

Environmental Setting and Site Design

***Land at Brent Hall, Russell Green, Boreham Road,
Chelmsford***

Prepared by



For

Land Logical Dartford Limited

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[LLDL-RG-ESSD-V2]

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LLDL-RG-EP-01	Environmental Permit Boundary	
8198-001-001	Existing Ground Conditions	
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LLDL-RG-PHS-01	Phasing Plan	
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70071-002-001	Planting Plan	

1. INTRODUCTION

1.1 This report provides the Environment Setting and Site Design for the proposed restoration work at Russell Green.

1.2 The works involve deposit of waste for recovery.

The Applicant

1.3 Land Logical Dartford Limited (LLDL) has vast experience in restoring and contributing to providing sustainable re-uses of land.

1.4 They have existing waste permits to carry out recovery operations and use mobile plant.

1.5 The company invest in staff training and development.

The Agent

1.6 This report has been prepared by Alison Crooks BSc AssocRTPI MCIWM CEnv, from Integrated Skills Limited.

Reason for Development

1.7 Planning permission has been granted for the restoration of land at Brent Hall, Russell Green, Boreham, CM3 3BA.

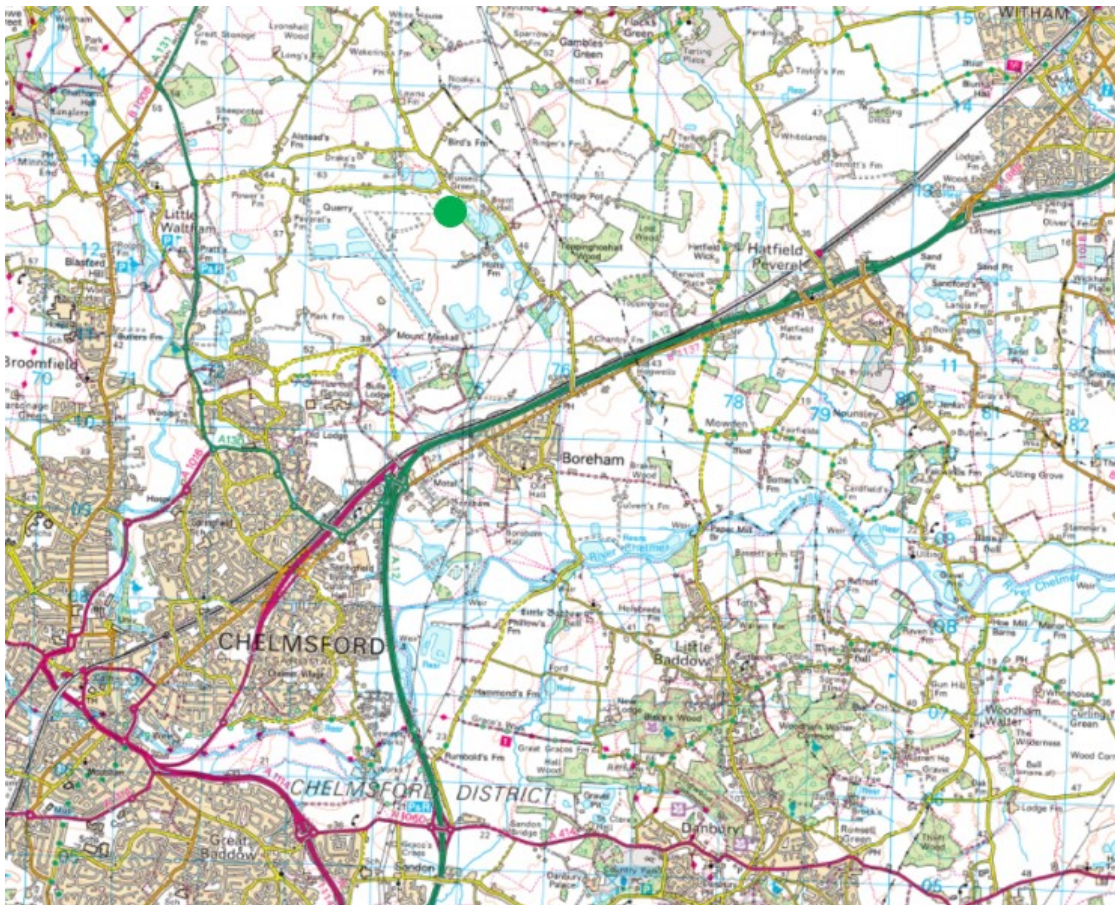
1.8 The Environment Agency has confirmed the scheme is a recovery operation.

