



# Killeen Wind Farm

## Technical Appendix 2.2: Outline Borrow Pit Management Plan

---

Author	Sandro Di Nardo
Date	04.06.2024
Ref	3226-789969

---

This document (the “Report”) has been prepared by Renewable Energy Systems Ltd (“RES”). RES shall not be deemed to make any representation regarding the accuracy, completeness, methodology, reliability or current status of any material contained in this Report, nor does RES assume any liability with respect to any matter or information referred to or contained in the Report, except to the extent specified in (and subject to the terms and conditions of) any contract to which RES is party that relates to the Report (a “Contract”). Any person relying on the Report (a “Recipient”) does so at their own risk, and neither the Recipient nor any person to whom the Recipient provides the Report or any matter or information derived from it shall have any right or claim against RES or any of its affiliated companies in respect thereof, but without prejudice to the terms of any Contract to which the Recipient is party.

## Contents

1	Introduction .....	1
2	Methods of Working .....	2
3	Environmental and Hydrological Aspects.....	9
4	Restoration and Aftercare Plans.....	16
5	Borrow Pit Site Plan.....	18
6	Annex 1 - Safety & Environmental Requirements for Contractors .....	19

# 1 Introduction

This outline Borrow Pit Management Plan (BPMP) is submitted by Renewable Energy Systems Ltd (RES) in support of the EIA Report (EIAR) for the proposed Killean Wind Farm (hereafter referred to as the Proposed Development). The principal objective of this document is to provide details of the proposed borrow pit management arrangements during the construction of the Proposed Development.

The borrow pit is proposed as a potential source of locally won rock for use primarily in the construction of tracks, hardstand areas and foundations in the Proposed Development. It is estimated that the Proposed Development will require approximately 28,500 m<sup>3</sup> of stone however this requirement is yet to be finalised through detailed design.

Utilising approximately 21% of the proposed borrow pit search area (see EIAR Figure 2.11 Borrow Pit General Arrangement) is expected to yield approximately 45,000 m<sup>3</sup> of a Sandstone rock material suitable for the construction of the Proposed Development.

## 2 Methods of Working

### 2.1 Location of Borrow Pits

The first proposed borrow pit search areas are located close to the proposed infrastructure. There are 6 borrow pit search areas in total and cover approximately 7.05ha:

- Borrow pit search area 1 - Directly south of T1 (172731/N645100),
- Borrow pit search area 2 - South of T9 (E171897/N645232),
- Borrow pit search area 3 - To the east of the site northeast of T6 where bedrock is anticipated to exist in proximity to the surface (E173178/N644107),
- Borrow pit search area 4 - to the east of the site east of T6 where bedrock is anticipated to exist in proximity to the surface (E173247/N643848),
- Borrow pit search area 5 - south of T1 (E172466/N645104)
- Borrow pit search area 6 - Southeast of T9 in proximity to cup-marked rock (E172117/N645254)

The near surface glacial deposits and weathered bedrock may be suitable for borrow pits and the re-use on site as earthworks, fill, subject to classification.

### 2.2 Programme of Implementation

An approximate sequence of works is outlined below:

**Table 2. Outline Programme of Implementation**

Stage of Construction	Considerations
Set out the borrow pit phases with the use of suitable survey equipment i.e. GPS (RTK) equipment.	The contractor shall ensure that markers which are to be used for setting out purposes are not harmful to the environment i.e. untreated wooden pegs or similar. Where possible, paints or other human-made materials will be limited.

