Cameby Downs Geotechnical TARP

Alarm Level	Normal	Level 1 Minor Hazard	Level 2 Major Hazard	Level 3 Failure Within Controls	Level 4 Failure Exceeding Controls
Description	No specific geotechnical hazard of significance observed.	Some indication of potential for failure; triggers described as minor or moderate.	Failure could occur; triggers described as significant.	A failure (Larger than isolated rockfalls) that was contained/controlled.	A failure that has breached controls and had the potential to cause serious injury or equipment damage.
HIGHWALL and ENDWALL Triggers (Geotechnical hazard indicators)	▪ Walls excavated to design ▪ Nil to minor cracking or loose material on wall ▪ Nil to minor rocks falling from wall ▪ Wall is dry/free draining ▪ No obvious signs of geotechnical instability	▪ Slopes >45° in weak material (Tertiary, Weathered Permian) blasted batters and soft walls not excavated to design (e.g. undercut, oversteepened) ▪ Moderate cracks, loose material on wall ▪ Minor cracking/heaving on bench ▪ Increased frequency/volume of localised rock falling within standoff ▪ Minor potentially unstable structures identified (e.g. heavily jointed rock, faults) ▪ Wet conditions (obvious surface run-off or where production has partially ceased due to wet weather), water build up within 20m of a crest, abnormal water flow in/out of slope ▪ Moderate material (cling-on) in front of (pre-split) wall ▪ Minor blast damage ▪Shallow sinkholes on excavator/dozer bench	▪ Significant deviation from slope design ▪ Slopes showing signs of movement (including noise and dust) ▪ Significant material (cling-on) left on wall (in front of pre-split) ▪ Significant loose material, cracking on the wall/crest or lipping, significant floor heave ▪ Significant potentially unstable structures identified (heavily jointed rock, faults) forming a wedge or toppling structure ▪ Excessive rockfalls from highwall falling within standoff ▪ Monitoring showing an unacceptable rate of movement (imminent failure) ▪ Excessive abnormal water flows, water ponding, obvious sinkholes or depressions, or water flowing into/through drillholes or structures ▪ Significant water or mud buildup above working areas (potential inrush hazard) ▪ Significant blast damage ▪ Seismic event (earthquake) felt locally	▪ Failure of a pit wall that was contained within standoffs or controls	▪ Failure of any pit wall that has affected an area outside the standoff/safe working distance (i.e. failure breached controls in place), and had the potential to cause serious injury or equipment damage.

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LOWWALL Triggers (Geotechnical hazard indicators)	▪ Walls excavated to design ▪ Nil to minor cracking on wall ▪ Nil to minor settlement or cracking on bench ▪ Nil to minor rocks falling from lowwall ▪ Ground is dry or free draining ▪ No obvious signs of geotechnical instability	▪ Slope excavated steeper than design ▪ Weak material (Tertiary or highly weathered rock) in excavator bench showing signs of minor instability ▪ Moderate settlement or cracking ▪ Minor skin failure on slope face or slumping (scarp development) ▪ Large unstable rocks on slope face, small rocks rolling down the face ▪ Minor cracking/heaving on floor ▪ Moderate run off or localised flooding, abnormal water flow in or out of slope, ▪ Actively spoiling or dumping weak material into water/mud, or in a single layer (not adequately mixed)	▪ Significant deviation from slope design ▪ Significant movement, cracking, heaving, bulging, lipping, toe creep, ravelling or scarp development ▪ Significant settlement of lowwall ▪ Monitoring showing an unacceptable rate of movement (imminent failure) ▪ Significant floor heave ▪ Excessive abnormal water in/outflows suggesting draining of significant source ▪ Large or deep sinkholes, or excessive mud, on lowwall ▪ Mud dams above working areas showing signs of breaching/instability (potential inrush hazard) ▪ Seismic event (earthquake) felt locally	▪ Failure of lowwall that was contained within standoffs or controls	▪ Large scale deep seated lowwall failure that has affected an area outside the standoff/safe working distance (i.e. failure breached controls in place), and had the potential to cause serious injury or equipment damage
TRUCK DUMP Triggers (Geotechnical hazard indicators)	▪ Dump constructed to design ▪ Nil to minimal cracking on dump face or floor ▪ Nil to minor rocks falling from dump face ▪ Ground is dry or free draining ▪ No obvious signs of geotechnical instability	▪ Dumping of sticky, wet or fine material causing face to stand-up ▪ Minor dump settlement or cracking ▪ Minor skin failure on dump face, Minor to moderate rocks rolling down the face ▪ Moderate run off or localised flooding, abnormal water flow into or out of slope, shallow sinkholes on dump surface ▪ Dumping into water or mud ▪ Poor dump geometry (e.g. not square) or not dumping to design (e.g. over height, exceeds design extents, incorrect material type or rejects co-disposal) ▪ Dump toe undercut	▪ Unplanned dumping of excessively wet material that runs out at the tip head base ▪ Significant settlement of dump ▪ Significant cracking, heaving, bulging, lipping, toe creep, slumping, ravelling or scarp development ▪ Monitoring showing an unacceptable rate of movement (imminent failure) ▪ Excessive abnormal in/outflows suggesting draining of significant source of water, large/deep sinkholes on surface ▪ Significant water or mud buildup above working areas (potential inrush hazard) ▪ More than one Level 1 operational trigger occurring at the same time (e.g. dumping onto a bull nose into water)	▪ Dump failure that was contained within standoffs or controls	▪ Large scale dump failure that has affected an area outside the standoff/safe working distance (i.e. failure breached controls in place), and had the potential to cause serious injury or equipment damage