1.9 The proposed development involves using waste to restore the former quarry and achieve slope stability.

2. SITE SETTING

- 2.1 The site is located on land at Brent Hall, Russell Green, Boreham, CM3 3BA, centred at NGR TL 74626 12590. It is approximately 1.6 miles north west of Chelmsford.
- 2.2 The site extends to approximately 2.6 hectares(ha) located to the north-east of Chelmsford and approximately 1.6 miles north-west of Boreham village. The site is adjacent to Boreham Road with an existing access to the site via a gated concrete-surfaced entrance to the north east of the site. Bulls Lodge Quarry abuts the application site to the south-west.
- 2.3 The application boundary is shown on Drawing No. LLDL/RG/EP/01, and the general location is shown on Figure 1.

Figure 1 – Site Location (Green Dot denotes site)



- 2.4 With reference to the MAGIC database, there are no ecological designations within 2km of the site. The search included Special Areas of Conservation, Special Protection Areas, Sites of Special Scientific Interest, Ramsar sites, Local Nature Reserves and National Nature Reserves.
- 2.5 The bedrock geology is unproductive. The superficial drift geology provides a secondary (undifferentiated) aquifer.
- 2.6 The site is not located in any Groundwater Source Protection Zone.

- 2.7 The site is in Flood Zone 1 and therefore has a low probability of flooding from rivers, sea and surface water.
- 2.8 The site does not lie within an Air Quality Management Area.

3. SITE DEVELOPMENT

Historical Development

- 3.1 Permission was granted in September 1983 for the extraction of sand and gravel from the site with subsequent restoration to farmland and a small, landscaped lake following mineral extraction. The site has not been restored and retains a large former sand and gravel quarry pit(s) located centrally within the site extending to approximately 2ha. The former quarry pit(s) have become established as a series of ponds and the remainder of the site contains grassland, scrub, trees and hedgerow.
- 3.2 The former sand and gravel extraction operations left a steep bank along the south west edge of the site. It is 12m high, with a steep gradient.
- 3.3 There are no known previous pollution incidents at the site.

Proposed Development

- 3.4 The stability of the bank has been assessed by third party geotechnical specialists. The average slope angle is 1:2. The Stability Risk Assessment confirms that the slope along the western quarry face will fail if not restored. Progressive failures have occurred at the unrestored western quarry faces since 2013.
- 3.5 Planning permission has been granted to restore the site and achieve a stable slope at 1:4. The development also includes landscaping.
- 3.6 To achieve the restoration will require the importation of 60,150m³ (85,000 tonnes) of inert material. There is already 3,300m³ of material on site which will be incorporated into the restoration.
- 3.7 A conversion factor of 1.8 has been used to calculate the tonnage.
- 3.8 There is also a need to import 23,270 tonnes of topsoil to create the final surface layer for planting and creating the biodiversity enhancement scheme.
- 3.9 The imported material will be used to stabilise the former western bank of the quarry from 12m high with a 1:2 gradient to a 1:4 slope. This will create a gentler and more naturalistic landform.
- 3.10 The following plans are provided:

Existing Contours	8198-001-001
Proposed Contours	8198-001-002
Cross Sections	8198-001-003
Phasing Plan	LLDL-RG-PHS-01
Planting Plan	70071_002_001 (Rev B)
- 3.11 The following wastes will be used to restore the site:

Table 1 – Proposed Waste Types

Waste Code	Waste Description
01 04 09	Waste sand and clays
17 01 01	Concrete
17 01 02	Bricks
17 01 03	Tiles and ceramics
17 01 07	Mixtures of concrete, bricks, tiles and ceramics
17 05 04	Soils and stones
19 12 09	Minerals (for example sand, stones)
20 02 02	Soils and stones

- 3.12 The wastes will be solid, and all waste will be subject to Waste Acceptance Procedures to ensure that they are suitable for the proposed use. The waste will be derived from construction and demolition sites. All waste producers will be required to complete a Waste Information Form, which provides basic characterisation. If there is any doubt about the condition of the site, a Soil Report will be requested, which provides a more detailed characterisation. This will ensure that only clean material will be used on site. The Waste Acceptance Procedures are set out in a separate document, Reference LLL-RG-EMS-V1.
- 3.13 The amount of material required to be brought to the site under the proposed development has been determined by the Stability Report, which has designed a landform to achieve a stable slope and final restoration profile to enable landscaping.
- 3.14 The applicant sought pre-application advice on the Waste Recovery Plan, which was approved.