Stage of Construction	Considerations
Prior to commencement of extraction works, fence off area with temporary stock proof fencing.	Access and egress points will be provided for pedestrian access.
Set out and install SuDS features, initially the surrounding cut-off , and associated SuDS works as appropriate within the proposed borrow pit areas.	SuDS will ensure that any suspended solids generated during construction are effectively mitigated and that down-catchment areas are not deprived of water supply.
Remove the top layer of vegetated material. Store the minimal topsoil deposits for later restoration of the areas.	This material will be removed and re-used to cover and promote natural re-vegetation of the reinstated borrow pits.
Excavate to rock head level and utilise non-structural overburden to form a surface water diversion bund adjacent to the cut-off drain. Additional overburden will be stockpiled within the proposed borrow pit areas.	If suitable, this material will be re-used as for partial backfill of the borrow pit.
Ripping may occur in the weathered zone of bedrock. Where rock becomes more competent, establish a first line blast to form a productive face. Utilise pattern blasting to loosen rock where required to extend the borrow pit in the desired formation.	Typically, face height will not exceed 15m or 70° slope angle and will generally follow HSE The Quarry Regulations.1999 guidance where appropriate. The peak of the existing land formation will not be removed.
Crushing/screening/grading of extracted rock prior to temporary stockpiling for removal and utilisation	Control of noise and dust emissions
Stockpiles of aggregate or overburden, where present, will remain below 5m in elevation beyond existing topography and will rest at their natural angle of repose.	Suspended sediment in surface run-off will be diverted to either the sump at the back of the areas or the rock filled drain at the entrance.
Extraction of stone and formation of steeply graded 1.5m high faces and 0.5 m wide benches to sloping base of the pitAdditionally, formation of ‘roll-over’ slopes along the more elevated parts the pit.	To mitigate potential effects of the extraction on visual amenity a ‘roll-over’ slope would be formed along the more elevated parts of the pitThis slope would be in keeping with existing topography in the vicinity and would be restored to dry heath and acid grassland to ensure its assimilation into the adjoining landscape.
Restoration will take place, initially using overburden materials but also local peat where appropriate, to backfill local depressions to near ground level	Reinstatement to mimic adjacent forms, geology and hydrogeology as far as practicable.
Vegetated material will be placed in areas where excavation faces are exposed.	It is important that this is undertaken promptly after borrow pit operations cease to speed up the re-vegetation process.

## 2.3 Operational (Extraction) Activities

The work at the borrow pit identified comprises the extraction of suitable material for reuse as aggregate for tracks, hardstand areas and foundations on the Proposed Development.

Key extraction activities at the borrow pit include rock breaking/blasting, crushing, screening/grading, stockpiling and haulage away from the borrow pit.

Once works onsite have begun it is estimated that the duration of extraction from the borrow pit is approximately 8 months. The daily operation and management of the borrow pit will be the responsibility of the contractor, however, in general the methodology set out below for careful management of the borrow pit will be adhered to minimise potential environmental impact.

In order to make the above possible, it will be necessary to implement a working method which ensures that provisions are in place to manage topsoil or peaty topsoil removal and re-use for restoration and overburden removal and storage. Provisions for the control of surface run-off during and post construction and the re-vegetating of working faces post construction are also included. Further details on these issues are provided in the following sections.

Blasting can give rise to both ground-borne vibration and airborne pressure waves, referred to as air overpressure. Blast-generated air overpressure levels are not anticipated to be high at residential locations due to the separation distances involved. The levels of vibration due to blasting are expected to be below the satisfactory magnitude of 6mm/s defined in BS 6472-2: 2008 'Guide to evaluation of human exposure to vibration in buildings, Part 2: Blast-induced vibration' for daytime periods at residential locations. Considering this, it is proposed that the following mitigation measures are implemented:

- Good practice on blasting, as recommended by Planning Advice Note (PAN) 50 'Controlling the environmental effects of surface mineral workings', shall be followed;
- The vibration and air overpressure reduction methods outlined in Section 8.6.9.2 of BS 5228-2: 2009+A1:2014 shall be adhered to where appropriate;
- Advance warning shall be given to nearby residents;
- Blasting should only occur between the hours of 0800-1800 on Mondays-Fridays or between the hours of 0800-1200 on Saturdays; and
- No more than three blasts per day should occur.

As a worst case, it is anticipated that blasting may occur up to 2-3 times a week for the duration of the construction works.

Once operations are sufficiently underway, restoration will take place progressively behind the working areas to encourage re-vegetation. This will minimise any impact to the surrounding environment by minimising the working areas at any point.

