Phase 3 Remediation Strategy

Kerrier Way

23 January 2024

Wheal Jane Consultancy
Wheal Jane Earth Science Park, Baldhu, Truro, Cornwall, TR3 6EE
01872 560200
www.wheal-jane-consultancy.co.uk
consultancy@wheal-jane.co.uk

Ref: 21817/PH3

DOCUMENT CONTROL SHEET

Client	Mei Loci
Project Title	Kerrier Way
Document Title	Phase 3 Remediation Strategy
Document No.	21817/PH3

Date	Status	Revision	Prepared By	Approved By
23 January 2024	Final	-	BH	WJC

CONTENTS

FIGURES

TABLES

EXECUTIVE SUMMARY

Objectives		
Wheal Jane Consultancy was commissioned by Mei Loci to undertake a Phase 3 Remediation Strategy at the site known as 'Kerrier Way'.		
Remediation		
Areas of Site Requiring Remediation	Remediation is required across the site in all areas.	
Remedial Requirements	**Soft Landscaping**	It is necessary to emplace a minimum depth of 300mm of clean Topsoil over a high visibility geotextile. This should be placed over the residual soils where either 300mm have been removed or on top of areas that are to be risen. These areas are highlighted green in Figure 4.1.
	Tree Protection	The roots of any existing trees should not be disturbed in order to maintain their health. Further details are given in the BSI Standards Publication 'Trees in Relation to Design, Demolition and Construction – BS 5837:2012'. For any new trees proposed a minimum soil depth of 1m over an area that will support the tree's mature rooting volume requirements, as per guidance from Green Blue Urban Tree Species Soil Volume Guide.
	Non-Continuous Hardstanding	It is necessary to cover the exposed soils with a high visibility geotextile. An overlay of at least 100mm of compacted, clean sub-base or lean-mix concrete should then be added. The proposed surfacing should then be placed above this layer. If gravel is to be installed it should be of at least 150mm depth. Non-continuous hardstanding should be placed over the residual soils, where a specified depth of contaminated materials have been removed to accommodate remedial materials. These areas are highlighted yellow in Figure 4.1.
Remediation Timescale	• It is expected that the scope of works should be completed at an early stage in the construction works. • Material excavated from the site should be treated as waste and would have to be disposed of to a licensed waste management facility.	

	• Any soil imported to site should be certified for residential end use with certification to demonstrate it is of suitable composition. • This remediation strategy should be submitted to the Local Authority prior to construction commencement.
Verification	• To complete the phased process, a Verification Report documenting the successful implementation of the outlined works above shall be produced and submitted to the Local Authority. • Photo documentation should be taken regularly during the course of the remedial work for the Phase 4 Verification Report. Key stages of the development to be photographed may include when a site is cleared, when excavations and footings are open, when geo-textile membranes are laid, when imported materials are being added and installed, when the site is complete. • For inspection and verification purposes, the installation of temporary plastic pipes in remediated areas is highly recommended. The pipes should be open ended and oriented vertically, with the base of the pipes sitting directly onto the surface of the geo-textile membrane. Remedial materials should then be appropriately installed surrounding the exterior of pipes. Pipes should be a minimum of 160mm in diameter to allow for visual inspection and measurements to take place. Once the Phase 4 Verification Report has been approved by the local planning authority, the pipes should be removed, and the remaining holes backfilled with suitable materials. • It is paramount that all invoices, analysis certification, waste transfer notices and all other general documentation relating to the remedial process be kept for verification purposes. • A suitably qualified person from Wheal Jane Consultancy will monitor the progress of the remediation and conduct a site visit upon completion of all outlined works to ensure compliance has been achieved.

2 INTRODUCTION

2.1.1 Wheal Jane Consultancy was commissioned by Mei Loci to plan a remediation strategy for the site; "Kerrier Way."

2.1.2 This report has been prepared by Wheal Jane Consultancy solely for the benefit of the client. It shall not be relied upon or transferred to any third party without the prior written authorisation of Wheal Jane Consultancy.

2.2 Scope and Objectives

2.2.1 The objective of this report is to outline a strategy of remediation to mitigate any risks to human health and that of flora and fauna inhabiting the site.

2.2.2 This strategy has been prepared with guidance from BS10175:2011+A2:2017 and the UK government Land Contamination Risk Management (LCRM) framework published October 2020 (superseding Environment Agency report CLR11), and as such represents a Phase 3 Remediation Strategy.

2.2.3 The conclusions and recommendations of this report are valid for a period of 12 months from the date of issue. Outside of this timeframe the report will require reviewing by a suitably qualified geoenvironmental engineer / environmental scientist, to ensure that the report complies with any changes to industry standards, policies and/or guidelines.

2.2.4 This report does not constitute an asbestos inspection that may fall within the 'Control of Asbestos' regulations, 2012.

2.3 Background

2.3.1 In order to comply with the latest Government guidelines on new building developments, the site needed to be subjected to a phased environmental assessment prior to any development works commencing. This report forms Phase 3 of this process and should be considered in conjunction with the previous Phase 1 and Phase 2 reports, detailed below (section 2.4).

3 THE SITE

3.1 Site Location

3.1.1 The site is located either side of Kerrier Way approximately 0.50km to the north-east of Camborne Town Centre. The site is approximately centred on National Grid Reference SW 65370 40271.

3.1.2 The site is irregular in shape and covers an area of approximately 0.75ha.

3.1.3 A site location plan (SLP) is contained in Figure 2.1, to the rear of the report (image obtained from Cornwall Council's Interactive Map).

3.2 Surrounding Area

Direction	Land Use
North	Residential, Road
East	Residential
South	Residential, Road
West	Supermarket, Fuel Station, Road

3.3 Proposed Development

3.3.1 It is proposed to redevelop the site as public open space.

3.3.2 The proposed site plan is contained in Figure 2.2, to the rear of the report (plan drawn by Mei Loci Landscape Architects, ref. DR-L-2001).

3.4 Previous Investigations

3.4.1 The following investigations have taken place on site;

Table 2.1: Previous Site Investigations

Report	Date	Author
Phase 2 Site Investigation – 20931/PH2	April 2022	Wheal Jane Consultancy

3.4.2 The BGS 1:50,000-scale bedrock geological map Sheet 352, Falmouth, of the area shows the site to be underlain by the Mylor Slate Formation.

