

shaping the environment



# Merton Street Depot Banbury

## Contractors Proposals

For  
**Grundon Waste Management Ltd**

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# 1 Introduction

This document forms Knowl Hill Ltd's (KHL's) review and assessment of Site Investigation data relating to Merton Street Depot, Banbury, Oxfordshire OX16 4RN and provides a proposals to remediate the site to a suitable quality for residential end use. The residential scheme and layout has not currently been finalised so for the purposes of this proposal residential end use incorporating apartment blocks, private dwellings with gardens and public open space has considered.

## 2 Information Sources

The following Reports relating to the site were provided for review:

- i. *Banbury Gas Works Site Investigation (Ref. AEAT/4496). Prepared by AEA Technologies 1999;*
- ii. *Environmental Assessment, Banbury Gasworks (Ref. R/EN2498.PMK.1.1.3). Prepared by Waterman Environmental, October 2001;*
- iii. *Site Investigation of the Former Banbury Gasworks (Ref. R/EN2498.PN.2.1.5). Prepared by Waterman Environmental, March 2002;*
- iv. *Outline Remediation Strategy, Merton Street Depot, Banbury (Ref. O/Ref: 6140-154). Prepared by Celtic Technologies, December 2009;*
- v. *Quantitative Risk Assessment Report, Merton Street Depot, Banbury (Ref. R1456/11/3999. Prepared by Celtic Technologies Ltd, March 2011; and*
- vi. *Site Investigation – Interpretative Report, Merton Street Depot, Banbury (Ref. R1512/12/4293). Prepared by Celtic Technologies Ltd, June 2012.*

## 3 Project Understanding

The site is 2.5Ha. and was subject to significant industrial use including Gasworks, Steel Fabricators and Scrap Yard. The site is currently used as a Depot for Grundon. It is the intention to relocate current site activities to a nearby site and redevelop the site for residential end use.

The site can generally be divided into three main areas:

1. Former gasworks in the north/northwest, with remnant in ground structures including railway sidings, a retort house, gas purifiers, two tar pits, an underground diesel tank and gasholders (decommissioned in the late 1950's/early 1960's);
2. Scrap yard in the northern central area comprising a large warehouse factory building and office facilities; and
3. Disused ground in the south, which appears to have been raised with Made Ground and areas of fly tipping.

The site has been subject to extensive site investigation (three phases of intrusive investigation dating back to 1999, which has detected significant soil contamination, mainly associated with the former gasworks (particularly the tar wells) and former structures in the northwest of the site. Additional contamination has been recorded in the south of the site including asbestos contaminated ground and fly-tipped rubbish.

Underlying ground conditions comprise Made Ground up to 5.5m below ground level (bgl), Alluvial Silts and Gravels up to 4.5m in thickness and Mudstone (encountered between 2.7m and 5.5m bgl). Groundwater was encountered within the Alluvial deposits between 1.2 and 2.9m bgl and was considered to flow towards the southwest.

Groundwater contamination has also been detected across the site, with the most significant contamination associated with the gasworks. Light non aqueous phase (LNAPL or floating free product) has also been detected in the north of the site.

The primary soil and groundwater contaminants of concern have been identified to be Total Petroleum Hydrocarbons (TPH), Polycyclic Aromatic Hydrocarbons (PAHs), Ammonia, Cyanide, Heavy Metals, Phenols and BTEX compounds. Human health and controlled waters quantitative risk assessment has been undertaken to derive remedial targets and zone remediation areas, however, no regulatory consultation has been undertaken to agree these assessments.

Upon review of the risk assessments we consider that the main driver for remediation is the risk to controlled waters, specifically the underlying groundwater and nearby Cherwell River (approx. 200m to the southwest). We believe that the risk to human health can be mitigated as part of the proposed development with measures such as gas and vapour protection in buildings and the importation of clean cover.

Remediation proposals have been made by Celtic, which we broadly agree with, including 'turning over' the site where extensive substructures are present, excavation and treatment of contaminated soils and LNAPL removal from groundwater.

## **4 Remediation Proposals**

### **4.1 Summary Proposals**

The remediation proposals and contamination delineation are based on the previous investigations, specifically the controlled waters quantitative risk assessment. The remediation proposals don't include demolition to ground slab level.

A key part of proposals will be to formally review the human health and controlled waters risk assessment and establish definitive Remediation Target Criteria (RTCS) in consultation with the Regulators, which may adjust the remediation zones and quantities. It is considered likely that the Environment Agency will request the controlled waters risk assessment to be modelled with the site boundary as the compliance point for comparative purposes. Furthermore, the establishment of development levels and the cut and fill balance will be an important exercise to minimise any offsite disposal and reduce costs.

There are several distinct elements to the remediation proposals which are summarised in the sections below. Also included is the option for a 45m bentonite slurry wall to be installed at the northern boundary of the site to prevent re-pollution of the remediated site from offsite sources. The requirement for the slurry wall will be assessed during the development of the Remediation Strategy and consultation with the Regulators and Stakeholders

Our proposed works are generally described in chronological order as follows:

We will mobilise and establish our compound on site and a soil treatment area. The site will be made secure and clearance of vegetation and surface waste will be carried out with offsite disposal of general waste. Green waste will be retained to aid bioremediation. The ground slab and substructures will be excavated under a watching brief, prior to crushing for reuse. Excavation of contaminated soils will commence in the northern area of the site and arisings will be stockpiled for testing to establish whether further treatment is required.

