



Drawn by: SS

Checked by: PH

Office: 4616

Job No. A112794-67

Drawing No. 002

Revision No. 001



Figure 3– Proposed Development Plan

staff / emergency exit

TOTAL SITE = 3 Hectares

livestock site area=1.6 Hectares

turning

FUTURE L3

PRODUCT INSPECTION FACILITY

LIVESTOCK INSPECTION FACILITY

EQUINE

OTHER COMMERCIAL TRANSPORT ANIMALS

SMALL ANIMALS (pets)

OFFICE

Car Park

TOTAL SITE = 3 Hectares

turning

PRODUCT INSPECTION FACILITY

LIVESTOCK INSPECTION FACILITY

EQUINE

OTHER COMMERCIAL TRANSPORT ANIMALS

SMALL ANIMALS (pets)

OFFICE

SECURITY HUT

Pets requiring further inspection are routed to Pet Inspection Facility

SIT

Client:	EU Designations of NI
Job:	Portal Facilities
Point of Entries NI	
Drawing:	LARNE
Scale:	1:1250 @ A1
Branch:	
Branch Manager:	
Drawn by:	
Verified by:	
Drawing No:	691999AOD / LNE/029
Amendment:	



Appendix A - WYG Terms & Conditions

WYG ENVIRONMENTAL & PLANNING (NI) LTD

REPORT CONDITIONS

Preliminary Risk Assessment

Larne Harbour, Larne

*This report is produced solely for the benefit of **DAERA** and no liability is accepted for any reliance placed on it by any other party unless specifically agreed in writing otherwise.*

This report is prepared for the proposed uses stated in the report and should not be used in a different context without reference to WYG. In time improved practices, fresh information or amended legislation may necessitate a re-assessment. Opinions and information provided in this report are on the basis of WYG using due skill and care in the preparation of the report.

This report refers, within the limitations stated, to the environment of the site in the context of the surrounding area at the time of the inspections. Environmental conditions can vary, and no warranty is given as to the possibility of changes in the environment of the site and surrounding area at differing times.

This report is limited to those aspects reported on, within the scope and limits agreed with the client under our appointment. It is necessarily restricted, and no liability is accepted for any other aspect. It is based on the information sources indicated in the report. Some of the opinions are based on unconfirmed data and information and are presented as the best obtained within the scope for this report.

Reliance has been placed on the documents and information supplied to WYG by others but no independent verification of these has been made and no warranty is given on them. No liability is accepted, or warranty given in relation to the performance, reliability, standing etc of any products, services, organisations or companies referred to in this report.

Whilst skill and care have been used, no investigative method can eliminate the possibility of obtaining partially imprecise, incomplete or not fully representative information. Any monitoring or survey work undertaken as part of the commission will have been subject to limitations, including for example timescale, seasonal and weather-related conditions.

Although care is taken to select monitoring and survey periods that are typical of the environmental conditions being measured, within the overall reporting programme constraints, measured conditions may not be fully representative of the actual conditions. Any predictive or modelling work, undertaken as part of the commission will be subject to limitations including the representativeness of data used by the model and the assumptions inherent within the approach used. Actual environmental conditions are typically more complex and variable than the investigative, predictive and modelling approaches indicate in practice, and the output of such approaches cannot be relied upon as a comprehensive or accurate indicator of future conditions.

The potential influence of our assessment and report on other aspects of any development or future planning requires evaluation by other involved parties.

The performance of environmental protection measures and of buildings and other structures in relation to acoustics, vibration, noise mitigation and other environmental issues is influenced to a large extent by the degree to which the relevant environmental considerations are incorporated into the final design and specifications and the quality of workmanship and compliance with the specifications on site during construction. WYG accept no liability for issues with performance arising from such factors.



Appendix B – Photographs



View of the entrance into the port owned section of site.



Former lorry repairs garage with adjacent inspection ramp, pump house & concrete plinth.

View of the former lorry repairs garage from the site entrance. Now used for storage of sandbags, chairs etc.



View inside the former garage, now used for storage with oil staining remaining on the concrete floor.



External possible tank location adjoining the pump house to the east of the former garage, with the vehicle inspection ramp to the south.



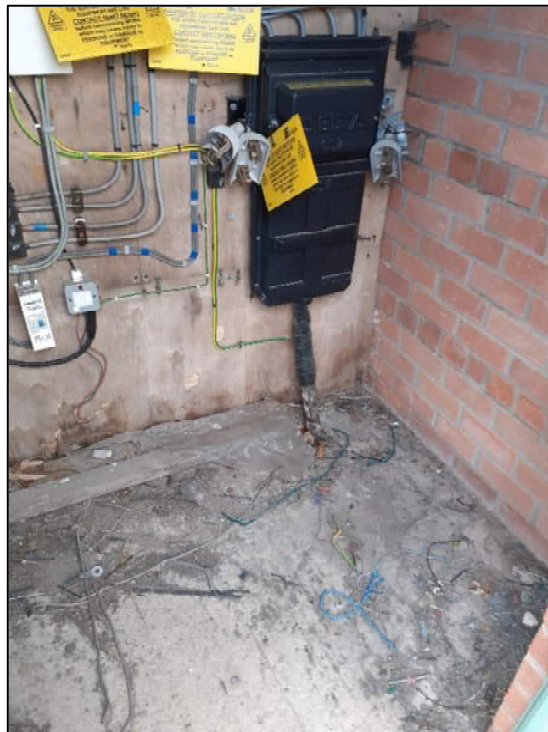
View of the vehicle inspection ramp with pump house to rear and viewing platform in the east.



