

Newport Centre, Kingsway

Phase 1 Geoenvironmental Desk Study

Client: Newport City Council and Coleg Gwent

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- Appendix B – Envirocheck Report Data
- Appendix C – Site Photograph Record



1 Introduction

- 1.1.1 Cambria Consulting Limited were instructed by Kew Planning on behalf of Newport City Council and Coleg Gwent - hereafter known as 'the Client', to undertake a Phase 1 Environmental Assessment (Desktop Study) for a proposed redevelopment of the Newport Leisure Centre, off Usk Way, Newport.
- 1.1.2 The site is currently occupied by the existing Newport Centre and associated areas of parking, access roads and landscaping (see Photographs in Appendix C). The boundary of the site is generally open.
- 1.1.3 Outline permission for the redevelopment of the site for circa 54,000 sqm of flexible floorspace for Educational use, or any other use within Use Classes A1, A2, A3, B1, C1, D1 and D2, with all matters reserved.
- 1.1.4 A comprehensive desk study report has been produced to refine the requirements and scope of an intrusive investigation. The Desk Study also formulates an opinion as to the potential for geotechnical instability at the site and for hazardous substances (contamination) or conditions to exist on, at or near the site at levels or in a situation likely to warrant mitigation or consideration appropriate to the proposed end use.
- 1.1.5 The assessment has been undertaken by Cambria Consulting Limited who resourced available historical Ordnance Survey maps, geological maps and memoirs, desk study information, assessment and reporting.
- 1.1.6 This report represents the findings of the brief relating to the proposed end use as detailed in the text. The brief did not require an assessment of the implications for any other end use, nor is the report a comprehensive site characterisation and should not be construed as such. Should an alternative end use be considered, the findings of the assessment should be re-examined relating to this use.
- 1.1.7 Where preventative, ameliorative or remediation works are required, professional judgement will be used to make recommendations that satisfy the site-specific requirements in accordance with good practice guidance.
- 1.1.8 Consultation with regulatory authorities will be required with respect to proposed works as there may be overriding regional or policy requirements which demand additional work to be undertaken. It should be noted that both regulations and their interpretation by statutory authorities are continually changing.
- 1.1.9 This report represents the findings and opinions of experienced geo-environmental and geotechnical specialists. Cambria Consulting Limited do not provide legal advice which may also be required.

2 Desk Study, Walkover Survey and Preliminary Risk Assessment

The information presented in this section comprises a Preliminary Risk Assessment which presents information obtained from desk-based research that was used to inform decisions made in scoping the physical works.

2.1 Site Location and Description

- 2.1.1 The site is located off Usk Way, Newport. The National Grid Reference at the center of the site is E:331420, N:187880 with the site location presented on Figure 1 and an aerial view of the site shown on Inset 1 below.
- 2.1.2 The site is irregular in shape and covers an area of approximately 0.8Ha. Ground levels have been identified at around 9-10mAOD across the site, but at this stage are taken from Ordnance Datum records only.
- 2.1.3 The most significant surface water feature is the River Usk which is approximately 60m to the north east and separated from the site by a main highway (Usk Way), followed by the University of Newport campus buildings.
- 2.1.4 The site is bordered to the north and east by Usk Way, limited areas of landscaping and the River. Usk. To the south and west by commercial and residential areas associated with Newport City Centre.
- 2.1.5 The site is currently occupied by the existing Newport Centre and associated areas of parking, access roads and limited landscaping (see Photographs in Appendix C). The boundary of the site is generally open.



Figure 1 - Site location map

2.2 Site History

2.2.1 The site history has been assessed from a review of available historical Ordnance Survey County Series and National Grid maps. Additionally a series of historical aerial photographs provided by Envirocheck have also been included. Relevant extracts of the maps are presented in Appendix A. The site history has been assessed primarily from 1:2,500 scale mapping and where appropriate the descriptions expanded with 1:10,000 scale mapping. Where little or no pertinent changes are noted on the historical mapping, date ranges have been combined to provide a thorough yet concise description of site history.

Nb. Due to positional accuracy of some older mapping, some “wandering” of the historical map boundaries is noted, however, the descriptions provided below are based on the proposed development boundary.