General site best practice will be applied through operation activities including:

- Use of fuel will be controlled to the minimum practicable by adequate management systems;
- Vehicle engines will be switched off when not in use;
- All vehicles will be properly maintained;
- Staff will be briefed on fire risk from cigarettes etc in dry conditions. Designated safe smoking areas will be located away from the temporary mineral working, with the finalised locations to be confirmed prior to site works commencing; and
- No fires to be lit on site.

## 2.4 Soil & Peat Material Handling

A geotechnical site investigation has yet to be carried out for the Proposed Development therefore a detailed description of the type of soils and rock to be

extracted from the borrow pit, including details of the existing water table and volumes of de-watering cannot be confirmed.

Peaty soil and peat deposits cover most of the Proposed Development Area and overlying glacial till. The 1:50,000 BGS superficial geology map from the [BGS onshore GeoIndex Viewer](#) indicates that the western half of the site is predominantly underlain by glacial till.

Peat depth probing surveys have been undertaken across the Proposed Development Area and indicate that some of the borrow pit search areas are located in largely shallow (<1m deep) peat.

The borrow pit search area has been positioned where rock is likely to be close to the surface and also in an area where peat slide risk rating is deemed negligible to low. On removal of the peat from the borrow pit area, the risk from peat movement will be mitigated through removing material from the higher areas down to avoid undermining or surcharging any peat materials. Peat arising from borrow pit activities will not be stored for any prolonged period and will be utilised in the restoration of the borrow pit areas.

Overburden will be temporarily stockpiled within a suitable area of the proposed borrow pit until the restoration phase commences. Where relevant, overburden will remain separate from peat deposits and will sit at an angle no greater than its natural angle of repose, not protrude beyond 5m in height above the existing topography and will be laid in layers of not more than 1m thick. Where possible, stockpiles will be placed to the side and on the flattest accessible areas and will avoid any placement on peat deposits.

Other overburden sub-soils will be utilised for the construction of a surface water diversion bund up topographic gradient, where practical.

## 2.5 Aggregate Material Handling

Where appropriate, stockpiles of aggregate will be temporarily stored in proximity to the crusher. To minimise environmental impact, the borrow pit is to be worked in discrete cells. As such, the location of the processed material stockpiles will be transient according to the working phases, however, all these locations will be at least 100m from the nearest watercourse.



Aggregate stockpiles will be formed to a maximum height of 5m above surrounding topography. They will be shaped as it is being built to shed water and sit at an angle no greater than its natural angle of repose.

## 2.6 Welfare Provision

Welfare facilities for the borrow pit will be located at the temporary construction compound (within the Proposed Development).

## 2.7 Security

Security arrangements at the borrow pit area will be agreed through consultation with the selected contractor and landowner. It is envisaged that the borrow pit area will be delineated by post and wire fencing to prevent access.

If deemed necessary, security measures may take the form of locking of the areas, CCTV, and/or security personnel.

## 2.8 Safety

Training/induction will be undertaken for all site staff prior to working on-site. Method statements will be communicated to all relevant personnel through activity plans including:

- Provision of ongoing training and review of relevant procedures with site staff throughout the contract, including through the use of using toolbox talks;
- Provision of ongoing monitoring of the effectiveness of mitigation and procedures and update as required;
- Provision of ongoing monitoring, review, and update of environmental control measures in method statements.

## 2.9 Environmental Inspections and Geotechnical Assessments

During operation, an on-going system of formalised assessment will be completed by a suitably qualified Geotechnical Engineer. They will be responsible for monitoring site workings and responding to changing ground conditions accordingly.

Environmental inspections are to be carried out by personnel based at the borrow pit and by the Environmental Clerk of Works (ECoW).

## 2.10 Working Hours

Construction traffic will adhere to programmed activities and agreed working hours specified for the Proposed Development (weekdays from 0700 to 1900 and Saturday from 0700 to 1300; with no working permitted on Sundays or public holidays). No construction traffic will undertake works beyond the agreed activities and hours unless by prior agreement.

