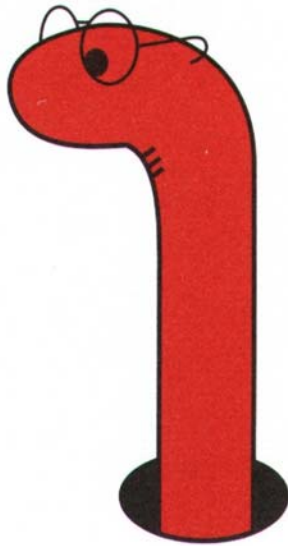


Electronic Report



WORMS EYE

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Our Ref: Ennerdale Avenue / M21 7NR / 2019
Date: 15th December 2020

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ENNERDALE AVENUE, MANCHESTER, M21 7NR
REMEDIATION AND VALIDATION STRATEGY – Subject to WAC Test Results

INTRODUCTION

A residential development is proposed. Following an intrusive report (15/12/20) instructions were to prepare a remediation strategy.

SITE LOCATION

The site is an irregular shaped plot, about 59 by 62 metres, to the northeast of Ennerdale Avenue in Manchester and at OS Grid Reference 382641, 391986. The site mostly comprises an overgrown wooded area at the northeast (with household rubbish mainly around the perimeter). At the southwest were two terraced houses, having gardens to their front and rear.

PROPOSED DEVELOPMENT

It is proposed to demolish the existing houses and build two small, two storey, apartment blocks at the southeast and southwest, with two pairs of semi-detached houses (four units) at the north. There will be an associated access road, and each property will have associated gardens and parking.

The plots have been numbered by Worms Eye (see plan) as follows:

- Plots 1 and 2 – Southwest.
- Plots 3 and 4 – North.
- Plots 5 and 6 – Northeast.
- Plots 7 and 8 – Southeast.

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INTRUSIVE INVESTIGATION

Worms Eye carried out an intrusive investigation dated 15/12/20. The salient points were:

Ground Conditions

Investigations were carried out at ten locations, shown on the plan. At each location a trial hole was excavated to 1.0 metre deep, to collect samples. At locations 1, 4 and 8 (plots 1 and 2) boreholes were drilled to investigate deeper, with a dynamic probe carried out at location 8 to check ground strengths.

The trial holes showed very similar conditions, THs 1, 4, 6, 8 and 9 having topsoil rich made ground with rare brick and gravel to about 0.5 to 0.7m overlying sand.

THs 2, 3 and 5 encountered topsoil rich made ground with more obvious manmade material (plastic bag, metal, glass, gravel) to below 0.6 – 0.85m overlying sand.

THs 7 and 10 encountered topsoil with no obvious features to 0.6 – 0.77m overlying sand.

Boreholes (Southwest Corner – Plots 1 and 2)

The following approximates to a section looking north.

Findings	TH1/BH1/Pr1 (m)	TH8/BH8 (m)	TH4/BH4 (m)
Made ground	0.0 – 0.65	0.0 – 0.61	0.0 – 0.62
Very low strength sand	0.65 – 1.9	0.61 – 1.4	-
Low strength sand		1.4 – 2.0	
Medium strength sand	1.9 – 4.1	2.0 – 3.0+	0.62 – 4.1
Clay	4.1 – 4.8+	-	4.1 – 5.0+
Near refusal	4.8	3.0	5.0
Probe (very high strength)	-	5.1 – 5.9+	-
Water	2.9	Dry	2.8

Intrusive Report Re-Cap Continued

Contamination

Contamination tests mostly show low levels of contaminants, below residential thresholds and indicating no risk to householders.

TH2 at 0.25m shows a borderline level of lead. Considering this further, the levels elsewhere, especially nearby TH5 and TH9 are low. The average level of lead across plots 3 and 4 (THs 2, 5 and 9) is 126 mg/kg, with a level across the whole site of 107 mg/kg, both were below the residential threshold (200mg/kg). It is considered that the borderline level of lead in TH2 does not pose a risk to householders.

The findings suggest no risk to householders and no further action or remedial works are needed.

