

CEMEX UK Materials Ltd  
**Parkfield Road Landfill**  
Site Operating Plan

PRL REP 002

Issue | 23 December 2020

This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.







Job number 254718

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# Document Verification

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# 1 Introduction

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## 1.1 Overview

Parkfield Road quarry is a closed quarry owned by CEMEX UK Cement Ltd (CEMEX). CEMEX proposes to fill the quarry void with inert waste and therefore an Environmental Permit is required.

This report is produced for CEMEX by Ove Arup & Partners Ltd (Arup) to support the application for an Environmental Permit. The application is for infilling of a quarry void with inert waste. The total quantity of waste within the facility will be approximately 1.9 million m<sup>3</sup>.

This Site Operating Plan provides the following:

- A summary of the operating times of the site.
- Details of the types of waste that can be deposited at the site and the procedures that must be followed for their acceptance.
- Details of the site preparation before and during filling.
- A description of how the waste is to be deposited.
- Details of the site infrastructure.
- Emissions management.
- Details of the records that are to be maintained.

## 1.2 Associated documents

This report should be read in conjunction with the following documents:

- Environmental Permit Application Forms Part A, B2, B4, F1
- ESSD Conceptual Site Model PRL-REP-001, Arup/Stantec 2020
- Site Monitoring Plan PRL-REP-003, Arup, 2020
- Supporting Information Report PRL-REP-004, Arup, 2020
- Landfill Gas Risk Assessment PRL-REP-005, Arup, 2020
- Stability Risk Assessment PRL-REP-006, Arup, 2020
- Hydrogeological Risk Assessment 330201391R1 Stantec, 2020

## 2 General considerations

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### 2.1 Hours of operation

The site will be open for the deposit of waste between the following hours:

0700 – 1900 Mondays to Fridays

0700 – 1300 Saturday.

There would be no train offloading or backfilling works on Sundays or Bank Holidays.

It is anticipated that between two and three train loads would enter the rail sidings per day. These train movements into and out of the sidings would take place between 0700 – 2300, seven days per week.

When the site operates during the hours of darkness during the winter months the company will provide portable electric lighting to:

- Ensure safe working conditions.
- Enable all waste deposited to be properly identified.

## 3 Waste quantities, types and acceptance procedures

### 3.1 Waste quantities

#### 3.1.1 Maximum capacity of operation

The total quantity of waste within the facility will be approximately 1.9 million m<sup>3</sup> (3.8 million tonnes at 2.0 tonnes/cubic metre).

#### 3.1.2 Annual waste deposition

The maximum quantity of imported waste accepted at the site per year will not exceed 844,000 tonnes, approximately 422,000m<sup>3</sup> per year for 4.5 years.

### 3.2 Permitted wastes

#### 3.2.1 Acceptable waste types

The waste types categorised in Table 1 are to be accepted at the site and can be accepted without testing. Waste types are categorised in accordance with the European Waste Catalogue. Other wastes may be accepted if appropriate testing results are available which demonstrate that the waste is inert, see SOU EP Volume 2, Section 3.

It is anticipated that the 99% of the material will comprise inert soils and stones (European Waste Catalogue 17 05 04), with brick and hardcore used for haul road construction.

Table 1 List of Wastes acceptable at Landfills for Inert Waste without Testing (reproduced from section 2.2.1 of the Annex to Council Decision 2003/33/EC)

European Waste Catalogue Code	Description	Restrictions
10 11 03	Waste glass-based fibrous materials	Only without organic binders
15 01 07	Glass packaging	
17 01 01	Concrete	Selected C&D waste only <sup>2</sup>
17 01 02	Bricks	Selected C&D waste only <sup>2</sup>
17 01 03	Tiles and ceramics	Selected C&D waste only <sup>2</sup>
17 01 07	Mixtures of concrete, bricks, tiles & ceramics	Selected C&D waste only <sup>2</sup>
17 02 02	Glass	
17 05 04	Soil and stones <sup>1</sup>	Excluding topsoil, peat; Excluding soil and stones from contaminated sites
19 12 05	Glass	

19 12 09	Minerals for example sand and stones <sup>1</sup>	Waste from mechanical treatment of wastes
20 01 02	Glass	Separately collected glass only
20 02 02	Soil and stones <sup>1</sup>	From garden and parks waste; Excluding topsoil, peat

1. For the purposes of waste acceptance, soil includes naturally occurring sands and clays
2. Selected construction and demolition (C&D) waste: with low contents of other types of materials (like metals, plastics, organics, wood, rubber, etc). The origin of the waste must be known.
  - No C&D waste from buildings, polluted with inorganic or organic dangerous substances, e.g. because of production processes in the construction, soil pollution, storage and usage of pesticides or other dangerous substances, etc, unless it is made clear that the demolished building was not significantly polluted.
  - No C&D waste from buildings treated, covered or painted with materials, containing dangerous substances in significant amounts.

### 3.2.2 Wastes for restoration

Insufficient indigenous sub-soil and topsoil is available on site for restoration. As a consequence, suitable restoration material will need to be imported/manufactured to complete the restoration of the site. Imported restoration soils will not exceed 1m and will not be deposited within the landfill, but may be stockpiled at appropriate locations for subsequent restoration use.

Subsoil and soil making materials will, where necessary, be screened on site for use in the restoration.

Table 2 Acceptable Waste Types for Restoration

European Waste Catalogue Code	Description	Classification	Restrictions
17 05 04	Soil and stones <sup>1</sup>	Inert	Excluding soil and stones from contaminated sites
20 02 02	Soil and stones <sup>1</sup>	Inert	Only from garden and parks waste

1. For the purposes of waste acceptance, soil includes naturally occurring sands and clays

## 3.3 Waste acceptance and control procedures

### 3.3.1 Introduction

CEMEX intend to accept only those wastes that do not require to be tested against the inert waste acceptance criteria (i.e. in accordance with BSEN 12457-3). This means that the waste acceptance procedures that CEMEX have adopted are designed to determine whether:

- a) The waste is on the list in Table 1,



- b) The waste is from a single source and
- c) There is reason to suspect that the waste may be contaminated (any such wastes being rejected).

Consequently, wastes that are identified as arising from multiple sources, such as residues from an inert waste transfer station, will not be accepted, neither would soils from the site of a former petrol station, since it may be contaminated with hydrocarbons.

Customers' attention is drawn to these limitations and a prerequisite of acceptance is the signed declaration by the customer that the waste to be brought to site will comply with these requirements.

In addition, CEMEX will undertake periodic random sampling. If this identifies elevated levels of contaminants the contract will be halted immediately if still ongoing. The contract will be investigated to determine the origin of the waste and the extent of the contaminants present, and an assessment will be made of the impact of the material in the ground. All laboratory results are reviewed by CEMEX Geological Services Department to determine the acceptability of the waste.

Any action required arising from the assessment will be agreed with the Environment Agency.

The waste acceptance procedures are explained more fully below.

### **3.3.2 Inquiry stage (level 1 basic characterisation)**

- i. Existing customers are aware of CEMEX's waste acceptance procedures. However where the Company is approached by a new customer the company's waste acceptance procedures will be explained including the need to carry out the Basic Characterisation requirements of the Landfill Directive.
- ii. Both new and existing customers will be required to provide CEMEX with the necessary Basic Characterisation information in advance. Particular attention will be given to the source/origin of the waste to ascertain whether there is any reason to believe that the waste might be contaminated.
- iii. If the information supplied suggests the waste is acceptable it will be summarised onto the top part of the Waste Information Form (WIF). A copy of the WIF form is included in Appendix B.
- iv. The WIF includes a declaration from the customer to say that the waste to be delivered to Parkfield Road Landfill will:
  - a) Comprise waste that is in Table 1 (i.e. those wastes that are acceptable at an inert landfill without testing);
  - b) not contain material that is suspected of being contaminated; and
  - c) not have come from a stockpile where dilution of other unauthorised waste may have occurred.

- v. The customer will be required to certify that the waste does not consist of or contain any wastes that are described in Article 5 (3) of the Directive (banned wastes).
- vi. If, after consideration of the basic characterisation information, the waste is not considered acceptable the customer will be informed so that he can seek an alternative disposal site.

In either case the landfill clerk will be informed so that he is aware that the waste has been approved for acceptance (subject to its on-site verification at the waste reception area and tipping face), or rejected as being unacceptable for disposal at Parkfield Road Landfill.

### 3.3.3 Compliance testing (level 2 characterisation)

The Company will only accept inert waste that is acceptable without testing, is from a single source and which is not suspected of being contaminated. In this circumstance the waste is exempted from the testing requirements for basic characterisation (leach testing) and is also exempted from the need to carry out compliance testing.

### 3.3.4 Waste reception at site

- i. All waste imported into the site will be via a rail head adjacent to the landfill.
- ii. Waste streams will be segregated, as required, so that each rail delivery can be identified according to specific approved WIFs.
- iii. The nature of the waste carried on each train delivery must be disclosed and the relevant documentation provided prior to the train's arrival by fax or email.
- iv. The landfill office will be manned by a clerk who will identify and record the loads being delivered. The clerk will complete transfer notes and CEMEX Delivery Tickets and is responsible for their safe storage. Transfer notes and related documentation will be made available for inspection by the Environment Agency on request.
- v. The clerk will ensure that a fully completed Waste Transfer Note is received for every rail delivery, and that the information provided aligns with the Basic Characterisation information previously approved.
- vi. Only authorised carriers will be allowed on site. Any new waste carrier must provide evidence of registration (registration certificate or official copy certificate) before being allowed to deposit any waste. In addition, occasional checks of waste carriers who regularly use the site will be carried out to check that their registration is still current.
- vii. The quantity of waste being delivered will be recorded by the Clerk.
- viii. For each rail delivery of approved waste the carrier will be issued with a receipt, in the form of a CEMEX Delivery Ticket. The ticket will be issued by email or fax directly to the waste producer.

### 3.3.5 On-site verification (level 3 characterisation)

#### 3.3.5.1 Waste reception at rail head

All loads of waste arriving at the rail head will be visually inspected at the waste reception area upon arrival at site, and during unloading. The objective of this inspection is to detect the presence of any unauthorised material and to ensure that the waste is in accordance with the Basic Characterisation information provided by the customer and approved by the CEMEX Waste Department.

If any unauthorised material is present in a load, or the waste does not match the Basic Characterisation information provided, it will be dealt with in accordance with the CEMEX waste rejection procedures.

The landfill clerk and machine operator will use two-way radios so that visual inspection and cross-checking of any waste load can be carried out. The Site Manager or his nominee will also carry a radio so that he can be made aware of potential problems at the earliest opportunity. This might, for example, be the arrival of a waste delivery containing unauthorised waste. The Site Manager will then be able to ensure that such waste is handled safely and removed from site as soon as practicable.

Waste transfer documentation, including the receipt docket and waste transfer note, will be completed once the load has been deposited and inspected.

#### 3.3.5.2 Tipping Face

On arrival at the working area the load will be deposited as directed by the operative(s) at the face.

The operative will observe every load as the waste is deposited from the delivery vehicle.

If the operative's inspection detects any unacceptable waste it will be dealt with in accordance with the waste rejection procedures below.

### 3.3.6 Waste rejection procedures

Waste will be rejected under the following circumstances:

- a) Unauthorised material is identified following on-site verification inspections.
- b) The waste does not match the description provided on the basic characterisation or waste transfer paperwork.
- c) There is any suspicion of contamination, for example following inspection of the waste load or if any additional information is provided by the waste producer or carrier.
- d) Any other reason which has the potential to cause pollution or any adverse environmental affect, as perceived by the Site Manager or his nominee.

If the rejected waste is identified before off-loading the waste, it will be left on the wagon for immediate removal.

If the rejected waste is identified after off-loading or deposit and the train has not yet left, where possible, the waste will be reloaded and returned to the Rail Depot associated with the waste transfer station.

If the waste is identified after the train has left site or the waste cannot be reloaded it will be isolated or moved to a temporary storage location if it is safe to do so.

Unacceptable waste must not be covered with other waste.

Arrangements to remove the unacceptable waste should be made by the waste carrier. If the carrier is unable to collect the waste, arrangements will be made by CEMEX to remove the waste to an alternative waste management facility that is authorised to receive such waste, using a registered waste carrier.

Wastes that have been deemed unacceptable will be removed from the site within 5 working days following delivery.

Each load of waste dispatched from the site will be accompanied by a Waste Transfer Note.

The incident will be recorded in the Site Diary by the Site Manager or his nominee and a Rejected Waste Form (Appendix B2) will be completed. The completed form will be stored securely at site and a copy will be provided to the waste carrier and/or producer.

### 3.3.7 Duty of care

#### 3.3.7.1 Overview

Section 34(1) of the Environmental Protection Act 1990 imposes a Duty of Care on any person who imports, produces, carries, keeps, treats or disposes of controlled waste. The Duty of Care is now implemented by way of *The Waste (England & Wales) Regulations 2011 SI 988*.

#### *Waste Transfer Notes*

These regulations require an adequate waste description to be provided and a Waste Transfer Note to be completed, signed and kept by the parties to a waste transfer. Waste Transfer Notes will be stored securely until the permit is surrendered, to allow inspection by the Environment Agency, in accordance with the Duty of Care Regulations. The contents of the Waste Transfer Note will be in accordance with *The Waste (England & Wales) Regulations 2011 SI 988* and will include:

- Description of waste, including EWC (List of Waste Regulations) code and quantity
- Name and address of the waste holder or producer
- SIC Code (2007)

- Source of the waste by unitary authority or council
- Name and address of the waste carrier
- Waste Carrier's Registration number
- Parkfield Road Landfill Site address and Environmental Permit number
- Names and signatures of the waste holder or producer, waste carrier and a representative of Parkfield Road Landfill Site
- Date

### 3.3.7.2 Duty of Care Testing

Duty of Care testing will be undertaken on random wagon loads of inert waste arriving at Parkfield Road and on random waste loads awaiting delivery to Parkfield Road from the waste transfer station. This testing will be carried out in accordance with the procedure outline below in order to monitor the efficacy of the Waste Acceptance Procedures. The frequency of sampling will be approximately one sample per source and at least every 10,000m<sup>3</sup> if from the same source. The random waste sample acceptance criteria are given in Table 3.

Table 3 Random Waste Sample Acceptance Criteria

Limit Values for Inert Waste	
Determinand	Raw Sample
	mg/kg
PAH*	100
Mineral Oil (C10 to C40)*	500
* only tested if toluene extractable material > 1500mg/kg	
Determinand	Leach L/S =10 l/kg
	mg/kg
Arsenic (As)	0.5
Cadmium (Cd)	0.04
Chromium (Cr)	0.5
Copper (Cu)	2.0
Lead (Pb)	0.5
Nickel (Ni)	0.4
Selenium (Se)	0.3 <sup>1</sup>
Sulphate SO <sub>4</sub> <sup>2-</sup>	3,000 <sup>2</sup>
Zinc (Zn)	4.0
Dissolved Organic Carbon (DOC)	500
Total Dissolved Solids (TDS)	12,000 <sup>3</sup>

1 3 x waste acceptance criteria for selenium

2 The limit value for sulphate may be increased to 6,000 mg/kg, provided that the value of C0 (the first eluate of a percolation test at L/S = 0.1 l/kg) does not exceed 1,500 mg/l. It

- will be necessary to use a percolation test to determine the limit value at  $L/S = 0.1$  l/kg under initial equilibrium conditions.
- 3  $\leq 12,000$  mg/kg ( $L/S=10$  l/kg) for individual test results (with retesting including sulphate analysis ( $\leq 6,000$  mg/kg) or percolation tests where this is exceeded.  $\leq 5,500$  mg/kg for the geometric mean on a rolling 12 month average (reviewed each 3 months and with any rising trends investigated as per the Duty of Care Testing sampling and analysis procedures

### 3.3.7.3 Sampling and analysis procedure

1. The site manager or his nominee will determine which wagon load is sampled on a random basis, at a frequency of approximately one sample per train arrival. The sample will be collected by the site manager or his nominee.
2. A sample number will be created using the site reference (PRL), the sample type (SS for soil sample), the date of collection, and the train reference, i.e. the number of the delivery that day. For example PRLSS 01/01/21/2, would be a sample from the second train arriving on 1st January 2021.
3. The site manager or his nominee will prepare a Sampling Form (Appendix B3) for the load to be sampled. A copy of this form will be forwarded to the CEMEX Waste Department.
4. The site manager or his nominee will subsequently take a combined sample from the load on the day it is delivered in accordance with the following steps.
5. Six portions from different parts of the load (front, back and sides) will be sampled by means of a hand shovel and combined together into a small pile.
6. With repeated twisting and cutting motions of the shovel (like hand-mixing concrete), the sampler will mix the sample for 30 seconds to reduce lumps and homogenise it.
7. From the blend produced, the sampler will fill a sample container supplied by the UKAS accredited laboratory for this purpose. Approximately 2kg is required.
8. The container will be sealed and labelled with the sample number (see step 2).
9. The sample will be kept in secure storage awaiting collection and transport to the laboratory. All soil samples will be prepared and analysed by the UKAS laboratory using MCERTS performance standards.
10. The results from the analysis will be reviewed by the CEMEX Waste Department.
11. If the sample does not meet the criteria set out in Table 3 the waste stream that was sampled will be investigated in more detail. This investigation will include identifying the source and reviewing the basic characterisation information provided by the waste producer. The quantity of waste from the same source will be established and further samples of any remaining

material still to be disposed of will be taken in order to determine whether the unacceptable sample is typical or atypical of the contract as a whole. When this additional information is available, an assessment will be made as to whether further waste loads can be accepted from this source, the waste stream should be stopped, or whether the deposited material represents a significant risk to the environment. If the assessment indicates that a significant risk is present then the waste will be located and removed, following discussion with the local Environment Agency.

### 3.3.7.4 Duty of Care Visits

Regular, unannounced visits will be made by CEMEX Representatives to the waste transfer station from which waste is delivered to Parkfield Road in order to monitor compliance with, and the efficacy of the CEMEX Waste Acceptance Procedures.

- i. Visits will be made by CEMEX Representatives to the waste transfer station at least quarterly, and a record of this visit will be made.
- ii. A random selection of waste acceptance paperwork, including Waste Transfer Notes and any Basic Characterisation information, will be checked against the information provided to CEMEX by the waste producer and carrier.
- iii. Any stored wastes awaiting delivery to CEMEX will be inspected and verified against the Basic Characterisation information. In particular, the inspection will look for any unauthorised material or any signs of contamination that would make the waste unacceptable at Parkfield Road. If any unacceptable waste is identified, the waste stream will be reassessed by CEMEX Waste Department.
- iv. If stored wastes awaiting delivery to Parkfield Road are present, a random sample may be collected and analysed in accordance the Duty of Care Sampling and analysis procedure described above.
- v. If any significant non-compliances are identified, the Waste Acceptance Procedures will be reviewed and a record of this review will be made.

## 4 Site preparation

### 4.1 Surface preparation

Before commencing construction of the enhanced geological barrier, any vegetation that exists within the quarry will be stripped and composted. Once decomposed, it will be mixed with selected soils segregated from the incoming waste stream used in the restoration process. Should it not be possible to compost the vegetation, it will be disposed of off-site at a suitably licensed facility.

### 4.2 Enhanced geological barrier

To comply with the requirements of the Landfill Directive, an enhanced geological barrier will be constructed for the disposal areas on the base and against the sidewalls of the quarry ahead of the deposit of waste. Suitable barrier material derived from selected imported waste (Table 1 EWC 17 05 04, 20 02 02) will be placed to comply with the requirements of the Landfill Directive.

The procedures that will be applied for selection of the material and construction of the basal and sidewall geological barriers are detailed below.

#### 4.2.1 Materials

The enhanced geological barrier will be constructed from fine grained materials (soils containing a significant proportion of silt and clay) derived from selected imported waste. The materials selected for incorporation in the enhanced geological barrier will be capable of being spread in thin layers using conventional earthmoving plant and tracked in, without heavy compaction, to form a homogeneous barrier 1m thick with a permeability of  $1 \times 10^{-7}$  m/s or less.

All materials used in construction of the enhanced geological barrier will comply with the requirements of Table 4.

Table 4 Physical Properties

Property	Defined and Tested in Accordance with	Acceptable within Limits	
		Lower	Upper
Grading	BS 1377 : Part 2	≥10% passing 0.002mm*	100% passing 125mm sieve
Plasticity Index	BS 1377 : Part 2	10%	-
Liquid Limit	BS 1377 : Part 2	-	90%
Undrained Shear Strength of Remoulded Material	BS 5930 Table 13	40	150

\* The minimum clay content (at least 10% finer than 0.002mm) has been set to ensure that the selected material will achieve the maximum permeability requirement of  $1 \times 10^{-7}$  m/s. The value has been determined using a well established and widely used formula produced



Property	Defined and Tested in Accordance with	Acceptable within Limits	
		Lower	Upper
by Hazen (1892) who stated that $k$ (permeability) = $10D_{10}^2$ mm/sec where $D_{10}$ = effective size (the largest size of the smallest 10%) Applying Hazen's formula to the selected material we have: $k = 10 \times (0.002)^2 / 1000$ m/s $= 4 \times 10^{-8}$ m/s			

## 4.2.2 Material selection

The materials for incorporation in the enhanced geological barrier will be selected by the Site Manager or other suitably qualified person (e.g. experienced geologist or engineer). The procedures for selection of the materials will be as follows:

### 4.2.2.1 Assessment of chemical suitability for imported material

Waste will only be accepted at the site if the prospective customer has completed a Waste Information Form (see Appendix B) which provides details of the source of the waste together with any available site investigation and chemical testing information.

The Waste Information Form for each new waste contract will be assessed by the Site Manager or other suitably qualified person to identify those that could provide suitable material for incorporating in the enhanced geological barrier. Where, based on the information on the Waste Information Form, the waste is considered to be potentially suitable, the following procedures will be followed to assess its suitability:

If the Waste Information Form indicates that the material is on the approved list of inert wastes, and is from a single source, the waste will be considered to be suitable.

### 4.2.2.2 Duty of care testing

The Company's waste acceptance and control procedures include a requirement for random Duty of Care testing of incoming wastes. Wastes accepted for incorporation in the enhanced geological barrier will be subjected to the duty of care testing regime to confirm that no unsuitable materials are used. Details of the sampling and testing procedures to be followed are included in Section 3.3.7.

### 4.2.2.3 Assessment of geotechnical suitability

Any geotechnical site investigation data provided by the customer will be reviewed by the Site Manager or other suitably qualified person to determine whether the waste meets the physical requirements of Table 4. If the site investigation data show that the waste meets the requirements of Table 4, the waste will be accepted for incorporation in the enhanced geological barrier without further testing. Incoming loads of the waste will be visually inspected to confirm that the material matches the description on the WIF, and any loads that

do not appear to satisfy the requirement for fine grained material will be directed to the active landfill tipping face. Acceptable loads will be directed either to the construction face or to a designated storage area for materials to be incorporated in the enhanced geological barrier.

Where the Site Manager or other qualified person considers that material may be suitable for use in construction of the enhanced geological barrier, but no geotechnical testing information is available, or if the available information is inconclusive, the material will be directed to a temporary storage area. At least one representative bulk sample (25kg) per 2000m<sup>3</sup> of the material will be taken for laboratory analysis to confirm that its physical properties meet the requirements set down in Table 4. The samples will be submitted to a suitable soils testing laboratory and tested in accordance with the following suite:

Table 5 Testing Requirements

Test Description	Method	Notes
Sieve analysis	BS 1377 : Part 2 : Sections 9.2 and 9.5	Wet sieving method for coarse soils and hydrometer method for fine soils
Plasticity characteristics	BS1377 : Part 2 : Sections 4 & 5	

In addition, the undrained shear strength of the material will be assessed using the following field test in accordance with BS5930:

Table 6 Field Test for Strength

Field Tests	Strength (kN/m <sup>2</sup> )	Comments
Finger easily pushed into soil up to 25mm	<20	Unsuitable unless dried*
Finger pushed in up to 10mm	10 – 20	Unsuitable unless dried*
Thumb makes impression easily	40 – 75	Suitable
Can be indented slightly by thumb	75 – 150	Suitable
Can be indented by thumbnail	150 – 300	Unsuitable
Can be scratched by thumbnail	>300	Unsuitable

\* Soft materials may be used provided they are spread in thin layers and allowed to dry before being tracked in and covered with subsequent layers.

