



REPORT

Draft Construction Environmental Management Plan (CEMP)

Aughinish Alumina Limited

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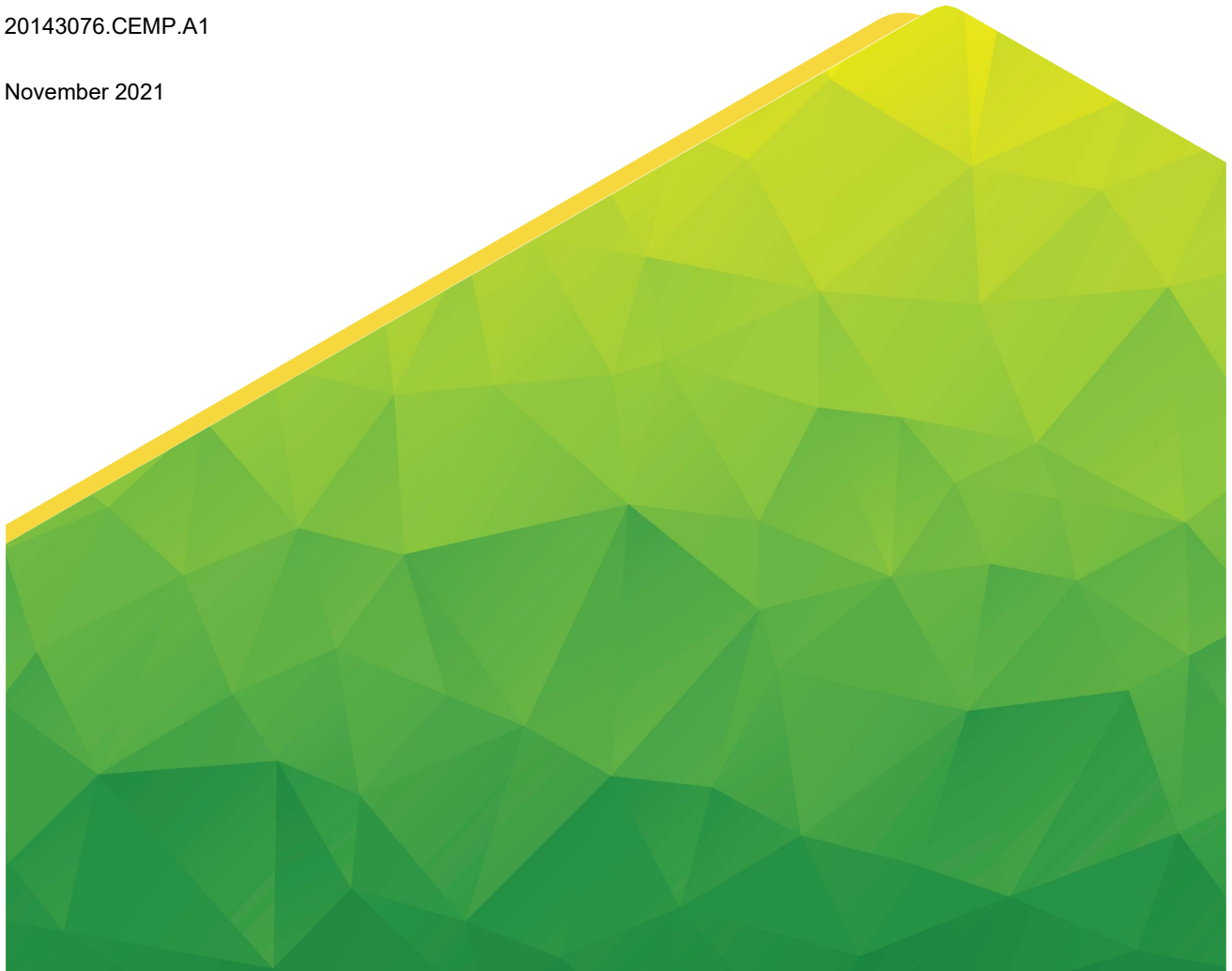
Prepared for:

Aughinish Alumina Limited

Aughinish Island
Askeaton
Co. Limerick

20143076.CEMP.A1

November 2021



Distribution List

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1.0 INTRODUCTION

1.1 General

Golder Associates Ireland Ltd (Golder) has been commissioned to prepare this draft Construction Environmental Management Plan (CEMP) on behalf of Aughinish Alumina Ltd (AAL), as the Applicant for the Proposed Development, on the 'Application Site' lands located at the AAL facility Aughinish Island, Askeaton, Co. Limerick.

1.2 Draft CEMP and Plan Objectives

The draft CEMP has been deemed to be an important part of the planning consent process.

The Proposed Development involves construction activities as an intrinsic part of the preparatory, construction, operational and closure phases, as the facility is progressively raised in elevation, as it is filled with bauxite residue, and is progressively restored on the side-slopes. Therefore, this plan will consider an **overall construction phase** encompassing the preparatory construction activities, construction activities during general operations and the closure construction activities.

For effective and efficient management, this draft CEMP may therefore be incorporated into the environmental management system of the overall AAL facility, but for the purpose of this stage of the planning application it forms a base document to communicate key planning and environmental steps relating to the management of the Proposed Development.

This draft CEMP is a 'live' document, which shall be advanced to a final CEMP by AAL and the appointed Main Contractor prior to project commencement and throughout the progression to completion.

It comprises general measures and a series of discipline-specific measures that align with the proposed mitigation and monitoring measures described in the Environmental Impact Assessment Report (EIAR) and the Natura Impact Statement (NIS) for the Proposed Development.

In particular, the draft CEMP will be updated to ensure the requirements of all relevant planning conditions and consents are incorporated.

This draft CEMP outlines the approach to the management and minimisation of environmental impacts during the construction of the Proposed Development, with the primary aim of avoiding, reducing or offsetting any adverse impacts identified in the EIAR.

The draft CEMP serves as a consistent point of reference for environmental considerations throughout the construction period for the Main Contractor, Sub-contractors, AAL, Limerick City & County Council (LCCC), and the Environmental Protection Agency (EPA).

It also details the key roles and responsibilities for individuals involved in the construction of the Proposed Development, as well as the training requirements for all staff in relation to managing environmental considerations.

AAL and the appointed Main Contractor (and Sub-contractors) are committed to undertaking the management and mitigation measures detailed in this draft CEMP and as appropriate those described in the EIAR for the Proposed Development.

2.0 FACILITY AND PROPOSED DEVELOPMENT DESCRIPTION

2.1 Facility

AAL is wholly owned by United Company RUSAL (UC Rusal) and operates the alumina refinery situated on Aughinish Island on the south side of the Shannon Estuary, in Co. Limerick, in accordance with the Conditions of the Industrial Emissions Licence (IEL) P0035-07 issued by the Environmental Protection Agency (EPA). The AAL facility is the largest alumina extraction plant in Europe and represents circa 33% of the total alumina production in Western Europe.

The importation of bauxite ore, primarily from West Africa, and the exportation of alumina (aluminium oxide) is undertaken by ship, via the dedicated AAL jetty located in the Shannon Estuary. The alumina extracted is exported to smelters in other countries for processing into aluminium. The bauxite residue is stored at the AAL facility in a designated facility termed the Bauxite Residue Disposal Area (BRDA).

The plant and ancillary structures were constructed between 1978 and 1983. Plant production has been continually increased since the commissioning of the plant in 1983 up to its maximum production of approximately 1.95 million tonnes of alumina per annum.

Aughinish Island is located on the south banks of the Shannon Estuary, at approximately 50km from the outlet to the North Atlantic, in the south-west of Ireland, and is bounded by the River Shannon to the north, the Robertstown River to the west and southwest and the Poulaweala creek to the east and southeast. The nearest towns are Askeaton (ca. 6.0 km to the east) and Foynes (ca. 3.5 km to the west) and the facility is located circa 30 km west of Limerick City, see Figure 2 below.



Figure 1: AAL Facility Location (source Google Maps, annotated by TPA, Nov 2020)

The 'Application Site' is located on Aughinish Island, Island MacTeige, Glenbane West and Fawnamore, and comprises circa 222 ha., shown by the red line on Figure 2., within the property of the long-established alumina extraction plant operated by AAL. AAL own a circa 601 ha. landholding in the area which is shown by the blue line on Figure 2.

The BRDA portion of the Application Site is located in the south-western sector of the landholding and is circa 184 ha. in size, see Figure 2. The SCDC is located within the BRDA. The borrow pit extension area is located towards the centre of the land holding. The permitted borrow pit area is shown by the green line boundary.

Aughinish Island and the surrounding areas are predominantly rural in character with the remaining land usage comprising agriculture, single low density residential housing and protected habitats (wetlands and grasslands).

The Application Site is located at the western portion of the Applicant's overall landholding at Aughinish Island, to the south-west of the process area of the plant. The Application Site is bounded by grassland and vegetation to the north, beyond which lies the Shannon Estuary.

The process area of the plant is located to the north-east of the Application Site with a nature trail area, AAL Sports grounds, LCCC water treatment plant and main site access road all located to the east of the Application Site.

The western boundary of the Application Site runs parallel with the Robertstown River, the edge of which is defined by an existing flood tidal defence berm (FTDB).

The Limerick – Foynes railway line (now disused) runs to the south of the Island, as does the N69 National Secondary Route between Limerick and Tarbert. Aughinish Island is accessed via the L1234 Aughinish Road, which is a two-way local road which connects with the N69.

Environmental receptors within the vicinity of the Application Site include the Lower River Shannon SAC (ca. 500 m north and ca. 600 m south) and River Shannon and River Fergus Estuaries SPA (ca. 500 m north and ca. 650 m south).

2.2 Proposed Development Activities

The Bauxite Residue Disposal Area (BRDA) Raise Development (Proposed Development) comprises the following development components:

- **Raise of the Bauxite Residue Disposal Area (BRDA):** The current BRDA is permitted to be constructed to Stage 10, which has a perimeter crest elevation of 24 mOD and a maximum dome crown elevation of 32 mOD. It is proposed that the permitted height of the overall BRDA be increased to accommodate the further storage of bauxite residue within the footprint (circa 8 million m³ of storage) and to extend the life of facility by approximately 9 years. The proposed increase in height is 12m which will comprise 6 x 2m high stages raises (Stages 11 to 16), to provide a new perimeter crest elevation of 36 mOD and a maximum dome crown elevation of 44 mOD.
- **Raise of the Salt Cake Disposal Cell (SCDC):** The current SCDC is located within the BRDA, comprises a footprint of approx. 1 ha. and is constructed to a perimeter crest elevation of 29 mOD. It is proposed the SCDC be vertically extended to accommodate further storage of salt cake within its current footprint (circa 22,500 m³ of storage) and to provide the equivalent of 3 years storage capacity. The proposed increase in height is 2.25m which will comprise a single raise to provide a new perimeter crest elevation of 31.25 mOD and a storage footprint of 1.45 ha.
- **Extension of the Borrow Pit:** The current permitted Borrow Pit is located to the east of the BRDA and is scheduled to provide circa 374,000 m³ of rock fill material to construct the BRDA to Stage 10. It is proposed to extend the footprint of the Borrow Pit from approx. 4.5 hectares to approx. 8.4 hectares (an additional footprint of 3.9 ha.) to provide an additional circa 380,000 m³ of rock fill material.

The Proposed Development will enter into an aftercare phase following the completion of the combined construction/operational phase.

