Quarry Management Plan
(incorporating Environmental Management Plan)

Prepared for:

Yennadon Stone Ltd

Document Status:

Version	Date	Author	Reviewer
DRAFT	September 2016	A. Robertson	M. Owen

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1.0 INTRODUCTION

1.1 Terms of Reference

This Quarry Management Plan (QMP) forms part of the Environmental Management Strategy (EMS) for operations at Yennadon Quarry, Iron Mine Lane, Dousland, Devon, PL20 6NA. This QMP has been produced by John Grimes Partnership Ltd. on behalf of Yennadon Stone Ltd.

This QMP will become active following the granting of planning permission for the extension of the exiting quarry to the north in conjunction with the phased restoration of the existing quarry area. This Quarry Management Plan (QMP) consists of two sections:

1) The Quarry Development Plan, which details the plans for developing the extension on site in a cost effective, safe and efficient manner; and the
2) Environmental Management Strategy, which provides details of individual environmental plans, procedures and performance targets to assist the quarry operate in an environmentally responsible manner.

The site operations and procedures have been designed to minimise environmental effects of the quarrying operations in accordance with the document "Mineral Planning Statement (MPS) 2, Controlling and Mitigating the Environmental Effects of Mineral Extraction in England". The implementation of the QMP will be carried out by site management. All documents relating to the QMP will be stored in the Quarry Office.

To address the evolving nature of quarries and the need for ongoing risk management and review of controls, this Quarry Management Plan (QMP) will be updated periodically as required. Future updated QMP's will be submitted to the Local Authority for approval.

1.2 Third Party Rights and Other Limitations

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1.3 Site Location and Setting

Address: Yennadon Quarry, Iron Mine Lane, Dousland, Yelverton, Devon, PL20 6NA.

Location: Grid Reference: SX 543 688; see Figure 1. Yennadon Quarry is located on the lower 'moorland fringe' of Yennadon Down; approximately 300m to the east of the village of Dousland.

Access: Access to the existing quarry is gained from Iron Mine Lane via an unmetalled road that runs along the quarry's western edge. Iron Mine Lane links with Burrator Road and then the B3212, which connects with the A386, which is the main road connecting Tavistock and Plymouth.

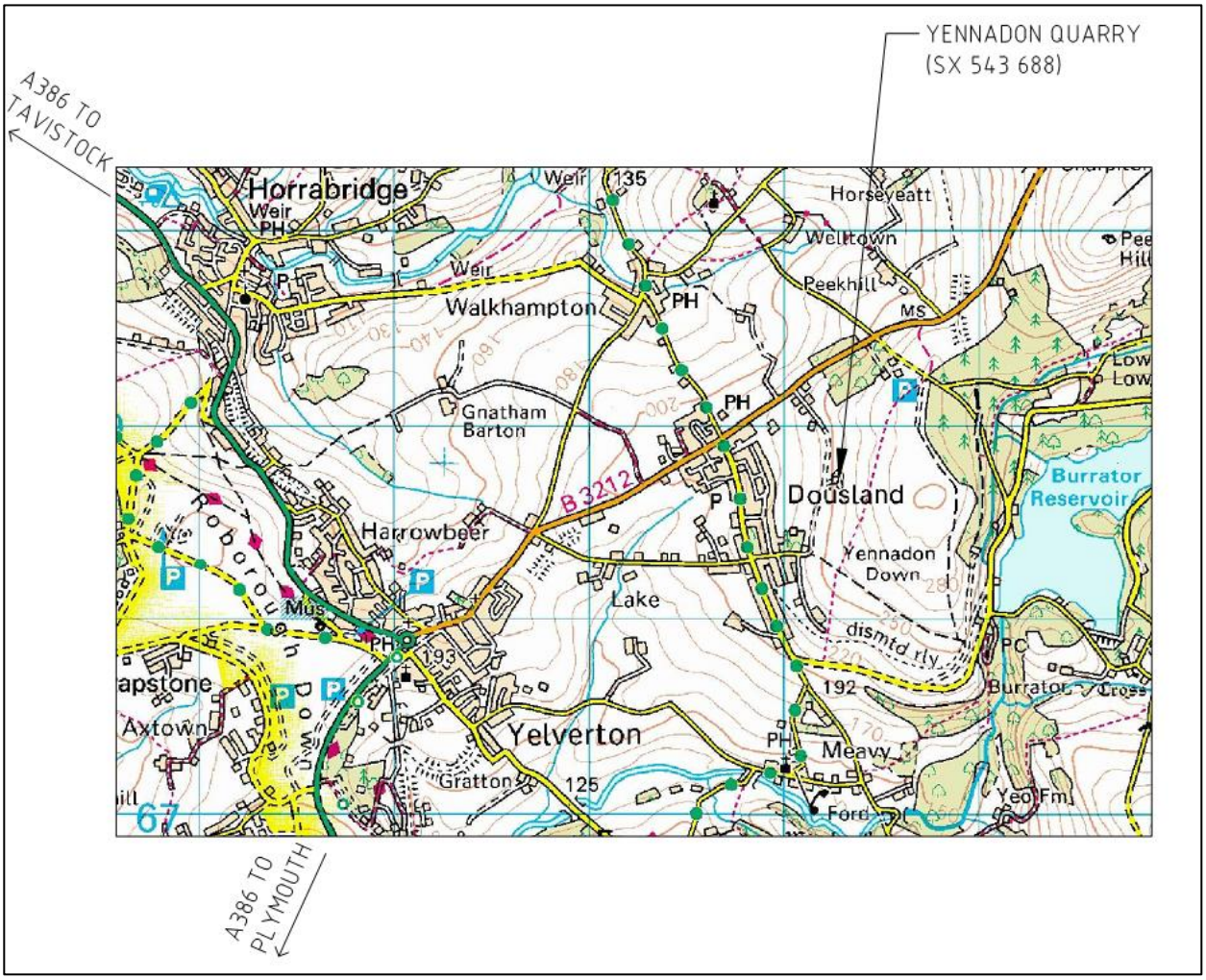

Figure 1: Site Location Plan

Yennadon Quarry is located within Dartmoor National Park on the western flank of Yennadon Down. The Down forms an elongate hill with contours orientated approximately north-south. The highest point on Yennadon Down is 301m AOD to the east of the quarry. The topography at the site slopes from around 269m AOD in the east to around 247m AOD in the west.

Yennadon Down comprises open moorland and is designated as Common Land. The Down is flanked on its northern boundary by Dousland Plantation and farmland. To its east is Yennadon Plantation, beyond which is Burrator Reservoir. To the immediate west of Yennadon Down is a strip of fields used for grazing, beyond which is the village of Dousland, which lies at an elevation of approximately 200m AOD to 230m AOD. Dousland is the nearest residential community some 300m to the west. The closest house (Higher Yennadon) lies some 155m to the north-west of the existing quarry.

Yennadon Down is owned by the Walkhampton Trust and administered by Lord Roborough's Maristow Estate. Yennadon Quarry has been run under its current lease from

the Maristow Estate for around 80 years and in its current form since 1990. The current operation of the quarry is subject to a licence agreement made in 2005 between the Walkhampton Trust and the current operator, Yennadon Stone Ltd.

The Local Planning Authority (LPA) is Dartmoor National Park Authority (DNPA). The current planning permission expires in 2025.