## 3 Environmental and Hydrological Aspects

### 3.1 Access and Traffic Management

Traffic associated with the borrow pit will be contained within the Proposed Development except for the delivery of plant to extract and transport material around the Proposed Development.

During the operation of the borrow pit, vehicles accessing the areas will be limited to the vehicles used by persons working at the site, site visitors and the HGVs required to deliver plant and materials or transport the aggregate from the temporary mineral working to the construction working areas.

### 3.2 Ecology

#### 3.2.1 General

The borrow pit location and extents have been selected to minimise impacts on any ecologically sensitive areas. To discourage site staff from potentially impacting upon the surrounding environment, the working areas, associated access tracks and storage areas will be marked by a fence or marker posts at all times always marked by a fence or marker posts during the operation of the borrow pit. No excursion beyond the delineated boundary will be permitted without authorisation. The Proposed Development Ecological Clerk of Works (ECoW) will undertake pre-construction surveys and will monitor the construction works in accordance with the approved Scope of Works submitted to the local Councils.

#### 3.2.2 Ornithology

Ornithological commitments apply to the Proposed Development as a whole and are relevant but not specific to the borrow pit area. Should any evidence of nesting be discovered, a buffer (10 m) will be established and clearly delineated around the nest and works in that area stopped until the birds either fledge or the nesting attempt ends, e.g. as the result of nest predation.

All contractors will be required to comply with all relevant ornithological commitments set out above.

#### 3.2.3 Flora and Fauna

Protected species commitments apply to the Proposed Development as a whole and are relevant but not specific to the borrow pit area. Notwithstanding the above,

should any evidence of a protected species having colonised the location since the walkover be discovered (e.g. a badger sett) an appropriate buffer (e.g. 30 m for badger) will be established and clearly delineated around the identified feature and works in that areas stopped and the ECoW contacted to organise how to proceed.

In order to ensure that no reptiles are affected during the establishment of borrow pit, all vegetation on the borrow pit area will be cut short in the week before any vegetation removal. Site contractors will be made aware of the species that could be present and to cease works if any reptiles are seen whilst the advice of the ECoW is sought.

No particular floral recommendations apply to the location. Floral mitigation is focussed on ensuring no impacts on surrounding habitats, as set out above.

All contractors will be required to comply with all relevant flora and fauna commitments set out above.

### 3.3 Archaeology

The proposed extraction of aggregate from the borrow pit will not affect any known archaeological or cultural heritage sites. Furthermore, given the small scale and temporary nature of the proposed works, it is considered that the Proposed Development will not give rise to any significant indirect impacts upon archaeological or cultural heritage receptors in the vicinity of the Proposed Development Area. Although considered unlikely, the potential for unidentified remains being present is a possibility. Therefore, site staff will be briefed on the nature of common archaeological finds including:

- Brick or tile fragments;
- Coins or pottery;
- Bone fragments or skeletons;
- Timber joists or post holes;
- Brick or stone foundations;
- In-filled ditches.

If any other suspected archaeological features are uncovered during excavation of spoil, excavation activities will cease, and the Construction Site Manager informed immediately.

### 3.4 Drainage and Surface Water Management

The borrow pit location has been selected away from watercourses and beyond a 100 m buffer area defined for site selection.

Cut-off drainage and or face crest bunding will divert surface flow around the operational areas and leave only incident rainfall to collect in the borrow pit. All cut-off drains will be constructed in advance of any operations occurring within the Proposed Development Area.

Borrow pit floor level will slope gently down to the rear of the area forming a natural pool to retain any surface water and enable suspended sediments to settle out. Water collected in a sump in the low point of the borrow pit will then be pumped to a SuDS settlement lagoon (located within the proposed borrow pit area, out of the rock extraction area) sequence prior to natural drainage. Diverted surface flow will also be retained and treated through a SuDS settlement lagoon sequence. No water from excavations and dewatering activities will be allowed to enter surface waters directly.

Staff will be briefed on the location of these features and importance of preventing water run-off from exiting the borrow pit and will be given regular toolbox talks about the risks of working near water and the potential to cause pollution.