Table 1: Review of Historical Plans

	On-Site	In Vicinity of Site
1883 – 1902	The majority of the site is indicated to be occupied by buildings and access roads. Annotations are unclear, however one building is indicated to be noted as a “Foundry” and from around 1902, an “Emlyn Iron Works”. Canal Parade and extensive railway lines, occupy the east portion. It is understood that “Canal Parade” was the former location of a Canal that predated available mapping (i.e pre- late 1800s).	<p>The areas to the west and east of the site are occupied by extensive railways, tramways and buildings associated with the River Usk wharves, which extend a significant distance up and downstream. The current “Usk Way” is noted to be called “Canal Parade” as prior to 1886, this is recorded to have been occupied by a canal.</p> <p>Beyond the railway lines the area is occupied by industrial and residential land use. The “Central Iron Works” is indicated approximately 200m south.</p> <p>Across the River Usk, a similar land use/layout is identified with the East Usk Oil Works, Ship Yards and Clarence Wharf Saw Mill indicated.</p>
1920 – 1947	The site is now indicated to be fully occupied by the Emlyn Iron Works and residential buildings.	No significant changes are indicated in the immediate vicinity of the site. The former oil works across the river is indicated to be the Newport Corporation Electric Power Station and the Central Iron Works, now the Central Engineering Works.

1955 1956	-	The site is now shown to be occupied by a warehouse, residential properties and a fireplace works.	A sand and gravel yard is indicated approximately 20m to the east. A number of travelling cranes are indicated to the south east of the site. A series of “issues” are noted along the river bank adjacent to the site. The engineering works to the west is now annotated as a Road Haulage Depot.
1965 1983	-	The residential buildings and railway lines are no longer indicated, and a car park is now shown to occupy the east portion. Mapping from 1983, indicates the site to be vacant.	Engineering and electrical works are indicated to the north, with further engineering works to the south. The travelling cranes are no longer indicated to the south east. The area to the east of the site is indicated to have been extended into the river channel, suggesting an area of land has been reclaimed from the river. From 1970, the area of railway/tramways to the west is now indicated to be a road (Parish Road) and car park. A bridge (George Street Bridge) is indicated approximately 100m to the south. From around the late 1990s, the area to the south is now longer indicated as an engineering works and is now indicated as a Bingo Centre and associated car park. General development of Newport City Centre is indicated to the north and west.
1987 Present day	-	The existing Newport Centre (Leisure Centre) is indicated on mapping from ~1987 and identifies its current layout.	No significant changes are indicated.

2.3 Site Walkover

2.3.1 A site walkover survey was undertaken on the 14th of June 2022 as part of this Desk Study compilation. The site is generally indicated to be fully occupied by the existing Newport (Leisure) Centre, areas of parking, access roads and limited hard standing. Very little of the site is unoccupied by the existing use, which we understand to comprise a leisure center, swimming pool, and convention/event facilities. During the walkover a number of structures were identified linked to power/heating the existing building and these included a substation, stored gas bottles and a possible gas governor in the east portion and what appeared to be water treatment/storage tanks and air conditioning units in the south east portion (see photographs in Appendix C).

A general aerial view of the site is presented on Figure 2 below and additional photographs provided in Appendix C