4. CSM: SOURCE, PATHWAYS AND RECEPTORS

Source

- 4.1 There is no evidence of historical pollution.
- 4.2 In terms of the proposed development the following potential sources of pollution have been identified:
- Proposed waste
 - Fuel from vehicles
 - Fuel tank
- 4.3 The following wastes will be used to restore the site:

Table 2 – Proposed Waste

Waste Code	Waste Description
01 04 09	Waste sand and clays
17 01 01	Concrete
17 01 02	Bricks
17 01 03	Tiles and ceramics
17 01 07	Mixtures of concrete, bricks, tiles and ceramics
17 05 04	Soils and stones
19 12 09	Minerals (for example sand, stones)
20 02 02	Soils and stones

- 4.4 The waste will be subject to acceptance checks to ensure that it is correctly characterised. This will include pre-acceptance checks to confirm the nature, volume and chemical characteristics, and on-site verification checks to confirm the waste conforms to the pre-acceptance checks.
- 4.5 The fuel tank will be a bunded tank, positioned in the secure compound near the site entrance. Only trained staff will use the tank. A spillage kit will be kept in the adjacent site office.
- 4.6 The site will not be operated on a cellular basis. It will be worked in phases, as set out on drawing no. LLL-RG-PHS-01 and described below. The proposed restoration plan is provided in Drawing No. 8198-001-002.

Phasing

Phase 1: Site Mobilisation (approximately 6 weeks)

- Construction of site entrance, internal haul road to working area, and compound. Installation of site office, wheel wash and fuel tank. See Drawing No. LLDL-RG-INF-01.
- The first 50m closest to road will be concrete over sub-base. The remainder to working area will be compacted secondary aggregate.

Phase 2: Site preparation (approximately 4 weeks)

- Removal of vegetation within working area (avoiding March to August).
- Strip topsoils, including cut-and-fill to minimise volume of import required, stockpile pending re-use in final layer.

Phase 3: Restoration enabling works (approximately 2 weeks)

- Drain existing ponds
- Clear and level base of ponds.

Phase 4: Landforming (approximately 7 months)

- Set out height markers
- Commencement of fill import.
- Key-in trenching against slope, in 250mm compacted layers from base.

Phase 5: Landscaping

- New pond formation and complete final levels with retained topsoil and other finishing soils as required (see Drawing 'Proposed Restoration design').

Phase 6: Landscaping

- Complete planting in accordance with approved Planting Plan (Drawing No. 70071_002_001).

Pond Creation

4.7 Phase 3 will involve draining the ponds. There are 4 existing ponds sized as follows:

- Pond 1 5206sqm
- Pond 2 1552sqm
- Pond 3 969sqm
- Pond 4 845sqm

- 4.8 The ponds are all shallow, with the current water level estimated to be no deeper than 1m.
- 4.9 The water will be pumped from ponds 2, 3 and 4 into Pond 1. Pond 1 forms part of the final pond landform. The water level in Pond 1 was measured to be at 38.5mAOD during the survey. The final restored pond will have a level of 37-44mAOD, showing there is sufficient capacity to hold water. Taking an average of 40mAOD, would have a pond area of 8475sqm.
- 4.10 During the construction, if the water levels need to be managed further, the water will be pumped into a holding tank and used in the wheel wash or for dust suppression.

Proposed Management Measures

- 4.11 The operations will be overseen by a technically competent manager. The site will have 3 site based staff for the duration of the work. These will be multi skilled personnel that can oversee the waste acceptance procedures and operate the plant to place and grade. The operations will be overseen by a technically competent manager. The site will have 3 site based staff for the duration of the work. These will be multi skilled personnel that can oversee the waste acceptance procedures and operate the plant to place and grade the imported material.
- 4.12 The site will only accept pre-notified waste deliveries that have provide basic characterisation of the waste. The site will carry out on-site checks during delivery and unloading.
- 4.13 The EMS documentation sets out the training requirements for all staff.
- 4.14 This is a short term construction project.

Pathway and Receptor

Geology, Hydrogeology and Hydrology

- 4.15 The superficial deposits are Head, which comprise of clay, silt, sand and gravel. The sand and gravels were extracted from the site.
- 4.16 The bedrock geology is the London Clay Formation.
- 4.17 The geology is provided on BGS map 241 Chelmsford. The full map is provided in Appendix A.