3.4.3 The Phase 2 Site Investigation in April 2022 involved the excavation of eight windowless sampler boreholes to depths of between 0.70m and 5.45m, across the two site areas. Samples were collected for laboratory analysis and tested for;

- Heavy Metals (As, B, Cd, Cr, Cu, Hg, Pb, Ni, Se, Zn)
- Sulphates
- Polycyclic Aromatic Hydrocarbons (PAH)
- pH
- Asbestos
- Total Petroleum Hydrocarbons (TPH)

3.4.4 Surface water and groundwater was encountered during the site investigation from surface.

3.4.5 Ground conditions indicated that Made Ground was present across the site overlying the weathered Mylor Slate Formation.

3.4.6 Chemical testing revealed that elevated concentrations of arsenic were observed across the proposed development at varying depths, up to a maximum concentration of 990.0mg/kg (generic assessment criteria for public open space is currently 170mg/kg). Levels of arsenic were considerably higher than the guideline value and therefore bioavailability testing is unlikely to bring them to within acceptable levels. There were no elevated levels of other heavy metals in relation to current residential assessment criteria. Concentrations of PAH and TPH were below guideline values.

3.4.7 Asbestos was also recorded on site in one location.

3.4.8 Recommendations were given in the Phase 2 report concerning the design sulphate class for concrete. It was classified as falling into the design sulphate class DS-1. The soils on site fall into class AC-1.

4 RISK ASSESSMENT

4.1 Introduction

4.1.1 The assessment of risk is based upon the principle of the pollutant linkage, which is described in more detail below. This assessment sought to identify plausible pollutant linkages associated with the proposed development. Once this was done, the resultant risk was determined based on the probability and the possible consequence of the pollutant linkages being present. As such, this qualitative risk assessment has been undertaken in accordance guidance published in CIRIA C552.

A summary of the CIRIA C552 risk classification matrix is presented in Table 3.1 below.

Table 3.1 *Risk Classification Matrix*

Risk Classification Matrix					
Taken from CIRIA C552		Consequence			
		Severe	Medium	Mild	Minor
Probability	High Likelihood	Very High	High	Moderate	Moderate / Low
	Likely	High	Moderate	Moderate / Low	Low
	Low Likelihood	Moderate	Moderate / Low	Low	Very Low
	Unlikely	Moderate / Low	Low	Very Low	Very Low

4.2 Refined Conceptual Model

4.2.1 This conceptual site model has been undertaken with due regard to guidance provided in BS10175:2011+A2:2017 and the UK government Land Contamination Risk Management (LCRM) framework published October 2020 (superseding Environment Agency report CLR11). The assessment of risk from land contamination also pays due regard to the definition of contaminated land, as defined within Part 2A of the Environment Protection Act 1990. This legislation defines contaminated land as any land that is in such a condition that by reason of substances in, on or under the land:

- Significant harm is being caused or there is a significant possibility of such harm being caused; or
- Pollution of controlled water is being, or is likely to be, caused.

4.2.2 This definition is based on the principles of risk assessment defined as a combination of the probability (or frequency) of occurrence of a defined hazard and the magnitude (including the seriousness) of the consequences. Central to the risk assessment process is the concept of pollutant linkage, which is a linkage between a contaminant and a receptor by means of a pathway.

Table 3.2. *Summary of statutory definitions relating to pollution linkage.*

Statutory definitions relating to pollution linkage.	
Contaminant	"a substance which is in, on or under the land and which has the potential to cause harm or to cause pollution of controlled waters."
Receptor	"a living organism, a group of living organisms, and ecological system or a piece of property" which meets given criteria. "controlled waters which are, or could be, polluted by a contaminant".
Pathway	"one or more routes or means by, or through, which a receptor: • is being exposed to, or affected by, a contaminant, or • could be so exposed or affected".

4.2.3 Without the presence of all three components, there is no linkage and therefore no risk. The relationship between these components is discussed below in order to identify the existence of any source-pathway-receptor linkage on the site, and hence the potential risks associated with any contamination. Following the site investigation, the preliminary conceptual site model was revised as outlined in the Phase 2 report, with regard to the quantitative risk assessment.

4.2.4 A Revised Conceptual Model (included as Table 3.4 overleaf) was produced following the conclusions of the chemical testing discussed above.

***Table 3.3**: Identified Sources, Pathways and Receptors*

Source – Pathway – Receptor Overview	
Contaminant sources	Natural geology – arsenic
	Natural geology – radon
	Made Ground - arsenic
	Made Ground – PAHs, TPHs
	Made Ground - Asbestos
	Dermal contact
Pathways	Ingestion
	Ingress into buildings
	Inhalation of dust and soil
	Flora & Fauna
Receptors	Future site users
	Water supply pipes
	Site workers

Table 3.4: Refined Conceptual Site Model

Preliminary Conceptual Model							
	Source(s)	**Contaminant(s)**	**Pathway(s)**	**Receptor(s)**	**Probability**	**Consequence**	**Risk Assessment**
On Site	Natural Geology	Radon gas	Ingress into proposed buildings	Future site users	High Likelihood	Medium	**High Risk** – The planned development is within an area where greater than 30% of properties are above the action level. Full radon protection measures are required.
		Arsenic	Dermal contact Soil and dust ingestion and inhalation	Future site users Site workers Site flora and fauna	Likely	Medium	**Moderate Risk** – Levels of arsenic on site are recorded up to 990mg/kg. This greatly exceeds the generic acceptance criteria value of 170mg/kg for public open space.
	Made Ground	Total Petroleum Hydrocarbons (TPH) Polycyclic Aromatic Hydrocarbons (PAH) VOCs & SVOCs	Dermal contact Soil and dust ingestion and inhalation Ground & surface waters	Future site users Site workers Site flora and fauna Building structures and services	Unlikely	Medium	**Low Risk –** There were no exceedances recorded on site for PAHs, TPHs, VOCs or SVOCs.
		Arsenic	Dermal contact Soil and dust ingestion and inhalation	Future site users Site workers Site flora and fauna	Likely	Medium	**Moderate Risk –** Levels of arsenic on site are recorded up to 990mg/kg. This greatly exceeds the generic acceptance criteria value of 170mg/kg for public open space.

	Asbestos	Dermal contact Soil and dust ingestion and inhalation	Future site users Site workers Site flora and fauna	Likely	Medium	**Moderate Risk –** Asbestos was encountered on site during the site investigation.
	Heavy Metals	Dermal contact Soil and dust ingestion and inhalation Ground & surface waters	Future site users Site workers Site flora and fauna Building structures and services	Unlikely	Medium	**Low Risk –** Levels of all other heavy metals are within the relevant generic acceptance criteria.