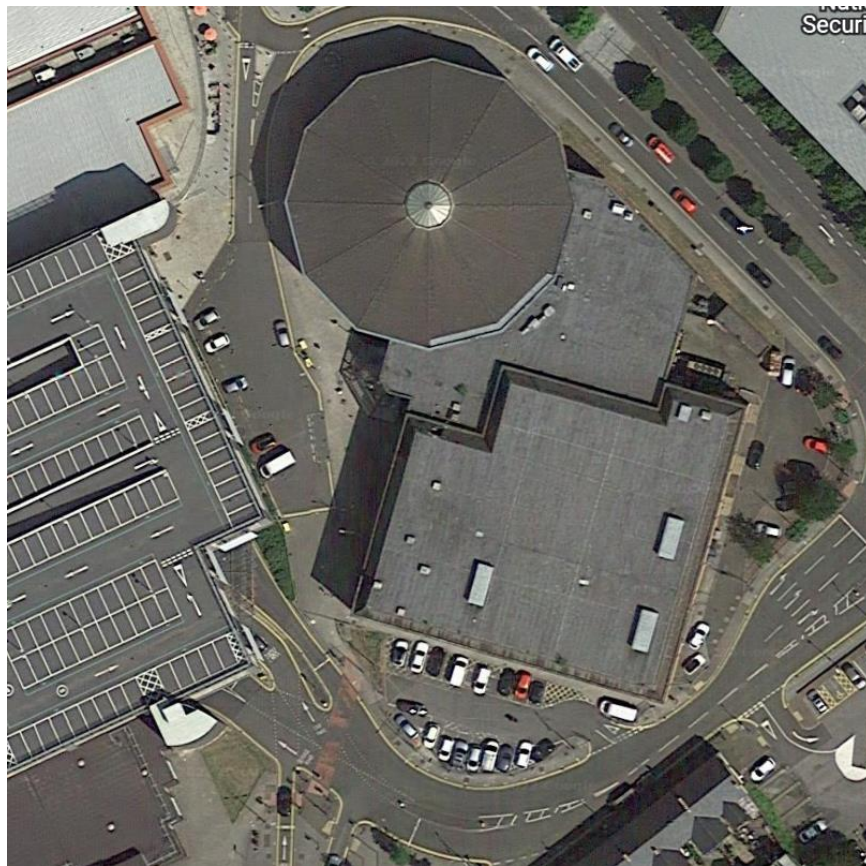


Figure 2 – Aerial View of Site

2.4 Geology, Hydrology and Hydrogeology

- 2.4.1 The geological mapping for the site (Sheet ST38SW, 1:10,560) indicates the site to be underlain by Tidal Flat Deposits, comprising Clays and Silts, overlying bedrock of the St Maughans Formation (Sandstone/Mudstone of Devonian Age). Based on the history of the site, a potentially significant cover of Made Ground is also anticipated in some or all areas of the site, particularly toward the east, which may have been reclaimed from the River Usk. Whilst not commonly recorded on mapping, a horizon of dense Fluvioglacial Deposits are frequently recorded between the Tidal Flats and St Maughan's Group bedrock in the area.
- 2.4.2 The British Geological Survey (BGS) borehole database has been consulted for available records in the vicinity of and on the site. No pertinent borehole information is available for the site or the areas immediately surrounding the site, however, boreholes identified further afield from the site and adjacent to the river, generally record the geology identified on the BGS mapping.
- 2.4.3 The nearest major surface water feature to the site is the River Usk which flows from north west to south east, approximately 60m north east of the site. The River Usk is a major river and is significantly affected by the tides of the Bristol Channel. In addition to this the River Usk is classified as a Site of Special Scientific Interest (SSSI) and a Special Area of Conservation (SAC).
- 2.4.4 Reference to the aquifer maps published on the Environment Agency website (EA) indicates that the Tidal Flat deposits are classed as Unproductive Strata, whilst the St Maughan' Groups Formation are classed as Secondary A. If present the Fluvioglacial Deposits will likely be classified as a Secondary B/A aquifers.

- ▶ Unproductive Strata are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow.
- ▶ Secondary A (generally corresponding with previously classified “minor aquifers”) – permeable layers capable of supporting water at a local rather than strategic scale and in some cases form an important base flow to rivers.
- ▶ Secondary B (generally corresponding with previously classified water bearing parts of “non-aquifers”) – lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering.

2.4.5 Perched water bodies within the Made Ground are anticipated; however, hydraulic connection is likely to be limited and discontinuous.

2.5 Contact with Regulatory Bodies & Local Information Sources

2.5.1 Due to the confidential nature of the project, at this time, no applications for information have been made to the Local Authority.

2.6 Environmental Setting

2.6.1 The site exists in a historically urban/industrial and now an urban setting.

Table 2: Summary of Envirocheck Data

Item	On the Site	In the Immediate Vicinity
Discharge Consents	None identified in Envirocheck Report.	2no. recorded between the site boundary and 250m from the site. 5no. recorded between 250m and 500m from the site.
Local Authority Pollution Prevention and Controls	None identified in Envirocheck Report.	3no. recorded between 250m and 500m from the site.
Pollution Incidents	None identified in Envirocheck Report.	7no. recorded between 250m and 500m from the site.
Contemporary Trade Directory Entries	None identified in Envirocheck Report, however, Newport Centre (leisure facility) is present on site.	41no. recorded between the site boundary and 250m from the site. A further 85no. recorded between 250m and 500m.
Water Abstractions/Protection Zones	None identified in Envirocheck Report.	None recorded within 500m.

