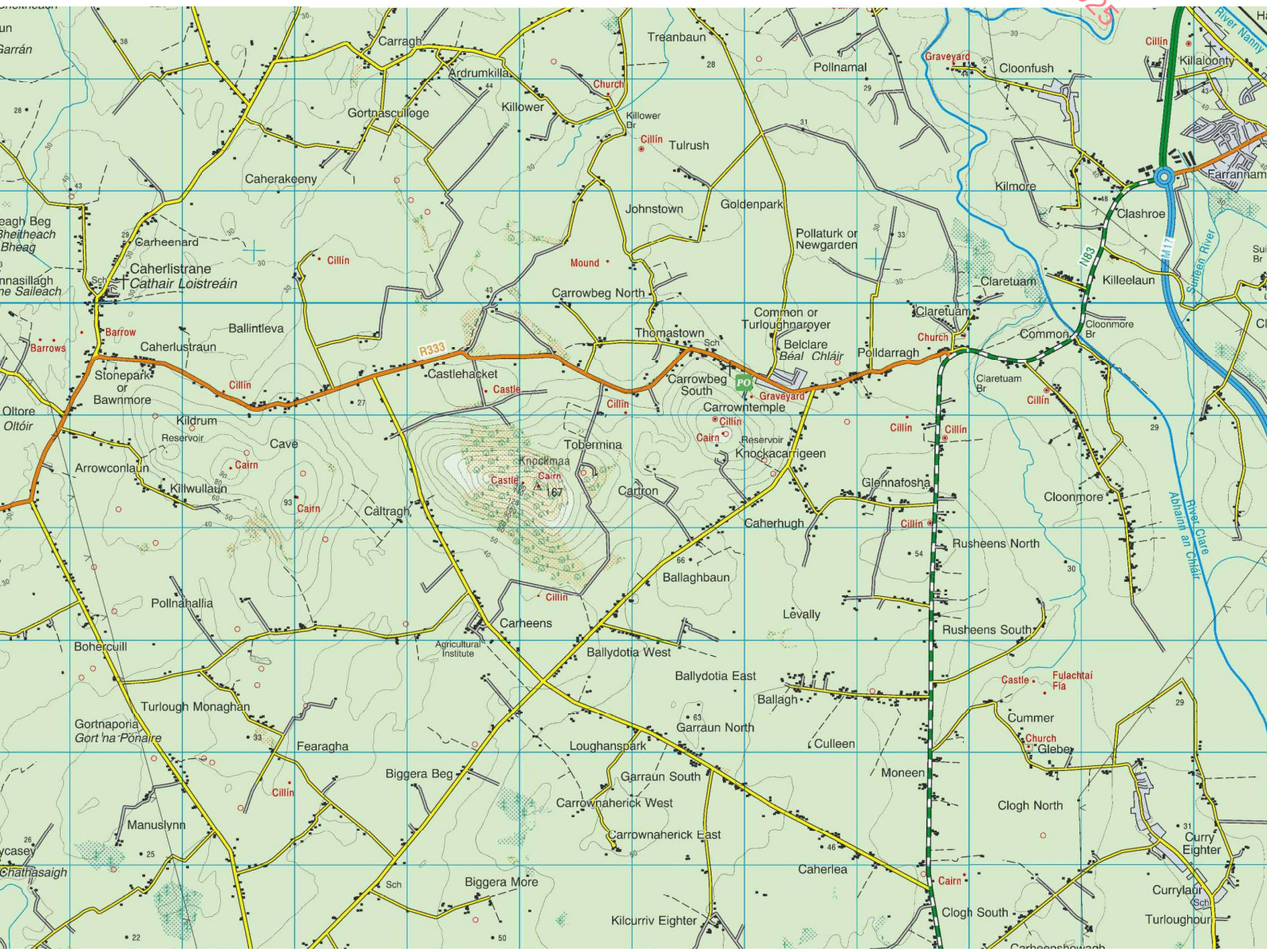
CHAPTER 17

MITIGATION AND MONITORING



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QUARRY CONSULTING

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INTRODUCTION

17.1 This chapter on 'Mitigation and Monitoring' is a critical component of the Environmental Impact Assessment Report (EIAR), designed to outline the specific actions and strategies that will be implemented to mitigate potential environmental impacts identified during the assessment phase of the proposed development. Following the Environmental Protection Agency's (EPA) guidelines, this chapter emphasises the importance of clarity, specificity, and commitment in presenting all mitigation and monitoring measures.

