



CONTAMINATED LAND REMEDIATION STRATEGY REVIEW

Site Address

Alton Towers
Farley Lane
Farley
Staffordshire
ST10 4DB

Client

Merlin Attractions Operations Limited

Prepared by

PCA Safety Ltd

Date

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2. INTRODUCTION

PCA Ltd. (PCA) were commissioned by Merlin Attractions Operations Limited (Client) to prepare and review the Remediation Strategy undertake a for a site located at Alton Towers, Farley Lane, Farley Staffordshire ST10 4DB

The study is required to ensure the of discharging condition 13 attached to planning permission ref. SMD/2022/0556 and support planning permission for the removal of existing structures and construction of new building to house indoor attraction, associated ground works, infrastructure and landscaping.

This document sets out the Remediation Strategy for the site. It should be read in combination with the Site Investigation report (Ref: CL-602-LKC 22 1510-02) produced by LK Consult on February 2023

The report is a combined report phase 1 and 2 ground investigation interpretative report incorporating a desk top study and site investigation

3.BACKGROUND

3.1 DESK TOP STUDY

The Phase 1 Desk Study produced for the site Undertaken by LKC in September 2022. Ref: LKC 22 151

In summary, the environmental risk is considered to be low.

preliminary Conceptual Model:

PL=Pollutant Linkage

PL1 Direct Contact (Human Health): High Risk (asbestos), Moderate Risk (metals, PAHs), Low Risk (Petroleum Hydrocarbons).

PL2 Inhalation of Vapours: Moderate Risk (volatile contaminants).

PL3 Gas: High Risk (hazardous and ground gas).

PL4 Controlled waters: Moderate Risk (mobile contaminants).

PL5 Water Pipelines: Moderate Risk (organic contaminants).

Recommendations: Site Investigation was recommended to further assess the above pollutant

linkages and provide geotechnical information.

No sources have been identified, apart from the potential for made ground from previous phases of development, and possible low volume and highly localised fuels/oils from maintenance of adjacent rides and structures.

3.2 SUMMARY OF PHASE 2 INTRUSIVE SITE INVESTIGATION

The site investigation work was carried out on the 5th to 13th December 2022 and 13th January 2023.



The ground investigation comprised:

Intrusive Investigation Work Undertaken:

6no. Window Sample boreholes (ref. WS101 to WS105 and WS101A).

3no. Rotary Holes (ref. RH101 to RH103).

2no. Trial Pits (ref. TP101 to TP102).

3no. Hand Dug pits (ref. HD101 to HD103).

5no. Soakaway Tests were undertaken in the Trial Pits and Hand Dugs.

16no. Advanced Continuous Surface Wave (ACSW) testing locations.

Monitoring Wells: Installed in WS101A, WS102, WS105, RH101 and RH103.

Soil Sampling: 11no. samples tested for metals, speciated PAHs, pH, sulphate, asbestos and SOM.

3no. samples tested for metals, speciated PAHs, cyanide, pH, sulphate, asbestos, phenol, TPHCWG, BTEX and SOM.

2no. Waste Acceptance Criteria.

Groundwater Sampling: 2no samples tested for metals, speciated PAHs, cyanide, pH, sulphate, hardness, phenol, TPHCWG and BTEX.

Monitoring: 1no. monitoring visit to check groundwater levels.

Based on WS101 to WS105, TP101 to TP102, RH101 to RH103 and ACSW testing. Maximum investigation depth 12.00mbgl. Made Ground to 0.40m to 2.50mbgl. SPT 'N' = 11 to 50 at 1.00mbgl, 'N' = >50 at 2.00mbgl. Gravelly SAND to 0.80m to 2.50mbgl over red

sandstone bedrock. SPT 'N' = 26 to 50 at 1.00mbgl, 'N' = >50 at 2.00mbgl.

Groundwater not encountered during drilling but generally present at 2.00mbgl during monitoring.

3.3 GENERIC QUANTITATIVE RISK ASSESSMENT REASSESSMENT OF POTENTIAL POLLUTANT LINKAGES

The table below shows a summary of the risk assessments undertaken for each pollutant linkage, the revised conceptual model and recommendation for either remediation and / or further investigation.

