
THE ARLEY CONSULTING COMPANY LIMITED

Chorleian House
49-51 St Thomas's Road
Chorley, Lancs
PR7 1JE



Tel: 01257 278300
Fax: 01257 268063
E-mail: mailbox@taccl.co.uk
www.taccl.co.uk

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FAO Angela Guy

Contaminated Land
Wrexham County Borough Council
16 Lord Street
Wrexham
LL11 1LG

Dear Angela

Former Hafod Red Brickworks, Ruabon

I write, further to our brief discussions on 8 July, in relation to the proposed redevelopment of the above site.

As discussed, please find below a note describing the conditions at a specific area in the southern part of the site, that we would like to discuss with you, before the reserved matters planning application is finalised and submitted.

Introduction

It is being proposed that the former Hafod Red Brickworks site be redeveloped, primarily for residential use, but also some commercial development and areas for public open space and Great Crested Newt mitigation.

A planning application is being prepared and the indicative layout drawing drawings are provided at Annex 1. It can be seen that a new access will be provided to the site from Bangor Road to the south. The residential area will be in the northern and eastern sections of the site to the north-east of the overhead electricity cables, with newt habitat and public open space to the south-west of the electricity cables and a series of commercial units close to the site entrance and Bangor Road on the southern site boundary.

A 'Tip' is marked on the base Ordnance Survey records for Drawing No SK01, immediately to the south of the intersection of the new access road and the overhead cables.

During recent investigations in the Tip area some contamination has been identified and TACCL has been consulted regarding remediation options. Other areas of made ground have also been identified across the wider development site, but these do not require any specific discussions at this stage.

In this Briefing Note TACCL outlines the conditions in the Tip area and provides an outline remediation strategy for discussion with you as Wrexham County Borough Council's Contaminated Land Officer.



Once broad agreement has been reached the required remediation actions shall be incorporated within the main contamination assessment and RemStrat for the wider site, being prepared by others. Or as a stand-alone RemStrat, if agreed that is the best approach.

In the following sections TACCL summarises the available information relating to this area of the site as the basis for discussions with the Contaminated Land Officer.

Phase 1 – Preliminary Risk Assessment (PRA)

A PRA was produced for the site in 2012 by Johnson Poole & Bloomer (JPB). At that time JPB noted *‘a number of grassed soil mounds in the northwest with bare soils present in the southeast, with small amounts of demolition rubble and ponded surface waters identified at the surface’* beneath *‘a pair of high voltage electricity transmission lines’*. On Drawing No MB616/02 appended to the report the area was annotated as a *‘Refuse Tip’* which comes from a Groundsure Report and possibly old Ordnance Survey maps.

JPB reported that, based on published records, the anticipated ground conditions at the site comprise glacial till across the entire site overlying the Etruria Formation (formerly known as the Ruabon Marl) which dip at approximately 4° to the east.

Historically the brickworks started at the northern end of the wider site in the later 1800’s. Brick manufacture reduced from the 1970’s and by the 1980’s the site was producing clay tiles. Manufacture of tiles continued into the 2000’s. For a period (between around 1898 and 1979) there was a tramway/railway through the southern part of the site connecting a clay pit to the south of Bangor Road to the brickworks, this past close to the eastern edge of the study area. A cement works is first shown on the 2008 OS map.

There is a large non hazardous waste landfill site to the south of Bangor Road. This site has been developed within an old brickworks clay pit. JPB reported that this landfill site represents a significant source of landfill gas and polluting leachate but will be tightly regulated via an environmental permit.

JPB reports that the 2002 and 2008 OS plans show *‘an area of refuse / landfilling in the centre of the southern half of the site, situated beneath the route of the overhead electricity transmission lines. Information held within the JPB Archive indicates that this area was put forward as a proposed stocking area in Planning Application Number 6/15143 by Dennis Ruabon Limited in 1989.’*

JPB also notes that it *‘has not been able to obtain any details of the materials landfill at this location. However, it is likely that they may have comprised a combination of reworked natural materials, overburden, colliery spoil and industrial waste from the brickworks, although other materials may also be present’*.

