16 MITIGATION AND MONITORING

16.1 INTRODUCTION

The purpose of this section is to collate the mitigation and monitoring measures identified in the Environmental Impact Assessment Report (EIAR) that are considered necessary to protect the environment prior to, and during the operational and restoration phases of the Proposed Development (See Chapter 2 for Project Description).

As described throughout this EIAR, the outline design of the Proposed Development has been progressed by taking account of environmental constraints and considerations that have been identified, thereby enabling avoidance of potential environmental impacts.

16.2 MITIGATION MEASURES

Mitigation and environmental commitments have been identified as general requirements which will help to avoid, reduce or offset potential impacts and are relevant to a number of the environmental aspects addressed in the EIAR.

General and specific mitigation measures identified within the EIAR technical assessments are provided in Table 16-1 to Table 16 13. The timing of the implementation of the mitigation measures is indicated within the tables also:

Operational Phase: During the ongoing extraction at the proposed development, including exportation of materials off-site; and during ongoing maintenance and phased restoration of certain site areas; and

Restoration Phase: The undertaking of the physical works to fully restore the extracted site upon cessation of extraction activities.

16.3 MONITORING MEASURES

A number of environmental monitoring activities are to be continued during the operational and restoration phases. These monitoring activities are required to confirm the effectiveness of the mitigations, to define the quality of the surrounding environment, and to establish if there are any trends in environmental parameters.

Monitoring measures have been identified in each of the technical chapters and an overall monitoring schedule has been provided in Table 16-14.

Table 16-1 - Specific Environmental Mitigation Requirements - Population and Human Health

Mitigation No.	Description of Mitigation Measure / Environmental Commitments	Stage of Proposed Development
PHH1	There are no further mitigation measures related to Population and Human Health other than the implementation of existing site management practices and the implementation of mitigation measures which are identified in each of the relevant chapters of the EIAR.	Operation & Restoration

Table 16-2 - Specific Environmental Mitigation Requirements – Ecology and Biodiversity

Mitigation No.	Description of Mitigation Measure / Environmental Commitments	Stage of Proposed Development
EC1	Habitat compensation and enhancement, as per Restoration and Habitat Management Plan.	Operation and Restoration
EC2	Adherence to relevant guidelines for removal of cherry laurel.	Operation
EC3	Avoidance of suitable habitat during breeding season where possible. Checks of suitable habitat by an ecologist prior to removal as necessary during the breeding season.	Operation
EC4	Relocation of existing refugia to elsewhere on the Application Site, prior to commencement of proposed works.	Operation
EC5	Following appropriate biosecurity measures and guidelines relating to the removal of invasive species (cherry laurel specifically).	Operation
EC6	Hedgerow – mostly existing hedgerows to be managed/enhanced,	Restoration
EC7	Woodland and Scrub Mosaic - Protection of existing and creation additional habitat;	Operation
EC8	Naturally recolonising bare ground – Protection of existing habitat to be managed to promote natural recolonisation by flora species preset at the site; and	Restoration
EC9	Aquatic and Marginal Habitat to be created.	Restoration
EC10	Hedgerow Bolstering: ▪ Carry out work between 1 November and 31 March each year; ▪ Prepare the ground along a 0.75 m wide strip adjacent to the existing hedge on one side only to provide good soil conditions and as little competition from other vegetation as possible; ▪ Apply any herbicide to the 0.75 m strip in August or September prior to planting and respecting the existing hedge; Plants must be: ▪ 2-year-old transplants; ▪ At least 450 mm to 600 mm high; ▪ Native species, with no one species making up more than 70% of the total; ▪ Planted in a single row 30 cm apart with a minimum of 3 plants per linear metre; and ▪ Kept clear of weeds until they are established. ▪ Remove individual guards and tree shelters once the plants are established; ▪ Replace all failures in the following planting season; ▪ Trim the newly planted hedge in at least the first 2 years to encourage bushy growth, allowing the hedge to become taller and wider at each cut; and	Restoration

