

APPENDIX 4 – QUALITATIVE RISK ASSESSMENT METHODOLOGY

QUALITATIVE RISK ASSESSMENT METHODOLOGY

The following Contaminated Land Risk Assessment methodology is based on CIRIA C552 (2001) *Contaminated Land Risk Assessment – A Guide to Good Practice*, in order to quantify potential risk via **risk estimation** and **risk evaluation**, which can be adopted at the Phase I stage. This will then determine an overall risk category which can be used to identify likely actions. This methodology uses qualitative descriptors and therefore is a qualitative approach.

The methodology requires the classification of:

- the magnitude of the **consequence** (severity) of a risk occurring, and
- the magnitude of the **probability** (likelihood) of a risk occurring.

The potential consequences of contamination risks occurring at this site are classified in accordance with Table A4.1 below, which is adapted from the CIRIA guidance.

Table A4.1: Classification of Consequence

Classification	Definition of Consequence
Severe	<ul style="list-style-type: none">• Short-term (acute) risks to human health.• Short-term risk of pollution of sensitive water resource or ecosystem.• Catastrophic damage to crops/buildings/property/infrastructure, including off-site soils.
Medium	<ul style="list-style-type: none">• Medium/long-term (chronic) risks to human health.• Medium/long-term risk of pollution of sensitive water resource or ecosystem.• Significant damage to crops/buildings/property/infrastructure (on or off-site).• Contamination of off-site soils.
Mild	<ul style="list-style-type: none">• Easily preventable, permanent health effects on humans.• Pollution of non-sensitive water resources.• Localised damage to crops/buildings/property/infrastructure (on or off-site).
Minor	<ul style="list-style-type: none">• Easily preventable, non-permanent health effects on humans, or no effects.• Minor, low-level and localised contamination of on-site soils.• Easily repairable damage to crops/buildings/property/infrastructure.

The probability of contamination risks occurring at this site will be classified in accordance with Table A4.2 below which is also adapted from the CIRIA guidance. Note that for each category, it is assumed that a pollution linkage exists. Where a pollution linkage does not exist, the likelihood is zero, as is the risk.

Table A4.2: Classification of Probability

Classification	Definition of Probability
High Likelihood	Circumstances are such that an event appears very likely in the short-term or almost inevitable in the long-term; or there is already evidence that such an event has occurred.
Likely	Circumstances are such that such an event is not inevitable, but is possible in the short-term and is likely over the long-term.
Low Likelihood	Circumstances are such that it is by no means certain that an event would occur even over a longer period, and it is less likely in the short-term.
Unlikely	Circumstances are such that it is improbable that an event would occur even in the very long-term.

For each possible pollution linkage (source-pathway-receptor) identified, the potential risk can be evaluated, as presented in Table A3.3. Based upon this, CIRIA C552 presents definitions of the risk categories, together with the investigatory and remedial actions that are likely to be necessary in each case, as in Table A3.4. These risk categories apply to each possible pollutant linkage, and not simply to each hazard/source of contamination or sensitive receptor.

Table A4.3: Overall Contamination Risk Matrix

		Consequence			
		Severe	Medium	Mild	Minor
Probability	High likelihood	Very high risk	High risk	Moderate risk	Low risk
	Likely	High risk	Moderate risk	Moderate risk	Low risk
	Low likelihood	Moderate risk	Moderate risk	Low risk	Very low risk
	Unlikely	Low risk	Low risk	Very low risk	Very low risk

Table A4.4: Definition of Risk Categories and Likely Actions Required

Risk Category	Definition and likely actions required
Very high	<ul style="list-style-type: none">• Severe harm to a defined receptor is very likely, or has already occurred.• The risk is likely to result in a substantial liability.• Urgent investigation (if not already undertaken) is likely to be required.• Urgent remediation is likely to be required.
High	<ul style="list-style-type: none">• Harm to a defined receptor is likely.• The risk, if realised, may result in a substantial liability.• Urgent investigation (if not already undertaken) is likely to be required.• Remediation is likely to be required in the long term, possibly sooner.
Moderate	<ul style="list-style-type: none">• Harm to a defined receptor is possible, but severe harm is unlikely.• Investigation is likely to be required to clarify the level of potential liability and risk.• Some remediation may be required in the longer term
Low	<ul style="list-style-type: none">• Harm to a defined receptor is possible, but is likely to be mild at worst.• Liabilities could theoretically arise, but are unlikely.• Further investigation is not required at this stage• Remediation is unlikely to be required.
Very low	<ul style="list-style-type: none">• Harm to a defined receptor is unlikely, and would be minor at worst.• No liabilities are likely to arise.• Further investigation is not required at this stage• Remediation is very unlikely to be required.