



Geo-Environmental Consultants

MINERVA STREET, GLASGOW

PHASE I

**DESK STUDY REPORT AND
COAL MINING RISK ASSESSMENT**

DATE

June 2021

CLIENT

Nevis Properties Limited

Nevis Properties Limited

**Minerva Street,
Glasgow**

PHASE I

**DESK STUDY REPORT AND
COAL MINING RISK ASSESSMENT**

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EXECUTIVE SUMMARY

General

We understand that the Client, Nevis Properties Limited is considering the development of a site titled 131 – 133 Minerva Street, Glasgow for residential flatted use with associated car parking and soft landscaping. As an integral part of the land and development design assessment, we were instructed to undertake a Phase I Desk Study and Coal Mining Risk Assessment, examining the geo-environmental conditions as far as they could be identified from available published and other sources. This report provides the findings of our researches, which included examinations of historical, geological and other land quality information. It provides advice on the potential site impacts and the scope of Phase II investigations necessary to provide clarity for design.

Our researches identified that the site within the indicated boundary was previously a Brass Foundry until the 1950's and then used as an office space. Presently the site is occupied by car park hardstanding and an office building located adjacent to Minerva Street.

Indicated Ground Conditions

The natural superficial deposits within the site are indicated to predominantly comprise of made ground of an unknown composition or origin and underlying natural sand and gravels. Due to the site's close proximity to the River Clyde, alluvial deposits may also be anticipated, typically comprising sands, clays and silts. The thickness of the superficial deposits may be in the region of 20m to 25m. The underlying solid strata are indicated to be sedimentary bedrock belonging to the Upper Limestone Group comprising sandstones, siltstones and mudstones with seams of limestone and coal.

Potential Contamination

Our researches have indicated that the site has previously been a brass foundry until the 1950s and then subsequently as another unknown commercial/industrial use. The site has been occupied with hardstanding and a single building along Minerva Street since the 1950's. It is understood that the site has most recently been in use as an office space with associated car parking. The surrounding area has had a significant industrial past. In the first half of the 20th century a large mineral railway and goods depot was located to the immediate west, with the associated Queens Dock to the south and a large metal foundry and later an engine workshop to the north and east of the site. Much of the heavy industry had closed by the late 1950's with significant commercial and residential re-development of the surrounding area. To the immediate east and north of the site, a garage and post office vehicle depot was recorded, along with the development of the city expressway road 1980's to the immediate south of the site. The railway lines were removed with the exception of a single line serving the city centre which still remains. The two large quays of the Queen's Dock were filled in and re-developed as the SECC during 1994 and 1995. The surrounding area has undergone substantial residential developments including office blocks throughout the late 20th century.

Based on our examinations of the past uses, the site geology and the proposed development, we have constructed a Conceptual Site Model which assesses potential receptors and impacts from a contamination source both within and beyond the site boundaries. This model informs the scope of necessary investigations for Phase II works which should include the recovery of soils and groundwater samples for testing. The necessary investigations are likely to include boreholes and trial pits recovering samples of the soils and groundwater,

Gas Emissions

The historical researches suggest made ground deposits are likely to exist. As such, a programme of gas monitoring from standpipes installed in boreholes, is advised.

Foundations

It is understood the development proposals includes multi-storey residential properties. Piled foundations are anticipated.

Mining

Based on the findings of our researches, we would consider there is a low risk of surface instability from shallow mine workings. Therefore, we would conclude that shallow abandoned mine workings do not pose a constraint to the proposed development. No mine entries are recorded within the site, or within 20 m of the site's boundary.

1.0 INTRODUCTION

1.1 General

1.1.1 It is understood that Nevis Properties Limited are proposing to develop a site titled '131-133 Minerva Street, Glasgow' comprising flatted residential properties with associated car parking and soft landscaping.

1.1.2 Following preliminary examinations of available information on the historical background to the site and its geology, we advised that more detailed researches would be necessary to fulfil the requirements of the local authority, leading to the production of a Phase I Desk Study report.

