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DUST MANAGEMENT PLAN

Environmental and sustainability solutions provided to BRYN AGGREGATES LTD

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1.0 INTRODUCTION

This Dust Management Plan (DMP) had been produced in accordance with the Environment Agency's Dust and Particulate Emission Management Plan Guidance, 'Control and Monitor emissions for your environmental permit' (8th November 2018) and relates to the waste materials imported to, and permanently recovered on, this site. Approximately 705,900m^3 of inert general fill waste, and soil waste material will be recovered to restore areas of the quarry that are no longer in use in line at Gelliargwellt Farm with condition 18 of Bryn Aggregate's planning permission (reference 12/0570/FULL) for the operation of the quarry. The annual throughput limit is 55,600 tonnes per annum and the daily throughput limit is 200 tonnes per day.

The DMP identifies the potential sources of dust emissions, the possible impacts associated with dust emissions and details the measures required to prevent and minimise the dust and particulate emissions. This DMP will be reviewed, at least, annually as part of an annual compliance audit. However, this document may be reviewed early if either of the following occur:

- An environmental pollution event occurs; or
- An element of the waste transfer operation changes.

1.1 Dust Management Aims

The aim of the DMP is to:

- Minimise dust generation and migration from the site;
- Ensure dust pollution at local sensitive receptors is minimal;
- Establish a dust minimisation strategy which shall be implemented on site;
- Ensure the operations on site consider the potential dust generation;
- Ensure that site operates within the permitted dust emissions limits.

2.0 SITE SETTING

Bryn Aggregates Ltd
Gelliargwellt Farm,
Gelligaer Road,
Hengoed
CF82 8FY

The area in which the waste would be deposited for recovery is within land that makes up part of Gelliargwellt Uchaf Farm. The primary vehicle access is from Gelligaer Road, which is located to the northwest of the site. It also connects neighbouring towns including Gelligaer and Penpedairheol which are located approximately 500m and 1,500m respectively, to the northeast of the site. Penybryn is located approximately 600m to the east of the quarry, with the Penallta Industrial Estate located slightly further east. Caerphilly is located approximately 8km south of the site.

The site is bound to the south by agricultural land and Parc Penallta Country Park, which comprises an area of public open space and woodland. Nelson Bog Site of Special Scientific Interest (SSSI) is located 350m to the south of the site. Waun Rydd Site of Importance for Nature Conservation (SINC) is located immediately adjacent to the north of the site and Coed Gelliau'r – Gwellt SINC is located approximately 550m to the west of the site and comprises an ancient woodland.

The list of waste types used on site can be seen in *BRY-OP02 Waste Acceptance*. However, in brief, the waste material is inert general fill and soil waste.

2.1 Hours of Operation

Site operational hours for the facility will be as identified below:

Table 1 – Operational Hours

Day(s)	Hours
Monday to Friday	07:00 - 18:00
Saturday	07:00 – 13:00

Sunday and Bank Holidays	Closed

2.2 Sensitive Receptors

There are potential sensitive receptors within 500m of the site where waste will be deposited. The distances from the site to the sensitive receptors are provided in Table 1.

Table 2 - List of Sensitive Receptors

No.	Receptor	Type	Distance from site	Bearing from site
1	Allotments	Leisure	385	N
2	Claerwen	Residential	455	NNE
3	Gelliargwellt Rd	Residential	460	E
4	Claerwen	Residential	470	NNE
5	Brynheulog St	Residential	470	E
6	Aneurin Bevan	Residential	490	NNE

Figure 1 - Map of Sensitive Receptors within 650m of the centre of the Site.

2.3 Impacts

Dusts and powders are not permitted waste types on this site, however, dust may arise from the movement of soils and inert waste. Potential impacts of dust emissions include a contribution to air pollution and a decrease in air quality through aerial dispersion. See the Risk assessment below in Table 1, for more information on the risks and impacts.