	Pollutant Linkage	Risk	Recommendations
1	Contaminants posing a risk to site users via dermal contact, ingestion and inhalation (of soil, dust, fibres and home-grown produce).	Moderate / Low (ACMs)	No ACMs identified. Recommendations: Watching brief during ground works
		Low (Metals, Hydrocarbons, PAHs)	No elevated contaminants. Recommendations: No remediation required.
2	Volatile contaminants posing a risk to site users via the inhalation of vapours	LOW	No elevated contaminants. Recommendations: No remediation required.
3	Gas posing a risk to buildings and site users via the migration of gas into building causing explosion and asphyxiation.	Moderate / Low (Hazardous & ground gas)	No viable source of gas encountered. Recommendations: No remediation Low required.
		Low (Radon)	
4	Mobile contamination posing a risk to controlled waters via the migration through permeable strata	LOW	No elevated contaminants identified in groundwater. Recommendations: No remediation required.
5	Organic contaminants posing a risk to water pipes.	LOW	No elevated contaminants. Recommendations: No remediation required.

The contamination testing did not find any levels of potential contaminants that would be of concern for the proposed development. No asbestos was detected in any of the samples. All the test results were lower than the conservative residential land use criteria.

It is concluded that there are no sources of contamination identified by either the desk study or the site investigation. Further stages of risk assessment are therefore not required and the risks to human health, ecological receptors, and controlled waters are low.

Given the findings of the site investigation, it was recommended that no remedial measures are undertaken.

4. REMEDIATION STRATEGY

This section outlines the remedial strategy that will be implemented as part of the development should contaminants be discovered during the works.

4.1 OBJECTIVES

The Remediation Strategy sets out the proposed remedial works to be undertaken at the Site to support its future development for a proposed visitor experience.

In order for land to be considered contaminated, there must be a contaminant (or source), a receptor and a pathway (via which the contaminant can reach the receptor) present at the site. When these three components are identified at a site, a pollutant linkage is said to exist.

At present based upon the information available there are no contamination

5. HEALTH AND SAFETY

The following measures will be undertaken as a minimum for the protection of the health and safety of site workers:

In working with, removing or treating any contaminating material it is important that any potential risks associated with the actual site works are mitigated by good environmental management of the site during the remedial phases. Standard health and safety precautions (as per HSE guidance⁵⁶) should be adopted by all workers involved with site enabling and construction works.

Provision of appropriate Personal Protective Equipment (PPE) including protective clothing, footwear, gloves and dust masks to all groundworkers on-site. These should not be removed from site, and advice should be given on when and how they are to be used;

Minimising the amount of dust and mud generated on-site;
good practices relating to personal hygiene (i.e. washing and changing procedures) should be adhered to on-site, i.e. food and drink should only be consumed within designated areas on the site and smoking should be prohibited in all working areas.

Provision of welfare facilities on the site;

Health and Safety Inductions and daily briefings.

All site works will be carried out in accordance with Health and Safety Executive regulations and guidelines and the Contractor's Construction Health and Safety Plan. Should be made to the Health and Safety Executive (HSE) document "Protection of Workers and the General Public during the Development of Contaminated Land".

6.0 WATCHING BREIF

Should any unexpected contamination be encountered then the discovery strategy outlined below should be followed.

Works should be halted if any suspicious ground conditions are identified by groundworkers.

The Contractor should assess the need for any immediate health and safety or environmental management control measures. If control measures are considered to be required, they should be implemented.

The Contractor should notify the Client's Environmental Consultant and the Local Planning Authority.

The Environmental Consultant should attend the site to record the extent of 'contamination' and if necessary, to collect samples.

If remedial action is considered necessary, then the proposed works should be agreed with the Local Planning Authority prior to implementation.

Once remediation is complete, the Environmental Consultant should collate evidence

of work carried out for inclusion in a Remediation Verification Report which should be submitted to the Local Planning Authority.

7. VERIFICATION STRATEGY

A Remediation Verification Report written by a competent environmental consultant will be submitted and will provide a complete record of the works that have been carried out on the site. The verification and validation reports will as a minimum contain the following:

- Details of qualifications of Validating Engineer
- Details and photographs of all work undertaken
- Details of who carried out the installation
- Details of who carried out the verification
- Description of protective measures installed with reference to method statements and drawings and manufacturers specification of the materials used
- Environmental test results on imported topsoil
- Environmental test results of validation of landscaped ground
- Details of the verification inspection
- Supporting information including plans, photographs and as built drawings
- Summary of verification data
- Clear statement that remedial objectives have been achieved supported by evidence



8. CONCLUSIONS

It is considered that the site contains no contamination however the proposed remedial measures will be sufficient to break any identified PPL if found and render the site suitable for the proposed use

It is recommended that a “watching brief” is kept at all times during the development.

The remediation strategy document provided by LKC is suitable and sufficient