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Our Ref: **108348/OG/JA/L8**
Date: **23rd May 2016**

Adam Desborough
Glen Howells Architects
321 Bradford Street,
Birmingham
B5 6ET

Dear Adam,

108348 – Lincoln House/123 Deansgate, Manchester
Planning Application Number 110078/FO/2015/C1 – Condition 11

ABERDEEN
BIRMINGHAM
BLACKBURN
BRISTOL
DUNDEE
EDINBURGH
ELGIN
GLASGOW
INVERNESS
LEEDS
LONDON
MANCHESTER
NEWCASTLE
SEVENOAKS
SHEFFIELD
TAUNTON
WATFORD

The following statements have been prepared in order to discharge Conditions 11 of the above referenced planning application.

11) Piling or any other foundation designs using penetrative methods shall not be permitted other than with the express written consent of the Local Planning Authority, which may be given for those parts of the site where it has been demonstrated that there is no resultant unacceptable risk to groundwater. The development shall be carried out in accordance with the approved details.

The proposed development is to comprise the demolition of the 2 existing multi storey buildings with piled foundation and construction of a new 12 storey tower block. In order to accommodate the high column loads piled foundation will be required. Based on the ground conditions identified the current proposals are to utilise Continuous Flight Auger (CFA) pile technique to between approximately 10m to 15m below existing ground levels found within the sandstone bedrock.

A Phase II Site Investigation (108348/03A) was undertaken on site to establish the soil profile, to develop a conceptual model, to develop an environmental risk assessment and to discharge condition 10 of the planning application.

During the site investigation the following soil profile was identified in the basement of Lincoln House;

- Concrete floor slab to between 300mm to 450mm
- Made Ground as brick and concrete fill to between 1.1m and 1.7m
- Numerous concrete obstructions encountered between 0.7m and 1.45m. Concrete proven to 2mbgl at one location (550mm thick) and down to 5.7m at a second location (possible pile)
- Bedrock as very weak to weak sandstone locally recovered as very dense sand proven to 20m
- Groundwater strike encountered at 6.2m below basement level (approximately 25.85mAOD) during the rotary drilling. During long term groundwater monitoring a water level of between 8.03m (24.02mAOD) and 10.0m below basement level (22.05mAOD) was recorded.
- No visual or olfactory signs of contamination identified during the site investigation

The potential implication of contamination on the subject site has been considered in terms of the planning process.

The statutory guidance sets out the definition of contaminated land within the context of Government Policy including the 'suitability of use' approach. Action is necessary only where there are unacceptable risks to human health or the environment, taking into account the current land and its environmental setting.

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

- **Source**: Substances that are potential contaminants or pollutants that may cause harm.

Chairman: R B McCracken *Senior Partner:* R Bryson
Partners: A J Connell M Peden P A Ridge P McMillan A R Milne G L Bruce D J Clayton I McKay J M Message P D Ward N M McSpadden A J Scott-Kiddie C A Clark S J Holmes J Lau
Financial Partner: M J Cullen

- **Pathway**: A potential route by which contaminants can move from the source to the receptor.
- **Receptor** or target: A receptor that may be harmed (for example the water environment, humans, flora and fauna).

Each of these elements can exist independently. They create a risk only where they are linked together, so that a particular contaminant affects a particular receptor via one of more pathways. This kind of linked combination of source - pathway - receptor is described as a pollutant linkage.

In order to assess the contamination risk at the subject site an assessment of pollutant linkages has been undertaken and is discussed in the following sections.

Sources

The following sources have been identified on site;

- No elevated concentrations of heavy metals, organics or inorganics within the made ground
- Localised asbestos fibres within the made ground
- Marginally elevated Diesel Range Organics (DRO) and Lube Range Organics (LRO) above the obsolete Drinking Water Standard identified the within the groundwater at depth.
- Though elevated compared to the obsolete DWS the concentrations are comfortably below the DW2 class threshold values specified in the Surface Water (Abstraction for Drinking Water). In addition there are no groundwater abstraction points within 1km of the site.

