

## STANWAY QUARRY INERT LANDFILL ENVIRONMENTAL PERMIT APPLICATION

### NON-TECHNICAL SUMMARY

#### 1.1 INTRODUCTION

##### *Application Details*

- 1.1.1 Tarmac Trading Limited (Tarmac) is applying for an Environmental Permit for the operation of an inert landfill facility to support the restoration of Stanway Quarry, Warren Lane, Stanway, Colchester.

##### *Site Setting*

- 1.1.2 Stanway Quarry is located on the outskirts of the village of Stanway in the county of Essex. The site is located c. 4.6km south west of the town of Colchester at National Grid Reference: TL 95532248. The quarry extends over an area of approximately 94.2 ha, of which the landfill footprint will occupy only c. 52.6Ha. Access to the site is via Warren Lane located along the western boundary of the quarry.
- 1.1.3 Beyond the quarry, active quarry and associated landfill facilities occupy large areas of land to the west of Warren Lane. Grymes Dyke Scheduled Ancient Monument, local nature reserve and public footpath is located along the eastern boundary, beyond which open agricultural fields. To the south of the quarry are several residential properties and wooded areas, beyond which is Maldon Road, Colchester Zoo and other isolated residential properties. The urban extends of Stanway and other neighbouring conurbations exist beyond agricultural fields to the north of the site.

##### *Regulated Facilities*

- 1.1.4 The regulated facility to be operated at Stanway quarry will be an inert landfill facility to support the restoration of the wider quarry facility. A total of 2.95million cubic metres of waste will be deposited at the landfill at a rate of c. 100,000m<sup>3</sup> or 200,000 tonnes per year over an anticipated period of between 23-24 years.

##### *The Operator*

- 1.1.5 The landfill operator is Tarmac Trading Limited whose registered office and installation addresses are below:

Registered Office:	Site Address:
Portland House	Stanway Quarry
Bickenhill Lane	Warren Lane
Solihull	Stanway
Birmingham	Colchester
B37 7BQ	Essex, CO3 ONN

#### 1.2 TECHNIQUES FOR POLLUTION CONTROL

##### *Management Techniques*

- 1.2.1 Tarmac Trading Limited will operate the landfill facility in accorded with an Environmental Management System accredited to ISO14001.

### **The Main Activities**

#### *Site Construction and Engineering*

- 1.2.2 The inert deposits will be directly placed over surface of the exposed London Clay, which is known to be approximately 30m thick in the locally and is reported to have a typical permeability of between  $10^{-11}$  and  $10^{-8}$  m/s.

The sidewalls of the quarry consist of exposed sand and gravels, which are water bearing. An Artificially Enhanced Geological Barrier (AEGB) will therefore be constructed from reworked London Clay excavated from within the landfill footprint. Due to the stability factors and construction techniques, the AEGB will be a minimum of 3m thick over sidewalls consisting of exposed sand and gravels, reducing to 0.5m thick over engineered restoration materials associated with the northern extension area. The maximum permeability of the AEGB will be  $1 \times 10^{-9}$  m/s. A drainage system will also be constructed beneath the AEGB to aid the removal of groundwaters which could otherwise impact upon the stability of the AEGB.

#### *Waste Disposal*

- 1.2.3 Waste deliveries to the installation will take place via the following infrastructure:

- Surfaced Access and Internal Haul Roads
- Weighbridge
- Wheel cleaning equipment

- 1.2.4 Vehicles will access the facility via Warren Lane and existing weighbridge facilities located in the western extents of the quarry, where deliveries will be subsequently directed to the active tipping area through designated metalled haul roads that route into the mineral processing and landfill area.

- 1.2.5 Waste deposited at the installation will be handled and compacted using a combination of tracked bulldozers.

#### *Surface Water*

- 1.2.6 Surface waters from all areas of site will continue to be managed within the existing network of drains and storage/settlement ponds/lagoons constructed over/in the London Clay Formation.

#### *Groundwater Management*

- 1.2.7 The surrounding sand and gravel deposits are water bearing in which all groundwater that flows into the quarry void are collected via a network of ditches at the toe of the sidewalls which subsequently drain to a network of storage/settlement ponds constructed in the London Clay Formation.

- 1.2.8 Groundwaters will also be encouraged to drain from beneath the engineered sections of the sidewalls via a granular drainage blanket or similar that will be constructed beneath the AEGB. The groundwaters that flow from the drainage systems will be managed via the existing management systems for subsequent reuse on site or discharge to surface water via the existing consented point of discharge.

## **1.3 RISK ASSESSMENTS**

### **Overview**

- 1.3.1 As part of the Application for the landfill Environmental Permit, the following Risk Assessments were prepared in order to determine whether any of the facility would have an unacceptable impact on the environment:-

- Stability Risk Assessment
- Hydrogeological Risk Assessment
- Amenity Risk Assessment (Nuisance and Health)

### **Stability Risk Assessment**

1.3.2 The stability risk assessment (SRA) has addressed stability issues arising from the construction of an inert landfill at Stanway Quarry. The primary issues investigated by this SRA are:

- The stability and integrity of the AEGB side-slope lining system;
- Stability of inert waste during construction of the landfill.

The stability analysis has shown that existing side slopes of the site have a factor of safety of ~1.2 which is less than the usual requirement of 1.3. However, the factor of safety of the side slope increases as the AEGB and waste is incrementally placed against the toe of the slope. As no instability of the existing slopes have been reported from site, and that this case is only temporary whilst the landfill is formed, a factor of safety of 1.2 is deemed acceptable. The analysis has shown for the worst-case waste slope, the factor of safety for the waste is greater than 1.3.

The integrity analysis has determined the shear strains within the AEGB as the landfill is incrementally constructed. The shear strains within the AEGB were well within acceptable limits, ensuring that the permeability of the lining system is maintained for the duration of the landfill operation.

It is recommended that to aid construction, drainage should be provided beneath the side slope AEGB to divert groundwater away from the liner being constructed. Also, any excavations for site won London Clay should be made no closer than 10m away from the side slopes of the site to prevent instability in the overlying sands and gravels.

### **Hydrogeological Risk Assessment**

1.3.3 A Hydrogeological Risk Assessment has been prepared to support the application for the development of an inert landfill facility at Stanway Quarry. Due to the sensitive nature of the local hydrogeological regime, the HRA comprises a quantitative assessment utilising Consim. The results of the assessment conclude the site will comply with the requirements of both the Landfill Directive and the Groundwater Regulations, 2009, during the active and post-closure phases of the development.

### **Amenity Risk Assessment (Nuisance and Health)**

1.3.4 The potential impact from the following emissions from the facility on the surrounding receptors has been considered:

- Noise and Vibration
- Odour
- Particulate Matter
- Litter
- Birds, Vermin and Insects
- Mud on Highway

1.3.5 All potential risks to nearby receptors have been considered and mitigated in that all residual risks are of a low magnitude.

## **1.4 ENVIRONMENTAL MONITORING**

1.4.1 During the operation and post closure period, the installation will be subjected to detailed environmental monitoring covering the following areas:

- Waste Composition (Operational Phases Only)
- Landfill Gas
- Surface Water
- Groundwater
- Site Topography
- Particulate Matter (Operational Phases Only)

- 1.4.2 Monitoring results will be submitted to the Environment Agency in accordance with the Permit conditions and records will be kept in order that monitoring trends can be reviewed and appropriate actions taken if necessary.
- 1.4.3 All monitoring systems will be maintained and calibrated by trained technicians and the equipment manufacturers to ensure that the equipment and infrastructure is maintained in good working order.