View of the remains of a brick base that may have housed a tank or boiler house.



View of former electrical sub-station (ESS), now decommissioned, at the southern boundary, adjacent to the DAERA site boundary.



View inside the decommissioned (ESS).



View of the rise in level from the southern section of the site to the mid site area and demolition wastes present.



View at the rear of the former garage, to the west, showing the level change and the commercial units bordering the site to the west.



View to the east over the open central gravelled area of the site with the tree line bordering the eastern site boundary.



View of the stockpiles of gravel and demolition rubble at the western site boundary.



View of the demolition rubble stockpiles.



View of the sea fenders stored in the north of the site.



View of old empty rusted metal oil tank with fenders to the rear in the northern area of the site.



Raised vegetated bank in the east of the northern section of the site with some tipped demolition rubble.



View of the timber sea piles stored in the north of the site adjacent to the fenders.



View over the central gravelled area of the site with timber sea pile in foreground and part of drilling equipment in background.



View from the middle of the site looking south towards Redlands Road.



View of the redundant empty plastic tank and IBC filled with suspected rainwater at the boundary with the southern section of the site.



View from Redland Road, through the exit way, of the DAERA Port Inspection Centre occupying the western section of the site. Showing the inspection gantry at the site of the building.



View to the north, behind the inspection centre building, of the lairage facility.



View of the cover over the Underground Storage Tanks (USTs) that capture the washings from the lairage.



Entrance to the lairage with grating to capture run-off along the front.



View of grating outside the lairage.



View inside the lairage showing drainage gates and hose on wall for washing down.



View of compressor and pump in the lairage for the power hosing.



View to western side of lairage where used straw is dumped.



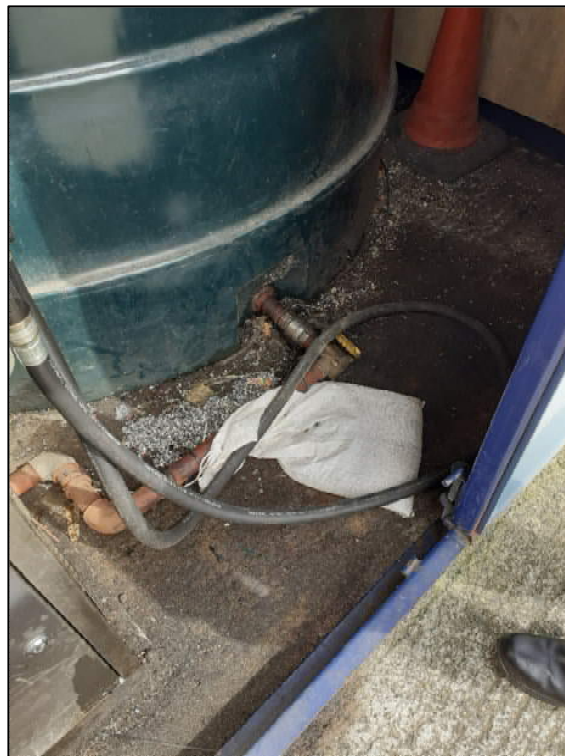
View of diesel tank and pump in container beside lairage.



View of diesel tank and pump inside container with staining on ground.



View of diesel tank fill point pipe and spill bucket below.



View of hydrocarbon staining on ground by the fuel pump fill point and connecting pipework.



View of straw storage area to east of the lairage with drainage gully's and grates.



View from northern end of the DAERA site outside lairage, looking south towards the inspection office and gantry.



Appendix C - Statutory Consultees

Env Ref: EIR/2020/642633
Being dealt with by: Mr Sam Mills Tel: - 0300 1245 000
sam.mills@midandeantrim.gov.uk



Date: 18th August 2020

Gemma Press
WYG
1 Locksley Business Park
Montgomery Road
BELFAST
BT6 9UP

Re:- Request for Environmental Information
Site:- Redlands Road, Larne

Please find information requested by you with regard to the above site in relation to contamination issues, IPPC Permits, waste/landfill sites.

This information in this response is provided in good faith based on your enquiry and on a 'without prejudice' basis.

A search radius of 500m has been carried out centred on the grid co-ordinates 341133, 402067.