The results from the tests will be reviewed by the Site Manager or other suitably qualified person to determine the suitability of the waste. If the testing results show that the waste meets the requirements it will be incorporated in the enhanced geological barrier. If the results show that the waste does not meet the requirements, the waste will be incorporated in the general waste mass.

## 4.2.3 Construction of the enhanced geological barrier

### 4.2.3.1 Introduction

The geological barrier will be constructed to ensure that there is a least 1m thickness of material with sufficient clay content capable of achieving a

permeability not greater than  $1 \times 10^{-7}$  m/s. Cross sections through the site showing the proposed enhanced geological barrier is shown in the drawing DESSD 15 of the ESSD report (PRL-REP-001).

#### 4.2.3.2 Basal geological barrier

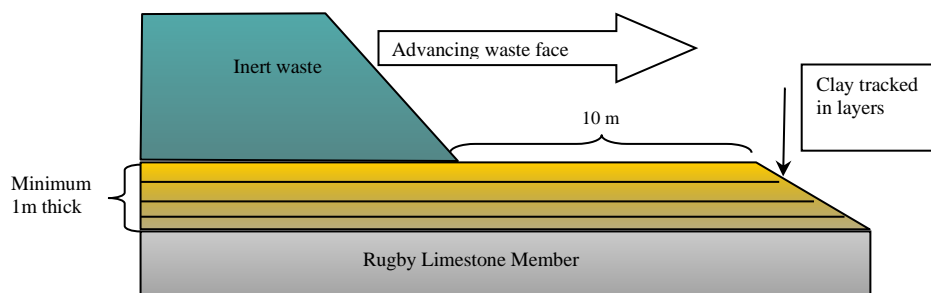
The barrier will be constructed from suitable material by spreading and compacting in a series of layers to achieve an overall thickness of 1m as follows:

- The surface onto which each layer is to be placed will be prepared by removal of any vegetation, excessively dry or excessively wet material.
- A survey will be conducted on the prepared base to record the commencing level for construction of the geological barrier.
- Each load of material for incorporation in the enhanced geological barrier will be tipped at least 6m back from the advancing construction face, where it will be inspected by the machine operator to check that the material is suitable. Any unsuitable material will be dozed to one side for subsequent reloading and transport to the main waste tipping face.
- After inspection, suitable material will be pushed forward over the advancing face and graded down to a thin layer, approximately 300mm thick, using a tracked dozer.

The dozer, towing a roller, will be tracked repeatedly back and forward over the material, taking care to ensure that the whole of the surface is compacted and that the barrier is free from voids.

- The basal geological barrier will be constructed a minimum of 10m ahead of the advancing waste face. This is illustrated below:

Figure 1 Construction of Basal Barrier



#### 4.2.3.3 Side-wall geological barrier

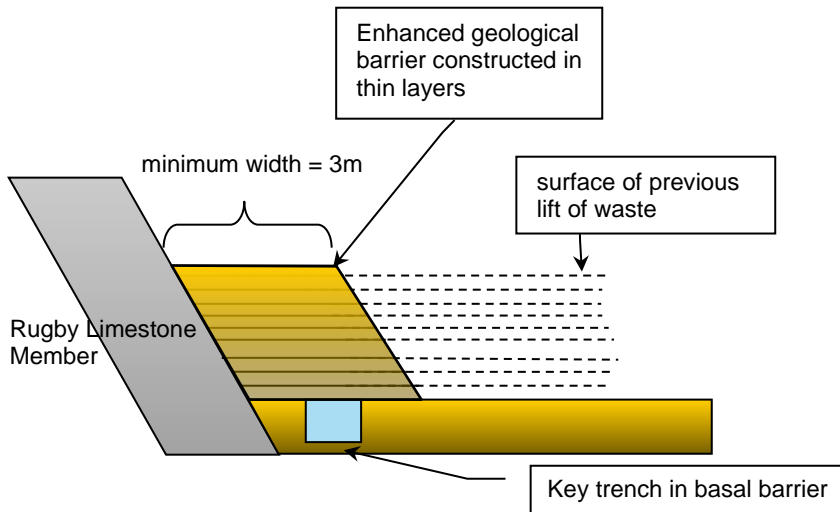
An engineered geological barrier will be provided around the perimeter of the site to separate the waste from the Rugby Limestone Member and River Terrace Deposits.

The enhanced sidewall geological barrier will be constructed in 250mm layers just ahead of the deposit of waste on a continuous basis as illustrated below. The geological barrier will be constructed at a minimum width of 1m measured perpendicular to the sidewall of the quarry to achieve a permeability less than or

equivalent to  $1 \times 10^{-7}$  m/s. However, it is anticipated that the minimum crest width will be 3m to allow safe plant access.

A 0.6m wide x 0.5m deep key trench will be excavated into the existing basal geological barrier prior to commencing the construction of the first lift to enable a good seal as shown in Figure 2.

Figure 2 Schematic section through sidewall barrier



An assessment of the condition of the bund placed against the northern quarry wall in 2012 will be undertaken prior to the construction of the geological barrier. If the bund is considered unsuitable then the material will either be re-engineered or removed and incorporated into the waste mass.

#### 4.2.4 Testing laboratory

The Contractors testing laboratory will be required to hold UKAS accreditation for the tests to be performed. Evidence of the accreditation is to be provided to the CQA Engineer prior to the commencement of testing.

#### 4.2.5 Construction quality assurance

The construction of the geological barrier will be subjected to inspection and testing at all stages by an independent CQA Engineer appointed by the Landfill Operator. A Construction Quality Assurance Plan for the enhanced geological barrier will be submitted to the EA in accordance with the permit, prior to commencing operations.

## 4.3 Groundwater and surface water management systems

### 4.3.1 Overview of water management systems during filling

Prior to commencement of landfill operations, the existing surface water body within the footprint of the landfill will be fully dewatered to 52 mAOD, and the basal geological barrier constructed. Any water entering the void, via rainfall or groundwater inflow, will be drained to a sump and pumped out via the consented discharge route to Sow Brook.

Low groundwater inflows within Rugby Limestone Member (RLM), are described in the hydrogeological risk assessment (330201391R1, Stantec, 2020). Vertical flow is negligible due to the low permeability of the mudstone layers within the RLM, therefore there is a negligible risk of basal heave of the geological barrier once dewatering ceases.

Notwithstanding the low risk of heave, to protect the basal barrier the final area to be completed will be surcharged quickly. A sump will be maintained for as long as practicable whilst the geological barrier around it is completed and surcharged with a least 3m of waste. Additional materials will be stockpiled close to the sump to allow the geological barrier to be completed and surcharged by 3m of waste immediately upon the cessation of pumping.

Following placement of the enhanced geological barrier and initial layers of waste, dewatering will cease until the groundwater levels reach 70m AOD, where it will be managed and maintained at that level.

The surface of the waste body above the water level will be kept free from standing water by grading the surface to falls.

### 4.3.2 Overview of water management systems following reinstatement

The northern part of the final restoration and the eastern platform area will comprise a surface that slopes gently down to a surface water attenuation pond with wetland margins. The western platform area will convey flow towards the pond and also towards a roadway filter drain. This pond will attenuate surface water within the site. The drainage plan is shown in DESSD 14 of the ESSD report (PRL-REP-001)

A filter drain network will convey surface water from the road and adjacent slopes towards a pumping station close to the mouth of the tunnel. The filter drains will also collect any groundwater seeping through the waste body, maintaining the groundwater level beneath the road.

The pumping station will be provided adjacent to the tunnel, at the low point within the site. Surface water from the access road and groundwater from the site will be pumped via the current pipeline to the Sow Brook consented discharge point (W2 on Drawing D-ESSD10).

Surface water draining into the pond will be retained and attenuated there. A high level overflow will be provided at the pond connecting into the access road filter drain network via gravity. This will allow water to drain towards the pumping station in a controlled manner when the water levels within the pond become high in an exceedance event.

When surface water flows exceed the existing pumped rate towards Sow Brook, an additional pump will be triggered which will pump excess flows towards the Works Grip area of the CEMEX site, where water is currently stored, for attenuation. The water will then be released to the consented discharge point on Sow Brook in a managed manner using the existing system.

### 4.3.3 Maintenance

Any surface water ditches will be inspected monthly for signs of erosion, instability or blockages. In the event that any deterioration is observed, remedial works will be carried out as soon as practicable.

## 4.4 Capping system

The waste to be deposited will be inert. As there is no requirement to collect leachate or minimise the infiltration of water into the waste, no engineered capping is proposed. The final deposit of waste will be covered with a 0.7m thick layer of subsoil and 300mm of topsoil.

## 4.5 Site completion and final landform

### 4.5.1 Design

The restoration scheme is shown on Drawing No DESSD 5. The site will be restored to species-rich grassland, woodland and scrub, permanent ponds and ephemeral wetland areas.

The final layer of waste will be covered by a 700 mm thick layer of subsoil which will be derived from on-site resources or suitable waste brought into the site, screened as necessary to remove any oversize or unacceptable materials. The subsoil layer will not be compacted. A 300 mm layer of topsoil will be spread over the subsoil. Indigenous topsoil or subsoil will be stored in screening bunds or stockpiled on the site for use in restoration. The locations of topsoil stockpiles may vary from time to time, however the stockpiles will be clearly marked on site and their locations will be notified to the Environment Agency.

In the event that waste disposal ceases before the landform shown on drawing DESSD 5 is achieved, uncompleted phases will be graded to achieve a landform with maximum gradients of 1(V) in 5(H) and minimum gradients of 1(V) in 50(H).

## 4.5.2 Construction

When infilling in any area is nearing completion, profile boards will be established indicating the top-of-waste levels and final restoration levels. The waste will be brought up to the final waste levels shown on the profile boards and graded using a bulldozer to achieve smooth contours.

The subsoil and topsoil will be placed by loose tipping using a tracked backhoe excavator to minimise compaction.

Each layer will be:

- Ripped using a winged tined ripper at 500 mm centres, the first layer will be ripped to the full depth, subsequent layers will be ripped to their full depth plus 150 mm. Ripping will be carried out in transverse directions down slope.
- Stone picked following ripping, stones greater than 100 mm will be removed.
- Trimmed to level using a low ground pressure dozer.
- Construction of the restoration layer will be limited to a total period of eight weeks in any 12 month period, owing to restrictions on the length of temporary operations where higher noise thresholds are permissible.

## 4.5.3 Quality assurance

Samples of the subsoil will be taken by hand auger to determine the thickness, nature and friability of each layer at a frequency of three per phase, analyses will be visual to determine thickness and by hand to determine friability.

## 4.5.4 Maintenance

Erosion of soiled areas will be minimised by the establishment of grass sward as soon as possible after soil placement.

Restored areas will be inspected in the first spring following restoration for signs of erosion, slippage or cracking. Any defects noted will be made good as soon as practicable.

Any areas requiring remediation with additional soils will be undertaken in the appropriate season.

Subsoil and topsoil will only be placed when in a dry and friable condition and in periods of dry weather. In unusually dry or windy conditions, soil handling would be suspended if it appears likely that dust may be carried towards any sensitive properties.

As a temporary measure the area will be secured from further access for future repair.

## 5 Waste deposit and placement

### 5.1 General

After inspection, acceptable wastes will be incorporated into the waste mass within the current working phase of the landfill.

The landfill will be backfilled to 89m AOD in the south east, with a relatively level area along the southern edge of the site, parallel to the rail siding at between 92m AOD and 90m AOD. The central water features with a base level of 83m AOD, and an access ramp from the tunnel entrance at 78m AOD eastwards through the centre of the site with a gentle slope up to the 90m AOD level. The final landform is shown on DESSD 5.

### 5.2 Phased infilling scheme

The landfilling will be completed in eight phases as shown in the ESSD report (PRL-REP-002) Appendix A and summarised in Table 7.

Table 7 Landfill Phasing

Landfill Phase	Operations	Approx. volume (m <sup>3</sup> )	Approx. duration (weeks)
1	Construct a 5m high screening bund parallel to the railway siding along the southern edge of the quarry void to provide an acoustic barrier to the landfill works.	7,000	1
2	Construct a ramp from the hardstanding area down to a level of 66m AOD. The ramp will comprise geological barrier quality material.	20,000	3
3	Construct an existing low ridge at the base of the quarry into a new causeway across the site at a level of 59m AOD This will assist with initial water management between two voids either side of the causeway.	28,000	4
4	Restoration backfill with the base of the quarry backfilled to a level of 62m AOD in the east, with the gentle fall to 56m AOD in the west, again to assist water management.	137,000	17
5	Progress the backfill operation to the next level of 76m AOD	910,000	114
6	Backfill the southern area of the site, creating a level platform at 85m AOD, and a gentle slope down to the phase 5 backfill levels in the centre of the site. The main access ramp from the working platform down into the void would be repositioned during phase 6 to accommodate the revised levels	272,000	34
7	Backfill against the southern quarry wall to increase the height of the original southern screen bund from 5m to 7m.	162,000	20



Landfill Phase	Operations	Approx. volume (m <sup>3</sup> )	Approx. duration (weeks)
8	Progress the backfill restoration towards final levels, to 86m AOD in the east and 78m AOD in the west, which corresponds to the level at the western tunnel entrance to the Rugby Cement Works.	185,000	23
9	Progress to the final restoration levels and the establishment of shallow depressions along the central axis of the site which will accommodate the water features to be created as part of the restoration scheme.	172,000	23
<b>Total</b>		<b>1,893,000 m<sup>3</sup></b>	<b>239 (4.5 years)</b>

### 5.3 Waste selection

All wastes accepted at Parkfield Road Landfill will be approved by CEMEX and will be characterised as inert, in accordance with Council Decision (2003/33/EC) following the procedures outlined in Section 3.3.

### 5.4 Method

Waste will be imported by rail and will be received at the rail sidings which run along the southern edge of the landfill.

The siding comprises two running lines with cross over points 20m to the west of the footbridge to the south west of the site, and 75m from the level crossing at the south eastern edge of the quarry, with a line length of some 370 between the crossing points.

The incoming trains will each comprise approximately 20 wagons, each having a load capacity of approximately 80 tonnes (40m<sup>3</sup>), giving a load capacity of 800m<sup>3</sup> per train. An average of two to three train loads per day is anticipated.

It is anticipated that the train would be split and the wagons shunted to an offloading facility at the south western edge of the quarry, to the east of the existing footbridge. The unloading area will be of sufficient length for three wagons.

Unloading of the wagons will be undertaken by grab excavator which will load a dump truck for onward transportation down the haul road ramp into the tipping area. Once the three waggons have been unloaded, the train will be shunted to position the next three wagons for offloading and this operation would then continue to complete the offloading operation.

On arrival at the working face, the load will be deposited as directed by the dozer driver.

The operative(s) will inspect the waste before and during deposition at the landfill face. If any unacceptable waste is discovered it will be dealt with in accordance with the procedure detailed under quarantine storage and rejection of waste.

Materials will be placed ahead of the advancing face in order to provide adequate working space for inspection of wastes. Fill will be compacted by repeated passes of earthmoving equipment and temporary slopes will be benched at an overall gradient of approximately 1 in 3.

All large items such as intact masonry or concrete will be placed at the base of the current working face away from the edges or flanks of the face, or the sides of the working area. Such items will not be placed within the final lift of waste in order to minimise the risk of uneven surface deformation, and to ensure that they do not interfere with restoration and aftercare activities.

Materials that are considered suitable for use on site may be separated and stockpiled. Such wastes may include hardcore for use in the construction or maintenance of haul roads and soils that are suitable for the site's restoration. The location of stockpiles may vary from time to time due to operational requirements, however stockpiles will be clearly marked on site and their locations will be notified to the Environment Agency. No stockpiles will be formed within 20m of the crest of the waste slope.

At the end of the working day the working face and flanks will be compacted to slopes at a gradient less than 1(V):3(H) and the working area will be left in a neat and tidy condition.

## **5.5 Use of daily and intermediate cover**

The wastes to be deposited at the site will be inert and are unlikely to give rise to unacceptable odours, aerial emissions or wind blown litter, nor are they likely to attract vermin, scavengers, corvids or gulls. Consequently, the use of daily and intermediate cover will not be necessary per se. However, the working area will be graded and left in a tidy condition at the end of each working day.

## **5.6 Removal of residual wastes from site**

In the event that the landfill operation ceases permanently, any residual wastes on the site will be removed to a suitably licensed facility following the waste rejection procedures (see Section 3.3.6).

## 6 Site infrastructure

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### 6.1 Proposed infrastructure

The site infrastructure includes:

- Railway sidings and railhead
- Concrete working pad
- Access from Western Relief Road for site users and mobile plant
- Quarantine area
- Site office including welfare facilities, canteen and car park
- Road signing and lighting as required
- Internal haul roads, principally the ramp into the landfill void

For details of the location of the site infrastructure see Drawing DESSD 6.

The waste reception area is secured by a pair of steel lockable gates erected at the entrance, and by stock-proof fencing and trees. The landfill void is secured by metal palisade fencing.

A noticeboard summarising the site rules for visitors is displayed in a prominent position in the waste reception area. Copies of the site rules will be available for issue to visiting drivers.

### 6.2 Provision of site identification board

#### 6.2.1 General

A notice board will be erected at the site entrance. The notice board will be constructed from durable materials and will display the following details:

- Name and address of the waste management facility.
- Statement that the site is permitted by the Environment Agency and the permit reference number.
- Name, address and telephone number of the permit holder.
- The Environment Agency's national numbers for general enquiries and emergencies.
- The emergency contact and telephone number of the licence holder.

Days and hours that the site is open to receive waste.

#### 6.2.2 Maintenance

The notice board will be inspected on a daily basis and checked for integrity and accuracy of the information. Repairs/alterations will be carried out as soon as possible after any defect is noted.

## 6.3 Site security

### 6.3.1 General

A gate to the landfill area is located near the end of the main site road and remains locked outside working hours. The perimeter of the site is bounded by a 2.4m high metal security fence. The majority of the site is also bounded by dense vegetation. The fencing is designed to restrict access to the site, to prevent vehicular access and to discourage casual visitors.

Once a month, all boundary fencing will be inspected and any necessary repairs put in hand. Any damage that exposes members of the public to significant risk or that allows unauthorised vehicular access to the site will be made good with a temporary repair until a permanent repair can be made.

A note will be made in the Site Diary of when the inspections are carried out and a record will be made of any damage discovered and the remedial action taken.

The site entrance gates are to be of sufficient height to prevent easy access. The gates are to be kept locked at all times outside working hours using a close-shackle padlock. At the end of each working day the site will be checked to ensure it is secure (i.e. all gates and buildings are locked).

All mobile plant will be parked securely at the end of each working day.

### 6.3.2 Buildings

Doors will be made of substantial material and preferably metal lined.

Door keys will never be left on top of the lintel, under stones or in other “concealed” places.

Windows will be fitted with toughened glass and be covered with bars or lockable steel shutters for protection during periods of closure.

### 6.3.3 Property

Keys giving access to the company’s property will only be kept by persons authorised to do so by the Landfill Manager.

A key register will be compiled and maintained for all properties.

Keyholders will be notified to the local police station and this information kept up to date.

Wherever possible, one person should be made responsible for locking up and where applicable setting the burglar alarm.

### 6.3.4 Vehicles and mobile plant

All vehicles and mobile plant are to be locked when not in use. Windows will be of toughened glass or protected by screens at night.

A record of serial numbers should be maintained for all mobile plant. Spare parts will be kept in a secure store and records maintained.

Clamping is desirable for cars, vans, and trucks left on site overnight.

### 6.3.5 Documents

There will be only one keyholder to the safe and the keyholder must keep the key on their person.

When not in use all confidential papers must be kept in a locked drawer.

There must be no delay in reporting the theft of any confidential documents.

### 6.3.6 Diesel or gas oil

Before delivery of diesel or gas oil a responsible employee must record the tank reading.

Gravity fed tanks will have the inlet and drain plugs secured with good quality, close-shackle padlocks. Gate valves to the outlet pipe will be similarly secured in the off position when not in use.

The nozzle of the outlet pipe will be similarly secured.

Electrically operated pumps will have the electrical switchgear adequately safeguarded and switched off at night.

### 6.3.7 Visitors

Unauthorised persons are not allowed on company's premises.

Visitors must call at the site office, identify themselves and state the nature of their business. Unless the caller is known he/she **MUST NOT** be allowed to find their destination unaccompanied.

Individuals will not be allowed to go onto the site to remove material(s) unless authorised in writing - totters are not permitted.

Once authorised waste is deposited in the licensed area it becomes the property of the company and unauthorised removal is therefore theft.

### 6.3.8 Report of thefts

Supervisors must immediately inform their site manager or nominee and CEMEX Group Security of any occurrence of:

- Breaking and entering of company's premises.
- Vandalism.
- Theft from company's premises.
- Any act or suspected act of dishonesty.

- Stock or cash deficiencies.

Where an outside element is suspected the police will be called without delay.

**CEMEX GROUP SECURITY CAN BE CONTACTED BY TELEPHONE ON  
01788 517421.**

## 7 Emissions management

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### 7.1 Air quality assessment

The air quality assessment<sup>1</sup> submitted for approved planning permission RBC/18CM017 is included for reference in Appendix C.

### 7.2 Dust control procedures

#### 7.2.1 Prevention and control of releases of dust, fibres and particulates

Dusts, fibres and particulates are found in wastes with a fines content and soils.

They are generated during periods of dry weather in combination with windy conditions.

The focus of the dust management strategy is to control dust generation and movement at source. The main sources of dust at the site are likely to be from the unloading of rail wagons, the internal haul road and from the surface of the already deposited wastes during periods of dry weather. Deposition of individual loads is considered to be less significant in terms of potential for dust generation.

The following measures will be implemented and maintained throughout the operational life of the site, the objective of which will be to prevent and minimise the release of airborne dusts, fibres and particulates arising from the permitted waste management operations in such quantities or concentrations that are likely to cause pollution of the environment or harm to human health.

##### 7.2.1.1 Controls measures during transportation of materials

Drop heights from the rail wagon unloading operation will be kept to the reasonably practicable minimum.

In unusually dry or windy conditions, unloading of waste that could generate dust would be suspended if it appears likely that dust may be carried towards any sensitive properties.

Within the site, internal haulage will be restricted to clearly delineated routes, generally on a prepared surface and at low level where possible. The haul routes will be compacted, graded and maintained to provide a smooth running surface and will be designed to avoid sharp changes in gradient or alignment.

Temporary haul roads will be maintained in good condition and kept free from mud by regular grading, good drainage and use of hardcore as necessary.

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<sup>1</sup> SLR, 2018. Environmental Statement Volume 1 Parkfield Quarry Revised Infill Restoration Scheme.

In dry weather, and when necessary, water will be used to control dust movement. A water bowser towed by a tractor will be used to suppress dust where necessary on haul roads and the exposed waste surface.

All site vehicles will be maintained in accordance with the manufacturer's instructions and will be fitted with upswept exhausts and radiator cowls.

Site haulage speeds will be controlled to minimise possible dust entrainment. Appropriate instruction will be issued to all vehicle drivers.

### **7.2.1.2 Controls measures during deposition and placement of materials**

The site will only accept inert wastes. The nature of much of this material is such that it will not in itself create significant dust arising. However, dust can arise from the physical operations associated with the actual deposition of the waste.

When necessary, the working areas will be sprayed with water to suppress dust by tractor and bowser as necessary, although any such application will be controlled.

The progressive approach to landfilling will ensure that the operational restoration area will be confined to fairly limited areas at any one time. This will ensure that the potential for widespread dust arisings will be reduced and that dust management controls can be focussed and concentrated on specific areas.