	▪ Prevent livestock and grazing animals from damaging the hedge by setting fencing at least 1.2 m from the centre of the hedge, or, if there is a bank, as close to the base of the bank as possible	
EC11	Hedgerow Management: The most effective way to manage existing hedgerows is by flail trimming. If used with care, this machine is considered to be the best way of trimming hedgerows as it is cost-effective and does an effective pruning job. Conservation best practice recommends the cutting of hedgerows only in alternate years. This is better for wildlife, and it reduces time and expense. Some species only flower on second year growth, so annual cutting reduces the flowering and subsequent berry crop.	Operation and Restoration
EC12	Woodland and Scrub Mosaic Creation: In advance of woodland creation, the proposed creation footprint will be surveyed by the appointed ECoW. This will ensure that the woodland footprint does not impinge on any features of residual ecological value. Tree planting is proposed at locations to afford biodiversity enhancement and screening. Tree planting will occur in winter (November – February). Any plant failures through disease, weather exposure, neglect or damage shall be replaced with equivalent species within one year of such failure, all to the satisfaction of the planning authority. The implementation of these protection measures will be monitored by the Environmental Manager. All tree planting will be implemented in accordance with BS 8545:2014 Trees: From Nursery to Independence in the Landscape. The native tree species to be used will comprise: ▪ *Alnus glutinosa;* ▪ *Betula pendula;* ▪ *Betula pubescens;* ▪ *Corylus avellana;* ▪ *Crataegus monoygna;* ▪ *Ilex aquifolium;* and ▪ *Quercus robur.* The establishment of woodland will be monitored by the appointed ECoW and updates to the management strategy will be provided as required. A potential badger sett with 4 No. entrances and sandy bank containing sand martin burrows are present on the northwestern edge of the primary soakaway. As a precautionary approach, planting is not proposed within 10 m of these features on the basis Smal (2006) states '*Badger sett tunnel systems can extend up to c. 20m from sett entrances. Therefore, no heavy machinery should be used within 30m of badger setts (unless carried out under licence); lighter machinery (generally wheeled vehicles) should not be used within 20m of a sett entrance; light work, such as digging by hand or scrub clearance should not take place within 10m of sett entrances.*'	Restoration
EC13	Recolonosing Bare Ground	Restoration

	This section of the plan is designed to all for natural regeneration of flora species onsite in order to promote local genetic plant stocks, and avoid negative impacts to genetic diversity in the local area by introduction of low genetic diversity seed mixes. If successful, and subject to pre-creation monitoring by the ECoW (April to September inclusive within the creation year), there will be: ▪ More flowering grass and wildflower species; ▪ Varied grass structure and height offering nectar and shelter for invertebrates; and ▪ Increased food supply for birds and shelter for small mammals. **Requirements:** ▪ Lands will be fenced so as to avoid grazing. ▪ Tracking of vehicles or plant to be minimised in areas of recolonising bare ground, and avoided where possible. ▪ **Do not:** • Plough, cultivate or re-seed the recolonising bare ground. • Use pesticides, except for herbicides to spot-treat or weed-wipe to control nettles or docks. The appointed ECoW will oversee any advanced ground preparation works or management to ensure the successful creation of this feature. The appointed ECoW will assess the pre-existing ground conditions to ensure that any residual features of biodiversity interest are retained where possible.	
EC14	Aquatic and Marginal Habitat Aquatic, semi-aquatic and ephemeral habitat features can provide important feeding areas for breeding wading birds such as lapwings and redshanks, and their chicks, which find invertebrate food in and around the wet muddy edges. Other farmland birds such as tree sparrows and yellow wagtails may also benefit from these insect-rich areas. The Restoration Plan drawing (Appendix A.1) illustrates where aquatic habitat will be created and managed for biodiversity gain. The specific design of this wetland area will allow for maximal seasonal variation in water levels creating a shallow gradient draw down zone in the southern extent of the lake that will benefit a diverse flora and fauna. Aquatic habitat will extend naturally toward large expanses of recolonising bare ground (refer Restoration Plan drawing; Appendix A.1). This wetland habitat will be left to colonise naturally and will provide quality habitat for invertebrates and also wading and ground nesting birds. In addition, this area will provide key ecological connectivity at the Site and local level. The design of this feature including the provision of wetland scrapes has been steered by good practice, documented by Farm Advisory Service (2017) in their Technical Note TN688 ‘Management and Conservation for Farmland Waders’ The aquatic marginal habitat will be planted, following wetland feature creation, with the following pre-established coir pallets to aid rapid establishment: ▪ Common reed; ▪ Branched bur-reed; ▪ Reed canary-grass;	Restoration