Table 3 – Environmental Risk Assessment Matrix

Pollutant Model			Judgement				Action	
Source	**Pathway**	**Receptors**	**P**	**C**	**M**	**Justification of Magnitude**	**Risk Management**	**Residual Risk**
Airborne dust particulates and microorganisms during the movement, handling and deposition of waste.	Aerial dispersion.	Local residents located in Pen y Bryn (E, 460m) and Gelligaer (NE, 455m). The general public using nearby footpath to the immediate south and east of the site. Greenhill Primary school located 600m NE of the site. Tourist attractions such as Colliers Adventure Farm (S, 1km), Llancaiach Fawr Manor (W, 1.3km) and Parc Penalta.	Med	Med	Med	Med - Dusts and powders are not permitted waste types on this site, however, dust may arise from the movement of soils and inert waste. There is the potential for dust exposure for local residents and visitors near the site. The nearest sensitive receptors are approximately 500m away. Potential harm inflicted by airborne dust particulates and microorganisms include respiratory issues and allergic reactions in	• The site has a Dust Management Plan (*EPR_B03_Dust_Management_Plan*) which details the preventative measures in place for reducing dust and the actions to be taken when there is a dust issue. • The site will be kept clean and dust suppression will be used when required. • Material will be assessed prior to receipt. • Materials will be handled carefully by trained operatives. • Daily site inspections. • Speed limit for vehicles on site. • The Site Manager will carry out a daily visual assessment of dust emission within the site and a continuous dust monitor is used to monitor dust emissions.	Low

Pollutant Model			Judgement				Action	
Source	Pathway	Receptors	P	C	M	Justification of Magnitude	Risk Management	Residual Risk
						humans due to inhalation of dust and exposure to pathogenic microorganisms.		
Airborne dust particulates from the transport of waste materials.	Aerial Dispersion	Local residents located in Pen y Bryn (E, 460m) and Gelligaer (NE, 455m). The general public using nearby footpath to the immediate south and east of the site. Greenhill Primary school located 600m NE of the site. Tourist attractions such as Colliers Adventure Farm (S, 1km), Llancaiach Fawr Manor (W, 1.3km) and Parc Penalta.	Med	Low	Low	Low - Limited potential for frequent and long-term exposure for residents close to the site due to location of facility. Potential harm inflicted by airborne dust particulates and microorganisms include respiratory issues and allergic reactions in humans due to inhalation of dust and exposure to pathogenic microorganisms.	• The site has a Dust Management Plan (*EPR_B03_Dust_Management_Plan*) which details the preventative measures in place for reducing dust and the actions to be taken when there is a dust issue. • Dust generation attributable to vehicle movements will be controlled by the use of water sprinklers on the site access roads. • Vehicles carrying waste to site are sheeted until the point of deposition at the quarry site. • Waste carried between the MRF site and the quarry site is done so in dumper trucks which shall be dampened prior to transport if required. • During dry weather action will be taken to remove dust from the road. • The Site Manager will carry out a daily visual assessment of dust emission within the site and a continuous dust monitor is used to monitor dust emissions.	Low

Pollutant Model			Judgement				Action	
Source	**Pathway**	**Receptors**	**P**	**C**	**M**	**Justification of Magnitude**	**Risk Management**	**Residual Risk**
Waste, mud and litter on local roads caused by vehicle movements.	Spillage from waste carrying vehicles or mud from vehicle tyres.	Local drivers and roads.	Med	Med	Med	Med – potential to cause a hazard on the roads, risking the safety of drivers in the area.	• Daily site inspection and cleaning of access roads around the site as necessary. • Wheel wash used to clean wheels prior to departure from site. • Main road is swept if required.	Low

2.4 Wind Direction

The following section identifies the prevailing weather conditions on site, in particular, the wind direction in order to predict the path of likely aerial dispersion of dust generated on site.

Information on wind direction has been derived by Meteoblue from a weather station at Caerphilly, which is located approximately 10km southeast of Gelliargwellt Farm over the last 30 years This data is illustrated by the wind rose in Figure 2. Figure 2 demonstrates that the predominant wind direction in the region is from a south-westerly direction. The land to the southwest of the site, is used for agriculture. The nearest non-agricultural land use is the village of Gelligaer, approximately 400m to the north of the site. The nearest sensitive receptor to the north of site is the edge of the village of Gelligaer which is approximately 500m away. The next nearest sensitive receptor to the site is at the edge of the village of Penybryn approximately 500m to the east. Due to the location of the sensitive receptors and the prevailing wind direction, there is a small chance of these receptors being affected by dust from the recovery operation.