Pathways

The following potential pathways have been identified:

- Inhalation
- Ingestion
- Dermal Contact
- Leaching and Lateral Migration
- Surface Run-off
- Direct Contact
- Root Uptake
- Accumulation in confined spaces
- Existing and proposed piles

Receptors

The following receptors have been identified;

- Site end users
- Construction Workers
- Adjacent Land Users
- Groundwater (Principle Aquifer)
- Buried Concrete
- Services

Refined Pollution Linkages

Pollution linkages based on the identified soil and ground gas hazards have been undertaken with respect to the pathways and receptors. A summary table of the expected level of risk from the identified hazards is presented in Table 1 (On Site Sources) and Table 2 (Off Site Sources).

Risk classifications used are detailed in Tables 3 - 6 contained within **Appendix B**.

Table 1 – Refined On Site Pollution Linkages

Source	Pathway	Receptor	Con.	Prob.	Risk	Are Mitigation Measures required?
General Made Ground	Ingestion, Inhalation and Dermal Contact	Future Site Users	**Md**	**Ul**	**L**	No
		Construction Workers	**Md**	**Lw**	**M/L**	Yes - Construction workers should adopt appropriate health and safety measures and use of appropriate PPE during any earthworks operations.
		Adjacent Land Users	**Md**	**Ul**	**L**	Yes - Dust suppression measures required to prevent fugitive dusts migrating to the adjacent land during construction phase.
	Leaching and Lateral Migration	Principle Aquifer	**Md**	**Ul**	**L**	No
	Existing and proposed piles	Principle Aquifer	**Md**	**Ul**	**L**	No.
	Direct Contact	Buried Concrete	**Mi**	**Lw**	**L**	Yes - Buried concrete should be designed in accordance with BRE special publication
		Services	**Mi**	**Lw**	**L**	No
	Direct contact & Root Uptake	Landscaping	**Mi**	**Lw**	**L**	No
Elevated groundwater contamination	Leaching and Lateral Migration	Principle Aquifer	**Md**	**Ul**	**L**	No.
Existing Built Development - Potential Asbestos Containing Materials.	Inhalation	Future Site User	**Sv**	**Ul**	**M/L**	No.
		Construction Worker	**Sv**	**Lw**	**M**	Asbestos survey required before pre demolition. Any asbestos identified to be removed by a specialist contractor.
Asbestos in made ground	Inhalation	Future Site User	**Sv**	**Ul**	**M/L**	No. Made ground will be confined beneath hardcovers.
		Construction Worker	**Sv**	**Lw**	**M**	Yes - Construction workers should adopt appropriate H&S measures and use of appropriate PPE during any earthworks operations.
		Off site land Users	**Sv**	**Ul**	**M/L**	Yes. Damping down to be undertaken during earthworks to prevent dust migration. Covered lorries to be used to remove material from site.
Ground gases	Inhalation	Future Site Users	**Md**	**Ul**	**L**	No - the site is classified as Characteristic Situation 1.
		Construction Workers	**Md**	**Lw**	**M/L**	Yes - Ground gas monitoring should be undertaken before man entry into void spaces.
Historical use of the site as print works.	Ingestion, Inhalation, Dermal Contact	Future Site Users	**Md**	**Ul**	**L**	No. No elevated concentrations of contamination identified.
		Construction Workers	**Md**	**Lw**	**M/L**	Yes. Construction workers should adopt appropriate health and safety measures and use of appropriate PPE during any earthworks operations
		Adjacent Land Users	**Md**	**Ul**	**L**	No.
	Leaching, Migration, and Surface run-off	Principle Aquifer	**Md**	**Ul**	**L**	No
	Existing and proposed piles	Principle Aquifer	**Md**	**Ul**	**L**	No

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Table 2 - Refined Off Site Pollution Linkages