5 REMEDIATION

5.1 Remedial Objectives and Options Appraisal

5.1.1 The remedial objectives for this site are designed to ensure that the final development greatly reduces the risk from exposure to the contaminants identified in the Phase 2 investigation by people, flora or fauna.

5.1.2 The proposed plan shows that soft landscaping is included in the design, and these are the most sensitive areas for exposure to contamination. Pathways are also proposed across the site.

5.1.3 Any made ground that is removed from the site should be treated as waste and is not suitable for use as structural fill.

5.1.4 A plan illustrating the remedial requirements is presented as Figure 4.1.

5.1.5 Several options to remediate the site have been considered and these are summarised in Table 4.1.

Table 4.1 Remediation Options Appraisal

Overview of Remedial Options	
Option	**Assessment**
Simple In-Situ Capping System	Excavation of a pre-determined depth of contaminated media before a geotextile fabric is laid over the exposed soil and capped with clean, cover material. This option ensures the removal of contaminated material, and the geotextile guarantees the pathway from the soil is broken.
Soil washing	This physical approach to remediation involves the extraction of contaminated soil and then treatment using mechanical and chemical separation of contaminants from uncontaminated soil. This method is likely to have constraints particularly regarding timescale, as a treatability study may have to be carried out.

Soil flushing	A flushing solution is delivered to the surface of the soil, utilising infiltration. Leachates are diverted and collected where they are subsequently treated at the surface. This approach may require the addition of further chemical treatment to neutralise acidity. It is also likely to be costly.
Stabilisation and solidification using hydraulic binders	Soil mixing equipment is used to cut and mix the soil. Pre-selected materials are then added to the mix to solidify and stabilise the soil. The area is gradually treated in columns. This technique is also costly and involves careful assessment of soil types and binder additives, usually during a treatability study.

5.1.6 The most suitable remediation methodology for this site is the simple in-situ capping system. This method will be suitable for all areas, with a separate consideration for the proposed areas of non-continuous hardstanding and ground where tree protection measures have been identified.

5.2 Remediation Strategy

5.2.1 Each of the areas requiring remediation are discussed separately below.

5.3 Soft Landscaping

5.3.1 The soft landscaping on site is highlighted in green in Figure 4.1. As this application is for the development of public open space; it is necessary only to excavate existing soils/made ground to a minimum depth of 300mm below the finished ground level. A high visibility geotextile should be placed over the residual soils and overlain with clean soil; Figure 4.2 depicts the recommended method of remediation. The soils should be clean, chemically inert topsoil. Alternatively, it is acceptable to use 150mm of clean subsoil with 150mm of topsoil. If there are areas where soil is not currently present and there is only exposed rock where gardens are planned, it will be necessary to install the geotextile above the rock and place the clean cover above it.

5.3.2 The following points should be noted:

5.3.3 The material excavated from the site should be treated as waste and would have to be disposed of at a licensed waste management facility. The materials should be handled in accordance with the Site Waste Management Plan. Waste transfer notes should be retained for your records. Should ground levels require it material may be required to be excavated in order to install the necessary depth of clean cover. Underlying material should be compacted prior to placement of the clean cover. A layer of sand beneath the geotextile may be required to ensure that the barrier is not pierced on stones when it is installed.

5.3.4 The geotextile and clean cover material must be stored securely if it is to be delivered and stockpiled on site prior to use, to prevent any mixing occurring with contaminated media.

5.3.5 The geotextile (a permeable synthetic textile sheet) should be of a suitable colour such as orange or white, such as Lotrak Alarm high visibility geotextile or Wrekin Multitrack NW 1000. The purpose of the geotextile would be to act as a barrier to prevent mixing of the imported clean soil and any contaminated ground beneath. It will also act as a warning device should future site users carry out any excavations.

5.3.6 The imported clean topsoil should be accompanied by an analysis of its content to prove its suitability for the proposed end-use (no more than 6 months old). The source of the material should also be recorded. The certificate of analysis should be retained for record purposes. The suitability of the soil should be verified prior to it being brought on site. If as part of any landscaping plan, retaining walls or raised beds are considered, it is important to ensure that the encapsulation layer is present across the area.

5.3.7 For inspection and verification purposes, the installation of temporary plastic pipes in remediated areas is highly recommended, as illustrated in Figures 4.2 & 4.3 The pipes should be open ended and oriented vertically, with the base of the pipes sitting directly onto the surface of the geo-textile membrane. Remedial materials should then be appropriately installed surrounding the exterior of pipes. Pipes should be a minimum of 160mm in diameter to allow for visual inspection and measurements to take place. Once the Phase 4 Verification Report has

been approved by the local planning authority, the pipes should be removed, and the remaining holes backfilled with suitable materials.

5.3.8 The remedial works are to be periodically inspected and documented by a suitably qualified person (e.g. Environmental Scientist) as part of the Phase 3 Verification Report.

5.4 Tree Protection Areas

5.4.1 A number of trees are proposed on site, these areas are highlighted orange in Figure 4.1.

5.4.2 The roots of any existing trees should not be disturbed in order to maintain their health. Further details are given in the BSI Standards Publication 'Trees in Relation to Design, Demolition and Construction – BS 5837:2012'.

5.4.3 For any new trees proposed a minimum soil depth of 1m over an area that will support the tree's mature rooting volume requirements, as per guidance from Green Blue Urban Tree Species Soil Volume Guide.

5.5 Hardstanding Areas

5.5.1 Where *non-continuous* hardstanding is proposed on site it will be necessary to excavate existing soils/made ground to a minimum depth to accommodate the installation of the clean aggregate and surface finish. Figure 4.1 indicates the areas of non-continuous hardstanding (highlighted in yellow). The exposed soils should be covered with a high-visibility geotextile. An overlay of at least 100mm of compacted, clean sub-base or lean-mix concrete should then be added, (Figure 4.4). The proposed surfacing should then be placed above this layer, gravel should be of at least 150mm depth.

- Where the ground level requires modification, it may be necessary to remove some of the existing soil. In which case the material excavated from the site should be treated as waste and would have to be disposed of to a licensed waste management facility. Waste transfer notes should be retained for your records.

- The geotextile (a permeable synthetic textile sheet) should be of a suitable colour such as orange or white. The purpose of the geotextile will be to act as a warning device should future site users carry out any excavations. A layer of sand beneath the geotextile may be required to ensure that the barrier is not pierced on stones when it is installed.

- The remedial works are to be inspected and documented by a suitably qualified person (e.g. Environmental Scientist) as part of this report.