	▪ Greater and Lesser pond sedge; ▪ Reed sweet-grass; ▪ Meadowsweet; and ▪ Purple loosestrife. The ECoW will monitor the establishment of this feature, including the presence of established marginal plants detailed above as part of the regular Site monitoring.	
EC15	Fencing and Securing the Waterbody A protective post & wire fence, 1.8 m high will be erected (complying with BS1722: Part 4 and erected in accordance with BS5837: 1991) around the Site perimeter. Rabbit proof netting shall be erected where required. New scrub and woodland planting will be protected from livestock grazing via suitable stock fencing. The waterbody in the base of the pit will also be fenced for safety and security. The use of the waterbody at the quarry for recreation or bathing will be prevented as far as is reasonably practicable by restricting access and the placement of appropriate warning signs. The landowner will be responsible for ensuring the fencing is maintained and secure. Other fencing may be required as appropriate to protect habitats during establishment.	Restoration
EC16	Roost Creation – Bat, invertebrate and Bird Boxes Commitments are provided as described which will increase the number of roosting opportunities for bats, invertebrates and birds on Site. Accordingly, Six bat boxes (the 2F Schwegler[1] generalist bat box, or similar) will be erected on suitable retained trees in the vicinity of the Site as indicated on the Restoration Drawing. The boxes will be placed at a height of between 3 – 6 m in sheltered sunny locations and will be placed with clear flight-lines to the box. Six invertebrate boxes[2] will also be placed in sheltered areas of the site as indicated on the Restoration Drawing. The restoration plan also provides for reptile refugia and basking habitat (see Appendix A.1). In addition, six bird boxes (the 2GR Schwegler[3] nest box, or similar) will be erected on suitable retained trees in the vicinity of the Site as indicated on the Restoration Drawing. The boxes will be placed at least 2 m above the ground, in locations sheltered from prevailing wind, rain, and strong sunlight, ensuring birds have unobstructed access to the box. The measures detailed above will be signed off as complete by the ECoW and will form part of the reporting process.	Restoration

[1] https://www.arkwildlife.co.uk/products/schwegler-2f-bat-box?gclid=EAIaIQobChMIxpHo9vKL7QIVWbvVCh36lwT7EAAYASAAEgIDE_D_BwE
[2] https://www.arkwildlife.co.uk/products/mason-bee-eco-nest-box?_pos=7&_sid=e2b1bb071&_ss=r
[3] https://www.nhbs.com/2gr-schwegler-nest-box