Please reply to:

Head Office
The Braid
1-29 Bridge Street
Ballymena BT43 5EJ

Ballymena Office
Ardeevin
80 Galgorm Road
Ballymena BT42 1AB

Carrickfergus Office
Museum & Civic Centre
11 Antrim Street
Carrickfergus BT38 7DG

Larne Office
Smiley Buildings
Victoria Road
Larne BT40 1RU

Tel: 0300 1245 000
www.midandeantrim.gov.uk

Chief Executive: Anne Donaghy



1. Pollution Incidents:

This department's remit is Public Health legislation, and thus restricted to incidents under Public Health legislation.

However we have conducted an analysis of complaint received by us for the time period 2014-2019 to date of request with a search radius of 500m distance from the enquiry site, which may indicate pollution incidents:

- Odour and Fume Complaint

As these are Public Health complaints, the situation will have been rectified at time of complaint.



Mid & East Antrim Borough Council
Tel: 0300 1245 000

www.midandeastantrim.gov.uk

This department's remit is Public Health legislation, and thus restricted to incidents under Public Health legislation. For any other details of pollution incidents (e.g. pollution of watercourses/illegal waste operations) contact should be made with the relevant regulatory body -

Contact information:

WATER POLLUTION - Department of Agriculture, Environment and Rural Affairs - Water Quality Unit.

ILLEGAL WASTE OPERATIONS - Department of Agriculture, Environment and Rural Affairs - Land and Resource Management Unit (Klondyke Building, Gasworks Business Park, Lower Ormeau Road, Belfast).

2. Contaminated Land:

The Council does not currently hold a register of statutorily defined 'contaminated land' as per the impending Part III of the Contaminated Land regime (The Waste and Contaminated Land (NI) Order 1997). Further information with regard to potentially contaminative land uses may be obtained by request from the DAERA, Northern Ireland Environment Agency who have such information held on a land quality database, which was developed in 1997.

Contact information:

Department of Agriculture, Environment and Rural Affairs - Land and Resource Management Unit (Klondyke Building, Gasworks Business Park, Lower Ormeau Road, Belfast).

However, there has been obvious previous development within the enquiry site and so site investigation will be required to investigate any sources of contamination.

3. PPC Consents:

This department has considered any Council (Part C) permitted installation under the Pollution Prevention and Control Regime within a 500m radius from the enquiry site. The following Part C permitted installations regulated by the Council are located within 500m.

Permit ID -	PL11
Company-	Topaz Larne Service Station
Address -	Redlands Road
Process-	Filling Station
Schedule -	1.2 GASIFICATION, LIQUEFACTION AND REFINING ACTIVITIES ,
Activity -	Unloading of petrol into stationary storage tanks at a service station

Further information with regard to Part A and Part B regulated installations may be obtained by request from the Northern Ireland Environment Agency - Industrial Pollution and Radiochemical Inspectorate.



Contact information:

Department of Agriculture, Environment and Rural Affairs, Northern Ireland Environment Agency - Industrial Pollution and Radiochemical Inspectorate (Klondyke Building, Gasworks Business Park, Lower Ormeau Road, Belfast)

4. Air Quality:

The enquiry site does not fall within any Air Quality Management Area (AQMA) Areas.

The enquiry area does not fall within a Smoke Control Area.

Mid and East Antrim Borough Council undertakes air quality monitoring with both automatic real time analyser and non automatic air quality monitoring (NO₂ diffusion tube)

NO₂ Diffusion tube monitoring sites are located within the enquiry site

LDT06 located at grid reference 341246, 401970

LDT07 located at grid reference 341274, 401767

NO ₂ Average Concentration (µg/m ³)										
Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
LDT06 Roadside	21.9	20.2	16.8	17.4	14.1	11.8	10.8	12.4	13.5	13.2
LDT07 Urban Background	15.3	12.1	9.9	10.5	10.1	11.3	10.4	9.6	12.7	9.2

Additional information specifically with regard to local air quality monitoring data for the following pollutants: Nox/PM10/SO₂/PaH may be accessed at www.airqualityni.co.uk

5. Noise Monitoring:

No noise monitoring has been undertaken by this department in relation to the enquiry site.

6. Private Water Supplies

Private Water Supplies located within 1500m of the enquiry area:

NONE

ID
Premises
Address
Nature



Additional information may be sought from Drinking Water Inspectorate for Northern Ireland (within Department of Agriculture, Environment and Rural Affairs)

7. **Waste / Landfill Sites**

In preparing this information, This department is currently unable to confirm the location of any historic landfilled areas in the vicinity of the site.