Figure 1 – Geology

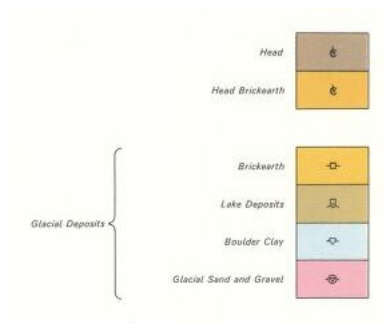
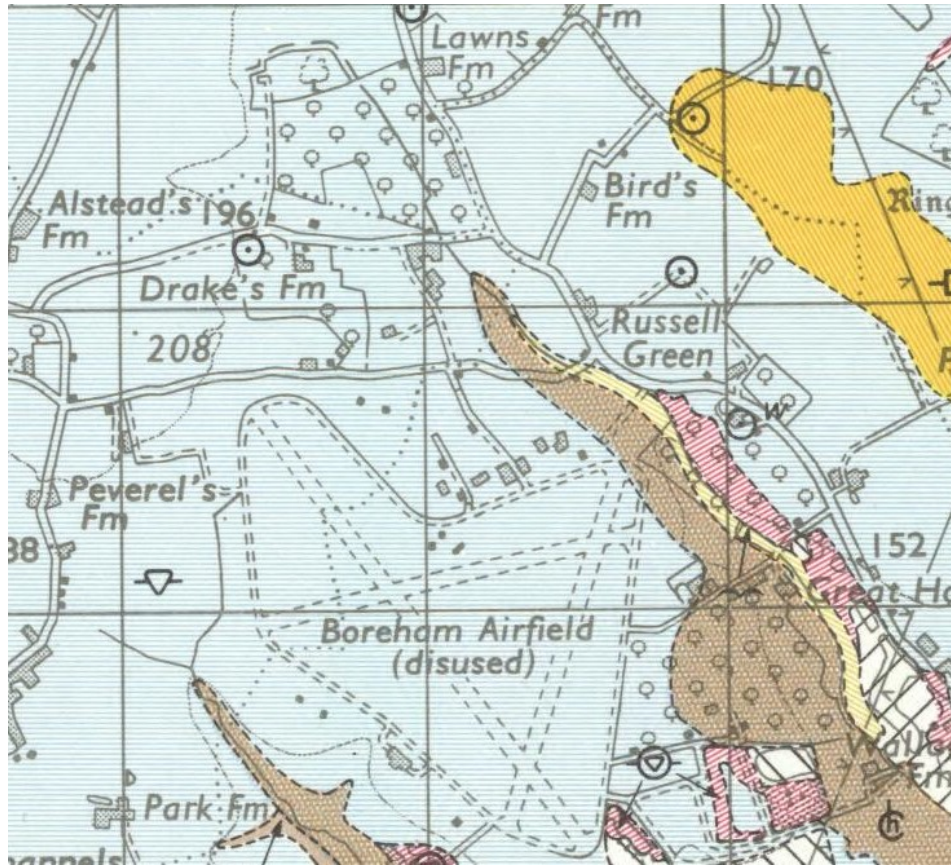