Yennadon Stone operates a "Hard Rock" quarry that produces dimension stone for natural stone building material and walling purposes. The quarrying operation maximises the material suitable for sale, with approximately 40% of the stone excavated being non-saleable waste. Small quantities of waste stone are sold; however, most of the waste stone is stockpiled on site and will be used for landscaping during phased site restoration.

Yennadon Quarry produces dimension stone using low technology extraction and processing methods. It does not employ 'prescribed' quarry processes that necessitate Local Air Pollution Control (LAPC) or Local Air Pollution Prevention and Control (LAPPC) permits. Prescribed quarry processes include drilling and blasting techniques, mechanical crushing and screening plant and transportation of stone using conveyor belts and chutes; none of which are used at Yennadon Quarry.

1.4 Quarry Product

The stone produced from Yennadon Quarry is a Dartmoor Rustic Stone. It is a metamorphosed sedimentary rock (Hornfelsed Slate) that is well suited to and favoured as a building stone due to its indigenous appearance, and resistance to both frost and weathering. It has an established reputation in the market place as a good, flexible, high quality building product. Yennadon Stone has distinct characteristics that make it unique. The stone is flat bedded and nearly all of the joints (naturally occurring discontinuities) within the rock are virtually set at right angles, so that rectangular or square blocks are formed resulting in all natural faces having the rustic colouring. It has distinct subtleties in colour, tone and patina creating a variegated overall appearance when seen in a wall. Its colour ranges between yellowy brown hues, some with iron oxide staining on joint faces, through to bluish grey tones on the cut faces. Yennadon Stone is a particularly strong and durable slate stone. The main source of demand for the material comes from the construction industry, for new builds, extensions, boundary walls and building repairs.

2.0 QUARRY DEVELOPMENT PLAN

The quarry is developed in phases and this development is ongoing over the life of the quarry. Because of economic cycles, during the life of a quarry there may be several boom periods as well as other periods of lower activity, and the quarry must be developed and managed according to these cycles.

The Quarry will be worked in accordance with its Planning Conditions, which include:

a) Total amount of material removed shall not exceed 10,000 tonnes per annum.
b) Lorry trips shall not exceed 30 in any week (Tractors and trailers are not included in this total).
c) Quarrying operations are restricted to periods 07:00 to 18:00 Monday to Friday and 08:00 to 13:00 on Saturdays; however, essential maintenance, pumping etc., can be carried on outside of these periods subject to LPA satisfaction.
d) Lorry movements are restricted to periods 08:00 to 18:00 Monday to Friday and 08:00 to 13:00 on Saturdays.
e) A minimum of 75% of the total tonnage of stone leaving the quarry each year shall be building and walling stone – 'to ensure that the output from the quarry contributes to the achievement of conservation objectives in the area'.
f) No blasting is to be carried out without agreement.

2.1 Phased Development and Working Plan

Development planning has involved consideration of a range of individual and combined environmental and operational constraints to evolve a preferred option for site development. The quarry will develop by controlled extraction within defined 'phase' areas over an anticipated period until planning permission expires. The boundaries of the phase areas are indicated on Figure 2.

To mitigate the impact of the extension, it is proposed to infill and restore the most visually prominent areas in the south-eastern corner of the depleted part of the quarry in a phased manner concurrently with the ongoing excavation. Infilled ground will be progressively landscaped, creating habitat for local species.

The restoration and landscaping activities will be progressive over the lifetime of the quarry. The timing and extent of restoration works will depend on the rate of quarrying and the phasing of the quarry development. The program for implementing new phases of works will primarily depend on the rate at which specific previous phased areas have been extracted to depth; i.e. a new phase will not be commenced until the previous phase is drawing to a close.

Pre-Excavation Works:

Prior to any excavation works within the new quarry area, the following pre-excavation works will be carried out:

a) The un-vegetated northern part of the existing bund will be re-graded so that the angle of slope of the outside face will be reduced (from ~45° to ~25°/30°). The height of the bund will be lowered (from 255m AOD to 252m AOD) consistent with the height of the vegetated bund adjacent to the quarry entrance; and graded at the northern end to blend into the natural ground contours. The width will be reduced and the upper 2m-4m of the inner face of the bund will be re-profiled (to ~25°/30°). Spoil removed from the existing bund will be placed in the south-eastern part of the existing quarry and backfilled in layers against the quarry face at a safe angle of repose; the method and

arrangement will be determined by the quarry operators. The south-eastern part of the existing quarry will become the main area for placing spoil throughout the lifetime of the operational phase of the quarry until the slope extends to the height of the quarry face.

Figure 2: Phased Extraction Areas

b) In accordance with the Common Land Enhancement Plan (see Section 3.3), **5.67ha** of gorse and bracken overgrowth will be randomly flailed / swiped (cut down by mechanical means) to restore land to grazing ground, which will more than compensate for the loss of **1ha** of land related to the extension. This will be carried out prior to fencing off any part of the extension area.

c) The area of the extension is common land and an application will be made to the Secretary of State for closure of this land before any fencing is erected. A new stock-proof fence will be erected around the western half of the extension area. The fence will be erected approximately 10m from the edge of the extraction area in order to minimise the amount of Common Land lost for grazing. During this stage, an ecological contractor will undertake any translocations required prior to scrub clearance, followed by an archaeological contractor conducting any necessary geophysical surveys and assessments.

d) A public information board will be designed for erection at the quarry entrance providing information on the history of the quarry and adjacent tramway. The board will be erected once agreement on the content and design has been achieved with the local authority.

Note: During the operational phase of the quarry, monitoring of vegetation will be carried out regularly by the quarry manager, with any invasive species (e.g. buddleia) being removed, as well as annually by the ecological contractor.

Phase 1a – Stripping Soil / Overburden:

a) The extraction area will be delineated by discreet marker posts. The soil and overburden (weathered rock) will be removed over the Phase 1 extraction area using a back-hoe excavator. The quarry faces comprising soil / overburden will be battered back to an approximately 45° slope to enable vegetation to self-establish/naturally regenerate. All soil/overburden stripping works will be conducted in accordance with good practice guidelines (MAFF 2000: Good practice guide for handling soils) to preserve soil quality and minimise dust generation.

b) Where possible, soil suitable for restoration will be separated from any overburden that is unsuitable for restoration. Topsoil will be placed directly onto the re-profiled existing bund and initial planting will be carried out as recommended by an ecologist. After which the bund will no longer be part of the operational area of the quarry and vegetation will be allowed to establish naturally.

c) Any remaining soil will to be placed in a temporary soil stockpile for use in later restoration; and any overburden / weathered rock not suitable for use in restoration will be placed in the south-eastern part of the existing quarry.

d) The area between the new fence line and the extraction area will become a 'landscape buffer zone' in which existing scrub and gorse will be allowed to mature and compensatory planting of trees will be carried out as recommended by an ecologist. The only access to the Phase 1 area will be from the northwest corner of the existing quarry; i.e. via the haulage road that currently leads to the existing bund.

With no grazing within the landscape buffer zone, the scrub and gorse will become denser within one growing season, which will provide additional beneficial visual and acoustic screening of the quarry; and in the long-term, together with the permanent fence, will provide a robust barrier adjacent to the steep quarry faces.

Note: The exact location of haulage roads needed for the staged quarry development will be constructed as they become necessary; whilst their general locations can be estimated, their final design and route will be a function of many practical things such as site-specific safety considerations, practicality and risk of other consequences (e.g. slope stability, erosion), etc.