Sensitive Land Uses	None identified in Envirocheck Report.	1no. recorded within 60m of the site. The River Usk is recorded as a Site of Special Scientific Interest and a Special Area of Conservation.
Radon	The site is in an area where 1% to 3% of homes are estimated to be at risk of Radon. The Envirocheck report states no protection measures are required.	
Landfill Sites & Waste Management Facilities	1no. identified on site. Recorded as operated by Douglas Plant Ltd. And lapsed since 1980. Authorised acceptance of hardcore and rubble (inert) waste produced on site.	Registered landfill sites are record within ~220m (to the south east) of the site and these may be associated with the historical reclamation and filling of areas reclaimed from the River Usk.
BGS Recorded Mineral Sites	None identified within Envirocheck report.	None identified within 500m of the site.
Fuel Station Entries	None identified within Envirocheck report.	None identified within 250m of the site.

2.7 Anticipated Site Hazards

- 2.7.1 Flooding from Rivers and Seas – Reference to available Natural Resources Wales data and Envirocheck data indicates that the site is not at risk of flooding from rivers or seas, however, the most easterly point of the site is indicated to be adjacent to areas of extreme flooding (see Figure 3). No further assessment of flood risk has been undertaken at this stage but may be required as part of detailed design/planning.
- 2.7.2 Surface Water (Pluvial) – Information available on the NRW website and within the Envirocheck report, indicates that the south and west boundaries of the site are at low to high risk of pluvial flooding (see Figure 4). The proposed development's surface water management strategy will be required to demonstrate that disposal of run-off is achieved without adverse flood risk impacts on surrounding properties. The incorporation of flow controls and associated attenuation measures will likely be required to restrict off-site peak discharge rates. System design parameters and performance criteria remains subject to consultation with the Natural Resources Wales and respective water authorities.
- 2.7.3 The potential for SUDs could also be considered as they can offer amenity, environmental and ecological enhancements to the development, however, their use may be dependent on the presence of condition of underlying Made Ground.
- 2.7.4 Groundwater – The Envirocheck report does not indicate the potential for susceptibility to flooding from groundwater.
- 2.7.5 No further assessment of flood risk from any of the sources outlined above, has been considered at this stage.