5.5.2 For inspection and verification purposes, the installation of temporary plastic pipes in remediated areas is highly recommended, as illustrated in Figure 4.3. The pipes should be open ended and oriented vertically, with the base of the pipes sitting directly onto the surface of the geo-textile membrane. Remedial materials should then be appropriately installed surrounding the exterior of pipes. Pipes should be a minimum of 160mm in diameter to allow for visual inspection and measurements to take place. Once the Phase 4 Verification Report has been approved by the local planning authority, the pipes should be removed, and the remaining holes backfilled with suitable materials.

5.5.3 If as part of any landscaping plan, retaining walls or raised beds are considered, it is important to ensure that the encapsulation layer is present across the area.

5.6 Remediation Timescale

5.6.1 It is expected that the scope of works should be completed at an early stage in the construction works.

5.6.2 This remediation strategy should be submitted to the Local Authority prior to construction commencement.

6 REPORTING OF UNEXPECTED CONTAMINATION

6.1.1 The Phase 2 investigation that has taken place on site have identified contamination within the underlying soil. This remediation strategy is aimed at breaking the source-pathway-receptor model and thus reducing risk.

6.1.2 Any contamination encountered during the course of construction which differs in type and/or quantity to that already identified on site must be reported in writing to the local planning authority. Development in areas of site affected by the unexpected contamination shall be suspended until a risk assessment has been carried out. Further sampling and analysis may be required.

7 VERIFICATION

7.1.1 To complete the phased process, a Verification Report documenting the successful implementation of the outlined works above shall be produced and submitted to the Local Authority.

7.1.2 Photo documentation should be taken regularly during the course of the remedial work for the Phase 4 Verification Report. Key stages of the development to be photographed may include when a site is cleared, when excavations and footings are open, when geo-textile membranes are laid, when imported materials are being added and installed, when the site is complete.

7.1.3 For inspection and verification purposes, the installation of temporary plastic pipes in remediated areas is highly recommended. The pipes should be open ended and oriented vertically, with the base of the pipes sitting directly onto the surface of the geo-textile membrane. Remedial materials should then be appropriately installed surrounding the exterior of pipes. Pipes should be a minimum of 160mm in diameter to allow for visual inspection and measurements to take place. Once the Phase 4 Verification Report has been approved by the local planning authority, the pipes should be removed, and the remaining holes backfilled with suitable materials.

7.1.4 It is paramount that all invoices, analysis certification, waste transfer notices and all other general documentation relating to the remedial process be kept for verification purposes.

7.1.5 A suitably qualified person from Wheal Jane Consultancy will monitor the progress of the remediation and conduct a site visit upon completion of all outlined works to ensure compliance has been achieved.

8 CONCLUSIONS AND RECOMMENDATIONS

8.1 Conclusions

8.1.1 This report has assessed the in-situ simple capping method is the most effective method to remediate the site in terms of cost, practicability, sustainability and overall reduction of risk. The following criteria are recommended:

8.1.2 In the soft landscaped areas to break the contamination pathway, it is necessary to excavate the existing soils to a minimum depth of 300mm below the final surface level. A high visibility

geotextile is to be placed over the residual soils and overlain with 300mm of clean cover, in private gardens. These areas are highlighted green in Figure 4.1.

8.1.3 Tree Protection Areas are shown in Figure 4.1. A modified approach to remediation will be required in the areas identified. Appropriate measures will also be taken in area areas of proposed new planting.

8.1.4 In areas of non-continuous hardstanding around the properties the exposed soils should be covered with a high-visibility geotextile. An overlay of at least 100mm of clean compacted sub-base or lean-mix concrete should then be added. The proposed surfacing should then be placed above this layer (gravel should be at least 150mm depth).

8.1.5 Where the ground level requires modification, it may be necessary to remove some of the existing soil. In which case the material excavated from the site should be treated as waste and would have to be disposed of at a licensed waste management facility.

8.1.6 Photo documentation should be taken regularly during the course of the remedial work for the Phase 4 Verification Report. Key stages of the development to be photographed may include: when a site is cleared, when excavations and footings are open, when geo-textile membranes are laid, when imported materials are being added and installed, when the site is complete.

8.1.7 The proposed development is in an area where greater than 30% of properties are estimated to be above the UK Action Level for radon.

8.1.8 Long-term monitoring post-remedial works will not be required.

8.1.9 On completion of remedial works to the required standard, a Phase 4 Verification report must be obtained before the site can be deemed suitable for its intended use.

8.2 Recommendations

8.2.1 The use of in-situ simple capping system will break the contamination pathway between the soil and the site users.

8.2.2 Any soil removed from site should be disposed of at a licensed waste facility. Waste transfer notices should be kept. The materials should be handled in accordance with the Site Waste Management Plan.

8.2.3 Any soil imported to site should be certified for residential end use with certification to demonstrate it is of suitable composition.

8.2.4 If any unrecorded contamination is encountered during site clearance operations, assessment will be required by a suitably qualified and experienced environmental scientist to ascertain the best procedure for remediation.

8.2.5 It is recommended that a copy of this report should be sent to the regulating authority before any works are commenced.

8.2.6 Health and safety requirements for the development of the site should include:

- In dry and dusty weather conditions, the site may require damping down to avoid excessive dust. Minimum PPE requirements should include dust masks, boots and gloves.
- It would also be considered prudent to complete a site induction/toolbox talk concerning elevated heavy metals and precautions to protect site workers and the public.

8.2.7 All workers on site should have access to hand-washing facilities. Current HSE guidelines must be adhered to with regards to working on this site.

9 REFERENCES

9.1.1 BSI (2011) BS 10175:2011 Investigation of Potentially Contaminated Sites - Code of Practice. London, British Standards Institution

9.1.2 BSI (2015) BS5930:2015. Code of Practice for Site Investigations. London, British Standards Institution

9.1.3 British Research Establishment (BRE) (2005) Special Digest 1 Concrete in Aggressive Ground. 3rd edn. Watford, BRE

9.1.4 Building Research Establishment (BRE) (2007) BR211 - Radon: Guidance on Protective Measures for New Buildings. Watford, BRE

9.1.5 Chartered Institute of Environmental Health (CIEH) and Contaminated Land: Applications in Real Environments (CL:AIRE) (2008) Guidance on Comparing Soil Contamination Data with a Critical Concentration. London, CIEH

9.1.6 CIRIA (2001) CIRIA C552 - Contaminated land risk assessment: A guide to good practice. London, CIRIA

9.1.7 CIRIA (2007) CIRIA C665 - Assessing Risks Posed by Hazardous Ground Gases to Buildings. London, CIRIA

9.1.8 Contaminated Land: Applications in Real Environments (CL:AIRE), Association of Geotechnical and Geo-environmental Specialists (AGS) and The Environmental Industries Commission (EIC) (2010) Soil Generic Assessment Criteria for Human Health Risk Assessment. London, CL:AIRE

9.1.9 Contaminated Land: Applications in Real Environments (CL:AIRE) (2012) A Pragmatic Approach to Ground Gas Risk Assessment. Research Bulletin 17

9.1.10 Contaminated Land: Applications in Real Environments (CL:AIRE) (2016) CAR SOIL: Control of Asbestos Regulations 2012. Interpretation for Managing and Working with Asbestos in Soil and Construction and Demolition Materials.