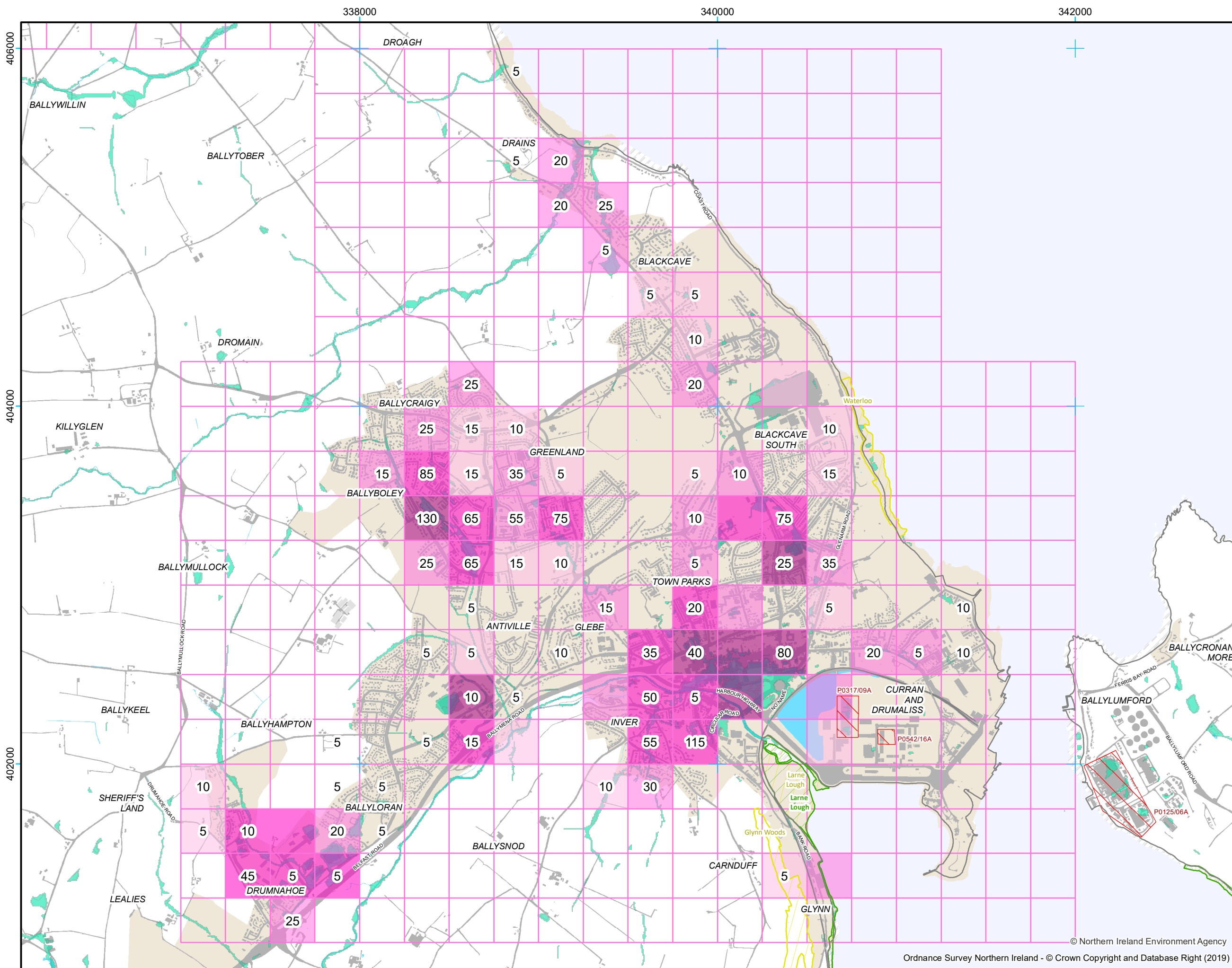
This information in this response is provided in good faith based on your enquiry and on a 'without prejudice' basis.

Yours faithfully

A handwritten signature in black ink, appearing to read 'Sam Mills', written over a horizontal line.

Sam Mills
Environmental Health Officer





EU Floods Directive: 2nd Cycle
Flood Risk Damages
High Probability
 3.33% chance that a flood of this magnitude or greater will occur in any given year.

Map Type: FLOOD RISK
Source: SURFACE WATER
Epoch: PRESENT DAY

Scale 1:20,000 when plotted at A3

Risk Data

- 3.33% AEP Flood Extent (1 in 30 or greater chance in any given year)
- 0 - 10K (£)
- 10K - 50K (£)
- 50K - 200K (£)
- 200K - 1M (£)
- > 1M (£)
- 5 Estimated number of Inhabitants affected

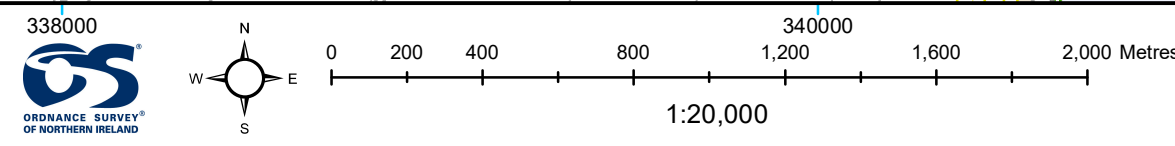
Environmentally Sensitive Sites

- IPPC Integrated Pollution Prevention & Control Installations (with permit number)
- SAC Special Areas of Conservation
- SPA Special Protection Areas
- ASSI Areas of Special Interest
- NIEA/DWI registered private water supplies
- Bathing Waters

Coordinate System: Irish Grid.
 Coordinates in metres.
 Heights in metres above MSL Belfast.
 Users of this map should refer to the guidance and conditions of use available at the DfI Rivers website.