EC17	Lighting No external lighting is proposed to be installed at the Site post-restoration. Any lighting used during the ongoing operation of the Site will be monitored by the ECoW to ensure that the lighting maintains suitable conditions around the Site for nocturnal and crepuscular species by using timers, cowls and hoods to maintain dark skies and avoid illuminating features such as the woodland and hedgerow habitat	Restoration
EC18	Reporting For each of the four management features there are requirements for monitoring by the ECoW, since it is only by regular monitoring that management can be appropriately reviewed and suggestions for improvements made. The ECoW will be responsible for determining any reporting requirements.	Restoration
EC19	Derogation Licences Although not envisaged, should any derogation licences for disturbing protected species be required, the need for these will be identified by, and sought by, the ECoW.	Restoration
EC20	Record Keeping An up to date copy of the Restoration Plan including HMP will be maintained at the main Site office. Associated records will be held in the contractor's files.	Restoration
EC21	Staff Training Environmental training will be delivered and assessed throughout the project, to ensure the relevant aspects of the plan are communicated to the project team and front-line staff (including relevant sub-contractors). This will include: ▪ Site Environment Induction; ▪ Daily Pre-Start Meetings; ▪ Environmental Toolbox Talks; ▪ Incident and Near Miss bulletins; and ▪ Sub-contractors kick-off meetings.	Restoration
EC22	Lessons Learnt Procedures will be put in place to record and learn from the restoration works. Where relevant any learnings which improve efficiency, quality of the works or increased protection of the landscape will be incorporated into future phases of the operation and restoration	Restoration

Table 16-3 - Specific Environmental Mitigation Requirements – Land, Soils and Geology

Mitigation No.	Description of Mitigation Measure / Environmental Commitments	Stage of Proposed Development
LSG1	Site operations are managed with relevant health and Safety legislation (Safety, Health & Welfare at Work Act (2005, as amended); and the Mines and Quarries Act (1965, as amended)) and subsequent Quarries Regulations relating to safety health and safety, training, appropriate site management	Operation
LSG2	Wheel wash for all vehicles exiting the quarry	Operation
LSG3	Refuelling takes place on-site by third party contractors using drip mats	Operation
LSG4	Exposed edges in the quarry are protected with safety berms, which also act to screen the Proposed Development	Operation
LSG5	Monitoring of groundwater and surface water quality. Groundwater and surface water quality monitoring will provide assessment of the effectiveness of the mitigation measures.	Operation
LSG6	Geotechnical appraisals are to be carried out on site to assess the stability of the worked faces.	Operation
LSG7	Regular geotechnical stability surveys of the quarry faces.	Operation
LSG8	Monitoring of the groundwater quality in monitoring wells and surface water quality within artificial ponds will be conducted in line with the Site's environmental programme.	Operation
LSG9	Drone surveys will be conducted when necessary to determine whether quarried depths and extents are consistent with those planned and approved.	Operation

Table 16-4 - Specific Environmental Mitigation Requirements - Water

Mitigation No.	Description of Mitigation Measure / Environmental Commitments	Stage of Proposed Development
W1	Dewatering – dewatering will only take place during excavation and only when flooding of the quarry occurs. This is anticipated to be required predominantly following rainfall events;	Operation
W2	Runoff - the floor (and faces) of all areas of the extraction area slope towards a low elevation point, helping water to collect the location of the quarry sump and pump, preventing any surface water runoff from the Site;	Operation
W3	Soakaway – the runoff water (combination of rainfall water and seepage) is pumped from the quarry sump into the soakaway and overflow ponds. The ponds are dug down into the bedrock shale (and unlined), allowing the discharged water to infiltrate back into the bedrock shale aquifer. There is therefore no discharge to surface water (assuming the water level in the ponds remains below the superficial Sands and Gravels as discussed in Section 6.4.11.2));	Operation
W4	Dust Suppression – water sourced from borehole rather than surface water contained in pit.	Operation
W5	Refuelling takes place on hardstanding in a designated area of the Site and plant is well maintained to prevent uncontained releases of hydrocarbons to the ground;	Operation
W6	All plant and machinery utilised in the quarrying process is and will continue to be regularly serviced and maintained;	Operation
W7	There are no significant quantities of hydrocarbons stored onsite and all plant is re-fueld from a visiting fuel-truck. Minor quantities of lubricating oils and hydraulic fluid is stored in bunded drip trays;	Operation
W8	Monitoring of groundwater and surface water quality using available monitoring wells and soakaway ponds, to ensure that no pollution of groundwater or surface water is occurring.	Operation
W9	Phased restoration – the Site will be subject to phased restoration during the proposed activities. This will reduce the stockpile of raw material and materials will be stabilised once vegetation has been established;	Operation
W10	Restoration materials – only materials which have been stockpiled at the Site during overburden stripping will be used during restoration and there will be no importation of off-site materials;	Operation
W11	Environmental Management System (EMS) – an EMS document was produced for the Site in 2007 (Byrne Environmental, 2007); and this EMS is being updated to reflect current site extents and operations.	Operation
W12	Wheelwash – an existing wheelwash is present at the Site. The wheelwash is a contained recycling system and will be maintained appropriately to avoid discharges of wash water; and	Operation
W13	Welfare facilities – the welfare facilities consist of an inbuilt holding tank, will continue to be collected by a suitable disposal contractor on a regular basis, to avoid discharges of wastewater. The applicant confirms that a current agreement exists for the servicing of the welfare facilities as required	Operation

