

Ms K Woods

Reservoir Road, Surfleet

Interpretative Desk Study

March 2026



Document Control

Project: Reservoir Road, Surfleet – Interpretative Desk Study

Site Address: Land adjacent to 23 Reservoir Road, Surfleet, Spalding, PE11 4DH

Client: Ms K Woods

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Report Reference: GJ394-01-R001-DS-V1

Brief Description of Contents Review of desk top information to determine likely ground conditions and develop a conceptual model in order to establish the geo-environmental site setting, identify any potential Source-Pathway-Receptor pollutant linkages and associated environmental issues, and to provide recommendations for any further works (as required).

Document Checking:

Date	Issue	Comments	Prepared by:	Checked by:	Issued by:
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1.0 INTRODUCTION

G&J Geoenvironmental Consultants Ltd (G&J) was commissioned by Ms K Woods to carry out an Interpretative Desk Study for the location of a proposed residential development on land adjacent to 23 Reservoir Road, Surfleet, Lincolnshire. The study is a requirement of Condition 4 of the Planning Consent.

The purpose of this report is to collate and interpret information pertaining to the site from a desk-based review of available data. The scope of the study is as follows:

- To determine the environmental setting of the site and its surroundings in terms of location, topography, ground conditions and land-use;
- To discuss the geology, hydrogeology and hydrology at, and in the vicinity of, the site;
- To determine the site history and that of the surrounding area;
- To assess potential contamination issues pertaining to the site with consideration of the site's current and historic use;
- To develop an initial Conceptual Site Model (CSM) linking sources of potential contamination with pathways and receptors;
- To produce a Preliminary Risk Assessment for contamination in accordance with the Environment Agency's *Land Contamination Risk Management* (LCRM) framework;
- To provide recommendations for any further work and / or mitigation measures (if required); and
- To support the discharge of relevant planning conditions.

1.1 Terms and Conditions

This report has been prepared for Ms K Woods in consideration of the current use of the site and the proposed future residential development. Much of the environmental information relates to the site in its present state and should not be used in a different context without reference to G&J.

1.2 Sources of information

The following sections describe the environmental setting of the site, the site history and the anticipated ground conditions based on information taken from a variety of sources, including;

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- Current maps and plans;
 - Geological maps and records;
 - Site Photographs (Appendix A);
 - Historical maps;
 - Website of relevant authorities and organisations such as The British Geological Survey, the Environment Agency, Defra, Groundsure, Natural England and the National Library of Scotland.

Although every effort has been made to ensure the accuracy of the information contained herein, no checks have been carried out to ensure the accuracy of information obtained from third parties and no liability can be accepted for any errors or misinterpretation of the third-party information where it has been incorporated into this report.

1.3 Policy Context – Land Contamination

The primary legal and policy mechanisms for managing contaminated land are Part IIA of the Environmental Protection Act 1990 and the National Planning Policy Framework.

Part IIA provides a statutory definition of Contaminated Land and supporting guidance which defines how to decide whether or not land meets this definition. For land to be determined as contaminated land, the onus is on demonstrating with sufficient certainty that land is in such condition, by reasons of substances in, on or under the ground that;

- a) Significant harm is being caused or there is a significant possibility of such harm being caused; or
- b) Significant pollution of controlled waters is being caused, or there is a significant possibility of such pollution being caused.

Significant harm and how to determine if a significant possibility of such harm exists is defined in the statutory guidance which accompanies Part IIA. The guidance also defines four categories of land with respect to the risks to human health and the water environment and how the degree of risk relates to the statutory definition of contaminated land, as summarised in the following figure:

Figure 1.1 Part IIA Categories

Land Category	Human Health	Water	
1	Unacceptably high probability that Significant Harm would occur if no action taken	Strong case that a Significant Possibility of Significant Pollution exists	Part IIA Contaminated Land
2	The risks are sufficient that a Significant Possibility of Significant Harm exists	Of sufficient concern to present a Significant Possibility of Significant Pollution	
3	Not low risk but does not pose a Significant Possibility of Significant Harm	The risks are not sufficient to constitute Significant Possibility of Significant Pollution	Not Part IIA Contaminated Land
4	Low risk to human health and no possibility of meeting the statutory definition	No/low risk to controlled waters and would not meet the statutory definition	