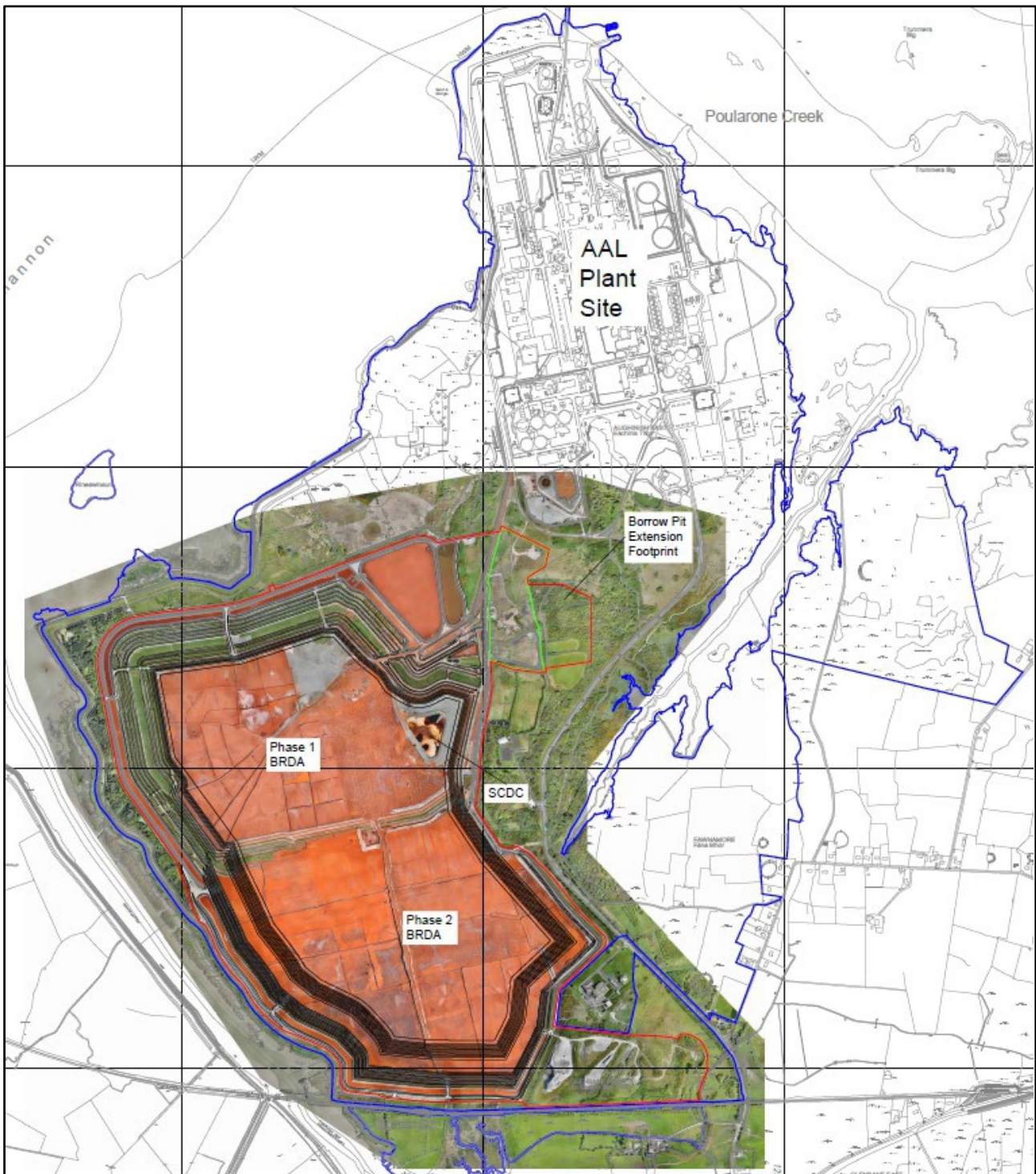


Figure 2: Facility Location Map - Blue Line is the AAL Ownership Boundary, Red Line is the Application Site Boundary and Green Line is the permitted Borrow Pit footprint

3.0 ENVIRONMENTAL MANAGEMENT

3.1 Roles and Responsibilities

The anticipated roles and responsibilities of the key parties involved in the management of environmental issues during the construction works are set out in Table 1 below and shall be in compliance with Condition 1.4 (ii) of the Industrial Emission Licence P0035-07 namely:

'No alteration to, or reconstruction in respect of, the activity, or any part thereof, that would, or is likely to, result in

(ii) any changes in:

- *Site management, infrastructure or control with adverse environmental significance;*

Shall be carried out or commenced without prior notice to, and without the approval of, the Agency.'

The Main Contractor shall be responsible for the environmental performance of their sub-contractors and monitoring of environmental performance will be undertaken by AAL.

Table 1: Roles and Responsibilities

Position	Name	Contact Details
AAL BRDA Operations Team	AAL BRDA Senior Engineer	(061) 604000
AAL Environmental Team	AAL Environmental Coordinator	(061) 604000
AAL Project Ecologist	Ecology Ireland Wildlife Consultants Limited	https://www.ecologyireland.ie/
AAL Facilitator	Nominated at Project Stage	-
Main Contractor Project Manager	Nominated at Project Stage	-
Main Contractor Representative to fulfil Environmental Role(s)	Nominated at Project Stage	-
Other Relevant Appointments nominated by Main Contractor	Nominated at Project Stage	-

Note: *Any changes in roles and responsibilities will be identified and clearly communicated to those affected.*

AAL will nominate a relevant Contract Facilitator / Field Facilitator and/or Designated Engineer for the Project. The Main Contractor will nominate a Contractor's Representative and other Relevant Appointments, as required.

These persons will liaise on environmental issues as described for safety under the safety regulations. The Main Contractor is responsible for the environmental performance of its sub-contractors.

The **AAL BRDA Senior Engineer** is responsible for operational works carried out on the BRDA, including health, safety and environmental procedures and performance.

The **AAL Environmental Coordinator** is responsible for ensuring the BRDA is operated in compliance with the licence (IEL P0035-07) and that any works conducted within the facility are carried out in accordance with the AAL Environmental Manual, the relevant licence conditions and specific conditions required by the planning authorities (as applicable).

The **AAL Project Ecologist** is an external consultant that will provide advice, prepare assessments and conduct monitoring for the AAL Environmental Team, as required, during the design and operational stages of the Proposed Development.

The **AAL Facilitator** is responsible for liaison between the AAL Environmental Team and the Main Contractor Team as is the front-line observer for monitoring and validation of environmental compliance.

The responsibilities of the Main Contractor's **Project Manager** will include:

- Implement the final CEMP and all associated management procedures and mitigation;
- To be the overall accountable person for the environmental compliance of the operations during the construction phase, including to ensure works are conducted in accordance with the relevant environmental requirements of the application and consent documentation and any other regulatory and contractual requirements;
- To ensure that relevant staff have received appropriate environmental training; and
- Appoint suitably qualified and competent sub-contractors.

The responsibilities of the Main Contractor's Representative as **Environmental Officer / Coordinator** will be:

- Manage the requirements of the final CEMP during the course of the construction phase;
- Maintaining, inspecting and updating the final CEMP and other relevant documents;
- Liaise with and provide advice to staff, sub-contractors and other relevant parties with regards to the environmental risks and controls for tasks;
- Monitor the performance of activities to ensure that identified risks and controls are implemented effectively;
- Undertake routine construction work area inspections, initiate appropriate actions, and complete a weekly environmental inspection report;
- Management of the environmental monitoring programme including noise, dust, and provide status reports, as appropriate;
- Conduct environmental audits as required by the final CEMP, to include audits of sub-contractors and suppliers, as appropriate;
- Assist in the investigation and resolution of complaints and incidents;
- Documenting and maintain records of above audits, inspections and reports securely; and
- Notify the Project Manager or their appointed compliance representative of any deficiencies in the performance of the final CEMP, so that necessary improvements can be implemented.

3.2 Legal Compliance

In the construction of the Proposed Development and as part of the environmental management, AAL and the appointed Main Contractor will adhere to all relevant Irish and EU environmental legislation, guidelines and best practice measures during the construction phase, including legislation relating to ecology and biodiversity; air; water and groundwater; noise and vibration, and other relevant environmental disciplines.

The appointed Main Contractor, and any sub-contractors, will comply with the final CEMP and associated management plans in order to adhere to relevant legislation and to meet relevant best practice measures during the construction phase.

This final CEMP will be regularly reviewed (every 6 months) and updated to ensure continued legal compliance.

The Main Contractor and sub-contractors must conduct their actions under the final CEMP in a manner compliant with licences and permits issued to the facility, including the IED licence.

3.3 AAL Environmental Management Systems

AAL operates the facility (including the current BRDA, the current SCDC and the permitted borrow pit area) under an environmental management system (EMS) accredited to ISO 14001 (ISO 14001:2015 Environmental management systems). This EMS is implemented on-site to ensure the environment is protected in line with the Industrial Emissions Directive and other relevant regulations and requirements. This EMS will be updated to include the Proposed Development,

Numerous activities and aspects of the facility management, including contractor activities, have the potential to impact on the environment so it is critical that controls are in place to manage these activities. AAL have in place a manual for contractors (*Environmental Manual for Contractors*, AAL Environmental Department, 2016). This manual outlines AAL rules applicable to contractors to ensure protection of the environment while they carry out work at the AAL facility. The rules also apply to sub-contractors. The Contractors and Sub-contractors are responsible for adherence to these rules.

The appointed Main Contractor shall have regard for the guidance and advice of the ISO14001 environmental management standard and relevant Construction Industry Research and Information Association's (CIRIA) guidance including, C741 Environmental good practice on-site guide (fourth edition).

3.4 Planning Permission

To ensure compliance with the Planning and Development Act (2000, as amended) and with the regional, county and local development plans, An Bord Pleanála and Local Authorities stipulate Conditions with planning consent. These Conditions are required to be followed and adhered to in order to ensure that the Proposed Development does not impact detrimentally on the environmental or public amenities and does not give rise to a hazard to the local area and public health. Wherever appropriate, these conditions will be incorporated into this draft CEMP and the functional management and mitigation will be described.

3.5 Industrial Emissions Licence

AAL operate the overall facility in accordance with an Industrial Emissions (IE) Licence issued by the EPA, IEL No. P0035-07.

The IEL establishes how the overall facility's environmental management will be controlled and operated. The Main Contractor will work with the AAL Environmental Team to integrate the environmental management of the Proposed Development in a manner consistent with the requirements of the IEL. This integration will ensure that all Proposed Development related activities undertaken by the Main Contractor and sub-contractors complies with the IEL (and all revisions to the IEL relating to the Proposed Development) for the facility.

3.6 Risk Assessments and Method Statements

The Main Contractor's Project Manager in co-operation with the AAL Facilitator and AAL's Environmental Team (as required) shall carry out written risk assessments – method statements (RAMS) for any activity presenting a significant environmental hazard that is not covered by existing environmental procedures. Copies of RAMS shall be retained by both AAL and the Main Contractor.

Written RAMS will be provided by the Main Contractor (and their sub-contractors) before work commences for any activities involving a significant environmental hazard. These will state the control measures or procedures to enable the work to be carried out with due concern for the environment, e.g., spillage precautions, discharge monitoring, waste management, etc.

As appropriate, the method statements will reference provisions in this draft CEMP and the final CEMP may be required to be updated following this process, (see Section 10.0). Method statements will include step-by-step explanations of how the work is to be done in relation to the environmental aspects. If possible, they will follow recognized codes of practice where available, or otherwise proven in similar work situations.

A competent person, acting on behalf of the Main Contractor, will be required to certify method statements.

4.0 HEALTH AND SAFETY

AAL has developed a Health and Safety Policy and the firm is committed to ensuring the safety and health of staff, on-site Contractors, sub-contractors, and other third-parties who may be affected by construction activities.

Aspects of facility management related to contractors and sub-contractors is identified within the Rusal *Health and Safety Manual for Contractors*, (Rusal, 2016). This manual outlines AAL rules applicable to contractors and sub-contractors to ensure protection of personnel health and safety while working at the AAL facility. The contractors and sub-contractors are responsible for adherence to these rules.

All personnel and activities at the AAL facility must comply with provisions in the Safety, Health and Welfare at Work Act 2005 (No. 10 of 2005; as amended), Health and Welfare at Work (General Application) Regulations 2007 (S.I. No. 299 of 2007; as amended), and the Safety Health and Welfare at Work (Construction) Regulations 2013 (S.I. No. 291 of 2013; as amended).

Within the Borrow-Pit areas, all personnel and activities will also be required to comply with the Safety Health and Welfare at Work (Quarries) Regulations 2008 (S.I. No. 28 of 2008; as amended). Compliance with the Health and Safety Authority (HSA) Safe Quarry Guidelines (Health and Safety Authority's (HSA; 2020) 'Safe Quarry. Adherence to the Guidelines to the Safety, Health and Welfare at Work (Quarries) Regulations 2008 will limit the potential for incidents to occur in those areas.