Soil excavations will continue to the eastern part of the site with continual assessment for treatment and reuse requirements. All excavation voids will be subject to validation testing. Excavations will be utilised to remove LNAPL contamination with a belt skimmer capable of removing 60 litres per hour. Contaminated soils will be subject to bioremediation (biopiles) to reduce organic contaminants to acceptable levels and or stabilisation to reduce the mobility of metal contamination. It is anticipated that there will be a degree of contaminated soils which will not be treatable or suitable for reuse and these will be disposed of offsite.

The southern part of the site is not significantly contaminated and it is not contaminated and therefore excavations can be minimised in this location.

Following successful soil treatment soils will be replaced and compacted.

## **4.2 Key Activities**

### **4.2.1 Pre-Commencement Activities**

Detailed method statements will be provided prior to commencement, and KHL will adopt the role of Principal Contractor in accordance with the CDM Regulations.

KHL will reassess the findings of the existing Quantitative Risk Assessment's (QRA's) and establish revised RTCs which will be agreed with the Regulators. This will be presented within the final Remediation Strategy.

KHL will prepare the other necessary licenses and consents concurrently, which include a Materials Management Plan, CL:AIRE declaration for the reuse of treated soils and the Mobile Treatment Permit Deployment and establish the site as a 'hub' site for soil treatment.

### **4.2.2 Mobilisation**

The site will be fully established as a secure gated facility, with sufficient welfare, power etc, to ensure completion of the works. An internal compound will be established along with a clean/dirty working areas and pedestrian routes.

A temporary materials treatment area will be constructed with managed surface water drainage and environmental controls.

### **4.2.3 Earthworks and Soil Treatment**

Slab and substructure removal will commence in the northern more heavily contaminated area of the site to give the maximum time for bioremediation. Substructures and contaminated materials will be carefully excavated under supervision and a stockpiling and testing methodology will be employed to maximise direct reuse of soils.

KHL has budgeted for the excavation for up to 10,250m<sup>3</sup> of reinforced concrete slabs and substructures and 25,950m<sup>3</sup> of soils. Of this it is estimated that 5,000m<sup>3</sup> of soils will require bioremediation/stabilisation and 1,000m<sup>3</sup> will be deposited of offsite. An allowance has also been made for disposal of asbestos contaminated materials (250 tonnes) and fly-tipped rubbish (1,200m<sup>3</sup>).

Prior to soil treatment excavation soils will be subject to pre-treatment, which may include the following:

- Mixing;
- Bulking;
- Sorting;
- Segregating;
- Screening;
- Particle size reduction; and
- Particle separation

The purpose of physical treatment of wastes prior to bioremediation is to remove non-treatable materials such as wood, large objects, metal and plastic and increase the efficiency of the bioremediation process. Additionally, this process will aerate the soils and kick start the biodegradation of the material.

Biopiles will be used to treat contaminated soils which may take up to 5 months to achieve the RTCs. Soil stabilisation using a mixture combination of OPC and PFA will be used to reduce the mobility of metal and inorganic contamination. All treatment will be undertaken in accordance with the deployment of our Mobile Treatment Permit.

#### **4.2.4 Soil Re-deposition**

Treated and validated soils will be re-deposited and compacted in the validated excavation voids under the CL:AIRE Code of Practice v2.

#### **4.2.5 Groundwater & LNAPL Removal**

The current controlled waters QRA has determined that no diffuse phase groundwater remediation is required due to the soil source removal. Groundwater proposals include treating the soil source described above and LNAPL removal. It should be noted that although remediation proposals for groundwater are based on robust ground investigation and assessment, these conclusions have not be agreed with the Environment Agency.

LNAPL removal will be undertaken utilising the soil excavation voids. An electric belt skimmer will be used, which can remove up to 60L of product per hour. LNAPL will be collected in an IBC and disposed of as hazardous liquid. An allowance for 100m<sup>3</sup> of hazardous liquid has been made. The skimmer will be moved from between excavations depending on site conditions. A dedicated collection trench may also be constructed.

#### 4.2.6 Validation

All excavated soils will be subject to testing to establish whether they can be reuse directly or whether they require treatment. Excavation voids and treated soils will also be subject to validation testing. The approved RTCs will seek to maximise the amount of direct soil reuse as possible. Site operations will be based on a detailed materials management plan and grid system so that accurate records can be maintained and presented for Regulatory Approval.

Following completion of the works a report will be compiled detailing the remediation activities that have taken place; the report will include the following:

- A description of the works completed;
- The extent and location of any soil / pipework excavation (details to include figures illustrating the extent of excavation and location of soil sampling);
- Laboratory analysis reports associated with validation;
- Records of all soil treatment (including volumes and validation testing analytical results);
- Records of LNAPL removal;
- Records of any offsite disposal;
- A photographic record;
- A summary of environmental monitoring and complaints; and
- Full copies of key regulatory correspondence.

The Completion Report will be submitted to the Cherwell District Council Planning and Environmental Health Department and the Environment Agency.

It should be understood that these proposals address pre-development remediation measures only. The protection to human health and associated sign off will only be achieved post development when measures such as clean cover and gas and vapour mitigation are completed.