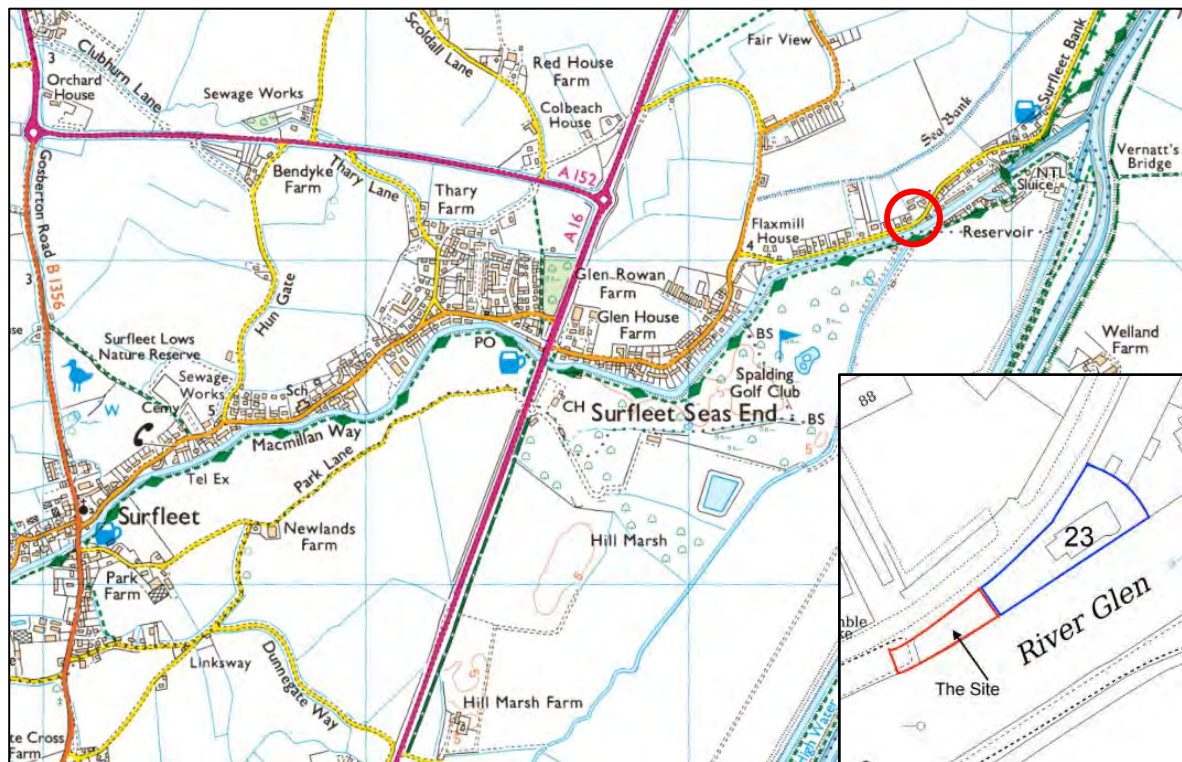
In terms of planning policy, a precautionary approach is adopted whereby it is necessary to demonstrate with sufficient confidence that the site cannot meet the statutory definition of contaminated land. Although the above categorisation is not explicitly applicable to planning decisions, a site classed as Category 4 should be considered suitable for development in accordance with planning policy. While a Category 3 site could be considered suitable, the reduced level of confidence associated with such a site means this is less likely.

2.0 SITE SETTING

2.1 Site Location

The site is located between Reservoir Road and the River Glen, in the east of Surfleet, Lincolnshire. The site is approximately centred on National Grid Reference 527710, 329115, and the site location and layout are shown in Figure 2.1.

Figure 2.1 Site Location and Layout



Contains Ordnance Survey data, © Crown copyright 2026

2.2 Site Description

The site comprises part of the existing garden area of 23 Reservoir Road. In the east of the development site is a shed / summer house from which the ground level falls to the adjacent River Glen. To the west of the shed is a plateau formed using sheet piles which provides a gravel driveway off Reservoir Road and a relatively flat grassed area. Within this area are a vent pipe and two manhole covers that provide access to a septic tank and soakaway.