The control measure would include the construction of temporary bunds around the specific landfill area if deemed appropriate.

In unusually dry or windy conditions, waste deposition and/or soil handling would be suspended if it appears likely that dust may be carried towards any sensitive properties.

### **7.2.1.3 Management procedures**

The Site Manager, or his nominee, will exercise day-to-day control on site at all times. He will have particular responsibility for ensuring full compliance with the conditions attached to the permit. Specifically, the Site Manager will assume control, either personally or by delegation to suitably trained and responsible staff, of:

1. Vehicle movements;
2. All loading, tipping and materials handling operations;
3. Operation of dust suppression measures; and
4. Inspection, cleaning and maintenance of all plant and equipment.

Staff at all levels will receive the necessary training and instruction in their duties relating to the control of all operations and the potential sources of dust emissions. Particular emphasis will be given to dealing with plant malfunctions and abnormal conditions. Site staff will inform the Site Manager whenever visible dust emissions are observed or appear likely to occur, as a result of any site operation.



The continuing effectiveness of this dust management scheme will be reviewed regularly.

## 7.2.2 Monitoring of dust, fibres and particulates

Visual inspections of the landfill, train unloading area and haul roads will be undertaken by the Site Manager or his nominee at least twice during each working day (start of day and mid-day as a minimum). A record of the inspections and their findings, together with the prevailing weather conditions, will be kept in a log book made specifically for this purpose.

Additionally, the deposition of dusty wastes will be carefully monitored during periods of high winds.

Dust suppression measures will be required to ensure that no visible dust leaves the facility.

The focus of the dust control strategy is to control dust generation and movement at source. Therefore, no receptor-specific dust monitoring will be undertaken. The requirement for receptor-specific dust monitoring will be reviewed at regular intervals.

## 7.2.3 Dust, fibres and particulates action plan

### 7.2.3.1 Action plan

In the event that any dust, fibres or particulates arising from the site are released outside the site boundary in such quantities or concentrations that they are likely to cause pollution of the environment or harm to human health, the actions specified below will be implemented:

- The site manager or his nominee will be informed immediately.
- The source of the dust, fibres or particulates will be identified and damped down.
- If the source of the dust, fibres or particulates is a particular waste stream, consideration will be given to suspending acceptance of that waste until appropriate measures are in place to control the release of dust, fibres or particulates from the waste.

If necessary, the Site Manager will instruct the suspension of any operation causing visible dust emissions until such time as the situation has been resolved.

### 7.2.3.2 Complaints procedure

A complaints procedure will be established to ensure that any emissions being caused to local residents is dealt with effectively. A register of complaints will be kept on-site to record all concerns made either directly to the Site Manager or via the regulatory authorities.

Each complaint will be investigated. The Site Manager will report the findings and the action taken to the Environment Advisor. The Minerals Planning Authority (and any other relevant regulatory authority) will be advised in writing within two weeks of any dust complaint received together with the findings of the investigation and any corrective action taken.

## 7.3 Odour control

The types of waste to be processed or disposed of at the site are not likely to give rise to unacceptable odours, consequently odour management, monitoring and action plans are not considered necessary.

## 7.4 Control of mud and debris

### 7.4.1 Overview

Mud and debris may be carried out of the site boundary onto public roads by the wheels of vehicles leaving the site. These vehicles will include vehicles delivering materials for the landfill such as fuels, and landfill site staff personal vehicles. The problem of mud and debris is most likely to occur during and after heavy rain.

Management and monitoring procedures will be used to control mud and debris.

### 7.4.2 Roadsweeping

The site entrance and access road will be inspected daily to check whether it is clean and tidy. A road sweeper or a tractor and brush will sweep the site entrance and the access road if the daily inspection indicates it is necessary.

Road cleaning will be undertaken within 2 hours of an inspection indicating that mud levels are unacceptable. If road cleaning cannot be undertaken within 2 hours, the Landfill Manager will review the situation and movement of vehicles on or off the site will be restricted as necessary.

Additional inspections will be included as necessary in response to comments from the general public or during and following periods of particularly heavy rainfall.

### 7.4.3 Internal haul roads

Internal site roads will be maintained in useable condition, fit for purpose and kept free from mud by regular grading, good drainage and the use of hard-core as necessary.

## 7.5 Litter control

The types of waste which will be accepted at the site are unlikely to give rise to significant amounts of litter. Notwithstanding this, the following measures will be implemented and maintained throughout the operational life of the site, the

objective of which will be to prevent any litter escaping from the confines of the site:

- The landfill clerk will give advance warning of loads containing light materials, e.g. glass fibres or man made mineral fibres to the machine operator by radio.
- Loose litter on the haul roads or at the site entrance will be collected daily.
- Inspections of the site as a whole will be carried out weekly and any litter discovered will be collected and disposed of on the current tipping area.
- Light materials will be covered immediately.
- The waste will be well compacted.

In the event that litter does escape from the site in windy conditions, it will be collected as soon as practicable, and not later than the middle of the following day.

## **7.6 Pest/vermin control**

### **7.6.1 Pest infestations**

The types of waste to be accepted at the site present a low risk of attracting pests or vermin. Notwithstanding this, the following measures will be implemented and maintained throughout the operational life of the site, the objective of which will be to prevent pest infestations arising on the site.

Herbicides and pesticides will be applied as required to control the growth of weeds and insects. The use of herbicides and pesticides will be controlled to prevent pollution of the environment and harm to human health.

The Site Manager or his nominee will inspect operational areas of the site for pest infestations on a daily basis. A record of the inspections and their findings will be kept in the Site Diary. A specialist contractor will be employed to control pests if required. If remedial action is required, a note of any treatment supplied will be made in the Site Diary.

### **7.6.2 Control of scavenging birds and other scavengers**

The types of waste to be processed or disposed of at the site are unlikely to attract birds or other scavengers, consequently control measures are not considered necessary.

## 7.7 Noise control

### 7.7.1 Noise assessment

The noise assessment<sup>2</sup> submitted for approved planning permission RBC/18CM017 is included for reference in Appendix D.

### 7.7.2 General procedures

The following measures will be implemented and maintained throughout the operational life of the site to minimise the impact of noise:

- All plant used on the site will be modern, equipped with silencers in accordance with the manufacturers specifications and will be maintained in good working order - plant found to have defective silencing systems will be stood down until the system is rectified.
- In order to reduce the noise from vehicles when reversing, all Company site vehicles will use smart alarms, which use a white noise system which can only be heard over short distances. Waste vehicles will be directed around the site in a such a way to minimise the necessity for reversing.
- Within the site, internal haulage will be restricted to clearly delineated routes; vehicle speeds will be regulated on site.
- Drop heights from unloading rail wagons will be kept to the reasonably practical minimum to prevent excessive noise from falling soils.
- Daily inspections will be carried out on all the plant.
- Vehicles transporting waste must be fit for purpose and in good working order.
- Restrictions on working periods for specific activities will be in force.
- Activities that may cause higher levels of noise or that cannot readily be mitigated will be handled as temporary operations. These activities may include:
  - Creation of noise bunds
  - Final restoration work
  - Landfilling within 50m of site boundary and within 3m of final levels in the vicinity of sensitive receptors.

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<sup>2</sup> SLR, 2018. Environmental Statement Volume 1 Parkfield Quarry Revised Infill Restoration Scheme.

## 7.8 Potentially polluting spillages and leaks

### 7.8.1 Potentially polluting spillages and leaks of waste

Potentially polluting wastes will not be accepted at the site (see Section 3). Therefore, control measures and action plans are not considered necessary.

### 7.8.2 Potentially polluting spillages and leaks of raw materials

#### 7.8.2.1 Fuels and oils

All fuels and oils used on the site will be kept in a safe place which will be securely locked at the end of each working day.

Should a spillage occur on the landfill site, the affected area will be excavated and removed for disposal at an appropriately licensed facility.

Oil absorbent booms will be kept on site for use in the event of any accidental spillage or release of oil/fuel to the lake.

All new or replacement tanks will include the following measures:

- Single-skinned tanks will be located within a bund having a capacity of not less than 110% of the total capacity of the largest tank or, if interconnected, all the tanks.
- Unconnected single-skinned containers or drums will be located within a bund, having a capacity of not less than 25% of the total capacity of all the containers or 100% of the capacity of the largest container, whichever is the greater.
- Double-skinned tanks will have an outer skin with a capacity of 110% of the inner skin. The tank will have a system for checking for leaks in the inner skin and will be protected from vehicle damage by a metal impact bar or concrete bollards of appropriate height.

In addition the operator will:

1. Ensure that the floor and walls of the bund are impervious to the contents of the tanks, drums or containers and that all inlet, outlet and vent pipes are directed downwards and, together with gauges, within the bund;
2. Ensure that all hosing is kept within the bund walls;
3. Inspect the bund or outer skin daily and record in the Site Diary any damage and action taken for repair;
4. Keep the bund empty of liquid and ensure that any liquid removed from the bund is disposed of to a suitably licensed site, or with the approval of the appropriate Statutory Water Undertaker, to foul sewer;
5. Maintain any storage tanks or containers and bunds in good condition throughout the life of the site.

### 7.8.2.2 Restoration materials

Potentially polluting materials will not be used as restoration materials. Therefore, control measures and action plans are not considered necessary.

## 7.9 Fires on site

### 7.9.1 Waste disposal areas

No wastes will be burned on site.

The types of waste which will be accepted at the site are not likely to give rise to fires or heating, therefore no specific control measures or action plan are required.

### 7.9.2 Other areas

Office and accommodation areas will have the necessary fire fighting equipment to fight fires.

### 7.9.3 Mobile plant

All mobile plant will carry a fire extinguisher and will be inspected and maintained in accordance with the plant maintenance schedule to mitigate any potential fires.

In the unlikely event that a fire does occur that cannot be safely dealt with using the on-site equipment, the local fire service will be called using **999**.

## 8 Site records

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### 8.1 Security and availability of records

#### 8.1.1 Security of records

All records which are required to be made under the conditions of the permit and the environmental management system will be maintained and kept secure from loss, damage or deterioration as detailed below:

#### 8.1.2 Written records

The following records and documents will be available for inspection at the site office:

- Visitors book
- Site diary
- Environmental permit
- Daily inspection reports
- Site operations manual
- Site monitoring plan
- Maintenance records
- Copies of all the Environment Agency visit or inspection reports
- Company Safety Policy
- Company landfill inspection forms
- Emergency procedures
- Daily intake forms
- Company Red and Black Lists (Confidential documents, not available for inspection)
- Waste transfer and acceptance documentation

With the exception of the visitor book, all records will be kept in secure, lockable filing cabinets or cupboards when the office is unattended.

#### 8.1.3 Electronic records

The following records will be maintained in electronic format on The Company's environmental database in the site office and at The Company's head office:

- Landfill gas monitoring records.
- Groundwater monitoring records.
- Gas monitoring records.

The following software will be used:

- Microsoft Excel
- EQUIS Environmental database.

## 8.2 Availability of records

All records which are required to be made under the conditions of the environmental permit will be made available for immediate inspection when required by an authorised officer of the Environment Agency.

A noticeboard will be maintained in the office with up-to-date versions of the following prominently displayed:

- Plan of method and direction of working signed and dated by the Site Manager
- Certificate of employers liability insurance
- Emergency telephone numbers
- The Company's conditions of acceptance of waste. (Printed copies will be available for issue should these be required.)
- The Company's landfill site safety rules for customers/visitors. (Printed copies will be available for issue should they be required.)

Records of wastes that are accepted at the site, records of waste that are rejected and despatched from site and site diary records will be kept for a minimum of two years. Environmental monitoring records will be kept until a certificate of completion is issued for the land.

## 8.3 Records of waste movements

A record will be kept of each load of waste accepted and each load of waste removed from the site. This record will include the following details:

- The nature of the waste, i.e. Solid.
- Waste type, see Table 1.
- Quantity, i.e. Tonnes, number.
- Date received.
- Date accepted, if different from received.
- Origin of waste, in terms of place.

A summary record of the waste types accepted and removed from the site will be made for each quarter of the financial year and will be submitted to the Environment Agency within one month following the end of the quarter. The format of the summary record will be agreed with the Agency.



## 8.4 Site diary

A site diary will be maintained by the Site Manager and will be kept secure as detailed in Section 6.3.5. The site diary will be available for inspection when required by an authorised officer of the Agency.

The diary will include a record of the following:

- Weather conditions
- Unacceptable waste details.
- Complaints received.
- Operational functions (visits for gas monitoring, water monitoring, plant services, etc).
- Observations made during daily site inspections.
- Any unusual circumstances.
- Changes to procedures.

### 8.4.1 Daily inspection checklist

To assist in the completion of the diary, the site manager refers to the “daily inspection check list”. The daily inspection may comprise of the following checks:

- That radios are working properly.
- All site plant is operating and maintained according to schedules.
- That the day’s routine monitoring has been done.
- On any high site monitoring readings reported.
- That the spray system and water bowser are in use if dust suppression is necessary.
- If litter is a problem.
- Fuel store levels.
- Signs of leakage or spillage from fuel store.
- Bare patches in vegetation (possible hot spots).
- If any unacceptable waste has been delivered. If so, ensure segregation, removal and reporting in site diary.
- The standard of haul roads and whether any repairs are required.
- Potential pests, birds, weeds etc.
- Cleanliness of access road (between entrance and office).
- Cleanliness of site entrance – mud on road, etc.
- Cleanliness of site office and surrounds.
- Condition of grass and vegetation both inside and outside the site.

- Condition of signs and notice boards.
- Covering of areas awaiting restoration.
- Covering of current working area.
- Damage to fences and gates.
- Any fly tipping.
- Possible leachate weeps or escapes.
- Odours at various points of the site, note to wind direction
- Presence of bubbles in standing water.
- Signs of discoloration of surface water.
- Signs of standing water.
- Standard of operation.
- Vandalism of on-site equipment.
- Completion of the site diary.

## 8.5 Reporting environmental performance

The Company will prepare a review of environmental monitoring data every year during the operational life of the site and during the post closure phase, and will undertake a review of the Groundwater Risk Assessment every six years. The reports will be submitted to the Agency at the frequency required in the permit, or as otherwise agreed with the Environment Agency. A completion report will be prepared at the end of the site completion phase.

The report will include the following information:

- An analysis and review of the environmental monitoring results recorded for the site, with an interpretation of the results against background and trigger levels.
- A review of the risk management systems provided for the site.

## **Appendix A**

### **Company safety rules**

## A1 Introduction

These rules are general rules that apply to all sites and are implemented in order to safeguard the health and safety of anyone working or visiting the sites. The document is a statutory document and as such represents the LAW.

### BREACHES OF THESE RULES CONSTITUTE A CRIMINAL OFFENCE

Where these rules refer to the Landfill Manager, their Deputy is the next point of contact should the Landfill Manager be unavailable.

### GENERAL RULES

G1	All areas shall be kept clean, clear and tidy at all times.
G2	The consumption of alcohol/drugs on site is strictly forbidden. Anyone appearing to be under the influence of alcohol/drugs will be instructed to leave the site.
G3	All offices and communal rooms are designated as non-smoking areas.
G4	All defects are to be reported immediately to the Manager.
G5	All Manager's instructions and site signs must be adhered to at all times.
G6	All guards/interlocks should be in place and securely fixed with a nut and bolt system on all machinery unless the lock out procedure is adopted.
G7	All open edges and sides of ramps to be protected by bund banks 1.5M high or other adequate edge protection.
G8	Abnormal work requires extra consideration and should not be carried out without consultation with the Unit Manager. Systems available to control these include Risk Assessments, Permits to Work and Safe Systems of Work.
G9	All equipment should be inspected before use, these include chains and hand tools. If any defect is present they must not be used.
<b><u>TIPPING AREA</u></b>	
E1	All working faces should be left stable with no overhanging edges.
<b>HOPPER AND CONVEYOR LINES</b>	

H1	No work is to be carried out inside the hopper unless the correct procedure is followed – detailed in the ‘Confined Spaces Procedure’.
<b>PROCESSING PLANT</b>	
P1	A safety harness must be worn for any work carried out without a suitable working platform, e.g. a platform without handrail protection.
P2	Electrical maintenance works shall only be carried out by the Company electrician or an approved contractor. Exception:- if a Unit Manager considers an employee is competent, and can demonstrate this, then fuses and light bulbs may be changed by competent employees.
<b>MOBILE PLANT</b>	
	This section forms the ‘Quarry Vehicle Rules’ in accordance with the Quarry Regulations 1999, Regulation 14, and are adopted as part of the Landfill Safety Procedures.
VR1	No person shall be allowed to drive any item of mobile plant unless authorised to do so by the Landfill Manager/Deputy.
VR2	All mobile plant operators will undergo a period of supervised training and an authorisation to drive will only be granted following a successful assessment of the operator’s competence.
VR3	Seat belts must be worn at all times.
VR4	No work shall take place in or from a raised loading shovel bucket. It is also forbidden to ride in a loading shovel bucket.
VR5	All daily checks and inspections shall be carried out and the mobile plant checklist completed accordingly (CS1), which must be handed into the Site Manager weekly. Any defects must be reported to the Landfill Manager immediately.
VR6	No item of mobile plant, (except for the tractor), shall be operated without fully functional CCTV reversing aids. Never reverse unless it is safe to do so. If camera failure occurs and a Risk Assessment is undertaken that demonstrates that reversing can be carried out safely, then the machine may operate in the short term without CCTV.
<b>MOBILE PLANT CONTINUED</b>	

VR7	All vehicles will be parked in areas where their presence does not provide a hazard to other vehicles or pedestrians. Where possible, vehicles shall be reversed into parking spaces to allow them to be driven out forwards from their parked position.
VR8	Headlights must be used during periods of darkness and poor visibility.
VR9	Only towing bonds (or towing chains stored separately to lifting chains and marked Towing Only) shall be used for towing activities.
VR10	When approaching the working area of a Landfill vehicle, first attract the driver's attention and ensure that it is safe to proceed.
VR11	Mounting and dismounting will be undertaken only on stationary vehicles, using the steps provided. Maintain three points of contact when ascending and descending access ladders.
VR12	Loading shovel buckets must be lowered to the ground when parked.
VR13	All site roads shall be maintained in a clean, level condition. Potholes will be filled in regularly and debris will be cleaned up with the loading shovel bucket.
<b>WORKSHOPS</b>	
W1	All lifting equipment will be kept clean and placed tidily on the storage racks inside the workshop.
<b>THIRD PARTIES</b>	
TP1	The minimum level of personal protective equipment in working/designated areas within the Landfill is hard hat, suitable footwear and hi-visibility garment (vest, coat). There is one exception to this rule for mobile plant fitters only, who need not wear hard hats in the designated mobile plant maintenance area, next to the workshop.
TP2	All contractors will undergo a period of induction prior to starting and their work will be subject to a Risk Assessment, controlled via the Permit to Work system, in line with the Group Standard "Control of Contractors".
TP3	All visitors will sign in at the waste reception area and will be accompanied, if unfamiliar with the Landfill, by a member of staff at all times whilst on the Landfill.
<b>LANDFILL TRAFFIC</b>	
QT1	All signs shall be kept clean and visible at all times.

QT2	No parking on roads except for the designated parking bay and sheeting area.
REFERENCES	
<p>These rules are written in conjunction with reference to a number of documents and procedures. These are implemented to ensure that minimum standards are maintained and that a culture of continuous improvement can be developed. It is, therefore, vital that the following are read in conjunction with these rules:-</p>	
	Landfill Risk Assessment
	Vehicle Brake Test Procedure
	Lockguard Procedure
	Confined Spaces Procedure
	Employees Guide to Health and Safety
	Full Company Safety Policy including Arrangements
	Manager's Rules
	Safety Rules, Customers and Visitors
	Landfill Safety Rules
	Guide to Emergency Procedures
	Health and Safety Document
	Jump Starting Procedure
	Authorised Persons Schedule

## **Appendix B**

### **Waste acceptance procedures**



# B1 Waste Information Form

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# W I F (Waste Information Form)



**\*PLEASE FILL IN THE HIGHLIGHTED BOXES\***

For CEMEX use only

**TO BE COMPLETED BY WASTE PRODUCER AND/OR WASTE CARRIER**

General Information

Waste Producer:	Contact Name:
Please tick box if person completing the form <input type="checkbox"/>	Telephone No.
Waste Carrier:	Contact Name:
Please tick box if person completing the form <input type="checkbox"/>	Telephone No.
Anticipated Volume of Waste: _____ m <sup>3</sup>	Anticipated Date (s) of Disposal
Indicate whether estimate is for -	loose/solid/stockpile

Information Required for Waste Characterisation

Full Address of Source of Waste: (including Postcode)	
Process from which waste arises	
Standard Industrial Classification (SIC) Code	Type of Waste <input type="checkbox"/> Inert <input type="checkbox"/> Non Hazardous <input type="checkbox"/> Hazardous
Description and/or composition of Waste (as detailed as possible):	
LoW Code: (Circle one)	10 11 03   15 01 07   17 01 01   17 01 02   17 01 03   17 01 07   17 02 02   17 05 04   19 12 05   20 01 02   20 02 02   Other
Details of Existing and/or Previous Use of Site (if known): (Identify any known previous potentially polluting uses. Contact Waste Producer for information)	
Is waste being generated as a result of site decontamination works? <span style="float: right;">YES / NO</span>	
Does waste contain any biodegradable material? (e.g. Wood, paper, grass, etc.) <span style="float: right;">YES / NO</span>	
Has a Site Visit/Inspection been carried out by CEMEX? <span style="float: right;">YES / NO</span>	
Has a Site Investigation been carried out? (If yes, attach ALL information e.g. Borehole & trial pit logs) <span style="float: right;">YES / NO</span>	
Are Chemical Analyses available? (If yes, attach ALL available analyses) <span style="float: right;">YES / NO</span>	
Is a Site Plan available? (If yes, attach site plan) <span style="float: right;">YES / NO</span>	
Proposed Disposal Site:	

Declaration

<p><i>I/we confirm that the information given above and the chemical analyses provided with this form are:</i></p> <p>a) representative of the material to be disposed of</p> <p>b) the analyses were carried out by a UKAS accredited laboratory using accredited analytical method and</p> <p>c) are compliant with Article 5 (3) –</p> <p style="margin-left: 20px;">i. Substances banned from being disposed of by landfill which are liquid, hospital or clinical waste, whole or shredded tyres, explosive, corrosive, oxidising, flammable or highly flammable.</p> <p style="margin-left: 20px;">ii. Waste is single sourced, not contaminated and not come from a stockpile where dilution may have occurred.</p> <p>Signed.....for .....</p> <p><b>N.B.</b> Any liability incurred by CEMEX that arises from the provision of false or misleading information on this form will be directed at the Producer of the waste, as it is his/her responsibility to properly characterise the waste.</p>	<p><b><i>This section to be signed by Waste Producer or Carrier</i></b></p>
---	---

Treatment

Can the waste be recycled or recovered (reused)? <span style="float: right;">YES / NO</span>	
Will the waste being delivered to the landfill have been treated (e.g. crushed or screened)? <span style="float: right;">YES / NO</span>	
If YES state process	Which waste(s) was reused/recycled?
What percentage of the total waste was reused/recycled? _____ %	Name
If NOT treated give reason:	Signature

**TO BE COMPLETED BY CEMEX**

CEMEX Audit Trail

Date WIF sent to Assessor: ..... Sent by: .....	
<b>TO BE COMPLETED BY WASTE ASSESSOR</b> (e.g. CEMEX or advisor)	
Do any determinands exceed Waste Management Licence / PPC Permit criteria?	YES/NO
Comments:	
The waste is suitable for disposal at .....	
The waste is not suitable for disposal at .....	
Signature of Waste Assessor: .....	Date Returned: .....