1.2 Objectives of the Investigations

1.2.1 The objectives of the study were to provide the following information:

- a) To document the historical background of the site and surrounding area with particular regard to any former contaminative uses or development.
- b) To provide an indication of the geological conditions beneath the site and the surrounding area.
- c) To identify the possible presence and assess potential risks associated with chemical contamination and ground gas generation.
- d) To consider the site hydrogeology.
- e) To establish the risk of mining instability arising from recorded and unrecorded shallow mine workings (if any).
- f) To create a robust Preliminary Conceptual Site Model upon which a targeted site investigation could be designed.

1.2.2 It was intended that the study would provide a framework and basis for the design of Phase II investigations, as described.

1.3 Information Sources

1.3.1 The following sources of information have been utilised in the compilation of this report:

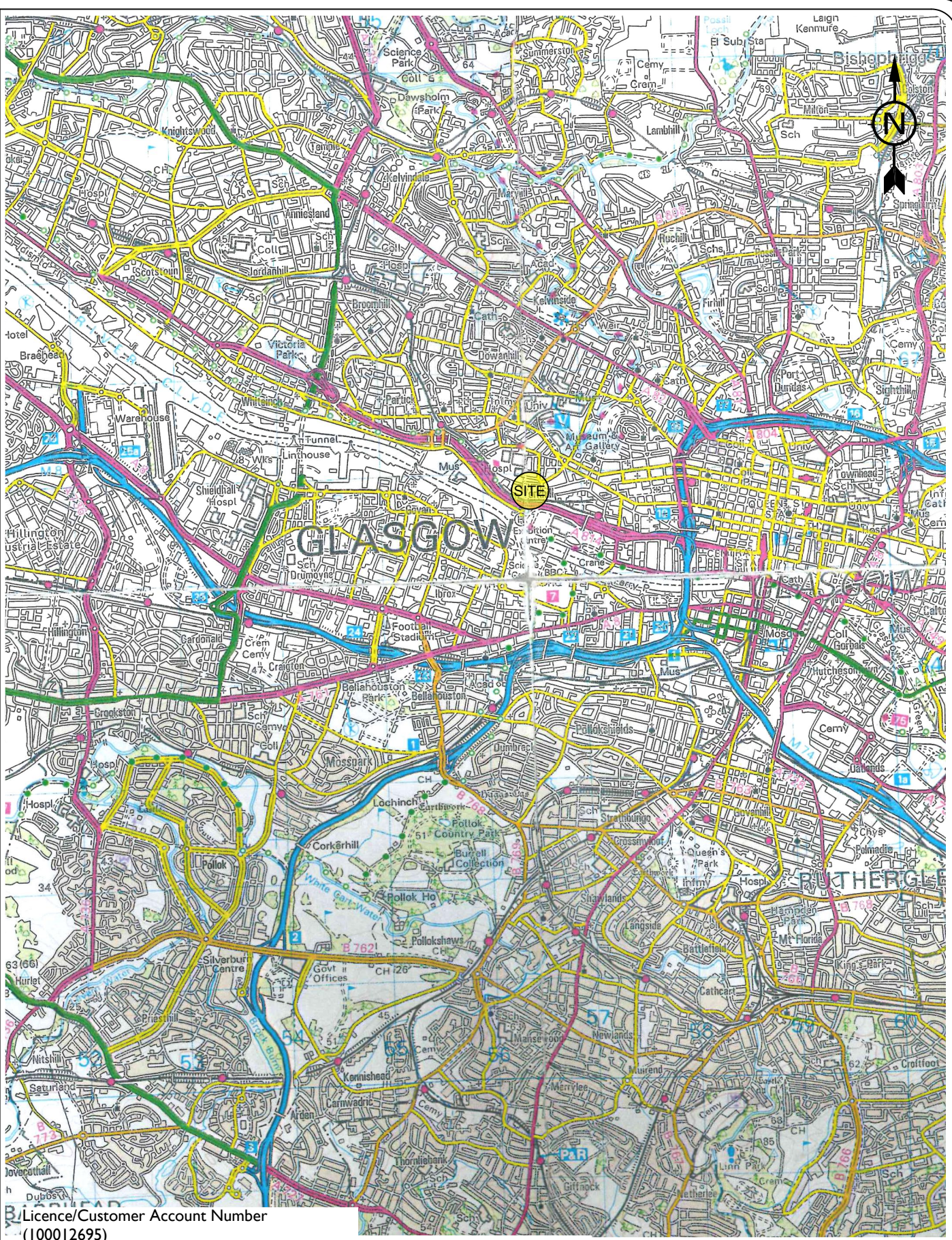
- Site walkover survey and relevant site photographs (Appendix 1)
- Envirocheck report, historical map extracts provided by Landmark and a report obtained from the Coal Authority (Appendix 3)
- SEPA Correspondence (Appendix 2)
- Extracts from published British Geological Survey maps