From the top of the sheet piling, the ground falls by approximately 1m to a grassed strip of land alongside the river. Further piling retains the site from the river. A small mooring is present in front of the shed.

Site photographs are included in Appendix A.

2.3 Surrounding Land Use

The surrounding land use is predominantly agricultural, with residential properties along Reservoir Road. A golf course is present to the south-west on the opposite side of the River Glen.

2.4 Potential Sources of Contamination

Other than the septic tank, no obvious potentially significant sources of contamination have been identified related to the present use. Minor contamination as a result of the use of domestic quantities of substances such as oils, paints and cleaning products is a possibility.

2.5 Sensitive Land Uses

The site is located within a Nitrate Vulnerable Zone. There are no other sensitive land uses within 1km of the site.

2.6 Proposed Development

It is understood that it is proposed to construct a single-storey dwelling ('Mirador') in the west of the site, as shown in Figure 2.2. The existing septic tank will be replaced with a domestic sewerage treatment plant that will service Mirador and number 23 Reservoir Road.

Figure 2.2 Proposed Development



3.0 GROUND CONDITIONS

3.1 Geology

The British Geological Survey (BGS) geological map of the area shows the site to be underlain by superficial Tidal flat Deposits (clay and silt) which are underlain by bedrock geology comprising the mudstone of the Oxford Clay Formation.

3.2 Mining and Extraction

The site is not in an area that may be affected by coal mining and there are no records of mineral extraction in the immediate vicinity.

3.3 Radon

The site is not located in a Radon Affected Area as defined by the Health Protection Agency (HPA), as less than 1% of properties are above the Action Level. Radon protective measures are not a requirement in new buildings in such areas.

3.4 Made Ground and Landfills

There are no records suggesting the presence of significant thicknesses of fill or Made Ground on the site, while there are no records of current or historical landfills within 1km of the site

3.5 Hydrogeology

The underlying geology is classed as unproductive in terms of water supply.

The site is outside any Groundwater Source Protection Zones, meaning it is outside the catchment of any groundwater source from which water is abstracted for public potable supply.

4.0 HYDROLOGY

4.1 Watercourses

The nearest surface watercourse is the River Glen, which flows in a north-easterly direction adjacent to the southern boundary of the site and joins the River Welland approximately 600m north-east of the site.

4.2 Flood Risk

The site is shown to be located in Flood Zone 3 on flood mapping, which represents areas that are predicted to have greater than 1:100 annual probability of flooding from rivers or the sea. However, a flood risk assessment for the site confirms the upper level of the site is actually within Flood Zone 1 (above the predicted extreme flood level), with only the lower level within Flood Zone 3.

The risks from other forms of flooding are considered to be low.

