

Geoff Little OBE
Chief Executive

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Your Ref 67596
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Please ask for Judith Scott
Direct Line 0161 253 5581
E-mail j.scott@bury.gov.uk

Donna Ball
Executive Director, Operations

Jennie Townsend
Bury Council Planning Department

Dear Jennie

Fernhill Caravan Park, Every Street, Bury. Planning application 67596 – Contaminated Land

The Environment Section has received copies of the following reports:

- Preliminary Land Risk Assessment, Fernhill Caravan Park, Every Street, Bury, RSK, Reference: 11542-01 (00), December 2020.
- Geo-environmental and geotechnical site investigation, Fernhill Caravan Park, Every Street, Bury, RSK, Reference: 11542 R02 (00), August 2021.

The Environment Section has reviewed the above information in order to assess the following points:

1. The adequacy of the desk study information available for this site.
2. The adequacy of the site investigation.
3. The adequacy of the final risk assessment.
4. The acceptability of the proposed remediation strategy.
5. Whether the information submitted is sufficient to determine that the site presents a low risk to human health and the environment.

The site is currently a traveller's residential site surrounded by residential properties, a primary school, industrial and commercial units and a waste transfer station. The site was formerly in use as a gravel pit associated with a Corporation Yard and was anecdotally developed as a caravan site by 1989. Surrounding historical uses have included woollen mills, a gravel pit, a refuse destructor, tanks, and a saw mill.

The site is underlain by the Pennine Coal Measures Secondary A Aquifer which is overlain by Glacial Till. The site is not within 250m of a registered landfill site although there is likely to be infilled features in the vicinity. The site is situated 200m to the east of the River Irwell.

The site is in a development high risk area for coal mining with records of previous shallow underground coal mining associated with the Arley Seam which was mined until 1900.

The site proposal is for the demolition of 17 existing Gypsy and Traveller pitches, amenity blocks and management blocks for the proposed redevelopment of the site to provide 12 permanent Gypsy and Traveller pitches including new amenity buildings

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and management block.

1. The adequacy of the desk study information available for this site

The desk study information has been previously assessed and found to be sufficient to assess the potential risks at the site.

Previous investigation of the raised bunds on site has been carried out (Tergeo - 2017 and RSK – 2018).

2. The adequacy of the site investigation

The site investigation was carried out between March and June 2021 and comprised the following:

Technique	No.	Comments
Window Sample Boreholes	6	BH01 – BH06, drilled to a maximum depth of 6.45 mbgl with ground gas and groundwater monitoring wells in 5 of the boreholes.
Soil Sampling	10 samples (made ground)	Metals, speciated PAHs, TPH, sulphate and asbestos.
	2 samples (natural ground)	Metals, speciated PAH and TPH and sulphates.

Site Ground Conditions: The Made Ground was noted to comprise two different types; a recent made ground, and a pre-1930s made ground. The recent made ground comprised a varied deposit of clay and silty sand with much brick and gravel and varied in thickness from 0.5 m to up to 2.0 m. The pre-1930s made ground comprised mostly ash and clinker and was encountered in BH2 underlying the recent made ground and was found to be nearly 3 m thick.

The pre-1930s made ground appears to be formed from the combustion of waste within the former gravel pit, overlain by a site wide cohesive and granular made ground of a more recent age.

Underlying the made ground was medium dense silty sand and silt which was found from 0.5 mbgl to the base of the boreholes (max. 7.45m).

Bituminous odours were encountered in the recent made ground and were anticipated to be remnant diesel and PAHs.

The soil sampling and chemical tests were designed to characterise the made ground and natural strata within the upper 1 m whilst also characterising deeper strata and the potential for contaminants migration from relevant sources.

Site Water Conditions: Groundwater levels were recorded during each ground gas monitoring visit. Groundwater was encountered in 4 of the 6 boreholes and 2 groundwater samples were taken for analysis. No evidence of visual / olfactory groundwater contamination.

Site Ground Gas Conditions: Potential sources of ground gas within influencing distance of the site were identified:

- Made ground (recent) typically <2.00 m deep site wide – on site. Low in organic material and was considered to have a low to moderate risk from carbon dioxide.
- Made ground (<1930) – limited to area of former gravel pit – on site. Derived from the waste destructor and is considered to have a low potential for organic content due to the combustion process (carbon dioxide).

No other sources were considered as having ground gases under pressure within close proximity.

The monitoring was to target the infilled gravel pit, mine workings and shallow made ground. Six rounds of ground gas monitoring have been carried out between 7 May and 18 June 2021. Atmospheric pressure was below 1000mb on two occasions. Maximum CO₂ concentrations were 7.4 % v/v and maximum methane concentrations were 0.1 % v/v. CO₂ was only found above 5% v/v on one occasion.

3. The adequacy of the final risk assessment

Ground Assessment: The soil analysis results have been compared to GACs for residential end-use with and without home-grown produce. The soil results have been split into appropriate data sets as follows:

Data set 1a – Made ground underlying the site.

Data set 1b - Made ground within the bund surrounding the site.