Note: Definitions of minor, moderate, and significant must remain subjective and at the discretion of authorised persons such as OCEs and Geotechnical Engineers who have the necessary experience and training to identify hazards in the context of local and general ground conditions. This is because risks arising from hazards remain high even when controlled because of the high consequences of an impacting event. Every slope will have a combination of geological and operational conditions including unknowns that must be considered under the circumstances that apply at the time.

Cameby Downs Geotechnical TARP – Actions and Responsibilities

Note: Cameby Downs normally operates under an OCE/Supervisor arrangement. If the shift is being undertaken with both an OCE and Supervisor in Production, then each role shall follow their respective Actions and Responsibilities as tabled below.

Alarm Level	Normal	Level 1 Minor Hazard	Level 2 Major Hazard	Level 3 Failure Within Controls	Level 4 Failure Exceeding Controls
Coal Mine Worker (CMW)	▪ Monitor work area for geotechnical hazards	▪ As per Normal and ▪ Notify OCE and Supervisor and other CMWs in the affected area ▪ Stop any work inside standoffs in wet weather unless a specific risk assessment has been completed and signed off by Supervisor and/or OCE (for access inside crest standoff's only)	▪ As per Level 1 and ▪ Immediately advise all CMWs to leave the affected area and secure access ▪ After a seismic event (earthquake) felt locally, cease work within standoffs until area is inspected by Supervisor and/or OCE		▪ As per Level 2/3 and ▪ Initiate site emergency if required
Supervisor	▪ Ensure *Working Near Crests and Slopes* is followed ▪ Ensure adequate survey control is in place ▪ Conduct regular work area inspections and compliance to plan checks ▪ Ensure excavation compliance to design	▪ As per Normal and ▪ Notify OCE ▪ Assess need to barricade, consult OCE ▪ Ensure hazard is communicated to all personnel working in/near affected area ▪ Hand over details of hazard to oncoming Supervisor for inclusion in pre-start meeting ▪ Ensure inspection frequency is at least once per shift in active mining areas ▪ Assess applicability of monitoring devices (e.g. tell-tales), install as required in consultation with OCE ▪ Ensure any monitoring devices if installed, are read at least once per shift in active mining areas, report readings to OCE ▪ Ensure work is discontinued inside standoffs during wet weather unless operating under a specific risk assessment or SWI (for access inside crest standoff's only)	▪ As per Level 1 and ▪ Notify Mining Superintendent ▪ Notify the OCE ▪ Verify all CMWs have left affected area ▪ Assess barricading requirements, in consultation with OCE ▪ Ensure inspection frequency is increased to minimum twice per shift in active mining areas ▪ Assess applicability of additional monitoring devices (e.g. tell-tales) and install as required in consultation with OCE and Geotechnical Engineer ▪ Ensure any monitoring devices if installed, are read once per shift in active mining areas as a minimum (or as required by Geotechnical Engineer) ▪ Report readings to OCE and escalate to Geotechnical Engineer if rate of movement increases as indicated by tell-tales. ▪ Inspect mining areas after seismic event (earthquake) felt locally		▪ As per Level 2/3 and ▪ Initiate site emergency if required

