ENVIRONMENTAL PERMIT APPLICATION

ENVIRONMENTAL AND ACCIDENT RISK ASSESSMENT

STURTON LE STEEPLE QUARRY
STURTON LE STEEPLE
RETFORD
NOTTINGHAMSHIRE
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ENVIRONMENTAL PERMIT APPLICATION – ENVIRONMENTAL AND ACCIDENT RISK ASSESSMENT: STURTON LE STEEPLE QUARRY,STURTON LE STEEPLE, RETFORD

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1.0 INTRODUCTION

1.1 Scope

1.1.1 This document presents an assessment of the risks to the environment and amenity posed by the operation of an inert mining waste operation at a new sand and gravel quarry near Sturton le Steeple, Nottinghamshire.

1.1.2 This risk assessment has been undertaken in accordance with the Environment Agency (EA) Guidance on 'Risk Assessments for your Environmental Permit'; published 1st February 2016 (updated 21st November 2023).

1.2 Site Setting

Site Description

1.2.1 This Environmental and Accident Risk Assessment (EARA) relates to the operation of an inert mining waste operation at a new sand and gravel quarry situated on land east of Sturton le Steeple, Nottinghamshire. There are two separate areas being applied for, a Western Area and an Eastern Area located within the wider quarry footprint. The two areas are centred on National Grid References (NGR): SK 81153 84408 and SK 81638 84067. The site location has been depicted in **Drawing No. AI1017/05/01**. The site is within the local authority of Bassetlaw District Council.

1.2.2 The site areas are currently agricultural fields set between the village of Sturton le Steeple and the River Trent to the east. They will become a part of and immediately adjacent to the wider quarry working. Entrance and egress to and from the site for heavy good vehicles will be via a haul road to the northwest at a junction on Gainsborough Road. However, no material is to be brought on or taken off site for the purpose of the mining waste operation except for the initial deliveries of the plant machinery. The site entrances are gated and will be locked outside of operational hours.

1.2.3 The proposed permitted boundary areas are depicted in **Drawing No.: AI1017/05/02**. The site is bounded by agricultural land which will become part of the quarry development. The unclassified roads; Middle Lane and North End Lane pass by and around the site.

1.2.4 Sturton le Steeple lies 2.3 km west. The village of Knaith lies 1.2 km east-northeast but lies across the River Trent. The wider surrounding area comprises agricultural land with scattered residential dwellings. West Burton Power Station lies 1.8 km northwest of the site. The town of Gainsborough is situated approximately 5 km north of the site.

1.2.5 The closest residential properties to the permitted site are Toll Bar Cottage ~830m south, Snaith Hall Cottage ~1km to the east-northeast, Littleborough Farm ~1.6km to the southeast and Low Holland Cottage, 1.2km to the west. The remainder of the surrounding area is occupied predominantly by agricultural land.

1.2.6 The local topography is flat but punctuated by deep ditches draining the Trent river floodplain.

1.2.7 The site does not lie within 2km of an Area of Outstanding Natural Beauty (AONB), Local Nature Reserve (LNR), National Nature Reserve (NNR), Ramsar site, Special Protected Area (SPA), Ancient Woodland, or Source Protection Zone (SPZ).

1.2.8 The site lies within the 'Trent from Carlton-on-trent to Laughton Drain' Surface Water Drinking Water Protected Area.

1.2.9 The western area lies withing the 'Catchwater Drain' catchment of the River Trent Nitrate Vulnerable Zone (NVZ) and the eastern area lies in the 'Seymour Drain' catchment of the River Trent Nitrate Vulnerable Zone. These are areas designated as being at risk from agricultural nitrate pollution. The designations are made in accordance with the Nitrate Pollution Prevention Regulations 2015.

1.2.10 One Local Wildlife Site borders the site. Mother Drain Local Wildlife Site follows the line of the mother drain watercourse.

1.2.11 Deciduous woodland, coastal and floodplain grazing marsh, and reedbeds are also present within 2km in all directions, the closest of which is 275m west of the west. Deciduous woodland is a protected priority habitat.

1.2.12 The indicative operational layout of the site is illustrated on **Drawing No.: AI1017/05/03**. Access to the facility will be via a metalled road - Gainsborough Road, to the west of the site. Exit from the site will be to the west, onto Gainsborough Road.