9.1.11 Department of Communities and Local Government (2012) National Planning Policy Framework. London, DCLG

9.1.12 Environment Agency (2004) Contaminated Land Report 11 - Model Procedures for the Management of Land Contamination. Bristol, Environment Agency

9.1.13 Historic England (2017) Land Contamination and Archaeology: Good Practice Guidance. London, Historic England

9.1.14 Environment Agency (2009) Updated Technical Background to the CLEA Model. Science Report SC050021/SR3. Bristol: Environment Agency

9.1.15 Environment Agency (2009) Human Health Toxicological Assessment of Contaminants in Soil. Science Report SC050021/SR2. Bristol: Environment Agency

9.1.16 Great Britain. Environmental Protection Act (1990). London, The Stationery Office

9.1.17 Great Britain. Water Act (2003) London, The Stationery Office

9.1.18 Great Britain. Environmental Permitting Regulations (2007). London, The Stationery Office

9.1.19 Great Britain. Environmental Damage (Prevention and Remediation) Regulations (2009). London, The Stationery Office

9.1.20 Great Britain. The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015. London, The Stationery Office

9.1.21 Hollingsworth, S.C, 2004. Cover Systems for Land Regeneration: Thickness of Cover Systems for Contaminated Land. Watford: BRE

9.1.22 National House Building Council (NHBC), Environment Agency and Chartered Institute of Environmental Health (CIEH) (2008) Research & Development Publication 66: Guidance for the Safe Development of Housing on Land Affected by Contamination. Amersham, NHBC

9.1.23 Land Quality Press, 2009. The LQM/CIEH Generic Assessment Criteria for Human Health Risk Assessment (2nd Edition). Replaced by Land Quality Press (2015) The LQM/CIEH Suitable 4 Use Levels for Human Health Risk Assessment (2nd Edition). Nottingham, Land Quality Press

9.1.24 Middleton, D.R.S. et al., 2017. Arsenic in residential soil and household dust in Cornwall, south west England: Potential human exposure and the influence of historical mining. The Royal Society of Chemistry – Environmental Science Processes and Impacts, vol. 19, p 517-527.

9.1.25 Royal Institution of Chartered Surveyors (RICS) (2012) Japanese Knotweed and Residential Property. Coventry, RICS

9.1.26 UK Water Industry Research (2010) Guidance for the Selection of Water Supply Pipes to be Use in Brownfield Sites: Report 10/WM/03/2

10 NOTES

10.1.1 This report is concerned solely with the property, as defined by this report, or parts thereof examined.

10.1.2 The report should not be used in connection with adjacent properties.

10.1.3 The information in the Groundsure EnviroInsight and GeoInsight reports, which have been used in compiling this Phase 1 Desk Study report, is derived from a number of statutory and non-statutory sources. While every effort is made by the supplier to ensure accuracy, the supplier cannot guarantee the accuracy or completeness of such information or data, nor to identify all the factors that may be relevant.

10.1.4 The conclusions and recommendations relate to the type and extent of development outlined in this report for this specific property only and should not be taken as suitable for any other form or extent of development on this property without further consultation with Wheal Jane Consultancy.

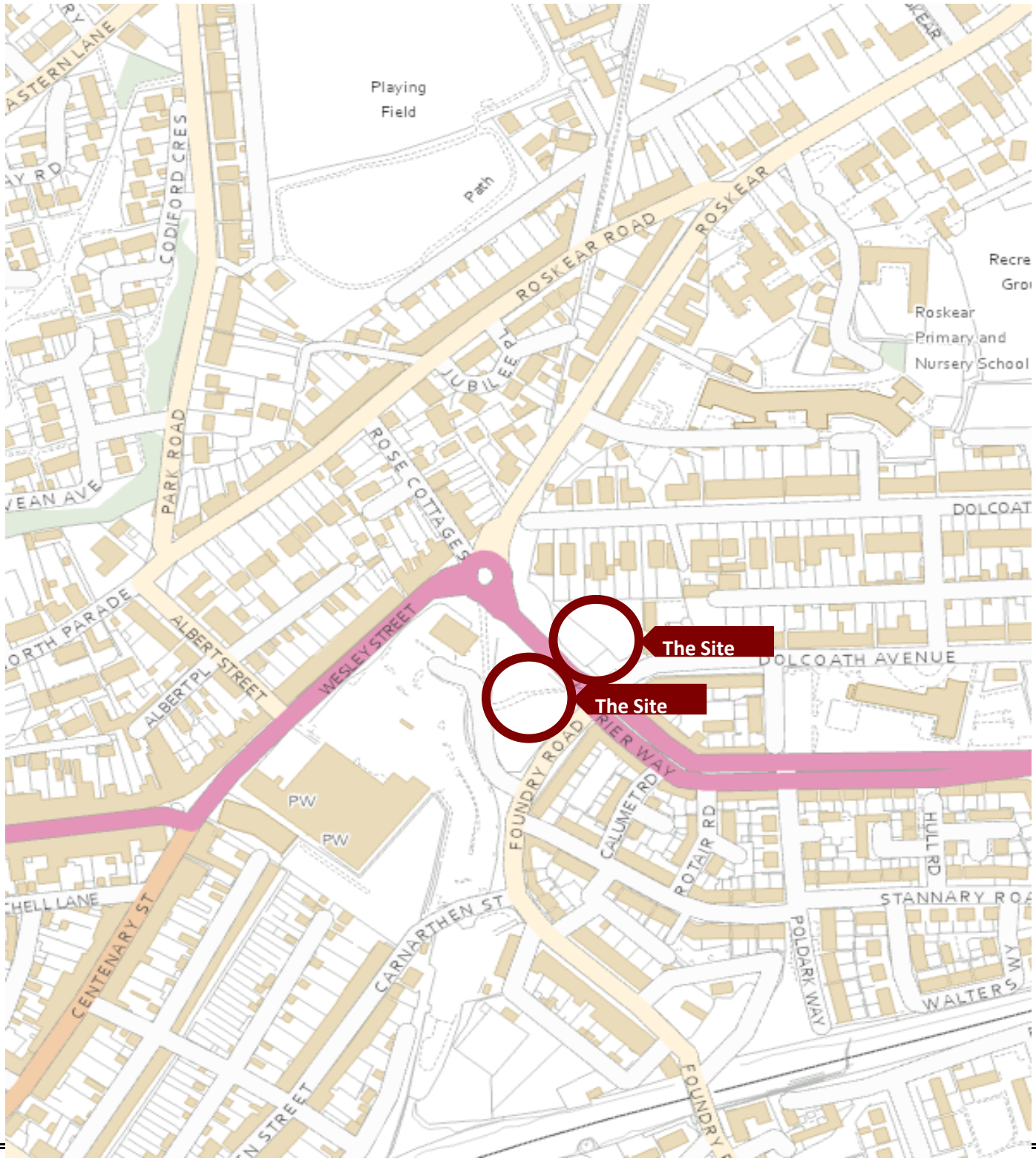
10.1.5 This report is confidential to the client, the client's legal and professional advisors, and may not be reproduced or distributed without our permission other than to directly facilitate the sale or development of the property concerned.