4.3 Site Drainage

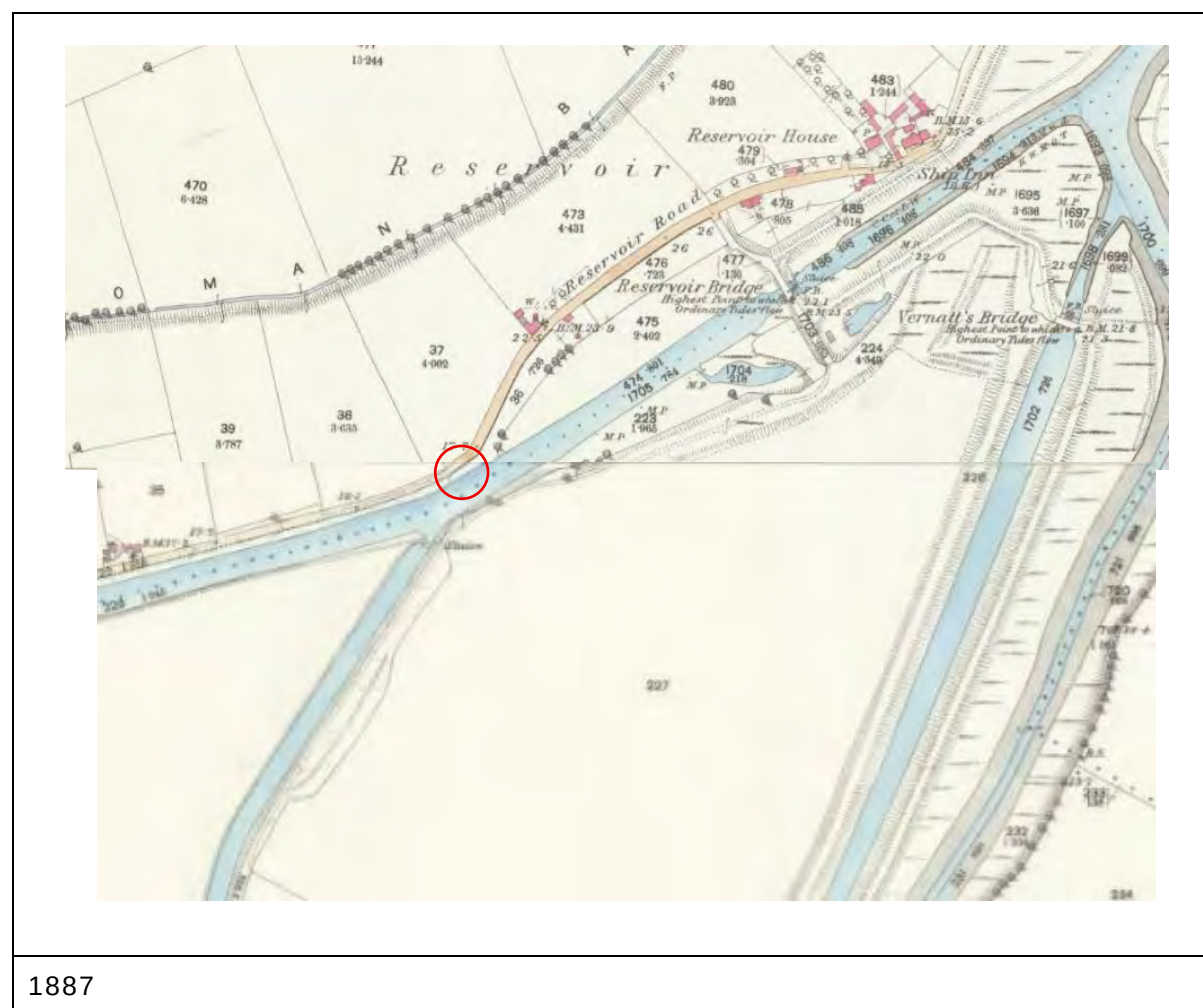
The site is current covered by soft ground, and drainage will likely be via a combination of infiltration and run-off to the river.

5.0 SITE HISTORY

5.1 Historical Mapping

The following is a summary of the relevant history of the site and its immediate surroundings, based on a review of historical Ordnance Survey (OS) maps and plans, available from the National Library of Scotland, and Google Earth imagery. A selection of historical maps and images are presented in Figure 5.1.