1.2.13 **Table EARA1** summarises the potential sensitive receptors that have been identified through a desk top study of the locality and the corresponding minimum distance from the proposed permit boundary of the site boundaries. The locations of the receptors are shown in **Drawing No.: AI1017/05/04**.

Table EARA1: Identified Potential Sensitive Receptors within 1km of the site boundaries.

Receptor Name	Receptor Type	Approximate nearest distance from the site boundary	Direction from proposed operation
Secondary B Bedrock aquifer – BEE LOW LIMESTONE FORMATION Secondary Superficial aquifer – West Area: HOLME PIERREPONT SAND AND GRAVEL MEMBER - SAND AND GRAVEL East Area: ALLUVIUM - CLAY, SILT, SAND AND GRAVEL	Groundwater	0m	Underlies the site and surrounding areas
Local infrastructure e.g. Middle Lane, North End Lane, Littleborough Road	Public Highways	Adjacent -1km	N, NW, W, SW, S
Rural	Agricultural, woodland, fields	Adjacent – 1km	All directions
Surface water features: Catchwater Drain Mother Drain New Ings Drain River Trent	Ponds, streams, drains	Adjacent – 1km	All directions
Protected Habitat (Deciduous woodland)	Habitat	275m –370m	W
Protected Habitat (Coastal and floodplain grazing marsh)	Habitat	465m – 816m	E
Protected Habitat (Deciduous woodland)	Habitat	585m – 815m	NW
Protected Habitat (Deciduous woodland)	Habitat	750m – 900m	E
Protected Habitat (Deciduous woodland) – (The Plantation)	Habitat	695m – 1km	SE

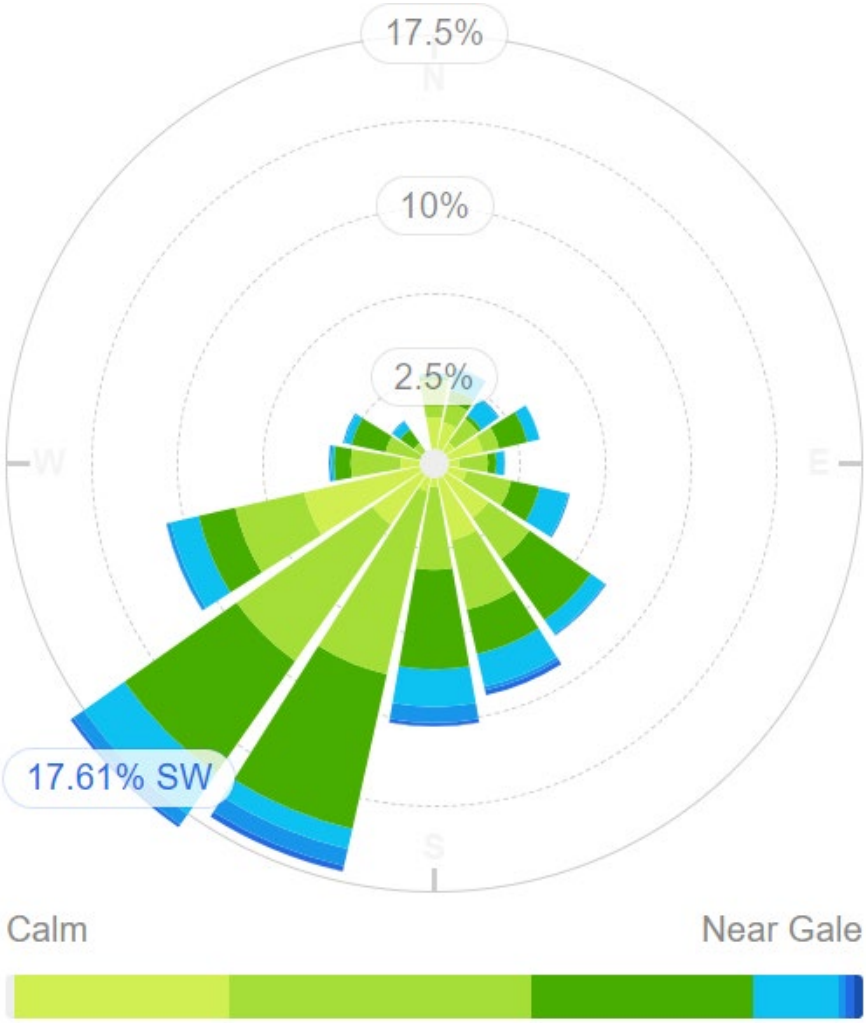
Receptor Name	Receptor Type	Approximate nearest distance from the site boundary	Direction from proposed operation
Protected Habitat (Deciduous woodland) – (Fenton Gorse)	Habitat	839m - 1km	S
Toll Bar Cottage	Residential Property	845m	S