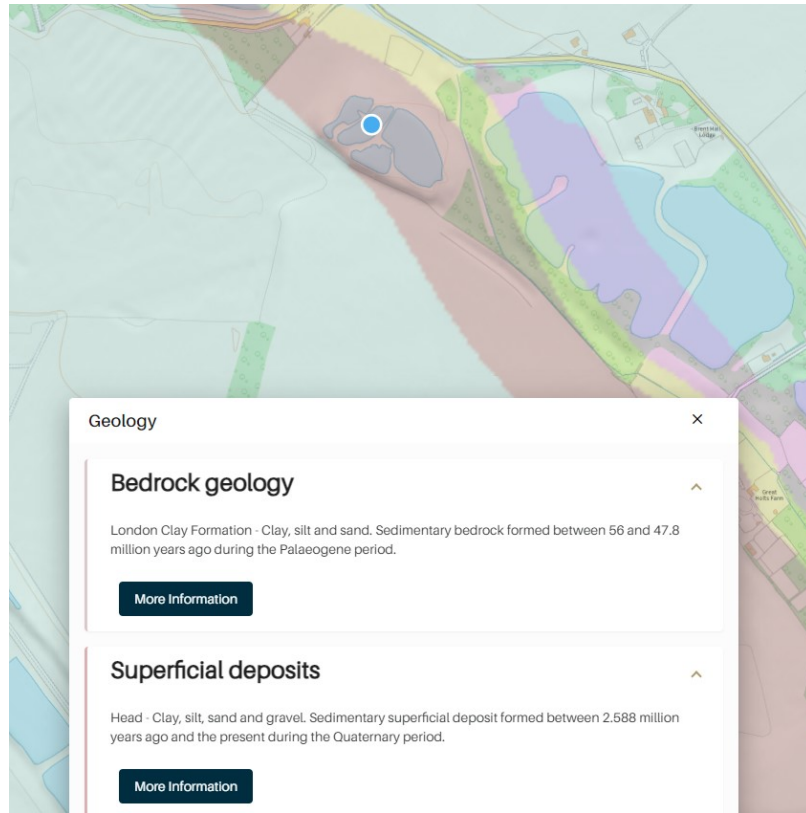
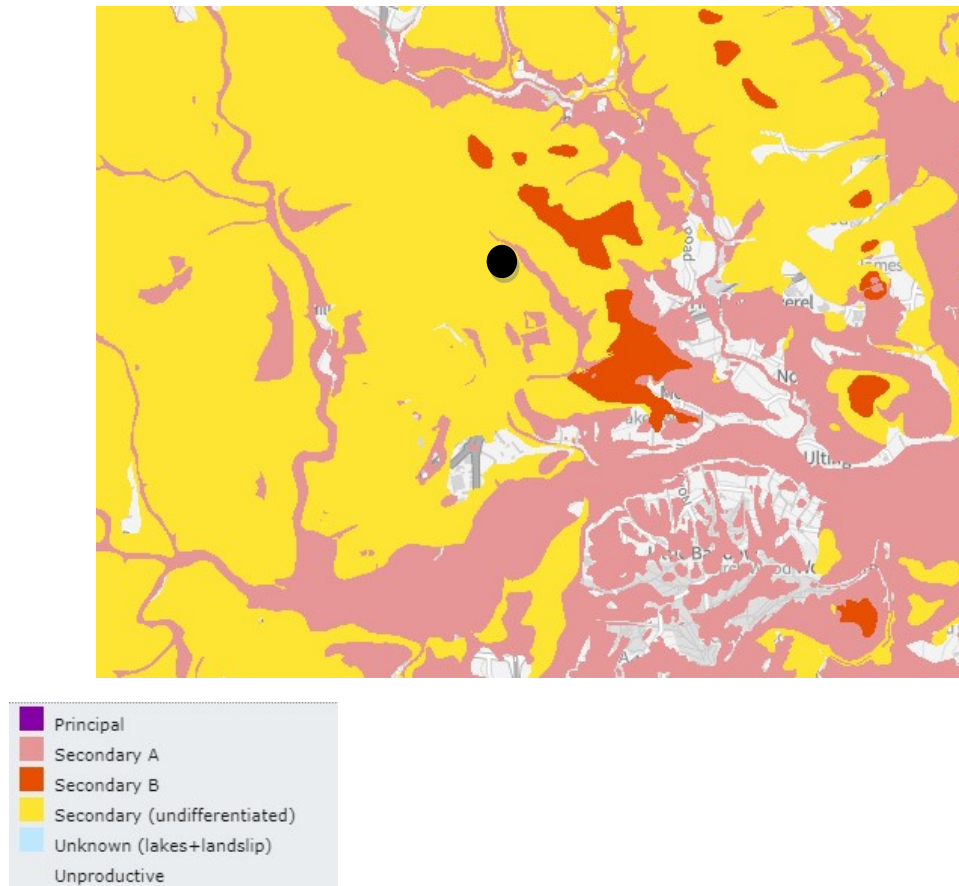