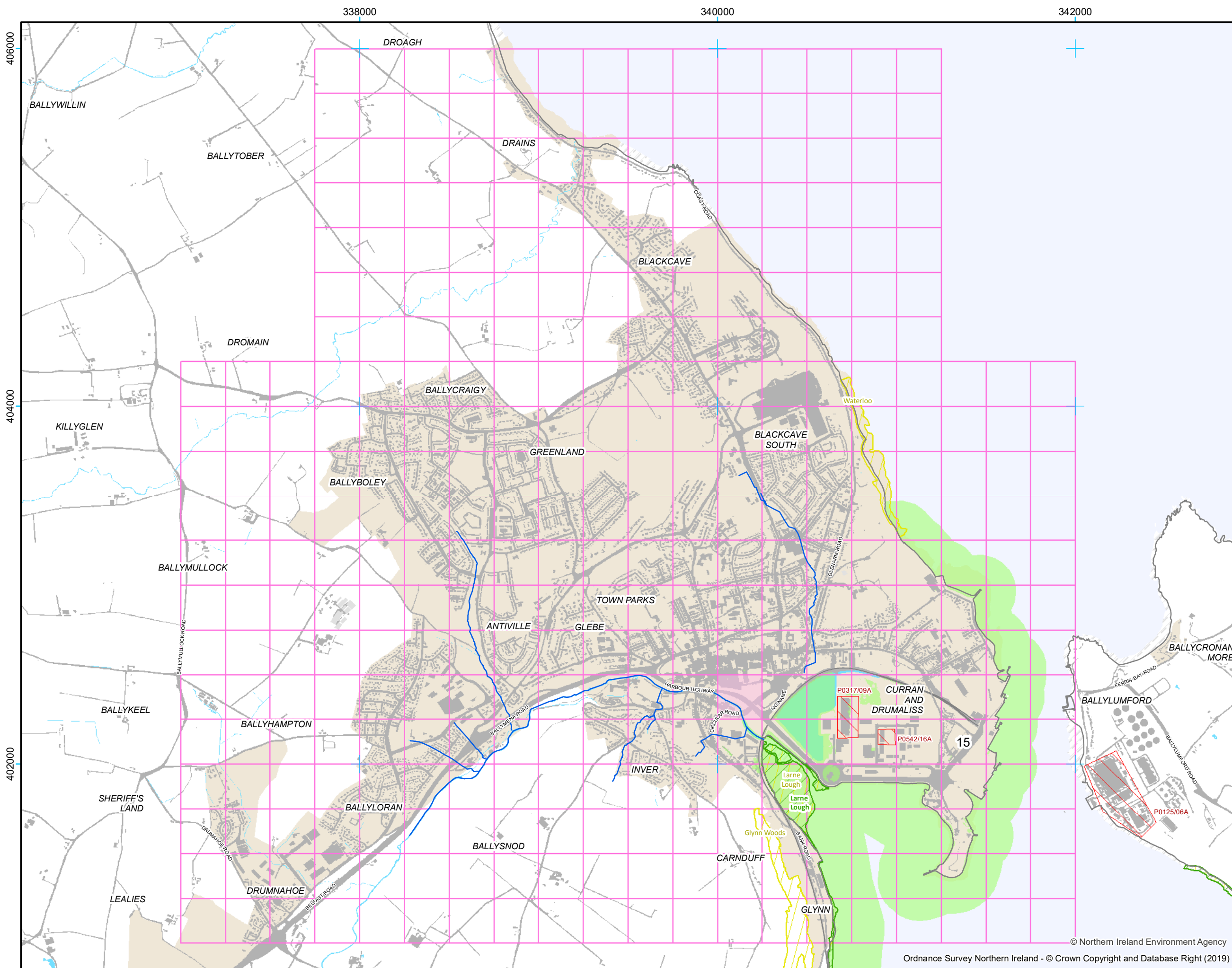
Department for Infrastructure
 An Roinn Bonneagair
www.infrastructure-ni.gov.uk

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 Compiled & published by the Department for Infrastructure, DfI Rivers, 49 Tullywiggan Road, Loughry, Cookstown, County Tyrone, BT80 8SG.

Study Area : Larne
 Drawing Number : PRH_Larne
 Publication Date: 22nd March 2020



EU Floods Directive: 2nd Cycle

Tidal Risk Damages

High Probability

10% chance that a flood of this magnitude or greater will occur in any given year.