W14	Install of a shallow monitoring bore in the sand and gravels south of the soakaway pond. To monitor water level and quality to detect any potential discharges to the sand and gravels from the soakaway ponds.	Operation
W15	Extension of the quarry sump for increased capacity. If increase rainfall collection and seepage in the quarry sump (from proposed extension) result in the soakaway and overflow ponds filling to capacity, then pumping should cease to prevent flooding, allowing the periodic filling of the quarry sump.	Operation
W16	Implementation of level monitoring in the soakaway and overflow ponds to better understand the volume changes in response to rainfall and quarrying activities.	Operation
W17	Communication with local water users to determine status (whether they are still in use / abandoned) of private water wells.	Operation
W18	It is recommended that the water quality in the Goldenhill River, both downstream and upstream of the Site be tested in order to assess potential connectivity with the Site and feed into the conceptual model of the Site.	Operation

Table 16-5 - Specific Environmental Mitigation Requirements - Air Quality

Mitigation No.	Description of Mitigation Measure / Environmental Commitments	Stage of Proposed Development
AQ1	Rock extraction will be conducted deep within the quarry, with blasting activities primarily contained within the quarry walls to minimise external impact;	Operation
AQ2	Dust monitoring will be undertaken at consistent monitoring locations on a routine basis;	Operation
AQ3	The timing of operations will be optimised in relation to meteorological conditions;	Operation
AQ4	A mobile water tank will be used for dust suppression on haul roads, stockpile areas and on the quarry floor, when required;	Operation
AQ5	All plant will be regularly maintained and operated within the void once topsoil and overburden has been removed;	Operation
AQ6	On site speed restrictions (<10km/h) will be maintained to limit the generation of fugitive dust emissions; and	Operation
AQ7	All HGVs exiting the Proposed Development will exit through the existing wheel-wash to minimise trackout	Operation
AQ8	Boundary dust deposition monitoring will continue	Operation

Table 16-6 - Specific Environmental Mitigation Requirements – Climate

Mitigation No.	Description of Mitigation Measure / Environmental Commitments	Stage of Proposed Development
C1	No vehicles or plant will be left idling unnecessarily;	Operation
C2	Vehicles and plant will be well maintained. Should any emissions of dark smoke occur (except during start up) then the relevant machinery will be stopped immediately, and any problem rectified before being used;	Operation
C3	Engines and exhaust systems will be regularly serviced according to the manufacturer's recommendations and maintained to meet statutory limits/opacity tests; Full loads used in road haulage in order to minimise the carbon footprint per load of exported materials;	Operation
C4	Site management will continue to explore energy efficiencies and incentives in the Site's electrical infrastructure and management practices to optimising energy consumption and GHG reduction in its operations. The energy reduction and efficient use will be promoted in areas of the Site including efficient site lighting using LED lighting.	Operation
C5	Undertake soils stripping during wetter periods (in as far as reasonably practical) to ensure carbon losses are reduced compared with warmer drier periods; and	Operation
C6	Minimising the double handling of materials.	Operation

