



Waste Rock Dumps

Environmental Notes on Mining, updated September 2009

Waste rock dumps are usually the most visual landforms left after open pit mining. Together with tailings storage facilities, they are also the most prone to erosion. For these reasons, it is essential that careful planning before and during construction produces cost efficient and effective rehabilitation to a safe, stable, non polluting landform, with an agreed post mining land use. If the dump is to be revegetated, use local native species.

SITE SELECTION

When selecting the location of any waste rock dump please:

- Take into account tenement boundaries and any natural features of the landform;
- Don't interrupt significant drainage lines;
- Blend the dumps into natural hill sides if possible;
- Choose a location that will not be in the way of any possible future pit cut back or any other development;
- Make sure the toe of any waste dump is not closer to the pit than the abandonment bund for that pit;
- Design the pit abandonment bund according to the Department of Mines and Petroleum's guidelines;
- Backfill earlier mined out pits if you can.

WASTE ROCK CHARACTERISATION

Before construction of the waste dump commences, it is essential to know the types of material that will be placed in the dump, so that their location within the dump can be planned. Materials that have: Acid Rock Drainage (ARD) potential; high salinity; any other potentially polluting leachate or; are highly dispersive, should be appropriately encapsulated in the dump.

The material that will be used for the outer surfaces, when covered with topsoil, should be suitable for revegetation.

DUMP DESIGN

Design the profile of the dump (e.g. height and slope angles) to ensure that the final structure is safe, stable and not prone to significant erosion. Factors that should be considered in the design are material types, proposed vegetation cover, natural topography and climate.

Generally, more dispersive material, poorer topsoil and high dumps will require flatter outer slopes. Only the best conditions and stable materials would justify slopes approaching 20 degrees.

DRAINAGE

A major cause of serious erosion on newly created landforms is the lack of adequate drainage control. It is therefore essential to design and construct drainage control measures that will handle expected rainfall events. In arid regions, it is preferable to design the dump profile to be water retaining. This means that the top surface, berms and batters need to be constructed so that they hold the maximum expected rainfall event. The construction of suitably engineered impoundments on the flat surfaces and deep ripping at suitable intervals on the sloping surfaces will generally achieve the necessary control. Minimising slope lengths will help reduce water velocity and therefore reduce erosion potential.



REVEGETATION

Previously cleared topsoil should be spread over all surfaces at a thickness of about 5 to 20 cm (depending on the nature of the under-lying waste rock). The surfaces should then be deep ripped (minimum 1 metre) on contour at appropriate spacings. It is essential that rip lines on outer slopes be survey controlled to ensure that they are horizontal for their entire length.

Direct seeding at the optimal time for your region, will maximise the benefit of annual rainfall events. Select the seed mix that consists of local native species and which will give maximum diversity. Post mining land use will have a bearing on the seed mix chosen.

This Environmental Note was approved for release in January 2001.

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