It is worth noting that quarry and mining by-products were classified as *‘controlled wastes’* under the Waste Management Licensing Regulations 2006. Prior to that time this material was not considered to be controlled waste.

The glacial till, underlying the site, is classified as unproductive strata and will probably provide a low permeability barrier between the surface and the underlying Etruria Formation (Secondary A Aquifer), which is also likely to have a relatively low permeability.

The site is not in groundwater Source Protection Zone and there were no groundwater abstractions within 1 km of the wider site boundary.



Aberderfyn Brook flows through the southern part of the wider site and is located quite close to the former tip identified. It is reported that water from the brook discharges into Black Brook, some 500 m to the south-east.

There were no surface water abstractions within 1 km of the wider site.

JPB recommended an environmental investigation, targeting some specific areas of the site, including the 'refuse tip'.

Extracts from the JPB report are provided at Annex 2.

Updated PRA source data has been obtained by REFA as part of current investigations at the site.

Phase 2 - Site Investigations

Opus investigated the wider site in 2013/14. Made ground was identified across much of the site overlying the natural superficial soils.

A series of trial pits and boreholes were drilled in and around the former tip area covered by this briefing note, as illustrated on Opus Drawing No DO J-D1120.00/402 R1. These include one window sample borehole (Borehole No WS04) and three trial pits (Trial Pit Nos 26, 27 & 32). Monitoring probes were installed in some of the boreholes, including Borehole No WS04.

Extracts from the Opus report are presented at Annex 3.

Opus reported that *'made ground was encountered extensively across the site... Although this material has proven to be chemically clean, with the exception of the hotspots, it is visually unsuitable for use in garden areas and as such a suitable growing medium should be provided'*. The four contamination hot spots identified were outside the tip area.

Made ground, greater than 300 mm thick was noted in Trial Pit Nos 26, 27, 28 & 32 within tip area. This material typically comprised *'red brown gravelly clay'* with bricks and tiles (at TP22) and is similar to other made ground found elsewhere at the site.

The natural superficial soils identified in this area comprise a combination of gravelly clay and gravelly sand.

Groundwater was encountered within the superficial soils at some locations with depths varying between 0.8 and 2.10 m.

One made ground sample (from Trial Pit No 26) was analysed for contamination and all results were within the residential assessment criteria at the time.

Opus undertook a second phase of intrusive investigation in the northern part of the site providing no further information relevant to the former tip area.

REFA has undertaken investigations at both the wider site and the specific study area during 2022.



As stated above REFA has updated the PRA searches and the findings are similar to those reported by Opus. The following is also reported:

- *'One (1 No.) historical waste site is recorded within the site boundary relating to the change of use from vacant industrial to environmental recycling and alteration to existing buildings. The scheme includes the demolition and landscaping of the site for ARC Plant, and the application was submitted 9th August 1996.'*

This is a waste transfer station located at the northern end of the wider site remote from the tip area.

- *'The Groundsure report has identified thirty-two (32 No.) licensed waste sites within the site boundary. The waste sites relate to numerous companies operating over a period of time, including metal recycling sites containing a vehicle dismantler, special waste transfer, household, industrial and commercial waste >25,000 tonnes and 75kte HCl waste and T5 + treatment and asbestos.'*

The identified waste sites all appear to relate to skip hire businesses, waste transfer stations and a vehicle dismantler all of which are located at the northern end of the wider site. None relates to the former refuse tip.

- *'The superficial deposits below the site are noted to be a Secondary Undifferentiated aquifer'.*
- *'The bedrock under the site is noted to be a Secondary A aquifer containing permeable layers capable of supporting water supplies at a local rather than strategic scale. In some areas they form an important source of base flow to rivers'.*
- *'The site is not situated within a source protection zone'.*
- *'The site is located within a Water Framework Directive (WFD) surface water body catchment area of the Black Brook (Clywedog). The site also lies in a WFD for surface water bodies and groundwater bodies, with an overall rating of good'.*
- *'The site does not lie within an area where there is a risk of flooding from rivers and seas'.*

REFA encountered similar conditions across the wider site to those observed by Opus, ie significant quantities of generally uncontaminated made ground overlying glacial soils. Slightly elevated lead and some asbestos have been identified at specific locations in the northern part of the site. REFA reports that:

- *'The south eastern extent of the site recorded an increase in sand and gravel units underlying the made ground deposits, at depths ranging from 0.30m to the maximum proven depth of 4.45 m bgl. These units were recorded as composing brown gravelly sand with gravel of sandstone, siltstone and mudstone'.*
- *'Groundwater was encountered across the site at depths ranging from 0.70m to 3.50 m bgl. The shallower water strikes are considered to represent perched water within the ... superficial deposits.'*
- *Bedrock, comprising 'weathered mudstone bedrock was encountered only within TP126 at 3.50 m bgl'.*



Tip Area Investigation

The investigation of this area has been carried out in two phases.

In October 2021 REFA excavated nine trial holes in and around the former tip. Additional trial pits and trenches were dug in February 2022. Trial pit records and a location plan are provided at Annex 4.

The first nine trial pits generally encountered a mix of soils (gravelly sandy clay and gravelly sand, with bricks, concrete and sandstone gravel and cobbles to depths of between 2.5 and more than 4.5 m. Other anthropogenic items were also encountered albeit in discrete bands and areas and not in all of the pits. These items included vehicle wheels and tyres, bike tyres, tree roots, wood and chipboard, 'burnt rubbish' plastic (including pipe and bottles), plasterboard, tubing, cloth and fabric, metal, fibreglass, and carpet tiles. No asbestos or asbestos containing materials were observed in any of the trial pits.

Where it was encountered the underlying natural soils comprised gravelly silty clay.

Occasional organic odours were noted.

Five samples from the former tip for chemical testing. The results have been compared to assessment criteria for residential land use and no exceedances have been noted. However, two samples contained trace/low levels of asbestos fibres, below the hazardous waste limit (<0.1%).

No groundwater observations are noted on the trial pit logs and in the photographs the pits appear to be dry.

The second phase of investigation in this area comprised a series of trial pits and trenches. Similar ground conditions were observed. The made ground was proved to a maximum depth of 6 m and water was noted in some of the excavations either in the deeper parts of the made ground or in the underlying natural strata.

The underlying soils typically consisted of gravelly sandy silty clay but also granular soil (sand and gravel) in a few of the pits.

Proposed Development

The former tip area forms part of a wider site which is to be redeveloped. The new site access road, off Bangor Road skirts past, to the west of, the former tip. The vast majority of the former tip will form part of the landscaped public open space to the south of the main residential area. However, some residential properties are proposed on the northernmost part of the former tip as illustrated on figure presented at Annex 4.

Potential Risks

The former tip represents a potential source of hazardous gases and contaminating leachate from the ongoing slightly elevated organic content and degradation of biodegradable matter within the former tip.



There does not appear to be any significant chemical contamination, but low levels of asbestos have been identified in some of the samples tested.

On the basis of this initial review TACCL has identified potential risks to:

- human health both as an area of public open space and possible residential development at the northern end of the former tip, associated both with ground contamination and hazardous gas
- controlled waters (shallow groundwater within granular superficial soils and Aberderfyn Brook)

Remediation Options

The purpose of this briefing note is to set out the conditions in this part of the development site for discussions with both the local authority but also National Resources Wales (NRW).

Of particular interest at this time is whether or not the refuse tip would need to be removed or if alternative options are available that would also be acceptable to the regulators.

TACCL has set out below some typical remedial solutions for ground contamination and provides some initial discussion. These options might form the basis of a meeting agenda.

Once the general principals have been established and agreed with the LA and NRW the developer can produce a RemStrat covering the works. If further investigative works are needed these can also be agreed and implemented.

1. Partial Removal

Our initial view is that whilst the complete removal of the tipped material would fully decontaminate this part of the site it is not the most appropriate or sustainable option available.

A partial excavation and removal might be a more appropriate way forward, ie excavation of made ground from the footprint of any proposed residential plots including material beneath the houses and associated gardens.

If this option is selected what can be done with the excavated material? It could be:

- removed from site for disposal or reprocessing,
- redeposited elsewhere within the tip area,
- sorted, retaining soils and removing potentially biodegradable anthropogenic materials for appropriate off-site disposal.