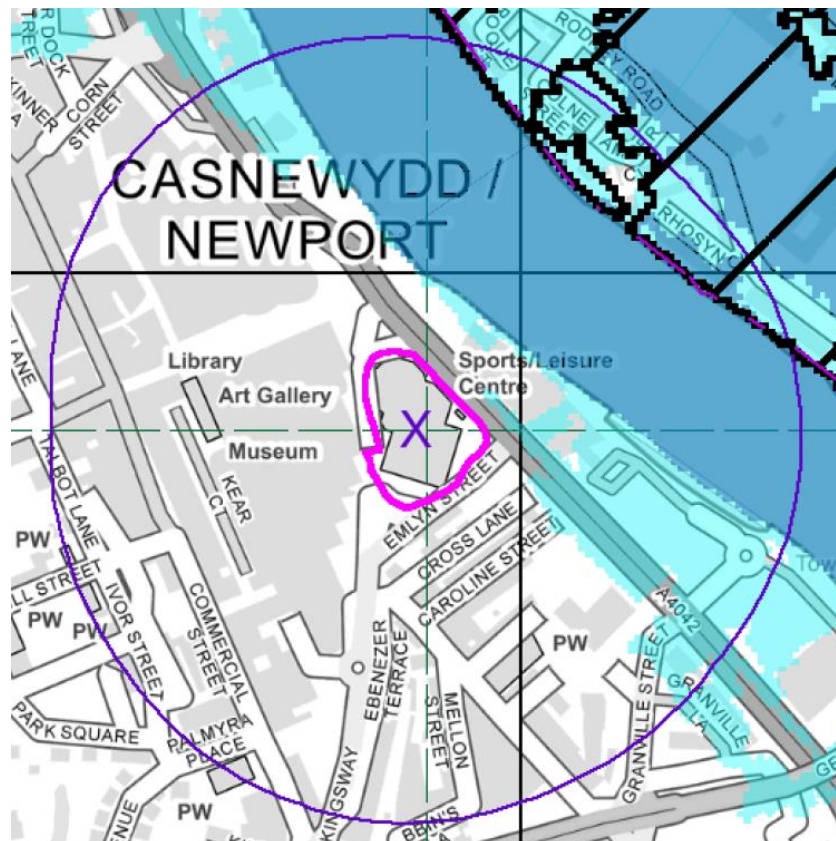


Figure 3 – Risk of Flooding from Rivers and Seas

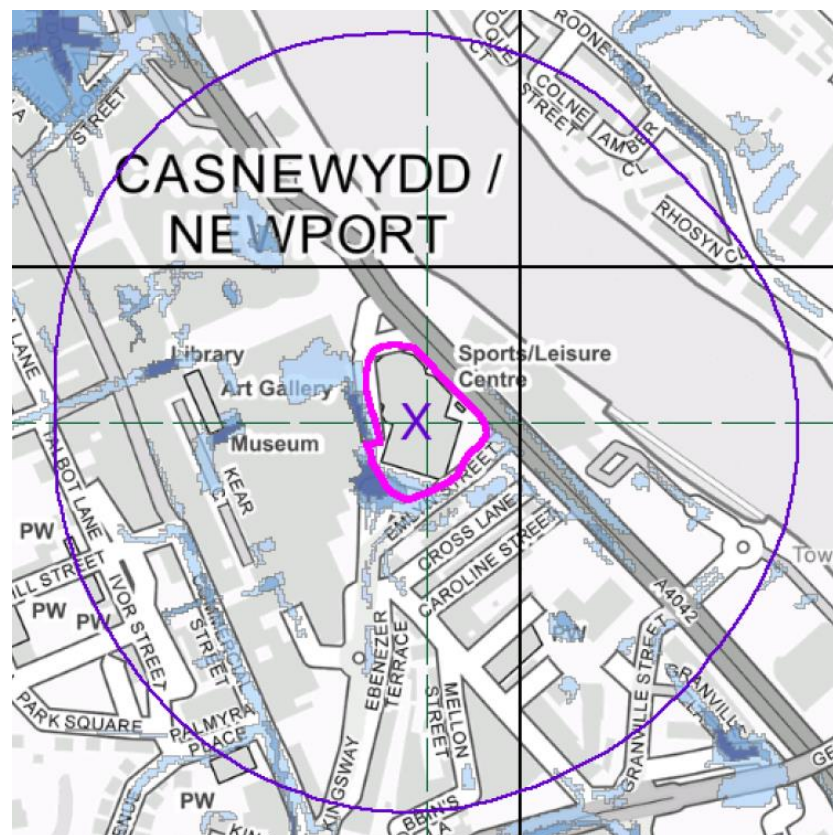


Figure 4 – Risk of Flooding from Surface Water

- 2.7.6 The site is not in area where Limestone Solution features are anticipated.
- 2.7.7 The site is not in an area indicated to be at risk from land slipping.
- 2.7.8 The site is in an area where infilling has likely occurred in the form of land reclamation from the River Usk and a Canal.

2.8 Geomorphology

The existing topography and geomorphology at the site have evolved over a period of many, perhaps sixty to seventy millions of years under a number of different erosional regimes. However, the original geomorphology of the area has been altered by man's activities, in particular:

- ▶ The previous uses of the site as a foundry, works, warehouse, residential use, canal, highway and railway lines.
- ▶ Likely infilling/land filling as a result of reclamation from the River Usk and operation of historic inert landfill on site;
- ▶ Land in the east, historically recorded as a canal and railway land;
- ▶ Reclamation of land to the east from the River Usk;
- ▶ Historical adjacent land uses including engineering works, gravel pits, oil works, iron works;
- ▶ The development of existing, local buildings;
- ▶ Development of local residential, commercial and industrial areas;
- ▶ Development of local infrastructure.