Meteorological Conditions

1.2.14 The local wind speed and direction data has been obtained from the meteorological station located at Waddington, which lies approximately 27.6 km south-east of the site. The National Grid Reference NGR for Waddington Observation Station is SK 50329 45623. This weather station is deemed the most appropriate for use in order to characterise the site due to its proximity to the site. Wind patterns at the Waddington Station are likely to be similar to those experienced at the site.

1.2.15 The wind rose, as shown by **Figure EARA1** shows the percentage of wind vector that could be generated in each of the 16 points of a compass. The wind rose indicates that the predominant wind directions are from the south-western quadrant with 17.61% from the south-west.

Figure EARA1: Average Wind Rose for Waddington Meteorological Recording station for the last 5 years (Source: www.willyweather.co.uk)



1.3 Risk Assessment

Risk Assessment Criteria

1.3.1 The risk assessment 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 EARA2**.

Table EARA2: 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 environmental and accident risk assessment for the waste recovery operations is presented in **Appendix EARA1**. The assessment covers the following potential risks;

- Fugitive emissions to air (dust and particulates);
- Odour;
- Litter;
- Mud and Debris on the road;
- Scavenging Birds, Vermin and Insects;
- Noise & Vibration;
- Fugitive emissions to water;
- Accidents; and
- Protected Habitats & Species.