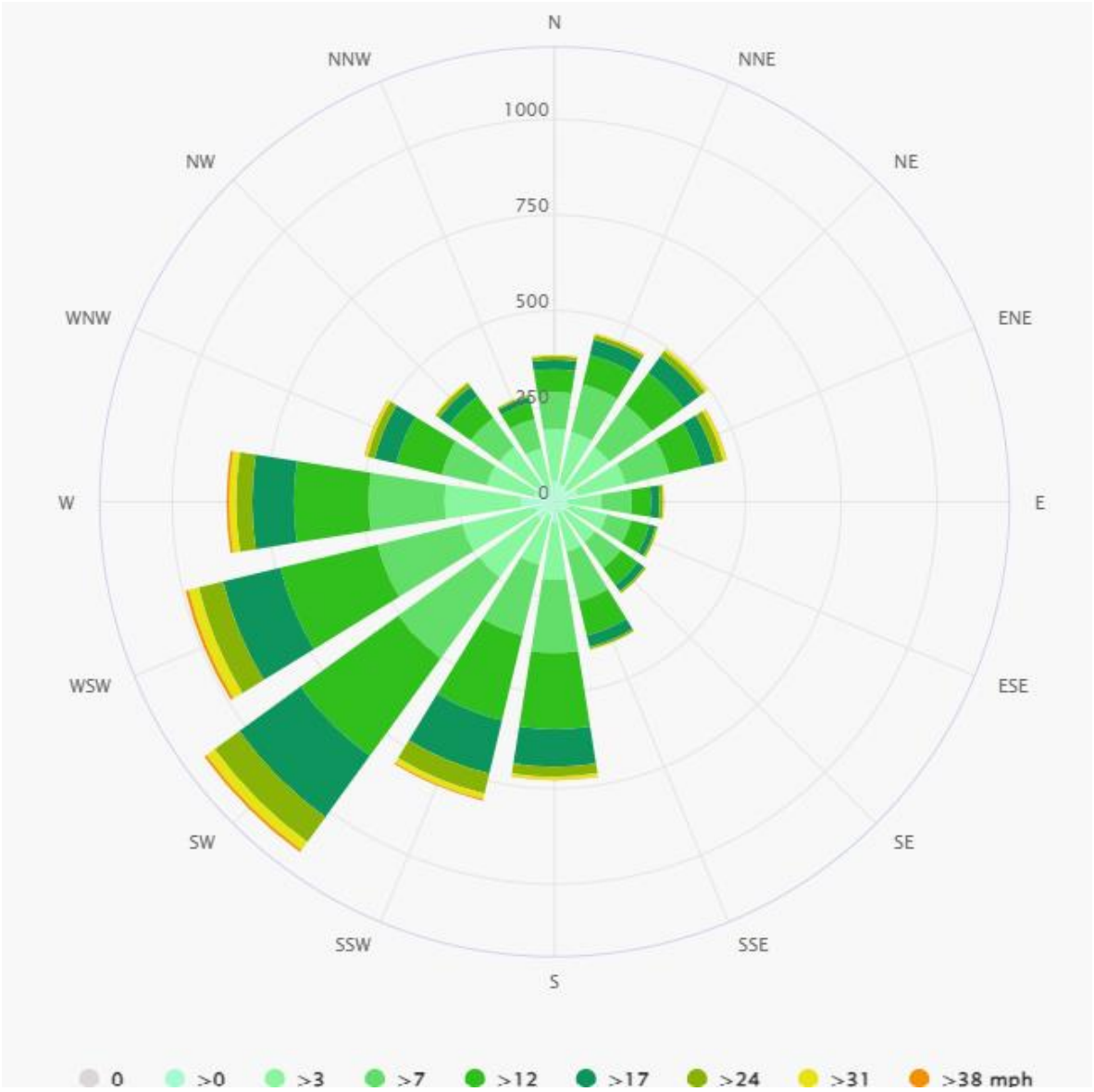

Figure 2 - Windrose showing the number of hours the wind has blown from each direction over the last 30 years at Caerphilly

3.0 DUST CONTROL MEASURES

The following section details the control measures that will be implemented onsite to prevent or minimise dust emissions arising from the potential dust sources onsite.