1.4 **General Methodology**

1.4.1 This report presents the results and interpretations of the desk study researches, examining aspects of the site's geological setting, environmental context and historical background. It is based on data sourced from various public sources including consultations with external bodies such as Scottish Environmental Protection Agency, British Geological Survey, and The Coal Authority. In addition to these direct consultations with the referred public bodies, we have acquired Envirocheck information from Landmark.

1.5 **Context**

1.5.1 This report has been prepared in accordance with current recommended practice and existing legislation. It is written in the context of the proposed residential and commercial development previously described. Should there be any alternative end-use, it would be prudent to consult us further to ensure the continued pertinence of the recommendations advised.



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client details:

NEVIS PROPERTIES LIMITED

90 MITCHELL STREET

GLASGOW, G1 3NQ

project title:

MINERVA STREET
GLASGOW

drawing title:

SITE LOCATION PLAN

project no:
P21/102

drawing no:
P21/102/DS/R/F/01

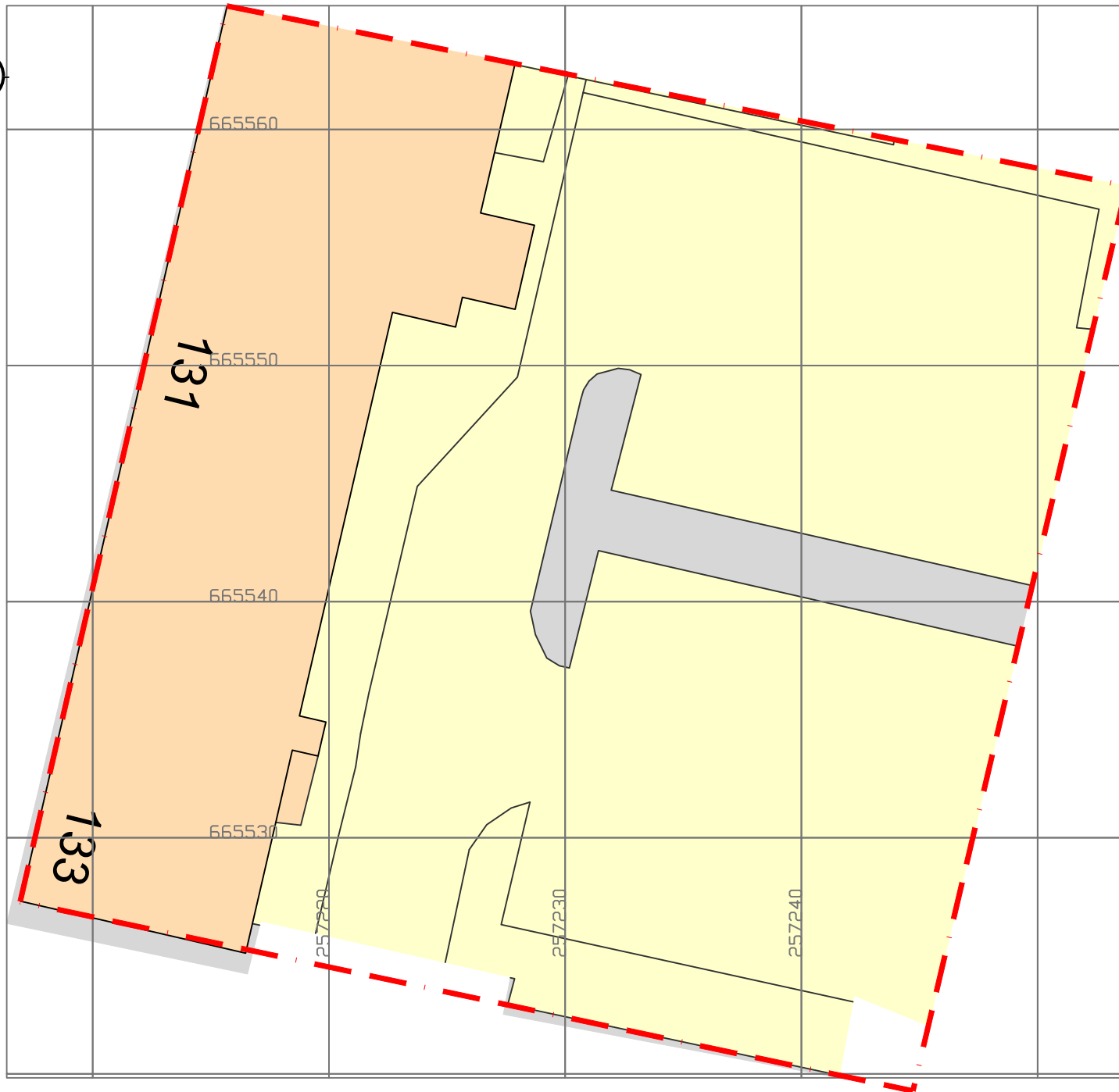
revision:

date:
03.06.21

drawn by:
RC

approved by:
NT

scale:
1:50,000



NOTES

--- Site boundary

REV	DATE	DETAILS
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NEVIS PROPERTIES LIMITED
90 MITCHELL STREET
GLASGOW
G1 3NQ

PROJECT TITLE

MINERVA STREET
GLASGOW

DRAWING TITLE

STUDY
AREA

DRAWN BY MB	CHK'D BY CW	APP'D BY NT	DATE 03.06.21	SCALE 1:250 @ A4
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PROJECT No. P21/120	DRAWING No. P21/120/DS/R/F/02	REVISION
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2.0 SITE LOCATION AND SUMMARY DETAILS

2.1 Site Description

- 2.1.1 The summary details of the site as understood from the supplied survey information and our Walkover Survey (Appendix I) are outlined in Table I, below. The information highlights that at the time of our assessment, the majority of the site was utilised open space with grass surface. There were no obvious signs of any storage tanks above or below ground.

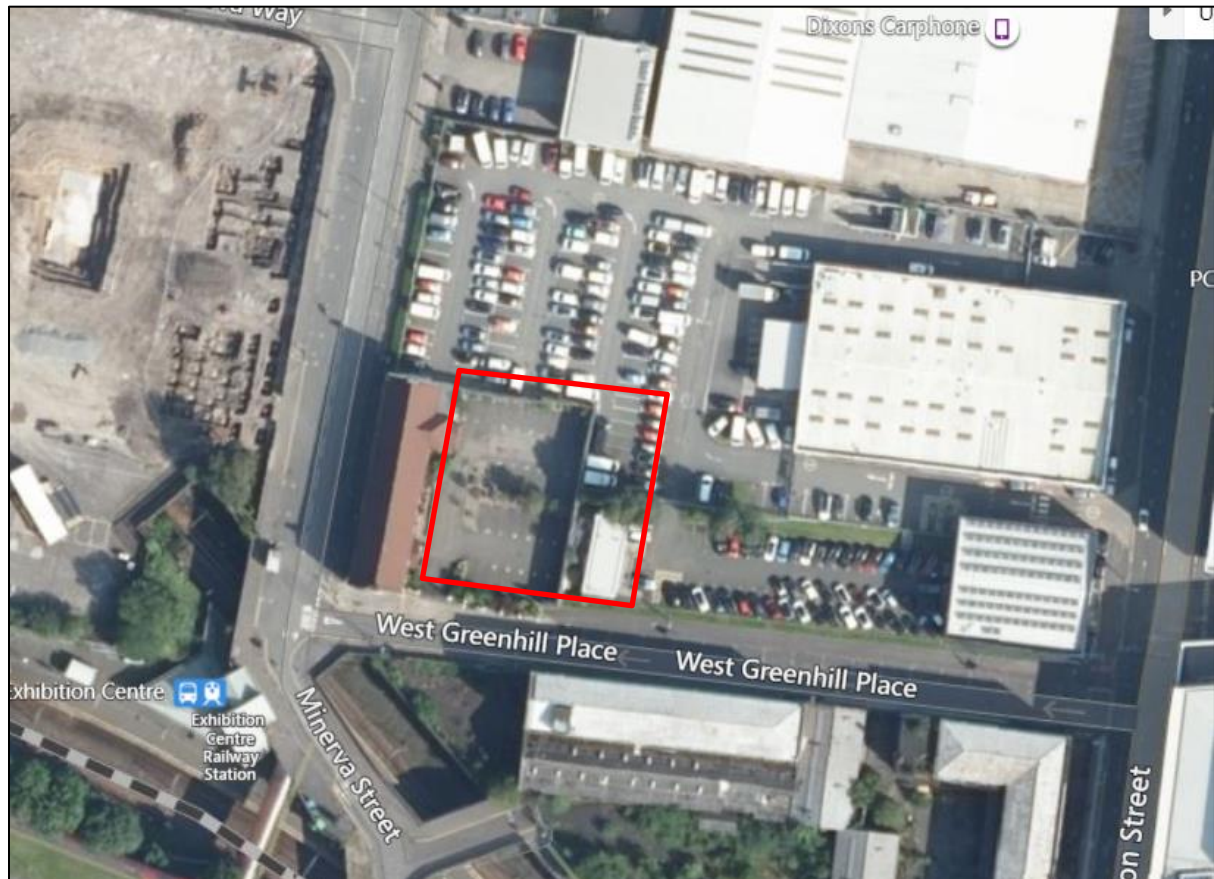
Table I: Summary Information on Site Location and Description.