Map Type: FLOOD RISK
Source: TIDAL
Epoch: PRESENT DAY

Scale 1:20,000 when plotted at A3

River Model Status

— Modelled in Detail

Risk Data

- 10% AEP Flood Extent (1 in 10 or greater chance in any given year)
- 0 - 10K (£)
- 10K - 50K (£)
- 50K - 200K (£)
- 200K - 1M (£)
- > 1M (£)

5 Estimated number of Inhabitants affected

Environmentally Sensitive Sites

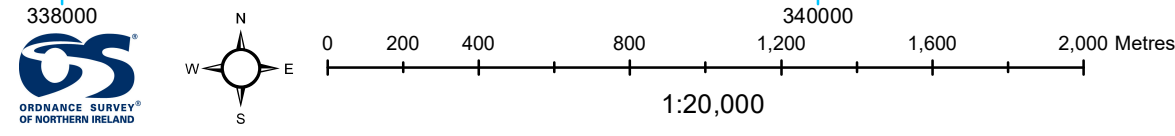
- IPPC Integrated Pollution Prevention & Control Installations (with permit number)
- SAC Special Areas of Conservation
- SPA Special Protection Areas
- ASSI Areas of Special Scientific Interest
- NIEA/DWI registered private water supplies
- Bathing Waters

Coordinate System: Irish Grid.
Coordinates in metres.
Heights in metres above MSL Belfast.
Users of this map should refer to the guidance and conditions of use available at the DfI Rivers website.



Study Area : Larne
Drawing Number : TRH_Larne
Publication Date: 17th December 2019

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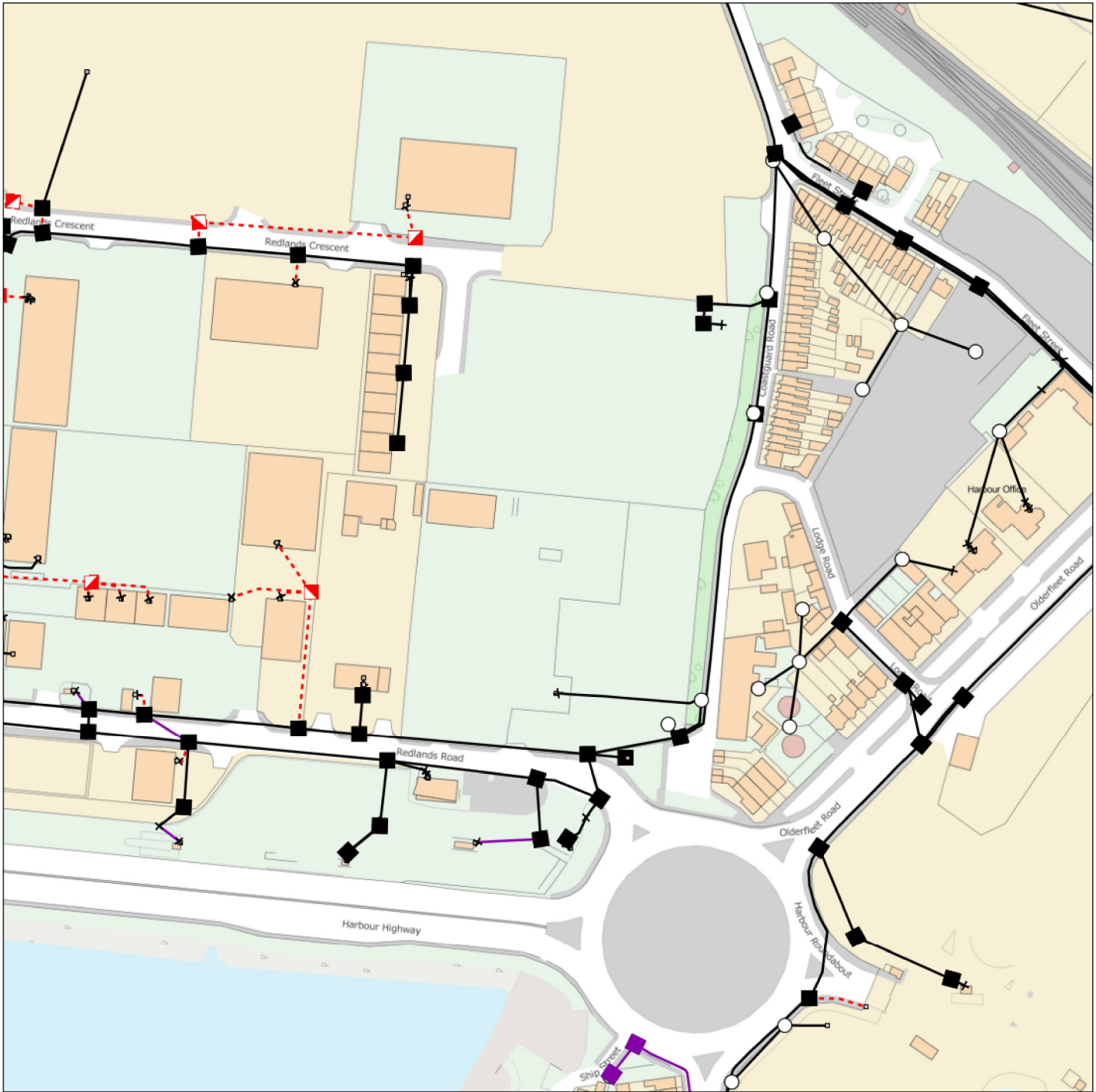
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Compiled & published by the Department for Infrastructure, DfI Rivers, 49 Tullywiggan Road, Loughry, Cookstown, County Tyrone, BT80 8SG.