3.1 Dust Generating Activities on Site

Potential dust emissions from the site may be generated from activities associated with

- Vehicle movement in and out of site and around site
- Handling, moving and tipping of waste
- Wind blowing across waste piles

Dust production may increase during periods of strong winds and/or dry weather.

3.2 Local Contributors of Dust and Emissions

The site is situated within a largely agricultural setting, albeit with a number of activities associated with the wider Gelliargwellt Farm taking place immediately adjacent. This includes the MRF site, composting site, and AD site, which are all located to the east of the quarry. There is also the continuing quarrying activities in other areas of the quarry. These are potentially significant local contributors of dust in the region.

3.3 Methods of Prevention

In order to minimise the dust, potentially generated at the site, the following control measures shall be implemented by the Site Manager to mitigate the effects of potential dust emitting activities identified. General measures will also be taken.

3.4 Vehicle Movements In/Out of Site

- Site access roads and internal roads shall be maintained and checked daily to limit the dust generation related to vehicle movements onsite.
- Mud and debris will be monitored by the site manager and roads will be cleaned when necessary.
- During periods of dry weather or heavy traffic, the site manager will ensure the road to the weighbridge and site roads are dampened to prevent dust production using the sprinkler system on these roads.
- A site speed limit of 20mph will be enforced for vehicles to reduce the likelihood of dust or particulates being emitted into the atmosphere and dispersing further. The speed limit can be reduced during dry weather or strong wind.

- The site will operate a controlled traffic system to limit the amount to vehicle movements on site at any one time to reduce dust production.
- Vehicles carrying waste loads to site shall be sheeted until the waste is tipped in its final location. Waste being transferred from the MRF site to the quarry site via the weighbridge shall be done so in a dumper truck. This waste shall be dampened as required.

3.5 Handling of Wastes

- Waste is to be permanently recovered in one location. Following arrival on site, the waste will be recovered at its final location. No waste will be stored on site prior to recovery.
- The waste soil will be dampened as it is being tipped, if required, to minimise dust and particulates being emitted into the atmosphere and dispersing.
- The waste will be tipped from a lower drop height to minimise the aerosolization of dust and bioaerosols.

3.6 Wind Action

- As part of the landscaping works, waste recovered will be compacted. This will also act to consolidate the material and reduce the amount of dust that can be generated by wind.
- During warmer periods the waste will be dampened if required when conditions are dry to prevent dust and bioaerosol particles becoming suspended in the air and dispersing. This should also be undertaken at the end of the working day if conditions are expected to continue to be dry and windy to prevent dust emissions outside of operation hours.
- Where possible, waste will not be recovered when windspeeds are above 15mph and when the wind is blowing from a south-southeasterly direction. If this is not possible due to fixed deadlines, the waste will be dampened prior to recovery to prevent dust being blown towards sensitive receptors.

3.7 General Measures

- The Site Manager shall conduct daily visual assessments of dust emissions within the site. The continuous dust monitor will also alert the Site Manager to a dust issue. If potential or actual dust issues are identified the appropriate preventative or remedial actions will be implemented as soon as practicable. The most effective action in these scenarios will usually be dampening the affected area with water.

- If required, the additional mitigation measure of dampening the waste material and site surface will be implemented.
- The washing of vehicles and roadways onsite to mitigate dust generation from vehicles.
- Operatives are instructed to handle the waste carefully and consider dust production before moving waste.
- Clean water is used for dust suppression to avoid recirculating fine material.

3.8 Suspension of Activities

The Site Manager shall decide when site activities will have to be suspended due to excessive dust generation. As per 3.7 the Site Manager will visually assess the dust emissions each day and the continuous dust monitor sends an alarm to Bryn Aggregates when the wind is blowing from between 180° – 270° and the concentrations of dust are greater than 200ug/m^3 for 24 hours or when the concentrations of PM10 or PM2.5 are greater than 40ug/m^3 over a 5-minute period. In this instance, all site activities will be suspended and an investigation will take place into the source of the high dust levels. Mitigation measures shall be imposed, such as dampening, and the activities shall recommence.