Phase 1b – 'High Level Working':
An initial 4m trench will be excavated from the haulage road in the north-west corner of the existing quarry, from which further excavations will progress horizontally northwards. Due to the gradient of slope, the western face will be 4m and eastern face will be 6m.

As is the current working practice at the quarry, two faces are worked simultaneously; usually one at low level and one at a higher level. Therefore, during Phase 1b, the remaining reserves in the south-east corner of the existing quarry will also be worked at 'low level'.

Three months prior to the completion of Phase 1b, the fencing off and stripping of soil/overburden in Phase 2a can commence.

By the end of Phase 1b it is anticipated that the existing quarry will be depleted; therefore, spoil from future phases will be used to continue to backfill against the southern and eastern faces.

Phase 2a – 'Stripping Soil/Overburden':
The stock-proof fencing will be extended eastwards to encompass the Phase 2 area. Then the area will be cleared by the ecological and archaeological contractors. The soil and overburden will be removed over the Phase 2 extraction area using a back-hoe excavator; and the quarry faces comprising soil/overburden will be battered back to a 45° slope to enable vegetation to self-establish. Stripped Topsoil will be place directly onto areas to be restored or onto temporarily stockpiles.

Phase 1c – 'Low Level' and Phase 2b – 'High Level':
A low level working face (within 1c) and a high level working face (within 2b) will be worked simultaneously. Phase 2b will be worked horizontally from the Phase 1 area. The workings within the Phase 1c area will be taken down to a maximum level of 240m AOD. By the end of Phase 1c/2b the south-eastern end of the existing quarry will be close to its final profile.

Three months prior to the completion of Phase 1c/2b and assessment will be made as to the actual area required for Phase 3 to take production up to end of planning permission.

Phase 3a – 'Stripping Soil/Overburden':
Stock-proof fencing will be extended eastwards around the Phase 3 area as required and the area cleared by the ecological and archaeological contractors. Soil and overburden will be removed (Phase 3a) using a back-hoe excavator, with the soil / overburden faces being battered back to a 45° slope to enable vegetation to self-establish. Topsoil from Phase 3a, together with any stockpiled topsoil, will be placed onto areas within the south and south-eastern end of the existing quarry. Any initial planting will be carried out as recommended by an ecologist.

Phase 2c – 'Low Level Working' and Phase 3b – 'High Level Working'
A low level working face (2c) and a high level working face (3b) will be worked simultaneously. Phase 3b will be worked horizontally from the Phase 2 area. The workings within the Phase 2c area will be taken down to a maximum level of 240m AOD. The volume to be extracted from the Phase 3b area will be dependent on tonnage required to take production up to the end of planning permission. Waste generated during this stage will be temporarily stockpiled within the Phase 1 area for use in final restoration.

Final Restoration
The restoration phase, which will be carried out prior to cessation of works in early 2026, involves the backfilling the southern and eastern faces within the quarry extension and re-grading / landscaping of the remaining areas within the quarry. **No soil will be imported**; only soils derived during the stripping of soil/overburden from the extension area will be used in site restoration. All buildings and infrastructure within the quarry area will be removed. The quarry will remain permanently fenced off providing a habitat for wildlife. An ecological contractor will manage creation of habitats during site restoration and after-care biological monitoring, in particular:

- A wildlife pond and wetland will be created in the base of the quarry (the pond will be between 10cm and 1.2m deep, maximising marginal, shallow habitats) in order to enhance the site for wildlife (particularly invertebrates including dragonflies). The habitat immediately surrounding the pond will be seeded using a species-rich seed mix of native plant species suitable for pond edge habitats.
- Sections of near vertical quarry face will be left to enhance biodiversity.
- In the remaining areas, vegetation will be allowed to establish itself naturally. During the aftercare phase, an ecological contractor will be employed to provide on-going monitoring and management of the site.

It is anticipated that this final restoration stage will take approximately 10 weeks to complete and a further two growing seasons to allow vegetation to establish.

In accordance with the Section 106 (agreed as part of the recent planning permission), the quarry operators and land owners have entered into a restoration bond to ensure that the quarry is restored upon cessation of works (including any early closure of the quarry). The bond will be reviewed periodically to make sure that it is sufficient to meet projected costs.

Should the quarry cease operations prior to the end of existing planning permission, the quarry will be restored in accordance with the principals of the Landscape Restoration Plan (Section 3.7) and Biodiversity Enhancement Mitigation Plan (Section 3.8); for example: any remaining quarry benches will be rounded-off to achieve a more natural profile; remaining spoil will be backfilled against quarry faces and landscaped to achieve reasonable profiles; and all buildings and equipment within the quarry will be removed.

2.2 Quarry Processes

The quarry process at Yennadon is shown in Figure 3 and is briefly described thereafter. The whole process is contained within the quarry, which is divided into three working areas:

1. Main Quarry / Extraction Area
2. Processing Area / Saw Shed
3. Office Compound (including welfare unit, workshop and storage container).

Within the main quarry area, stone is removed by tracked excavators with either ripper or pecker attachments, supported by similar machines with bucket attachments.

For efficient operation, two working faces are advanced at the same time. Stone is pre-sorted by hand at the face before being loaded by hand into an excavator bucket which transfers the stone into a small dumper truck. The stone is then transported either to a stockpile or directly to the processing area.

At the cutting tables, each slate block is cut with a diamond impregnated circular saw blade running under constant water spray. There are five cutting tables in the saw shed, with small conveyor belts to reduce manual handling. Cut stone is stockpiled onto pallets or in dumpy bags; whereas loose walling stone is placed into dumpy bags or into 1.5t tipping skips for loading direct into the Heavy Goods Vehicle (HGV). The pallets and dumpy bags are taken by forklift from the processing area to the site office compound where they are loaded onto the non-articulated HGV and transported off-site.
There is a visitor car park area adjacent to the quarry entrance. All visitors and employees use this car park area for their private vehicles. The car park area comprises compacted stone.

There is an inner compound adjacent to the site offices where company vehicles are parked, including the HGV. The inner compound is covered in compacted crushed rock, which can be muddy following wet weather.