Site	Details
Name	131-133 Minerva Street, Glasgow
Location	Located in Finnieston, Glasgow
Site Area	0.161 Ha (approximately).
Grid Reference	257227, 665543 (approximate centre).
Local Authority	Glasgow City Council.
Current Usage	The area is occupied by building in the west currently in use as offices and car park hardstanding.
Past Usage	Office Buildings and Brass Foundry
Topography	Generally flat although the car park area is raised above street level. Possible filling.
Surface Covering	Building cover and hardstanding.
Surface Water Features	No surface water features.
Fly-tipping	None noted during the time of the walkover.
Boundary Conditions	The site is bound by a building in the west and brick walls in the north, south and east boundaries.

2.2 Local Context

- 2.2.1 The context of the site is indicated in Figure I, which shows it to be bound by West Greenhill Place to the immediate south Minerva Street to the west and a large car park to the north and east. The nearest surface water feature was the River Clyde which flows east to west approximately 400 m to the south of the site.

Figure 1: Aerial photograph from showing the site (courtesy of Bing Maps).



2.3 **Site Access**

2.3.1 Walk on access was gained from the southern boundary directly from West Greenhill Place.

2.4 **Active Processes on Site**

2.4.1 Our site walkover survey noted that the site is in use as an office space for several business with associated car parking.

2.5 **Public Utilities**

2.5.1 During our site walkover, overhead BT lines were noted along West Greenhill Place.

3.0 GEO-ENVIRONMENTAL DATABASE

3.1 General

3.1.1 As described, the researches included consultations with public bodies and regulators, supplemented with researches of various documents and related website sources on the geological and environmental context of the site. Much of the information was summarised in the Landmark Envirocheck Report which is included in Appendix 2, with the findings outlined in Table 3. In the compilation of the table, we have listed the key geo-environmental impact sources identified within the Envirocheck report. In each of these cases, we have assigned a notional risk level based on a qualitative assessment of the potential for a defined hazard to impact on the site and its users. Where the risk is estimated to be 'low', we consider that there is sufficient information available to suggest that the indicated source is unlikely to have any material effect on the site and its intended usage. Where a 'moderate' risk is shown, we consider that circumstances could reasonably arise where the site and its users could be impacted by the identified source. In the case of an assigned 'high' risk, we consider that there is sufficient information to indicate that the site will be impacted by the defined source. In this instance, we consider that potential sources have a low to high risk of impacting upon the site and its users.