17.2 Mitigation measures are actions taken to avoid, reduce, or compensate for environmental impacts. Monitoring measures, on the other hand, are implemented to track the effectiveness of mitigation actions and ensure ongoing environmental protection throughout the lifespan of the development. Together, these measures play a pivotal role in safeguarding environmental resources and ensuring the sustainability of the project.

17.3 For organisational clarity and ease of reference, the chapter is structured to include a comprehensive compendium of all mitigation and monitoring commitments. The detailed elaboration on each measure is addressed within the main body of the EIAR.

Proposed Mitigation Measures

17.4 Proposed Mitigation Measures are provided in Table 17.1.

Table 17-1: Mitigation Measures

Topic	Mitigation Measures
Population and Human Health	**Site Security**: Barriers are installed along the site boundary to prevent unauthorised access, ensuring no trespassing or accidental entry. Warning signs are posted at intervals along the perimeter, providing a clear indication of the site's boundaries and potential hazards. These security measures should remain in place post-operation to continue protecting public safety.
Land, Soils and Geology	**Slope Stabilisation and Erosion Control**: Stockpiles will be placed with slope angles no steeper than 1:1.5, re-vegetated to minimise erosion. Overburden will be stored for future restoration efforts. **Face Stability and Access for Scientific Study**: A comprehensive working and restoration plan has been designed, accounting for face slopes and setbacks from boundaries. Quarry face stability has been assessed to ensure long-term integrity. Access for scientists will be permitted during operations, with options to preserve notable geological features for future study or educational use. If significant bedrock exposures are discovered, the company will collaborate with the Geological Survey of Ireland (GSI) to protect these features. **Restoration Planning**: Restoration efforts will allow for agriculture and habitat creation with minimal geological impact.
Water	**Hydrocarbon and Hazardous Material Storage**: All fuels, lubricants, and other hazardous materials will be stored within designated containment areas. Bunds will be capable of containing 110% of the stored volume, and drip trays for drums will accommodate at least 25% of their capacity. Waste materials will be stored away from water drainage areas. **Water Quality Management**: Regular maintenance of the wheel wash, silt traps, and oil interceptors will be conducted to prevent sediment or hydrocarbon contamination of water. Visual inspections of the wetland discharge zone will ensure no contaminants are reaching the groundwater.
Climate	Use energy-efficient machinery. Reduce greenhouse gas emissions through optimised logistics.
Air Quality	**Dust Suppression**: Measures include minimising drop heights for material handling, limiting vehicular speed, and regularly using water sprays on haul routes and dust-prone areas. Access roads will be swept to reduce material accumulation. **Minimising Disturbance**: Mechanical disturbance of materials will be limited, especially in adverse weather, to prevent dust from becoming airborne. Berms and vegetative screens will provide further containment.
Noise & Vibration	**Noise Reduction**: Noise control measures in place include enclosed asphalt plant motors, rubber linings at material transfer points, and white-noise reversing alarms on mobile equipment. Plant machinery will be turned off when not in use to reduce noise levels further. **Blasting Protocols**: Blasting activities will occur following a rigorous protocol including site-specific blast patterns, certification for operators, neighbour notification and monitoring to ensure vibration levels meet regulatory limits.
Landscape	**Screening Berms and Planting**: Screening berms and hedgerows retained and “gapped” up as necessary.

Traffic	**Traffic Management:** Adequate parking is provided within the quarry for all vehicles to avoid road congestion. Visibility at site access points will be maintained. A wheel wash is available to prevent dirt tracking onto public roads. **Decommissioning Phase Traffic:** During decommissioning, local materials and equipment will be used to minimise additional transportation impacts.
Material Assets	**Waste Management**: Waste generated on-site will be sorted by type, stored in labelled containers on impermeable surfaces, and transported by licensed operators. Training on waste management and emergency spill procedures will be provided to all staff.