Figure 5.1 Historical Mapping





1929



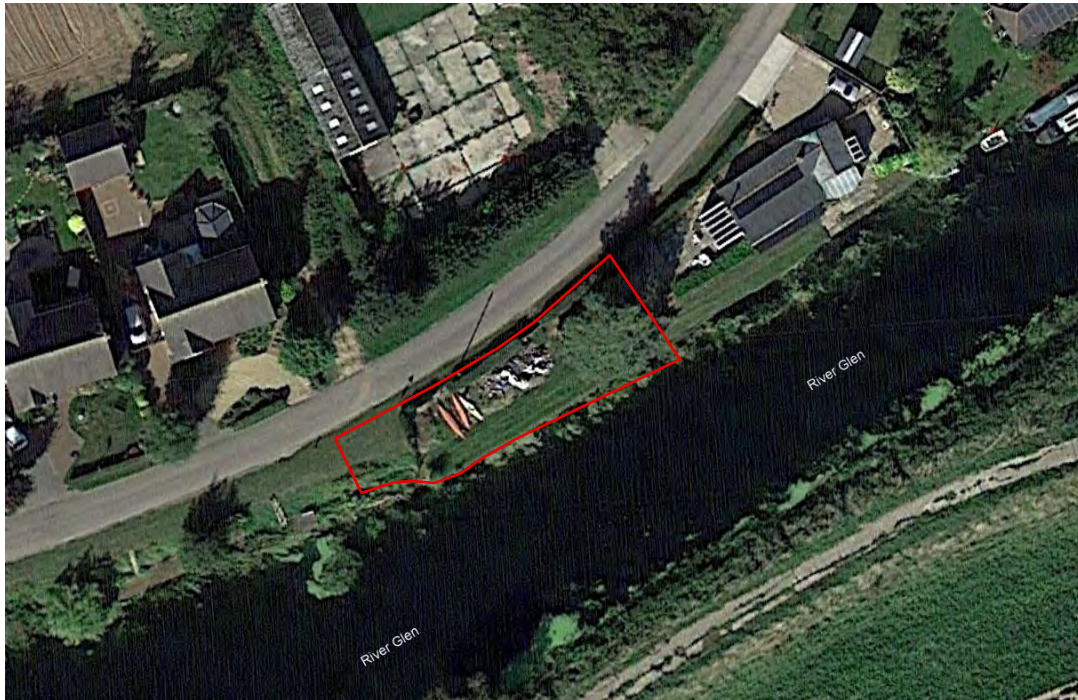
1955



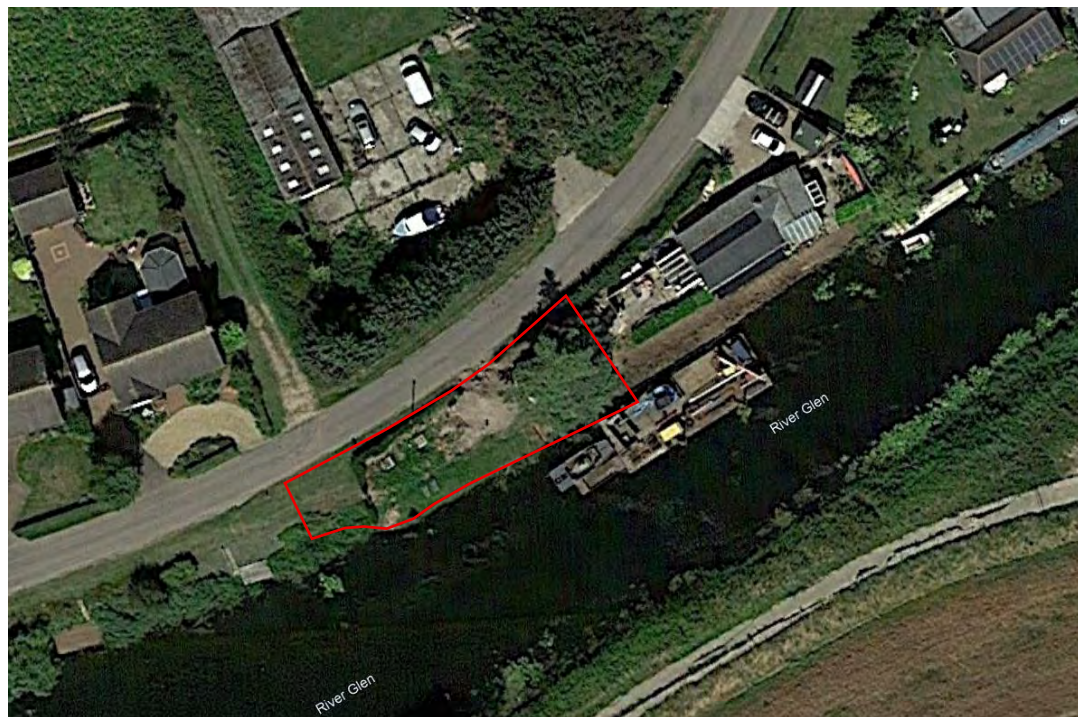
1971



1999 (Google Earth)



2016 (Google Earth)



2020 (Google Earth)



2024 (Google Earth)

Historical maps reproduced with the permission of the National Library of Scotland.