Table 3: Summary of Envirocheck Records of Potential Impact Sources within 250 metres of the Site

Potential Impact Source	Distance	Details	Impact Risk
Mineral Sites		No recorded mineral sites within 250 m of the site.	Low
Discharge Consents	216 m SW	No discharge consents within 250 m of the site. Nearest recorded discharge consent noted as a storm sewage overflow into the River Clyde 516 m to the south west,	Low
Radon	-	Intermediate probability the site lies within a radon area. Basic radon protection measures are necessary in the construction of new dwellings.	High
Flooding (SEPA Flood Map)	-	Potential risk for Flooding to occur at the surface. Potential risk for groundwater flooding below ground level. A flood risk assessment should be undertaken. See Section 3.5 below.	Medium
Current Off-site Contamination Sources (Active Trade entries)	38 No. recorded trade directories within 250 m of the site	38 separate trade directories are recorded within 250 m of the site, including car garages, car dealers, printworks and electronic shops.	Low
Registered Landfills	-	Local landfill coverage by Glasgow City Council. Nearest registered landfill noted as the Queens Dock 119 m to the south west, now recorded as disused. This area is known to have been infilled prior to the development of the SECC.	Low

3.2 British Geological Survey Information

3.2.1 The available published maps indicated that the majority of the site is underlain by made ground of an unknown thickness. The natural soils within the site are indicated to be dominated by sands and gravels and may be in the region of 20m to 25m in thickness (Drawing No P20/457/DS/R/F/03 and 04). Historic trial pits excavated within the site, indicate concrete and brick hardstanding with underlying ash fill to approximately 1.25 m – 1.45 m depth. A historic borehole approximately 50 m to the east of the study area recorded ashy made ground to 1.50 m

underlain by medium dense silty fine to medium sand to a depth of 12.00 m at the base of the borehole. The underlying rock strata were indicated to comprise the Upper Limestone Group (Drawing No P21/102/DS/R/F/05) generally comprising sedimentary sandstones, siltstones and seams of limestone and coal. Depth to rockhead in the surrounding area is in the region of 20m to 25m. The geological survey map information indicates the site is not underlain by shallow mining (Drawing No P21/102/DS/R/F/06). This is discussed further in Section 5.0. The geological context is summarised in Table 4.

Table 4: Summary of Indicated Geological Context

Geological Unit	Typical description
Made Ground	Made ground is anticipated.
Raised granular beach deposits	Sand and Gravels
Rockhead	Depth to rockhead is unknown.
Rock Strata	Upper limestone group comprising sandstones, siltstones and seams of coal and limestone.
Economics	No economic seams are indicated to outcrop within the site. The Orchard limestone seam outcrops 15 m to the north of the site and is conjectured to potentially lie beneath the site at shallow depths however there is no evidence to suggest this has been worked beneath the site.
Groundwater (Aquifer)	'Minor or Moderately Permeable Aquifer' – rocks do not have high permeability.

3.3 Hydrogeology

3.3.1 The hydrogeological assessments of groundwater vulnerability indicate the rock strata to have no real potential as an aquifer, and we are unaware of any abstraction in the vicinity. However, it is possible that shallow groundwater will exist either within the made ground or natural soils. The Scottish Environmental Protection Agency (SEPA) provide guidance in document WAT-PS-10-01 'Assigning Groundwater Assessment Criteria for Pollutant Inputs' (August 2014) for assessing contamination risks to groundwater and the water environment. It is possible that groundwater within the superficial soils beneath the site will meet the minimum criteria to be classified as a water body i.e., an abstraction could achieve 10 m³ per day. Therefore, until proven otherwise, groundwater will be regarded as a sensitive receptor and would need to be assessed in the investigation of any contamination arising from the site.

3.3.2 Again, this is discussed later in relation to the land use and the potential for a contamination source to enter the groundwater systems. Based on the geological information, there could be systems of groundwater within the soils and at deeper levels within the rock strata. We consider that there are three distinct geological units that could influence the groundwater characteristics of the site: made ground, granular raised beach deposits and sedimentary bedrock. The typical permeabilities of each of these strata are recorded in Table 5.