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Alarm Level	Normal	Level 1 Minor Hazard	Level 2 Major Hazard	Level 3 Failure Within Controls	Level 4 Failure Exceeding Controls
Open Cut Examiner	▪ Conduct statutory inspections ▪ Ensure *Working Near Crests and Slopes* is followed	▪ As per Normal and ▪ Change access to reflect TARP Level ▪ Assess area for barricading and consult Supervisor ▪ Assess applicability of monitoring devices (e.g. tell-tales), install as required in consultation with Supervisor ▪ Ensure inspection frequency is at least twice per shift in active mining areas ▪ Ensure any monitoring device is read at least once per shift in active mining areas ▪ Record reading on OCE report and assess rate of movement, if increasing escalate to Level 2 ▪ Include TARP condition on OCE report and notify oncoming OCE ▪ Participate in and sign-off risk assessments ▪ Verify TARP Level during inspections ▪ Verify work has ceased inside standoffs during wet weather unless operating under a specific risk assessment (for access inside crest standoff's only) ▪ Consult with Supervisor to determine when conditions have sufficiently stabilised to change access back to Normal ▪ Enter comment in shift report to justify TARP Level change or to resolve hazard	▪ As per Level 1 and ▪ Notify Geotechnical Engineer for assessment ▪ Inspect adjacent areas for signs of failure/instability progression ▪ Ensure area is adequately barricaded, consult Supervisor ▪ Accompany Supervisor on inspections where required ▪ Ensure inspection frequency is increased to minimum twice per shift in active mining areas ▪ Verify correct TARP Level and barricading is in place during inspections ▪ Assess applicability of monitoring devices (e.g. tell-tales), install as required in consultation with Supervisor and Geotechnical Engineer ▪ Ensure any monitoring device is read minimum once per shift in active mining areas (or as required by Geotechnical Engineer) ▪ Escalate to Geotechnical Engineer if rate of movement increases ▪ Participate in and sign-off risk assessments ▪ Inspect mining areas after seismic event (earthquake) felt locally ▪ Consult with Supervisor and Geotechnical Engineer to determine when conditions have sufficiently stabilised to reduce TARP Level		
Superintendents	▪ Verify personnel are trained and competent in ground control awareness ▪ Verify excavation compliance to design (Production Superintendent) ▪ Ensure appropriate survey control is provided to confirm compliance (Production Superintendent)	▪ As per Normal	▪ As per Level 1 and ▪ Review risk assessments ensuring geotechnical requirements are included and appropriate controls in place ▪ Confirmation of in field inspections of the work area ▪ Communicate operational issues to Operations Manager/SSE and affected Superintendents ▪ Support investigation if required		▪ As per Level 2/3 and ▪ Notify Operations Manager and other affected Superintendents of failure and restrict/close pit access to affected area ▪ Ensure all relevant parties and Geotechnical Engineer are involved in recovery plan ▪ Notify SSE

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Technical Services Manager (site Risk Owner for Fall of Ground material risk)	▪ Verify design process is followed	▪ As per Normal	▪ As per Level 1 and ▪ Ensure changed conditions and agreed upon geotechnical requirements are allowed for in the short term plan ▪Enter the hazard into Intelex	▪ As per Level 2 and ▪ Ensure event is entered in Intelex	▪ As per Level 3 and ▪ Review risk assessments ▪ Ensure investigation is initiated and conducted
Geotechnical Engineer/ Geotechnical Services (Note: Where reference is made to the geotechnical engineer within this TARP this can be interchanged with the geotechnical representative (Site Geologist) who shall liaise with the Geotechnical Engineer to undertake the specified actions).	▪ Provide design criteria to meet short and long term plans ▪ Provide advice for design and execution as required	▪ As per Normal and ▪ Collate and distribute weekly geotech report ▪ Notify OCE of any hazards identified or reported that are not on the shift report ▪ Assist OCE in setting TARP Level as required ▪ Advise OCE in assessing requirements for monitoring device (e.g. tell-tales) location, setup and interpretation of readings as required	▪ As per Level 1 and ▪ Complete assessment, determine standoff distance and issue hazard controls to reduce risk as required ▪ Assess if additional geotechnical monitoring required ▪ Advise OCE, Supervisor & Superintendent of any changed conditions (including TARP Level) as a result of data collected from specialist monitoring (e.g. radar) ▪ Review and sign-off risk assessments ▪ Participate in/support investigation		

Access Controls				
Normal	Level 1 Minor Hazard	Level 2 Major Hazard	Level 3 Failure Within Controls	Level 4 Failure Exceeding Controls
▪ Adhere to primary standoff distances and access requirements as per *Working Near Crests and Slopes* procedure.	▪ As per Normal and ▪ Risk Assessment approved by OCE and Supervisor for a CMW to work inside standoff under Level 1 conditions (minor geotechnical hazard present) ▪ OCE and/or Geotechnical Engineers conducting visual crest inspection as per normal condition	▪ Risk Assessment approved by OCE, Supervisor and Geotechnical Engineer required for a CMW to work inside standoff under Level 2 or above conditions (major geotechnical hazard present)	▪ No Access, reclassify TARP Level	▪ No Access, reclassify TARP Level
▪ Grader rill indicating primary standoff	▪ Install a berm at least 2m high, with appropriate hazard signage (where possible) at a distance that is not less than the primary standoff distance to delineate the TARP area.			