3.9 Dampening

Dampening of waste material will be carried out in the following situations:

- During periods of dry weather, such as during summer;
- During unloading, when the soil being imported has been identified as dusty;
- When dust emissions are observed by the Site Manager during the visual assessment and the high dust alarm from the continuous dust monitor has been received;
- When dust emissions have been observed outside of the site boundary during the daily visual inspection;
- In response to any complaints received about dust from the site;
- When wind speeds are greater than 15mph; and,
- When significant dust is observed on the site during routine site inspections.

There are a number of ways in which dampening on site can occur. The road down to the weighbridge from the B4254 and the tracks on site are all served by a sprinkler system which can be operated at any time in response to the above situations. Waste material being deposited or shaped on the quarry site can be dampened using a mobile bowser if required. The water source for both of these dampening mechanisms is the same; extraction from the quarry under licence. This water is stored in a submerged tank with two pumps. The sprinklers

and bowser are inspected daily when in use and any repairs required carried out immediately. Over the winter period when it is wetter, the sprinklers are removed and serviced. The two water pumps are also serviced at the required intervals.

4.0 MONITORING AND REPORTING

4.1 Dust Monitoring

Dust monitoring will be carried out at four locations on the site boundary twice daily, once at mid-morning and once at mid-afternoon, as part of a routine visual inspection of the site, the location of which can be seen as red crosses in Figure 3 below. Observations will be recorded and kept onsite. The dust monitoring form can be seen in Section 5 below.

