

AMENITY RISK ASSESSMENT

1.1 Introduction

1.1.1 The document presents an assessment of the risks to amenity posed by the operation of an inert landfill site at Stanway Quarry, Colchester.

1.1.2 This risk assessment has been undertaken in accordance with the Environment Agency Guidance on 'Risk assessments for your environmental permit', published 1st February 2016.

1.2 Site Setting

Site Description

1.2.1 Stanway Quarry is located within the village and parish of Stanway in the county of Essex. The site is located c. 4.6km south west of the town of Colchester at National Grid Reference: TL95532248. The location of the quarry relative to its surrounding is presented on **Drawing Nos. B030-00676-01 & -02** and extends over an area of circa. 77 ha.

1.2.2 To the west of the landfill area is the remaining quarried area of Stanway Quarry, which is bound to it west by the unclassified road, Warren Lane, from which the quarry site is accessed. Immediately beyond Warren Lane is the Bellhouse Quarry Landfill site operated by Cory Environmental Limited. The Bellhouse Quarry landfill is permitted to accept non-hazardous wastes.

1.2.3 The residential properties of Priory Lodge, Stanway Hall Farm Cottage, The Chase, Warrens, and Heckford Lodge are located beyond the southwestern boundary of the landfill, beyond which is the B1022 (Maldon Road) and then Colchester Zoo. The B1022 routes west-east along the quarry's southern boundary. Residential properties extend eastwards along the Maldon Road to the southeast of the quarry.

1.2.4 Grymes Dyke extends along the quarry's eastern boundary beyond which large areas of agricultural land extend. This dyke and the surrounding agricultural land forms the "Gosbecks Iron Age and Romano-British site" that is listed as a Scheduled Ancient Monument.

1.2.5 The existing site comprises operational mineral extraction areas, areas undergoing restoration, the current mineral processing plant, bagging plant and associated areas of hardstanding and open storage. These operations are set behind mature vegetation (including perimeter hedgerows) and developing woodland.

1.2.6 **Table ARA1** summarises the potential sensitive receptors that have been identified through a desk top assessment of the locality and the corresponding minimum distance from the permit site boundary. The locations of the receptors are shown in **Drawing No. B030-00676-13**.

Table ARA1: Potential Sensitive Receptors identified within 500m of the site

ID	Receptor Name	Type of Receptor	Approximate nearest distance from the operational boundary	Direction from the operational areas	Description
R1	Footpath	Recreational/ Public Right of Way	Adjacent	West	Public Right of Way that extends northwest from Butchers Wood located southwest of the site and subsequently traverses north-south through the quarry (remains accessible to be public)
R2	Warren Plantation & Policeman's Lagoon	Woodland and water body	Adjacent	West/ Southwest	Woodland plantation and wetland/pond to the south of the quarry and north of Maldon Road (B1022)

