

Annex H

**Proposals for Land  
Contamination Study**

# 1 SHATIN SEWAGE TREATMENT WORKS STAGE III EXTENSION : PROPOSAL FOR LAND CONTAMINATION STUDY

## 1.1 BACKGROUND

The construction of foundations required for the Sha Tin Sewage Treatment Works (STW) Stage III Extension will involve the excavation of a significant quantity of material. As the Project Site is located on reclaimed land, this material may comprise reclamation fill and underlying marine sediments, which may be contaminated. In some areas, the excavated material may also be contaminated due to the present and previous uses of the site. Particular concerns arise from the designation of an area of the site as sludge lagoons.

The main areas of concern include the area of land currently designated as sludge lagoons (see *Figure 1*) and the lorry parking area (to be developed for the dewatering house, sludge cake storage, HV/switchgear room and air blower house). If not properly managed, handling and disposal of contaminated excavated material may cause adverse health risks to the construction personnel and environmental impacts.

This Proposal, which details proposed methodology for the land contamination assessment, has been prepared by Environmental Resources Management (ERM) for submission to the Drainage Services Department (DSD). The aims of the assessment are:

- to determine whether the sludge lagoons and lorry parking area are contaminated and to characterise the nature of any contamination;
- to ensure that any problems associated with land contamination can be eliminated or minimised; and
- if necessary, to recommend proper remedial measures to restore the land to an acceptable condition for the extension of the sewage treatment works.

## 1.2 METHODOLOGY

As discussed in *Section 1.1* above, the areas of land contamination will likely be limited to the sludge lagoons and the lorry parking and the aim of the survey are to determine whether these areas are contaminated, it is proposed that soil samples will be taken at six sampling locations at the sludge lagoons<sup>(1)</sup> and two at the lorry parking area. This proposal is developed in order to provide a rapid and cost-effective evaluation of the land contamination issues at the site. If the soil samples collected are found to be contaminated, the need for further investigation will be evaluated. If required, appropriate mitigation measures will be recommended for the minimisation of contaminated excavated material requiring handling and disposal.

<sup>(1)</sup> Two of these six locations (TP6 and TP7) are consistent with DSD's planned excavations as shown in *Figure 1*.

### *Task 1 : Review of Site History and Contaminated Uses*

ERM will undertake a review of the available data and drawings to determine possible land contamination in the Project site (in particular the existing sludge lagoons and lorry parking area) and identify potential impacts, risks and hazards associated with the handling and disposal of the contaminated material.

### *Task 2 : Development of a Site Investigation and Laboratory Testing Programme*

ERM will develop a recommended site investigation and laboratory testing plan and submit it to the Director's Representative for approval prior to its implementation. The plan will include survey design and sampling techniques, testing parameters and QA/QC requirements. The investigation may involve the following principal components:

- excavating 2 m depth trial pits at six locations at the sludge lagoons and two at the lorry parking area
- at each sampling location, taking 2 kg of soil sample at depths of 0.5m and 1.5m below ground level.

It is understood from DSD that the depth of excavation will be limited to 2 m below ground. The maximum depth of samples to be collected will therefore be limited to 1.5 m.

With respect to the previous activities of the site, samples collected from the sludge lagoons will be tested for heavy metals including cadmium, chromium, copper, mercury, nickel, lead and zinc. At the lorry parking area, the parameters to be analysed may include total petroleum hydrocarbons (TPHs), polyaromatic hydrocarbons (PAHs) and the suite of heavy metals identified above.

### *Task 3 : Field Work and Laboratory Testing*

Excavation of trial pits will be carried out by DSD's Term Contractor. ERM will be responsible for sample collection. ERM will invite at least three HOKLAS laboratories to provide quotations for the laboratory testing works. Upon EPD's approval of the recommended laboratory, ERM will supervise the laboratory testing. The field sampling will be conducted to avoid potential for cross contamination between sampling points and to ensure the integrity and collection of representative samples.

### *Task 4 : Assessment of Results*

The results of all surveys, investigations and chemical analyses will be interpreted in accordance with the EPD's *ProPECC Note No 3/94*. The *Dutch Ministry of Public Housing, Land-use and Environment Guidelines (1995)* will be used as criteria for the risk assessment. Any contaminated marine sediment required to be excavated will be classified in accordance with EPD's *Technical Circular 1-1-92*. Remediation measures for any such contaminated areas will be outlined.

### *Task 5 : Reporting*

The findings of the assessment will form part of the EIA study and will be presented in the EIA report.