Figure 2 – Geology Status



- 4.18 The bedrock geology is unproductive. The London Clay typically has a low hydraulic conductivity and will restrict the vertical movement of water. The ponds present at the site support this. There is no map to show this status.
- 4.19 The superficial drift geology provides a secondary (undifferentiated) aquifer.

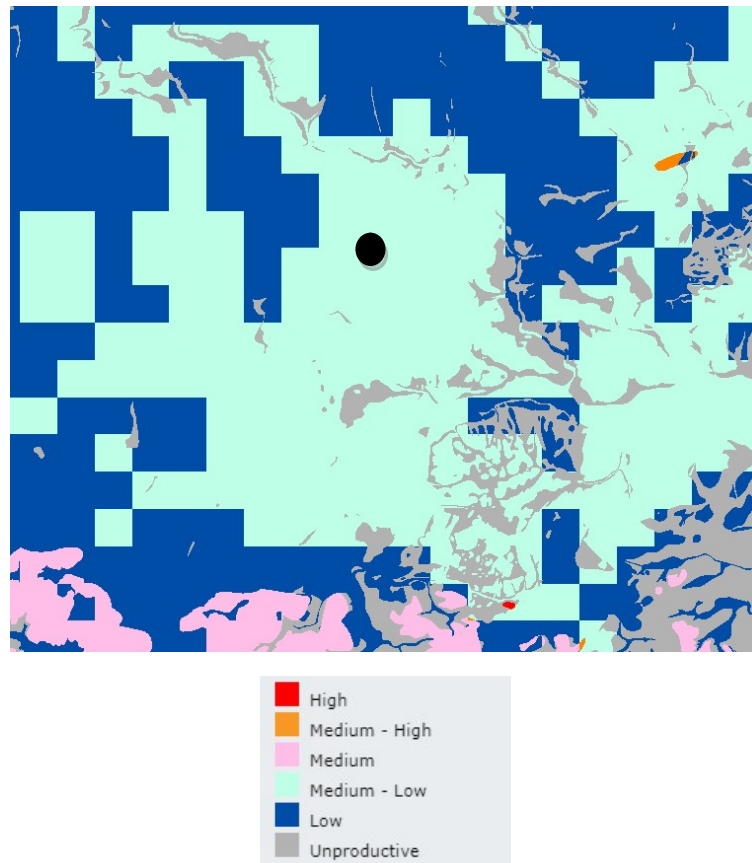
Figure 3 Superficial Geology Aquifer Status



4.20 The site is not located in any Groundwater Source Protection Zone.

4.21 The Groundwater Vulnerability Map confirms the groundwater is classified as Medium-Low. See Figure 4.

Figure 4 - Groundwater Vulnerability Map



- 4.22 The risk assessment has demonstrated that there will be no risk to the groundwater. The groundwater is not highly sensitive, and the use of clean, inert waste will ensure there is no source. The acceptance of material to the site will be subject to Waste Acceptance Procedures, set out in LLDL-RG-EMS-V1.
- 4.23 The low risk to the local hydrogeology and with the management controls in place, a Hydrogeological Risk Assessment is not necessary. This is set out in the Risk Screening tab (LLDL-RG-ERA-V1).

Surface Water

- 4.24 The nearest surface water body is the water in the former quarry. The site is not within 10m of any other watercourse. The restoration scheme will provide a new pond as part of the landscape/ecological scheme.
- 4.25 The existing water will be pumped from one pond to another, to allow each pond to be infilled. The final pond will be used to create the new pond. Pumping the water from the ponds will remove this water as a receptor.
- 4.26 The site is not located within an area that is liable to flood from rivers.
- 4.27 As part of the planning application, a Preliminary Ecological Assessment was carried out, including surveys for notable species. These have been managed through the planning conditions attached to the consent.

- 4.28 The restoration will not impact any of the above designations. The Waste Acceptance Procedures will ensure that only uncontaminated wastes will be used in the project.
- 4.29 There are no man-made subsurface pathways.

Receptors

Amenity (Nuisance and Health)

- 4.30 The Environmental Risk Assessment has assessed the potential risk to all receptors. The risk assessment has shown that the construction works will be carried out without causing a nuisance. Table 3 provides the nearest receptors within 500m of the site. These are also shown on Figure 5.
- 4.31 The nearest ecological designation is the River Ter Site of Special Scientific Interest. This is 2.7km north of the site. There are no Special Areas of Conservation, Special Protection Areas or Ramsar Sites within 10km of the site.
- 4.32 There are Local Nature Reserves or National Nature Reserves within 5km of the site.
- 4.33 There are no Schedule Monuments within 4km of the site.
- 4.34 The nearest Listed Building is Brent Hall, which is a Grade II Listed Building located 330m north east of the site.