During the tender stages, a Design Stage Safety and Health Plan shall be developed for the Proposed Development activities (see Section 1.2). This Plan will be developed by the appointed Project Supervisor for the Design Process (PSDP) in accordance with the above-mentioned health and safety regulations.

Prior to the commencement of construction works, a Construction Stage Safety and Health Plan shall be created for the Proposed Development activities (see Section 1.2) and this plan will reflect the provisions of the overall AAL health and safety system to ensure efficient management. This Plan will be developed by the appointed Project Supervisor for the Construction Stage (PSCS) in accordance with the above-mentioned health and safety regulations.

5.0 GENERAL ENVIRONMENTAL MITIGATION MEASURES

A range of general environmental mitigation measures have been committed to that will help to avoid, reduce or offset potential impacts. Adherence to this draft CEMP is an important mechanism for implementing environmental mitigation measures, but adherence to the following plans is also required:

- Design Stage Safety and Health Plan;
- Construction Management Plan;
- Construction Traffic Management Plan;
- Construction and Demolition Waste Management Plan; and
- Construction Stage Safety and Health Plan.

These documents will be developed at the tender stage and/or prior to the commencement of construction stages of the Proposed Development.

In order to protect material assets, pre-construction consultation will be undertaken, and authorisation achieved for all relevant infrastructure connections with the relevant infrastructure or utility provider, e.g., Irish Water and Gas Networks Ireland. Any construction stage works required to material assets on or around the Application Site will be carried out in conjunction with the relevant provider to ensure minimal disruption to existing users. Any such works will be carried out strictly in accordance with the relevant provider's Code of Practices.

5.1 Corrective Action

Where the AAL Facilitator or AAL Environmental Team conducting monitoring and validation of environmental compliance identifies an impact on the receiving environment, the AAL Environmental Coordinator and the AAL BRDA Senior Engineer shall be notified immediately.

The AAL Environmental Coordinator and the AAL BRDA Senior Engineer, or their nominated representatives, will conduct an inspection of the location and the surrounds to identify the source of the impact and will review recent construction activities in that area.

If the source of the impact is identified as an emission from the construction activities, the AAL Environmental Coordinator is responsible for ensuring corrective action is undertaken to isolate and minimise the effects of the emission. If required, environmental monitoring may be required to determine the extent of the impact. The number and location of any monitoring points will be established in consultation with the monitoring personnel and noted on a plan so that inspection of such monitoring points can be completed if required by external agencies.

The AAL Environmental Coordinator is required to monitor implementation of any corrective actions to ensure that they are carried out and are effective.

Where the cause of emissions is identified to be the result of the design of the Proposed Development, the Main Contractor and AAL shall ensure that the design deficiencies are rectified to avoid recurrence.

AAL will ensure appropriate consultation is carried out with LCCC, the EPA, National Parks and Wildlife Service (NPWS) and the Health and Safety Authority (HSA), as required.

6.0 RECORD KEEPING AND REPORTING

6.1 Records to be Maintained

The management and record keeping required for the construction of the Proposed Development will be integrated and managed with the environmental commitments of the overall facility and the IE Licence.

The AAL Facilitator and the AAL Environmental Team will be accountable for overseeing the implementation of the final CEMP and associated management plans and will be responsible for maintaining a register of monitoring, which will be made available for auditing and inspection.

An up-to-date copy of the final CEMP will be maintained at the project office(s). Associated records will be held in the Main Contractor's files.

The AAL Facilitator and the AAL Environmental Team will be responsible for all record keeping of all environmental monitoring and compliance documentation. This will include:

- Relevant management plans;
- Weekly environmental inspection reports;
- Periodic environmental reporting, if required by the relevant authorities;
- All environmental monitoring data and consultant reports;
- Waste and chemical inventories; and
- Register of environmental complaints, and corrective action reports.

These documents will be made available to the relevant authorities if required.

6.2 Reporting

The Main Contractor will be required to provide periodic reporting to AAL. The reporting of construction progress will be documented with input from the AAL Facilitator. This reporting will include:

- A summary of environmental non-conformance at the project(s) and compliance with the provisions of the final CEMP;
- The interpretation of the results of any ongoing environmental monitoring;
- Records of environmental incidents and/or complaints, and details of corrective actions undertaken; and
- Records of environmental training carried out.

6.3 Complaints Management

The AAL Environmental Coordinator, along with any necessary input from the Main Contractor's Project Manager, is responsible for responding to environmental complaints, in accordance with the IE Licence, or queries from other stakeholders and must ensure that:

- All complaints are investigated and dealt with appropriately;
- Any corrective actions required are implemented;
- A record is made of all complaints, along with any response and/or actions taken; and
- The complaints record is periodically reviewed to identify any trends and appropriate corrective actions are taken.

The following information is recorded for all complaints received:

- Stakeholder name;
- Stakeholder address;
- Stakeholders contact details (if required for follow up, as appropriate);
- Complaint category type (e.g., noise, vibration, dust, waste, traffic);
- Details of the complaint;
- Timing and duration of nuisance or pollution; and
- Additional information.

When investigating a complaint, the AAL Facilitator and the Main Contractor's Representative is expected to confirm if the relevant mitigation measures detailed in the final CEMP were implemented and, if not, ensure corrective action is taken.

Complaints will be reported to the appropriate authorities by AAL depending on the nature of the complaint received. Complaints may be required to more than one authority and may include LCCC, EPA, NPWS and the HSA.

7.0 DISTRIBUTION

Copies of the final CEMP and associated construction plans identified in Section 5.0 will be retained by the AAL and the appointed Main Contractor.

Additional copies will be distributed to those individuals defined in Table 1.

8.0 INDUCTIONS, STAFF TRAINING AND APPOINTMENTS

8.1 BRDA Construction Activities

All Main Contractor staff (including sub-contractor staff) will be required to undergo the AAL BRDA induction and the Main Contractor induction prior to commencing work.

Environmental training will be delivered and assessed throughout the construction period, to ensure the relevant aspects of the final CEMP and associated construction plans are communicated to the project team and front-line staff (including relevant sub-contractors).

The Main Contractor will be the appointed Project Supervisor for the Construction Stage (PSCS) and will ensure that the training is appropriate for the level of works being undertaken by the staff and sub-contractors. The training will be provided as appropriate in the below format:

- Prior to the commencement of works, all personnel will undergo environmental inductions, including AAL training and briefing to all new contractor and sub-contractor personnel, as well as refresher training as required;
- Daily Pre-Start Meetings;
- Environmental Toolbox Talks;
- Incident and Near Miss bulletins; and
- Sub-contractor kick-off meetings.

All operatives will require safe pass and manual handling training as well as be competent in the area of work they will be engaged in and have received specific training relating to this.

Only suitably qualified and trained personnel will conduct certain tasks, including refuelling of plant, management of any chemical stores, conducting specialised environmental monitoring and the management of waste stores.

The Main Contractor will ensure that:

- All staff and sub-contractors receive instruction, information and training appropriate to the role and works they are conducting;
- Relevant worker training certificates, permits and licences are provided to AAL in advance of any such works;
- All staff are aware of the reporting procedures surrounding environmental incidents, and that all such incidents are required to be reported immediately; and
- All staff are aware of the environmental sensitivities of the area surrounding the Proposed Development and how certain works can cause impact and effects.

8.2 Borrow Pit Areas Construction Activities

In addition to the requirements for BRDA construction activities, the Main Contractor is obliged to comply with the statutory duties laid down in the Acts, Regulations and other legislation in respect of the operation of the Borrow Pit areas as a Quarry, i.e.,

- Mines and Quarries Acts 1965;
- Safety, Health and Welfare At Work Act, 2005 and its General Application Regulations 2007;

- Safety, Health and Welfare at Work (Quarries) Regulations 2008 (S.I. No 28 of 2008) as amended;
- Safety, Health and Welfare at Work (Quarries) (Amendment) Regulations 2013 (S.I. No 9 of 2013);
- the Safety, Health and Welfare at Work (Quarries) (Amendment) Regulations 2019 (S.I. No 179 of 2019); and
- other relevant legislation.

All Contractor personnel including Sub-Contractor personnel and working in, driving or maintaining mechanical plant in the Borrow Pit Area shall have up to date Quarry Skills Certification Scheme (QSCS) Registration cards. Construction Skills Certification Scheme (CSCS) cards shall not be accepted for this qualification.

The Main Contractor shall nominate a person to be appointed as the '**Quarry Operator**' in writing by AAL. The person nominated as the Quarry Operator shall be competent, experienced, qualified and have sufficient resources to conduct the role and shall be subject to the approval of AAL.

A suitable qualified and experienced **Driller** shall be appointed by the Quarry Operator for the drilling of shot holes and shall be supervised by the Shotfirer and/or the Explosives Supervisor.

An **Explosives Supervisor** shall be appointed by the Quarry Operator under Regulation 44 of the Safety, Health and Welfare at Work (Quarries) Regulations 2008, as amended, and is required to organise and supervise all work involving explosives, prepare the Blast Plan / Specification and carry out the Duties of an Explosives Supervisor as detailed in Part 5 (Explosives) of the Safety, Health and Welfare at Work (Quarries) Regulations 2008, as amended.

Note: *The Explosives Supervisor must hold a current registration card to carry out shottfiring operations issued by SOLAS.*

A **Shotfirer** shall be appointed by the Quarry Operator and is required to carry out the Duties of the Shotfirer as detailed in Part 5 (Explosives) of the Safety, Health and Welfare at Work (Quarries) Regulations 2008, as amended. The Shotfirer must ensure that an adequate danger zone is established, cleared and sentries appointed to prevent inadvertent access; and ensure that the shot is fired from a safe place. The Shotfirer must inspect following the blast to ensure that all the shotholes have fired and that no misfires have occurred and to ensure that the quarry face and sides are in a safe condition and establish that material did not project beyond the danger zone. The Shotfirer, in conjunction with the Explosives Supervisor, shall carry out any shottfiring operations in accordance with the shottfiring rules and blast specification.

Note: *The Shotfirer must hold a current registration card to carry out shottfiring operations issued by SOLAS.*

The Contractor shall be responsible for the procurement, conveyance and custody, temporary storage, installation and subsequent removal of all empty and/or deteriorated explosive materials for the blasting activities. No explosive material shall be permitted to be stored at the AAL facility between blasts in accordance with Condition 5.12 (vi) of the AAL IEL

The Contractor shall manage the process in accordance with the Guidance Notes to Explosive Legislation in Ireland, May 2020, with Part 5 (Explosives) of the Safe Quarry Guidelines to the Safety, Health and Welfare at Work (Quarries) Regulations 2008, as amended, and with the Guidance of the Safe Use of Explosives in Quarries, as adopted by the Safety and Health Commission, 2002.

9.0 ENVIRONMENTAL MANAGEMENT

The Main Contractor and the AAL Environmental Team will refer to the good practice provision in the Construction Industry Research and Information Association's (CIRIA) C741 Environmental good practice on site guide (fourth edition).

The Main Contractor will be responsible for reviewing and updating these measures in accordance with consultation responses and in light of final planning conditions.

9.1 Housekeeping

The Main Contractor will emphasise the importance of good housekeeping and general environmental practice during the construction phase. Housekeeping is an important part of good environmental practice, and it helps everyone to maintain a more efficient and safer work area. The work area should be tidy, secure, and have clear access routes that are well signposted.

Equipment for protection of the environment, appropriate to the risk shall be provided by and used by the Main Contractor. Examples are portable bunds for liquids, equipment to contain and mop up spills, and provisions to minimise noise.