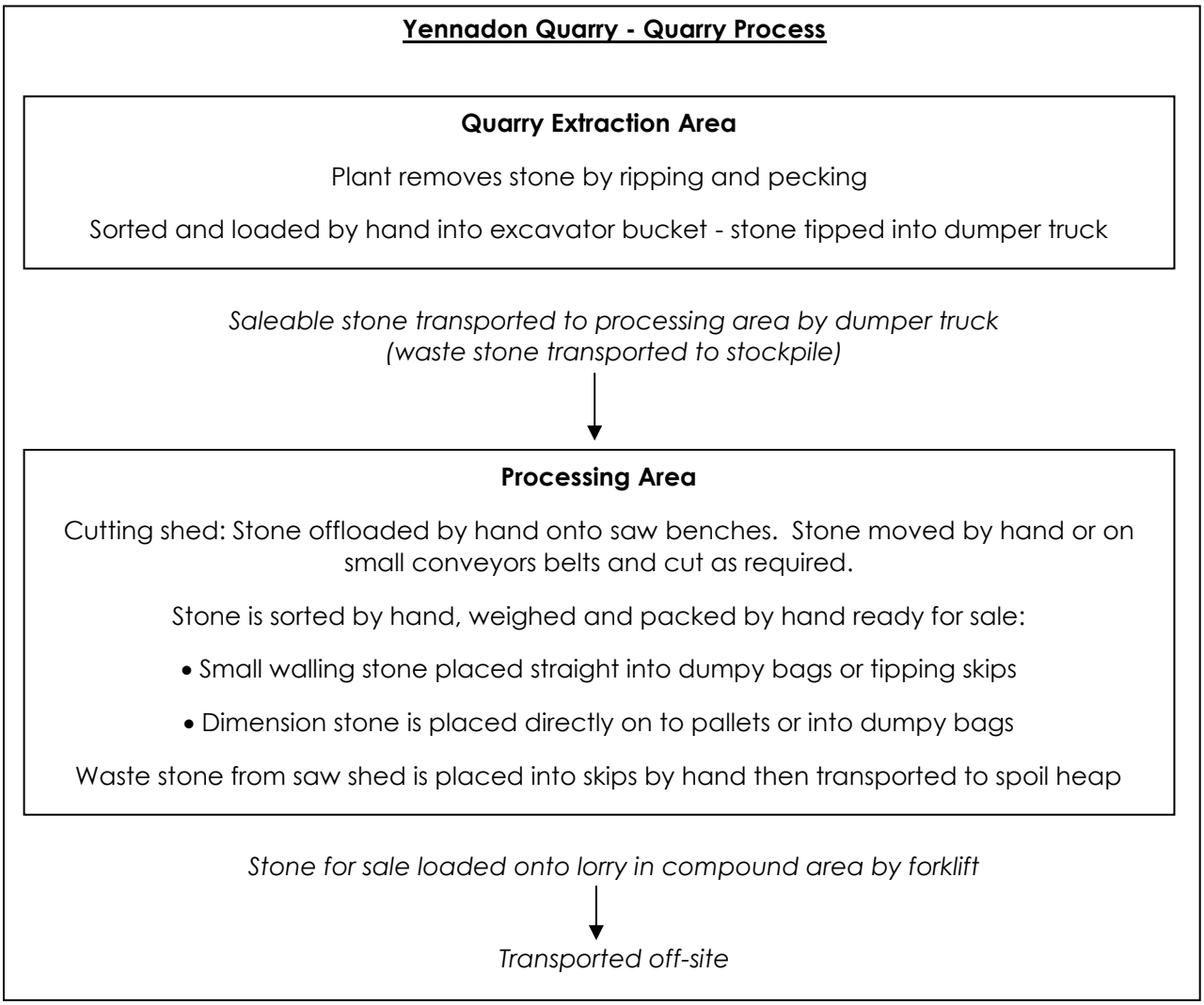

Figure 3: Flowchart of Quarry Process

2.2.1 Plant

All mobile plant at the quarry have reversing alarms. Mobile Plant at Yennadon Quarry comprises:

1. Excavators - only two excavators are usually in operation at one time, using either a breaker (pecker) attachment or a ripper-tooth attachment. All are based in the 'Quarry Extraction Area'. There is one screening bucket attachment known as a spinner (rotating sieve), which enables the excavator to remove smaller stones. All excavators also have standard bucket attachments (into which the stone is loaded prior to being placed in the dumper trucks). Excavators are used intermittently and turned off when not in use. In general, excavators are used 20% - 25% of the working day Monday – Friday (i.e. approximately 2 hours during a 9 hour working day) and 5 hours on Saturday during 'muck shift'.

2. Two 6 tonne dumper trucks: These operate approximately 50% of the time (4.5 hours per day) and are mainly used to transport stone from the 'Quarry Extraction Area' to the 'Processing Area'.
3. Two forklifts: These are used to transport loaded pallets and dumpy bags from the 'Processing Area' to the HGV loading area. The forklifts are used on average only 20% of the working day (just under 2 hours per day).
4. One HGV: It will carry a maximum 16 tonne load (giving total weight of 26 tonnes). The HGV takes 2 – 3 loads off-site each working day.

Static Plant at Yennadon Quarry comprises:

1. Four generators [one at 40 kva and three at 27 kva], all of which are housed in acoustic chambers. The generators only operate during site hours and they occasionally operate one overnight during freezing conditions.
    a. the first generator powers the site offices, one borehole abstraction pump and one saw;
    b. the second powers two saws and a second borehole abstraction pump;
    c. the third generator powers two saws and the workshop; and
    d. the fourth generator powers a mobile saw and the container.

2. 6" pump: Used to direct water from the base of the quarry to soakaway, usually only operational during and following wet weather. It is only occasionally operated overnight.

There are short conveyor belts between workbenches and saws in the processing area. These conveyor belts are horizontal and there are no drops or chutes that could generate dust. All cutting is conducted under a water spray to prevent dust generation.

Yennadon Quarry operates a strict equipment maintenance programme. This involves conducting daily maintenance checks on both mobile and static plant, as well as regular detailed maintenance, e.g. changing filters, oil changes, use of drip trays, etc. All plant has independent annual engineering inspections conducted for insurance purposes. Six weekly VOSA safety inspections are a legal requirement.

2.2.2 Fuel Storage

Fuel is delivered weekly and stored within a 2500 litre bunded above ground fuel storage tank. The tank is inspected annually by independent engineers for insurance purposes.

Two generators are located close to the fuel tank and re-fuelled using hoses. Two of the generators require refuelling once a week; the other two need refuelling twice a week. Other mobile equipment is tracked to the tank for re-fuelling. The only item re-fuelled *in-situ* is the 6" pump, which is re-fuelled using portable fuel cans. Spill kits are kept adjacent to the tank and are taken with portable fuel cans during re-fuelling.

Oils are stored within the workshop in a bunded area.

2.2.3 Litter

Yennadon Stone Ltd has a strict in-house policy where all litter is binned and skipped. All paper and general waste is kept within the canteen / site office area. This policy keeps wind-blown litter to a minimum.

2.2.4 Mud

Within the processing area, the processing of the stone under a water spray produces moderate levels of mud, which is periodically scraped off the concrete hardstanding from around the saw shed. The tailings are placed on spoil heaps. The tailings are covered by larger stones to prevent wind-whipping of dust.

None of the mobile plant that operates within the main quarry area leaves the extraction or processing areas, with the exception of the forklifts. This reduces the transfer of mud into the office compound area.

A minor amount of mud does adhere to vehicles leaving the inner compound; however, due to the length and nature of the compacted stone track / access road, this mud is eroded from tyres prior to vehicles reaching Iron Mine Lane. Yennadon Stone Ltd. maintains the compacted stone access track. During dry weather the access track can be a source of dust, which can be generated by wind whipping, vehicle movements, horses and livestock.

2.2.5 Utilities

Water Supply:

There are two water abstraction boreholes on site. Groundwater is abstracted for drinking water and sanitation, as well as being used in the 'Processing Area' – sawing is conducted with a water spray as dust suppression. Groundwater quality is tested regularly to ensure it is fit for consumption. In addition to the boreholes, the quarry operators also recycle some of the processing water for re-use in the Processing Area and recycles water from settling pond in the base of the quarry, which is pumped back to the processing area through a 'silt-buster' to reduce abstraction requirements.

The groundwater from the boreholes is pumped to a header tank with a maximum capacity of 17m^3. Water is piped from the header tank to the 'Processing Area'. A full tank has sufficient water for the quarry's daily requirements at reasonable production rates. The offices, mess and toilet are supplied direct from the borehole.

Yennadon Quarry does not require a groundwater abstraction licence as it does not exceed the 20m^3 permitted each day.