Table 3– Site Setting

Receptor	Map Reference	Direction from Operational Area	Minimum Distance from Site Boundary (approx.) (m)
Designated ecological habitats e.g. Ramsar, SAC, SPA, SSSI, LNR			
River Ter SSSI	Not Shown	North	2.5km
Other designations e.g. National Park, AONB, World Heritage Sites			
	N/A	N/A	N/A
Domestic Dwellings			
Brent Hall	B	North East	330
Russell Green Bungalow	C	North East	250
Cranham Road	D	North West	145
Boreham Road	I	South West	640
Listed Buildings			
Brent Hall	B	North East	330
Parks/Green Spaces			
		N/A	N/A
Surface Water			
Pond	A	North West	85
Pond	E	North West	250
Farm Land			
	Surrounding		
Schools / Hospitals / Cemetery			
		N/A	N/A
Recreation			
Commercial and Industrial Premises			
Industrial Estate	F	North West	670
Quarry	G	South West	615
Holts Lane Industrial Estate	H	South East	425

Figure 5 – Site Setting (Blue represents 1km radius around the site, green represents operational boundary)



Compliance Points

- 4.35 The site is not in a sensitive location. No compliance points are proposed.
- 4.36 The scheme includes the provision of a pond as part of the restoration plan.

5. POLLUTION CONTROL MEASURES

Site: General

- 5.1 The site will be secured by perimeter fencing and lockable access gates.
- 5.2 The site entrance gates will be locked when the site is not manned.
- 5.3 The site owner lives adjacent to the site and will notify the operator of any unauthorised access.
- 5.4 The site infrastructure will be located near to the site entrance. This will include a secured, fenced compound containing the site office and bunded fuel tank. There will be a spill kit located in the site office.
- 5.5 The fuel tank has been located approximately 100m from the working area.
- 5.6 The site entrance will be concreted. The haul road will be constructed using compacted hardcore.
- 5.7 The surface water will be managed by pumping the water from the ponds. This will remove any potential receptor.
- 5.8 Conditions will be monitored and if following heavy rainfall, water has collected in the base of the site, it will be removed before works recommence.

5.9 Basal and Site Slope Engineering

- 5.10 Basal and side slope engineering is not relevant as these apply to landfill. A Stability Risk Assessment has been prepared to demonstrate that the existing slope is not stable and requires an engineering solution to achieve stability.

Capping

- 5.11 Capping is not relevant insofar as it relates to landfill development. The restoration work will be completed by a layer of topsoil to provide the landscaping profile for planting.

Restoration

- 5.12 The restoration will be completed to the approved contours. Restoration will also involve the provision of planting to provide the approved final landform.
- 5.13 The approved planting plan is provided on Drawing 70071-002-001.

Surface Water Management

- 5.14 On completion, the site will be graded to create a pond within the site. The existing ponds have been used to manage surface water and the new pond will continue to provide a surface water storage feature.
- 5.15 The design involves the creation of gentler slopes, which will direct water to the pond.
- 5.16 No ditches or drains are proposed.

Post Closure

- 5.17 On completion of the work, the land will be surveyed to ensure that the approved levels have been achieved.
- 5.18 The site infrastructure will be removed (site compound, wheel wash, haul road).
- 5.19 The planting will be implemented in accordance with the approved plan.
- 5.20 There is a requirement to provide a Landscape and Ecological Management Plan under the planning consent. This will include long term management and implementation of the plan to show how conservation aims and objectives are being met and contingency measures and/or remedial action.

Monitoring

- 5.21 No formal monitoring is proposed. The Risk Assessment confirms that due to the site location, remoteness from sensitive receptors and site management techniques, there will be no risk to receptors. As such, no monitoring is required.
- 5.22 The Site Manager will monitor the weather forecast to plan for inclement weather. This may include ceasing work during Red Alerts issued by the Met Office for wind and/or rain.

6. MONITORING

- 6.1 Other than monitoring the weather as part of the day to day site management, there will be no other monitoring undertaken.
- 6.2 The risk assessment has demonstrated that with the Waste Acceptance Procedures, there will be no risk to identified receptors. This will be a short term construction project and as a result, no monitoring is required.