The Main Contractor and Environmental Officer / Coordinator will ensure that they:

- Adequately plan the work area with designated area of materials and waste storage. A stockpiling area for imported materials (soil and organic soil improver) has been defined within the Application Site to the south-east of the BRDA. A location for stockpiling crushed rock material has been identified within the Borrow Pit areas;
- Segregate different types of waste as it is produced and arrange frequent removal;
- Keep the work areas and trafficked areas between the Borrow-Pit areas and the BRDA clean and tidy;
- Ensure no windblown litter or debris leaves the facility boundary;
- Use covered skips and bins;
- Ensure that materials and plant storage areas are properly managed. Lightweight materials to be covered with sheeting and secured as required;
- Frequently maintain and clean wheel washing facilities;
- Maintain haul routes in a clean and tidy condition;
- Ensure adequate space is given for the safe refuelling of construction plant with appropriate protections in place for refuelling operations;
- Ensure that their equipment does not have any fault that could result in damage to the environment;
- Employ the services of a road sweeper, as required; and
- Ensure the facility boundary is secure.

The work area must be kept as clean as possible during the work and left clean to the satisfaction of the relevant AAL manager at completion.

The Main Contractor is responsible for the reporting and clean-up of spills or harmful releases. The use of cleaning agents must not form an environmental hazard.

9.2 Working Hours

Maximum construction hours will be the same as those of the overall AAL facility, irrespective of day light conditions, and are listed below:

- 08:00 hrs to 18:00 hrs Monday – Saturday

No work will be carried out on Sundays or public holidays and the work areas will remain secure when construction and operational activities across the overall facility are not taking place.

No work, or other activity that could reasonably be expected to cause annoyance to residents in the vicinity (including deliveries), will take place between 19:00 hours and 07:00 hours.

Ultimately, the working hours and days will be subject to the requirements of the planning permission and revisions to the IEL.

9.3 Construction Lighting

The BRDA has permanent light fixtures at discrete locations to permit operational activities outside of the normal working hours. These BRDA light fixtures are at locations where no further construction is envisaged as part of the Proposed Development and nor do they provide a sufficient coverage to meet construction requirements.

Lighting on construction sites is essential for health and safety in the winter and spring months in order to ensure work areas are sufficiently illuminated. However, lighting can annoy the local residents and disturb ecology.

Should the construction and operational works require additional lighting, the Main Contractor and AAL Environmental Team will develop a lighting plan that minimizes the extent and duration of directional lighting. Any additional lighting installations will be consistent with the overall proposals for lighting in the Proposed Development application/consent and the EIAR.

9.4 Facility Security

AAL and Contractors can be held liable for environmental damage even when it is caused by unauthorised entrants onto the facility. Security is an important component of good environmental management.

Note: *AAL have an existing security team operating across the overall facility and a security fence is erected at the facility boundary. Unauthorized entry has not been an issue to date at the facility.*

The various areas included in this Proposed Development will be incorporated into the patrols of the facility security team. AAL will ensure:

- The facility boundary is secured using perimeter fencing with high quality locks on gates and access points;
- Closed-circuit television cameras are in place to monitoring key construction areas;
- Materials are not stacked against the boundaries so that opportunities to scale hoarding are prevented; and
- Fuels, or hazardous/flammable materials will not be stored in close proximity to boundaries in order to avoid the potential for theft and arson.

9.5 Incident Preparedness and Response

The Main Contractor shall provide for any likely environmental emergency that could arise through the work. A method of alarm raising with the AAL Facilitor / AAL Security and emergency services will be agreed in advance of the commencement of works. The Main Contractor shall take immediate action to mitigate the consequences of an emergency and co-operate fully with AAL's emergency procedures.

Environmental incidents must be reported immediately to the relevant AAL and Main Contractor supervisors. Responsibility for incident reporting rests with the Main Contractor. The Main Contractor must, also co-operate with and assist AAL in the investigation of incidents

Emergency Response Contacts and Procedure

A list of emergency contacts is presented in Table 2. A copy of these contacts will be included in the Construction Stage Safety and Health Plan, and in appropriate locations throughout the facility, including project offices, noticeboards and the various project welfare facilities.

Further details of appropriate contacts should be included by the Main Contractor in the Table below: which may include:

- Spill clean-up contractors;
- Waste contractors; and
- Public and neighbouring business that could be affected.

Table 2: Emergency Contacts

Contact	Telephone Number
First Aid / AAL Facility Security Office	(061) 604 444 or 4444
Emergency Services	999 or 112
Project Manager	TBC
Environmental Officer / Coordinator	TBC
Health and Safety Co-ordinator	TBC
Environmental Protection Agency (EPA)	053 916 0600
Health and Safety Authority (HSA)	01 614 7000
Project Supervisor Construction Stage (PSCS)	TBC
Project Supervisor Design Stage (PSDS)	TBC
ESB Emergency Services	1850 372 999
Bord Gáis Emergency	1850 20 50 50
Gas Networks 'Dial Before You Dig'	1850 427 747
Gas Networks Transmission Enquiries	021 453 4562
Irish Water Emergency	1850 278 278
Eir Emergency	1902
Newcastle Garda Station (24 hours)	069 20650
Askeaton Garda Station Monday to Friday: 24/7 Saturday to Sunday: 24/7	061 601 630
LCCC County Offices	061 556 000
LCCC Environmental Health Officer	TBC

Emergency Response

Emergency response procedures for the project(s) will be in accordance with the current AAL Emergency Response Plan (Revision April 2017). The emergency response plan encompasses a number of emergency scenarios. Emergencies covered by the procedures include all emergencies both on and off AAL property which effect AAL or its personnel in a significant way and external emergencies for which AAL assistance may be required. Health and safety related response will be documented within the Main Contractor's Construction Health and Safety Management Plan.

Note: *Depending on the nature of the emergency, the EPA, in accordance with the IEL, and/or the HSA, in accordance with Health and Safety regulations, will be contacted immediately.*

In the event of an environmental incident, the AAL Environmental Coordinator, the Main Contractor Project Manager (Project Manager) and the Main Contractor Representative (Representative) will be notified immediately. The Project Manager will be responsible for identifying the appropriate responsible persons for coordinating the response procedure as per the AAL Emergency Response Plan. Upon the commencement of the construction phase the Project Manager will be responsible for defining a chain of command for situations where they may be unavailable to deal with an incident; such definitions should be coordinated with the emergency plan for the overall facility.

The existing Emergency Response Plan addresses the following key items:

- The identification of a 'Facility Control Centre', the location from where the direct mitigation and control of the incident is being directed;
- The roles and responsibilities of the personnel in the 'Facility Control Centre' including the 'Facility Controller';
- Initial emergency steps and notifications;
- Provisions for appropriate drills and scenario training for staff and sub-contractors, appropriate to the level of risk; and
- Emergency communication procedures.

Specific emergency response action cards and response procedures are available in the AAL Emergency Response Plan. The action card for all employees has been recreated in Figure 3 below.

Further action cards are provided for other facility personnel including, the Shift Plant Facilitator, Security Control Officer, the Aughinish Fire Brigade Leader, Plant Manager, Safety Officer and First Aiders.

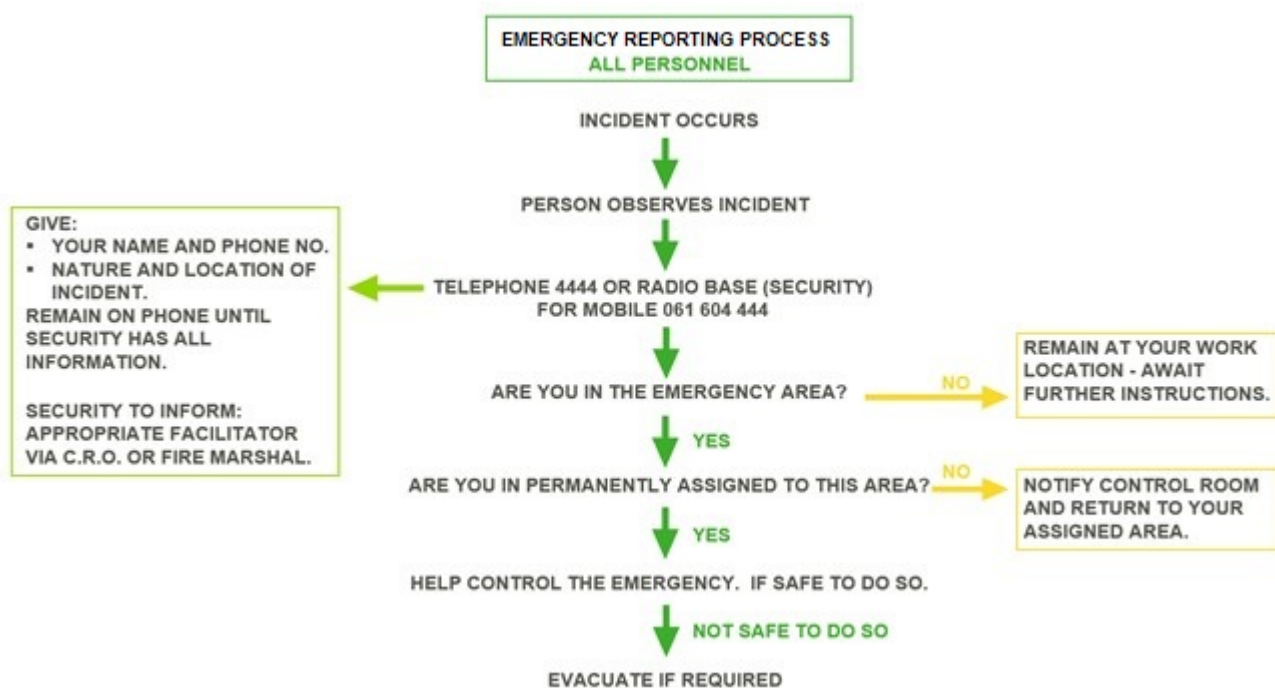


Figure 3: Emergency Reporting Procedures for all AAL and Contractor Employees.

Environmental Risks and Pollution

The likelihood of an incident can be minimised by effective planning through development of a pollution incident response plan. This plan will take incorporate the AAL Emergency Response Plan, the requirements of the IE Licence and any conditions required by planning permissions.

The Representative shall assess the environmental risk prior to the commencement of each phase of activity, and the appropriate controls will be put in place. This incident characterisation and risk classification will be carried out in accordance with existing AAL procedures for the overall facility. The Main Contractors and sub-contractors RAMS will be reviewed to ensure they include appropriate provisions for environmental risk and mitigation.

The Representative will identify substance to be used during the works and will ensure that the below are available for the activities:

- Copies of the material safety data sheets of the substances being used:
- Details of environmental and health and safety storage, handling and transportation controls for the substance;
- The emergency response equipment and locations in the event of an incident; and
- Appropriate Personal Protective Equipment (PPE) for the tasks.

Suitable equipment, such as spill kits, oil booms and absorbent material, should be held at appropriate locations on-site and clearly marked.

Upon the commencement of the construction phase the Project Manager and Representative will assess the number of spill-kits required and the appropriate deployment areas across the work areas. These areas will be in or directly adjacent to where they will be needed.

The Representative will manage and maintain these kits accordingly. Spill-kits will be obtained from a reputable supplier and are to be specific to the oils and chemicals that are on-site. The contents of a spill-kit will depend on the area of use, but are likely to include:

- Absorbent granules, pads, booms and socks;
- PPE; including gloves, goggles and overalls. The Main Contractor will review this provision of PPE with the Health and Safety Manager and in accordance with the Construction Stage Safety and Health Plan and overall AAL health and safety requirements. The PPE required will be depended on the substances and the requirement in the substances' Safety Data Sheet and the risk assessments and method statements for use;
- Drain covers/blockers; and
- Polythene sheeting and bags.