Site Drainage

Water from the saw shed (Processing Area) is directed to a container via gulleys, where the silt fraction partially settles out and the water is then pumped to a soakaway. The soakaway is located in the northwest of the existing quarry within the main spoil area.

Foul water from the site offices drains via a sewage system to a storage tank on site, which is emptied approximately every six weeks by a suction tanker.

Electricity Supply

All electricity for the cutting tables, office and mess room is provided on-site by diesel generators.

3.2.6 Lighting

There are no floodlights in operation within the Quarry Extraction Area. Additional lighting is only used in and around the covered Processing Area and offices during winter months within working hours and only when required.

3.0 ENVIRONMENTAL MANAGEMENT STRATEGY

3.1 Introduction

This section outlines the controls and mitigation measures in place at Yennadon Quarry to safeguard the environment. It provides the framework for environmental management at the quarry and information for managing the site and site activities, as well as providing a practical guide at the operational level to contain environmental impacts.

The Environmental Management Strategy (EMS) sets out roles and responsibilities at all staff levels, training requirements and continuous improvement aims.

Individual environmental management plans have been developed for particular identified significant issues. These plans provide management objectives, identify specific activities, mitigation measures, responsibilities, monitoring and reporting requirements; and where applicable performance targets. The EMS and individual plans will be regularly reviewed to ensure environmental impacts are managed. The plans prepared for Yennadon Quarry include;

- Common Land Enhancement Plan;
- Noise Management Plan;
- Dust Management Plan;
- Phased Restoration and Landscaping Plan; and
- Biodiversity Mitigation and Enhancement Plan (BMEP)

3.2 Procedures and Organisational Structure

The Quarry Management will be directly responsible for ensuring environmental management objectives and standards are achieved for the operation. Environmental consultants will be engaged to provide expert advice on particular issues or concerns.

The management will ensure that its employees comply with its Environmental Management Strategy (EMS). General control measures include:

- Maintain proper management, supervision and training of quarry processes, with particular emphasis given to control procedures during start-up, shut down and abnormal conditions;
- Ensure staff at all levels have the necessary training and instruction in their duties and the proper use of equipment;
- Conduct effective preventative maintenance on all plant and equipment concerned with the control of emissions;
- Maintain a high standard of housekeeping; and
- Any spillages should be cleaned up promptly using appropriate spill kits and handling methods.

Specific responsibilities for the Quarry Management and other personnel are detailed in the individual environmental management plans.

3.2.1 Training

Particular emphasis is placed on inducting all new employees on work place Health and Safety issues, company procedures and employee responsibilities. The majority of the environmental procedures and practices training is conducted "on the job" under the guidance of suitably experienced supervisors. Records of training, including inductions will be maintained on site.

3.2.2 Complaints

The quarry management will investigate all complaints and ensure that reasonable complaints are resolved and appropriate action is taken within a reasonable timeframe. The quarry shall implement an 'open door policy' with the local community and welcome community members to visit the quarry and observe activities on the site.

All complaints relating to the operation of the quarry must be recorded in the 'Environmental Management Logbook' with the following details:

a) time, date and nature of complaint including urgency and significance.
b) type of communication (telephone, letter, personal communication, etc.).
c) contact name, address and telephone number of complainant (note: if the complainant does not wish to be identified then 'not identified' is to be recorded).
d) investigation undertaken as a result of the complaint.
e) action and response taken as a result of the complaint investigation.

The investigations should include:

- determining what activities (and equipment) were being carried out or operated at the time of the complaint.
- determining whether, at the time of the complaint, normal day to day activities were conducted or whether new / non-routine activities were conducted.
- identifying whether the source of the complaint was from the quarry, or from an external source (i.e. elsewhere in the local area).

If the complaint is deemed reasonable, the quarry management will determine what potential actions may be carried out to resolve the complaint and/or minimise the likelihood of further complaint.

The quarry management will be responsible for ensuring all employees at the quarry site are familiar with the procedure for complaint recording.

Employees receiving a complaint are required to record the complaint and notify the quarry management that the complaint has been received. Employees are to show respect and understanding to complainants.

3.2.3 Environmental Monitoring

Monitoring will be undertaken to ensure effectiveness of environmental management / mitigation measures that have been put in place to protect the amenity of surrounding land and environmental environs. Monitoring may either be qualitative (for example, visual surveillance) or quantitative (for example, measuring sound levels at a near residence).

The Quarry Manager is responsible for ensuring that all monitoring is carried out by a competent person, the results are recorded in a consistent fashion and that records stored for at least five years. Records will be reviewed by the quarry management to ensure compliance.

Monitoring records shall include:

- type of monitoring (e.g. dust, noise, etc.) and methodology or protocols;
- person(s) undertaking the monitoring;
- date, time and prevailing weather conditions;
- location(s) of monitoring point(s) and any relevant site observations (e.g. off-site sources of audible noise, etc.);
- the type, model, serial number and calibration of any monitoring equipment used (where relevant); and
- the monitoring results (including units).

Management shall make available monitoring results following a written request from the local authority, Environmental Protection Agency or other relevant stakeholder.

3.3 Common Land Enhancement Plan

Common Land covers approximately 37% of the Dartmoor National Park. Yennadon Down lies within the Common Land Unit CL191 Meavy Common and is more commonly known as Lynch Common, Wigford Down and Yennadon Down.

Common Land Unit CL191 covers 283 acres and currently comprises approximately 50% (140 acres) gorse and bracken overgrowth and 50% grazing ground. There are no Stewardship Agreements in place and therefore there are no controls on stock numbers, therefore any farmer with allocated Commons Rights on Yennadon Down is free to graze cattle, sheep and ponies with no restriction. The extension of the quarry will involve the closure of approximately 1% of the common land within CL191.

This Common Plan Enhancement Plan outlines the mitigation works to compensate for the loss of grazing land.

3.3.1 Mitigation Measures

Prior to fencing off any of the extension area, to compensate for the loss of grazing, 14 acres (5.67ha) of gorse and bracken overgrowth will be flailed / swiped (cut down by mechanical means) and restored to grazing ground.

Flailing and swiping of the gorse and bracken would have the same effect as the destruction of such vegetation as the annual swailing (controlled burning) that is done on Commons across Dartmoor to return vegetation to grassland. Swailing is part of Natural England's method of gorse and bracken control on those Commons of Dartmoor that are controlled by Higher Level Stewardship and Environmental Sensitive Agreements. The use of mechanical vegetation destruction (flailing and swiping) is considered to be less environmentally harmful than swailing.

A specialist contractor will be employed to randomly flail 14 acres (10%) of the vegetation area across Yennadon Down, which would more than compensate for the 3 acres' loss to Yennadon Quarry. The flailing would be carried out during the autumn and further swiping will be carried out the following autumn. This then will clearly give the opportunity for the grasses to return since they will not be oversailed by gorse and bracken.

3.3.2 Responsibilities and Monitoring

The common land enhancement scheme will be jointly funded by Yennadon Stone Ltd and the Maristow Estate. The scheme will be managed and monitored by the Maristow Estate. The Commoners will be kept informed of the timescales and areas to be flailed and swiped by the Maristow Estate.

3.4 Noise Management Plan

Uncontrolled or unmitigated quarry noise has the potential to be a nuisance at neighbouring residences. Surface mineral operations can be, by their nature, noisy, in common with many activities of an industrial character. It is not practicable to stop all noise emissions, however the mitigation measures laid out in this noise management plan are aimed at reducing noise emissions to acceptable levels to protect the acoustic environment at surrounding residences and local amenity and to minimise the likelihood of complaint.