Appendix A – Geology Map Chelmsford

Geological Survey of Great Britain (England and Wales)
Chelmsford
 1:50 000 Series

Sheet 241
 Solid and Drift Edition

GENERALIZED VERTICAL SECTION
 DRIFT
 (Not drawn to scale)

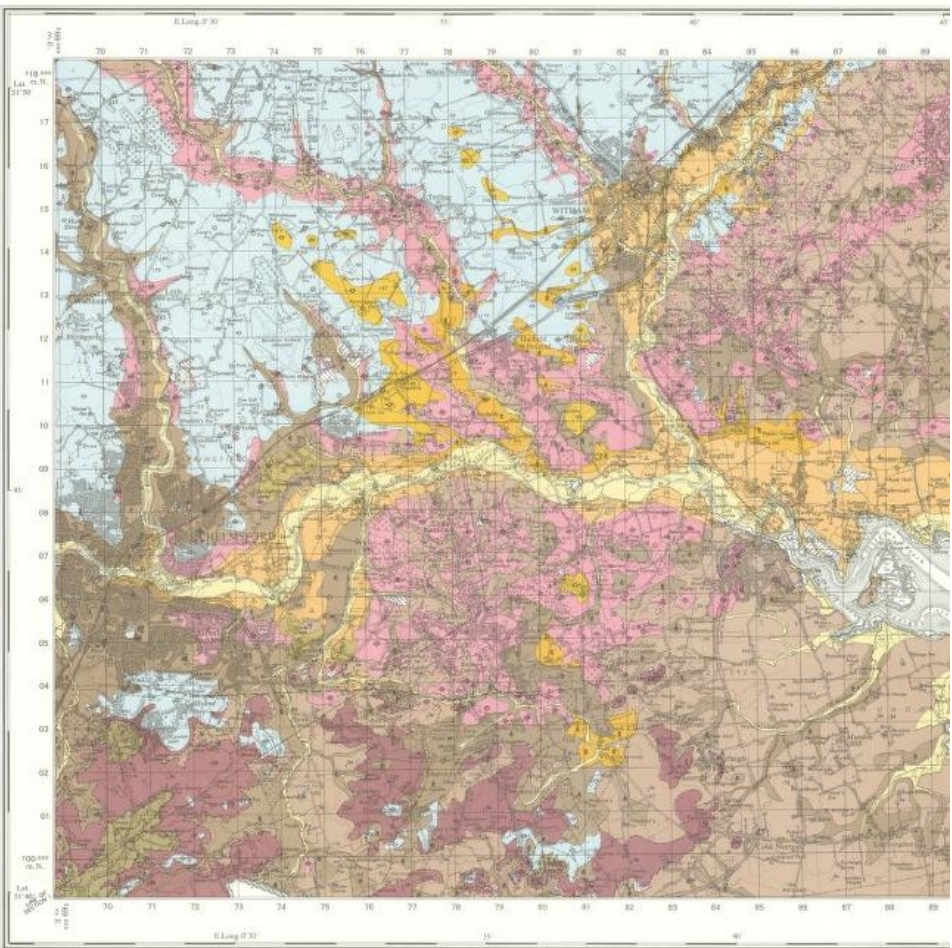
	Cotswold Tuff	
	Flint	
	Tuff (Tuff Deposits)	
	Recent Gravel (Recent)	
	Alluvium (Alluvium)	
	Tertiary Deposits	
	1st Tertiary (Lower)	
	1st Tertiary (Middle)	
	2nd Tertiary (Upper)	
	2nd Tertiary (Lower)	
	3rd Tertiary (Upper)	
	3rd Tertiary (Lower)	
	4th Tertiary (Upper)	
	4th Tertiary (Lower)	
	5th Tertiary (Upper)	
	5th Tertiary (Lower)	
	Tertiary unaffiliated	
	Sand	
	Hard Breccium	
	Breccium	
	Lake Deposits	
	Sluicite Clay	
	Shallow Sand and Gravel	

SOLID
 (Scale - 1 centimetre to 10 metres)

	Rugby Reddish Sand (1st to 4th)	
	Rugby Sand (1st to 2nd)	
	Claygate Sand (1st and 2nd)	
	London Clay (Upper 1st-4th)	

INDEX AND EXPLANATION
 OF GEOLOGICAL SYMBOLS

<ul style="list-style-type: none"> ○ Boundary △ Boundary across site extension □ Mine and/or quarry ◇ Quarry Walled site (wall and ground lines) Mark ground 	<ul style="list-style-type: none"> — Boundary of site, dip or degree Level ground (solid surface, slight uneven to detail) Topographic boundary (contour) Geological boundary (solid) Fault or surface, presumed relative to stratigraphic order Boundary line (dashed or dotted)
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ORDNANCE SURVEY OF GREAT BRITAIN
 Scale 1:50 000

Property maps in blue shown where they occur. Contours are at 50-foot vertical intervals.