Table 5: Typical Material Permeability

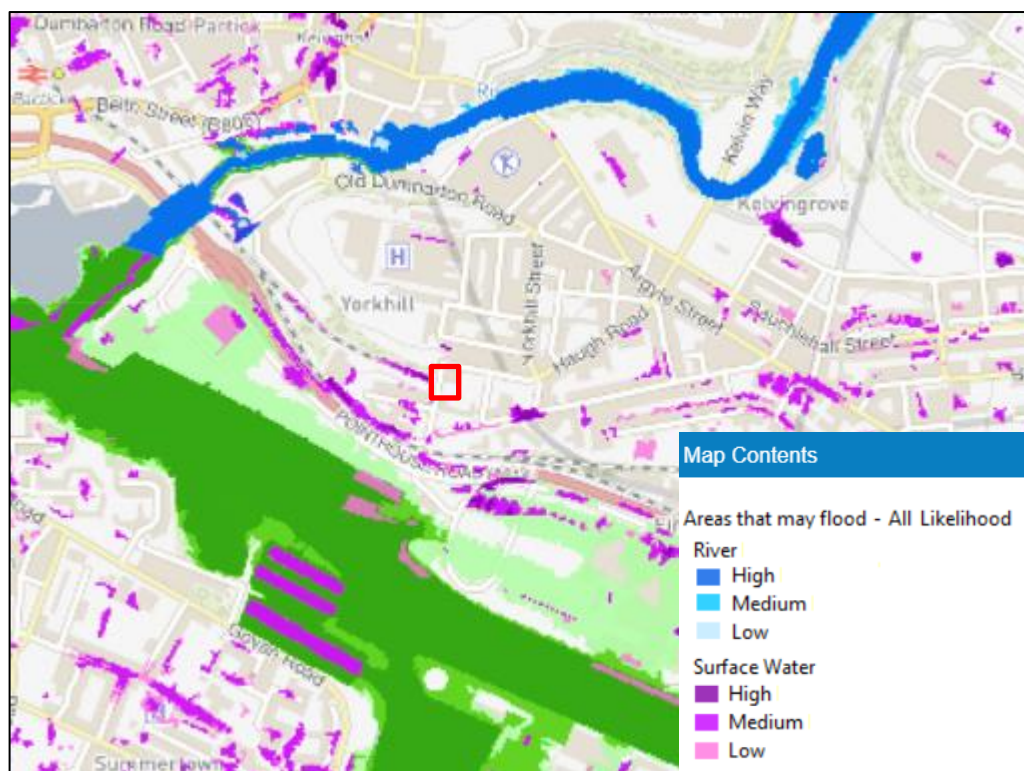
Material	Typical Permeability Range
Made Ground	Variable
Raised Beach Deposits (Granular)	Moderate to high
Sedimentary bedrock	Low

3.3.3 At present, surface run-off from the site would be considered to be high due to hardstanding and building cover across the site. The underlying soils were considered to comprise made ground of variable constituency and relatively permeable granular raised beach deposits. Consequently, infiltration of surface water would therefore be considered to be moderate.