Stockpiles (of superficial deposits and aggregate) will be located in suitable locations to ensure that there is no risk of material washing out and contaminating watercourses.

No refuse or debris will be stored at the borrow pit, however, it will be gathered daily and stored in secure skips located at the temporary construction compound (within the Proposed Development), prior to regular removal to avoid risk of polluting watercourses.

The source of any water used to suppress dust will be in accordance with legal requirements and if doubt exists about what is permissible consultation with SEPA will occur.

All plant and equipment will be maintained appropriately including checking for leaks and cleaning/removing visible oil.

Any contaminated soil will be disposed of to a licensed waste disposal site in accordance with legal requirements.

There will be no sewage discharges from the borrow pit.

Following completion of the interim site restoration, the sites will be inspected by suitably qualified personnel, to ensure that any drainage features retained within the sites are functioning properly and that the sites are in good condition.

### **3.5 Waste Management**

There is no waste developed by works at the borrow pit anticipated, natural soils will be either utilised as dressing material or stockpiled for restoration.

No facilities will be present within the borrow pit, no hydrocarbon storage will take place. A diesel-powered pump will be situated on a drip tray. Regular inspections will take place to check for leaks and drips. The drip tray will have the capacity to safely store at least 110% of total fuel capacity of the pump.

### **3.6 Noise and Vibration**

A Construction Noise Mitigation Plan will be undertaken for the Proposed Development and will be included within the Construction Environmental Management Plan. The report will include an assessment of the construction noise for the borrow pit and associated construction of infrastructure for the Proposed Development. The report assesses the noise and vibration impact upon the most acoustically sensitive residential properties during the construction period.

Primary activities for which noise arises during the construction period are from the excavation of borrow pit and the construction of access tracks and roads. Noise from vehicles on access tracks will also arise due to the transportation of aggregate.

For all activities, measures shall be taken to reduce noise levels with due regard to practicality and cost as per the concept of ‘best practicable means’ as defined in Section 72 of the Control of Pollution Act 1974

### 3.7 Dust and Air Pollution Management

The main activities on the Proposed Development that may cause dust emissions include the following:

- Excavation and movement of site won material;
- HGV movement on borrow pit haul roads;
- Crushing of site won material;
- Stockpiles.

The potential issue of dust creation during the works will be weather and season dependant, therefore detailed dust management methods will be subject to the works programme and contractor working methods.

Dust management will be always carried out in accordance with industry best practice measures to ensure that any local sensitive receptors are not affected by nuisance levels of dust from the works.

The Construction Site Manager will be responsible for undertaking and recording the following daily checks to manage dust emissions.

The following methods of dust suppression will be implemented during the construction phase of the borrow pit:

- Access tracks to be damped down using bowser or other suitable system;
- Speed limits to be put in place to ensure low vehicle speeds;
- Damping of dry excavations and cutting/crushing activities which generate dust; and
- Programming of works to minimise the time that materials are exposed.

### 3.8 Responding to Environmental Incidents

Environmental controls will be implemented through the RES Safety & Environmental Requirements for Contractors and should any incidents occur contracts will comply with the Emergency Procedure in the Event of a Contaminant Spillage. These documents will be detailed in the Construction Environment Management Plan prior to construction.

### 3.9 Daily Check Management

A daily management check will be implemented and will generally follow the example in Table 3 below.

**Table 3. Daily Checks**

Daily Check	Description
Weather forecast	Check the local weather forecast at start of working day to identify likely daily weather conditions.
Sensitive receptor	Identify which sensitive receptors may be affected by dust pollution from the Proposed Development Area.
Dry weather	Apply water bowsers to excavations, haul roads and soil storage areas regularly throughout the day.
	Undertake regular visual checks throughout the day to ensure dust at the above locations is being suppressed.
Wind	Cover open skips and stockpiles containing loose fines.
	In the event that dust is being blown off-site, cease dust generating activities until wind conditions improve or dust is suitably managed
On-site activities	Undertake regular visual checks throughout the day of dust management during excavation, crushing and regular movement of HGVs on haul roads.
	Focus water bowsers on areas where dust is being generated.
Neighbour notification	In the event that there is a risk of dust being transported off-site despite the above management measures being put in place, inform neighbours in advance of risk and what management measures have been put in place.
	Actively monitor dust management and where dust pollution is likely to affect neighbours, cease all activities until suitable management procedures can be implemented.
Complaints	A record will be kept on-site of all dust related complaints and remedial actions taken.
	If required, staff will be briefed on changes required to working practices to ensure the incident is not repeated.

