

VSS 9 PIT, STOCKPILE & WASTE DUMP STABILITY – SAFETY PERFORMANCE STANDARD

1. Scope

This standard is applicable to all business units and managed operations, including new acquisitions; during exploration, through all development phases and construction, operation to closure and - where applicable - for post closure management.

- 1.1. This standard covers the geotechnical hazards associated with temporary or permanent slopes excavated for the purposes of mining an ore reserve. It also covers waste dumps, stockpiles, spoil, and land bridges (collectively called “dumps”).
- 1.2. Businesses shall comply with Codes of Practice, guidelines and procedures outlined in relevant Environmental Management Plans and Biodiversity Action Plans as well as conditions stipulated in regulatory licenses to operate issued by national/local authorities.

2. People

- 2.1. Every person working on dump area such as dozer/truck operator or spotter shall be equipped with suitable means of communication e.g. 2-way radio;
- 2.2. Only experienced spotters shall be deployed on dumps;
- 2.3. Spotters, operators, engineers and surveyors shall be trained on the risks of tension cracks and ground movement and shall be empowered to stop activities;
- 2.4. A communication system must be developed including emergency response and training must be imparted to people working on dumps.

3. Process

- 3.1. A manager must be appointed with responsibility for the implementation of this standard;
- 3.2. The nominated manager must arrange for the development of a Slope Management Plan (SMP) & Dump Management Plan (DMP). These plans must:
 - 3.2.1. Be developed using suitably qualified and experienced engineers and specialists;
 - 3.2.2. Be based on adequate geologic, geotechnical and hydrogeological data;
 - 3.2.3. Include operating and slope monitoring procedures;
 - 3.2.4. Document that slopes and dumps are designed and constructed to specified minimum stability criteria using industry-accepted design techniques;
 - 3.2.5. Define accountabilities;
 - 3.2.6. Undergo an independent review every two years, or more frequently as determined by a risk assessment;
- 3.3. Dumps shall be constructed and maintained per the approved design;
- 3.4. Dump stability shall be confirmed by a competent agency;
- 3.5. Dumps created from the ground up should be made in lifts where the dump height exceeds 20m;
- 3.6. Trucks shall unload material at least 20m from the crest or at a distance determined by a geotechnical risk assessment as safe and then spread by dozer;
- 3.7. Dumps shall have proper drainage system including toe- drains and “garland” drains to keep water away;
- 3.8. Dumps shall be designed to not accumulate water and a slope of 1 in 100 should be maintained for drainage;

- 3.9. Dump sites are to be selected and designed such that material is not cast into a water-logged area;
- 3.10. In case of heavy rain, active dumping shall cease, and a geotechnical engineer shall verify when work can resume;
- 3.11. Ravines and gullies formed by heavy rain shall be patched with suitable material approved by a geotechnical engineer;
- 3.12. Clay material shall not be allowed;
- 3.13. Dumps shall be regularly monitored for settlement and movement by suitable survey systems. The monitoring process and frequency shall be determined by a geotechnical engineer based on the nature of rock, dump height, rainfall etc.;
- 3.14. Dumps witnessing tensile cracks (other than settlement cracks) shall be inspected by a geotechnical engineer at the beginning of each shift to give clearance that work can continue;
- 3.15. Dumps made by filling existing pits where the height exceeds 50m shall be monitored through a real time monitoring system like slope stability radar;
- 3.16. Dumps should be created away from any crest a distance of 0.5 to 0.75 times the dump height;
- 3.17. Dumps shall be audited and surveyed through an external independent agency at defined frequencies.

4. Review

- 4.1. Operations must complete routine monitoring on a periodic basis, the intervals for which must be determined by risk assessment;
- 4.2. Procedures and accountabilities must be in place to verify the conformance of the pit slopes, stockpiles, spoils and waste dumps to design and current conditions.
- 4.3. Management of change must be employed if changes are made to the excavation or dump geometries that depart from the design;
- 4.4. Accurate surveys of the dump location(s) must be checked against the property and permit boundaries and recorded.



Phil Turner
Group Head HSE & Sustainability