Source	Pathway	Receptor	Con.	Prob.	Risk	Are Mitigation Measures required?
Historical and present land use as works, hospital and warehouses.	Ingestion, Inhalation, Dermal Contact	Future Site Users	**Md**	**Ul**	**L**	No
		Construction Workers	**Md**	**Ul**	**L**	No
	Leaching, Migration and Surface run-off	Principle Aquifer	**Md**	**Ul**	**L**	No

After CIRIA Report C552, Contaminated Land Risk Assessment A Guide To Good Practice, 2001

KEY: **Consequence**: Sv = Severe, Md = Medium, Mi = Mild, Mr = Minor
Probability: Hi = High likelihood, Li = Likely, Lw = Low Likelihood, Ul = Unlikely
Risk: VH = Very High, H = High, M = Moderate, M/L = Moderate/Low, L = Low, VL = Very Low

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Based on the refined environmental risk assessment piling does not represent a risk to groundwater.

Yours sincerely



Owain Gwilym
Geo Environmental Engineer

Email: owain.gwilym@fairhurst.co.uk

Appendix A

Drawings

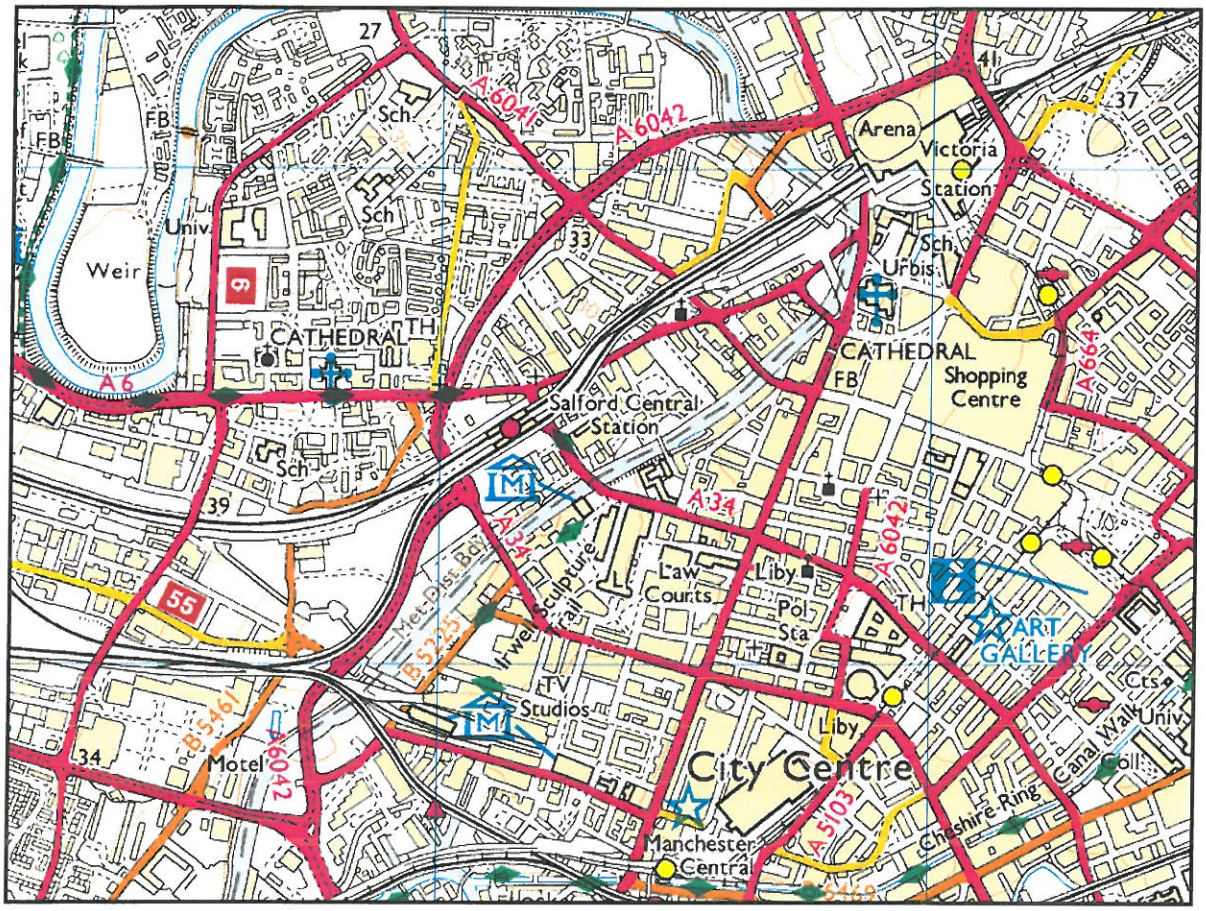

Figure 1 - Location Plan

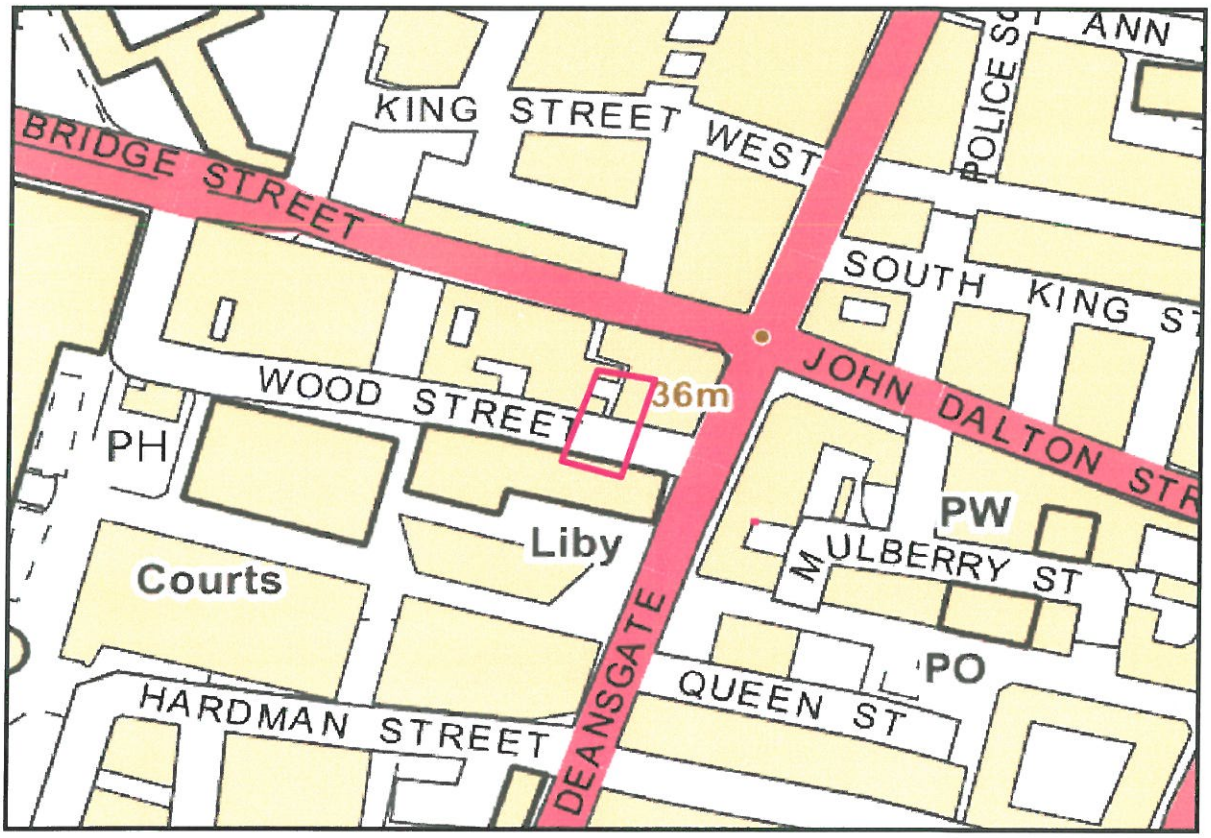

Figure 2 - Site Plan

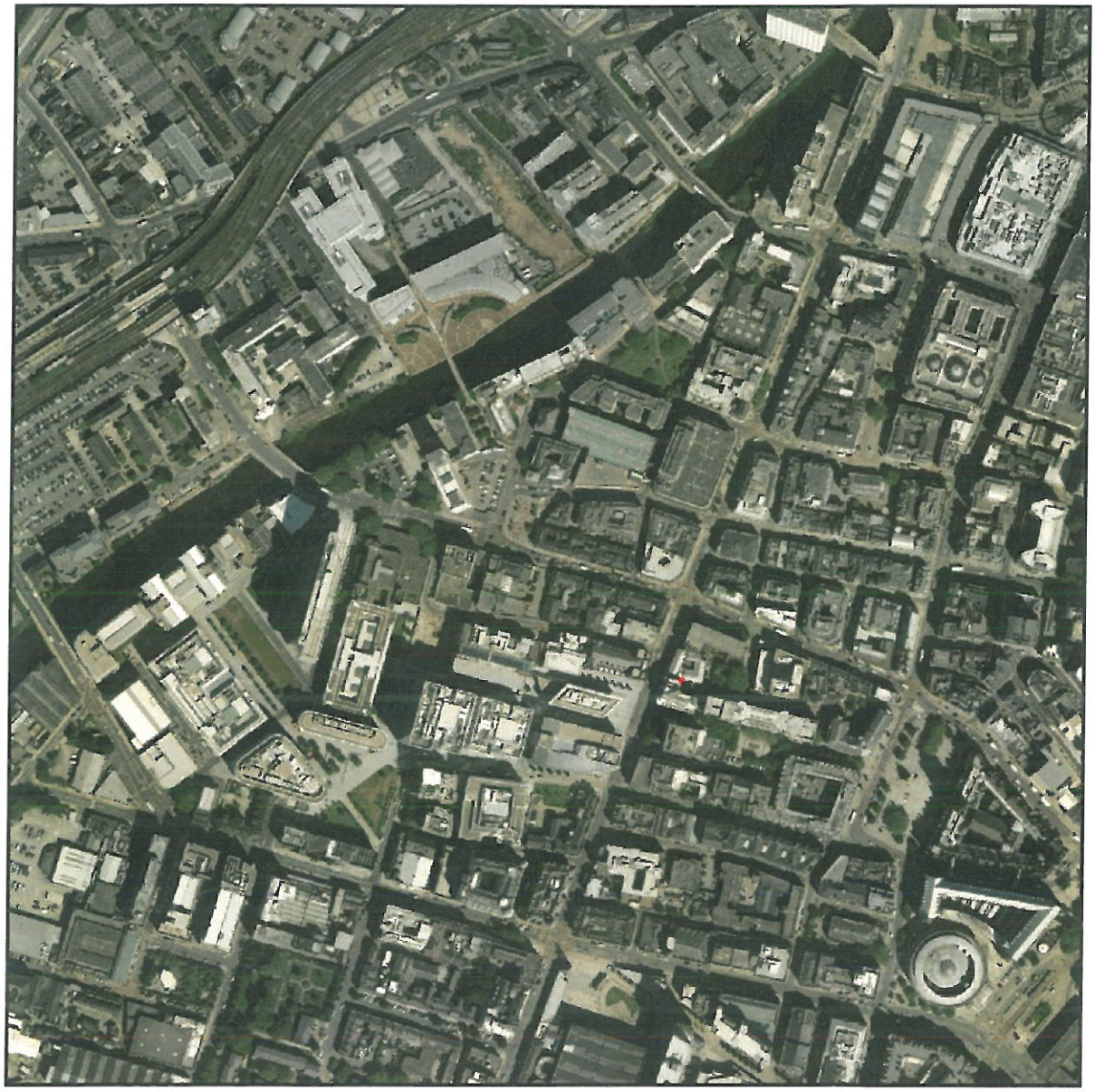

Figure 3 - Aerial Photograph

Table 1 – Risk Classification Matrix

		Consequence			
		Severe (Sv)	Medium (Md)	Mild (Mi)	Minor (Mr)
Probability	High (Hi)	Very high risk	High Risk	Moderate Risk	Moderate/low risk
	Likely (Li)	High risk	Moderate risk	Moderate/low risk	Low risk
	Low likelihood (Lw)	Moderate risk	Moderate/low risk	Low risk	Very low risk