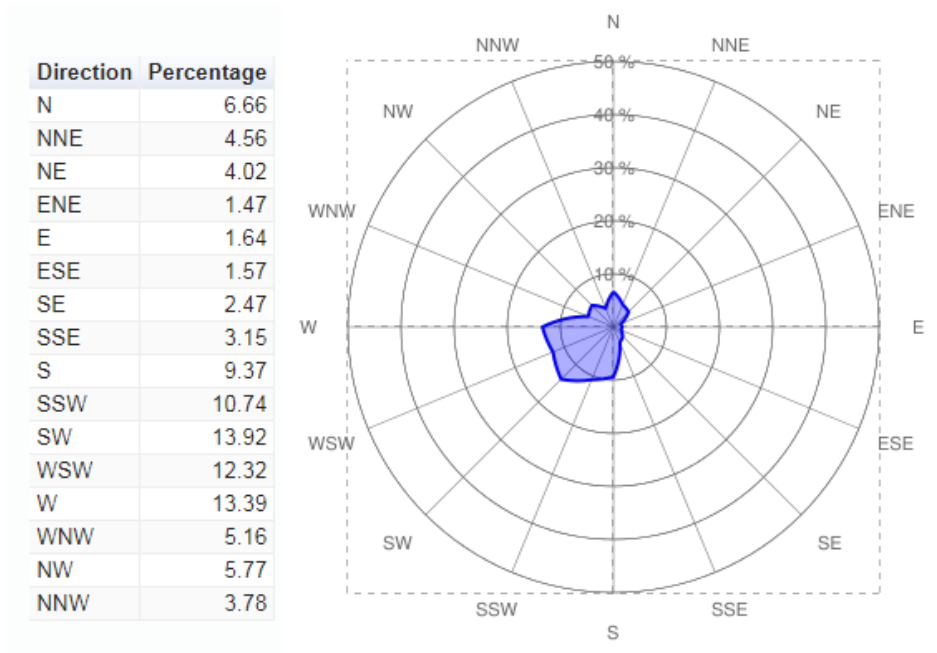
ID	Receptor Name	Type of Receptor	Approximate nearest distance from the operational boundary	Direction from the operational areas	Description
R3	Gryme Dyke	Public Right of Way, Scheduled Ancient Monument and Local Wildlife Site	Adjacent	East	A historical dyke which is accessible to the public and designated as a LWS for its ancient and deciduous woodland habitats
R4	Residential properties along Warren Lane	Residential	15m	Northwest	Several residential properties located off Warren Lane: including Milneburg, Bullace Lodge, Kestrels, Guidepost Cottages (Nos. 1-4), Nos 45,47 & 49 Warren Lane, and Streamlines
R5	Furzehill	Residential	20m	North	Secluded residential property
R6	Gosbecks Iron Age and Romano-British site	Scheduled Ancient Monument and Agricultural Land	25m	East	Known former site of a Roman Fort and Iron Age & Roman Settlement, currently utilised for agriculture
R7	Maldon Road (B1022)	Public Highway	25m	Clockwise from southeast to southwest	Public Highway running parallel to the quarry's southern boundary in an east/west alignment
R8	Agricultural Land	Agricultural	35m; 50m; 250m.	South; East; North	Agricultural land used for cultivation of arable crops and/or the grazing of livestock. To the north of the site lies a fruit
R9	Residential Properties along Maldon Road (B1022)	Residential	35m; 50m; 100m	Southwest; Southeast; East.	Numerous properties located along Maldon Road, including Priory Lodge, Stanway Hall Farm Cottage, Warrens, The Chase and The Firs to the south/southwest, Springfields to the southeast, and 8 properties to the east (nearest being Randoms).
R10	Warren Lane	Public Highway	45m	Clockwise from Southwest to northwest	Unclassified public highway
R11	Stanway Hall & Colchester Zoo	Commercial/Industrial	140m	Southwest	Private Zoo attraction comprising various buildings, a car park, open land and several surface water bodies
R12	Dyers Lane	Public Highway	140m	North	Unclassified public highway
R13	Stanway Village	Residential	140m	Clockwise from northwest to north east	Residential properties to the west of Stanway Green, including Wisemans' Farm, and properties along Heath Road, Gryme's Dyke Way and adjoining residential streets
R14	Northbank Stream/Drain	Water Body	150m	West/ southwest	Unnamed tributary to the Roman River
R15	Olivers Thicks/ Butchers Wood	Local Wildlife Site	175m	Southeast	Designated as a LWS for its ancient and lowland mixed deciduous woodland, dry acid grassland, ancient and species-rich hedgerows and green lanes and urban habitats

ID	Receptor Name	Type of Receptor	Approximate nearest distance from the operational boundary	Direction from the operational areas	Description
R16	Bellhouse Quarry Landfill	Industrial	250m	West	Active landfill facility for accepting non-hazardous waste
R17	Northbank Stream/Drain	Water Body	350m	Southeast	Unnamed tributary to the Roman River
R18	Stanway Pits	Local Wildlife Site	425m	Northwest	Designated as a LWS for its open mosaic habitats on previously development land

Meteorological Conditions

1.2.7 Local wind speed and direction data has been obtained from the meteorological station located at Wattisham Airfield (EGUW). This monitoring station is located approximately 40km north of Stanway Quarry. The wind direction data recorded at this observing station are appropriate for characterising the wind climate at the landfill site. Wind direction data and a wind rose for the period 2000 to 2010 (inclusive) are presented in **Figure ARA1**.

Figure ARA1: Wind direction data and wind rose for Wattisham Airfield meteorological recording station between 2000-2010 (inclusive (Source: RenSMART)



1.2.8 The predominant winds are from the southwestern quadrant, which accounts for c. 60% of the total winds in the region. Wind from the north-western quarter occurring relatively less frequently, with winds from the south-eastern and north-western, occurring very infrequently.

1.3 Risk Assessment

Risk Assessment Criteria

1.3.1 The risk assessments will be prepared using the widely-accepted source-pathway-receptor methodology, and is the preferred method specified in the EA guidance. Where any complete source-pathway-receptor linkage exists the magnitude of any such risk is qualified by the probability and consequence of any such risk occurring. The criteria to be adopted for the risk assessment are present in **Table ARA2**.