10.1.6 We have no liability toward any person not party to commissioning this report.

10.1.7 Unless otherwise expressly stated, nothing in this report shall create or confer any rights or other benefits pursuant to the Contracts (Rights of Third Parties) Act 1999 in favour of any person other than the person commissioning this report.

10.1.8 This report is not an asbestos inspection that may fall within the control of Control of Asbestos Regulations 2006.

FIGURES:



Title: **Site Location Plan**

Project: **Kerrier Way**

Client: **Mei Loci**

Report Title: **Phase 3 Remediation Strategy**

Date: **18/10/2023** Ref: **21817** Figure: **2.1**

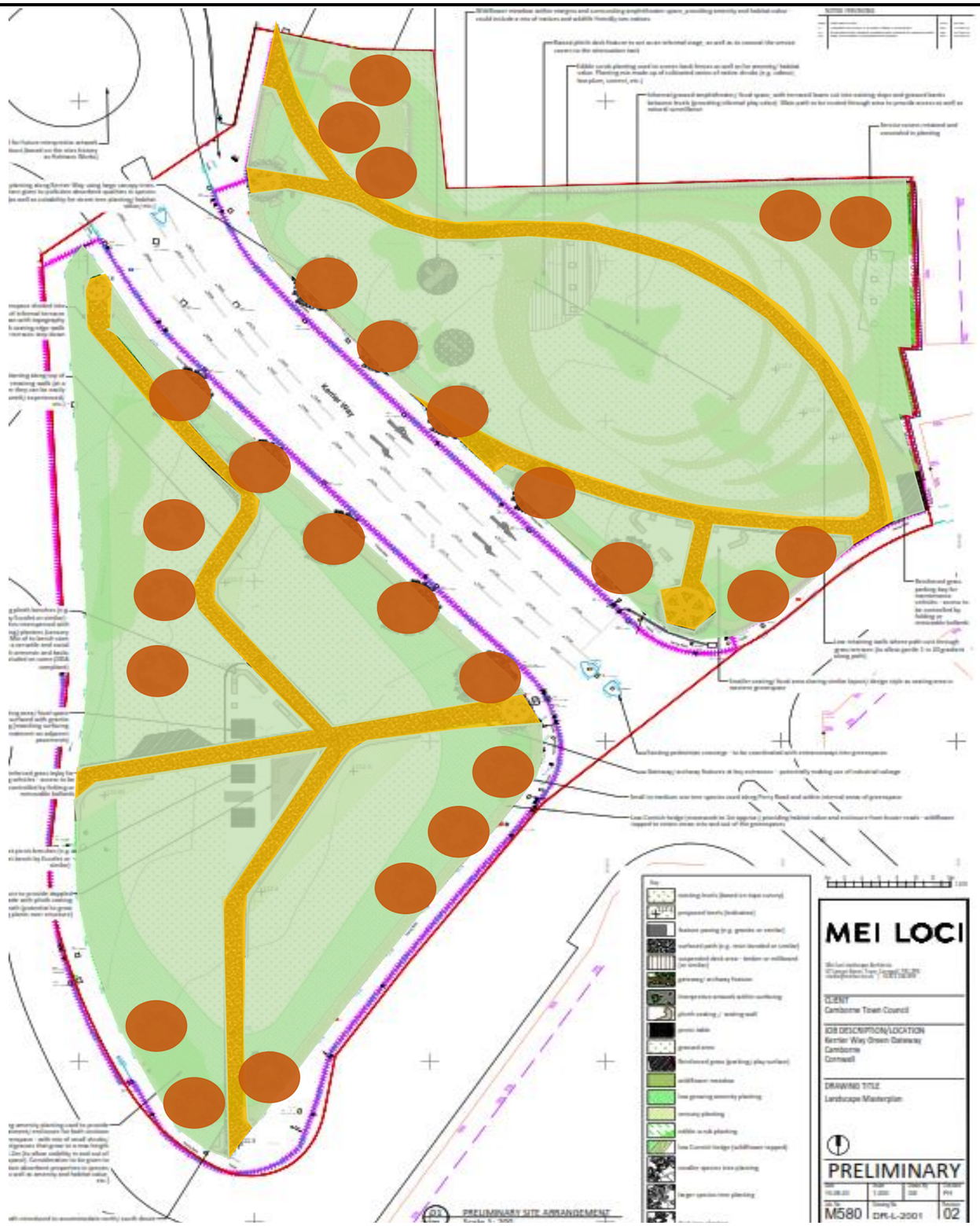
WHEAL JANE CONSULTANCY
GEOTECHNICAL, ENVIRONMENTAL & MINING SERVICES

N

WHEAL JANE CONSULTANCY

GEOTECHNICAL, ENVIRONMENTAL & MINING SERVICES

Title:	**Proposed Development Plan**
Project:	**Kerrier Way**
Ref:	**21817**
Client:	**Mei Loci**
Date:	18/10/2023
Scale:	NTS
Drawn by:	
Revision:	A
Figure:	2.2
Report Title:	Phase 3 Remediation Strategy



N

Legend:

