
Proposed Residential Development, Glan Gors, Wrexham.

Outline Contamination Strategy and Additional Site Investigation Brief

On behalf of
Pennaf Housing Group and Wrexham County Borough Council

October 2012

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WCBC	Preliminary	/	S Reynolds	Nick Lewis	October 2012

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Outline

The purpose of this document is twofold,

Firstly it is to set out the outline Engineering design strategy along with strategies for dealing with the site wide contamination issues, it is not intended to be submitted for discharge of planning conditions however it is intended to be a live document setting out the initial principles for the site development with a view to establishing all data gathering parameters and final reporting and detailed designs required to discharge relevant planning conditions.

Secondly this document sets out what is considered to be the necessary scope of works for further site investigation works required to inform and confirm final design.

An outline consultation meeting took place with Wrexham County Borough Council (WCBC) contaminated land officers on Thursday 18th October 2012 those present at the meeting included:

- Simon Reynolds – Bay Associates
- Angela Guy, Helen Bradshawe – WCBC

This meeting was held to discuss proposals and ascertain further available information and site history and review/discuss areas of concern with a view to firming up proposals as presented in this report.

Outline Engineering Design Strategy

The proposed strategy is based on our current knowledge of the site and will be refined as further investigations are carried out.

- Proposed development: Outline planning for 23 No Residential mixed 2 – 4 bed units all with residential gardens associated externals and driveways. Access to the development is off Coed Aben utilising a cul-de-sac adopted highway with turning head.
- Client: Joint venture with Pennaf Housing and Wrexham Council – WCBC Contact: Mike Jenkins

Available Information.

Smith Grant: Environmental Consultancy

- 1) Former Landfill Sites – Additional stage 2 contamination Assessment
Bala Road

For Wrexham County Borough Council

October 2007

2) 2012 – Update Report

The reports outlined above have been carried out for WCBC as part of an assessment programme of former landfill sites within the region with a view to ascertaining whether the site is classified as contaminated land under part IIA of the Environmental protection act 1990.

The initial 2007 report concludes that the full site does not constitute contaminated land but concludes that disturbance of the site could alter the environment and risks to receptors could arise in the future.

The 2012 update report provides updated information mainly on the continuing gas monitoring that the site has been subjected to along with an update on the generic assessment criteria for soils to 2012 based on residential without Garden uptake.

Observations based on existing information

It is apparent that the site has been assessed based on current land use as part of the WCBC obligations under part IIA, This assessment provides a substantial amount of useful data that is pertinent to the proposed site footprint particularly with regard to ground Gas.

It is recognised that the made ground of the site will comprise some domestic waste within the approx 0-4m varying depth of made ground. However it must be noted the sampling carried out across the site does not indicate exceedence levels of metals or hydrocarbons in this made ground. Notwithstanding the above it is recognised that this initial assessment has not been carried out with regard to residential development with Garden uptake. However it does provide useful baseline data.

Worst case gas level results recorded across the **whole** of the land fill site i.e. at the north perimeter (outside our development boundary) from 2005 - 2010 would for residential purposes be classified under CIRIA C665 as Characteristic situation 2.

Shallow groundwater is noted within the fill and alluvial/glacial deposits. However this is of poor quality and not abstracted from, the lower minor aquifer is also not abstracted from and is not within a source protection zone. The reports to date have concluded pollutant linkages associated with river Gwenfro are considered unlikely.

Outline Engineering considerations

At this stage it is anticipated that a piled solution will be required, with either a cast in-situ floor slab suspended or beam and block. Gas protection measures will be required and will need to be confirmed following more detailed site investigation. It is anticipated that venting to the floor will be required along with the installation of an appropriate barrier taped and sealed as appropriate to the detailed design. Full details of method of construction, fitting and validation will be required as part of the detailed design proposal.

Due to the made ground and potential voiding in the existing fill the external works will need a suitable solution to reduce settlement and it is anticipated that the access roads and hard standing would be reinforced with a geotextile. An earthworks specification/strategy will be needed to ensure all formations are prepared and tested accordingly. Drainage externals can readily be designed to cater for a degree of settlement.

Based on the available information and the fact that no significant contamination or free product has been identified across the overall site we would at this time anticipate that a capping strategy would be employed to break the pollutant linkage to any receptor. This would be in the form of hard surfaces and clean imported inert fill for residential gardens.

Thickness of capping system will need to be confirmed following completion of site investigation works however we are aware at this time of WCBC requirement for a clean and certified imported capping thickness off 800-1000mm.

