File Note

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Project title	Hayling Island Stoke Common South	Job number	216885
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Subject	Stoke Common South Ground Contamination Assessment Note		

1 Introduction

The Environment Agency (EA) proposes to construct a low flood bund on top of a historical landfill along the alignment of the existing informal path located at Stoke Common South. An informal footpath would be constructed on top of the bund to tie in with the existing footpath. The proposed works comprise very limited penetration of the upper soils in order to clear the vegetative covering and 'key' the bund to the underlying soils. Anecdotal evidence suggests the upper layer of the landfill comprised a capping layer, which is also confirmed in general by the investigation results, although a small amount of landfill like materials (plastics etc) were identified mixed into the soils matrix.

A ground investigation at Stoke Common South was commissioned by the EA to investigate ground conditions in the location of the proposed bund. The scope of the ground investigation was specified by the EA, with input from Arup, and was carried out by Fugro Engineering Services Limited (FESL) in August 2011. The ground investigation comprised of five trial pits which were excavated to a maximum depth of 0.42m below ground level (bgl). Soil samples were collected from the trial pits and selected samples were submitted to the laboratory for geochemical analysis.

The local authority (Havant Borough Council) confirmed that they were in agreement with the EA assessment that the proposed low bund is unlikely to represent a significant loading on the landfill, and is therefore unlikely to have any significant adverse effect on leachate or gas generation rates.

This note provides a brief overview of an informal confirmatory human health risk assessment and waste classification undertaken by Arup to inform the classification of materials arising from the works and following development. It does not comprise a detailed human health assessment.

2 Contamination assessment

The EA have published soil guideline values (SGV) for four standard end uses (residential with consumption of home grown produce, residential without consumption of home grown produce, allotments and commercial developments) based upon specific assumptions about contaminant behaviour and toxicology, site users and their activity patterns and the potential exposure pathways for each standard end use. Where SGV have not been derived by the EA, generic assessment

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criteria (GAC) can be calculated using the software version of the Contaminated Land Exposure Assessment (CLEA) model, associated model guidance and toxicological information published by the EA.

It is anticipated that the site will predominately be used by the general public walking along the footpath. The chemical data from the FESL ground investigation has initially been compared to the assessment criteria for a standard residential end use (no consumption of home grown produce). The assumptions associated with this standard end use are closest to the proposed end use of the site are overly protective of human health due to different exposure pathways and the amount of time that future site users would spend on the site. This has been used to provide an initial assessment and identify any particular contaminants of concern requiring a more site specific assessment.

Most of the results were low and concentrations of petroleum hydrocarbons, phenol and benzene, toluene, ethylbenzene and xylene (BTEX) were largely below detection limits. Asbestos was not detected in any of the samples. The majority of the results were below the residential assessment criteria, with the exception of two samples collected from exploratory holes located on or very near to the existing footpath. Concentrations of benzo[a]anthracene and benzo[a]pyrene exceeded the assessment criteria in these samples.

Site specific assessment criteria (SSAC) have been derived for benzo[a]anthracene and benzo[a]pyrene to identify whether there are potential human health risks associated with the concentrations of these two contaminants. The selected receptor has been defined as a young female child (over four years of age) who might visit the site for 30 minutes every day over their lifetime (past retirement) and who may be directly exposed to soils and/or dusts by the exposure pathways of ingestion, dermal contact and/or inhalation (effectively a dog walker or someone who crosses the site every day, all year for most of their life). The assumptions include high levels of ingestion everyday (100mg for a child and 50mg during adult life) and typical dermal contact assumptions for an outdoor residential setting (indoor exposures were turned off). SSAC have been developed based on this critical receptor and generated using CLEA (v1.06) software.

The measured concentrations of benzo[a]anthracene and benzo[a]pyrene were below the calculated SSAC.

The soil results are generally low and all results are below the relevant assessment criteria. The potential for significant contamination to be present in the shallow soils (samples to 0.4m bgl) at the site is considered to be low based on the results of the FESL ground investigation. It is possible that unidentified contamination may exist between exploratory hole locations.

There is a potential for construction workers to come into contact with in-situ soils during the excavation of approximately 200mm to create the earth bund. Site neighbours may be exposed to dusts that may be generated during construction works. The risk of harm to construction workers and site neighbours is assessed to be very low based on the results of the FESL ground investigation, although good practice construction measures are required to reduce exposure to as low as reasonable practical, as described in Section 3.

It is unlikely that future users of the site will actually come into contact with in-situ landfill soils in the proposed area of development, as soils will be covered with approximately 500m^3 of clean imported materials. The imported materials should be tested and demonstrated to be suitable for use.

All the results were well below thresholds for hazardous waste. All the results except one were below the inert thresholds, and the one result above was only slightly above limits for total organic carbon (low significance).

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3 Recommendations

It is recommended that good practice measures are implemented during earthworks and maintenance requiring ground break, to include:

- a contamination watching brief;
- general appropriate personal protection equipment and hygiene practice;
- dust control measures; and
- verification testing of imported materials.

DOCUMENT CHECKING (not mandatory for File Note)

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