5.2 Summary of Site History

Reservoir Road is present from at least the late 19th century, but no development is shown on the site until sometime between 1955 and 1971, when number 23 Reservoir Road is shown and the site is shown as part of the garden.

Google Earth imagery shows the western boundary of the garden was several metres inside the site until recently. The garden is variously shown as a grassed area and rough ground (where kayaks are stored in several images), with the manhole covers for the septic tank and soakaway visible on later images.

6.0 CONCEPTUAL SITE MODEL

6.1 Introduction

The information obtained from the desk-based study has been collated and evaluated to develop a Conceptual Model for the site.

The site has been assessed in line with current UK guidelines, namely the Contaminated Land (England) Regulations 2000 and Part IIA of the Environmental Protection Act 1990, and follows the procedures set out in the Environmental Agency 'Land Contamination Risk Management' (LCRM) framework.

LCRM provides the technical framework for structured decision making about land contamination and replaces 'Model Procedures for the Management of Land Contamination – Contaminated Land Report (CLR) 11', which built on previous work carried out under the Contaminated Land Research Programme of the former Department of the Environment. LCRM has adopted and refined the methodology and terminology that has been used in contaminated land risk assessment for a number of years.

LCRM defines the three essential elements to any risk:

- A contaminant source - a substance that is in, on or under land and has the potential to cause harm or to cause pollution of controlled waters.
- A receptor – in general terms, something that could be adversely affected by a contaminant, such as people, an ecological system, property or a water body.
- A pathway - a route or means by which a receptor can be exposed to or affected by a contaminant.

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

The following describes a Preliminary Risk Assessment and presents a Stage 1 Conceptual Model for the site, based on the proposed residential development.

6.2 Hazard Identification

6.2.1 Potential Contamination Sources

Overall, the desk study has not identified any obvious historical or contemporary potential sources of significant land contamination on the site. Minor contamination as a result of general domestic activities, for example vehicle parking and site maintenance, is a possibility, however there is currently no evidence of this.

The septic tank may be considered a potential source of contamination (mainly nutrients and pathogens, but also domestic substances such as detergents), but such systems are designed to treat and discharge effluent to ground, and should therefore not present a significant risk.

6.2.2 Potential Receptors

The following are considered the potential receptors assuming a future residential use of the site.

- Future land users – Occupiers of the proposed development.
- Buildings (including foundations) and below ground services / infrastructure – Concrete foundations, drinking water supply pipes and other service infrastructure.
- Surface Water – River Glen.
- Flora – Any vegetation within current or proposed landscaping

6.2.3 Potential Contamination Pathways

The following are considered potential contamination pathways given the nature of the site and the potential contaminative sources identified, and assuming a future residential end use with gardens.

- Ingestion and dermal absorption through direct contact with contaminated soils and soil-derived dusts;
- Uptake of contaminants by plants intended for human consumption;
- Inhalation of airborne soil-derived dust/particulate matter;
- Migration and inhalation of gases and vapour;
- Contamination of drinking water pipes by contaminated material leading to the ingestion of contaminated drinking water;

- Attack on concrete foundations by aggressive soil conditions;
- Run-off (and possibly migration via the unsaturated zone) to the River Glen;
- Uptake by plants in gardens and landscaped areas.

6.3 Preliminary Risk Assessment

Risks from land contamination in the UK are assessed on the 'suitability for use' principle, whereby pollutant linkages are considered with regard to the intended end use of the site, and the specific exposure pathways and receptors associated with that use.

The CSM forms the basis for the design of subsequent stages of investigation, which should aim to confirm (or otherwise) the presence and significance of the potential pollutant linkages highlighted by the CSM. The risk assessment has been carried out based on a residential land use without gardens.