In addition to the above daily checks, the following dust management will be followed:



- All staff will be trained in the importance of dust management procedures;
- Activities on-site will be planned to ensure risk of pollution from wind-blown dust is reduced to minimum;
- Stockpiles (of fines and aggregate) will be no greater than 5 m above surrounding topography. The material will be tipped to ensure that the sides of the stockpiles are stable;
- Only appropriate plant will be used, and all equipment will be regularly maintained;
- No unauthorised burning of materials will be permitted on-site;
- Regularly monitor the performance of dust management procedures at the Proposed Development Area.

## 4 Restoration and Aftercare Plans

All restoration works will be undertaken following consultation with RES, South Ayrshire Council, East Ayrshire Council, SEPA and other consultees.

### 4.1 Restoration Concept

The restoration proposal for the proposed borrow pit is illustrated in the Borrow Pit GA included in EIAR Figure 2.11.

### 4.2 Restoration Landform

The excavation of borrow pits can result in anomalous steep sided voids and rectilinear exposed extraction faces. This can result in loss of visual amenity and ecological interest. In order to avoid this the borrow pit will incorporate a gently graded ‘roll-over’ slopes consistent with those of the existing landscape and will remove the most elevated and potentially visible faces in each pit. The ‘roll-over’ slopes will also provide a suitable landform for the replication of previous habitats. Lower faces will be covered by restoration materials placed in the excavation void. However, one exposed face would be retained in each pit and will be subject to restoration blasting and/or mechanical amendment to achieve a more natural and irregular finish which provides for ecological niches.

### 4.3 Restoration Materials

Initially, the excavation void will be partially filled by selected moisture retentive overburden released from both the borrow pit excavation and, if necessary, from construction works elsewhere from the Proposed Development. This material will then be topped by a combination of acrotelm and catotelm peat to provide suitable substrate for afforestation with commercial species. The peat material will be placed at a total maximum thickness of 2m and surfaced with translocated acrotelm peat turfs from the borrow pit excavation and/or from a suitable donor site within the broader Proposed Development.

Restoration of the final profile will be undertaken by direct translocation of ‘in-situ’ turf and substrate

The restoration will be connected hydrologically to with adjoining areas of existing peatland by means of the breaking out of any impermeable barrier between existing peatland habitats and those within the borrow pit.

The borrow pit will be enclosed by suitable stock-proof fencing to prevent incursions.

#### 4.4 Aftercare and Monitoring

The restored site will be subject to a programme of annual aftercare throughout the operational life of the Proposed Development. Key priorities during the aftercare period will comprise:

- Annual NVC and hydrological monitoring of habitats in the borrow pit;
- Hydrological monitoring shall consist of groundwater level measurement and monitoring of peat turves for drying/shrinkage. If necessary (e.g. in the event of a period of drought during the early establishment of the peat habitats) artificial hydration can be initially applied to prevent peat desiccation. If turf shrinkage occurs, remediation shall consist of backfilling gaps between the turves with selected peat materials and limited hydration as appropriate;

## 5 Borrow Pit Site Plan

As the development of the borrow pit is largely governed by the required aggregate quantities needed for the Proposed Development construction at any given time; the overall indicative site plan has been provided in EIAR Figure 2.11. The infrastructure layout for the Proposed Development is included in EIAR Figure 1.2.

Further development of the site operation plan with the borrow pit contractor (not yet confirmed) will be required before detailed site operation plans can be produced for submission.