NOTE: Please complete all parts of upper section of form – refer to Waste Producer for any missing information

a  
b  
c  
d  
e  
f  
g  
h  
i  
j  
k  
Completion notes overleaf

l

### Notes for completion of the Waste Information Form

General Information

- a) **Waste Producer and Waste Carrier** – ensure these boxes are filled in and contact names & numbers are provided so that we may contact you if necessary. Please tick the appropriate box for the person completing the form.
- b) **Volume of Waste** – this information must be included in order to assess whether sufficient analytical information is provided for the volume of waste concerned. Please indicate whether your estimate refers to waste on the lorry (loose) or waste in the ground (solid), by deleting the word that does not apply.
- c) **Address of Source of Waste** – this information must be provided in as much detail as possible e.g. site name, road name, town name and postcode.
- d) **Process from which waste arises** – e.g. ‘construction’ or ‘demolition’ or ‘reject product’ etc.
- e) **Standard Industrial Classification Code** – This is a code used by Government to classify business establishments. The code to be used applies to the process producing the waste. In most cases, wastes on the ‘approved list’ will arise during site preparation (site clearance, demolition etc) and so will have the site preparation code 43.12. In cases where this code does not apply the waste producer should refer to the National Statistics publication ‘UK Standard Industrial Classification of Economic Activities 2007’. This document is available on the internet at the following web address [http://www.statistics.gov.uk/methods\\_quality/sic/downloads/SIC2007explanatorynotes.pdf](http://www.statistics.gov.uk/methods_quality/sic/downloads/SIC2007explanatorynotes.pdf)
- f) **Description of Waste** – this section must be completed as fully as possible. A broad description such as ‘muck’ or ‘earth’ is **not** acceptable. If the waste is likely to contain soils, bricks, concrete, weathered tarmac etc. this information must be provided on the form. The description should also include anything unusual such as a distinctive smell. If the person completing the form cannot provide an adequate description then the Waste Producer should be consulted for this information. It may also be helpful to refer to any Site Investigation Report and/or borehole or trench hole logs (if they are available), which should provide a good description of the likely types of waste present.

In addition to a description of the waste, the law requires that the List of Waste (LoW) Code (formerly the European Waste Catalogue (EWC) Code) be provided. Please circle the code overleaf that corresponds to your waste in the table below.

LoW Code	Waste Description	Exclusions
10 11 03	Waste glass based fibrous materials	Only without organic binders
15 01 07	Glass packaging	
17 01 01	Concrete	Selected C & D waste only*
17 01 02	Bricks	Selected C & D waste only*
17 01 03	Tiles and ceramics	Selected C & D waste only*
17 01 07	Mixtures of concrete, bricks, tiles and ceramics	Selected C & D waste only*
17 02 02	Glass	
17 05 04	Soil and stones including naturally occurring sand and clay	<b>Excluding</b> topsoil and peat
19 12 05	Glass	
20 01 02	Glass	<i>Separately collected glass only</i>
20 02 02	Soil and stones from garden and parks only	<b>Excluding</b> topsoil and peat

If your waste does not appear on the approved list above, please refer to the complete EWC Catalogue, which can be found at the following internet address:-

[http://www.environment-agency.gov.uk/commondata/acrobat/low\\_guide\\_v1.2\\_1397222.pdf](http://www.environment-agency.gov.uk/commondata/acrobat/low_guide_v1.2_1397222.pdf)

- g) **Details of Existing and/or Previous Site Use** – This is one of the most important sections of the form. The Waste Producer and/or Waste Carrier must consult the site investigation reports (if available) for historical information and summarise it on the form (or attach the information to the WIF). If there has been no site investigation then historical information might be gleaned from the local library or discussion with local residents.
- h) **Is the waste being generated as a result of Site Decontamination Works?** – If the person completing this form is not the Waste Producer then contact him for assistance with historical information.
- i) **Site Visit/Inspection by CEMEX** – If a member of our sales team has visited the site to assess whether it would be suitable for disposal at a CEMEX site please indicate accordingly.
- j) **Other Information** – if the completed form indicates that site investigations, borehole reports or chemical analyses are available but have not been provided with the form the waste will be rejected until such information is provided.
- k) **Proposed Disposal Site** – if CEMEX have more than one site in the area where the waste is located, please indicate your preferred disposal site.
- l) **Will the waste have been treated?** – From 30<sup>th</sup> October 2007 the Landfill Regulations require all waste to be treated prior to disposal. This might involve crushing or screening of the waste for example. If it is not technically feasible to treat the waste – perhaps because of its clay content, then the law makes provision for this, but the WIF must contain a statement why treatment is not possible and the waste producer must sign it to confirm that this is the case. If the waste is treatable but the producer is unable to do so because of lack of facilities then CEMEX may be able to treat the waste at additional cost. This should be discussed with the sales team, as not all sites will have treatment facilities.

Basic Characterisation Information – required by Landfill (England & Wales) (Amendment) Regulations 2004

Treatment

## B2 Waste Rejection Form

FAXED TO:  
DATE OF FAX:

FORM NO.

### REJECTED WASTE FORM

This form is to be completed for **each load** of waste **rejected** at the **site weighbridge office** or at the **tipping face** or for a load in a **Quarantine Bay** for which an **Unacceptable Waste Analysis Form** is received.

<b>Name of Site</b>	SOUTHAM QUARRY
<b>Date and time waste delivered</b>	
<b>Name of company delivering load</b>	
<b>Vehicle Registration No.</b>	
<b>WASTE Ticket No.</b> (where applicable, i.e. for loads rejected at tipping face)	
<b>Address waste collected from (see waste ticket from driver)</b>	
<b>Description of waste on ticket</b>	
<b>REASON LOAD REJECTED</b>	
<b>ACTION TAKEN BY COMPANY</b> <i>(to be completed by company)</i>	<p><b>Driver and/or waste carrier*</b> provided with a copy of this form, and advised to deliver the waste to a suitably licensed site.</p> <ul style="list-style-type: none"> <li>• delete where applicable</li> </ul> <p><b>Other Action taken on site</b></p>
<b>WASTE TRANSFER NOTE NO.</b> <u>if</u> waste being removed from quarantine bay	

**COPY TO LANDFILL MANAGER**

**COPY TO BE KEPT IN SITE OFFICE FOR VIEWING BY ENVIRONMENT AGENCY**

## **B3 Sampling Form**

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Sampling Form for Quarantined Loads

Sample Ref No.

Chain of Custody No.  
Date Sent to Lab

PRLSS ___/___/___/___
___/___/___

This section is to be completed by the Quarry Manager or his Deputy

This form is to be completed for each sample of waste taken from a load deposited in the quarantine area of the site. The sampler will make a copy of the form. The copy form is to be retained in the quarry office. The original of the form is to be sent with the sample to the laboratory, together with an STL Chain of Custody Form. Sample Ref No. is PRLSS followed by the date the load was delivered and the Bay No. e.g. PRLSS11/02/05/4

<b>Site Name</b>	<b>PARKFIELD ROAD INERT LANDFILL</b>		
Bay No.			
Date and time load delivered			: am/pm
Person taking sample and date of sampling	___/___/___		
Name of company delivering load			
Vehicle Registration No.			
Ticket Nos.( Site and Waste Transfer Note)	Site Ticket:	WTN:	
Address waste collected from (see waste ticket from driver) & Waste Information Form No. (WIF No.)			WIF No.
Description of waste on ticket			
Sample Description (e.g. soils, rubble, etc.) to be completed by site manager, sampler			

**Note to the Analytical Laboratory**

The attached sample is to be analysed for the following determinands:-

Information for UKAS Laboratory

Raw Sample	Soil and Stones
	Toluene Extract (Tolex)
Leachate from prEN 12457-3	As
	Cd
	Cr
	Cu
	Pb
	Ni
	Zn
	DOC
	TDS

**If Tolex above 1500 mg/kg then carry out**

Raw Sample	PAH
	Mineral Oil (C6 to C40) i.e. TPH by GC (6 Split)

NOTE TO LABORATORY: Results sheet to be presented in EQUIS format

This Section for Geological

Approved, Mark Adjacent Box and Fax/e-mail to Quarry Manager

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## Appendix C

Dust assessment from 2018  
environment statement

## **C1 Air quality chapter**

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## **10.0 AIR QUALITY**

### **10.1 Introduction**

This chapter has been prepared by Air Quality Assessments Ltd and assesses the likely effect that the operation of the proposed development will have on local air quality, including dust.

### **10.2 Scope**

This chapter describes the existing air quality conditions in proximity to the site and assesses the likely effect that dust generated during the restoration works will have on local air quality and the amenity of receptors close to the application site. The main pollutants of concern are dust and fine particulate matter (PM<sub>10</sub>). Dust emissions from mineral sites are more likely to be associated with coarse particulate matter; therefore, effects on the very fine fraction of particulate matter (PM<sub>2.5</sub>) are not considered further.

The infill materials will be brought to the site by rail; therefore, the impacts of road traffic emissions have been screened out of the assessment. Defra Technical Guidance explains that diesel locomotives can give rise to high short-term sulphur dioxide (SO<sub>2</sub>) concentrations where locomotives are regularly (at least 3 times a day) stationary for periods of 15 minutes, which may require assessment where there is relevant exposure within 15m of the locomotives. There will be no receptors within 15m of the stationary locomotives; therefore, further assessment of the air quality impacts due to emissions from the diesel engines is not required.

The assessment has been prepared taking into account all relevant local and national guidance and regulations.

The references used in this assessment are shown in **Appendix 10.1**.

## **10.3 Legislation, Guidance and Industry Good Practice**

### **10.3.1 EU Limit Values**

The European Union's Directive on ambient air quality and cleaner air for Europe (European Parliament, Council of the European Union, 2008) set legally binding limit values for nitrogen dioxide, PM<sub>10</sub> and PM<sub>2.5</sub>. The Air Quality Standards Regulations 2010 (The Stationary Office, 2010) implement the EU Directive limit values in English legislation. Achievement of the limit values is a national obligation rather than a local one.

The limit values are the same as the objective values (see Table 10-1); however, the compliance dates differ, and the limit values apply at all locations (apart from where the public does not have access, where health and safety at work provisions apply and on the road carriageway). The PM<sub>10</sub> limit value applied from 2005.

### **10.3.2 The Air Quality Strategy**

Part IV of The Environment Act 1995 required the UK Government to prepare an Air Quality Strategy. The Air Quality Strategy (Defra, 2007), provides an overview and outline of ambient air quality policy in the UK and the devolved administrations. The strategy sets out air quality standards and objectives intended to protect human health and the environment. Standards are the concentrations of pollutants in the atmosphere, below which there is a minimum risk of health effects or ecosystem damage; they are set with regard to scientific and medical evidence. Objectives are the policy targets set by the Government, taking account of economic efficiency, practicability, technical feasibility and timescale, where the standards are expected to be achieved by a certain date.

The Air Quality Strategy also describes the system of Local Air Quality Management (LAQM), introduced in Part IV of the Environment Act 1995,

## AIR QUALITY 10

which requires every local authority to carry out regular review and assessments of air quality in its area. Where an objective has not been, or is unlikely to be achieved, the local authority must declare an Air Quality Management Area (AQMA), and prepare an action plan which sets out appropriate measures to be introduced in pursuit of the objectives.

The objectives for PM<sub>10</sub>, as prescribed by the Air Quality (England) Regulations 2000 and the Air Quality (England) (Amendment) Regulations 2002 (The Stationary Office, 2000; The Stationary Office, 2002), are shown in Table 10-1. The objectives for PM<sub>10</sub> were to have been achieved by 2004 and continue to apply in all future years thereafter.

**Table 10-1 The Objectives for PM<sub>10</sub>**

Pollutant	Concentration Measured As	Objective
PM <sub>10</sub>	24-hour Mean	50 µg/m <sup>3</sup> not to be exceeded more than 35 times a year
	Annual Mean	40 µg/m <sup>3</sup>

The objectives apply at locations where members of the public are likely to be regularly present and are likely to be exposed for a period of time appropriate to the averaging period of the objective. Examples of where the objectives should apply are provided in the Local Air Quality Management Technical Guidance (Defra, 2016) issued by the Department for Environment, Food and Rural Affairs (Defra). The annual mean PM<sub>10</sub> objective should apply at the building façades of residential properties, schools, hospitals, care homes etc.; it should not apply at the building façades of places of work, hotels, gardens or kerbside sites. The 24-hour mean PM<sub>10</sub> objective should apply at all locations where the annual mean objective applies, as well as the gardens of residential properties and hotels.

### 10.3.3 National Planning Policy

The National Planning Policy Framework (NPPF) (DCLG, 2012) sets out planning policy for England and acts as guidance for local planning authorities in drawing up plans and as a material consideration in determining applications. It places a general presumption in favour of sustainable development, stressing that the planning system should perform an environmental role to minimise pollution.

The NPPF states that:

*“The planning system should contribute to conserving and enhancing the environment and reducing pollution by: preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability.”*

The NPPF goes on to say that:

*“To prevent unacceptable risks from pollution and land instability, planning policies and decisions should ensure that new development is appropriate for its location. The effects (including cumulative effects) of pollution on health, the natural environment or general amenity, and the potential sensitivity of the area or proposed development to adverse effects from pollution, should be taken into account.”*

With specific reference to air quality, the NPPF states that:

*“Planning policies should sustain compliance with and contribute towards EU limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and the cumulative impacts on air quality from individual sites in local areas. Planning decisions should ensure that any new development in Air Quality Management Areas is consistent with the local air quality action plan.”*

The NPPF is supported by Planning Practice Guidance (PPG) (DCLG, 2014). The PPG states that:

*“Defra carries out an annual national assessment of air quality using modelling and monitoring to determine compliance with EU Limit Values. It is important that the potential impact of new development on air quality is taken into account in planning where the national assessment indicates that relevant limits have been exceeded or are near the limit”.*

The PPG goes on to state that:

*“Whether or not air quality is relevant to a planning decision will depend on the proposed development and its location. Concerns could arise if the development is likely to generate air quality impact in an area where air quality is known to be poor. They could also arise where the development is likely to adversely impact upon the implementation of air quality strategies and action plans and/or, in particular, lead to a breach of EU legislation (including that applicable to wildlife).”*

The PPG makes clear that:

*“... dust can also be a planning concern, for example, because of the effect on local amenity.”*

The PPG also sets out the information that may be required in an air quality assessment, stating that:

*“Assessments should be proportional to the nature and scale of development proposed and the level of concern about air quality.”*

It also provides guidance on options for mitigating air quality impacts, and makes clear that:

*“Mitigation options where necessary, will depend on the proposed development and should be proportionate to the likely impact.”*

## 10.3.4 Local Planning Policy

Policy DM2 – Managing Health, Economic and Amenity Impacts of Waste Development of the Warwickshire Waste Core Strategy (Warwickshire County Council, 2013) states that:

*“Planning permission will not be granted for waste management proposals which have unacceptable adverse impacts on the local environment, economy or communities through any of the following: ...dust ...either individually or cumulatively with other existing or proposed developments.*

*Proposals will only be permitted where the adverse impacts will be:*

- i) avoided; or*
- ii) satisfactorily mitigated where an adverse impact cannot be avoided or the adverse impacts have been avoided as far as possible.”*

The Rugby Core Strategy includes Policy CS16: Sustainable Design, which states that (Rugby Borough Council, 2011):

*“All development will demonstrate high quality, inclusive and sustainable design and will only be allowed where proposals are of a scale, density and design that would not cause any material harm to the qualities, character and amenity of the areas in which they are situated.*

*Development will ensure that the amenities of existing and future neighbouring occupiers are safeguarded.”*

## 10.3.5 Dust Deposition

The Institute of Air Quality Management (IAQM) has published Guidance on the Assessment of Mineral Dust Impacts for Planning (IAQM, 2016). The guidance has been prepared to assist practitioners in undertaking dust assessments for the operational phases of minerals developments; however, there are many common features with inert waste landfill and it is considered appropriate to follow the source-pathway-receptor approach

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underlying the IAQM dust assessment method for assessing the impacts of the restoration work.

### 10.4 Assessment Approach

#### 10.4.1 Existing Conditions

Information on existing air quality within the study area has been collated from the following sources:

- The results of monitoring and the LAQM review and assessment reports undertaken by Rugby Borough Council; and
- Background pollutant concentration maps published by Defra (Defra, 2018b).

#### 10.4.2 Dust Impacts

The IAQM Guidance on the Assessment of Mineral Dust Impacts for Planning includes a source-pathway-receptor assessment methodology, which has been used for this assessment.

Locations sensitive to dust emitted during site operations will be places where members of the public are regularly present. Residential properties and commercial operations close to the application site will be most sensitive to operational dust. Any areas of sensitive vegetation or ecology that are very close to dust sources may also be susceptible to some negative effects.

The IAQM minerals guidance describes a qualitative source-pathway-receptor approach to determine the risk of dust effects. The assessment method uses a number of steps to determine the site characteristics and baseline conditions, an estimate of the dust impact risk and an estimate of the likely magnitude of effects. Potential dust sources and activities have been identified and the risk of impacts at sensitive receptors determined based on the prevailing meteorological conditions and topography, the likely magnitude of emissions (with mitigation in place) and the distances over which effects may occur. Appendix 10 sets out the dust assessment methodology in more detail.

### 10.4.3 Dust Assessment Criteria

#### *Deposited Dust*

The IAQM minerals dust guidance includes a matrix of the dust impact risk and receptor sensitivity that provides descriptors for dust effects (as shown in Table 10-2). The significance of the effect is determined to be either significant or not significant.

**Table 10-2 Descriptors for Magnitude of Dust Effects**

Dust Impact Risk	Receptor Sensitivity		
	Low	Medium	High
High	Slight Adverse	Moderate Adverse	Substantial Adverse
Medium	Negligible	Slight Adverse	Moderate Adverse
Low	Negligible	Negligible	Slight Adverse
Negligible	Negligible	Negligible	Negligible

#### *Suspended Dust*

The IAQM minerals guidance takes the approach that, if background ambient PM<sub>10</sub> concentrations are below 17µg/m<sup>3</sup>, there is little risk that a process contribution from a dust source would lead to an exceedence of the objectives. For this assessment, should the background PM<sub>10</sub> concentration at the application site be less than 17µg/m<sup>3</sup>, the impact from the proposed development on health will be deemed as not significant.

**Significance of Dust Effects**

The judgement of significance should be made by a competent, suitably qualified professional, and the professional experience of the consultant preparing this chapter is set out in **Appendix 10.4**.

**10.5 Baseline Conditions**

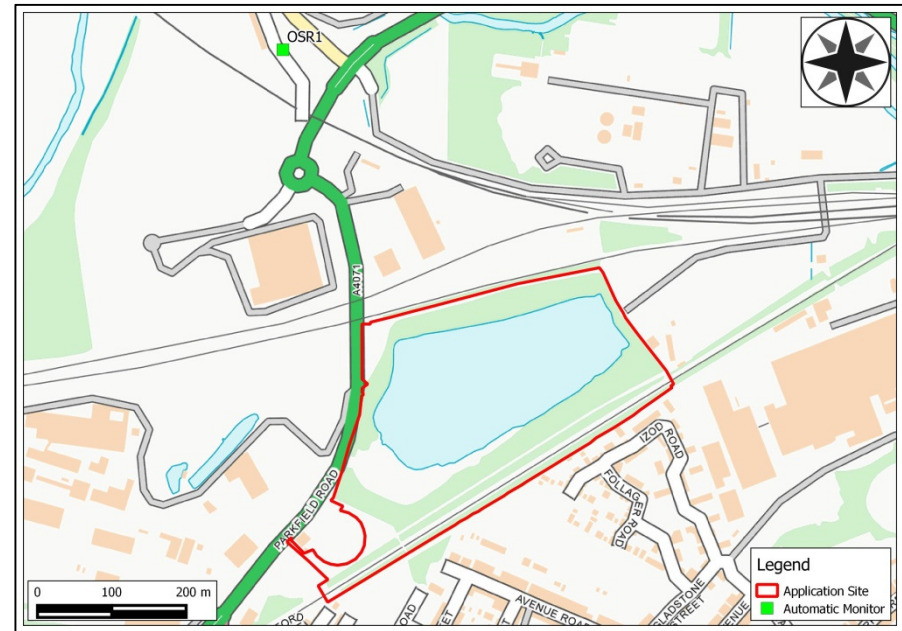
**10.5.1 LAQM Review and Assessment**

Rugby Borough Council has declared the whole urban area an AQMA for exceedences of the annual mean nitrogen dioxide objective. In terms of PM<sub>10</sub>, Rugby Borough Council has concluded that there are no exceedences of the objectives; therefore, it is highly unlikely concentrations in the vicinity of the application site exceed the objectives (Rugby Borough Council, 2017).

**10.5.2 Local Air Quality Monitoring**

Rugby Borough Council has operated one Turnkey Osiris dust monitor located at Parkfield Road, approximately 400m north of the application site since 2015 (see Figure 10-1). The Osiris automatic monitor is not certified as reference equivalent and cannot strictly be used to show compliance with the air quality objectives; however, it does provide indicative PM<sub>10</sub> concentration data. Rugby Borough Council have classified the monitoring site as a roadside site, but given its distance from any significant road traffic sources, it would more accurately be described as a background site. Results from the years 2015 and 2016 are shown in

Table 10-3. Measured concentrations are well below the objectives for PM<sub>10</sub>.



**Figure 10-1 Location of Automatic Monitoring Site**

**Table 10-3 Summary of PM<sub>10</sub> Monitoring Data**

Site ID	Location	Site Type	2015	2016
<b>Annual Mean (µg/m<sup>3</sup>)</b>				
OSR1	Parkfield Road	Background	12.8	12.5
<b>Objective</b>			40	

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Number of Days > 50 µg/m <sup>3</sup>				
OSR1	Parkfield Road	Background	3	1
Objective			35	

### 10.5.3 Defra Background Maps

The estimated background PM<sub>10</sub> concentration at the application site is shown in Table 10-4. The background concentration has been derived from data in the national maps published by Defra and is well below the objective. The Defra estimated background PM<sub>10</sub> concentration is higher than that measured at the OSR1 automatic monitoring site.

**Table 10-4 Estimated Annual Mean Background Concentrations in 2018 (µg/m<sup>3</sup>)**

Year	OS Grid	PM <sub>10</sub>
2018	449500,275500	13.8
Objective		40

## 10.6 Assessment of Effects and Significance

### 10.6.1 Screening

Inert waste materials will be used to fill the void at the application site, potentially leading to dust emissions. There are human receptors within 10m of the application site boundary. The receptors will be at a greater distance from any operational areas; however, they will be within 250m of potentially dust generating activities and a detailed dust assessment is required. There are no sensitive ecological receptors within 250m of the application site, and the

impacts on ecology are not be considered further in this chapter, but potential effects on wider ecological interests are discussed in Chapter 7.0 of the ES.

### 10.6.2 Dust Generating Activities

The following activities are likely to have the greatest potential for dust emissions:

- Site preparation/restoration;
- Material handling;
- On-site transportation; and
- Exposed surfaces.

All infill materials will be brought to the application site by rail; therefore, there will be no trackout of dust onto the local highway and the dust effects of off-site transportation will not be considered further.

### 10.6.3 Residual Source Emissions

The residual source emissions, i.e. the emissions with designed in mitigation in place, have been estimated for each of the main operational activities.

#### *Site Preparation/Restoration*

An acoustic wall approximately 40m in length will be constructed along the southern side of the offloading area (see Phase 1 plan ref 1711-J308). The 8m high wall will screen receptors to the south of the offloading area from any dust emissions that arise during offloading.

A 5m high bund will be constructed along the entire southern boundary to the east of the acoustic wall (see Phase 1 plan ref 1711-J308). The bund will be grass seeded immediately on completion. Existing planting also screens the application site along all the site boundaries.

A 5m high acoustic wall will be constructed along the eastern barrier between the infill operations and Tank Cottages and also along the western end of the southern site boundary (see Phase 1 plan ref 1711-J308). The wall will screen Tank Cottages and receptors to the south of the application site from any dust emissions that arise during the infill and offloading operations.