Data set 1a – samples from the natural strata did not find any elevated contaminants. Samples from the more recent made ground found slightly elevated levels of lead and zinc, asbestos, TPH and PAHs. A source signature double ratio plot has been carried out and all PAH compounds are associated with coal based processes. The deeper pre 1930s made ground within BH2 was thought to be the bi-product of the waste destructor (ash and clinker) and was found to contain significantly elevated concentrations of arsenic (194 mg/kg), copper (1440 mg/kg), lead (2110 mg/kg), nickel (137 mg/kg) and zinc (1100 mg/kg). Concentrations of compounds within TPH CWG and US EPA 16 suites were all negligible.

Data set 1b – the bund was sampled by Tergeo and RSK during 2017 and 2018. The Tergeo investigation. Asbestos was encountered within two samples. Metals exceeded threshold for human health without plant uptake for lead and zinc. This material was deemed suitable for use at depth of 0.6m from proposed surface. Combustion related hydrocarbon compounds were found along with PAH compounds but found to be suitable as engineered fill.

RSK also recovered samples from the bund and similar results were found. The only type of asbestos found was chrysotile in the form of loose fibres and clumps with one sample of chrysotile board.

The made ground both underlying the site and contained within the bund is not suitable to be present at the surface of the proposed end use.

Controlled Waters Assessment: The analytical results obtained from groundwater in BH1 and BH3 are below GAC protective of groundwater receptors therefore groundwater is not considered to be impacted by contamination.

Ground Gas Assessment: Borehole hazard gas flow rates have been calculated for each borehole, using maximum methane and carbon dioxide concentrations in accordance with BS8485 for each monitoring round. Worst case GSV using worst case concentrations/flows from across the site are below:

Methane: $0.1\% \text{ v/v} / 100 \times 0.2 \text{ l/hr} = 0.0002 \text{ l/hr}$

Carbon dioxide: $7.4\% \text{ v/v} / 100 \times 0.2 \text{ l/hr} = 0.0148 \text{ l/hr}$

The monitoring determined that although carbon dioxide was present, the concentration encountered was both below the tier 1 threshold concentration of 5% for all but one reading, with no gas flow recorded. Ground gas is therefore not considered to pose a risk to the development. The site has been classified as CS1 and ground gas protection measures are not considered necessary.

The final risk assessment appears to be acceptable.

4. The acceptability of the proposed remediation strategy

The top 2m of the site are to be turned over and material within the bund is to be screened and sorted for suitable material and then used as a development platform. A remediation proposal for the turnover of material is required.

The following measures have been proposed:

- All landscaping areas to have 0.60m inert cover comprising 0.15m of topsoil and 0.45m subsoil with a material separator or hard to dig boundary underlying the inert cover.
- Protectorline potable water supply barrier pipework anticipated to be required. A UU risk assessment for water pipes is required to be carried out.
- Mitigation measures in relation to asbestos will be required for the handling of material.
- A watching brief to be carried out during the processing of the made ground to confirm consistency and to address any localised areas of contamination encountered.
- All licenses and permits to be obtained by a competent contractor.
- WAC testing to be carried out on surplus soils on site for disposal.
- Mitigation measures for handling asbestos during the development phase and post development.

The above the remediation proposals were found to be acceptable to this Section. However the following additional information is required for submission:

- Detailed remediation strategy to include:
 - The remediation plan for the turn over and sorting of material.
 - Details of mitigation measures when handling asbestos contaminated material.
 - Details of how imported clean material will be tested and confirmed to be suitable for use.

5. Whether the information submitted is sufficient to determine that site presents a low risk to human health and the environment

In order for this Section to be satisfied that this development does not pose a risk to human health or the environment, the following information needs to be submitted to the Council for approval:

- (i) A detailed remediation strategy as outlined above.
- (ii) A materials management plan if the CL:aire Definition of Waste Protocol is to be used.
- (iii) After completion of site works, a verification report is required to validate that the work undertaken conforms to the remediation proposals received and agreed by this Section. The report would be expected to include the following:
 - Summary of desk study, site investigation report and remediation strategy.
 - Details of who carried out the work.
 - Details and justification of any changes from original remediation strategy.
 - Substantiating validation data that should include where appropriate:
 - Laboratory and *in-situ* test results.
 - Monitoring results for groundwater and gases.
 - Summary data plots and tables relating to clean-up criteria.
 - Plans showing treatment areas and details of any differences from the original remediation strategy.
 - Photographic and other media records.
 - Waste management details and records.
 - Confirmation that remediation objectives have been met.

Please do not hesitate to contact me if you require any clarification of the above.

Yours sincerely

A handwritten signature in black ink, appearing to read 'J Scott', written in a cursive style.

Judith Scott
Environmental Protection Officer

Please Note:

The Environmental Services Division has used all reasonable endeavours to determine the risk from contaminated land and ground gas based upon the information available to it. However, the comments made above should not be taken to imply that the land is safe or otherwise suitable for this or any other development. The responsibility for safe development rests with the developer.