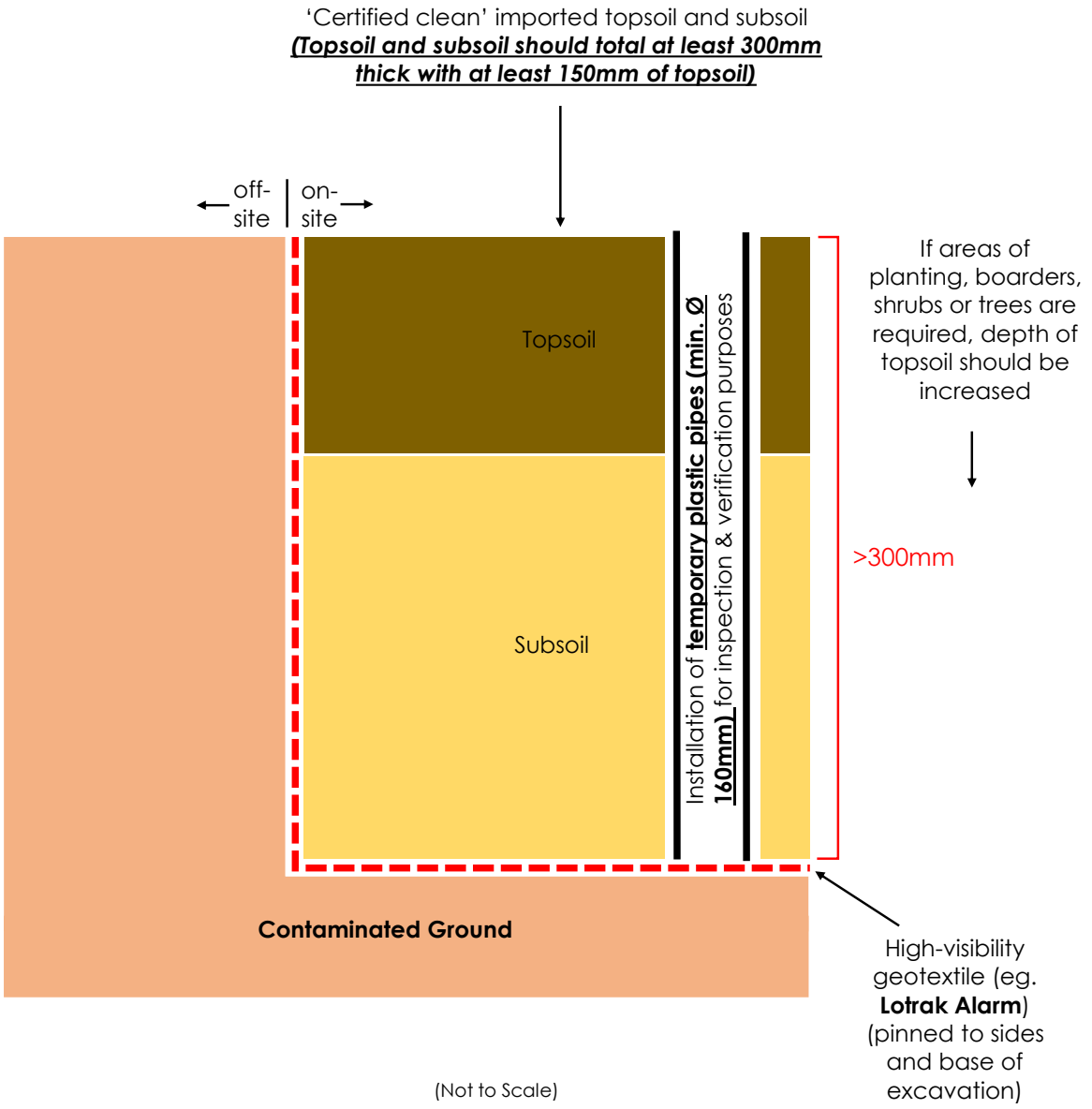
Exisiting Highway	No Remediation Required
	Tree Protection Required
	Non-Continuous Hardstanding Remediation Required
	Soft Landscaping/Cornish Wall Remediation Required
	Site Boundary

WHEAL JANE CONSULTANCY

GEOTECHNICAL, ENVIRONMENTAL & MINING SERVICES

Title:	**Proposed Development Plan**
Project:	**Kerrier Way**
Ref:	**21817**
Client:	**Mei Loci**
Date:	18/10/2023
Scale:	NTS
Drawn by:	WJC
Revision:	A
Figure:	4.1
Report Title:	Phase 3 Remediation

Private Gardens & Soft Landscaping



Title: **Soft Landscaping**

Project: **Kerrier Way**

Client: **Mei Loci**

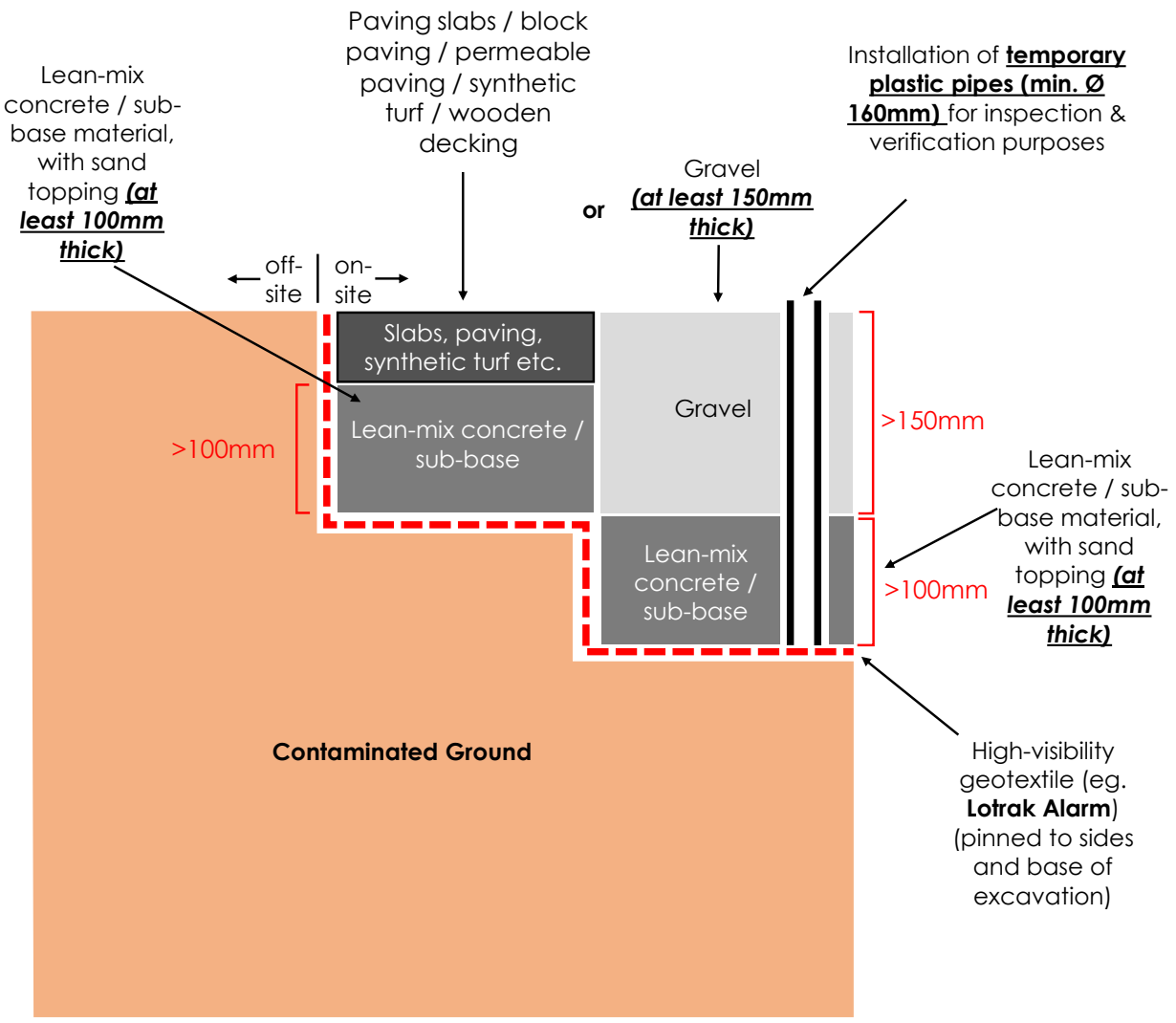
Report Title: **Phase 3 Remediation Strategy**