The site preparation will involve the construction of the concrete working pad, the 5m high earth bund and the acoustic barriers. The preparation work will occur over a relatively short time period and the exposed surface of the bund will be grass seeded as soon as possible.

The ongoing restoration scheme will involve a working area of around 8.5ha with a volume of around 2m m<sup>3</sup> of potentially dusty inert material used as infill; however, as the infill material will comprise excavated material from the HS2 tunnelling project, it will have a high level of inherent moisture, which will help prevent any emissions of dust. There will be five heavy plant simultaneously active on the site, 2 excavators, 2 dump trucks and a bulldozer. With regard to Table A10.7 in **Appendix 10.3** the residual source emission magnitude during site preparation/restoration is considered to be medium.

### ***Material Handling***

Inert materials will be imported by rail and used to infill the void space of around 2 million m<sup>3</sup> over a period of approximately 4.5 years. It is anticipated that 2-3 incoming train loads per day, with each train consisting of approximately 20 wagons, will bring the inert waste into an offloading area at the southwestern edge of the quarry.

The inert materials will be unloaded from the wagons using two excavators, which will load the materials directly into two dump trucks for transport to the working face of the landfill. The unloading area will be concrete surfaced and water suppression will be used to minimise re-suspension of dust from the surface as the plant move around. The dump trucks will then carry the infill

materials down a ramp to the working face of the landfill, where a bulldozer will place and compact the infill where required.

The infill materials will be potentially dusty; however, most of the infill works will occur at a distance over 50m from the application site boundary and within the void space. With regard to Table A10.7 in **Appendix 10.3** the residual source emission magnitude during material handling is considered to be medium.

### ***On-site Transportation***

The ramp into the quarry void will not have a hard surface; however, it is within the void, minimising dust emissions. There will be continual movement of dump trucks transporting material from the train wagons into the void followed by periods of inactivity between deliveries. The vehicle speed on-site will be limited to 10 mph. With regard to Table A10.7 in **Appendix 10.3** the residual source emission magnitude during on-site transportation is considered to be medium.

### ***Exposed Surfaces***

The exposed surface of the void is likely to be more than 2.5ha, but less than 10ha, with daily transfer of materials into the void. The infill material will be potentially dusty with approximately 900,000 tonnes per year brought in; however, there will be no stockpiles at the site, and the exposed areas will be below the level of the surrounding area. With regard to Table A10.7 in **Appendix 10.3** the residual source emission magnitude for exposed surfaces is considered to be medium.

### ***Summary of Designed in Mitigation Measures***

The following is a summary of the mitigation measures that will be utilised during the operation of the proposed development:

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- Acoustic screens and bunds will be constructed along the site boundary between the onsite operations and nearby sensitive receptors;
- Existing vegetation will largely be retained, where practicable, notably along the southern boundary of the rail siding;
- Drop heights during offloading of the wagons and placing of the infill materials will be minimised;
- Water suppression will be used as necessary;
- Duration and timing of dust generating activities will be restricted during dry/windy conditions;
- On-site vehicle speeds will be kept below 10mph;

### Summary of Residual Source Emissions

A summary of the residual source emissions is shown in Table 10-5.

**Table 10-5 Summary of Residual Source Emissions for Each Phase**

Activity	Residual Source Emissions
Site Preparation and Restoration	Medium
Materials Handling	Medium
On-site Transportation	Medium
Exposed Surfaces	Medium

### 10.6.4 Pathway Effectiveness

The transport of fugitive dust in the air is dependent on the prevailing meteorological conditions. Receptors downwind of the dust emissions source, with regard to the prevailing wind, will be exposed to dust more frequently than those located upwind. The five year average wind rose from Church Lawford meteorological station (Figure 10-2) shows that the prevailing wind direction is from the southwest. The Church Lawford meteorological station is located approximately 4 km to the west of the application site and wind conditions are likely to be very similar to those at the application site.

There is a risk that dust will be entrained from the ground even when no dust generating activities are taking place. Wind speeds greater than 5 m/s are considered strong enough to initiate the suspension of dust from the ground, and the risk is increased on dry days, i.e. when less than 0.2 mm of rainfall are recorded over a 24 hour period. The prevailing wind data show that, for approximately 84% of the time, wind speeds are likely to be below 5 m/s, when dust is unlikely to become suspended in the air.

Analysis of average rainfall data for the area shows that, over the 30 year period from 1981 to 2010, an average of 160-170 days will be wet days, i.e. rainfall will be greater than 0.2 mm (Met Office, 2015). Therefore, for approximately 45% of the time, daily rainfall will be greater than 0.2 mm, when there will be natural dust suppression.

It is commonly accepted that the greatest impacts on dust deposition and PM<sub>10</sub> concentrations will occur within 100m of an emissions source. There are dust sensitive receptors within 100m of dust generating activities to the west and north of the northwest corner of the site, and to the east and south east of the application site. In order to simplify the assessment, receptor areas have been identified, as described in Table 10-6 and shown in **Error! Reference source not found.** The sensitivity of the receptors areas has been determined based on the land use and the information in Tables A10.3 and A10.4 in Appendix



10.3. There are no ecological sensitive receptors within 250m of the application site boundary.

The wind frequency category for each receptor area, estimated from the meteorological data and with regard to Table A10.8 in **Appendix 10.3**, is shown in Table 10-7.

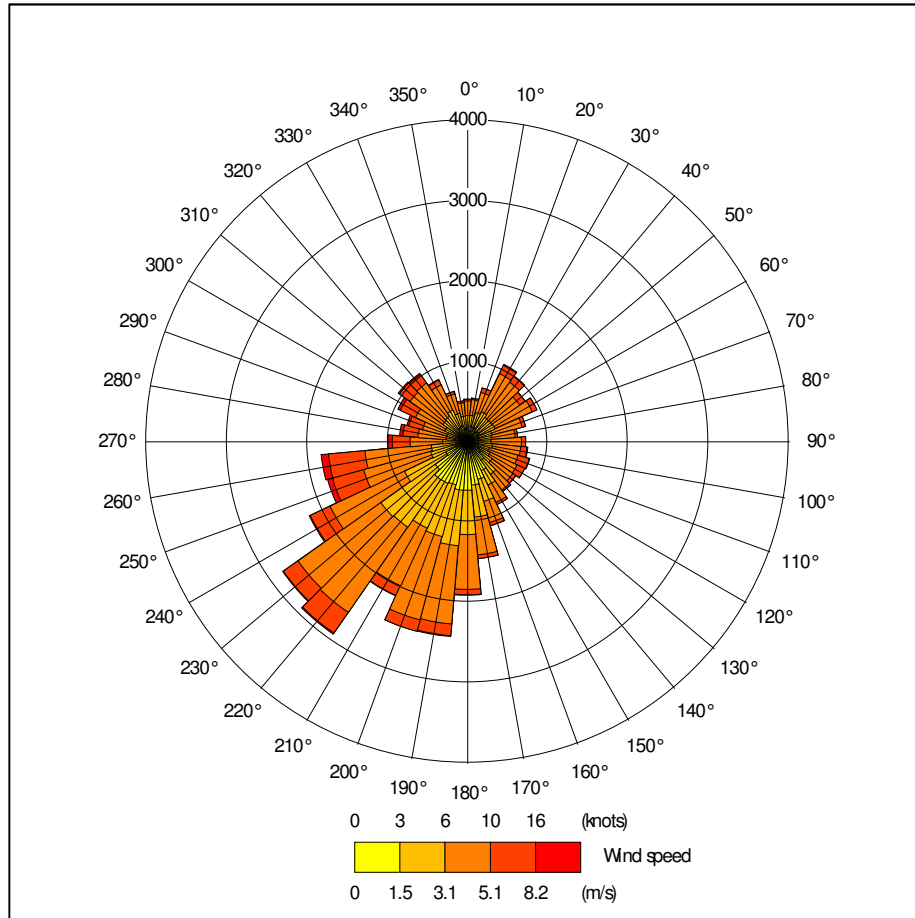


Figure 10-2 5 Year Average Wind Rose Church Lawford (2011-2015)

Table 10-6 Receptor Areas

Receptor Area	Description	Land Use	Sensitivity Dust Soiling	Sensitivity PM <sub>10</sub>
R1	Lawford Bridge Close	Residential	High	High
R2	Bridle Road	Residential	High	High
R3	Bridle Road	Residential	High	High
R4	Avenue Road	Residential	High	High
R5	Allotments	Local Amenity	Medium	Medium
R6	Izod Road	Residential	High	High
R7	Willan Works	Industrial	Low	Medium
R8	Tank Cottages	Residential	High	High
R9	Parkfield Industrial Estate	Industrial	Low	Medium
R10	Recycling	Industrial	Low	Medium

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	Facility			
R11	Cement Works	Industrial	Low	Medium

Table 10-7 Wind Frequency Category for Each Receptor Area

Receptor Area	Wind Sectors Affecting Receptor Area	Frequency of Wind >5m/s Towards Receptor Area	Frequency of Wind >5m/s Towards Receptor Area on Dry Days	Wind Frequency Category
R1	0-60°	13	2	Infrequent
R2	0-60°	13	2	Infrequent
R3	300-50°	22	4	Infrequent
R4	270-60°	31	6	Moderately Frequent
R5	260-60°	35	7	Moderately Frequent
R6	240-60°	44	10	Moderately Frequent
R7	240-330°	28	8	Moderately Frequent
R8	200-320°	50	10	Moderately Frequent
R9	90-230°	52	6	Moderately Frequent

R10	90-170°	19	2	Infrequent
R11	90-170°	19	2	Infrequent

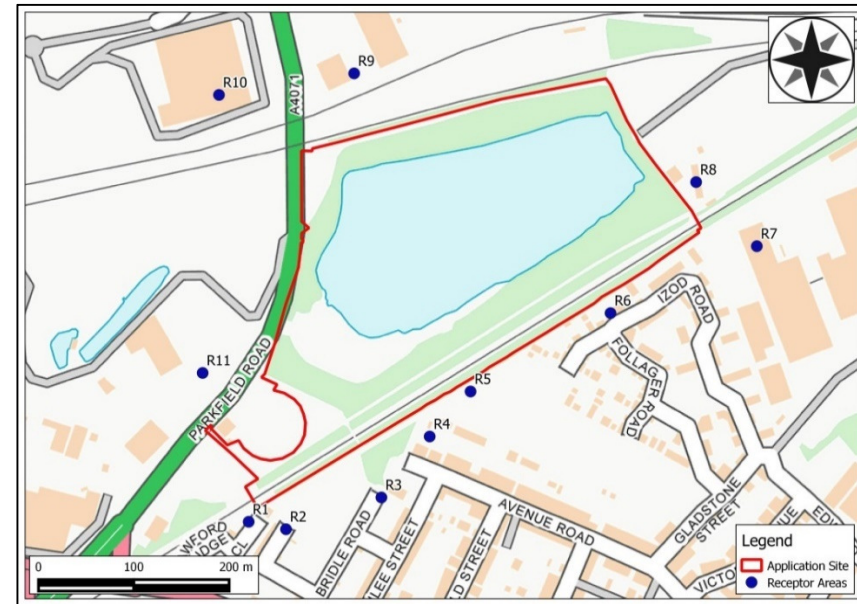
The potential impact of dust emissions at receptors is dependent on the distance from the source to the receptor and the presence of any physical features that may affect dispersion. Particles responsible for most dust annoyance will usually deposit within 100m of the source and within this distance receptors would be categorised as close. The receptor distance category for all of the receptor areas is described as close, with regard to Table A10.9 in **Appendix 10.3**.

Combining the wind frequency category with the receptor distance category using Table A10.10 in **Appendix 10.3** determines the pathway effectiveness for each receptor, as shown in Table 10-8.

Table 10-8 Pathway Effectiveness for Each Receptor Area

Receptor Area	Frequency of Potentially Dusty Wind	Receptor Distance Category	Pathway Effectiveness
R1	Infrequent	Close	Ineffective
R2	Infrequent	Close	Ineffective
R3	Infrequent	Close	Ineffective
R4	Moderately Frequent	Close	Moderately Effective
R5	Moderately Frequent	Close	Moderately Effective

R6	Moderately Frequent	Close	Moderately Effective
R7	Moderately Frequent	Close	Moderately Effective
R8	Moderately Frequent	Close	Moderately Effective
R9	Moderately Frequent	Close	Moderately Effective
R10	Infrequent	Close	Ineffective
R11	Infrequent	Close	Ineffective



**Figure 10-3 Dust Receptor Areas**

Contains Ordnance Survey data © Crown copyright and database right 2018

### 10.6.5 Potential Dust Deposition Effects

The pathway effectiveness has been combined with the overall residual source emissions to estimate the dust impact risk using Table A10.6 in **Appendix 10.3**. The dust impact risk and receptor sensitivity have then been used to determine the magnitude of the dust effect at each receptor area using Table 10-2. The dust deposition effects are described as negligible to slight adverse, as summarised in Table 10-9.

**Table 10-9 Summary of Dust Deposition Effects**

Receptor Area	Overall Residual Source Emissions	Pathway Effectiveness	Dust Impact Risk	Receptor Sensitivity	Magnitude of Dust Effect
---------------	-----------------------------------	-----------------------	------------------	----------------------	--------------------------

## AIR QUALITY 10

R1	Medium	Ineffective	Negligible	High	Negligible
R2	Medium	Ineffective	Negligible	High	Negligible
R3	Medium	Ineffective	Negligible	High	Negligible
R4	Medium	Moderately Effective	Low	High	Slight Adverse
R5	Medium	Moderately Effective	Low	Medium	Negligible
R6	Medium	Moderately Effective	Low	High	Slight Adverse
R7	Medium	Moderately Effective	Low	Low	Negligible
R8	Medium	Moderately Effective	Low	High	Slight Adverse
R9	Medium	Moderately Effective	Low	Low	Negligible
R10	Medium	Ineffective	Negligible	Low	Negligible
R11	Medium	Ineffective	Negligible	Low	Negligible

### 10.6.6 Potential Suspended Dust Effects

The Defra background PM<sub>10</sub> concentration at the application site and the surrounding area is 13.8 µg/m<sup>3</sup> in 2018 (see Table 10-4). Therefore, in line with IAQM guidance, it is considered that the impact on the health of

people within the receptor areas close to the application site due to PM<sub>10</sub> emissions will be insignificant.

### 10.7 Mitigation

The assessment has shown that the designed in mitigation measures provide an appropriate level of mitigation at the site. The mitigation will be incorporated into a planning condition, which should be approved by the local planning authority prior to commencement of work at the site.

During adverse weather conditions, such as prolonged dry weather and/or high winds, additional water suppression will be used to prevent dust emissions from the site. Activities with the potential to cause dust emissions will be monitored, and should visible dust be generated, corrective will be taken, including the use of water suppression. Site operations close to sensitive receptors where there is a risk of slight adverse effects will be suspended if visible dust emissions cannot be controlled.

If required, a water misting system could be installed, if required, alongside the acoustic barriers if visible dust were to become an issue.

### 10.8 Residual Effects

With the implementation of additional dust controls in areas close to receptors where there is a risk of slight adverse effects, the overall residual effect is judged to be insignificant.

### 10.9 Summary and Conclusions

The assessment has considered the likely effect that the operation of the proposed development will have on local air quality, including dust.

The potential effects have been assessed following a source-pathway-receptor approach as set out in the methodology in IAQM Guidance on the Assessment of Mineral Dust Impacts for Planning.

Infill materials will be brought to the site by rail; therefore, the impacts of road traffic emissions have been screened out of the assessment. There will be no receptors within 15m of the stationary locomotives; therefore, there will be no effect on local air quality due to diesel emissions.

Background PM<sub>10</sub> concentrations are below 17µg/m<sup>3</sup>; therefore, there is little risk that a process contribution from the restoration works would lead to an exceedence of the PM<sub>10</sub> objectives, and the health effects from the proposed development are judged to be not significant.

The qualitative dust assessment has determined that, with the designed in mitigation measures, there is a risk of slight effects due to dust deposition at residential receptors close to the southern and eastern site boundary. Additional dust control measures will be implemented should visible dust occur beyond the application site boundary close to residential receptors, and site operations will be suspended if visible dust emissions cannot be controlled. With these additional dust controls, adverse effects are likely to be negligible, and the effect has been determined to be not significant.

There should be no constraints to the restoration of the site, with regard to air quality, as the proposed development is consistent with the NPPF, Policy DM2 of the Warwickshire Waste Core Strategy; and Policy CS16 of the Rugby Core Strategy.

## **C2 Air quality appendix**

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Appendix 10 - Air Quality	
Parkfield Quarry, Warwickshire	
Job number:	J0164
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Date:	08 May 2018
Client:	CEMEX
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## 10.2 Glossary

<b>AQMA</b>	Air Quality Management Area
<b>AURN</b>	Automatic Urban and Rural Network
<b>DCLG</b>	Department for Communities and Local Government
<b>Defra</b>	Department for Environment, Food and Rural Affairs
<b>EPUK</b>	Environmental Protection UK
<b>Exceedence</b>	A period of time when the concentration of a pollutant is greater than the appropriate air quality objective. This applies to specified locations with relevant exposure
<b>IAQM</b>	Institute of Air Quality Management
<b>LAQM</b>	Local Air Quality Management
<b>LDF</b>	Local Development Framework
<b>µg/m<sup>3</sup></b>	Microgrammes per cubic metre
<b>NPPF</b>	National Planning Policy Framework
<b>Objectives</b>	A nationally defined set of health-based concentrations for nine pollutants, seven of which are incorporated in Regulations, setting out the extent to which the standards should be achieved by a defined date. There are also vegetation-based objectives for sulphur dioxide and nitrogen oxides
<b>PM<sub>10</sub></b>	Small airborne particles, more specifically particulate matter less than 10 micrometres in aerodynamic diameter
<b>PM<sub>2.5</sub></b>	Small airborne particles less than 2.5 micrometres in aerodynamic diameter
<b>Standards</b>	A nationally defined set of concentrations for nine pollutants below which health effects do not occur or are minimal

## 10.3 Dust Assessment Methodology

### Introduction

A10.3.1 The IAQM minerals dust guidance divides activities on minerals sites into four types to reflect their different potential impacts:

- • Site preparation/restoration;
- • Mineral extraction;
- • Material handling;
- • On-site transportation;
- • Mineral processing;
- • Stockpiling/exposed surfaces; and
- • Off-site transportation.

A10.3.2 A series of steps then consider the potential impact due to:

- the risk of health effects from an increase in exposure to PM<sub>10</sub>;
- annoyance due to the deposition of dust;
- harm to the natural environment.

### Screening

A10.3.3 A detailed dust assessment would usually be required where there is a human or sensitive ecological receptor within 250m of a sand and/or gravel site, or within 400m of a hard rock quarry, measured from the nearest dust generating activities.

A10.3.4 Where there are no sensitive receptors within 250 of a sand and/or gravel site, or within 400m of a hard rock quarry, it would normally be assumed that a detailed dust assessment is not required.

A10.3.5 The sensitivity of receptors is defined in Table A10.1, Table A10.2 and Table A10.3; however, professional judgement should be used to identify where on the spectrum between high and low sensitivity a receptor lies.

**Table A10.1: Sensitivities of People to Dust Soiling**

Class	Principles	Examples
High	Users can reasonably expect enjoyment of a high level of amenity; or the appearance, aesthetics or value of their property would be diminished by soiling; and the people or property would reasonably be expected a to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land.	Dwellings, museum and other culturally important collections, medium and long term car parks and car showrooms.

Class	Principles	Examples
<b>Medium</b>	Users would expect to enjoy a reasonable level of amenity, but would not reasonably expect to enjoy the same level of amenity as in their home; or the appearance, aesthetics or value of their property could be diminished by soiling; or the people or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land.	Parks and places of work.
<b>Low</b>	The enjoyment of amenity would not reasonably be expected; or property would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling; or there is transient exposure, where the people or property would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land.	Playing fields, farmland (unless commercially-sensitive horticultural), footpaths, short term car parks and roads.

**Table A10.2: Sensitivities of People to PM<sub>10</sub>**

Class	Principles	Examples
<b>High</b>	Locations where members of the public may be exposed for eight hours or more in a day.	Residential properties, hospitals, schools and residential care homes.
<b>Medium</b>	Locations where the people exposed are workers, and where individuals may be exposed for eight hours or more in a day.	Office and shop workers, but will generally not include workers occupationally exposed to PM <sub>10</sub>
<b>Low</b>	Locations where human exposure is transient.	Public footpaths, playing fields, parks and shopping streets.

**Table A10.3: Sensitivities of Receptors to Ecological Effects**

Class	Principles	Examples
<b>High</b>	Locations with an international or national designation and the designated features may be affected by dust soiling; or locations where there is a community of a particularly dust sensitive species.	Special Areas of Conservation (SAC) with dust sensitive features.
<b>Medium</b>	Locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown; or locations with a national designation where the features may be affected by dust deposition.	Sites of Special Scientific Interest (SSSI) with dust sensitive features.
<b>Low</b>	Locations with a local designation where the features may be affected by dust deposition.	Local Nature Reserves with dust sensitive features.

### Dust Impact Risk

A10.3.6 The dust impact risk is determined by combining the residual source emissions and the pathway effectiveness, as shown in Table A10.4.

**Table A10.4: Estimation of Dust Impact Risk**

Pathway Effectiveness	Residual Source Emissions		
	Small	Medium	Large
<b>Highly Effective</b>	Low	Medium	High
<b>Moderately Effective</b>	Negligible	Low	Medium
<b>Ineffective</b>	Negligible	Negligible	Low

A10.3.7 The residual source emissions and pathway effectiveness have been defined using the following guidelines.

### *Residual Source Emissions*

A10.3.8 The IAQM guidance sets out examples of the residual source emissions magnitude for a number of activities (see Table A10.5). The residual source emissions take account of designed in mitigation measures and landscaping.

**Table A10.5: Examples of Residual Source Emissions Magnitude**

Large	Small
<b>Site Preparation / Restoration</b>	
Large working area (>10ha)	Small working area (<2.5ha)
High bunds (>8m)	Low bunds (<4m)
High volume of material movement (>100,000m <sup>3</sup> )	Low volume of material movement (<20,000m <sup>3</sup> )
High no. of heavy plant (>10 simultaneously active)	Low no. of heavy plant (<5 simultaneously active)
Minimal seeding/sealing of bund surface	Bunds seeded/sealed immediately
Material of high dust potential (fine grained, friable)	Material of low dust potential (high moisture content)
<b>Mineral Extraction</b>	
Large working area (>100ha)	Small working area (<20ha)
High energy extraction methods (drilling and blasting)	Low energy extraction methods (hydraulic excavator)
Material of high dust potential (small particle size and/or low moisture content)	Material of low dust potential (coarse material and/or high moisture content)
Potential high extraction rate (1,000,000 tpa)	Low extraction rate (<200,000 tpa)
<b>Materials Handling</b>	
High no. heavy plant (>10 loading plant)	Low no. of heavy plant (<5 loading plant)
Unconsolidated / bare surface	Hard standing surface
Activities close to site boundary (<50m of site boundary)	Activities within quarry void or >100m of site boundary
Material of high dust potential	Material of low dust potential
<b>On-site Transportation</b>	
Unconsolidated/unpaved haul road	Conveyors and/or paved haul road
Road surface of high dust potential	Road surface of low dust potential
High no. of HDV movements (>250)	Low no. of HDV movements (<100)
High total haul road length	Low total haul road length (<500m)
Uncontrolled vehicle speed	Controlled vehicle speed (<15 mph)
<b>Mineral Processing</b>	
Raw material of high dust potential (hard rock)	Raw material of low dust potential (wet sand/gravel)

Large	Small
End product of high dust potential (cement)	End product of low dust potential
Complex or combination of processes	Single process
High volume of material processed (>1,000,000 tpa)	Low volume of material processed (<200,000 tpa)
<b>Stockpiles / Exposed Surfaces</b>	
Long term stockpile (>12 months)	Short term stockpile (<1 month)
Frequent material transfers (daily)	Infrequent material transfers (weekly)
Material of high dust potential	Material of low dust potential
Unconsolidated ground surface	Hardstanding
Stockpiles close to boundary (<50m)	Stockpiles well within quarry void or away from boundary (>100 m)
Large areas of exposed surfaces (>10ha)	Small areas of exposed surfaces (<2.5 ha)
High wind speeds / low dust threshold	Low wind speeds / high dust threshold
Large quarry production (1,000,000 tpa)	Small quarry production (<200,000 tpa)
<b>Off-site Transportation</b>	
High no. HDV movements (>200/day)	Low no. HDV movements (<25/day)
Unconsolidated access road	Paved access road
Limited/no vehicle cleaning facilities	Extensive vehicle cleaning facilities
Small length of access road (<20m)	Large length of access road (>50m)

### **Pathway Effectiveness**

A10.3.9 A frequency category, derived from wind and rainfall data (Table A10.6) and a receptor distance category (Table A10.7) are combined in a matrix (Table A10.8) to classify the pathway effectiveness.