2.9 Archaeology

- 2.9.1 No assessment of archaeology has been undertaken and we understand that if necessary this aspect is will be addressed by others.

2.10 Unexploded Ordnance

- 2.10.1 No assessment of unexploded ordnance (UXO) has been undertaken, however, the site is an area recorded at high risk from UXO and any intrusive works (investigation/development) would be required to consider this aspect further.

2.11 Previous Investigations and Assessments

- 2.11.1 We are not aware of any previous investigations undertaken at the site.

2.12 Anticipated Site Contamination & Migration Pathways

- 2.12.1 Desk Study information suggest that the site has been occupied with and surrounded by potentially contaminative land uses since at least the late 1800s. These land uses have included:
 - ▶ Use of the site as a foundry, works, warehouse, residential use, canal, highway and railway lines;

- ▶ Likely infilling/land filling in the east portion and off site land to the east as a result of reclamation from the River Usk and on site inert landfilling.
- ▶ Land in the east portion, historically recorded as likely within and old canal and railway land;
- ▶ Historical adjacent land uses including engineering works, gravel pits, oil works, iron works.

2.12.2 At present contamination at the site is likely to be present within any Made Ground that is present at the site, with there also being a high potential for contaminant migration vertically and laterally into natural soils and sensitive features (aquifers, the River Usk etc.).

2.12.3 Potential contaminants, listed below, have been identified as likely to be present, assisted by information presented within the EA/DEFRA document Potential Contaminants for the Assessment of Land - CLR8. Based on the previous land uses, the following contaminants could potentially be present: Cadmium, Chromium, Copper, Lead, Nickel, Vanadium, Zinc, Boron, Free Cyanide, Nitrate, Sulphur, Sulphate, Organolead Compounds, Asbestos, Oil/fuel hydrocarbons, PAHs, Aromatic Hydrocarbons, Chlorinated Aliphatic Hydrocarbons, MTBE and PCBs.

2.13 Development Considerations

2.13.1 Outline permission for the redevelopment of the site for circa 54,000 sqm of flexible floorspace for Educational use, or any other use within Use Classes A1, A2, A3, B1, C1, D1 and D2, with all matters reserved.

2.14 Preliminary Risk Evaluation & Plausible Pollutant Linkages

2.14.1 The land use history of the site and surrounding area, as established from the desk study, has identified the potential for significant contamination sources, with the site located above Secondary A and B aquifers and adjacent to a SSSI (the River Usk).

2.14.2 The methodology set out in CIRIA C552 (2001), Contaminated Land Risk Assessment – A guide to Good Practice, has been used to assess whether or not risks are acceptable, and to determine the need for collating further information or remedial action.

2.14.3 Whilst at a later stage, this methodology may be informed by quantitative data (such as laboratory test results) the assessment is a qualitative method of interpreting findings to date and evaluating risk. The methodology requires the classification of:

- ▶ The magnitude of the potential consequence (severity) of risk occurring (defined below);
- ▶ The magnitude of the probability (likelihood) of risk occurring (defined below).

Table 3 Classification of Consequence

Classification	Definition	Examples
Severe	<ul style="list-style-type: none"> • Short-term (acute) risk to human health likely to result in <i>Significant Harm</i>. • Short-term risk of pollution to a sensitive water resource. • Catastrophic damage to buildings/property. • Short-term risk to ecosystem, or organism forming part of that ecosystem. 	<ul style="list-style-type: none"> • High concentrations of Cyanide at surface of informal recreation area. • Major spillage of contaminants from site into controlled water. • Explosion causing building collapse.
Medium	<ul style="list-style-type: none"> • Chronic damage to human health. • Pollution of sensitive water resource. • A significant change to ecosystem, or organism forming part of that ecosystem. 	<ul style="list-style-type: none"> • Contaminant concentrations exceed assessment criteria. • Leaching of contaminants to Secondary A aquifer. • Death of species within nature reserve.
Mild	<ul style="list-style-type: none"> • Pollution of non-sensitive water resources. • Significant damage to crops, buildings, structures. • Damage to sensitive buildings, structures or the environment. 	<ul style="list-style-type: none"> • Pollution of Secondary A groundwater sources. • Damage to building rendering it unsafe to occupy.
Minor	<ul style="list-style-type: none"> • Harm, although not necessarily significant harm, which may result in financial loss, or expenditure to resolve. • Non permanent risks to human health (easily prevented by means of PPE). • Easily repairable effects of damage to buildings and structures. 	<ul style="list-style-type: none"> • The presence of contaminants at such concentrations that PPE is required during site works. • The loss of plants in a landscaping scheme. • Discoloration of concrete.