	Unlikely (Ul)	Moderate/low risk	Low risk	Very low risk	Very low risk

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Table 2 – Classification of Consequence

Classification	Definition	Examples
Severe	Short-term (acute) risk to human health likely to result in "significant harm" as defined by the Environment Protection Act 1990, Part IIA. Short-term risk of pollution (note: Water Resources Act contains no scope for considering significance of pollution) of sensitive water resource. Catastrophic damage to buildings/property. A short-term risk to a particular ecosystem or organisation forming part of such ecosystem (note: the definitions of ecological systems within the Draft Circular on Contaminated Land, DETR, 2000).	High concentrations of cyanide on the surface of an informal recreation area. Major spillage of contaminants from site into controlled water. Explosion, causing building collapse (can also equate to a short-term human health risk if buildings are occupied).
Medium	Chronic damage to Human Health ("significant harm" as defined in DETR, 2000). Pollution of sensitive water resources (note: Water Resources Act contains no scope for considering significance of pollution). A significant change in a particular ecosystem or organism forming part of such ecosystem, (note: the definitions of ecological systems within Draft Circular on Contaminated Land, DETR, 2000).	Concentration of a contaminant from site exceeds the generic or site-specific assessment criteria. Leaching of contaminants from a site to a major or minor aquifer. Death of a species within a designated nature reserve. Lesser toxic and asphyxiate effects of carbon dioxide