Spill response training will be provided to all personnel. The spill response procedure will be available to all staff and the following steps will be carried out to contain spills and leaks which may occur:

- Identify the product spilled. Refer to the product's Material Safety Data Sheet. Make sure area is safe for entry and the spill does not pose an immediate threat to health or safety of responder;
- Check for hazards (flammable material, noxious fumes, cause of spill). If flammable liquid is spilled, turn off engines, nearby electrical equipment and other sources of ignition. If serious hazards are present leave the area, notify persons in the area, the relevant project manager and call the AAL Facility Security Office. When in doubt, consult the applicable Material Safety Data Sheets for hazards;
- Keep a safe perimeter and carefully located the source of the release. If the situation is safe to do so the attempt to stop the source of the release. Approach the spill with the wind at your back. Stop source of spill (plug hole, upright the container, shut off valve);
- Stop spill from entering drain (use absorbent or other material as necessary, close valve to drain, cover or plug drain). Do not attempt to flush the spill away;
- Materials used to control the spill are to be disposed in appropriately segregated containers and removed by a licenced haulier to an appropriate facility;
- If the spill is no longer under control, notify the relevant project manager and call the AAL Facility Security Office. The appropriate emergency response procedure will then be followed as per the AAL Emergency Response Plan;
- The Project Manager and Representative will inspect the works area to ensure other appropriate actions are taken and incident reporting and corrective actions are taken; and
- The AAL Environmental Coordinator, with necessary input from the Main Contractor, will notify the appropriate regulatory bodies, as appropriate and in compliance with the IE Licence.

9.6 Ecology and Biodiversity

There are a number of ecological mitigation measures which will be applied during construction which will minimise the risk to any flora and fauna occurring at the development.

- During construction where required excavations will be fitted with escape boards to ensure that there is a means of egress for any wildlife to exit. Excavations shall be inspected daily and in the unlikely event that any birds, mammals or other protected species are present and appear unable to vacate the area the facility wildlife specialist will be contacted to provide advice.
- The Proposed Development does not comprise any new lighting installations. However, a number of existing lighting installations for the BRDA are required to be raised as the BRDA increases in elevation;
- The final agreed landscaping restoration plan will be implemented in a progressive timing both during and at the end of the operational life of the facility.

Measures specific to the borrow pit areas to ensure there is no residual environmental risk to the designated Natura 2000 sites within the zone of influence include:

- No rock-blasting will take place during the overwintering period for birds (October to March inclusive).
- Rock blasting will only take place during daylight hours April to September inclusive.
- Construction operations will take place during the hours of daylight to minimise disturbances to faunal species active in the nocturnal/crepuscular period.
- The borrow pit areas will not be lit at night (with the exception of low-level switchable safety lighting). Any lighting systems present will be designed to minimise nuisance through light spillage. Shielded, downward directed lighting will be used wherever possible, and all non-essential lighting will be switched off during the hours of darkness.
- To allow mammals to commute across the active borrow pit areas, openings of minimum 200mm diameter will be provided in the boundary fence at intervals of 100-200m along the fenced area.
- All edible and putrescible wastes will be stored and disposed of in an appropriate manner. Similarly, all construction materials will be stored and stockpiled at planned locations and double-handling of stripped soil will be avoided insofar as possible by implementation of a materials storage plan.

9.7 Water, Soils, Land and Geology

Potential impacts to the water environment (surface water and groundwater) and land, soils and geology, during the Proposed Development will be managed through the design of the Proposed Development along with additional mitigation measures.

- **Proposed Development Design** – understood to comprise the project design principles and standards adopted to avoid or prevent adverse safety and environmental effects, construction and operation to appropriate codes of practice and guidelines, and including fixed procedural commitments such as instrumentation and monitoring. This measure provides the baseline for the assessment of impacts.
- **Additional Mitigation** - measures required to reduce and if possible offset likely significant adverse environmental effects, in support of the determined significance of effects.

9.7.1 Surface Water and Groundwater Management

9.7.1.1 Design of Proposed Development

The elements of the Proposed Development design and good working practices that reduce the potential for impacts to the water environment include the following.

- Rock fill material sourced from the Borrow Pit areas will be used for the construction of the BRDA and SCDC. No rock fill material is anticipated to be needed to be imported for construction purposes.
- Soil and organic soil improver will be imported to implement the landscaping design for the Proposed Development. These imported materials shall be of a suitable quality that will not lead to ground contamination. Any imported material will come from a suitable source where the quality of the material will have been confirmed prior to acceptance;
- There will be no septic tanks or underground storage tanks during construction or after-use to prevent leaks to ground and the water environment. Welfare facilities are provided on the main plant area of the facility;
- The BRDA and SCDC are existing structures which are compositely lined (or demonstrable equivalent), as would be the proposed raises to both;
- Surface water runoff, bleed water, sprinkler water and seepage from the bauxite residue will continue to percolate through the rock fill stage raises and discharge into the encompassing PIC;
- There will be no requirement for a connection to a water mains or abstraction from groundwater to enable the Proposed Development; and
- There are no planned discharges to groundwater during operations from the Proposed Development, which will reduce the potential for impacts to water quality.

Post passive aftercare phase licensee and subsequent occupiers of the Proposed Development will be responsible for managing their activities and applying for (and working within the constraints of) any environment authorisations or consents required for their operations.

9.7.1.2 Additional Mitigation

To further mitigate the initial effects associated with natural resources and built structures, the following additional mitigation procedures will take place:

- Adoption of the existing AAL Environmental Management System (EMS) and other procedures (including Health and Safety) for the AAL Facility;

- A draft Construction Environment Management Plan (CEMP) has been developed which incorporates relevant mitigation measures for the management of surface and groundwaters during construction to ensure the Proposed Development is compliant with the licence requirements. Enforcement of the final CEMP and licence requirements will minimise potential for impact on the surface or groundwater environment;
- The management of construction works, to be conducted by external Contractors and internal AAL alliance Contractors, will be carried out in line and in accordance with all monitoring provisions identified in the final CEMP, with the IEL requirements, with the AAL Environmental Manual for Contractors (AAL, October 2016), and with any Conditions imposed by the planning authorities;
- Haul roads will be wetted down using a water bowser regularly to reduce the deposition of construction dust material on the surrounding road network that could get into the water environment;
- Mobile plant and semi-static plant, i.e., crushers and screeners, (for all AAL plant, AAL alliance Contractors and external Contractors) will be refuelled by the current method which is an AAL operated mobile double skinned fuel bowser which drives around the BRDA. Drip trays with absorbent mats are utilized.
- Any mobile plant on the Application Site shall be regularly maintained, and where plant is damaged or leaking it will be fixed or replaced immediately, as part of the ongoing operational management of the borrow area to reduce the risk of leaks;
- Stockpiles will be evaluated and monitored by the main Contractor to minimise erosion and input of suspended solids to the water environment;
- An emergency spill kit (including absorbers) will be used in the event of an accidental spill;
- No storage of hydrocarbons will take place on the Application Site;
- All waste generated, whether from the operation of Plant or BRDA activity, or from construction activity in the Application Site during the construction or operation of the Borrow Pit Extension, the BRDA stage raises or the SDCC raise, is the responsibility of AAL as the originator in accordance with the licence. All transport of waste off-site is undertaken by AAL via licenced waste contractors and AAL is responsible for waste document control;
- The Main Contractor (and sub-contractor) must obtain AAL approval for all chemicals used in advance of bringing the materials on-site. Safety Data Sheets must be provided, and precautions taken for environmental protection. The unloading and loading of materials shall be carried out in areas protected against spillage and runoff; and
- Testing of the lining system for the SCDC will take place after construction to ensure the seams are air-tight and the panels have not been damaged to ensure the potential for leakages is reduced; and

In addition, good housekeeping during operations, by adhering to best construction practices within the development area, i.e., following the final CEMP, will mitigate against potential impacts on the surrounding environment.

9.7.2 Soils, Land and Geology Groundwater Management

The elements of the Proposed Development design and good working practices that reduce the potential for impacts to soils, land and geology include the following.

9.7.2.1 Design of Proposed Development

- The design of the Borrow Pit Extension follows the Health and Safety Authority's *'Guidelines to the Safety, Health and Welfare at Work (Quarries) Regulations 2008, (as amended), for all activity for the extraction, crushing and stockpiling of rock;*
- Security fencing will be installed at the Borrow Pit Extension boundary and the gate will be locked and controlled by the projects' management. The exposed edges in the quarry will be protected with safety berms;
- Installation of the additional pump upgrades and coordinate the operational procedures required for the BRDA water management system to perform effectively during the operational inflow design event
- Operations at the Borrow Pit Extension will be managed in accordance 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 health and safety, training, and appropriate project management;
- Regular inspections, audits, stability assessments and daily walk-over condition and stability checks are and will be carried out on the proposed BRDA Raise, the SCDC Raise and the Borrow Pit Extension area in accordance with the Physical Stability Monitoring Plan (Golder 2021) and the operating procedures for the BRDA are directed by the series of stand-alone Standard Work Method (SWM) documents which are prepared, maintained and updated by the AAL BRDA Engineering Team; and
- The current AAL Physical Stability Monitoring Plan, AAL Emergency Plan, AAL BRDA Operational, Safety and Maintenance (OSM) Manual and the AAL Operating Procedures for the BRDA (SWMs) will be updated to include the Proposed Development; and
- Installation works to insert as per existing practice, the piezometers, inclinometers and settlement systems in the BRDA, as the facility increases in elevation.

9.7.2.2 Additional Mitigation

To further mitigate the initial effects associated with natural resources and built structures, the following additional mitigation procedures will take place:

- Adoption of the existing AAL Environmental Management System (EMS) and other procedures (including Health and Safety) for the AAL facility;
- A draft Construction Environment Management Plan (CEMP) has been developed which incorporates relevant mitigation measures for environmental protection during construction to ensure the Proposed Development is compliant with the licence requirements. Enforcement of the final CEMP and licence requirements will minimise potential for environmental impact;
- The management of construction works, to be conducted by external Contractors and internal AAL alliance Contractors, will be carried out in line and in accordance with all monitoring provisions identified in the final CEMP, with the IEL requirements, with the AAL Environmental Manual for Contractors (AAL, October 2016), and with any Conditions imposed by the planning authorities;
- Installation of gabion mattress protection on the downstream slope of the SWP and LWP and increase in the elevation of existing gabion mattresses installed on the downstream slope of the OPW for the PIC

along the north and west flanks of the BRDA, as detailed in the permitted planning permission and IE Licence.

- Continued layered deposition and mud farming in accordance with the Conditions of the IEL. Regular validation of the strength parameters of the deposited bauxite residue in order to achieve the target FoS, as the BRDA is raised in elevation, as set out in the Physical Stability Monitoring Plan.
- Operational procedures to avoid water collecting in the perimeter interceptor channel along Sectors E and F, when constructed in future at downstream of Inner Stage 4 and Inner Stage 6, respectively, by providing sufficient gradient to allow surface water to runoff;
- Refuelling and the addition of hydraulic oils or lubricants to vehicles or generators will take place on-site using a mobile bowser fuelling plant (i.e., no bulk fuel storage tanks will be used). This will only take place in designated areas. The designated areas will have impermeable surfaces, any fuel/oils that enter the drains will be intercepted, and the refuelling areas will be equipped with easily accessible spills kits that staff have been trained to use;
- Any waste removal will be managed and undertaken by a competent Contractor according to best practice and disposed of accordingly by a licenced waste disposal Contractor (see Chapter 13: Material Assets - Waste of this EIAR);
- Groundwater monitoring of existing wells at the facility will be undertaken on a regular basis (refer to Chapter 10: Hydrology and Hydrogeology); and
- The AAL Health and Safety Department will ensure compliance with relevant safety and statutory legislation and best practices.

Post passive aftercare phase licensee and subsequent occupiers of the Proposed Development will be responsible for managing their activities and applying for (and working within the constraints of) any environment authorisations or consents required for their operations.

9.7.3 Monitoring

The future monitoring programme at the facility will be carried out in accordance with the monitoring requirements of the IE Licence (currently P0035-07), as amended by future IE Licence revisions. The IE Licence requires that specific emission limits are adhered to which are specified in *Schedule B.2 Emissions to Water* of the licence. Schedule C.6 includes ambient monitoring which will be carried out for groundwater wells.

Monitoring of piezometric levels will take place regularly (minimum of quarterly) to monitor the phreatic surface head in the bauxite residue stack. Regular (minimum of quarterly) water quality sampling in perimeter observation wells (OWs) and at the designated surface water locations to assess if there are any seepages.

Regular visual inspections of the dam wall integrity by a suitably qualified engineer will be undertaken for both the Proposed Development and regular visual inspections of the faces in the proposed Borrow Pit Extension area.