Appendix D - Utility Responses

Maps by email Plant Information Reply



IMPORTANT WARNING

Information regarding the location of BT apparatus is given for your assistance and is intended for general guidance only. No guarantee is given of its accuracy. It should not be relied upon in the event of excavations or other works being made near to BT apparatus which may exist at various depths and may deviate from the marked route.



openreach

CLICK BEFORE YOU DIG

FOR PROFESSIONAL FREE ON SITE ASSISTANCE PRIOR TO COMMENCEMENT OF EXCAVATION WORKS INCLUDING LOCATE AND MARKING SERVICE

email nicbyd@openreach.co.uk

ADVANCE NOTICE REQUIRED
(Office hours: Monday - Friday 08.00 to 17.00)
www.openreach.co.uk/cbyd

Accidents happen

If you do damage any Openreach equipment please let us know by calling 0800 023 2023 (opt 1 + opt 1) and we can get it fixed ASAP

KEY TO BT SYMBOLS

		Change Of State	+	Hatchings	
	<i>Planned</i>	<i>Live</i>	×	Built	
PCP			▲	Planned	
Pole			■	Inferred	
Box			Ⓚ	Duct	
Manhole			Other proposed plant is shown using dashed lines. BT Symbols not listed above may be disregarded. Existing BT Plant may not be recorded. Information valid at time of preparation. Maps are only valid for 90 days after the date of publication.		
Cabinet					
	<i>Pending Add</i>	<i>In Place</i>	<i>Pending Remove</i>	<i>Not In Use</i>	
Power Cable					
Power Duct				N/A	

Reproduced from the Ordnance Survey map by BT by permission of Ordnance Survey on behalf of the Controller of Her Majesty's Stationary Office

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BT Ref : KIK07117U

Map Reference : (centre) D4115502085

Easting/Northing : (centre) 341155,402085

Issued : 18/08/2020 19:11:43

WARNING: IF PLANNED WORKS FALL INSIDE HATCHED AREA IT IS ESSENTIAL BEFORE PROCEEDING THAT YOU CONTACT THE NATIONAL NOTICE HANDLING CENTRE. PLEASE SEND E-MAIL TO: nicbyd@openreach.co.uk

Our Ref: 2008/50093

Your Ref: None

Miss Gemma Press
WYG
belfast.env@wyg.com
BT6 9UP

17th August 2020

Website: <http://www.nienetworks.co.uk/>

Dear Miss Press

Re: Redlands Crescent, Larne

We refer to your request for a marked up cable drawing showing NIE Networks equipment. We enclose for your attention but ask you to note that **all cable positions are approximate only** as indicated clearly on the drawing. Therefore, the onus is on you and your subcontractor to locate and avoid all underground and overhead electrical equipment owned by NIE Networks and to prevent any damage whatsoever to **any** electrical equipment.

Please note specifically that smaller service cables may not show on the marked up drawing and therefore all reasonable steps should be taken by you to locate any cable whether, underground or overhead.

As you know, work in the vicinity of any electrical equipment involves a high risk of danger or injury and therefore all care must be taken.

Any damage must be reported immediately as no matter how minor the damage may appear, live electricity cables are extremely dangerous and can kill.

All site safety **MUST** be maintained in accordance with Health and Safety legislation and we refer you to the following guidance notes, for information, but these do not form an exhaustive list:

1. HSE guidance notes GS6 (avoidance of danger from overhead electric lines) and
 2. HSE booklet HS (G) 47 avoiding danger from underground services
- These guidance notes are available from the Health & Safety Executive for N.I. (HSENI).

NIE Networks also have a website section on 'Contractor Safety' to which we refer you.

If any damage whatsoever occurs to NIE Networks equipment all work in the vicinity **must stop immediately** and the damage **must be reported at once** to NIE Networks on the following number: **03457 643 643**

As you will appreciate, fault location and repairs are less expensive to carry out should a matter be reported immediately at the time of damage. We would ask you to note that even what may appear insignificant damage can involve a cable faulting at some time later and the location and repair costs in such an instance are considerably higher. NIE Networks will pursue the responsible party for all costs

incurred by it in the locating and repairing of any of its electrical equipment and this letter will be used in support of that claim.