**Table A10.6: Categorisation of Frequency of Potentially Dusty Winds**

Frequency Category	Criteria
<b>Infrequent</b>	Frequency of winds (>5 m/s) from the direction of the dust source on all days are less than 5%
<b>Moderately Frequent</b>	The frequency of winds (>5 m/s) from the direction of the dust source on dry days are between 5% and 12%
<b>Frequent</b>	The frequency of winds (>5 m/s) from the direction of the dust source on dry days are between 12% and 20%
<b>Very Frequent</b>	The frequency of winds (>5 m/s) from the direction of the dust source on dry days are greater than 20%



**Table A10.7: Categorisation of Receptor Distance from Source**

Receptor Distance Category	Criteria
<b>Distant</b>	Receptor is between 200m and 400m from dust source
<b>Intermediate</b>	Receptor is between 100m and 200m from dust source
<b>Close</b>	Receptor is less than 100m from dust source

**Table A10.8: Pathway Effectiveness**

Receptor Distance Category	Frequency of Potentially Dusty Winds			
	Infrequent	Moderately Frequent	Frequent	Very Frequent
<b>Close</b>	Ineffective	Moderately Effective	Highly Effective	Highly Effective
<b>Intermediate</b>	Ineffective	Moderately Effective	Moderately Effective	Highly Effective
<b>Distant</b>	Ineffective	Ineffective	Moderately Effective	Moderately Effective

***Descriptors for Magnitude of Dust Effects***

A10.3.10 The magnitude of the dust effect is then determined by combining the dust impact risk with the receptor sensitivity, as shown in Table 10.2 of Chapter 10 Air Quality.

## 10.4 Professional Experience

Bob Thomas, BSc (Hons) PgDip MSc MEnvSc MIAQM CSci

Bob Thomas is a Director at AQA, with over ten years' experience in the field of air quality management and assessment. He has carried out air quality assessments for a wide range of developments, including residential, commercial, industrial, minerals and waste developments. He has been responsible for air quality projects that include ambient air quality monitoring of nitrogen dioxide, dust and PM<sub>10</sub>, the assessment of nuisance odours and dust, and the preparation of Review and Assessment reports for local authorities. He has extensive dispersion modelling experience for road traffic, energy centre and industrial sources, and has completed many stand-alone reports and chapters for inclusion within an Environmental Statement. Bob has worked with a variety of clients to provide expert air quality services and advice, including local authorities, planners, developers, architects and process operators, and has provided expert witness services at public inquiry. He is a Chartered Scientist, a Member of the Institute of Air Quality Management and a Member of the Institution of Environmental Sciences.

A full CV for Bob Thomas is available at <http://aqassessments.co.uk/about>

## **Appendix D**

Noise Assessment from 2018  
environmental statement

## **D1    Noise assessment chapter**

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## 9.0 NOISE

### 9.1 Introduction

A study of the noise effects associated with the proposed infilling and revised restoration of the void due to historic quarrying operations in Parkfield Quarry to the east of Parkfield Road in Rugby has been undertaken by The Walker Beak Mason Partnership (WBM). As part of that exercise, baseline noise surveys have been carried out to establish existing noise levels in the vicinity of the site.

The noise implications of the development have been assessed by comparing calculated site noise levels with site noise limits suggested in line with current government guidance.

It is proposed that inert infill material will be imported by rail and deposited into the void over a period of around 4.5 years.

The void is currently partially filled with water, which will be pumped out and once filled and restored will provide opportunities for enhanced nature conservation and amenity uses.

This chapter sets out the findings of baseline noise surveys conducted in April and July 2017 at positions representative of the closest dwellings to the proposed extension area and discusses site noise limits for infilling operations at the site in relation to the background noise levels observed in April and July 2017.

This chapter considers the mitigation measures aimed at enabling the site to conform with acceptable noise levels at all dwellings.

In order to appreciate some of the terms, Appendix 9.1 describes the noise units that are referred to in this report.

## 9.2 Assessment Methodology

The relevant noise guidance and other documents referenced in preparation of this assessment are detailed below.

### 9.2.1 NPPF and Planning Practice Guidance

The National Planning Policy Framework (NPPF) was published in March 2012 and sets out the Government's planning policies for England. At the heart of the National Planning Policy Framework is a presumption in favour of sustainable development.

The NPPF revoked and replaced a number of Planning Policy Statements (PPS), Planning Policy Guidance (PPG) and other guidance documents, including Planning Policy Guidance 24: Planning and Noise.

With regard to noise there are various aims, including that noise from a new development should avoid giving rise to significant adverse impacts on health and quality of life, and that other adverse impacts should be mitigated and reduced to a minimum including through the use of conditions.

Section 11 of the NPPF (Conserving and enhancing the natural environment) refers specifically to noise in the following paragraphs:

*“109. The planning system should contribute to and enhance the natural and local environment by...preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability...”*

*“123. Planning policies and decisions should aim to:*

*avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development;*

*mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions;*

*recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not*

## NOISE 9

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*have unreasonable restrictions put on them because of changes in nearby land uses since they were established (subject to the provisions of the Environmental Protection Act 1990 and other relevant law); and*

*identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.”*

Technical guidance on noise was provided in more detail in the accompanying document “*Technical Guidance to the National Planning Policy Framework*”, dated March 2012, which was superseded in March 2014 by the Planning Practice Guidance.

Paragraphs 19 to 22 inclusive of the “*Minerals*” chapter of the Planning Practice Guidance are under the heading “*Noise emissions*” within the section “*Assessing environmental impacts from mineral extraction*”.

Paragraph 19 Reference ID: 27-019-20140306 states:

**“How should minerals operators seek to control noise emissions?”**

*Those making mineral development proposals, including those for related similar processes such as aggregates recycling and disposal of construction waste, should carry out a noise impact assessment, which should identify all sources of noise and, for each source, take account of the noise emission, its characteristics, the proposed operating locations, procedures, schedules and duration of work for the life of the operation, and its likely impact on the surrounding neighbourhood.*

*Proposals for the control or mitigation of noise emissions should:*

*consider the main characteristics of the production process and its environs, including the location of noise-sensitive properties and sensitive environmental sites;*

*assess the existing acoustic environment around the site of the proposed operations, including background noise levels at nearby noise-sensitive properties;*

*estimate the likely future noise from the development and its impact on the neighbourhood of the proposed operations;*

*identify proposals to minimise, mitigate or remove noise emissions at source;*

*monitor the resulting noise to check compliance with any proposed or imposed conditions.”*

Paragraph 20 Reference ID: 27-020-20140306 states:

**“How should mineral planning authorities determine the impact of noise?”**

*Mineral planning authorities should take account of the prevailing acoustic environment and in doing so consider whether or not noise from the proposed operations would:*

*give rise to a significant adverse effect;*

*give rise to an adverse effect; and*

*enable a good standard of amenity to be achieved.*

*In line with the Explanatory Note of the Noise Policy Statement for England, this would include identifying whether the overall effect of the noise exposure would be above or below the significant observed adverse effect level and the lowest observed adverse effect level for the given situation. As noise is a complex technical issue, it may be appropriate to seek experienced specialist assistance when applying this policy.”*

Paragraph 21 Reference ID: 027-021-20140306 states:

**“What are the appropriate noise standards for mineral operators for normal operations?”**

*Mineral planning authorities should aim to establish a noise limit, through a planning condition, at the noise-sensitive property that does not exceed the background noise level (LA90,1h) by more than 10dB(A) during normal working hours (0700-1900). Where it will be difficult not to exceed the background level by more than 10dB(A) without imposing unreasonable burdens on the mineral operator, the limit set should be as near that level as practicable. In any event, the total noise from the operations should not exceed 55dB(A) LAeq, 1h (free field). For operations during the evening (1900-2200) the noise limits should not exceed the background noise level (LA90,1h) by more than 10dB(A) and should not exceed 55dB(A) LAeq, 1h (free field). For any operations during the period 22.00 – 07.00 noise limits should be set to reduce to a minimum any adverse impacts, without*

*imposing unreasonable burdens on the mineral operator. In any event the noise limit should not exceed 42dB(A) LAeq,1h (free field) at a noise sensitive property.*

*Where the site noise has a significant tonal element, it may be appropriate to set specific limits to control this aspect. Peak or impulsive noise, which may include some reversing beepers, may also require separate limits that are independent of background noise (e.g. Lmax in specific octave or third-octave frequency bands – and that should not be allowed to occur regularly at night.)*

*Care should be taken, however, to avoid any of these suggested values being implemented as fixed thresholds as specific circumstances may justify some small variation being allowed.”*

Paragraph 22 Reference ID: 27-022-20140306 states:

**“What type of operations may give rise to particularly noisy short-term activities and what noise limits may be appropriate?”**

*Activities such as soil-stripping, the construction and removal of baffle mounds, soil storage mounds and spoil heaps, construction of new permanent landforms and aspects of site road construction and maintenance.*

*Increased temporary daytime noise limits of up to 70dB(A) LAeq 1h (free field) for periods of up to eight weeks in a year at specified noise-sensitive properties should be considered to facilitate essential site preparation and restoration work and construction of baffle mounds where it is clear that this will bring longer-term environmental benefits to the site or its environs.*

*Where work is likely to take longer than eight weeks, a lower limit over a longer period should be considered. In some wholly exceptional cases, where there is no viable alternative, a higher limit for a very limited period may be appropriate in order to attain the environmental benefits. Within this framework, the 70 dB(A) LAeq 1h (free field) limit referred to above should be regarded as the normal maximum.”*

## 9.2.2 British Standard 5228 Part 1: 2009 +A1: 2014

BS 5228-1:2009+A1:2014 “Code of practice for noise and vibration on construction and open sites – Part 1: Noise” gives recommendations for basic methods of noise control relating to construction sites, including sites where demolition, remediation, ground treatment or related civil engineering works are being carried out, and open sites. This part of BS 5228 provides guidance concerning methods of predicting and measuring noise and assessing its impact on those exposed to it.

*“Table E.1 shows an example of the threshold of potential significant effect at dwellings when the site noise level, rounded to the nearest decibel, exceeds the listed value. The table can be used as follows: for the appropriate period (night, evening/weekends or day), the ambient noise level is determined and rounded to the nearest 5 dB. This is then compared with the site noise level. If the site noise level exceeds the appropriate category value, then a potential significant effect is indicated. The assessor then needs to consider other project-specific factors, such as the number of receptors affected and the duration and character of the impact, to determine a significant effect”*

The time period “T” corresponding to the “Threshold value, in decibels (dB)(LAeq, T)” is for the relevant period e.g. 8 hours for the Night-time (23.00-07.00).

If this threshold of potential significant effect at dwellings were to be used for this development the averaging times for the Threshold Values would be the same as the corresponding period, e.g. 12 hours for Daytime (07:00-19:00) Monday to Friday and 6 hours for Saturdays (07.00-13.00).

The Threshold Values in Table E.1 include levels for Night-time, Evenings and Weekends. The infilling operation will only take place during the stated hours of 07:00-19:00 Monday to Friday and 07.00-13.00 on Saturdays and therefore only the Threshold Values for “Daytime” are considered relevant for this application.

Train movements in and out of the site between the hours of 07:00 to 23:00 hours have been assessed separately, particularly those outside the infilling hours of Monday to Friday 07:00 to 19:00 and Saturdays 07:00 to 13:00.

Table E.1 **Example threshold of potential significant effect at dwellings**

Assessment category and threshold value period	Threshold value, in decibels (dB)( $L_{Aeq,T}$ )		
	Category A <sup>A)</sup>	Category B <sup>B)</sup>	Category C <sup>C)</sup>
Night-time (23.00-07.00)	45	50	55
Evenings and weekends <sup>D)</sup>	55	60	65
Daytime (07.00-19.00) and Saturdays (07.00-13.00)	65	70	75

NOTE 1 A potential significant effect is indicated if the  $L_{Aeq,T}$  noise level arising from the site exceeds the threshold level for the category appropriate to the ambient noise level.

NOTE 2 If the ambient noise level exceeds the Category C threshold values given in the table (i.e. the ambient noise level is higher than the above values), then a potential significant effect is indicated if the total  $L_{Aeq,T}$  noise level for the period increases by more than 3 dB due to site noise.

NOTE 3 Applied to residential receptors only.

<sup>A)</sup> Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values.

<sup>B)</sup> Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as category A values.

<sup>C)</sup> Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than category A values.

<sup>D)</sup> 19.00-23.00 weekdays, 13.00-23.00 Saturdays and 07.00-23.00 Sundays.

The standard also includes the following guidance with regard to noise from longer term earth moving operations:

### “E.5 Construction works involving long-term substantial earth moving

When construction activities involve large scale and long term earth moving activities, then this is more akin to surface mineral extraction than to conventional construction activity. In this situation, the guidance contained within the Technical Guidance to the National Planning Policy Framework needs to be taken into account when setting criteria for acceptability.

The Technical Guidance states:

*‘Subject to a maximum of 55 dB(A) LAeq, 1h (free field), mineral planning authorities should aim to establish a noise limit at the noise-sensitive property that does not exceed the background noise level by more than 10 dB(A). It is recognised, however, that in many circumstances it will be difficult not to exceed the background level by more than 10 dB(A) without imposing unreasonable burdens on the mineral operator. In such cases, the limit set should be as near to that level as practicable during normal working hours (0700-1900) and should not exceed 55 dB(A) LAeq, 1h (free field). Evening (1900-2200) limits should not exceed background level by more than 10 dB(A) and night-time limits should not exceed 42 dB(A), LAeq, 1h (free field) at noise-sensitive dwellings.’*

*Based upon the above, it is suggested that the limits of 55 dB LAeq, 1h is adopted for daytime construction noise for these types of activities but only where the works are likely to occur for a period in excess of six months. Precedent for this type of approach has been set within a number of landmark appeal decisions associated with the construction of ports.*

*Other recommendations with regard to noise emissions given in paragraphs 28 to 31 of the Technical Guidance to the National Planning Policy Framework should also be taken into account, where appropriate.”*

## 9.2.3 World Health Organisation (WHO)

### WHO Guidelines for Community Noise 1999

The World Health Organisation (WHO) “Guidelines for Community Noise” 1999 provides guidance on community noise based on knowledge of the health impacts of community noise and also provides guidance on the protection of people from the harmful effects of noise in non-industrial environments. Some of the relevant guideline values according to specific environments and critical health effects are presented in the following table:



Specific environment	Critical health effect(s)	L <sub>Aeq</sub> [dB(A)]	Time base [hours]	L <sub>Amax</sub> fast [dB]
Outdoor living area	Serious annoyance, daytime and evening	55	16	-
	Moderate annoyance, daytime and evening	50	16	-
Dwelling, indoors	Speech intelligibility & moderate annoyance, daytime & evening	35	16	
Inside bedrooms	Sleep disturbance, night-time	30	8	45
Outside bedrooms	Sleep disturbance, window open (outdoor values)	45	8	60

According to the WHO guidelines, the time base for L<sub>Aeq,T</sub> values is 16 hours for daytime (including evening) and 8 hours for night-time.

The effects of noise in dwellings are usually sleep disturbance, annoyance and speech interference. For bedrooms the critical effect is sleep disturbance. The WHO indoor guideline values for bedrooms are 30 dB L<sub>Aeq,T</sub> for continuous noise. If the noise is not continuous, maximum noise levels should be used to indicate the probability of noise-induced awakenings with 45 dB L<sub>Amax,f</sub> as the relevant criterion. The WHO guidelines state that “For a good sleep, it is believed that indoor sound pressure levels should not exceed approximately 45 dB L<sub>Amax</sub> more than 10-15 times per night...”

At night-time, external noise levels outside the façades of bedrooms should not exceed 45 dB L<sub>Aeq,T</sub> and 60 dB L<sub>Amax,f</sub> and so that people may sleep with bedroom windows open, assuming a noise reduction of 15 dB from outside to inside with the window open.

To protect the majority of people from being seriously annoyed during the daytime, the outside noise level from steady, continuous noise should not exceed 55 dB L<sub>Aeq,T</sub> on balconies, terraces and in outdoor living rooms. To protect the majority of people from being moderately annoyed during the daytime, the outside noise level should not exceed 50 dB L<sub>Aeq,T</sub>.

It is important to note that these are health based guidelines rather than levels set out in current Government legislation.

### WHO Night Noise Guidelines for Europe 2009

The World Health Organization “Night Noise Guidelines for Europe” 2009 document provides guidelines that are neither standards nor legally binding criteria. The guidelines may be considered as an extension to, as well as an update of, the previous WHO “Guidelines for Community Noise” 1999.

This document proposes that an L<sub>night,outside</sub> of 40 dB should be the target of the night noise guideline (NNG) to protect the public. The L<sub>night,outside</sub> indicator is defined in Environmental Noise Directive 2002/49/EC and is the year average at the most exposed facade. It is the long-term A-weighted average sound level (L<sub>Aeq</sub>) determined over all the night periods of a year, where night is eight hours in duration (usually 23.00 to 07.00 hours) and a year is a relevant year as regard the emission of sound and an average year for meteorological conditions. The L<sub>night,outside</sub> is determined at a receiver height of 4 metres above local ground and is taken to be a free field level even though it would be assessed near the most affected façade of a dwelling.

The Night Noise Guidelines also reports that effects on sleep quality can occur at a threshold levels of 42 dB L<sub>Amax,inside</sub> (internal level) although biological effects such as EEG awakening and changing sleep structure can occur at lower noise levels.

### 9.2.4 Local Authority

The Parkfield Road site falls within the jurisdiction of Warwickshire County Council.

A “Request for Scoping Opinion” was submitted by CEMEX and SLR on 01 September 2017 containing the following approach to the noise assessment:

### “6.5 Noise

6.5.1 In relation to the proposed restoration backfill operations at Parkfield Quarry, the noise study will review the advice relating to noise set out in National Planning Policy Framework (NPPF 2012) and the more detailed advice on noise at mineral working sites set out in the Planning Practice Guidance accompanying NPPF (PPF 2014, updated as web based resource.

6.5.2 Reference will be made to existing noise levels measured on two days at three locations deemed to be representative of noise sensitive residential properties in the vicinity of the site. The parameters reported will be background noise level  $\text{dB } L_{A90,T}$  together with the equivalent continuous noise level,  $\text{dB } L_{Aeq,T}$ .

6.5.3 Average background noise levels at the sample locations / properties will be defined ( $\text{dB } L_{A90,T}$ ), and noise criterion levels will be set at a maximum of  $\text{dB } L_{A90,T}$  plus 10 dB or an upper limit of 55  $\text{dB } L_{Aeq,1 \text{ hour, free field}}$  as defined in PPG, with a limit of 70  $\text{dB } L_{Aeq, 1 \text{ hour free field}}$  for temporary operations (again as defined in PPG).

6.5.4 The study will undertake noise modelling which considers the sound power levels of the plant and machinery to be used at the site, and will assess the ability to comply with the noise criteria set out for the defined locations. Recommendations for mitigation measures designed to ensure adherence to the defined criteria levels will be made as appropriate.

6.5.5 Conclusions will be reached as to the ability of the development to progress in accordance with the defined criteria, and the study will make recommendations for noise limits which could be reasonable imposed as planning conditions in the event that permission is granted for the development.

6.5.6 At this preliminary stage, it is considered that noise measurements should be undertaken at the following properties / locations:

- Lawford Bridge/Bridle Road;
- Avenue Road/Jubilee Street;

- Tank Cottages/Railway Cottages;
- Follager Road; and
- Izod Road.

6.5.7 In relation to Follager Road and Izod Road it is noted that some of the properties contain living accommodation on second floors. It is thus intended that the study will include modelling of noise at both ground and second floors at such properties.

6.5.8 The noise modelling will include predictions of noise from train movements, the rail offloading operations, the movement of dump trucks into and within the quarry void; and the effects of the backfilling to higher levels as the void is progressively filled.

6.5.9 In this context, preliminary modelling has indicated the need for noise attenuation at the rail offloading facility. This has resulted in a conceptual design for barrier attenuation along the southern side of the rail offloading location and a partial enclosure above the offloading area. These designs will be refined as part of the project design, and will be assessed as part of the noise study and recommendations for mitigation measures.”

A response from Warwickshire County Council dated 15 December 2017 was issued to the applicant, which did not specifically request information other than that proposed in the “Request for Scoping Opinion” was submitted by CEMEX and SLR on 01 September 2017.

## 9.3 Site Description

The proposed site for the infilling and landscaping operation is located to the east of Parkfield Road in Rugby. The CEMEX Rugby Cement Works is located to the west of Parkfield Road.

The site is bounded to the north by the London to Birmingham railway line, to the south by a rail siding beyond which lie residential properties and allotments. To the west of the site is industrial land associated with the cement works with industrial or vacant land to the east.

The nearest noise sensitive premises to the site are the residential properties to the south of the rail siding on the southern side of the void from which the imported infill will be unloaded.

There are no residential properties within 500 metres to the north, east and west of the site.

There are a number of stages to the proposed infilling operation:

It is proposed that the void is drained by means of pumping the water to the Sow Brook or indirectly to Sow Brook via the Lodge Farm Pit to allow the infilling works to take place.

Initial temporary works will include the construction of an enclosure (8 metres in height) for the rail offloading area at the western end of the rail siding, the construction of a 5 metre high bund along the northern side of the siding to provide noise protection for the properties to the south of the site. A 5 metre high acoustic barrier will also be placed at the eastern end of the site, and at the western end of the siding (for the train locomotive) for noise protection purposes.

Following these works a ramp will be constructed on the western side of the site for the longer term operations, i.e. unloading of material from the train and transportation of the material into the void by means of dump trucks.

The level of the infill material will progress raising the ground level within the void eventually forming a larger level area along the southern side of the void as infilling progresses. As the infilling progresses and the workings within the void take place at raised ground level, the 5 metre high bund will be increased to a height of 7 metres above local ground level.

Once the final ground levels across the site have been achieved, the bunding will then be removed and the area restored.

## 9.4 Measurement Methodology

### 9.4.1 Measurement of Existing Noise Levels

The locations at which baseline measurements have been made were chosen as being representative of the nearest properties to the proposed infilling area.

Baseline noise surveys were conducted on three days at three locations representative of the nearest noise sensitive properties to the site. Eighteen sample measurements were made over the three visits which took place on Thursday 27 April 2017, Tuesday 04 July 2017 and Monday 10 July 2017.

The measurements were undertaken between about 08:45 and 10:45 on Thursday 27 April 2017, between about 11:00 and 13:20 on Tuesday 04 July 2017 and between around 11:30 and 13:40 on Monday 10 July 2017. Late evening / night-time samples were made between 23:40 on Monday 05 February and 00:40 on Tuesday 06 February 2018.

The measurements were taken at a microphone height of approximately 1.4 metres above local ground level away from reflecting surfaces other than the ground, with a wind shield used throughout each measurement. The sample measurements were of 15 minute duration.