2. Complete Removal

Our initial view is that the complete removal of the material from the former refuse tip may not be the most sustainable option available.



Any material removed from site would need to be disposed to a suitably permitted waste facility which could lead to many vehicle movements into and out of the site, using local roads. This use of fossil fuel and also vehicle emissions would not be desirable or sustainable.

Removal of the entire former tip is probably unnecessary as only a small part is within the proposed residential area, the rest being in an area of public open space. You mentioned that many of the Council's old landfill sites are now safely used as POS.

3. Excavation and Processing

Digging up the area for on-site 'remediation' through sorting, picking, removal of the most severe contamination or anthropogenic materials with the re-use of suitable soils subject to further assessment is possible. Treatment of the entire former tip may be unnecessary as only a small part is within the proposed residential area, as stated above, where potential human health risks will be greatest.

The presence of some asbestos, albeit at low levels might make processing the material more complicated when potential risks could be mitigated with only minor disturbance.

4. Capping

This is a typical method of dealing with areas of contamination on development sites and may be suitable at the site. The capping layer would provide a physical barrier between future residents and the material within the former tip, which would potentially break many of the standard pollutant linkages.

The viability of this option would depend on the following:

- Potential risks associated with ongoing degradation of organic matter and production and possibly migration of hazardous gases.
- Potential risks to controlled waters.

5. Partial Removal/Treatment

Partial excavation and removal of the made ground might be an appropriate and balanced way forward, i.e. excavation of made ground from the footprint of any proposed residential plots including material beneath the houses and gardens.

If this is a viable option a question arises; what can be done with the excavated material?

In theory there are three potential options, as follows. It could be:

- removed from the development site for disposal or reprocessing elsewhere,
- excavated from its current location and be redeposited elsewhere within the former tip area or even the wider development site,
- excavated material could be sorted, retaining suitable soils on site, subject to a program of testing, and removing potentially biodegradable, anthropogenic materials for off-site disposal.



As stated at Point 3 above the retention of the former tip material on site could only be acceptable if any residual risks are acceptable.

(a) Potential Gas Risks

Gas monitoring has been carried out to the north of the former tip at the edge of the residential development area. Borehole locations are illustrated on a figure presented at Annex 4. Monitoring is ongoing but current data indicates that no elevated gas concentrations have been measured to date. The gas risk assessment will need to consider the nature of the material within the former tip and potential long-term risks associated with further, ongoing degradation of the organic matter identified.

It is worth noting that the former refuse tip seems to be mainly an above ground feature and so any gas is more likely to vent to atmosphere than migrate sub-terraneously towards the residential properties, although there is still a potential risk.

The risk assessment may determine that some additional measures should be taken to mitigate future risks as a precaution, eg gas mitigation measures within the closest properties and/or a barrier/vent trench between the former tip and the residential development.

In any event, it will be necessary to cap the former tip to provide a physical barrier and growing medium for the establishment of vegetation. The detailed cap design would need to take into account both human health and gas risks. Passive venting requirements would need to be considered.

(b) Potential Risks to Controlled Waters

Limited background information is available regarding the quality of groundwater and surface water in the area.

There are no abstractions in the vicinity of the site and the site is not within a groundwater Source Protection Zone. Therefore, potential risks are likely to be restricted to local groundwater contained in granular soils within the predominantly low permeability superficial soils at the site and/or the water in Aberderfyn Brook and downstream watercourses.

This is an area where further work may be required and this will be discussed further with NRW.

Proposed Meeting

I would be very grateful if you could let me have some dates for a meeting to discuss this part of the site with you. I think that this is best done face to face rather than via Zoom or Teams and would be happy to meet at the Councils offices.



I look forward to hearing from you. If you have any queries at this stage or require any further information in advance of a meeting, please do not hesitate to contact me.

Yours sincerely

Martin Lovelock
Technical Director

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Annex 1 – Indicative Development Layout
Annex 2 – Extracts from the JPB Phase 1 Report
Annex 3 – Extracts from the Opus Phase 2 Report
Annex 4 – REFA Investigation Records & Figure

cc Andy Davies, SG Estates
Dave Hough, Gladman