Table 4 Classification of Probability

Classification	Definition
High Likelihood	There is a pollutant linkage and an event that either appears very likely in the short term and almost inevitable over the longer term. Or, there is already evidence at the receptor of harm or pollution.
Likely	There is a pollution linkage and all the elements are present and in the right place, meaning that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short term and likely over the longer term.
Low Likelihood	There is a pollutant linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a longer period such an event would take place, and is less likely in the shorter term.
Unlikely	There is a pollutant linkage, but circumstances are such that it is improbable that an event would occur, even in the very long term.

The classifications defined above are then compared to indicate the risk presented by each pollutant linkage, allowing evaluation of a risk category.

Table 5 Risk Categories – Comparison of consequence against probability

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

Table 6 Description of Risk Categories

Classification	Description
Very High Risk	<ul style="list-style-type: none"> • There is a probability that severe harm could arise to a designated receptor from an identified hazard. Or, there is evidence that severe harm to a designated receptor is currently happening. • The risk, if realised, is likely to result in a substantial liability. • Urgent investigation (if not already undertaken) and remedial action are likely to be required.
High Risk	<ul style="list-style-type: none"> • Harm is likely to arise to a designated receptor from an identified hazard. • Realisation of the risk is likely to present a substantial liability. • Urgent investigation (if not already undertaken) is required, and remedial action may be necessary in the short term and are likely over the longer term.
Moderate Risk	<ul style="list-style-type: none"> • It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, or if any harm were to occur, it is more likely that the harm would be mild. • Investigation (if not already undertaken) is normally required to clarify the risk and to determine potential liability. Some remedial action may be required in the longer term.
Low Risk	<ul style="list-style-type: none"> • It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild.
Very Low Risk	<ul style="list-style-type: none"> • There is a very low possibility that harm could arise at a receptor. In the event of such harm being realised, it is not likely to be severe.

The methodology described above has been used to establish Plausible Pollutant Linkages and to evaluate the risks posed by those linkages, using information known about the site, at this stage.

2.15 Plausible Pollutant Linkages

Source	Pathway	Receptor	Classification of Consequence	Classification of Probability	Risk Category	Further Investigation or Remedial Action to be Taken
Covering of Made Ground (potentially thick) across the site associated with previous on site and surrounding development as outlined in Section 2.11. Including inert landfilling, historic canal, railway lines and industrial buildings.	Direct contact/ Inhalation/ Ingestion of contaminated soil or dusts.	Site uses/visitors.	Medium – potential for elevated levels.	High likelihood based on potential contaminative features identified.	High Risk	Further investigation to establish presence and thickness of Made Ground and contamination status, be undertaken, as described within Section 3.0.
	Direct contact/ Inhalation/ Ingestion of contaminated soil or dusts.	Construction and Maintenance workers.	Medium – potential for elevated levels.	High likelihood based on potential contaminative features identified.	High Risk	
	Leaching of soil contaminants.	Impact on Controlled Waters.	Medium – due to the underlying Secondary A and B Aquifers.	High likelihood based on potential contaminative features identified.	High Risk	
	Leaching of soil contaminants.	Impact on surface waters.	Medium. Potential for impact of nearby surface waters such as the River Usk.	High likelihood based on potential contaminative features identified.	High Risk	
	Damage to building materials by aggressive ground.	Building/property.	Medium – Owing to potential aggressive ground.	Likely – Aggressive ground conditions potentially present where Made Ground is anticipated.	Moderate Risk	