The nearest noise sensitive place (residential property of Higher Yennadon) is located some 142m from the northern boundary of the existing quarry and 90m from the fence line of the extended quarry (note: an approximately 15m wide landscape buffer zone will be in place inside the fence line). The incorporation of the landscape buffer zones with increased scrub vegetation will help to mitigate noise emissions.

During normal quarry operations, most of which are carried out below external ground level, noise levels from the quarry can be controlled to no more than 50 dB L_{Aeq}. This limit is 5 dB lower than the maximum level recommended in the National Planning Policy Framework (2012) guidance and is therefore considered to be robustly protecting the amenity of the neighbours.

3.4.1 Noise Mitigation Measures

The following management practices will be maintained:

- The site compound area, office and processing and are all currently located within the base of the quarry as to minimise noise impacts. These will remain in their current location.
- All site and haulage vehicles will be well-maintained and fitted with mufflers;
- Employees will avoid the unnecessary revving of motors;
- The access track, haul road and hardstand surfaces will be maintained in good condition (free of potholes and ruts);
- All employees will adhere to a maximum 5mph speed limit on the access track;
- All new employees will be inducted on the requirements of the Noise Management Plan; and
- Any temporary surface workings (e.g. stripping of topsoil/overburden or restoration works) will be planned to ensure they are of the minimum duration.

3.4.2 Responsibilities and Monitoring

The quarry management will initiate regular noise surveys at the boundary of the nearest sensitive receptor to check compliance with the performance target of 50 dB L_{Aeq}. Records of all noise monitoring undertaken will be reviewed and maintained by the quarry management.

Employees are to be made aware of the Noise Management Plan and are advised of their roles to minimise the generation of noise, such as adhering to the 5mph speed limit along the access track. Training, awareness, competence and performance will be evaluated on a routine basis to ensure effectiveness.

3.5 Dust Management Plan

Prevailing wind direction is from the south western quarter. Although the prevailing wind direction is from the south-west, the topography of Yennadon Down results in a northerly local wind pattern. The site is also relatively sheltered from easterly winds. Downwind from the prevailing wind direction (i.e. southwest of Yennadon Down) is predominantly farmland. Although Bowdens Plantation lies directly south of Yennadon Down, there are no significant wooded areas downwind of the site that particularly influence local wind patterns.

Regional rainfall data (Met. Office) shows that the site lies in an area of the UK with comparatively high rainfall of around 2,000mm per annum. More specifically for Dartmoor there are approximately half the days in the year when the rainfall is 1mm or greater and reference to MPS shows this is above the amount needed to suppress wind-blown dust and emissions. Consequently, there should be a significant degree of dust suppression by surface wetting and removal of entrained dust from the atmosphere.

Activities on the quarry site will generate dust and if not adequately controlled has the potential to be a nuisance at the nearest residences. The objective of the dust

management plan is to protect air quality of the locality and to minimise the likelihood of complaint.

Quarry activities at the site that have the potential to impact on air quality of the locality include;

- wind action on stockpiles and the access track; and
- topsoil/overburden stripping

Dust generation rates depend upon factors such as prevailing meteorological conditions (wind speed/direction and rainfall) and the implementation of specific control measures (e.g. methods of topsoil/overburden stripping and materials handling.

3.5.1 Dust Control Measures

Control measures for reducing dust emissions will be based on best management practice. Details of the general dust controls are as follows:

- Using water sprays within the saw sheds (processing area) to prevent dust being generated.
- Speed restrictions are currently employed by Yennadon Stone staff to minimise wheel generated dust along the access track. Employees of Yennadon Stone should continue to adhere to the **5 mph** speed limit on the access track. This speed limit is instructed during inductions, is stated in their employee manual and posted on site notice boards.
- Tailings are regularly cleared up and placed on stockpiles, which are immediately covered with larger cobbles to prevent wind-whipping of dust.
- Grassing/planting of bunds and open areas to minimise erosion.
- Visually monitor the processes within the quarry to ensure that no excessive dust is being generated.
- Monitor the amount of visual dust being generated on the compacted stone access track. Reviews should be carried out as to amount of dust being generated. Repairs or re-surfacing of the track should be carried out using very low-fines aggregate.
- Topsoil stripping and storage should be carried out in accordance with good practice guidelines (MAFF 2000: Good practice guide for handling soils) to minimise dust generation. Wind speed and direction will be taken into account during such activities. Dust monitoring will be undertaken during stripping of overburden to ensure mitigation measures are effective. Water suppression techniques could also be utilised during prolonged dry periods for wetting tip/restoration work areas if required.
- Soil storage areas, soiled bunds and restored areas will be seeded and vegetated as soon as practicable. Guidance in MAFF 2000 (Good practice guide for handling soils) should be followed to reduce wind whipping of particles and minimise dust generation during bund construction. Trees, bushes and vegetation to be planted on bunds as appropriate to form wind breaks/dust screens.
- Positioning of stock piles to take advantage of shelter from the wind.

- Observation of weather forecasts and wind speed to decide on preventative/ mitigation measures.
- Dust control measures to form part of employees and contractor's induction.

3.5.2 Dust Action Plan

All personnel on site are responsible for maintaining visual awareness of dust emissions deriving from the quarry or from the access road. Any significant dust emissions should be reported to the site management who will investigate the cause and implement immediate action to minimise dust emissions. A record of any incidents and mitigation measures taken should be recorded in the 'Environmental Management Logbook'.

During non-routine activities, such as stripping/placing soils, quantitative dust monitoring should be carried out to ensure that dust suppression / mitigation measures are adequate. Monitoring locations should include on-site as well as off-site control points and should include directional gauges to determine the source of any dust emissions.

If during routine or non-routine operations, abnormally significant volumes of airborne dust are identified that have the potential to detrimentally affect nearby residential receptors, the following actions will be taken:

- Immediately investigate the cause of the abnormal emissions;
- Cease operations until corrective action can be taken, or adverse weather conditions change;
- Implement corrective action (e.g. water suppression techniques, or ensure vehicles are obeying site speed limit); and
- Record incident in 'Environmental Management Logbook'.

3.5.3 Site Management Responsibilities

The site management are responsible for ensuring the Dust Management Plan is enforced on site, as well as ensuring that:

- all employees and contractors are informed of the Dust Management Plan as part of the induction procedure and are advised of their roles to minimise the generation of dust. Training, awareness, competence and performance will be evaluated on a routine basis to ensure effectiveness;
- all plant and equipment is maintained;
- where non-routine processes are required (e.g. stripping or placing of soils), that employees receive adequate training of critical procedures;
- during unfavourable weather conditions, that activities can be scheduled to minimise the potential for dust generation or that suitable dust mitigation measures can be deployed; and
- instructions are given on actions to be taken if excessive dust is generated.

3.6 Traffic Management Plan

Traffic generated by the quarry includes both employees travelling to and from the quarry, as well as the haulage of product to the quarry's customers and occasional deliveries (e.g. fuel, etc.). The quarry operates on a maximum of 30 lorry trips per week (a lorry is defined in the current planning conditions as any vehicle as having a load capacity of 3 tons or over, but excluding tractor trailers).

Access to the existing quarry is gained from Iron Mine Lane (unclassified road) via an approximately 400m long private compacted stone access track. There is a staff / visitor car park adjacent to the site entrance. The quarry operates one HGV for deliveries. The HGV remains in the site office compound area and does not enter the quarry processing area or working area where excessive mud can occur.