9.8 Air Quality and Climate

9.8.1 Construction Impacts to Air Quality and Climate

Construction traffic are expected to be the dominant source of greenhouse gas emissions as a result of the construction phase of the Proposed Development. Construction vehicles, generators etc., may give rise to some CO₂ and NO₂ emissions. A series of mitigation measures will be implemented which will mitigate GHG emissions including:

- All vehicles will be required to switch off engines when stationary (no idling);
- All vehicles will be serviced and maintained to ensure emissions are minimised; and
- Limestone will be sourced from the on-site borrow pit thus minimising transportation distances for the construction and operational phase of project.

Dust emissions arising from activities within the BRDA construction, Borrow-Pit and stockpiling areas can also cause health risks to receptors and nuisance and annoyance to local residents and businesses. Nuisance dust must also be avoided when and where possible. The level of dust emitted will be dependent on the activity undertaken, the location of the activity, and the nature of the dust. The generation and dispersion of the dust will be influenced by other meteorological factors such as wind speed and direction and/or, periods of dry weather. Traffic movements have potential to generate dust emissions as vehicles travel along the routes within the facility.

For the management of dust, the Project Manager and Representative will be required to implement best practice measures. The measures will include:

Project Management

- Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner and record the measures taken.
- Record any exceptional incidents that cause dust and/or air emissions, and the action taken to resolve the situation in a logbook.

Preparing, Maintaining and Operating

- Plan works layout so that machinery and dust causing activities including stockpiling are located away from receptors, as far as is possible.
- Water misting or sprays is used as required if particularly dusty activities are necessary during dry or windy periods.
- Material handling systems and site stockpiling of materials are designed and laid out to minimise exposure to wind. Fully enclose site or specific operations, where possible, when there is a high potential for dust production.
- Avoid runoff of water or mud.
- Burning of waste is strictly forbidden.

Operating Vehicle / Machinery and Sustainable Travel

- Hard surface roads will be swept while any un-surfaced roads will be restricted to essential construction traffic. Furthermore, any road that has the potential to give rise to fugitive dust is regularly watered using tractor tower bowser tanks, as appropriate, during dry and/or windy conditions.
- Ensure all vehicles switch off engines when stationary – no idling vehicles.

- Avoid the use of diesel or petrol-powered generators, where practicable, and use mains electricity or battery powered equipment where practicable.
- Impose and signpost a maximum speed limit of 25 kph on surfaced and 15 mph on unsurfaced haul roads and work areas.

Earthworks

- Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.
- Do not leave exposed soils at the Borrow-Pit footprint.

Activities and Trackout

- Ensure an adequate water supply (and water bowser) for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
- Record all inspections of haul routes and any subsequent action in a logbook.
- During drier period consider using covered vehicles to prevent escape of materials during transport.
- Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the facility where reasonably practicable). Vehicles delivering material with significant dust potential use a dedicated wheel wash prior to leaving the facility.

9.8.2 BRDA Operational Phase Measures

- AAL have installed the network of automatic water sprinklers to increase the moisture of the bauxite residue and thus reduce dust emissions. This extensive network of automatic water sprinklers will be maintained to mitigate against dust erosion from the BRDA.
- Additional activities to mitigate BRDA dust erosion include:
 - Residue farming over fresh residue;
 - Monitoring weather forecasts;
 - Managing residue placement and water levels; and
 - Inspection and water washing of plant roads.
- Ongoing tree and hedge planting and hydroseeding along the perimeter of the BRDA.
- Ensure the construction of raised residue berms confirm with design specifications identified in the EIAR.

9.8.3 Monitoring

- Increase the frequency of inspections when construction activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
- Undertake dust deposition and PM₁₀ and PM_{2.5} monitoring in accordance with IE Licence conditions.

9.9 Noise and Vibration

The operation of plant and machinery, and general construction activities are potential sources of noise that will require management across the facility, and in particular within the Borrow-Pit and Stockpiling Area. Vibration activities from blasting within the Borrow-Pit will be the main source of vibration from the Proposed Development. Nuisance noise and vibration must also be avoided when and where possible. The Main Contractor and sub-contractors must comply with statutory limits and IE licensed noise and vibration emission limits at all times.

Best practice control measures for noise and vibration during operation are taken from BS 5228 (2009 +A1 2014) Code of Practice for Noise and Vibration Control on Construction and Open Sites Parts 1 and 2. As the activities progress it is recommended for the Main Contractor to review this code of practice to assess if additional best practice measures can be incorporated into their works.

Effective management of on-site activities will significantly reduce the likelihood of impacts to off-site receptors. Understanding, adopting, communicating and integrating Best Practice Measures to minimise noise and vibration at all times and all locations, is the best way to indicate to the local authorities, local residents and workers that noise and vibration is being managed satisfactorily on site.

9.9.1 Best Practice Noise Management

Best practice noise measures should always consider: 1) the proximity of the works to receptors, 2) the duration of the works, and 3) the time of the day the works will be carried out.

Standard and commonly undertaken good practice measures to control noise on-site will include:

- Specification and substitution:
 - Be cognisant of noise when choosing plant and activities to be employed on site; and
 - If noise problems arise during activities, where reasonably practicable, replace noisy plant or activities with quieter alternatives.
- Use and modification of plant and equipment:
 - Plant should always be used in accordance with manufacturers' instructions. The Main Contractor may wish to seek to modify existing plant and equipment or apply improved sound reduction methods, to reduce noise generated. The original equipment manufacturer and a specialist in noise reduction techniques should be consulted when undertaking any modifications;
 - Fit all pneumatic tools with silencers or mufflers;
 - Use rubber linings in chutes and dumpers, where practicable;
 - Hoppers to the crusher should be lined with a resilient material, where practicable, to dampen impact noise of rocks being loaded into the crusher;
 - Noise from diesel engines can be reduced by fitting a more effective exhaust silencer system or by designing an acoustic canopy to replace the normal engine cover;
 - If necessary, reduce noise caused by resonance of body panels and cover plates by stiffening with additional ribs or by increasing the damping effect with a surface coating of special resonance damping material;
 - Ensure engine and acoustic covers, as well as access panels, are kept in place on the plant; and
 - Minimise direct metal-to-metal contact; and

- For the rock breaking activity: the main contractor should fit suitably designed muffler or sound reduction equipment to the tool, where practicable, to reduce noise without impairing machine efficiency. A dampened bit should also be used to eliminate ringing.
- Timing of operations:
 - Move plant onto and around the work areas within core construction working hours;
- Noise enclosures:
 - Where practicable and necessary, contain fixed plant and equipment (e.g., compressors and generators) within suitable acoustic enclosures or behind acoustic screens; and
 - Ensure that a reflecting surface, such as a parked HGV or other sizable mobile plant, is not located opposite the open side of noise enclosures. Any openings in complete enclosures (e.g., for ventilation) should be effectively sound-reduced. The effectiveness of partial noise enclosures and screens is reduced if they are used incorrectly.
- Location of plant and equipment:
 - Utilise work area topography to screen activities. Situate crushers and screen within the pit and close to pit faces, i.e., as close as is safe and practical;
 - Position noisy plant (such as the crusher and screen), equipment and loading operations away from noise-sensitive areas;
 - Wherever practicable, orientate plant so that the noise generated is directed away from noise-sensitive areas; and
 - Demountable enclosures will also be used to screen operatives using hand tools and will be moved around as necessary.
- Loading and unloading of materials:
 - Take care when loading and unloading vehicles to minimise noise;
 - Lower rather than drop materials whenever practicable. If it is necessary to drop materials, minimize the drop height; and
 - Where appropriate, cover surfaces on to which materials are being moved with resilient material.
- Engine noise reduction:
 - Prohibit unnecessary idling of construction traffic within the facility boundary or at the facility access points;
 - Switch plant off when not in use (including during breaks and down times of more than 30 minutes);
 - Avoid operating plant simultaneously or close together to avoid cumulative noise impacts;
 - Avoid unnecessary revving of engines;
 - Keep internal haul routes well maintained and avoid steep gradients; and
 - Close engine acoustic covers when engines are in use and idling.

- Maintenance of plant and equipment:
 - All items of plant should be subject to regular maintenance. Such maintenance can prevent unnecessary increases in plant noise and can serve to prolong the effectiveness of noise control measures;
 - Ensure that trained personnel regularly maintain equipment and plant, as increases in noise are often indicative of future mechanical failure;
 - Frictional noise from the cutting action of tools and saws can be reduced if the tools are kept sharp;
 - Noises caused by friction in conveyor rollers, trolleys and other machines can be reduced by proper lubrication; and
 - Noise caused by vibrating machinery having rotating parts can be reduced by attention to proper balancing.

9.9.2 Best Practice Vibration Management

The face of the quarry will be profiled and scanned, and a Blast Plan will be developed in conjunction with the required specification and submitted to the Client and subsequently to EPA for Approval. Once approval is received the Contractor will use a blast plan and drill the rock for blasting. The blast contractor will complete the blasting operation. Once the blast has taken place, the oversize rock will be broken by mechanical means. The rock will be stock piled and crushed in a designated working area. An excavator will be used to load the mobile crusher. A loading shovel will be used to remove the crushed material from the mobile crusher and to a stockpile.

Practical methods to reduce noise, air overpressure and vibration associated with the blasting activities have been set out below.

- There shall be no more than one blast per week at the Borrow-Pit;
- Blasting activities will be restricted within the hours of 08:00 to 18:00 hours Monday to Friday, (no blasting will take place at weekends or on public holidays);
- As per Section 9.6, Ecology and Biodiversity, no rock-blasting will take place during the overwintering period for birds (October to March inclusive), i.e., only permitted during April to September;
- A public information campaign for the local community will be undertaken before any work and blasting starts (e.g., 24-hour written notification);
- The firing of blasts at similar times will be avoided to reduce the 'startle' effect;
- On-going circulars informing the local community of the progress of the works will be undertaken.
- The use of independent monitoring by external bodies for verification of results.
- Ensuring appropriate burden to avoid over or under confinement of the charge;
- A method statement for blasting operations will be submitted to the EPA for approval prior to commencement of blasting. The method statement shall include the specific blasting contractor noise, vibration and air-overpressure control measures;
- Trial Initial blasts to assist in blast designs and identify potential zones of influence;
- Accurate setting out and drilling;

- Appropriate charging;
- Appropriate stemming with appropriate material such as sized gravel or stone chipping;
- Delay detonation to ensure small maximum instantaneous charges;
- Decked charges and in-hole delays;
- Blast monitoring to enable adjustment of subsequent charges;
- Good blast design to maximise efficiency and reduce vibration;
- Avoid using exposed detonating cord on the surface;
- A warning sign will be posted at the Borrow-Pit and AAL facility entrance on the day of each blast and will be removed following each blast;
- The blast operator signals prior to each blast;
 - 15 mins - 1 long horn signal
 - 5 mins - 3 long horn signals
 - 1 min - Series of short signals
 - All Clear - 1 prolonged horn signal
- The blast operator signals after each blast under Garda supervision;

Blasting Plan and Operations

The Explosives Supervisor shall prepare a Blast Plan for each blast operation in accordance with Regulation 47 of the Safety, Health and Welfare at Work (Quarries) Regulations 2008, (as amended). The Blast plan will be submitted to AAL and Golder for approval for each blast. The danger zone, shotfiring position and sentry positions will be clearly identified and arrangements detailed for their establishment.

The Explosives Supervisor will also conduct a risk assessment for each blast, this will determine the danger zone for the blast which should extend beyond the expected spread of the blast with a significant margin of safety included.

The Explosives Supervisor will implement a protocol for the safe transport and handling of the explosives. The protocol will be as follows:

- Appoint competent and qualified personnel including shotfirers, (a storekeeper will not be appointed or required as explosives will not be stored at the AAL facility);
- Submit statutory notifications;
- Prepare documentation for transport of the explosives from the storage facility to the quarry;
- Co-ordinate and arrange Garda escorts for explosives material;
- Prepare the location at the quarry for set down of the delivery vehicle;
- Inductions for visiting delivery drivers; and
- Agree communication route between delivery driver, Explosives Supervisor, Quarry Manager and Shotfirer for the safe handling of the material.