3.4 Flood Risk

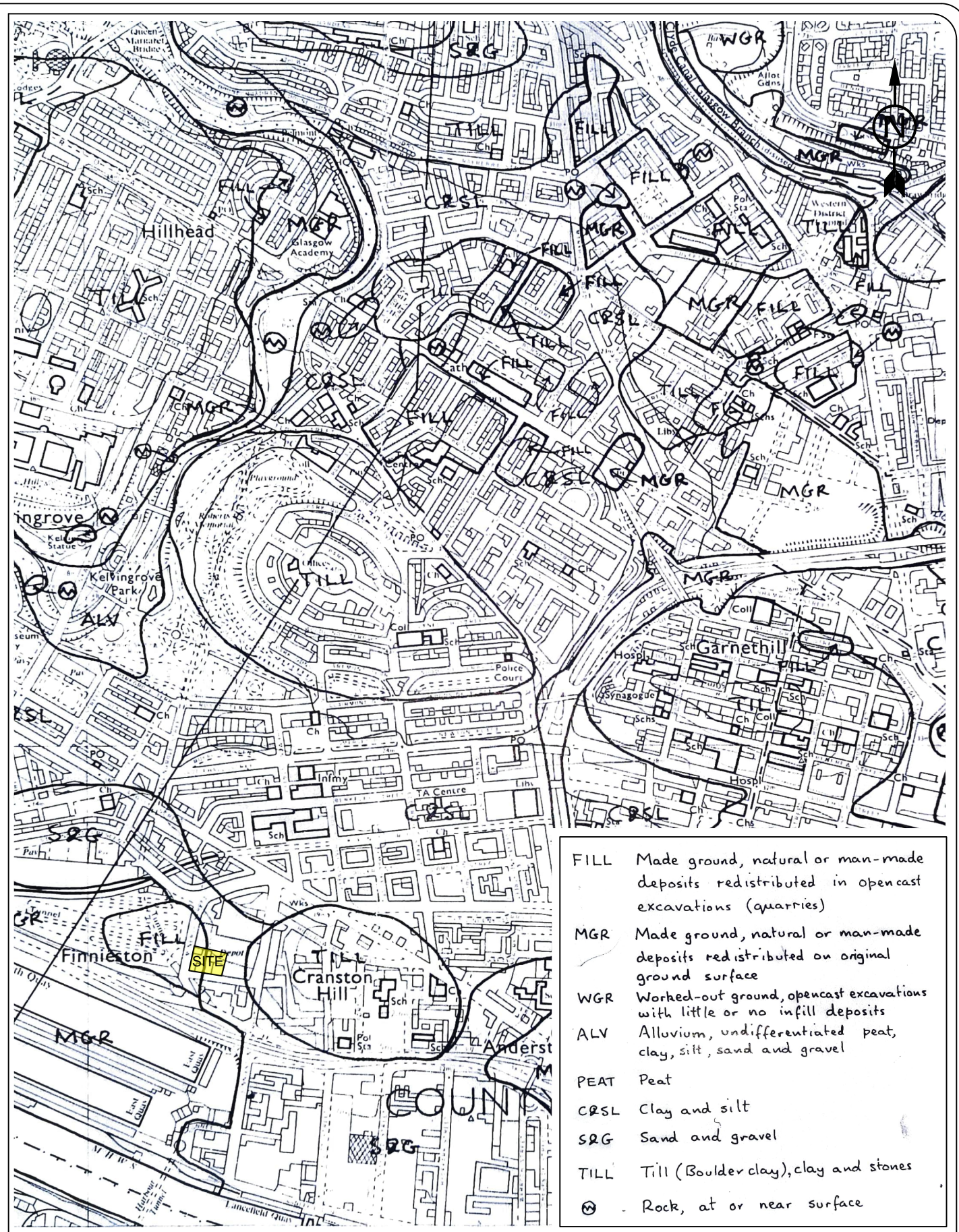
3.4.1 The Scottish Environmental Protection Agency has provided maps which indicate areas at risk from potential flooding. However, they highlight that the maps are for guidance only and they do not show where there could be the combined impacts of a river and coastal floods happening at the same time. As such, the map shown (Figure 2) is provided for initial guidance on the potential for flooding based on the SEPA Flood Map. In all such circumstances, detailed studies of flood risk are required for a more comprehensive assessment of potential flood risk within the site. In this particular instance, the map indicated the site to potentially be affected by surface water flooding in the west of the site of the site.

Figure 2: Extract from SEPA Flood Map



3.5 Invasive Plant Species

3.5.1 No visible evidence of invasive plant species was recorded during our recent site walkover.



- FILL Made ground, natural or man-made deposits redistributed in opencast excavations (quarries)
- MGR Made ground, natural or man-made deposits redistributed on original ground surface
- WGR Worked-out ground, opencast excavations with little or no infill deposits
- ALV Alluvium, undifferentiated peat, clay, silt, sand and gravel
- PEAT Peat
- CRSL Clay and silt
- SRG Sand and gravel
- TILL Till (Boulder clay), clay and stones
- ⊗ Rock, at or near surface



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client details:		NEVIS PROPERTIES LIMITED 90 MITCHELL STREET GLASGOW, G1 3NQ			
project title:		MINERVA STREET GLASGOW		drawing title: EXTRACT FROM PUBLISHED GEOLOGICAL SURVEY MAP (DRIFT LITHOLOGY)	
project no: P21/102	drawing no: P21/102/DS/R/F/03	revision:	date: 03.06.21	drawn by: RC	approved by: NT
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