Proposed Environmental Monitoring

17.5 Proposed Monitoring requirements are provided in Table 17.2.

Table 17-2: Proposed Monitoring: Refer to Figure 17.1 for locations

Proposed Environmental Monitoring	
Dust Monitoring	Undertaken at the site with locations reviewed and revised as necessary.
Water Monitoring	Water monitoring is carried out and will continue to be carried out.
Meteorological Monitoring	Utilisation of data from Athenry weather station.
Vibration Monitoring	Ground vibration monitoring is carried out for each blast and will continue to be carried out.
Noise Monitoring	Carried out at the nearest sensitive receptors with locations reviewed as necessary.
Stability and Settlement Monitoring	Visual inspections of quarry faces and screening berms.
Aftercare and Monitoring	5-year aftercare program for tree planting and monitoring of restoration success.

Proactive Monitoring and Compliance Verification

17.6 In line with the EPA guidelines, monitoring in the context of an EIAR should be a structured process to verify that the project adheres to EIA predictions and complies with consent conditions. Monitoring should ideally commence post-consent, ensuring that the project operates as intended and allowing early detection of any unforeseen effects.

17.7 Monitoring programs should avoid excessive reliance on reactive measures, as this can unintentionally alter project operations outside the scope originally assessed. Instead, monitoring should ensure compliance with defined performance criteria, emission limits, and other operating conditions. Importantly, monitoring should not defer essential information gathering that is critical for initial project assessments and consent.

17.8 All monitoring plans should follow an "if-then" approach, specifying the triggers that would prompt remedial actions and clearly defining roles. For instance, if air quality monitoring identifies that particulate emissions exceed the specified limit, then dust suppression measures will be immediately intensified, with oversight from the developer.

17.9 In scenarios where effects continue to exceed thresholds despite intervention, the developer and consent authority may jointly assess further measures or modifications needed to restore compliance.

17.10 It is recommended to adopt the specific limits from the 2006 EPA guidelines for dust deposition, noise, vibration, and air overpressure in quarry developments. The following limits and methods, based on these guidelines, will inform the monitoring and mitigation actions to ensure compliance and minimise environmental impact:

Water Quality Monitoring

- **Measurement Methods**: Monitoring will include regular sampling of surface and groundwater at the discharge point to assess quality parameters such as pH, suspended solids, nitrates, and hydrocarbons.
- **Trigger Limits**: If water quality parameters approach threshold limits outlined in the site's discharge licence or relevant water quality regulations, immediate investigation and mitigation will be initiated, including possible adjustments to the site's water management system.
- **Remedial Measures**: Elevated suspended solids, for instance, will prompt enhanced sediment control measures such as additional silt traps, while hydrocarbon detections may necessitate oil interceptor maintenance or upgrades.

Dust Deposition

- **Measurement Method**: The Bergerhoff Method (German Standard VDI 2119, 1972), as recommended by the EPA.
- **Dust Deposition Limit**: 350 mg/m²/day, averaged over a 30-day period, measured at site boundaries.

17.11 This limit will help control dust nuisance, with exceedances triggering enhanced dust suppression measures, such as increased watering or windbreak installation at sensitive points.

Noise

- **Measurement Periods**:
  - **Daytime (08:00 - 20:00)**: Noise levels should not exceed **55 dB(A) LAeq (1h)** at the nearest noise-sensitive receptor.

- Night-time (20:00 - 08:00): Noise levels should not exceed **45 dB(A) LAeq (1h)** at the nearest receptor.

- **Allowable Exceedance**: 95% of all measured noise levels must meet these values, with no single measurement exceeding the limit by more than 2 dB(A).

17.12 Exceedances will lead to operational adjustments such as equipment relocation, timing modifications, or the installation of additional noise barriers.

Blasting: Vibration and Air Overpressure

17.13 For blasting activities, the following Environmental Limit Values (ELVs) apply at the nearest sensitive location (e.g., residential properties):

- **Ground-borne Vibration**: Peak particle velocity (PPV) should not exceed **12 mm/s** in any of the three mutually orthogonal directions, for vibrations below 40 Hz.
- **Air Overpressure**: Should not exceed **125 dB (linear maximum peak)**, with a 95% confidence limit.

17.14 If measurements approach or exceed these ELVs, the blasting schedule or charge size will be adjusted, with further consultation with the consent authority if continued exceedances occur.

FIGURES


RECEIVED: 12/06/2025
Legend
Application Area
Dust Monitoring Locations
Blast Monitoring
D1
D2
D3
D4
Blast Monitoring
0
100
200 m
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