APPENDIX EARA1
Environmental and Accident Risk Assessment

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**
What is the agent or process with potential to cause harm?	*What are the harmful consequences if things go wrong?*	*How might the receptor come into contact with the source?*	*What is at risk? What do I wish to protect?*	*How likely is this contact?*	*How severe will the consequences be if this occurs?*	*What is the overall magnitude of the risk?*	*On what did I base my judgement?*	*How can I best manage the risk to reduce the magnitude?*	*What is the magnitude of the risk after management?*
Dust/Particulates									
Particulate matter and dusts from silt lagoons	Harm to human health - respiratory irritation and illness.	Air transport, deposition then inhalation.	Local human population	Very Low	High	**Low-Moderate**	Silt produced via a wet process. The closest residential property lies >800m from the site (Toll Bar Cottage), it lies south of the site and the prevailing wind direction is from the south and south-west to the north and north-east. Therefore, this residence is upwind of the site and is unlikely to be affected by fugitive dust emissions. With regard to receptors in the form of public highways and private roads, dust from the site poses very little risk to human health due to the transient nature of these receptors, as members of the public are simply passing through these areas and no long-term dust exposure will occur. Dust is also unlikely to be a nuisance to these receptors due to the internalised nature of the operations.	The waste being stored is inherently wet from production and is required to be kept in sub-aqueous conditions in order to treat it. This will limit dust and particles from becoming airborne and the silts will collect into a cake at the bottom of the silt lagoons. This will further ensure that the likelihood of fugitive emissions remains low even if the lagoon dried out in a contingency. 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 Quarry Manager or nominated deputy. Contact information for the site and the EA as well as the permit reference number will be displayed to the public via signage at the site entrance to ensure Aggregate Industries Ltd is made aware of any off-site nuisance as soon as possible to allow mitigation measures to be actioned. Any complaints received will be recorded on integrated Environment, Health and Safety (EHS) database complaint logging system	Very Low
	Nuisance - dust on property, clothing etc.	Air transport then deposition	Local human population	Very Low	Moderate	**Low**			Very Low
	Smothering of habitats and crops	Air transport then deposition	Local wildlife habitats/ species	Low	Moderate	**Moderate**	Potential particles most likely to contribute result in smothering or nutrient enrichment will likely deposit within 400m. A deciduous woodland site is located near to the site's boundary; however, it is crosswind of the prevailing wind direction. A LWS is also located to the immediate east of the site boundary but it's a surface water feature and more resistant to smothering by dust. All other conservation areas are more than 500m from the site and are unlikely to be significantly impacted by the permitted activities.		Very Low
Odours									
Fugitive odours from silt lagoons	Nuisance, loss of amenity	Air transport then inhalation.	Local human population	Very Low	Moderate	**Low**	Silt wastes do not have a significant odour generation potential Nearest residential property lies >800m from the silt lagoons Receptors such as public highways and private roads are unlikely to be affected by odours due to their transient nature.	Daily inspections to extend to olfactory monitoring in vicinity of the silt lagoons to be carried to identify any potential odours, if generated. Operational staff will also be trained to assess any odour generation at the site throughout the working day and will alert the Quarry Manager or nominated deputy who will investigate the issue and take corrective action. Contact information for the site and the EA as well as the permit reference number will be displayed to the public via signage at the site entrance to ensure Aggregate Industries Ltd is made aware of any off-site nuisance as soon as possible to allow mitigation measures to be actioned. Any complaints received will be recorded on the integrated Environment, Health and Safety (EHS) database complaint logging system	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 from silt lagoons	Nuisance, loss of amenity, road traffic accidents and harm to animal health	Air transport and then deposition	Local human population, livestock and wildlife. Local road users. *(All Receptors)*	Very Low	Low	**Very Low**	No litter is expected to be generated from the silt management operations at the site.	Daily inspections of the site will be conducted which will include inspections for evidence of litter around the site. Operational staff will also be trained to observe any evidence of such emissions and the Quarry Manager or nominated deputy will be advised. They will then investigate the issue and action the appropriate remedial measures. Good housekeeping will be employed at the site to ensure there is not build up of waste residue or litter.	Negligible
Mud and Debris									
Overtopping of silt lagoons on to internal haul roads and tracking o to public roads causing accident, hazards and nuisance to road users.	Nuisance, loss of amenity, road traffic accidents and harm to animal health	Overtopping of lagoons then tracked by vehicles entering and leaving site.	Road users	Very Low	Moderate	**Low**	Silts lagoon located close to processing areas. Vehicles will not be driving within the site areas except in exceptional circumstances. All main public road networks are located over 1km from the site reception.	Silt and water levels will be inspected weekly to ensure sufficient freeboard level excess within the lagoons.	Very Low
Scavengers, Insects and Other 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.	Very Low	Moderate	**Low**	Silt lagoons will not comprise materials likely to attract scavengers to pests. The site is located in a rural area and, therefore, a variety of wildlife is likely to be in relatively close proximity to the proposed WTS. An increase in pests and scavengers to the area could impact on the species and habitats.	Daily inspections of the site for any signs that any operations are attracting pests or scavengers. Site staff will also be trained to recognise and alert the Quarry Manager or nominated deputy of any suspected pest infestations. This enables any issues to be identified quickly and allow further investigation and remediation to take place. In the event that the daily site inspections or the observations of operational staff find evidence of the presence of scavengers such as rats and other pests, a specialist contractor will be called to attend the site for pest control. A record of all incidents will be recorded in the site diary.	Very Low
Noise & Vibration									
Noise and vibration caused by transfer of silt to and pumping of recycled process waters from lagoons.	Nuisance, loss of amenity, loss of sleep or harm.	Noise through the air and vibration through the ground.	Local human population	Very Low	Moderate	**Low**	The emplacement and storage of the site will not produce significant noise levels. The site is >800m from the nearest residential property.		Very Low

