

## DUST MITIGATION PLAN

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### INTRODUCTION

1. Quarry HG10 is a large quarry by local standards. It is approximately 750 m long, and its width varies between 90 m and 170 m. The quarry is cut in the Lower Coralline Limestone Formation that outcrops along the north-eastern shore of Gozo.

### SITE ACTIVITIES

2. Quarrying activities at a hardstone quarry entail the extraction of the mineral through the use of controlled explosions in a blasting operation or by mechanical means, which will produce large boulders of the mineral. This is either stockpiled for future processing or transferred by lorries to a rock crusher situated within the quarry itself (**Figure 1**). The crushing activity breaks up the boulders into smaller rocks, depending on the size of mineral required. The crushed rock is passed through a mechanical sieve to separate out the various fractions, which are then stockpiled separately within the quarry void (**Figure 2**).

**Figure 1: Crushing Plant processing mineral resources**



3. The mineral so crushed is then sold to third parties or used by the company for various applications, depending on the size and hardness, such as for concrete production, for the production of bricks, tarmac or asphalt, or as spalls in road base layers or foundations. Occasionally, for specialised applications, the limestone can also be cut by means of saws or diamond wire to produce blocks of limestone, which, when polished, can resemble marble.

**Figure 2: Stockpiles**



4. A typical limestone quarrying operation would have approximately 17 different fractions and hence stockpiles (**Table I**).

**Table I: Stockpiles always in store at Quarry HG10**

Stockpile No.	Use	Size of mineral	Type of mineral
1	Stockpiles for quality A material for concrete	19 mm	Aggregate
2		12 mm	Aggregate
3		8 mm	Aggregate
4		1 – 5 mm	Sand
5	Stockpiles for quality AA material for better grade concrete	19 mm	Aggregate
6		12 mm	Aggregate
7		8 mm	Aggregate
8		1 – 5 mm	Sand
9	Stockpiles for production of bricks	7 mm	Aggregate
10		1 – 4 mm	Sand
11	Stockpile of fine sand for plastering	1 – 2 mm	Fine Sand
12	Stockpiles for Type IA road base aggregate and sand material	19 / 12 mm	Aggregate
13		1 – 4 mm	Sand
14	Stockpiles for Lean Mix concrete	75 mm	Aggregate
15		19 / 12 mm	Aggregate
16		1 – 4 mm	Sand
17	Stockpiles for concrete walkway kerbs	1 – 4 mm	Sand

5. Most of the activities taking place at the quarry can generate dust. These include:
  - Rock blasting;
  - Rock crushing;
  - Hauling of material to stockpiles and crushing plant;
  - HGV movements to and from quarry (including by third parties);
  - Deposit of inert material to infill quarry voids;
  - Dust entrainment from stockpiles.
6. The quarry operator is cognisant of these impacts and takes measures to mitigate them. The following sets out the measures that are employed on site or are being planned for implementation.

## **DUST MITIGATION MEASURES**

7. The location of the quarry on the coastal area and away from sensitive receptors in itself helps to minimise the nuisance factors, though fugitive dust from the quarry operations can affect the surrounding land and landscape and may impact visitors to the area.
8. A number of dust mitigation measures are already being implemented at the quarry. Others are being explored to improve the conditions on and around the site. These are described hereunder.

### **Rock extraction**

9. Extraction of the mineral is undertaken through blasting activity. This is typically carried out in the morning when the ground is wet with early morning dew (or even after rains), which helps to dampen the dust. Blasting involves the drilling of vertical holes along benches and the detonation of charges placed inside the hole. The fracturing of the rock and its collapse creates some dust, which mostly remains inside the quarry confines.

### **Rock crushing**

10. The extracted rock is loaded onto HGVs and transported internally from the rock face to the crusher. Rock crushing generates some dust but goes down into the aggregate hoppers as the mineral is broken down into smaller pieces. Most of the dust falls downwards and is collected in the hopper, from where it is cleaned once or twice a year and deposited in the infill areas within the quarry void itself. The finer fractions, however, can, create dust plumes, especially in summer. Currently these are not being mitigated, but the quarry operator intends to cover the conveyor belts of the crusher to eliminate one of the main sources of dust from the crushing operation. It should be possible to achieve this within 6 months of the issue of the permit. The possibility of installing a dust cover over the crusher is also being explored. Finally, as a secondary option, the quarry operator is looking into the feasibility of installing a mist cannon within the quarry that could be used to mist spray the crusher during operation.

11. The operator is also planning to install a mobile crusher that would be used as back up to the main crusher when the latter needs to undergo maintenance / servicing, as well as to carry out crushing directly at the rock face. This would eliminate some of the internal truck movements (which also generate some dust – see below) and could further help in mitigating dust since the crusher can be located in more sheltered positions. In addition, the new mobile crusher is also equipped with its own sprinklers, which are activated during crushing.

### **Handling of materials**

12. Mineral handling takes place continually on site. With mineral collected from one area, loaded onto HGVs and transported to a different area or to other sites, as described. Handling of mineral materials also generates dust and especially the loading process. In order to minimise fugitive dust emissions, loader drivers are instructed to keep drop heights as low as possible.

### **HGV movements**

13. HGV movements take place several times daily. These can be truck movements to and from the quarry, either HGVs owned by the quarry operator and that convey minerals to other sites, as well as third party HGVs that either visit the quarry to purchase mineral or to deliver inert materials for infilling purposes. Other movements take place within the quarry itself and may involve:
  - front-end loaders loading lorries;
  - lorries hauling excavated mineral from the rock face to the crusher;
  - lorries hauling crushed mineral from the crusher to the stockpiling areas;
  - lorries depositing inert material in infill areas; and
  - front end loaders shifting dust into infill areas.
14. Most of the internal haul roads are not surfaced since they also tend to be altered with time as mineral extraction progresses. HGV movement over unsurfaced haul roads tends to whip up dust. Haul roads are wetted regularly, especially during the drier months, to dampen the dust. This is done by means of third party bowsers equipped with sprinklers. Excess dust is also collected regularly and deposited in the quarry voids. However, lorry movements will always kick up some dust. To counteract this, the quarry adopts a low-speed rule (10 km/hr) on site. Haul roads are wetted daily in summer and as needed in winter (depends on the weather).