The parameters reported are the statistical indices  $L_{A10,T}$  and the Background Noise Level,  $L_{A90,T}$  as well as the Equivalent Continuous Noise Level,  $L_{Aeq,T}$ . An explanation of the noise units presented is given in Appendix 9.1.

Plant measurements of the similar train unloading operation that takes place at Barrington Quarry in Cambridgeshire were undertaken during a visit on Thursday 06 July 2017 between 07:40 and 08:40.

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Measurements of a dozer similar to that to be used on the site were also undertaken by WBM at Stanford-le-Hope in Essex on Friday 25 August 2017 between 10:30 and 11:30.

The instrumentation and calibration details used for the sample measurements and plant measurements are shown in Appendix 9.3.

### 9.4.2 Existing noise levels

The detailed results of the sample measurements are set out in Appendix 9.4.

A summary of the sample measurement results is presented in the following tables.

**Table 9-1 Baseline Daytime Noise Levels (Samples)**

Location	Average	Average	Range
	dB L <sub>Aeq, 15 min</sub>	dB L <sub>A90, 15 min</sub>	dB L <sub>A90, 15 min</sub>
1. Recreation Ground	58	49	48 to 50
2. Allotment Entrance	51	47	46 to 48
3. Tank Cottages	51	44	42 to 44

Note: All stated levels are free field.

Daytime noise levels were generally controlled by noise from the CEMEX cement works, distant and local road traffic noise, birdsong, trains and aircraft movements.

**Table 9-2 Baseline Night-time Noise Levels (Samples)**

Location	dB L <sub>Aeq, 15 min</sub>	dB L <sub>A90, 15 min</sub>	dB L <sub>Amax,f</sub>
1. Recreation Ground	51	50	58
2. Allotment Entrance	41	37	54
3. Tank Cottages	48	36	68

Note: All stated levels are free field.

Night-time noise levels were generally controlled by noise from distant plant and distant road traffic.

## 9.5 Evaluation and Analysis of Noise Data / Noise Limits

Evaluation of the noise impact of the proposed infilling operations has been considered in two stages, the initial temporary operations including the bund formation and the longer term infilling operations when material can be transported into the void via the ramp.

The longer term operations involving movement of the unloaded infill material into the void and placement/grading/compaction of the material will take over six months to complete and as such would be subject to a lower noise limit based on the guidance in Annex E to BS 5228-1:2009+A1:2014 “Code of practice for noise and vibration on construction and open sites – Part 1: Noise”, which states in Section E.5 of Annex E:

*“When construction activities involve large scale and long term earth moving activities, then this is more akin to surface mineral extraction than to conventional construction activity. In this situation, the guidance contained within the Technical Guidance to the National Planning Policy Framework needs to be taken into account when setting criteria for acceptability.”*

This refers to the setting of noise limits for such operations in line with the “*Technical Guidance to the National Planning Policy Framework*” which has since been superseded by the web-document “*Planning Practice Guidance*” although the guidance has remained consistent.

Based on this approach and the measured background noise levels in the vicinity of the nearest dwellings, a site noise limit for the longer term operations of 55 dB  $L_{Aeq, 1 \text{ hour free field}}$  is considered appropriate.

As stated above, the guidance contained in Section E.5 of BS 5228-1:2009+A1:2014 “*Code of practice for noise and vibration on construction and open sites – Part 1: Noise*” relates large scale and long term earth moving activities to surface mineral extraction referring to paragraphs 28 to 31 of the “*Technical Guidance to the National Planning Policy Framework*”.

It is therefore considered that the site noise limit for the temporary operations such as the bund formation at the Parkfield Quarry site should be based on the current advice for mineral sites contained within the Planning Practice Guidance, Paragraph 019 of which mentions noise from “*mineral development proposals, including those for related similar processes such as aggregates recycling and disposal of construction waste*”.

Planning Practice Guidance suggests a noise limit for “*periods of up to 8 weeks in a year at specified noise-sensitive properties*” for temporary short term operations such as bund formation and soil stripping (Paragraph 022 of Planning Practice Guidance equivalent to Paragraph 31 in “*Technical Guidance to the National Planning Policy Framework*”) of 70 dB  $L_{Aeq, 1 \text{ hour free field}}$ .

## 9.6 Calculated Site Noise levels

### 9.6.1 Calculated Site Noise Levels

The Equivalent Continuous Noise Level,  $L_{Aeq, T}$ , is the preferred unit for assessing noise sources. It is the value of a continuous level that would

have equivalent energy to the continuously varying noise over the specified period “T”. This unit is recommended internationally for the description of environmental noise and is in general use. It is the chosen unit of BS 5228 for Construction and Open site noise; Planning Practice Guidance to the National Planning Policy Framework and BS 7445 for the Description and Measurement of Environmental noise.

The noise levels likely to arise at dwellings depend on the method of working and the sound power levels of the plant chosen to work a site as much as on the distance to the properties and the effects of intervening ground. Proper allowance can be made for these variables in order to calculate site noise levels.

### 9.6.2 Noise Calculation Methodology

The calculations in this report are based on the methods contained in BS5228-1: 2009 “*Code of practice for noise and vibration control on construction and open sites – Part 1: Noise*” + A1: 2014, Annex F.

Further details of the calculation methods are set out in Appendix 9.6 to this report. A summary site noise calculation sheet for one of the dwellings considered is included in Appendix 9.6.

### 9.6.3 Noise Sources and Sound Power Levels

The infill material is to be imported by train and unloaded by tracked excavators.

The unloaded material will be transported into the void by means of dump trucks and placed/graded/compacted by a dozer. The number of vehicle movements for dump trucks on site is based on projected site activity.

Sound Power Levels of the machinery used on site are based on measurements conducted by WBM of similar plant items currently in use on sites in Barrington, Cambridgeshire as measured on 06 July 2017 and Stanford-le-Hope in Essex as measured on 25 August 2017. Details

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results of the plant measurements at Barrington and Stanford-le-Hope are presented in Appendix 9.5.

The plant items used in the calculations are listed in the table below along with the Sound Power Levels and on times used in the calculations.

**Table 9-3 Plant Items Used in Site Noise Calculations**

Location	Sound Power Level dB L <sub>WA</sub>	On Time (%)
Locomotive (Stationary)	100	100
Train Movement	92	3
Excavators Unloading of train wagons	103	97
Infill Material into Dump Trucks	103	97
Dump Truck Movement into Void	108	100
Placement/Compaction in Void (by Dozer)	107	100

### 9.6.4 Proposed Mitigation Measures

The following mitigation is proposed and is included in the calculations based on the details of the working scheme outlined in the email from WBM dated 09 October 2017:

The proposed bunding 350 metres in length along the southern boundary of the site (north of the siding) to a height of 5 metres initially (apex at 97 metres AOD) and then increased to 7 metres (apex at 99 metres AOD) above local ground level (depending on the stage of infilling);

The proposed acoustic barrier for 70 metres on the eastern boundary of the site to a height of 5 metres above local ground level (this barrier is also included in the calculations for the temporary site preparation/bund formation activities);

The enclosure 60 metres in length around the train unloading area at a height of 8 metres above local ground level;

The 215 metre long barrier on the western end of the siding for the train locomotive to a height of 5 metres above local ground level.

### 9.6.5 Site Operation Assumptions

In order to assess the noise levels for the proposed site operations, the contribution from each significant specific noise source has been evaluated separately and then combined together to give the overall noise level.

The activities that will take place on the site are:

- Train movement to place wagons in unloading area;
- Unloading of train wagons using tracked excavators;
- Loading of dump trucks;
- Dump truck movements in and out of the void;
- Placement/Compaction of infill by means of a dozer.

The percentage on time for the train movement during the unloading process is based on eight wagons being unloaded an hour (4 train movements) and 30 seconds per movement, i.e. 2 minutes per hour (3%).

In order to assess the noise levels for the proposed site operations, the contribution from each significant specific noise source has been evaluated separately and then combined to give the overall noise level.

### 9.6.6 Effects on Assessment Locations

Site noise limits for the initial temporary operations and the longer term infilling operations have been suggested in Section 9.5 of this chapter.

A comparison of the calculated site noise levels at the nearest dwellings and the suggested site noise limits is shown in the following table. The calculated site noise levels and the suggested site noise limits in the tables below are all in terms of dB L<sub>Aeq, 1 hour, free field</sub>.

Calculated site noise levels are presented for the longer term operations of train unloading and transportation/placement of the unloaded infill into the void. The calculation locations are shown on the plan in Appendix 9.2.

**Table 9-4 Calculated Site Noise Levels (Longer Term Operations)**

Site Noise Calculation Receiver Location	Calculated Site Noise Level	Suggested Site Noise Limit
	dB L <sub>Aeq, 1 hr</sub>	dB L <sub>Aeq, 1 hr</sub>
Lawford Bridge/Bridle Road	50	55
Avenue Road/Jubilee Street	49	55
Follager Road (Ground Floor)	51	55
Follager Road (First Floor)	52	55
Follager Road (Second Floor)	54	55
Izod Road (Ground Floor)	50	55
Izod Road (First Floor)	52	55

Site Noise Calculation Receiver Location	Calculated Site Noise Level	Suggested Site Noise Limit
	dB L <sub>Aeq, 1 hr</sub>	dB L <sub>Aeq, 1 hr</sub>
Izod Road (Second Floor)	53	55
Tank Cottages/Railway Cottages	50	55

Note: All stated levels are free field.

The calculated site noise levels for the longer term infilling operations comply with the suggested site noise limits at all of the chosen calculation locations.

### 9.6.7 Temporary Operations

The initial operations on site during which the 5 metre high bund will be constructed from material unloaded adjacent to the siding and the construction of the upper levels of the ramp from within the void are considered to be temporary short term operations and will be subject to the noise limit of 70 dB L<sub>Aeq, 1 hour free field</sub> based on the advice contained in BS5228-1: 2009 + A1: 2014 “Code of practice for noise and vibration control on construction and open sites – Part 1: Noise” and Planning Practice Guidance.

Once the ground levels within the site have increased, the bund to the north of the rail siding is to be increased from 5 metres to 7 metres above local ground height and this will be considered to be a similar temporary operation and subject to the same noise limit.

The highest L<sub>Aeq,T</sub> noise levels expected from the closest temporary operations in the proposed infilling area at Parkfield Road, are shown in the following table.

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The calculated levels in the table include some barrier attenuation due to the proposed 5 metre acoustic barrier to the east of the site protecting Tank Cottages/Railway Cottages.

**Table 9-5 Calculated Site Noise Levels (Temporary Operations)**

Site Noise Calculation Receiver Location	Calculated Site Noise Level	Suggested Site Noise Limit
	dB L <sub>Aeq, 1 hr</sub>	dB L <sub>Aeq, 1 hr</sub>
Lawford Bridge/Bridle Road	55	70
Avenue Road/Jubilee Street	66	70
Follager Road	70	70
Izod Road	70	70
Tank Cottages/Railway Cottages	69	70

Note: All stated levels are free field.

The proposals comply with the suggested site noise limit for the initial short term operations of 70 dB L<sub>Aeq, 1 hour, free field</sub> noise limit for temporary works in line with the advice contained within BS 5228-1:2009+A1:2014 “Code of practice for noise and vibration on construction and open sites – Part 1: Noise” and Planning Practice Guidance.

### 9.6.8 Out of Hours Train Movements

Although the operations proposed on site (including train movements) will take place during daytime hours, i.e. 07:00 to 19:00 hours, there may also be a need to move trains in and out of the site outside these hours, specifically between 19:00 and 23:00 hours Monday to Friday, 13:00 to 23:00 on Saturdays and 07:00 to 23:00 on Sundays.

Train movements between 19:00 and 23:00 hours would involve at most one train entering the site, stopping and switching off and one train starting up and leaving the site. There would be no other activity such as unloading during this period and the trains would not be allowed to idle on site.

The calculations are based on the assumption that the movement of the train into or out of the site is completed in no more than 5 minutes.

The “High Speed Two Phase One Information Paper: E20: Control of Airborne Noise from Altered Roads and the Operational Railway” February 2017 suggests operational airborne noise impact and effect levels from altered roads and the operational railway in the following table:

**Table 9-6 Noise Effect Levels for Permanent Residential Buildings**

Time of day	Lowest Observed Adverse Effect Level (dB)	Significant Observed Adverse Effect Level (dB)
Day (0700 – 2300)	50 L <sub>pAeq, 16hr</sub>	65 L <sub>pAeq, 16hr</sub>
Night (2300 – 0700)	40 L <sub>pAeq, 8hr</sub>	55 L <sub>pAeq, 8hr</sub>
Night (2300 – 0700)	60 L <sub>pAFMax</sub>  (at the façade, from any nightly noise event)	80 L <sub>pAFMax</sub>  (at the façade, from more than 20 nightly train passbys), or  85 L <sub>pAFMax</sub>  (at the façade, from 20 or fewer nightly train passbys)



The  $L_{pAeq}$  and  $L_{pAFMax}$  referred to in Table 9-6 are the same parameters as  $L_{Aeq}$  and  $L_{Amax,f}$  used in the WHO “Guidelines for Community Noise” and used throughout this assessment.

The document states that the Lowest Observed Adverse Effect Levels for daytime (07:00 to 23:00) was determined based on the information used to support the “WHO Guidelines for Community Noise” indicating that daytime sound levels of less than 50 dB  $L_{pAeq}$  cause little or no serious annoyance in the community.

The Significant Observed Adverse Effect Level is consistent with the daytime trigger level in the “Noise Insulation (Railways and Other Guided Transport Systems) Regulations”.

**9.6.9 Calculated Noise Levels Due To Train Movements 07:00-23:00**

Calculated noise levels at the dwellings due to train movements (at a distance of 15 metres) are presented in the following table.

**Table 9-7 Calculated Noise Levels Due to Train Movements (Ranges)**

Calculated dB $L_{Amax,f}$	Calculated dB $L_{Aeq, 1hour}$	Calculated dB $L_{Aeq, 16 hour}$ (07:00-23:00)
74 to 79	49 to 55	45 to 51

The calculated levels assume that no more than 6 train movements will take place during the daytime/evening period of 07:00 to 23:00 hours. For the one hour  $L_{Aeq}$  level, it is assumed that one train movement will take place during that hour. No more than 2 train movements will take place between 19:00 and 23:00.

The calculated maximum noise levels are based on measurements at a similar site using a single locomotive and include some brake squeal noise.

Based on calculated  $L_{Aeq, 16 hour}$  noise levels from the measured data at the similar site and assuming six train movements during the period 07:00 to 23:00, daytime noise levels due to train movements would range from 45 to 51 dB  $L_{Aeq, 16 hour}$ .

The noise due to the movement of trains in and out of the site during the period 07:00 23:00 hours would therefore be below or just above the Lowest Observed Adverse Effect Level of 50 dB  $L_{Aeq, 16 hour}$  for daytime and would be 14 to 20 dB(A) below the Significant Observed Adverse Effect Level of 65 dB  $L_{Aeq, 16 hour}$  for daytime.

It is proposed that train movements in and out of the site will only take place during the period 07:00 to 23:00 hours.

The WHO guidance and the document “High Speed Two Phase One Information Paper: E20: Control of Airborne Noise from Altered Roads and the Operational Railway” do not stipulate a maximum noise level for the period 07:00 to 23:00.

**9.7 Residual Effects**

The calculated overall site noise levels for longer term and short term temporary operations in the proposed infilling area are below the suggested site noise limits at all dwellings considered.

Where reversing sirens or beepers are used on mobile site plant and give rise to noise problems, the use of quieter or silent types of alarm or warning devices that are more environmentally acceptable should be explored.

Movement of trains in and out of the site will be restricted to taking place between the hours of 07:00 to 23:00 to protect the night-time amenity of the nearby residences.

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Train movements outside the infilling hours of 07:00 to 19:00 Monday to Friday and 07:00 to 13:00 on Saturdays would involve at most one train entering the site, stopping and switching off and one train starting up and leaving the site. There would be no other activity such as unloading during this period and the trains would not be allowed to idle on site.

The proposals for the control and/or mitigation of the noise from the site have been developed with the intention of minimising the impact of the operations on the nearest residential properties in line with Paragraph 019 of Planning Practice Guidance, which states that mineral operators should “*identify proposals to minimise, mitigate or remove noise emissions at source*”.

The same paragraph also states that mineral operators should “*monitor the resulting noise to check compliance with any proposed or imposed conditions*”.

### 9.8 Recommendations

#### 9.8.1 Suggested Noise Conditions

For the purpose of ensuring that the site can be operated whilst minimising the noise impact on the nearest residential properties, the following planning conditions with regard to noise are suggested:

*“1. Except for site preparation and temporary operations such as bund formation activities, the free field Equivalent Continuous Noise Level (dB  $L_{Aeq, 1 \text{ hour}}$ ) at the following measurement locations representative of the nearest noise sensitive properties shall not exceed 55 dB  $L_{Aeq, 1 \text{ hour free field}}$  during the hours 07:00-23:00 Monday to Friday and 07:00-13:00 on Saturdays:*

- 1. The Recreation Ground;*
- 2. Allotment Entrance;*
- 3. Tank Cottages.*

*Measurements shall be made no closer than 3.5 metres from the any façade or other reflecting surface.*

*Site management measures and shall be implemented in accordance with details which have been submitted to and approved in writing by the Local Planning Authority to ensure that the stipulated noise level shall not be exceeded.*

*2. For temporary operations such as site preparation and bund formation/enhancement or removal, the free field Equivalent Continuous Noise Level (dB  $L_{Aeq, 1 \text{ hour}}$ ) at the measurement locations listed in Condition 1 shall not exceed 70 dB  $L_{Aeq, 1 \text{ hour free field}}$ .*

*Measurements shall be made no closer than 3.5 metres from any façade or other reflecting surface.*

*Temporary operations shall not exceed a total of eight weeks in any continuous 12 month duration.*

*3. Noise levels shall be monitored at three monthly intervals from the date of the commencement of the development at the monitoring locations described in Condition 1. The results of the monitoring shall include  $L_{A90}$  and  $L_{Aeq}$  noise levels, the prevailing weather conditions, details and calibration of the equipment used for measurement and comments on other sources of noise which affect the noise climate. The monitoring shall be carried out for at least 2 separate periods of 15 minutes at each monitoring location during the working day. The results of the monitoring shall be submitted to the Local Planning Authority within one month of the survey being carried out. The frequency of the monitoring will be reviewed by the Local Planning Authority following the first year of operations on site.*

*4. Train movements in and out of the site will only take place between the hours of 07:00 to 23:00. Train movements in and out of the site outside the hours 07:00 to 19:00 Monday to Friday and 07:00 to 13:00 on Saturdays will be restricted to no more than one train entering the site and one train leaving the site. Trains will not be permitted to idle on the site outside the*

*working hours of 07:00 to 19:00 Monday to Friday and 07:00 to 13:00 on Saturdays.*

*5. No vehicle and/or mobile plant used exclusively on site shall be operated unless they have been fitted with white noise alarms to ensure that, when reversing, they do not emit a warning noise that would have an adverse impact on residential amenity.*

*6. No vehicle, plant, equipment and/or machinery shall be operated at the site unless it has been fitted with and uses an effective silencer. All vehicles, plant and/or machinery shall be maintained in accordance with the manufacturer's specification at all times."*

## 9.9 Uncertainty

The site noise calculations use noise levels based on data measured of the similar activities taking place on other sites, and includes on-times that represent a realistic scenario.

The calculations and assessment assume that the barriers and enclosures are constructed to a reasonable standard of workmanship and that there will be no obvious acoustic weaknesses due to unintended holes or gaps in the construction.

The number of train movements during the periods 07:00 to 19:00 and 19:00 to 23:00 are based on the information supplied by the Applicant and assumes that weekend/evening train movements would be restricted to, at most, one train entering the site and switching on and one train starting up and leaving the site during each period.

The calculated noise levels due to train movements will depend on the type of locomotive used. The calculations of train movement noise are based on measurements at a similar site, but if noisier locomotives than those expected or multiple locomotives are used, the calculated noise levels at the dwellings will be higher.

The assessment assumes that the locomotive will not be left idling outside the infill working hours of 07:00 to 19:00 Monday to Friday and 07:00 to 13:00 on Saturdays.

## 9.10 Summary and Conclusions

As part of a planning application for the proposed infilling of the void east of Parkfield Road, Rugby with imported inert materials to be delivered by train to the rail siding to the south of the site, a noise assessment has been conducted to establish baseline noise levels, suggest site noise limits and to test compliance with the noise limits to examine the potential noise impact of the proposals.

Noise limits at dwellings for site noise are suggested, based on the guidance contained in BS 5228-1:2009+A1:2014 "*Code of practice for noise and vibration on construction and open sites – Part 1: Noise*" and Planning Practice Guidance and having regard to the measured background noise levels at locations taken to be representative of the dwellings selected for this assessment.

Site noise calculations have been undertaken for four locations, taken to be representative of the nearest dwellings to the proposed unloading/infilling areas. The calculated site noise levels are presented for inspection and comparison with the suggested site noise limits at the dwellings and demonstrate compliance with the suggested site noise limits at the nearest noise sensitive properties.

The calculated site noise levels for both the initial temporary site preparation operations and the longer term unloading/infilling operations comply with the suggested site noise limits at all the assessment locations.

Since the proposed operations conform to the advice set out in the aforementioned guidance with regard to noise from both site preparation and longer term operations, it is considered that the site can be worked while complying with noise levels in line with the guidance for mineral sites and long term earth moving operations as presented in BS 5228

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1:2009+A1:2014 “Code of practice for noise and vibration on construction and open sites – Part 1: Noise” and Planning Practice Guidance.

The Applicant wishes to move trains in and out of the site between 07:00 and 23:00, i.e. including up to two movements outside the infilling working hours of the site, specifically between 19:00 and 23:00.

The noise from the movement of trains in and out of the site has also been examined in this assessment and noise from train movements in and out of the site during the period 07:00 to 23:00 have been demonstrated to be below or just above the Lowest Observed Adverse Effect Level of 50 dB L<sub>Aeq 16 hour</sub> for daytime/evening.

Planning conditions relating to noise have also been suggested including a condition related to site noise monitoring as suggested in Planning Practice Guidance to ensure that noise emissions from the site will be kept to within the suggested site noise limits.

## **D2**    **Noise assessment appendices**

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## **Appendix 9.1 – Glossary of Acoustic Terms**

### **General Noise and Acoustics**

The following section describes some of the parameters that are used to quantify noise.

#### **Decibels dB**

Noise levels are measured in decibels. The decibel is the logarithmic ratio of the sound pressure to a reference pressure ( $2 \times 10^{-5}$  Pascals). The decibel scale gives a reasonable approximation to the human perception of relative loudness. In terms of human hearing, audible sounds range from the threshold of hearing (0 dB) to the threshold of pain (140 dB).

#### **A-weighted Decibels dB(A)**

The 'A'-weighting filter emulates human hearing response for low levels of sound. The filter network is incorporated electronically into sound level meters. Sound pressure levels measured using an 'A'-weighting filter have units of dB(A) which is a single figure value to represent the overall noise level for the entire frequency range.

A change of 3 dB(A) is the smallest change in noise level that is perceptible under normal listening conditions. A change of 10 dB(A) corresponds to a doubling or halving of loudness of the sound. The background noise level in a quiet bedroom may be around 20 –30 dB(A); normal speech conversation around 60 dB(A) at 1 m; noise from a very busy road around 70-80 dB(A) at 10m; the level near a pneumatic drill around 100 dB(A).

#### **Façade Noise Level**

Façade noise measurements are those undertaken near to reflective surfaces such as walls, usually at a distance of 1m from the surface. Façade noise levels at 1m from a reflective surface are normally around 3 dB greater than those obtained under freefield conditions.

#### **Freefield Noise Level**

Freefield noise measurements are those undertaken away from any reflective surfaces other than the ground

#### **Frequency Hz**

The frequency of a noise is the number of pressure variations per second, and relates to the "pitch" of the sound. Hertz (Hz) is the unit of frequency and is the same as cycles per second. Normal, healthy human hearing can detect sounds from around 20 Hz to 20 kHz.