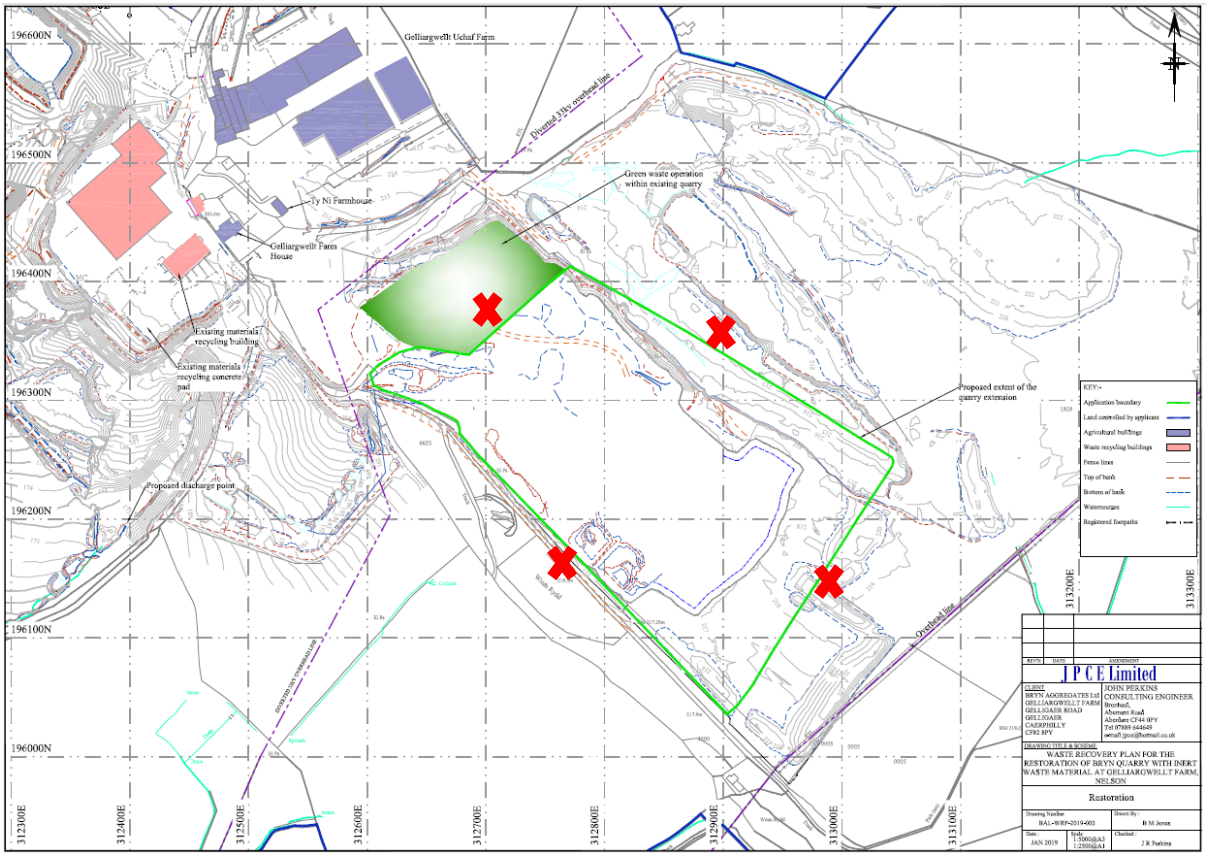

Figure 3 – Daily dust monitoring locations

Site operatives will report any significant dust or particulate emissions that occur during the handling or movement of waste to the Site Manager immediately and it will be recorded in the site diary. Significant emissions are considered to be those where dust could potentially leave the site boundary. Where dust emissions are high during the handling or movement of waste, operations will cease, and the site boundary will be inspected to ensure that dust isn't being emitted from the site. If dust emissions are observed outside of the downwind site boundary, then material shall be dampened before works can recommence.

Dust monitoring shall be carried out during operational hours, when waste is being imported to site and used in landscaping works, when the potential for dust generation is greatest.

The site operative will record the dust monitoring results when dust emissions occur including the dates, times and observations. These records shall be retained onsite. Wind direction and weather conditions are recorded and stored by the on-site weather station. As per the monitoring form, should dust be seen to be in the air at the monitoring location, details such as the apparent source of the dust is noted. Should it be considered that the site activities are

the source of the dust at the site boundary, the actions presented in Section 4.2 below shall be taken. There is no requirement to increase the frequency of the monitoring due to the presence of the continuous dust monitor. Where regular complaints are received over a two-week period the dust mitigation measures will be reviewed.

Additionally, as part of quarrying activities, Bryn Aggregates have agreed with Caerphilly County Borough Council (CCBC) to assess total dust, PM10/PM2.5/PM1 concentrations using a Turnkey Osiris real-time dust monitor. CCBC have their own login for the monitor and the live data is also publicly available via the Bryn Group website. The monitor is located in a field to the east-northeast of the quarry, immediately west of the houses on Brynheulog Street (see yellow cross in Figure 4 below).

Figure 4 - Location of Turnkey Osiris real-time dust monitor

The data is recorded every minute and the monitor sends an alarm when the limits are breached. An alarm goes off when the average concentration for PM10 or PM2.5 is above 40ug/m^3 for 5 minutes whilst the wind direction is between 180° to 270°. An alarm also goes off when the average concentration is above 200ug/m^3 over a 24-hour period whilst the wind direction is between 180° to 270°.

The data is summarised into a report on weekly basis and sent to the Operator who stores this on site. Copies of the report are available to CCBC on request. If dust complaints are received, the data from the corresponding period will be investigated.

The monitors are compliant with the Environment Agency MCERTS certification scheme and includes an anemometer to collect wind speed and direction data. The monitor's location was determined by Airshed, based on the highest risk sensitive receptor.

In case of high levels of complaints at a time when the continuous monitor has not raised any alarms, directional dust is monitored using DustScan (sticky pad) directional dust samplers. Being cylindrical, the samplers collect dust from 360° around the sampling head and, as set out below, the data are reported in discrete 15° intervals (i.e. 0 – 15°, 15 – 30° and so on).

Dust settlement is also monitored using DustScan DustDisc samplers. This sticky pad deposited dust monitor collects dust falling out of the air and depositing onto a horizontal surface. The samplers are installed in accordance with best practice guidance (including M17) and the supplier's instructions and are located away from nearby obstructions to ensure a clear air flow to the monitoring head.

4.2 Response to Dust Events

Where the level of dust is considered high i.e. when the continuous monitor alarm is raised or when dust is detected at the site boundary monitoring locations and the deposit for recovery activities are considered to be the source, the Site Manager will conduct an investigation to identify the cause of the dust emissions.

If the dust emissions are attributed to an activity on the site and mitigation measures have failed, the activities that are the source of the emissions will cease until remedial measures have been implemented. Visual monitoring will be increased as necessary along the site boundary until the dust problem is resolved.