Source	Pathway	Receptor	Classification of Consequence	Classification of Probability	Risk Category	Further Investigation or Remedial Action to be Taken
Ground gas generated by general Ground, in particular Made Ground associated with the former on site landfill and canal and surrounding contaminative land uses identified in Section 2.11.	Asphyxiation/poisoning. Injury due to explosion.	Site users/visitors.	Severe – acute risk.	High Likelihood – significant evidence for ground gas sources.	Very High Risk	To be further assessed dependent on ground conditions identified and potential for ground gas generating materials, alongside ground gas monitoring.
	Damage through explosion.	Building/property	Severe – acute risk.		Very High Risk	



3 Preliminary Assessment of Hazards Identified

3.1 Geoenvironmental Considerations

- 3.1.1 Desk Study information suggests that the site has been developed since at least the late 1800s and has been occupied with previous uses that include a foundry, works, warehouse, residential use, canal, highway and railway lines. There is also a high likelihood for infilling/land filling as a result of reclamation from the River Usk and operation of a historic inert landfill on site.
- 3.1.2 In addition to this there is a potential for the infilling/land filling in the north east portion and off site to the east as a result of reclamation from the River Usk. Historical adjacent land uses also include engineering works, gravel pits, oil works and iron works.
- 3.1.3 At present contamination at the site is likely to be present within any Made Ground, with there also being a high potential for contaminant migration vertically and laterally into natural soils and sensitive features (aquifers, the River Usk etc.).
- 3.1.4 Based on the information obtained as part of this Desk Study Assessment none of the historical uses or features identified need preclude redevelopment of the site, however, significant detailed consideration of the contamination potential and the requirement for potential remedial options would need to be assessed based on contemporary ground investigation information.
- 3.1.5 Ground investigation and geoenvironmental assessment would be required to provide design data for detailed assessment of ground contamination at the sites. These requirements are discussed further in Section 4.0.

3.2 Geotechnical Conditions

- 3.2.1 A, potentially, significant cover of Made Ground may be present across the site, including where infilling/land filling may have occurred. This Made Ground will likely be underlain by deep, low strength Tidal Flat Deposits. These deposits will be unlikely suitable for use as competent founding stratum.
- 3.2.2 The probable presence of the deeper underlying Fluvioglacial Deposits and deeper St Maughan's Group will likely provide competent founding strata and dependent on the ground conditions encountered, consideration will need to be given to the use of ground improvement techniques or piled foundations, dependent on final scheme designs/layout/loadings.



4 Recommendations

4.1 Potential Contamination Hazards

- 4.1.1 Based on the identified history of the site and surrounding areas, ground investigation and geoenvironmental assessment should be undertaken to establish the ground conditions and contamination potential at the site.
- 4.1.2 Based on the anticipated ground conditions, a detailed series of investigation works are likely to be required, including trial pits, windowless sampling/dynamic probing and light cable percussion boreholes supported by ground gas monitoring, geoenvironmental testing (soils and leachate) and reporting. This will likely need to be phased and dependent on access within/around the existing building.
- 4.1.3 It should be noted that dependent on emerging conditions, it may be necessary to undertake detailed geoenvironmental assessment, including of the risk posed to Controlled Waters and detailed gas monitoring. It should be noted that in cases where a high ground gas risk is identified, this can preclude certain end uses.
- 4.1.4 Enquiries should also be made directly to Newport Council to obtain any information they hold on the site, particularly to confirm the information supplied to Envirocheck regarding filled land.

4.2 Potential Stability Hazards

- 4.2.1 Thick Made Ground and Tidal Flat Deposits are likely to lead to unacceptable differential settlement of new structures. The use foundations are likely and the presence of coarse Fluvioglacial Deposits and the and deeper St Maughan's Group will likely provide competent founding strata. It would be prudent to engage early with piling contractors to ensure that site investigation can obtain any information that they may require as part of their design.
- 4.2.2 The ground investigation outlined for contamination aspects (above) would also provide preliminary design data for assessment of stability and foundation recommendations.
- 4.2.3 This report has not considered the impact of archaeology, unexploded ordnance, ecology or invasive species and the requirement for an assessment of these aspects should be addressed as part of detailed design.



5 References

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Appendix A: Extract from Historical Maps



Appendix B: Envirocheck Report



Appendix C: Site Photos