Table 16-7 - Specific Environmental Mitigation Requirements - Noise

Mitigation No.	Description of Mitigation Measure / Environmental Commitments	Stage of Proposed Development
N1	A noise monitoring programme will be maintained at the existing monitoring locations annually. This will clarify that noise levels are within thresholds as specified in the EPA Guideline Document for Extractive Industries (2006), and the Irish Concrete Federation Environmental Code, (2nd Edition, 2005);	Operation
N2	Site activities will continue to take place during the hours of 07:00 and 18:00 Monday to Friday and 07:00 and 14:00 on Saturdays. Quarry activities and loading of trucks may take place outside of these times and will comply with the appropriate noise limits, (55 dB(A) L_{Aeq1hr} during 08:00 to 20:00 hrs; and 45 dB(A) L_{Aeq1hr} during 20:00 to 08:00 hrs). There is no activity on site on Sundays or Public Holidays;	Operation
N3	Perimeter screening berms have been constructed along the relevant site boundaries;	Operation
N4	All haul roads will be kept clean and maintained in a good state of repair;	Operation
N5	Heavy goods vehicles entering and leaving the existing the quarry have tailgates securely fastened; all mobile plant used at the proposed development has noise emission levels that comply with relevant guidance;	Operation
N6	Plant will be operated in a proper manner with respect to minimising noise emissions, e.g. minimisation of drop heights, no unnecessary revving of engines, plant used intermittently not left idling;	Operation
N7	Plant will be subject to regular maintenance, i.e. all moving parts kept well lubricated, the integrity of silencers and acoustic hoods maintained; and	Operation
N8	Plant will be fitted with effective exhaust silencers and maintained in good working order to meet manufacturers' noise rating levels. Any defective silencers will be replaced.	Operation

Table 16-8 - Specific Environmental Mitigation Requirements - Vibration

Mitigation No.	Description of Mitigation Measure / Environmental Commitments	Stage of Proposed Development
V1	The screening berms around the perimeter of the quarry will be left intact for the life of the quarry (and in perpetuity to continue to provide biodiversity to the Site and the local environment). They will serve to mitigate against noise and potential dust emissions from the quarry, as well as offer reduced visibility of the quarry from the passageway, public road network and surrounding lands;	Operation
V2	Laser profiling used to establish an accurate geometry of the quarry face, thereby enabling the optimum burden and spacing to be applied for the blast;	Operation
V3	All blasts will continue to be initiated by an electronic detonation system, which is the latest technology available to fire a blast;	Operation
V4	Ensuring that the optimum blast ratio is maintained and ensuring that the maximum amount of explosive on any one delay, the maximum instantaneous charge, is optimised so that the ground vibration levels are kept below those specified;	Operation
V5	Explosive charges have been properly and adequately confined by using a sufficient quality of 20 mm aggregates for stemming, as they provide the best particle interlock;	Operation
V6	Adequate confinement of all charges by means of accurate face survey and the subsequent judicious placement of explosives;	Operation
V7	Blasting operations have been confined to between 1000 hours and 1600 hours, Monday to Friday;	Operation
V8	No exposed detonating fuse has been used in blasting;	Operation
V9	All blasts will be measured (ground vibration & air overpressure) in the area of at least one sensitive residence to ensure compliance with the aforementioned limits;	Operation
V10	Kildare County Council, all habitable houses within 500 m of the Site, and relevant dairy farmers will continue to be notified at least one working day before any blasting will be carried out on site. Residences were notified of blasting times by means of a phone call, text message or letter drop prior to the blast taking place. Residents that were not contactable by phone were informed of the intention to blast by a card system, which outlined the dates and times of blasting. In addition, prior to the firing of any blast the quarry gave notice of their intention by the sounding of an audible siren for a minimum period of one minute. This alarm was of sufficient power to be heard within 500 m of the quarry. An ‘all clear’ signal was given by means of a siren or other agreed measures when blasting has been completed;	Operation
V11	Monitoring locations will continue to be operated for each of the blasts. Monitoring stations can be set up at relevant residences at the request of the owners;	Operation
V12	All monitoring equipment will be calibrated regularly to ensure that peak particle velocity and air overpressure generated from each blast is accurately measured;	Operation