Shotfirers will ensure that;

- All shotfiring operations are conducted in accordance with the shotfiring rules and the blast specifications;
- Explosives will be mixed under licence on site and will comply with the conditions set out on the licence. Explosives will be mixed where they are to be used and only in sufficient quantities for immediate use;
- They are fully satisfied that each shot hole has been drilled and charged in accordance with the blast specification;
- Where pumped emulsion explosives are used the rise of the explosives in holes will be checked at regular intervals to ensure the shothole is being correctly charged;
- If it is not possible to conform to the specification, or the danger zone appears to be different from that shown, shotfiring operations should be suspended until any change to that specification has been authorised by its author or other designated person;
- They only connect a tester to a shotfiring circuit when ready to test or fire the shot. The exploder should be disconnected immediately after firing or in the event of an unsatisfactory test on the firing circuit. Only the shotfirer or a trainee shotfirer under the close supervision of a shotfirer should be able to operate the exploder;
- All persons must obey any relevant instructions in relation to shotfiring operations, for example, from the shotfirer or sentries. Sentries are there to prevent persons entering the danger zone and must not leave their post until the all-clear signal has been given, or until released by the person who appointed them; and
- Explosives will not be stored at the Quarry.

9.9.3 Liaison with the Public

AAL, in conjunction with the Quarry Operator or any sub-contractors will provide proactive community relations and will notify the public and sensitive premises before each blast within the Borrow-Pit. The operation of Borrow-Pit equipment such as crushers and rock-breakers shall be strictly controlled so as to minimise impact at noise sensitive locations. The operation of the rock breakers and crushers is prohibited during evening time, night-time, on Sundays and Public Holidays.

Any complaints will be logged and followed up in a prompt fashion. In addition, prior to particularly noisy activity, e.g., rock breaking, blasting, etc. AAL will inform the nearest noise sensitive locations of the time and expected duration of the works.

9.9.4 Monitoring Noise

The future annual operational phase noise monitoring programme at the facility will be carried out in accordance with the monitoring requirements of the facility's IE Licence (currently P0035-07), as amended by future IE Licence revisions.

The current IE Licence (P005-07) requires that noise from the installation shall not give rise to sound pressure levels ($L_{Aeq,T}$) measured at the specified noise sensitive locations (including those specified in *Schedule C.5 Noise Monitoring Locations*, of this licence) which exceed the limit value(s).

Table 3 below outlines the relevant noise criteria as outlined in Schedule B.4 Noise Emissions of the sites IEL.

Table 3: IE Licence Schedule B.4 Noise Emission Criteria (Operational Phase)

Daytime dB L _{Ar,T} (30 minutes)	Evening time dB L _{Ar,T} (30 minutes)	Night-time dB L _{Aeq,T} (15-30 minutes)
55	50	45 ^{Note 1}

Note 1: *There shall be no clearly audible tonal component or impulsive component in the noise emission from the activity at any noise sensitive location*

Noise monitoring will be undertaken to assess levels during Proposed Development works, this will be carried out by an appropriately qualified person, using equipment which meets the minimum requirements provided in BS5228. The Main Contractor and Environmental Coordinator will consider the incorporation of this monitoring with the monitoring plan for the overall facility. Monitoring will be used to assess compliance with the noise criteria set out in the consent conditions.

Vibration

It is required that the appointed blasting contractor monitor levels of noise, and vibration and air-overpressure at GNI pipeline and three locations representative of the nearest sensitive locations during any blasting activity. The below vibration and air overpressure Emission Limit Values (ELVs) are adopted and applied at the nearest vibration and air overpressure sensitive location:

Table 4: Ground-borne vibration and air overpressure emission limit values.

Parameter	Locations	Limit Values
Vibration (IEL Compliance)	NSL2, NSL5, NV1	PPV threshold 12mm/s
Vibration (GNI Compliance)	GP1, GP2	PPV threshold 50mm/s
Vibration (Golder Compliance)	BRDA1, BRDA2	PPV threshold 25mm/s
Air Overpressure	NSL2, NSL5, NV1	125 Db (lin) max peak

A vibration monitor will also be deployed to assess vibration at the gas supply line. Blasting operations shall be confined to between 08:00 hours and 18:00 hours, Monday to Friday

As part of the original borrow pit application discussions were held between AAL and Gas Networks Ireland (GNI) in relation to potential vibration emissions affecting the nearby gas pipeline.

A vibration limit of 50 mm/s (PPV) that should not be exceeded at the pipeline during blasting was set. In this regard initial blasting and vibration monitoring at the pipeline will be carried out in order to ensure compliance with the agreed vibration limit.

9.10 Cultural Heritage and Archaeology

- A programme of targeted archaeological test-trenching will be carried out within the north-eastern, previously undisturbed, section of the Application Site.
- The work within the north-eastern, previously undisturbed, section of the Application Site will be carried out under licence from the National Monuments Service (NMS).
- A suitably qualified and licenced archaeological contractor will be appointed to carry out and oversee any archaeological monitoring. The archaeological contractor will conduct works in accordance with an overarching method statement for the archaeological works which will be agreed with the National Monument Service.
- If any features of archaeological potential are discovered during the course of the works further archaeological mitigation may be required, such as preservation in-situ or by record and/or monitoring. The area in which the features are discovered will be protected from further groundworks until the appropriate mitigation, preservation or monitoring measures are undertaken. The overarching method statement for the archaeological works will detail specific measures, procedures and responsibilities for dealing with an unexpected find. These measures will include protocols for:
 - Initial inspections by the archaeological consultant;
 - NMS update and method statement for resolutions; and
 - Liaison with Main Contractor and AAL with regards to area segregation/protection until a resolution is reached.
- Any further mitigation will require approval from the National Monuments Service of the Department of Housing, Local Government and Heritage (DoHLGH).
- As there are no potential impacts associated with development in the western and south-eastern sections of the Application Site, no mitigation is deemed necessary in these areas.

9.11 Landscape and Visual

The BRDA raise element of the Proposed Development is a continuation of the permitted and emerging BRDA development that will result in an additional 6 No. stage raises, i.e., stage raises 11 to 16, on top of the permitted 10 No. stage raises. The overall BRDA, and the SCDC, will then be capped with a gently sloped dome (4% grade) at Stage 16 in the same manner and form as the permitted dome at Stage 10.

The terraced and sloped appearance of the BRDA derives from the nature and process of bauxite residue disposal and is a function of geotechnical and hydrological requirements described.

The role of landscape mitigation is to consider and identify landscape solutions that can be applied to the completed stages of the BRDA that will result in a more natural appearance that integrates with the landscape context.

The principles adopted in developing essential landscape mitigation proposals include:

- Breaking down the overall scale and geometric appearance of the BRDA terraces and slopes;
- Adopting a progressive restoration approach so that revegetation and restoration is not dependant on completion of the BRDA and can be implemented as the BRDA evolves, including:
 - Short and medium-term solutions to reduce the prominence of newly established rock stage lifts through preliminary revegetation using hydro seeding that has been successful on the existing BRDA in greening the rock slopes;
 - Medium and long-term landscape mitigation that will introduce additional landscape features on the overall side slopes that will disrupt the continuous geometric nature the side slopes; and
- Ensuring the optimum final land use provides a strong natural and biodiversity rich closure solution.

AAL will build on the significant experience it has gained over the last twenty years in establishing different plant species on the terraces and slopes of the built stages of the BRDA.

It also has an ongoing working relationship with University of Limerick (UL) in researching, trialling, monitoring and evidence-based development of alternative revegetation strategies. The outcome of collaboration with UL has been the development of the 'amended mud' recipe, the identification of plant species that establish successfully in this 'amended mud' layer and the identification of effective plant species for the wetlands.

9.11.1 Design of Proposed Development

The elements of the Proposed Development design that aid the integration of the BRDA, the SCDC and the Borrow Pit Extension into the landscape and views as the successive stages are:

- Preliminary treatment of the stage raises, as they are constructed, by hydroseeding the downstream exposed rock fill downstream sloped. Hydroseeding has been used effectively on completed slopes of the existing BRDA and provides a greener and more neutral appearance to the rock fill slopes than the bright freshly formed limestone rock material.
- The capping containment design comprises a rock fill depth of circa 500mm to be applied over the benches at each stage raise to establish a continuous permeable layer for the side-slope of the facility. This provides a surface water drainage route from the side slopes to the existing perimeter interceptor channel (PIC) and a working platform for the landscaping mitigation.

- Spillways will be constructed at eight locations around the BRDA, at either 6m or 8m widths depending on the location and will provide direct surface water drainage from the BRDA dome to the PIC. These spillways will subdivide and disrupt the continuous geometric appearance of the BRDA side slopes.
- Intermediate progressive restoration of the BRDA slope segments. The BRDA is visually subdivided into three slopes parts, i.e., lower slope is Stage 0 to Stage 5, middle slope is Stage 6 to Stage 10 and upper slope is Stage 11 to Stage 16. As each slope part is completed and operations move to the next part, progressive restoration comprising the final capping containment works and spillway construction can be implemented so that landscape mitigation can also be progressive.
- Final restoration will commence when operation cease and when the proposed Stage 16 and associated dome have been formed. At that point, landscape mitigation and spillways on the two lower BRDA slope parts, or Stages 1 to 10 inclusive, will have been completed and established to different degrees. Final restoration will include restoration of the upper slope, or Stages 11 to 16 inclusive, construction of the amended layer for the dome and seeding of the dome
- The perimeter interceptor channel (PIC) around the base of the BRDA will be cleaned out and lined with soil and revegetated to form a wetland that will collect surface water runoff from the spillways leading from the dome and will subsequently discharge to the environment (subject to the granting of a discharge licence and EPA approval of appropriate water quality limits); and
- Final restoration of the Borrow Pit areas and the stockpiling areas in accordance with the landscaping masterplan.

9.11.2 Additional Mitigation

The following additional mitigation measures will be implemented to aid the integration of the BRDA, the SCDC and the Borrow Pit Extension into the landscape and views;

- Provision of localised areas of landscape mounds on the completed terraces and slopes of the BRDA so as to disrupt the rhythmic and continuous appearance that is an inherent characteristic of the stage raises. These will be organic forms of varying sizes and shapes spanning two or more stages; and
- Planting of hedgerows across the dome to establish a field pattern that breaks down the overall scale of the dome and presents a field pattern that is more consistent with the surrounding landscape context.

9.12 Roads and Traffic

9.12.1 Baseline

External traffic generation associated with the operation of the existing AAL facility predominantly consists of employee and permanent contractor car trips and HGV delivery trips. The plant has a total of 482 no. permanent employees as well as 385 no. long-term contractors in a variety of administrative, maintenance and operational roles, with shift work patterns applicable for many employees. The site operates 24 hours per day 7 days per week, with employees of the facility working on a rolling shift basis. External HGV trips on the local road network currently include those associated with the sourcing of rock fill material (c. 1,000 tonnes per day during a ca. 20 to 24-week period), and other plant activities such as importation of certain raw materials.

Internal traffic movements are also required as part of the operation of the facility. Bauxite residue is deposited within the BRDA by way of piped infrastructure and is not transported by vehicle. The main source of internal transport movements to the BRDA from the main plant area relate to the transport of process sand (from the sand separation area) to the BRDA using a dumper truck and internal HGV trips transporting salt cake material from the organic removal facility with the plant area to the BRDA also using a dumper truck. Other internal trips primarily relate to the movement of vans and cranes onsite.

9.12.2 Proposed Development

A small number of seasonal workers (required for 16 to 20 weeks per year when blasting occurs) will be needed to operate equipment at the expanded Borrow Pit and these would include 2 no. drill rig operators intermittently, 2 no. crusher and excavator drivers, a maintenance/breakdown fitter intermittently and a quarry manager. Commuting trips and parking requirements associated with the 5 - 6 no. additional workers during this process are considered insignificant compared to the current baseline.