It is anticipated that an engineered cover system will be designed to include a defined geotextile separation layer between existing potentially contaminated fill and clean imported capping material. Careful consideration will need to be given for detailing of this layer around externals.

As the proposed development is managed by a housing association it is anticipated that a significant level of control would be in place to prevent alterations to hard landscaping.

To reduce impact of waste off site we would look to maximise levels to allow the introduction of clean capping. At this stage we don't anticipate that the existing made ground will be suitable for reuse anywhere on the site except perhaps under building footprint and hard standings. Installation of all services would need to comply with relevant guidelines however it is anticipated all new services will be installed in appropriate new service trenches.

We would anticipate that the management of the site earthworks and arisings including assessment for off-site disposal would be managed under a CL:AIRE protocol and registered with the Environment Agency This would be a suitable vehicle to allow the design team to set out all appropriate site constraints that would need to be considered during construction and allows an implementation plan to be developed incorporating measures for dealing with potential unknown risks during construction. For example identification of hydrocarbons or other contaminants, odours as well as the more common nuisances associated with construction activities such as dust and noise. This Code of Practice (COP) also required verification that all works have been carried out in accordance with the implementation plan and it is anticipated that the document will be used to sign off the planning condition regarding contamination prior to commencement, with the final verification documentation appended upon completion of all works within the ground. Bay Associates have successfully delivered a number of sites utilising this industry recognised COP.

Site Investigation.

It has been confirmed by WCBC that the existing data as noted above can be referenced in developing the site investigation strategy. Within the proposed development footprint there are currently 4 No Shallow Gas and ground water monitoring wells and it is the intention to utilise these existing wells alongside the installation of addition shallow and deep wells across the site. In developing this additional investigation brief reference has been made to the following documents

- CIRIA - C665 – Assessing risks posed by hazardous ground gases to buildings
- R&D Technical Report P5-066/TR [51]
- BS10175 (2011)

Site investigation Brief.

The Site investigation consultant will carry out a full interpretive geotechnical and geo-environmental investigation which should be able to address as a minimum the following objectives

- Identify the potential environmental liabilities at the site associated with any soil and groundwater contamination from past site uses.
- Provide a summary of the environmental conditions at the site, together with any necessary remediation works to render the site fit for its intended future use.
- Provide recommendations with regard to any ground gases and provide full recommendations in accordance with current guidelines.
- Determine the type, strength and bearing characteristics of the shallow superficial and underlying solid geology.
- Provide recommendations for a suitable and economic foundation/floor slab solution for the development and external finishes including anticipated CBR results to aid highway design along with anticipated likely settlement.
- Provide recommendations with regard to any other geo-technical aspects that may affect the development.

As a minimum The following Intrusive works will be carried out and will be based on a targeted sampling regime due to the availability of existing information and a defined site layout.

- Installation of 3 No deep boreholes to ascertain geotechnical properties and provide an appropriate pile depth. Gas and ground water monitoring wells are to be installed.

- Installation of 3 No additional shallow BH's gas and groundwater monitoring wells to be installed. These wells are to monitor gas, VOC's and ground water within the made ground (landfill).
- A Soil sample is to be taken from each of the 6 New BH's at 1.0 – 1.5 m depth within the made ground containing waste (depth of waste layer likely to vary across site).
- 4 Number addition soil samples to be taken at approx 1.5m depth (within the waste material made ground).
- Chemical analysis of all soil samples noted taken above based on landfill testing suite.
- In-situ ground gas/groundwater monitoring following completion of intrusive works. It is initially anticipated that 6 No visits will be required over 2 ½ months however this will be the minimum carried out. Subject to results achieved from BH's further monitoring visits may be required.

For ground gas assessment both existing and new wells to be sampled (10 No in total). Groundwater analysis to be undertaken based on landfill testing suite

- 2 No WAC tests to be carried out on made ground within the top 1.5m.
- 4 No CBR tests to be undertaken at 2 No locations at GL -500mm and GL – 1000mm depth.
- Collation of results and provision of 4 No copies of geotechnical and geo environmental report included groundwater risk assessment based on proposed development.

Refer to attached drawing No 6503-130 attached for intrusive investigation locations.

It is anticipated the site investigation consultant will interrogate the existing data to complete desk study and develop conceptual model.

Upon completion of these works and detailed review of recommendations, Bay Associates will finalise all engineering strategies and commence on CL:AIRE development industry code of practice in conjunction with client and contractor, for submission to satisfy planning condition.

It is anticipated that consultation with WCBC will be ongoing as results are made available this will allow fine tuning of site works if required subject to initial results, this is particularly relevant with regard to gas monitoring.