Where dust emissions are continually identified as excessive on site and the continuous monitors alarm is raised or when complaints are repeatedly received, the Site Manager will review the mitigation measures and monitoring strategy detailed in this Dust Management Plan to prevent emissions from being released from the site.

4.3 Community Liaison

Should there be any issues relating to dust emanating from the quarry site during the deposit for recovery activities, Bryn Aggregates shall message the new community notification WhatsApp group and leave a message on the local community Facebook page. These messages shall detail the specific issue and the action being taken by Bryn Aggregates.

4.4 Training

Bryn Aggregates shall provide the necessary training on dust management to ensure that staff to carry out their roles in line with the DMP and minimise complaints in the form of a toolbox talk on the details of the DMP. Training should be reviewed annually, at a minimum, and more frequently if a need for training becomes apparent. Any new staff joining Bryn Aggregates will be required to undertake training as part of an induction. Records of training shall be stored in the site office.

4.5 Recording

The dust monitoring results from the daily inspection including the dates, times, wind direction, weather conditions and observations will be recorded and retained on the site. See Section 5.0 for the recording form. The completed recording forms shall be stored in the site office.

4.6 Complaints

All complaints received concerning dust emissions from the site will be dealt with in accordance with the company's environmental management system complaints procedure.

Bryn Aggregates will decide and implement any necessary action in response to any complaints or concerns expressed by interested parties, including operatives, customers, clients and regulatory authorities.

The operator shall record the:

- Name and contact details of the person who expressed concern or made a complaint;
- Specific subject(s) of the concern or complaint;
- The source / location of where the complaint comes from;
- Date and time communicated to the producer and name of the person to whom it was communicated;
- Nature and date(s) of any actions and checks and who carried them out;

- Nature and date of any response to the person who expressed a concern or made the complaint; and,
- Name of the person who communicated the response.

The complaint form can be seen in Section 6.0 below.

Upon receipt of a complaint regarding dust, Bryn Aggregates will open an investigation. The investigation will look into the site operations at the time of the complaint, weather conditions at the time of the complaint and any other points of note such as off-site activities being undertaken at the time of the complaint.

Following the investigation, corrective actions will be taken to reduce / eliminate the release of dust following the mitigation measures set out in Section 3 as necessary. Where mitigation measures are unsuccessful, the site activities will be stopped on the instruction of the Site Manager until the wind direction changes or the cause of the dust release is identified and corrected.

Each complaint will be treated in the same manner, on a case-by -case basis. Bryn Aggregates will complete the complaint form within 48 hours of receipt of the complaint. The completed complaint form shall be stored in the site office.

Natural Resources Wales (NRW) shall be informed of any emissions, not controlled by an emissions limit, which have caused, is currently causing or may cause significant pollution. Complaints received by NRW relating to dust emissions from the site will be dealt with as soon as practicable upon notification.

4.7 Responsibility

The Site Manager is responsible for this Dust Management Plan and the procedures within it. Should the Site Manager be away from the site, responsibility will rest with the designated deputy.

5.0 DUST MONITORING FORM

Dust Monitoring Report Form				**Date:**
Time of test				
Location of test				
Weather conditions (dry, rain, fog etc)				
Temperature (very warm, warm, mild, cold or degrees if known				

Wind strength (none, light, steady. strong, gusting). Use Beaufort scale if known				
Wind direction (e.g. from NE)				
Is dust present in the air?				
Duration (of test)				
Constant or intermittent in this period				
What does it look like?				
Receptor sensitivity (see below)				
Is the source evident?				
Any actions required?				
Any other comments or observations?				

6.0 COMPLAINTS FORM

Date:		**Ref No.**	
Name, address and phone number of complainant.			
Time and date of complaint.			
Date, time and duration of offending dust release.			
Weather conditions (e.g., dry, rain, fog, snow).			

Wind strength and direction (e.g. light, steady, strong, gusting).	
Complainant's description of dust: -Duration -Constant or intermittent	
Has complainant any other comments about the offending dust release?	
Any other previous known complaints relating to installation (all aspects, not just dust).	
Any other relevant information.	
Potential dust sources that could give rise to the complaint.	
Operating conditions at the time offending dust release occurred.	
Action taken	
Final outcome	
Form completed by (signed):	