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**
Water									
Generation of contaminated run-off, process waters from silt lagoons	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.	Very Low	Moderate	**Low**	Silt wastes are inert in nature and sourced from the site-won minerals. Only flocculants with a low environmental risk will be used to assists in enhanced settlement rates when silt levels within the lagoon increase.	Monitoring for any visible oil and grease in the lagoons to be carried out weekly. Flocculant dosing will be carefully managed by trained operatives. Spills kits to be positioned strategically across the site. All plant and equipment to be maintained in accordance with manufacturers recommendations. No oils or potentially polluting substances are to be stored within the permit boundaries.	Very Low
Flooding of the site	Contamination of buildings, gardens, agricultural land, natural habitats etc downstream resulting from waste washed off-site.	Flood waters	Local human population, crops and local habitats. *(All receptors)*	High	Low	**Moderate**	Upon review of the Environment Agency flood risk map, the site lies within a Flood Zone 3 (annual flood probability of 1% or more; high risk). There is a flood defence embankment running parallel to the River Trent (the potential source of flooding) which means that the risk of flooding is reduced. It is also likely that the severity of flooding will also be reduced. The silts in the process waters settle out into a 'cake' at the bottom of the lagoon. And will be unlikely to remobilise into slow moving waters. In the event of a flood large enough to cover the land which the site is on, the amount of silt that would be added to the flood waters would be negligible compared to that already carried by the flood waters. Only site-won inert silt wastes will be emplaced at the site.	Silts may be encouraged to settle more quickly into the 'cake' by using flocculants. Flocculant dosing will be carefully managed by trained operatives.	Low

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**
Accidents									
On site hazards: lagoons and pumping equipment	Bodily injury	Direct physical contact	Local human population	Low	High	**Moderate**	The site is fully secured.	The site is in a remote area and surrounded by fencing and gates will be locked shut outside of operational hours. Signs are present at the site entrance and along the perimeter to deter trespassers. All site staff and visitors will receive an induction to the site to ensure safety protocols are adhered to. All site staff will receive thorough training on the site safety procedures and the use of the plant and equipment on site. Appropriate personal protective equipment (PPE) will be provided for all site staff, particularly those handling waste. Designated pedestrian routes are clearly marked around the site.	Low
Fire resulting from arson/vandalism or an accident causing the release of polluting materials (smoke or fumes) to air, water or land.	Bodily injury	Direct physical contact	Local human population	Very Low	Moderate	**Low**	The mining waste stored on the site is not flammable and the banks of the lagoons are unlikely to have sufficiently dry vegetation that fires can be easily set. The site is in a remote area and surrounded by fencing and gates will be locked shut outside of operational hours.	No fires are permitted on site. There is a dedicated smoking shelter and smoking will not be permitted in any other location on site. The site is in a remote area and surrounded by fencing and gates will be locked shut outside of operational hours. Plant and equipment will be operated and regularly maintained in line with manufacturers recommendations. Plant and equipment will be inspected daily as part of the site checks. In the event any damage is observed, it will be recorded and reported to the site operations manager, TCM or nominated deputy. Any repairs will be affected as soon as possible or within 5 working days (subject to replacement material availability). Mitigation measures will be undertaken immediately if there is a possibility for ignition. Site staff will be trained in the fire protocols, including the locations and use of firefighting equipment, emergency exits, emergency contacts and the fire assembly point. An Incident Management Plan (IMP) will be made available to staff. Firefighting equipment at the site will be clearly marked and tested, at appropriate intervals, to confirm their suitability and functionality. Access routes will remain clear to ensure fast access for emergency services vehicles. Records of all incidents will be kept on site together with the remedial action taken.	Very Low