For the purpose of this report, the environmental risks associated with each potential pollutant linkage have been initially assessed based on the available information using the following scale;

Figure 6.1 Risk Definitions

Risk Level	Description
Very Low / Negligible	The contaminant linkage may not be complete or is otherwise very unlikely to result in significant effects*, and further investigation should not be necessary
Low	Significant effects* are unlikely and further investigation may not be necessary, but should be considered
Medium	Significant effects* are a possibility and further investigation is recommended
High	Significant effects* are likely and further investigation is required
Very High	There is evidence that significant effects* are currently occurring, or are likely to occur, and immediate action is required.

*Significant effects are considered to be any of the following:

- Exposure of site users to levels of contamination that may constitute significant harm as defined by Part IIA of the Environmental Protection Act
- An impact on controlled waters from contamination in contradiction of the aims of the Water Framework Directive, which may constitute Part IIA significant harm
- Exposure of an ecological system, or part thereof, to levels of contamination that may constitute Part IIA significant harm

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- Exposure of crops, domesticated animals and animals subject to hunting / fishing rights to levels of contamination that may constitute Part IIA significant harm
 - Exposure of construction and underground service materials to levels of contamination which may cause damage or exceed industry thresholds

In accordance with LCRM, professional judgement has been employed to evaluate the risk on a qualitative basis using available information.

Based on the potential sources, pathways and receptors associated with the proposed residential development site use, an initial Conceptual Site Model has been developed, and is summarised in Table 6.1.

Table 6.1 Conceptual Site Model

Area / Structure	Contaminants (Chemicals of Concern)	Pathway		Risk	Comment / Recommended Actions
Minor contamination associated with domestic activities Septic tank	Hydrocarbons, PAHs, metals, nutrients, pathogens	Ingestion and dermal adsorption through direct contact	Humans (Future site users)	Very Low / Negligible	The potential for significant contamination to be present is very low. The site has been in use as a domestic garden area since 23 Reservoir Road was constructed, and will essentially remain in the use.
		Consumption of plants grown in contaminated ground		Very Low / Negligible	
		Inhalation of dust / particulates		Very Low / Negligible	
		Inhalation of gases / vapours		Very Low / Negligible	
		Direct contact	Buildings / Foundations / Services	Low	The potential for significant contamination is considered to be very low, however, some sampling and analysis may be required to determine the natural aggressiveness of the ground with regards to concrete classification.
		Run-off and migration via the unsaturated zone	River Glen	Low	Discharge from the septic tank has potential to impact the river, but the risks are considered to be low in terms of land contamination. Any risks should be managed by the correct operation and maintenance of the system.
		Plant uptake	Flora	Very Low / Negligible	Further investigation is not considered necessary given the low potential for significant contamination.

7.0 CONCLUSIONS AND RECOMMENDATIONS

7.1 Preliminary Risk Assessment

Based on the information reviewed during this survey, the risks from land contamination (except those to construction workers) are considered to be very low to low. The risks reflect the very low potential for significant contamination to be present based on past and present use, and the high sensitivity of the development.

7.1.1 Construction Workers

Given the unique exposure scenario for any construction, investigation or maintenance worker involved in groundworks or excavations, the risks are considered separately from those to other receptors which are described above.

There is always a risk of exposure to contamination for those involved in ground disturbance, particularly in Made Ground and near surface soils where materials such as asbestos can be present. Measures should be taken to minimise exposure of such workers to these risks, in accordance with common good practice.

7.2 Future Work Requirements

The potential for significant contamination to be present, that would represent a significant risk for the proposed development, is considered to be very low and no intrusive investigation works with respect to land contamination are considered necessary. Ground investigation works may be required for geotechnical purposes (foundation design etc) and to determine the concrete classification for the site.

The septic tank should be decommissioned by an appropriately experienced contractor, and the new sewerage treatment system installed to ensure it operates as designed.

7.2.1 Unexpected Contamination

Should any evidence of previously unidentified and unexpected potentially significant contamination be encountered during future site works (such as suspicious materials, odours, staining, significant Made Ground), then a geo-environmental specialist should be consulted and an assessment undertaken to determine whether any further action required.

APPENDICES

A – Site Photographs



Looking east from the western boundary



Looking west from the east of the site



Eastern boundary in front of the shed / summer house



Rear of shed / summer house



Looking west from the driveway with wood chippings in the foreground



Site entrance from Reservoir Road



Drone view of the site