#### **Octave and Third-Octave Bands**

Two frequencies are said to be an octave apart if the frequency of one is twice the frequency of the other. The octave bandwidth increases as the centre frequency increases. Each bandwidth is 70% of the band centre frequency.

Two frequencies are said to be a third-octave apart if the frequency of one is 1.26 times the other. The third octave bandwidth is 23% of the band centre frequency.

There are recognised octave band and third octave band centre frequencies. The octave or third-octave band sound pressure level is determined from the energy of the sound which falls within the boundaries of that particular octave or third octave band.

## Appendix 9.1 (continued)

### Equivalent Continuous Sound Pressure Level $L_{Aeq,T}$

The 'A'-weighted equivalent continuous sound pressure level  $L_{Aeq,T}$ , is a notional steady level which has the same acoustic energy as the actual fluctuating noise over the same time period T. The  $L_{Aeq,T}$  unit is dominated by higher noise levels, for example, the  $L_{Aeq,T}$  average of two equal time periods at, for example, 70 dB(A) and 50 dB(A) is not 60 dB(A) but 67 dB(A).

The  $L_{Aeq}$  is the chosen unit of BS 7445-1:2003 "Description and Measurement of Environmental noise".

### Maximum Sound Pressure Level $L_{Amax}$

The  $L_{Amax}$  value describes the overall maximum 'A'-weighted sound pressure level over the measurement interval. Maximum levels are measured with either a fast or slow time weighted, denoted as  $L_{Amax,f}$  or  $L_{Amax,s}$  respectively.

### Noise Rating NR

The noise rating level is a single figure index obtained from an octave band analysis of a noise. The NR level is obtained by comparing the octave band sound pressure levels to a set of reference curves and the highest NR curve that is intersected by the sound pressure levels gives the NR level.

### Sound Exposure Level $L_{AE}$ or SEL

The sound exposure level is a notional level which contains the same acoustic energy in 1 second as a varying 'A'-weighted noise level over a given period of time. It is normally used to quantify short duration noise events such as aircraft flyover or train passes.

### Statistical Parameters $L_N$

In order to cover the time variability aspects, noise can be analysed into various statistical parameters, i.e. the sound level which is exceeded for N% of the time. The most commonly used are the  $L_{A01,T}$ ,  $L_{A10,T}$  and the  $L_{A90,T}$ .

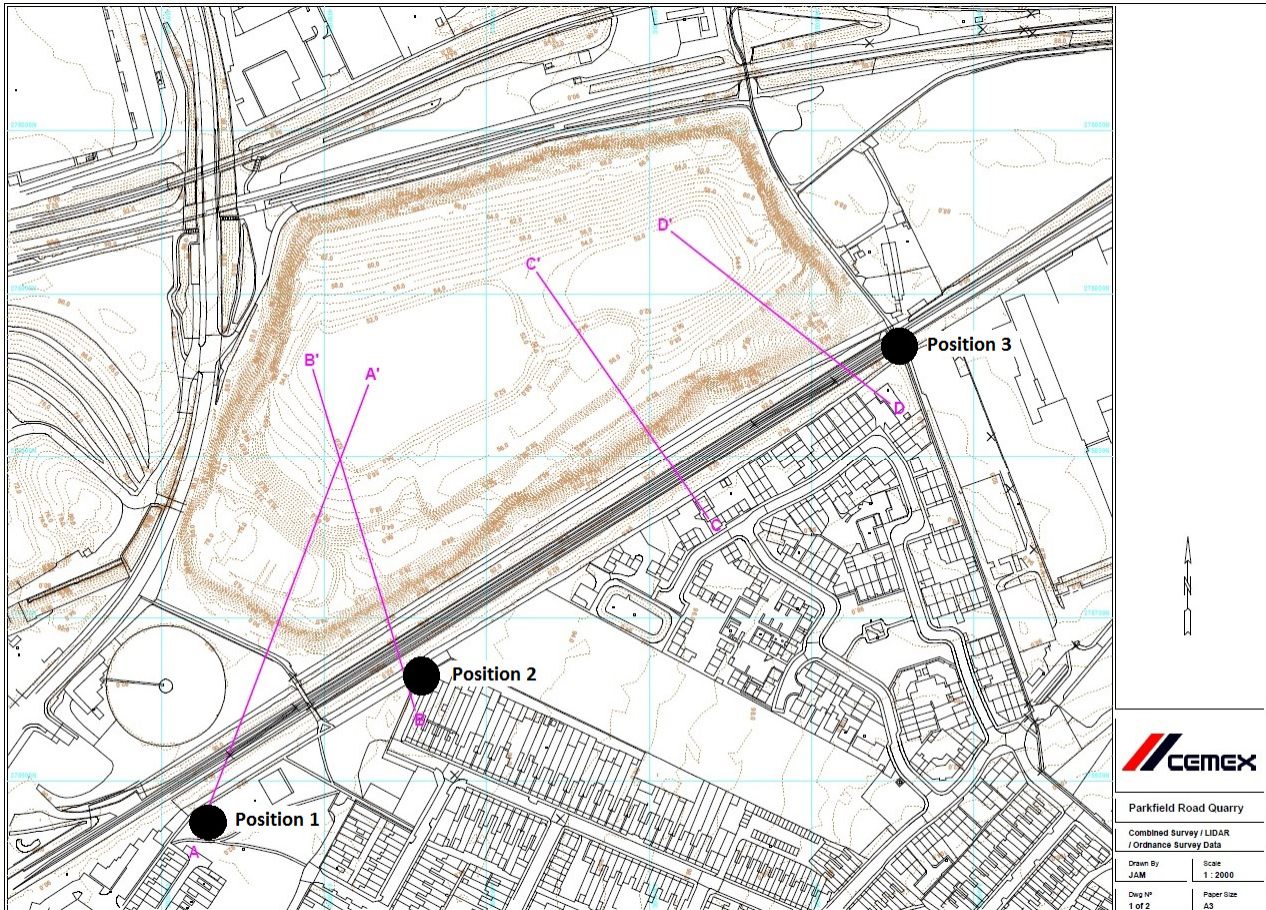
$L_{A01,T}$  is the 'A'-weighted level exceeded for 1% of the time interval T and is often used to give an indication of the upper maximum level of a fluctuating noise signal.

$L_{A10,T}$  is the 'A'-weighted level exceeded for 10% of the time interval T and is often used to describe road traffic noise. It gives an indication of the upper level of a fluctuating noise signal. For high volumes of continuous traffic, the  $L_{A10,T}$  unit is typically 2–3 dB(A) above the  $L_{Aeq,T}$  value over the same period.

$L_{A90,T}$  is the 'A'-weighted level exceeded for 90% of the time interval T, and is often used to describe the underlying background noise level.

## Appendix 9.2 – Site Location Plan & Measurement/Calculation Locations

### Measurement Locations:



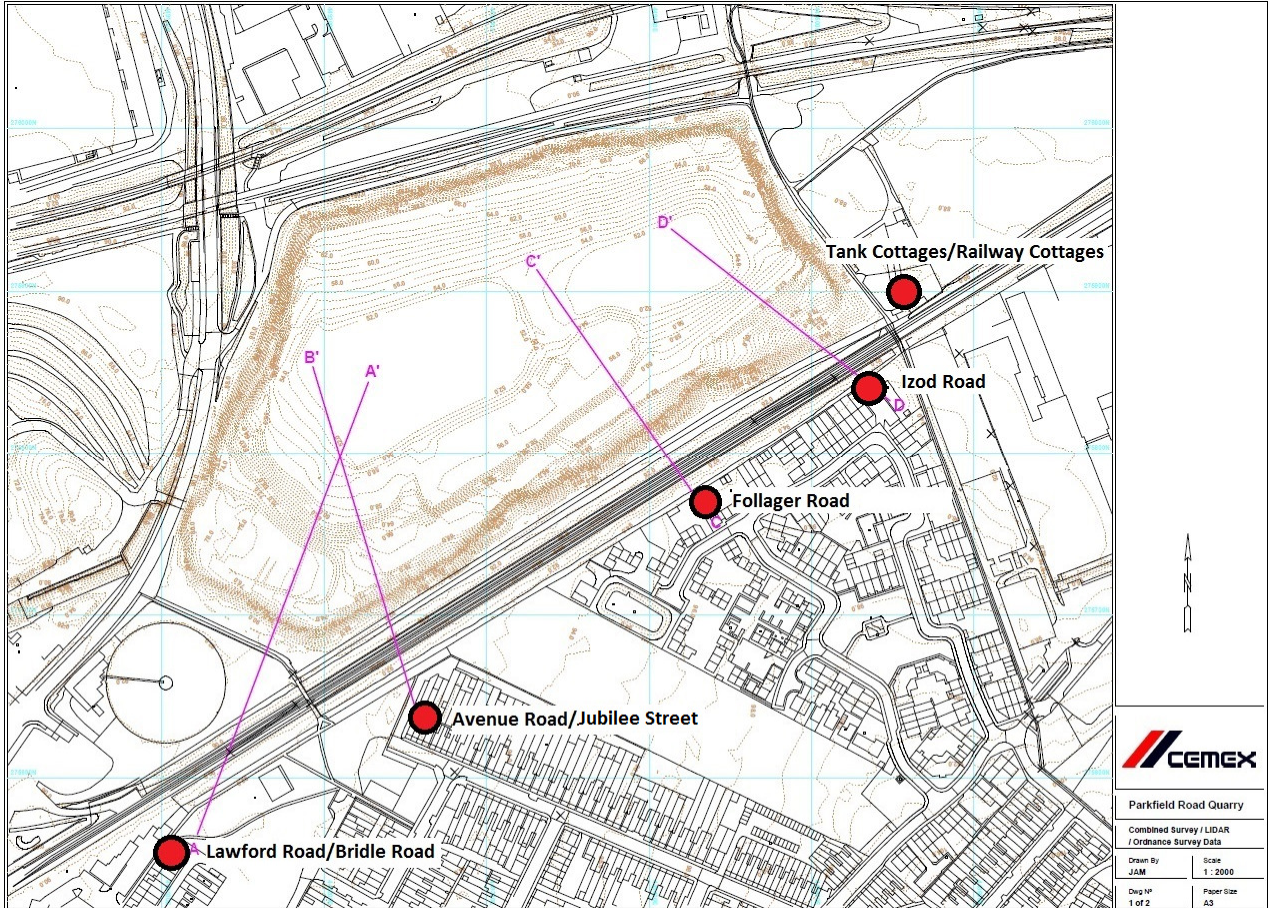
● Approximate positions of baseline noise survey locations

Location	Description
1. Recreation Ground	On recreation ground, 7.5 metres from fence of nearest garden.
2. Allotment Entrance	On path 10 metres from locked gate to allotments.
3. Tank Cottages	On path by disused railway lines.



## Appendix 9.2 - Site Location Plan & Measurement/Calculation Locations (continued)

### Calculation Locations:



● Approximate positions of calculation locations

## Appendix 9.3 – Instrumentation and Calibration Details

### Date and Location of Survey

Thursday 27 April 2017

In the vicinity of Parkfield Road, Rugby

### Survey carried out by

Paul Cockcroft

### Weather Conditions

Dry, light cloud, northerly wind 1-2 m/s, 6-9°C

### Instrumentation used (Serial Number)

Norsonic 140 Sound Level Meter (1403136)

Norsonic 1251 Calibrator (31992)

### Calibration

The sensitivity of the meter was verified on site immediately before and after the survey. The measured calibration levels were as follows:

Survey Date	Start Cal	End Cal
Thursday 27 April 2017 (Between 08:50 and 10:45)	113.8 dB(A)	113.9 dB(A)

The meter and calibrator are tested monthly against a Brüel and Kjær Pistonphone, type 4220 (serial number 375806) and a Norsonic Calibrator, type 1253 (serial number 22906) with UKAS approved laboratory certificate of calibration.

### Survey Details

Attended sample measurements of 15 minute duration were taken at each of the chosen locations. The microphone was at a height of approximately 1.4 metres above local ground level, with a windshield used throughout.

The start times of each sample are tabulated with the results in Appendix D.

## Appendix 9.3 – Instrumentation and Calibration Details (continued)

### Date and Location of Survey

Tuesday 04 July 2017

In the vicinity of Parkfield Road, Rugby

### Survey carried out by

Matthew Sweet

### Weather Conditions

Dry, overcast, south-westerly wind 1-3 m/s, ~18°C

### Instrumentation used (Serial Number)

Norsonic 140 Sound Level Meter (1403136)

Norsonic 1251 Calibrator (31992)

### Calibration

The sensitivity of the meter was verified on site immediately before and after the survey. The measured calibration levels were as follows:

Survey Date	Start Cal	End Cal
Tuesday 04 July 2017 (Between 11:05 and 13:20)	113.8 dB(A)	113.7 dB(A)

The meter and calibrator are tested monthly against a Brüel and Kjær Pistonphone, type 4220 (serial number 375806) and a Norsonic Calibrator, type 1253 (serial number 22906) with UKAS approved laboratory certificate of calibration.

### Survey Details

Attended sample measurements of 15 minute duration were taken at each of the chosen locations. The microphone was at a height of approximately 1.4 metres above local ground level, with a windshield used throughout.

The start times of each sample are tabulated with the results in Appendix D.

## Appendix 9.3 – Instrumentation and Calibration Details (continued)

### Date and Location of Survey

Monday 10 July 2017

In the vicinity of Parkfield Road, Rugby

### Survey carried out by

Robert Storey

### Weather Conditions

Dry, cloudy, westerly wind 0-3 m/s, 22-24°C

### Instrumentation used (Serial Number)

Norsonic 140 Sound Level Meter (1404819)

Norsonic 1251 Calibrator (33321)

### Calibration

The sensitivity of the meter was verified on site immediately before and after the survey. The measured calibration levels were as follows:

Survey Date	Start Cal	End Cal
Monday 10 July 2017 (Between 11:30 and 13:40)	113.8 dB(A)	113.7 dB(A)

The meter and calibrator are tested monthly against a Brüel and Kjær Pistonphone, type 4220 (serial number 375806) and a Norsonic Calibrator, type 1253 (serial number 22906) with UKAS approved laboratory certificate of calibration.

### Survey Details

Attended sample measurements of 15 minute duration were taken at each of the chosen locations. The microphone was at a height of approximately 1.4 metres above local ground level, with a windshield used throughout.

The start times of each sample are tabulated with the results in Appendix D.

## Appendix 9.3 – Instrumentation and Calibration Details (continued)

### Date and Location of Plant Noise Survey

Thursday 06 July 2017

At Barrington Quarry, Cambridgeshire

### Survey carried out by

Paul Cockcroft

### Weather Conditions

Dry, cloudy, ~16°C

### Instrumentation used (Serial Number)

Norsonic 140 Sound Level Meter (1404819)

Norsonic 1251 Calibrator (33321)

### Calibration

The sensitivity of the meter was verified on site immediately before and after the survey. The measured calibration levels were as follows:

Survey Date	Start Cal	End Cal
Thursday 06 July 2017 (Between 07:40 and 08:40)	113.8 dB(A)	113.8 dB(A)

The meter and calibrator are tested monthly against a Brüel and Kjær Pistonphone, type 4220 (serial number 375806) and a Norsonic Calibrator, type 1253 (serial number 22906) with UKAS approved laboratory certificate of calibration.

### Survey Details

Attended sample measurements of up to 15 minute duration were taken at three locations close to the operation measured. The microphone was at a height of approximately 1.4 metres above local ground level, with a windshield used throughout.

The results are tabulated with the results in Appendix E.

## Appendix 9.3 – Instrumentation and Calibration Details (continued)

### Date and Location of Plant Noise Survey

Friday 25 August 2017

At Stanford-le-Hope, Essex

### Survey carried out by

Paul Cockcroft

### Weather Conditions

Dry, sunny, calm, ~19°C

### Instrumentation used (Serial Number)

Norsonic 140 Sound Level Meter (1403136)

Norsonic 1251 Calibrator (31992)

### Calibration

The sensitivity of the meter was verified on site immediately before and after the survey. The measured calibration levels were as follows:

Survey Date	Start Cal	End Cal
Friday 25 August 2017 (Between 10:30 and 11:00)	113.7 dB(A)	113.7 dB(A)

The meter and calibrator are tested monthly against a Brüel and Kjær Pistonphone, type 4220 (serial number 375806) and a Norsonic Calibrator, type 1253 (serial number 22906) with UKAS approved laboratory certificate of calibration.

### Survey Details

Attended sample measurements of up to 5 minute duration were taken at various locations close to the operation measured. The microphone was at a height of approximately 1.4 metres above local ground level, with a windshield used throughout.

The results are tabulated with the results in Appendix E.

## Appendix 9.4 – Baseline Survey Results

### Results and Observations

**Thursday 27 April 2017, 08:50 to 10:45**

Dry, light cloud, northerly wind 1-2 m/s, 6-9°C

Position	Start Time	Results dB (T = 15 minutes)				Comments
		L <sub>Aeq,T</sub>	L <sub>Amax,f</sub>	L <sub>A10,T</sub>	L <sub>A90,T</sub>	
1. Recreation Ground	08:50	50	64	52	47	Road traffic. Birdsong. CEMEX cement plant. Distant train horns.
2. Allotment Entrance	09:08	54	72	57	47	CEMEX cement plant. Birdsong. Trains. Horns. Power tool in garden. Aircraft.
3. Tank Cottages	09:34	52	73	54	44	CEMEX cement plant. Trains. Car turning. Church bells. Birdsong.
3. Tank Cottages	09:50	53	69	58	44	CEMEX cement plant. Birdsong. Vehicle movement/activity at Alstom Limited site. Trains. Aircraft.
2. Allotment Entrance	10:12	52	69	53	47	Cemex cement plant. Birdsong. Distant road traffic. Trains.
1. Recreation Ground	10:30	52	64	54	49	CEMEX cement plant. Parkfield Road traffic. Birdsong.

## Appendix 9.4 – Baseline Survey Results (continued)

### Results and Observations

**Tuesday 04 July 2017, 11:05 to 13:20**

Dry, overcast, south-westerly wind 1-3 m/s, ~18°C

Position	Start Time	Results dB (T = 15 minutes)				Comments
		L <sub>Aeq,T</sub>	L <sub>Amax,f</sub>	L <sub>A10,T</sub>	L <sub>A90,T</sub>	
1. Recreation Ground	11:05	52	66	55	48	Plant noise and activity from CEMEX site. Road traffic. Birdsong. Some brief plant noise to west. Distant train and horn.
2. Allotment Entrance	11:24	49	64	50	46	Continuous plant noise from CEMEX site. Distant road traffic. Birdsong. Distant train movement.
3. Tank Cottages	11:52	49	76	51	42	Continuous plant noise from CEMEX site. Distant road traffic. Train passes to north. Birdsong. Breeze in trees. Some brief hammering noises to SE at derelict site.
1. Recreation Ground	12:16	51	59	52	50	Constant plant noise from CEMEX site. Sound of water pouring into open tank to west. Birdsong. Road traffic.
2. Allotment Entrance	12:37	50	67	52	48	Continuous plant noise from CEMEX site, including water noise from tank. Passing trains. Birdsong. Light aircraft. Occasional car on local road.
3. Tank Cottages	13:01	49	64	51	44	Continuous plant noise from CEMEX site. Passing trains on line to north. Birdsong. Distant road traffic.



## Appendix 9.4 – Baseline Survey Results (continued)

### Results and Observations

**Monday 10 July 2017, 11:30 to 13:40**

Dry, cloudy, westerly wind 0-3 m/s, 22-24°C

Position	Start Time	Results dB (T = 15 minutes)				Comments
		L <sub>Aeq,T</sub>	L <sub>Amax,f</sub>	L <sub>A10,T</sub>	L <sub>A90,T</sub>	
1. Recreation Ground	11:32	52	65	54	50	CEMEX site (plant noise, impact noises, horn). Birdsong. Breeze in trees. Low light aircraft. Trains and train horns. Distant road traffic. Loud motorbike on residential street. Distant car horn.
2. Allotment Entrance	11:49	51	65	53	48	CEMEX site (plant noise). Breeze in trees. Birdsong. Distant road traffic. Voice of resident. Low light aircraft. Trains and train horns.
3. Tank Cottages	12:12	49	63	52	44	CEMEX site (plant noise, reversing beepers, impact noise). Distant road traffic. Birdsong. Train and train horn. Voice of cyclist. Breeze in trees. Industrial noise to NW (cutting/welding, impact noise.) Chimes at church.
1. Recreation Ground	12:35	64	94	53	50	CEMEX site (plant noise, impact noises, horn). Distant road traffic. Birdsong. Breeze in trees. Voice of dog walker. Dog barking. Trains. Aircraft.
2. Allotment Entrance	13:04	50	69	51	47	CEMEX site (plant noise, impact noises). Distant road traffic. Birdsong. Breeze in trees. Trains and train horns. Aircraft. Distant car horns.
3. Tank Cottages	13:25	49	66	52	44	CEMEX site (plant noise, reversing beepers). Birdsong, Distant road traffic. Distant dog barking. Aircraft. .Industrial noise to NW (plant noise, cars, impact noises). Trains and train horns. Distant train horn. Breeze in trees. Chimes at church.

## Appendix 9.5 – Plant Noise Survey Results

### Plant Measurements (Barrington Quarry)

Thursday 06 July 2017

Dry, cloudy, ~16°C

Comments	Distance to Plant, m	Measured Activity Noise Level $L_{Aeq,T}$	Measured Activity Noise Level $L_{Amax,f}$	Measured Activity Noise Level $L_{A90,T}$
Liebherr LH60 Tracked Material Handler unloading train	23	65	84	60
	23	65	78	61
Liebherr 944 Tracked Material Handler unloading train	19	77	94	74
Komatsu D65 PX Dozer on infill	30	72	81	57

### Plant Measurements (Stanford-le-Hope)

Friday 25 August 2017

Dry, sunny, calm, ~19°C

Comments	Distance to Plant, m	Measured Activity Noise Level $L_{Aeq,T}$	Measured Activity Noise Level $L_{Amax,f}$	Measured Activity Noise Level $L_{A90,T}$
Liebherr PR276 Crawler Tractor/Dozer	30	64	73	60
	22	72	81	66
	22	73	86	64
	40	66	81	49
	30	71	89	62
	30	71	91	63

## Appendix 9.6 – Noise Calculation Method and Calculation Sheet

Specific noise levels are predicted or measured in terms of the Equivalent Continuous Noise Level,  $L_{Aeq,T}$  over a given reference time interval, T. In the Planning Practice Guidance for the NPPF the time interval for daytime, evening and night the reference time interval is 1 hour.

The calculation method for any plant which is relatively fixed in location is that set out in BS 5228-1: 2009 + A1: 2014, Annex F, and is the “Method for activity  $L_{Aeq}$ ” described in section F.2.2 or the “Method for plant sound power level” described in section F.2.3.

The calculation method for site mobile plant such as lorries and dump trucks is that set out in BS 5228-1: 2009 + A1: 2014, Annex F, and is the “Method for mobile plant using a regular well defined route (e. g. haul roads)” described in section F. 2. 5.

Ground Absorption has been calculated using the technique set out in BS 5228-1: 2009 + A1: 2014, Annex F, assuming 80% soft ground between the infilling area and the receiver locations.

The method of assessing screening is that attributed to Maekawa as used in BS 5228-1: 2009 + A1: 2014, Annex F and various other Government published documents. This method uses the calculated path difference and octave band noise data for each noise source over the frequency range stated in BS 5228-1: 2009 + A1: 2014, Annex F.

The effects of ground absorption are not used in the calculations if screening has been assessed and offers a higher attenuation.

The nearest distances to the respective dwellings, from the various items of plant, have been used in an acoustic model for the site to calculate the reasonable worst case  $L_{Aeq,T}$  site noise levels.

A summary site noise calculation sheet for one of the receiver locations is included below.