Water Soluble Sulphate levels are low and sulphate resistant concrete is not required.

The tests results suggest, subject to approval, the site is suitable for normal PE water pipes.

Levels of volatile hydrocarbons are very low and there is no risk from hydrocarbon vapours.

CONCEPTUAL MODEL

Source	Receptors	Pathway	Complex Pollutant Linkage
Asbestos (none seen)	End-users	Inhalation	No
	Off-site	Migration off-site	No
Inorganic contaminants (low)	Householders	Direct contact, ingestion, from home grown vegetables, ingestion and inhalation of dust	No
	Groundwater	Leaching towards	No
	River/stream	Leaching towards	No
Sulphate (low)	Building fabric	Concrete directly in contact with soil	No
Hydrocarbons (low)	Householders	Direct contact, ingestion, from home grown vegetables, ingestion and inhalation of dust	No
	Service pipes	Seeping into drinking water pipes	No
	Groundwater	Leaching towards	No
	River/stream	Leaching towards	No
Hydrocarbon vapours (very low)	Householders	Inhalation of vapours indoors and outdoors	No
Landfill gas	End-users - in buildings	Seeping into buildings, explosion, asphyxiation	No
Radon	End-users - in buildings	Seeping into buildings	No

End of Intrusive Report Re-Cap

REMEDIATION AND VALIDATION STRATEGY

Construction Workers

Normal precautions for an urban renewal type project are required. These would include the use of gloves and the provision of washing facilities to avoid ingestion of contaminants.

Watching Brief

A watching brief for unexpected contaminants should be maintained.

If unexpected contaminants (e.g. asbestos, oily material, unusual smells) are seen, especially during excavations, work should cease and the consultant be notified and the site inspected.

This may require further testing the remediation strategy may need to be reviewed.

Disposal of Excavated Soils

Test results have been compared with hazardous waste thresholds and a Hazwaste report is enclosed. This suggests excavated soil would not be classed as hazardous waste.

Disposal of soil is now a complex matter and the analysis should be submitted to the receiving site for confirmation of its status.

Imported Soils

All soils (e.g. topsoil, bulk fill hardcore) and similar materials imported on-site to be proved to be uncontaminated. Imported material will require testing as follows:

- Greenfield soils – minimum of 3 tests or 1 test per 100m³ (whichever is greater). Testing to include arsenic, cadmium, chromium (total), chromium VI, copper, mercury, nickel, lead, selenium, zinc, PAH (16 USEPA speciation), asbestos, TPHs (speciated), boron, cyanide, thiocyanate, sulphide, sulphur, sulphate, pH, Som.
- Brownfield/screened/manufactured soils – minimum of 3 tests or 1 test per 50m³ (whichever is greater). Testing to include arsenic, cadmium, chromium (total), chromium VI, copper, mercury, nickel, lead, selenium, zinc, PAH (16 USEPA speciation) asbestos, TPHs (speciated), boron, cyanide, thiocyanate, sulphide, sulphur, sulphate, pH, Som.

Soil Screen Values

Tests carried out on the imported material, either by the supplier or the consultant, to be screened against residential values, based on 1% SOM. If these are exceeded, site specific value may be derived, subject to them being appropriate.

Validation

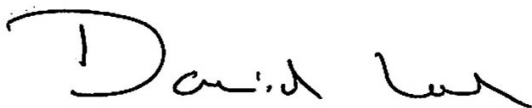
A validation report will be required on completion, this will require but not necessarily be limited to:

- Tickets from waste removal contractor and receiving landfill.
- Contamination test results for tests on imported soils.
- Photographs to confirm thickness of imported soil types.
- Document (receipt, delivery notes) to show soil types and sources.
- Documented site inspection, including photographs.
- Confirmation of watching brief.

This report is usually a collaboration between the contractor, who will collect the above documentation and Worms Eye, who can assist in preparing the Validation Report

Yours faithfully

on behalf of Worms Eye Ltd

A handwritten signature in black ink, appearing to read 'David Lord', with a stylized, cursive script.

David Lord
BSc (Hons)
FGS, MEnvSc, AIEMA