The construction activities associated with the raising of the BRDA and the SCDC are part of the ongoing operations and are consistent with the current baseline internal traffic movements. These works will require a small number of seasonal workers for specific tasks, e.g., geosynthetic material installation and pipework. Similarly, the commuting trips and parking requirements associated with the 5 - 6 no. additional workers during this process are considered insignificant compared to the current baseline.

The current baseline for external HGV traffic associated with the importation of rock fill will be eliminated by the operation of the operation of the permitted Borrow Pit; scheduled to commence in April 2022. The operation of proposed Borrow Pit Extension will eliminate external HGV traffic for the future importation of rock fill to construct the BRDA raises, and the closure works.

However, there will be additional external HGV trips required associated with the importation of soil, organic soil improver and gypsum for the progressive closure works (capping and restoration). Any other additional vehicle movements generated by site activities associated with these materials will be wholly internal to the site itself. During the first 8 years of operation (2028 to 2035), the import of these materials is expected to result in an additional average of 12.7 HGV trips to site per day. During the final 2 years of closure (estimated to be 2041 to 2042), the import of these materials is expected to result in an additional average of 21.3 HGV trips to site per day. These additional HGV movements have been assessed to have no material impact upon the operation of the local road network.

9.12.3 Design of the Proposed Development

The sourcing of rock material on-site removes the potential impacts upon the operation of the local road network, with traffic movements concentrated on-site.

9.12.4 Additional Mitigation

As the proposed development will have no material impact upon the operation of the local road network, no mitigation measures are proposed for the external traffic generation.

Internal traffic management will be carried out in accordance with the AAL (2016) '*Health & Safety Manual for Contractors*'.

General internal contractor traffic management measures include:

- Contractors are required to bring on-site only those vehicles absolutely necessary for the completion of the works;
- Car parking spaces are available to Contractors in the car park at Building A76 and the overflow car park opposite Building A76, both of which are located along the access road prior to entry to the AAL facility;
- Where the Contractor needs to bring a vehicle, on-site permission must be received from Security firstly and a pass issued to the driver;
- If a Contractors' vehicle(s) needs to be located at or near the work areas, then it must be parked in a designated parking space;
- For the purposes of offloading and loading of equipment then a temporary parking location nearer the works area must be selected and agreed with their relevant Contract Facilitator / Field Facilitator or designated engineer;
- This location / parking duration of this temporary parking place must be so as to cause the least obstruction or no additional hazard;
- All vehicles coming into the AAL facility must be maintained in proper roadworthy condition in compliance with the requirement of all relevant statutory provisions, i.e., DOE and NCT;
- In particular, clean cabs, proper tool / equipment storage, secure loads, sound tyres, brakes and steering as well as freedom from oil leakage, excessive exhaust emissions and noise will be expected; and
- Ongoing compliance with the HGW (Handbrake, Gears & Wheels) Rule will be monitored.

9.13 Material Assets

Material assets comprise the physical resources in the environment, which may be of human or natural origin. Material assets in the vicinity of the Application Site comprise of built services and infrastructure such as surface water drainage, telecommunications, electricity, gas, water supply infrastructure and sewerage.

To mitigate potential impacts on these services and infrastructure the Main Contractor will be required to implement the following project design and mitigation measures:

- Pre-construction consultation and authorisation will be achieved for all of the relevant infrastructure connections;
- Prior to the commencement of works the Main Contractor will conduct a survey to locate existing infrastructure and services in the footprint of the works. These services will then be either isolated and decommissioned or identified for their protection;
- Any works required to material assets on or around the Application Site will be carried out in conjunction with the relevant provider to ensure minimal disruption to the existing users;
- Any works required to material assets on or around the Application Site will be carried out strictly in accordance with the relevant provider's Code of Practices; and
- Efficiencies in water usage should be considered throughout the engineering design and construction phase of the Proposed Development.

9.14 Waste Management

For effective and efficient management, the management of wastes arising from the Proposed Development will be incorporated into the environmental and waste management systems for the overall AAL facility. The Main Contractor shall be responsible for the segregation of all waste arising from the work except where otherwise agreed. Segregation must be done in accordance with legislation and AAL's procedures for the types of waste produced.

Quantities of waste materials may vary depending on the construction activity methodologies adopted by the Main Contractor(s).

A non-exhaustive list of non-hazardous and hazardous waste categories which may be generated during the Proposed Development construction activities have been identified below, and the appropriate European Waste Catalogue Code for these wastes has been identified in Table 2.

The Main contractor will advise AAL of any waste arisings from the work which are defined as hazardous under the Waste Management legislation and in the European Waste Catalogue Code.

Non-Hazardous Waste Streams

- Scrap and offcuts of geosynthetic materials (geotextile, GCL, geomembrane and concrete canvas)
- Scrap metal;
- Concrete;
- Cardboard and other packaging;
- Plastic including wrapping and packaging;
- Waste wood;
- Paper;
- Glass
- Tyres
- Sewage waste from on-site portable toilets
- Uncontaminated clean cloths and rags used in various construction activities
- Mixed municipal general wastes; and
- Damaged materials.

Hazardous Waste Streams

- Oily and contaminated rags from vehicle maintenance;
- Batteries; and
- Oils, fuels and lubricants from machinery and equipment.

Table 5: Typical C&D waste expected from the construction phase of the Proposed Development.

Waste Material	LoW / EWC Code
Concrete, bricks, tiles and ceramics	17 01
Bricks	17 01 01
Mixture of concrete, bricks, tiles & ceramics	17 01 07
Wood, Glass and Plastic	17 02
Wood	17 02 01
Glass	17 02 02
Plastic	17 02 03
Metals (including their alloys)	17 04
Copper, Bronze, Brass	17 04 01
Aluminium	17 04 02
Lead	17 04 03
Zinc	17 04 04
Iron and Steel	17 04 05
Tin	17 04 06
Mixed Metals	17 04 07
Paper and Cardboard	20 01 01
Wood other than that mentioned in 20 01 37	20 01 38
Hydraulic oils	13 01 01*
Fuel oils and diesel	13 07 01*
Aqueous liquid waste other than those mentioned in 16 10 01 (to be considered for portable toilet wastes)	16 10 02
Batteries – lead acid	16 06 01*
Tyres	16 01 03
Absorbents, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing contaminated by hazardous substances	15 02 02*
Absorbents, filter materials, wiping cloths and protective clothing other than those mentioned in 15 02 02	15 02 03
Mixed municipal waste	20 03 01
Cesspit/septic tank sludge and chemical toilet waste	20 03 04

Waste Management

All waste generated, whether from the operation of Plant or BRDA activity, or from construction activity in the Application Site, during the construction or operation of the Borrow Pit Extension, the BRDA stage raises or the SDCC raise, is the responsibility of AAL as the originator in accordance with the Industrial Emissions Licence (P0035-07). All shipping of waste off-site is undertaken by AAL. Therefore, Contractors are only responsible for the sorting and internal transport to the designated internal waste transfer locations and notification to AAL of the appropriate units of construction waste generated within the Application Site.

The Main Contractor will be responsible for maintaining waste storage areas within the respective construction areas so that they are secured, and waste materials are appropriately organised. The relocation of these areas

will be planned appropriately by AAL, and the Main Contractor as works progress. The Main Contractor will implement the AAL waste management policies whereby waste materials generated on-site are to be segregated as far as practicable.

Waste Disposal and Collection

AAL will be responsible for the removal of wastes from the overall AAL facility. AAL will ensure that all waste which arise from the construction of the Proposed Development will be removed from the facility by an approved waste contractor. These contractors will be required to hold a valid waste collection permit. Furthermore, all waste materials which are required to be disposed off-site will be reused, recycled, recovered or disposed of at an appropriate facility which holds appropriate registration, permit or licence. Up-to-date copies of the relevant collection permits, and facility registrations, permits and licences will be retained on file by AAL.

All materials being transferred from the facility, whether for recycling or disposal, will be subject to a documented tracking system which can be verified and validated. This information will include the below at a minimum:

- Date and time of removal;
- Waste type and description;
- EWC Code;
- Volume of waste;
- Name of waste collection contractor;
- Waste collection contractor's permit number;
- Waste collection receipt;
- Vehicle registration number;
- Driver's details;
- Destination of waste; and
- Waste Permit / Licence number of destination facility.

Waste Record Keeping

Waste handling and all documentation will be monitored in accordance with the procedures outlined.

As well as a waste collection docket, a receipt from the destination of the material will be kept as part of the on-site waste management records. All information will be entered in a waste management system to be maintained on-site.

Waste Training

A hard copies of waste management plans will be maintained on-site in the main project office, (and in other applicable locations) so that it is available to all relevant personnel on site.

Arrangements will be put in place for all project personnel and sub-contractors to be instructed on the objectives of waste plans and materials management. These instructions shall be incorporated into the project induction and refreshed during regular toolbox talks throughout the project.

Project management shall ensure that all personnel are aware of their specific responsibilities under the plan, including appropriate storage and handling of waste materials, reusable materials and recyclables.

Waste Auditing

The waste audit procedures represent a systematic study of the project's waste management practices. The purpose of the waste auditing is to identify any problems with the project's waste procedures and also the benefits of prevention and minimisation that is in place.

The audit will be a 'self-audit' process carried out by the AAL in conjunction with the Main Contractor (as required). An Audit Plan will be created and will identify the appropriate frequency at which the audits are to be conducted over the course of the project.

The audit process will identify appropriate performance and waste output or re-use targets. As appropriate, corrective actions will be identified if targets have not been met.

The audit findings will highlight any corrective actions that may need to be taken in relation to waste management procedures or project practices. These corrective actions will be tracked in order to identify root-causes as appropriate.

10.0 CEMP AUDITING, REVIEW AND VERSION UPDATES

This draft CEMP has been submitted with the Planning Application for the consent of the Proposed Development. Following consent and during the construction phase this draft CEMP will be reviewed and updated by the Environmental Officer / Coordinator and Main Contractor. Details of the review dates and version updates are provided in Table 6.

The final CEMP will be updated to include:

- Relevant details of the An Bord Pleanála (ABP) planning consent, including all appropriate conditions, mitigations measures, and monitoring requirements;
- Matters agreed with ABP and/or the LCCC under planning conditions;
- Relevant conditions from the EPA IE Licence review for the Proposed Development;
- Relevant input from the EPA;
- Appropriate environmental performance criteria and relevant compliance thresholds;
- A register of all applicable legislation and guidance, relevant to the Main Contractors management and methods; and
- The Main Contractors relevant procedures, method statements and work instructions.

To ensure the final CEMP remains 'fit for purpose' for the duration of the project it will be regularly reviewed and updated to facilitate efficient and effective delivery of the project legal and environmental commitments.

These subsequent audits and reviews will be undertaken by the AAL Environmental Team, with feedback provided to the Main Contractor's Project Manager and overall AAL Facility Management. A log will be kept including a summary of the update and a record of the review.

The audits will check that all necessary current documentation is held in both electronic and hard copy as needed. Visual monitoring and complaints records will be audited to ensure that full records are kept, and all necessary information is recorded.

The findings of the reviews reported to the Main Contractor's Project Manager, overall AAL Facility Management, and other staff members as required.

An audit schedule will be arranged but will include an annual audit, as a minimum requirement. For effective management the CEMP auditing schedule should be incorporated into other facility auditing activities.

Updates to the final CEMP will be made no less than every 6 months during the project, or when:

- Changes to existing or new An Bord Pleanála permissions, and EPA IE Licence reviews;
- New or amended legislation which is applicable to the activities of the Proposed Development;
- If improvements are required due to perceived environmental impact and effects;
- As a result of environmental management audit findings;
- Where method statements and risk assessments identify high environmental risk and practice changes are required; and
- As a result of an incident or complaint.

Table 6: Construction Environmental Management Plan Review and Version Updates

Version	Review Date	Review Comments and Changes Made to CEMP	Date of Next Review

11.0 CONCLUSION AND APPROVAL

This draft CEMP shall be further developed by the appointed Main Contractor upon the grant of consent and appointment.

Environmental provisions will be refined further and elaborated once as more information on the construction methods and program become available.

These details will all be incorporated in the final CEMP by the Main Contractor prior to the commencement of construction at the Proposed Development.

12.0 REFERENCES

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