Table ARA2: Risk Assessment Criteria

Probability ⇒ Consequence ↓	Very Low	Low	Moderate	High
Very Low	Negligible	Very Low	Low	Low-Moderate
Low	Very Low	Low	Low-Moderate	Moderate
Moderate	Low	Low-Moderate	Moderate	High
High	Low-Moderate	Moderate	High	Very high

1.3.2 An amenity risk assessment for the landfill operations is presented in **Appendix ARA1**. The assessment covers the following potential risks:-

- Fugitive emissions to air;
- Mud and Debris on the road
- Bird, Vermins and Insects
- Noise & Vibration;
- Odour;
- Fugitive emissions to water

Data and information				Judgement				Action (by permitting)	
Source	Harm	Pathway	Receptor	Probability of exposure	Consequence	Magnitude of risk	Justification for magnitude	Risk management	Residual risk
<i>What is the agent or process with potential to cause harm?</i>	<i>What are the harmful consequences if things go wrong?</i>	<i>How might the receptor come into contact with the source?</i>	<i>What is at risk? What do I wish to protect?</i>	<i>How likely is this contact?</i>	<i>How severe will the consequences be if this occurs?</i>	<i>What is the overall magnitude of the risk?</i>	<i>On what did I base my judgement?</i>	<i>How can I best manage the risk to reduce the magnitude?</i>	<i>What is the magnitude of the risk after management?</i>
Dust/Particulates									
Particulate matter and dusts from delivery and dispatch and handling of wastes/materials, including trafficked mud and debris, preparation engineering	Harm to human health – respiratory irritation and illness.	Air transport, deposition then inhalation.	Local human population <i>(R1, R3, R4, R5, R7, R8, R9, R10, R11, R12, R13, & R16)</i>	High	High	High	Wastes will not consist solely or mainly of dusts, powders or loose fibres. Areas of human occupation within 50m of the present and proposed boundaries of Stanway Quarry Site boundary. Receptor 'R3' and areas of 'R13' downwind of prevailing wind.	All delivery and dispatch vehicles to be sheeted or fully enclosed. Mechanical road sweeper and/or towed spray bowser will prevent waste surfaces and haul roads from becoming dry and dusty, especially during periods of dry weather.	Low
	Nuisance – dust on property, clothing etc.	Air transport then deposition	Local human population <i>(R1, R3, R4, R5, R8, R9, R11, R13, & R16)</i>	High	Moderate	Moderate-High	Existing perimeter vegetation and earth bunds will provide screening.	Operational staff to be trained to assess dust generation at the site throughout the working day. Further visual assessment to be carried out daily by the site operations manager and the Environmental Managers.	Low
	Smothering of habitats and crops	Air transport then deposition	Local wildlife habitats/species <i>(R2, R3, R8, R14, R15, R17 & R18)</i>	High	Moderate	Moderate-High	Receptor R3 located downwind of prevailing wind. Wastes will not consist solely or mainly of dusts, powders or loose fibres. Existing perimeter vegetation and earth bunds will provide screening.	All haul roads outside of the landfill void to be of concrete hardstanding and kept free from mud and debris Vehicle speed limits will be imposed to prevent dust arising Earth bunds and tree lines along site perimeter to be maintained.	Low
Odours									
Odours from delivery and dispatch of wastes/materials Handling and deposition of inert waste	Nuisance, loss of amenity	Air transport then inhalation.	Local human population <i>(R1, R3, R4, R5, R7, R8, R9, R10, R11, R12, R13, & R16)</i>	Very Low	Moderate	Low	Site located in rural setting. Only inert materials will be accepted at site for disposal Olfactory monitoring will be carried out by trained operatives within the vicinity of the operations of cells and other areas of the site throughout the day. Areas of human occupation within 300m of site boundary.	All wastes loads delivered and dispatched from the site will be sheeted or fully enclosed. All wastes to be inspected prior to acceptance at the site. All highly odorous waste will be discharged for internal storage and treatment. The building will consist of in active extraction with discharge via abatement system. Earth bunds and tree lines along site perimeter to be maintained. Operational staff to be trained to assess odour generation at the site throughout the working day. Further olfactory assessment to be carried out daily by the site operations manager and the operator's Environmental Managers. Odour Management Plan will be maintained for the site.	Negligible

Data and information				Judgement				Action (by permitting)	
Source	Harm	Pathway	Receptor	Probability of exposure	Consequence	Magnitude of risk	Justification for magnitude	Risk management	Residual risk
Litter									
Litter within waste deposited at the site Tracking of mud and debris onto public roads causing accident, hazards and nuisance to road users.	Nuisance, loss of amenity, road traffic accidents and harm to animal health	Vehicles entering and leaving site. Air transport and then deposition	Local human population, livestock and wildlife. Local road users. <i>(All Receptors)</i>	Very Low	Moderate	Low	Little potential for litter generation due to the types of waste accepted on site.	All deliveries or dispatches of waste to be sheeted or enclosed. All vehicles to be inspected prior to leaving site. Wheel cleansing facilities to be provided / utilised as appropriate. Internal roads will comprise hard surfacing to minimise tracking of mud and debris onto public roads. Where public roads will be monitored daily and more frequently during adverse weather conditions. Security fence to be maintained along site boundary to prevent litter escaping and daily litter inspections carried out on site. The site entrance will be inspected daily for evidence of mud and debris. Daily litter inspections will be carried out across the site. Site entrance to be mechanical swept to remove mud and debris deposited. Litter picking to be carried out on signs of litter generation. The source of any litter will also be investigated and remedied. Security fence to be maintained along site boundary to prevent litter escaping. Daily litter inspections will be carried out across the site.	Negligible