Mild	Pollution of non-sensitive water resources. Significant damage to crops, buildings, structures and services ("significant harm" as defined in the Draft Circular on Contaminated Land, DETR, 2000). Damage to sensitive buildings/structures/services or the environment.	Pollution of non-classified groundwater. Damage to building rendering it unsafe to occupy (e.g. foundation damage resulting in instability).
Minor	Harm, although not necessarily significant harm, which may result in a financial loss or expenditure to resolve. Non-permanent health effects to human health (easily prevented by means such as personal protective clothing, etc). Easily repairable effects of damage to buildings, structures and services.	The presence of contaminants at such concentrations that protective equipment is required during site works. The loss of plants in a landscaping scheme. Discoloration of concrete.

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Table 3 – Classification of Probability

Probability Classification	Definition
High likelihood	There is a pollution linkage and an event that either appears very likely in the short term and almost inevitable over the long term, or there is 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, which means 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 long term
Low Likelihood	There is a pollution 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 event would take place, and is less likely in the shorter term.
Unlikely	There is a pollution linkage but circumstances are such that it is improbable that an event would occur even in the very long term.

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Table 4 - Classification of Risk and Likely Action Required

Very high risk (Vh)	There is a high 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. This risk, if realised, is likely to result in a substantial liability. Urgent investigation (if not undertaken already) and remediation are likely to be required.
High risk (Hi)	Harm is likely to arise to a designated receptor from an identified hazard. Realisation of the risk is likely to present a substantial liability. Urgent investigation (if not undertaken already) is required and remedial works may be necessary in the short-term and are likely over the longer-term.
Moderate risk (Md)	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 relatively mild. Investigation (if not already undertaken) is normally required to clarify the risk and to determine the potential liability. Some remedial works may be required in the longer-term.
Low risk (Lw)	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 (Vl)	There is a low possibility that harm could arise to a receptor. In the event of such harm being realised it is not likely to be severe.

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