As the quarry is located within a rural environment, haulage vehicles must not arrive at or leave the quarry site outside of the approved operating hours of 07:00 to 18:00 Monday to Friday and 08:00 to 13:00 on Saturdays (as stated in the existing planning conditions).

The access track that extends from Iron Mine Lane to the quarry and continues along the west of the quarry to the north was originally the line of the old Plymouth and Dartmoor Tramway. The track is constructed of compacted stone. During prolonged dry weather, the access track has the potential to generate wind-whipped and traffic / livestock generated dust. During intense wet weather, significant surface water run-off can be generated from the moor and can cause erosion of the track resulting in pot-holes and rutting resulting in increased traffic noise.

3.6.1 Traffic Control Measures

The traffic management arrangements are as follows:

- Vehicle maintenance plan for HGV comprising basic daily inspections and frequent thorough maintenance checks. Six weekly VOSA safety inspections are a legal requirement.
- The compound comprises areas of concrete hardstanding and compacted stone fill, which during wet weather has a thin layer of mud across the area. The amount of mud in compound area and staff / visitor car park is monitored and cleaning / maintenance carried out when excessive mud accumulates.
- The compacted stone access track effectively removes any mud / debris from the HGV tyres prior to it joining the local highway network. Yennadon Stone maintains the access track to a condition suitable for their use. There is a 5mph speed limit imposed on all Yennadon employees using the access track, including the HGV.
- The access track will be regularly inspected by the quarry management, with pot holes and ruts infilled as required. Any re-surfacing of the track will be carried out using very low-fines aggregate, which will reduce dust generation from the track.
- The access routes to the quarry will be inspected to ensure the excess track effectively removes mud from HGV tyres.

- Ensure all staff receive training and guidance on the speed limit along the access road. Reduced speed and increased care to be taken by drivers.

3.6.2 Responsibilities

The quarry management are responsible for educating all employees of the requirements of the Traffic Management Plan and for enforcing the control measures.

All employees are responsible for maintaining the 5mph speed limit on the access track and for reducing speed and taking increased consideration of other road users and residents when driving through the village of Dousland.

All employees are responsible for reporting any accidents, incidents or near misses to the quarry management, who will record any transport related incidents.

3.7 Landscape Restoration Plan

Yennadon Quarry lies within the 'Upland Moorlands with Tors' character type (as detailed in *The Dartmoor Landscape Character Assessment* (DLCA)), close to the boundary with the 'Moorland Edge Slopes' area. The western flank of Yennadon Down has a "locally distinctive" landscape as it falls within the transition zone between these two character types (i.e. the surrounding area exhibits features of both character types).

Abandoned quarries are an important and often highly visible part of the Dartmoor landscape. They form focal points and places of historic interest and can contribute positively to the special qualities of the National Park. At Yennadon Down, the landscape is of an operational quarry set within open moorland. During the lifetime of the quarry this will not change.

The principal objectives of the Landscape Restoration Plan are to:

- progressively restore the site to a stable, non-polluting and self-sustaining state, compatible with the site being an historic quarry set within a moorland landscape;
- backfill and landscape the most visually prominent south-eastern part of the quarry;
- create the landscape buffer zones to reduce the amount of land disturbance to that which is essential for the quarry to extract during its life, whilst providing a degree of visual and acoustic screening, providing habitat and protecting visual amenity;
- protect the general amenity of the area both during and subsequent to extractive operations;
- promote native plant species regeneration on bunds and batters (apart from compensatory planting of hawthorn trees, the backfilled areas will be allowed to naturally vegetate with typical moorland vegetation);
- retain a near vertical rock face retained in the least visible north-western part of the site, which will maintain the historic presence of the quarry within the landscape;
- provide opportunities for increased bio-diversity and habitat creation within the restored site; and
- minimise long-term site maintenance costs.

The Landscape Restoration Plan has been designed so that on final restoration, the quarry can be assimilated back into the local landscape. The land immediately adjacent to the west of the site is characterised by naturally re-generating small trees, which provide opportunities to assimilate the site into the local landscape that do not exist at more elevated locations. The restored quarry will form a focal point for future visitors to the moor, whilst also providing opportunities for biodiversity enhancements within the site.

An information board will be maintained close to the entrance of the quarry describing the history of mineral extraction on Dartmoor and in particular the link between Yennadon Quarry and the adjacent historic minerals tramway, as well as the nearby historic Yennadon Iron Mine.

3.7.1 Control Measures

Quarrying activities modify the landscape, cause land disturbance and have the potential to impact on visual amenity, flora and fauna. The **Phased Development and Working Plan** (detailed in Section 2.1) incorporates the mitigation and control measures necessary to ensure that the visual amenity of the locality is protected and that habitats and biodiversity are managed appropriately both during and subsequent to the operations. Details of the habitat and biodiversity mitigation measures are detailed in the **Biodiversity Mitigation and Enhancement Plan** (Section 3.8). In brief, the landscape mitigation and control measures are as follows:

- The well-established vegetation on the original bund (to the north of the site entrance) screens views into the existing quarry and integrates the bund into the landscape. This area will be retained as existing;
- The un-vegetated northern part of the existing bund will be re-profiled during the initial phases of the revised proposals to match that of the original bund, capped with site-derived soil, planted with sporadic hawthorn trees and allowed to re-vegetate naturally;
- Protected 'landscape buffer zones' will be created around the extraction area. Sporadic hawthorn trees will be planted during each development phase. The aim of the landscape buffer zone is to allow the existing vegetation to mature (without grazing by livestock) enhancing habitat / biodiversity and to provide a degree of visual and acoustic screening (to preserve public amenity);
- Spoil derived during the operational phases of the quarry will be battered against the south-eastern and eastern quarry faces to a stable angle of repose. Earthmoving equipment will progressively shape and trim the spoil to the required profiles. Soil stripped during the progressive development of the quarry extension will be used to cap the restored areas. Sporadic hawthorn trees will be planted and the restored areas will be allowed to naturally re-vegetate;
- The delineated extraction area within the new extension lies at a lower elevation than the most northerly limit of excavations within the existing quarry therefore will be a less prominent part of the landscape;

- On completion of extraction works, any remaining quarry benches will be rounded-off to achieve a more natural profile. Final landscaping will be carried out, including creating a seasonal wetland and pond in the base of the quarry. All buildings and equipment within the quarry will be removed; and
- On closure, the quarry will remain fenced off to prevent grazing by livestock and to enable the site to be developed and managed as a wildlife haven (see Section 3.8).

3.7.2 Monitoring and Responsibilities

The quarry management will ensure that part of the annual budget allocates funds for landscaping and restoration activities; and that the phase working scheme and landscaping restoration plans are adhered to.

The quarry management will ensure that land disturbed is that absolutely essential for extraction and that there is no intrusion into the landscape buffer zones. The quarry management will also ensure that the backfilling and landscaping achieve appropriate profiles; and that habitat and biodiversity monitoring is carried out as detailed in Section 3.8.3.

All new employees will be inducted and trained on the requirements of the phased working and restoration plans.

3.8 Biodiversity Mitigation and Enhancement Plan (BMEP)

This BMEP outlines the mitigation measures and management strategy for managing and enhancing the biodiversity of the landscape buffer zones and the progressively restored areas of the quarry, as well as the long-term after-care of the quarry following its closure.