Scale: **Not to Scale**

Date: **23/01/2024** Ref: **21817** Figure: **4.2**

WHEAL JANE CONSULTANCY
GEOTECHNICAL, ENVIRONMENTAL & MINING SERVICES

Non-Continuous Hardstanding



(Not to Scale)

Title: **Non-Continuous Hardstanding**

Project: **Kerrier Way**

Client: **Mei Loci**

Report Title: **Phase 3 Remediation Strategy**

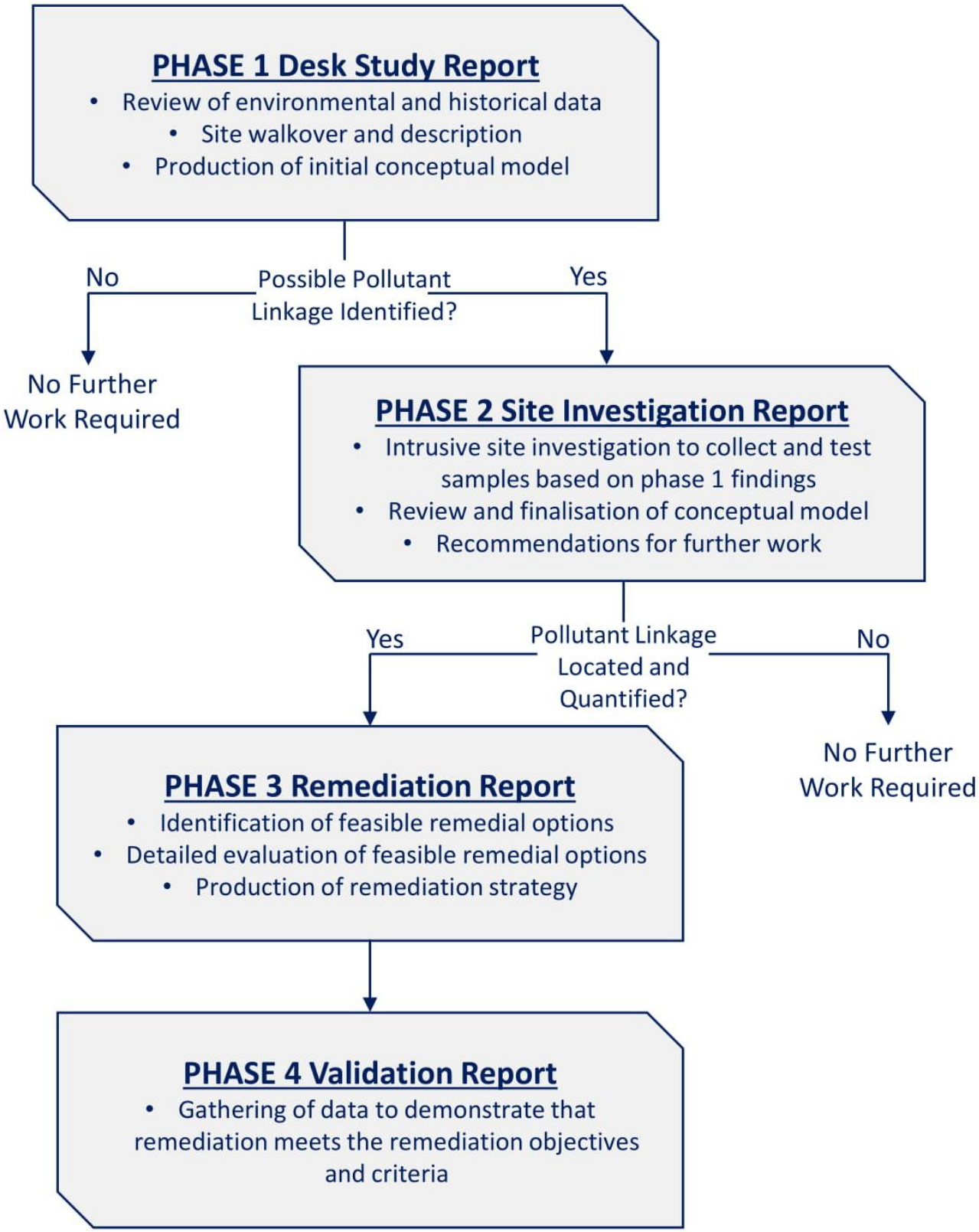
Scale: **Not to Scale**

Date: **18/10/2023** Ref: **21817** Figure: **4.3**

WHEAL JANE CONSULTANCY
GEOTECHNICAL, ENVIRONMENTAL & MINING SERVICES

The Phased Approach to Land Contamination

As set out in Contaminated Land Report 11 - Model Procedures for the Management of Land Contamination. Environment Agency Guidelines



WHEAL JANE
CONSULTANCY

GEOTECHNICAL, ENVIRONMENTAL
& MINING SERVICES