Data and information				Judgement				Action (by permitting)	
Source	Harm	Pathway	Receptor	Probability of exposure	Consequence	Magnitude of risk	Justification for magnitude	Risk management	Residual risk
Mud and Debris									
Waste debris and mud on local roads Tracking of mud and debris onto public roads causing accident, hazards and nuisance to road users.	Nuisance, loss of amenity, road traffic accidents and harm to animal health	Vehicles entering and leaving site.	Local human population, livestock and wildlife. Road users (R7)	Very Low	Moderate	Low	Approx. 850m of metalled internal roadways present at the quarry prior to vehicles existing on Warren Lane.	<p>All deliveries or dispatches of waste to be sheeted or enclosed.</p> <p>All vehicles to be inspected prior to leaving site. Wheel cleansing facilities to be provided / utilised as appropriate.</p> <p>Internal roads will comprise hard surfacing to minimise tracking of mud and debris onto public roads. Where public roads will be monitored daily and more frequently during adverse weather conditions.</p> <p>Security fence to be maintained along site boundary to prevent litter escaping and daily litter inspections carried out on site.</p> <p>The site entrance will be inspected daily for evidence of mud and debris. Daily litter inspections will be carried out across the site.</p> <p>Site entrance to be mechanical swept to remove mud and debris deposited. Litter picking to be carried out on signs of litter generation. The source of any litter will also be investigated and remedied.</p> <p>Security fence to be maintained along site boundary to prevent litter escaping.</p> <p>Daily litter inspections will be carried out across the site.</p>	Very Low
Scavengers and Pests									
Scavenging animals and scavenging birds, Pests (e.g. flies) attracted to or infesting wastes	Harm to human health – from waste carried off site and faeces. Nuisance and loss of amenity. Negative effects on habitats and crops	Air transport and over land.	Local human population, crops and local habitats (All receptors)	Very Low	Low	Very Low	<p>Permitted waste likely to attract scavenging animals and birds.</p> <p>Only inert materials will be accepted at site for disposal</p> <p>Site is located in a rural area.</p> <p>Insect pests can multiply on permitted wastes, particularly in summer months when waste is likely to have a higher odour potential and attracts flies.</p>	Discharge of deliveries to the site will be supervised by trained site operatives. Visual inspection undertaken at weighbridge.	Negligible

Data and information				Judgement				Action (by permitting)	
Source	Harm	Pathway	Receptor	Probability of exposure	Consequence	Magnitude of risk	Justification for magnitude	Risk management	Residual risk
Noise & Vibration									
Noise and vibration caused by engine noise and vibrations from loading shovel, lorry movements etc.	Nuisance, loss of amenity, loss of sleep or harm.	Noise through the air and vibration through the ground.	Local human population (R1, R3, R4, R5, R7, R8, R9, R10, R11, R12, R13, & R16)	Moderate	Moderate	Moderate	Proximity of receptors to site Site Operations restricted to: 07:00 – 18:00 Monday to Friday 07:00 – 13:00 Saturday Landfill operations will largely be carried out c. 10–15m below surrounding ground levels, with c 3m high attenuation bunds currently present along southern and north–western boundaries.	Earth bunds and tree lines along site perimeter to be maintained. Speed limit restrictions apply on internal roads. Metal roads will be maintained free of ruts and potholes to minimise body slap. All site plants used on site will be operated and maintained in accordance with manufactures recommendation. Noise levels will be monitored daily by site manager) or nominated deputy) to ensure that operations are not resulting in significant levels of noise beyond the site boundary. Daily subjective monitoring will be supported by 6–monthly noise surveys required under by the conditions of Planning consent. If reversing sirens or beepers are used on a mobile plant which gives rise to noise complaints, the use of quieter or silent types of alarm or warning devices that are more environmentally acceptable will be explored.	Low
Water									
Generation of contaminated run-off and leachate from waste deposits and other hazardous substances handle on site (e.g. fuels, oils etc)	Harm to protected site through nutrient enrichment, leachate, contaminated surface water runoff,	Surface water run-off, and sub-surface transport of leachates then base and spring flows to rivers.	Groundwater, surface water bodies and their associated habitats. (R2, R3, R8, R14, R15, R17 & R18)	Low	Moderate	Low–Moderate	Only inert wastes will be deposited at the site. The site will be engineered in accordance with the requirements of the Landfill Directive	Written waste acceptance procedures in place to prevent the acceptance of contaminated wastes. All plant and equipment will be maintained in accordance with manufacturers recommendations	Very Low