This BMEP provides a programme of mitigation, compensation and enhancement measures to ensure that the quarry development has due regard for protected species and that the site is enhanced appropriately to benefit biodiversity. It promotes the use of natural re-vegetation of the site. The BMEP will be managed by a specialist ecological consultancy, who will undertake or supervise aspects of the BMEP as required. During the aftercare phase and long-term, an ecological contractor/consultant will be employed to provide on-going monitoring and management of the site.

3.8.1 Mitigation Measures

The following mitigation strategies have been developed to avoid any offences under wildlife legislation and reduce impacts to habitats and species. Measures have also been implemented to enhance the biodiversity value of the site. This BMEP provides a programme of mitigation, compensation and enhancement measures to ensure that the development has due regard for protected species and that the site is enhanced appropriately to benefit biodiversity.

The following measures will mitigate for the loss of existing habitats and will benefit a range of species including reptiles, invertebrates (including butterflies), birds and bats.

Site clearance:

Site clearance will be undertaken in a manner (and at a time of year) which will avoid harm to nesting birds or reptile species. Site clearance works will be carried out and/or supervised by a suitably experienced ecological consultant.

For each phase of the quarry development, the new phase area will be fenced off prior to any site clearance works. Staged site clearance works comprise:

1. Gorse and bracken clearance – vegetation within the area of the proposed works will be cut back to ground level (<4cm) during the period **October to end of February** when birds are not nesting and reptiles are not active. All cuttings (e.g. gorse brash and bracken) will be removed from the area as this could otherwise be used as nesting habitat (and cover for reptiles). This stage should be carried out during the winter before stage 2;
2. Reptile translocation (as detailed below) to be conducted from **April to September** during suitable weather conditions of between 10°C and 20°C, with low winds and no precipitation; and
3. Stripping of soil/overburden will be carried out from **September to the end of February** (i.e. outside of the skylark nesting season).

Where possible, stripped soil will be placed directly onto areas being restored to minimise disturbance of the soil structure and seed bank. Temporary soil stockpiles will be carefully managed to preserve its composition.

Reptiles:

Once vegetation has been cleared, a translocation of reptiles will be implemented by a suitably experienced ecologist. The translocation will comprise:

- the setting out of artificial reptile refugia (tiles made from bitumen roofing felt/corrugated metal sheets) at a high density (~500 - 1000 tiles per hectare) in suitable habitat throughout the site. These refugia will then be left in situ for approximately two weeks prior to commencing the translocation;
- erection and maintenance of temporary reptile barrier fencing to prevent re-colonisation of the new phase area. As the reptile barrier fencing will be within the stock-proof fence-line, there is a low risk of trampling by livestock; however, the reptile fencing will be checked by site staff on a monthly bas is (or as necessary) to ensure that it is intact and 'reptile proof'. Repair works will be undertaken as necessary. On completion of soil stripping works for each Phase, the reptile barrier fencing will be removed to allow reptiles to disperse around the landscape buffer zones; and
- visits undertaken by the ecologist to catch reptiles from underneath/on the refugia or elsewhere on site, and move them to adjacent areas of Yennadon Down that

will not be affected by the proposed quarry extension works. The translocation process will continue until very low numbers of/no reptiles are found for three consecutive visits.

Two reptile hibernacula will be created on the existing bund as part of the landscaping / restoration works. The reptile hibernacula will be constructed under the supervision of a suitably experienced ecologist in accordance with The *Reptile Habitat Management Book* (Amphibian and Reptile Conservation 2010; pages 45/46). Hibernacula comprise features of rock and log piles under turf where reptiles can both overwinter and bask on top of.

Provision of nest boxes:

New nesting opportunities will be provided for woodland bird species by the installation of four nest boxes on mature trees within the vicinity of the quarry (e.g. alongside the access track), but in a location that is not accessible to livestock. The trees alongside the access track offer numerous opportunities to be enhanced for nesting birds. The bird boxes will comprise:

- 2x 1B Schwegler Nest Boxes with a 32mm entrance hole (suitable for tits, etc.), erected at a height of >2m on north facing tree trunks.
- 2x 1N Schwegler Deep Nest Box (suitable for robins, etc.), erected at a height of approximately 1.5m on north facing tree trunks.

Provision of bat boxes:

New roosting opportunities will be provided for bat species by the installation of four bat boxes (2x Schwegler 2F and 2x Schwegler 2FN bat boxes) on suitable mature trees bordering the site to the north of the new quarry extension. These will be erected on a trunk, a minimum of 3-4m above ground level and face in a southerly or south-easterly direction. Boxes will have a clear flight path to them (i.e. not situated immediately behind dense vegetation). Erection of boxes will be supervised or undertaken by a suitably experienced ecological consultant.

Restoration of bunds and backfilled sections of the quarry:

The existing bunds and phased areas of restoration (quarry faces backfilled with spoil) will be landscaped as detailed in Section 2.1. The bunds and spoil will be capped with site-derived soil and allowed to naturally vegetate from on the seed bank existing within the soils. During vegetation establishment, the restored spoil piles will be monitored and managed to ensure no invasive species establish. The final habitat will comprise a mosaic of scrub (mainly European gorse and/or heather), bracken, scattered trees, areas of acid grassland, scree slopes and sections of near vertical quarry face for the benefit of a variety of local species including birds, reptiles and invertebrates.

Tree planting:

Hawthorn trees will be progressively planted within the newly created landscape buffer zone during each phase of works and during final site restoration. These trees will be

planted in a randomised way to give the appearance of scattered and naturally self-sown trees, rather than a straight formal line, evenly spaced. The trees will be native and of local provenance. Young trees will be protected by tree guards until established to prevent damage by rabbits, which will be removed once established.

Pond and seasonal wetland:

As part of final site restoration, the drainage pond located at the base of the existing quarry will be modified to form a pond and seasonal wetland to enhance the site for wildlife (such as amphibians, dragonflies and fairy shrimp). The restoration works will be supervised or undertaken by a suitably experienced ecological consultant. The pond will have the following specifications:

- Surface area of approximately 350-400m^2
- Gently sloped edges (gradient no more than 1 in 3 and ideally shallower) to allow escape by amphibians.
- The pond will have irregular (wavy) margins to maximise marginal, shallow habitats.
- Pond depth will vary between 10cm and 1.2m depth.
- No fish or exotic (non-native) vegetation will be introduced.
- Soils will be retained to enable the ground surrounding the pond and wetland area to be seeded using a species-rich seed mix of native plant species suitable for pond edge habitats, thereby increasing the habitat immediately surrounding the pond.

3.8.2 Monitoring and Responsibilities

The monitoring will be undertaken to ensure site mitigation and enhancement measures are establishing correctly and that populations are returning to or increasing from the baseline levels present prior to the quarry extension. Monitoring of the habitat will be carried out in accordance with the methodology and programme laid out by the contracted specialist ecological consultant.

The quarry management will monitor the areas being restored to verify the establishment of vegetation on a monthly basis until vegetation has established. Any invasive species that start colonising (e.g. buddleia), will be removed by the quarry management. Re-planting will be undertaken as necessary.

The ecological consultant will undertake annual monitoring during the working lifetime of the quarry; and on alternate years for at least four years. Monitoring visits will be undertaken in May/June during suitable weather conditions and will involve:

- Conducting walked transects to survey for butterflies, birds, reptiles, etc.
- Checking bat boxes for signs of use.
- Checking areas of landscaping to ensure that planting has established successfully.
- Checking habitat and species diversity.