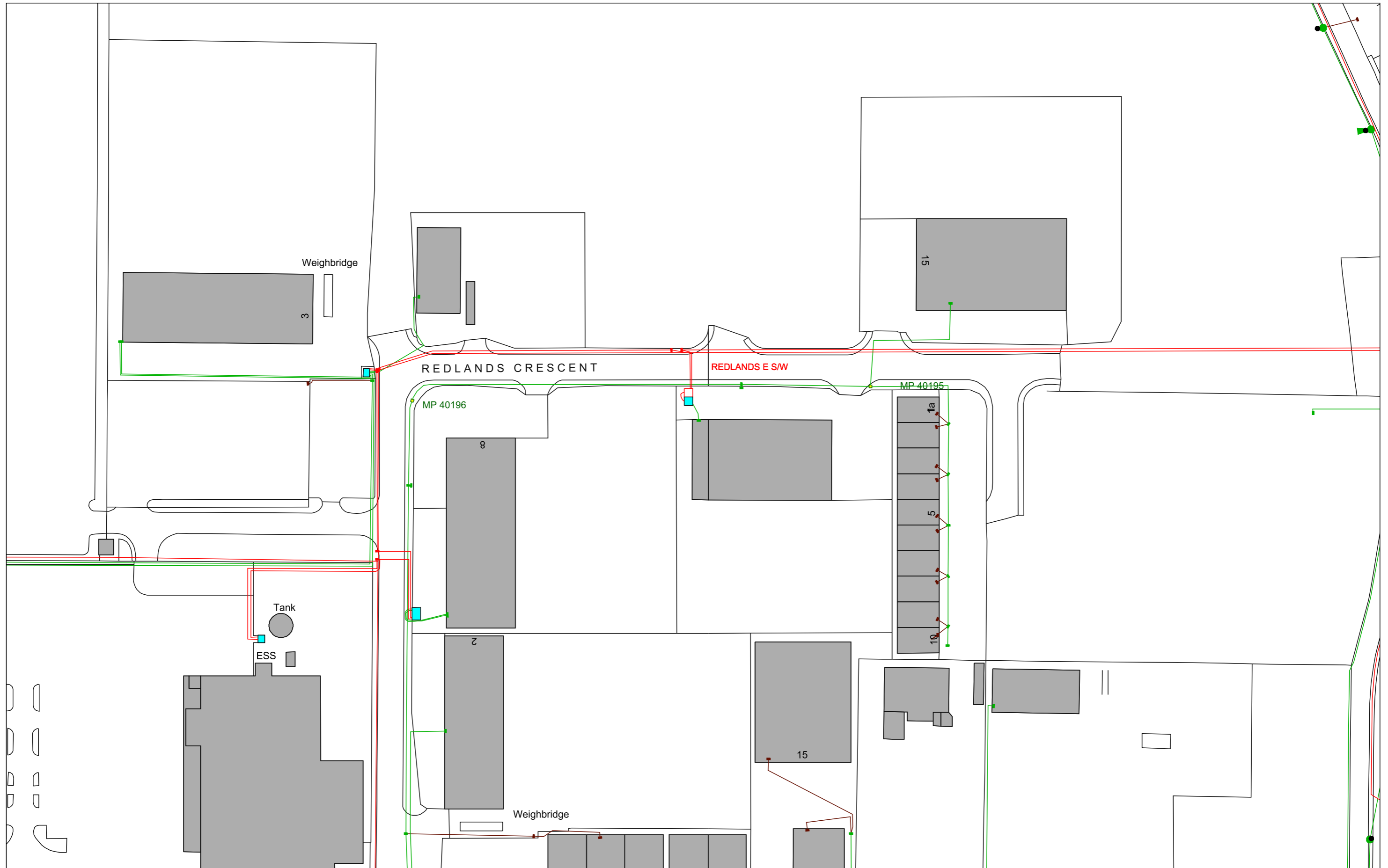
You should ensure that the attached mark up and a copy of this letter are given to any contractor or subcontractor who may have personnel or machines working on this site and we have enclosed two copies for your convenience. Also note, that NIE Networks original drawings must be used at all times and this present drawing is only valid for 3 months from the date of this letter.

Should you require any further information you can contact us by phoning 03457 643 643.

Yours sincerely

NIE Networks

Network Performance and Safety



1 Based upon the Ordnance Survey map with the permission of the director and the chief executive, Crown copyright. ©

Drawing No:
Project No:

North Arrow
Date : 17/08/2020 09:10:03
Scale : 1:1250
Map Centre : 340995,402191

400 kV
275 kV
110 kV
33 kV
11 kV
6.6 kV
L.V.
Service

CAUTION! CABLE POSITIONS ARE APPROXIMATE ONLY.
Please note that smaller service cables may not be shown. Always remember that it is the responsibility of the excavator to locate and avoid damage to N.I.E. equipment. Failure to do so may result in those responsible being held liable.



GNIS SYMBOLOGY



275 KV Overhead



110 KV Overhead



33 KV Overhead



11 KV Overhead



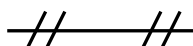
6.6 KV Overhead



MV Overhead



Services



De-energised or Decommissioned
(Voltage as per colour code below)



275 KV Cable



110 KV cable



33 KV Cable



11 KV Cable



6.6 KV cable



MV Cable



Steel Pole



Tower



HV Pole



Pole Mounted Sub



Ground Mounted Sub



Stay. Can be 2 Stay (2S)
or 3 Stay (3S)



3 Pole. Can be 4 Pole (4P)



H Pole



Jockey Pole



V Stay



Switching Site



Leader Line



Flying Stay



MV Pole



MV Stay



MV 2 Stay



MV Strut



Mini Pillar



UDB

SP

Steel Pole

JP

Jockey Pole

GW

Guard Wire

FS

Flying Stay

OR

Outrigger Stay