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**
Leaks and Spillages from on-site plant/vehicles, waste or contaminated rainwater runoff (including firewater).	Deterioration of water quality, contamination of ground/surface waters,	Direct run off from site across ground surface, indirect runoff via the soil layer or transport through soil/groundwater	Groundwater, surface water bodies and their associated habitats.	Low	Moderate	**Low-Moderate**	Only inert wastes will be handled at the site. Potential off-site rainwater runoff is likely to only have inert materials with a local origin, similar to that which is being deposited into the lagoons for restoration.	Spills kits will be strategically positioned around the wider quarry site. The condition of the site surfacing will be inspected daily. Any repairs will be undertaken as soon as reasonably practicable.	Low
Abnormal Conditions									
Containment Damage	Contamination of surrounding land, groundwater and surface water.	Direct run off	Local human population, crops and local habitats	Very Low	Moderate	**Low**	Only inert silt wastes will be handled and stored in the lagoons. The lagoons are topographically lower in elevation than the land surrounding them, There is no potential for the waste to mobilise or cause harm in the event of damage to the lagoon walls.	The stability of any unconfined lagoons sidewalls will be inspected weekly.	Low
Power loss	Harm to human health and local habitats and surface water via fugitive emissions Nuisance to local human receptors via fugitive emissions	Airborne transport	Local human population, crops and local habitats	Very Low	Moderate	**Low**	Should the site lose power, there is no significant potential for emissions to occur due to that power loss.	If power / water is lost for a sufficiently long period of time where it has the potential to affect ancillary functions outside of the main operations then alternative means of power generation/water supply will be sought.	Very low
Vandalism and security breach	Bodily injury	Direct physical contact	Local human population	Low	Moderate	**Low-Moderate**	The material stored on site is not of value to criminal elements. The site is not particularly politically or ethically sensitive.	The site is surrounded by fencing and the access gate will be locked shut outside of operational hours of the wider quarry site. Signs will be installed on the perimeter fencing and gates to alert potential trespassers or vandals of the presence of CCTV in order to deter their illegal entrance to the site. Site security infrastructure will be inspected daily as part of the daily site inspection. Any damage will be recorded on the check sheet and will be reported to the site operations manager, TCM or nominated deputy. Any damage to the integrity of the boundary, gates or any other security structure, where practicable, will be repaired by the end of the working day. If it is not possible to make repairs within a working day, temporary repair measures will be implemented. Final repairs will be carried out within 7 working days of the damage being detected or any other such period as agreed in writing with the EA. All damage and repairs (temporary or permanent) are to be recorded in the Site Diary. All visitors to the site (including personnel) must report to the site office to sign in and sign out on exit.	Very Low

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**
Operator error	Bodily injury Harm to human health - respiratory irritation and illness. Nuisance – dust, olfactory, and noise emissions Contamination of surrounding land, groundwater and surface water.	Direct physical, air transport then deposit or inhalation, direct run off	Local human population, crops and local habitats. *(All receptors)*	Low	High	**Moderate**	The lagoons are topographically lower in elevation than the land surrounding them, There is no potential for the waste to mobilise or cause harm in the event of damage to the lagoon walls.	Technically competent people oversee the management of activities at the site, in accordance with the fit and proper person requirements. Training (including refresher training) will be given to all site staff on the environmental permit, health and safety and incident response procedures. Site staff will be trained on site equipment/plant prior to first use and supervised by a technically competent person. Employment of Aggregate Industries Processing's Standard Operating Procedures (SOPs) developed in accordance with published Best Practice and Health and Safety Executive Guidance.	Low
Emissions from plant or equipment due to abnormal conditions	Harm to human health - respiratory irritation and illness.	Air transport, deposition then inhalation.	Local human population	Low	High	**Moderate**	-	All machinery used on site will be operated and maintained in accordance with manufacturers' recommendations. The plant and equipment to be used on site will be classified as Euro 3 emission standard engines. Consideration will be taken to procure Euro 5 standard plant as and when they require replacement. All operational areas will be underlain with an impermeable concrete surfacing as is appropriate to the environmental risk posed by that part of the overall operation. All machinery will undergo regular checks and maintenance in line with manufacturers recommendations. All plant and equipment will be inspected for damage / leaks before and after use as part of daily operation and maintenance checks. Any damage will be recorded on a check sheet and reported to the site operations manager, TCM or nominated deputy. Any plant or equipment identified as being defective will be removed for active use and repaired as soon as possible.	Low
Protected Species and Habitats									
On site activities	Harm to a protected site through contamination, nutrient enrichment, smothering, disturbance, predation etc.	Any	Protected species and habitats	Very Low	Moderate	**Low**	Silt wastes are derived from processing of site-won mineral that are inert in nature. The nearby waterways will be at a higher elevation than the levels of the lagoon. Therefore, lagoon water will not be able to flow into these waterways. The protected habitats all have a significant intervening distance and are at a higher elevation which will prevent any fugitive water emissions from affecting them. Fugitive dust emissions are extremely unlikely due to it being a wet process. However, should dust be ejected then there are no protected habitats within a kilometre downwind of the site.	The mitigation and control measures for the site to prevent fugitive emissions which could affect species and habitats have been outline previously in this risk assessment. The discharge of excess process waters to surface water or land will be subject to monitoring in accordance with the current permit limits.	Low