V13	Blasting will be carried out by trained personnel;	Operation
V14	Drilling contractors completed a log for every borehole drilled; and.	Operation
V15	The screening berm/bund along the re-located passageway acted as an acoustic barrier (noise barrier) and will assist in the mitigation of Air-Overpressure.	Operation

Table 16-9 - Specific Environmental Mitigation Requirements - Cultural Heritage

Mitigation No.	Description of Mitigation Measure / Environmental Commitments	Stage of Proposed Development
	None Proposed	

Table 16-10 - Specific Environmental Mitigation Requirements - Landscape and Visual Impact

Mitigation No.	Description of Mitigation Measure / Environmental Commitments	Stage of Proposed Development
	None proposed	

Table 16-11 - Specific Environmental Mitigation Requirements - Traffic

Mitigation No.	Description of Mitigation Measure / Environmental Commitments	Stage of Proposed Development
TR01	To facilitate that operations take place within lands owned by the Applicant, an amended access haul route alignment though the first portion of the site is proposed. To facilitate this realigned access, it was necessary to relocate existing plant (wheelwash and weighbridge) and car parking to an alternative position within the site. The new access haul route design was achieved within the curtilage of the Applicant's lands with the alternative location for the plant/car parking presenting no impediment for vehicles accessing/egressing the site.	Operation

Table 16-12 - Specific Environmental Mitigation Requirements - Material Assets

Mitigation No.	Description of Mitigation Measure / Environmental Commitments	Stage of Proposed Development
MA1	Any works required to material assets on or around the Site will be carried out in conjunction with the relevant provider to ensure minimal disruption to the existing users.	Operation
MA2	If utility disruption is required, then prior notification of disruptions shall be given to all impacted properties. This shall include information on when disruptions are scheduled to occur and the duration of the disruption. Consultation with relevant neighbouring parties shall be undertaken prior to any proposed disruptions, as appropriate.	Operation
MA3	Interaction with overhead utility lines in and around the site will be avoided.	Operation
MA4	All underground services will be identified, and protection will be put in place.	Operation

Table 16-13 - Specific Environmental Mitigation Requirements – Major Accidents and Disasters

Mitigation No.	Description of Mitigation Measure / Environmental Commitments	Stage of Proposed Development
MAD1	Implementation and maintenance of safe working practices and risk assessment across the Site and operational activities.	Operation
MAD2	In accordance with Section 55 of the Safety, Health and Welfare at Work (Quarries) Regulations 2008 (S.I. No 28 of 2008) (SHW Quarries Regulations), a geotechnical assessment of the Site should be undertaken by a geotechnical specialist to identify and assess all factors liable to affect the stability and safety of the proposed and existing excavation and provide conclusion as to whether there is a significant hazard by way of instability or movement.	Operation

Table 16.14: Environmental Monitoring Schedule

HBL Environmental Monitoring	Q1			Q2			Q3			Q4		
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Groundwater (Levels) *Monthly*	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Ground Water (Quality) *Quarterly*		✓			✓			✓			✓	
Surface Water Quality *Quarterly*		✓			✓			✓			✓	
Water Quality (Goldenhill River) *Bi-annual*		✓						✓				
Dust Monitoring *Monthly*	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Noise Monitoring *During Blasting and Annually*					✓						✓	
Vibration Monitoring *Ongoing through the year.*	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