

## APPENDIX D1

### DRAFT OUTCOMES, OUTCOME MEASURABLE CRITERIA, AND LEADING INDICATOR CRITERIA

# ANGAS PROCESSING FACILITY

## MISCELLANEOUS PURPOSES LICENSE APPLICATION

2019/0826



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Unit 7 / 202-208 Glen Osmond Road | Fullarton SA 5063



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## 1 PUBLIC SAFETY

Proposed Outcome	Proposed Measurement Criteria	Proposed Leading Indicator Criteria
No public injuries and/or deaths to members of the public caused by mining operations	Independent investigation of all incidents that result in injury or death of the public are completed within 14 days, or as agreed with the Chief Inspector of Mines and demonstrate that the mine operator could not have reasonably prevented the incident from occurring.	Annual public safety review does not identify additional actions that could reasonably be taken to reduce risks to the public.
No public injuries and/or deaths to members of the public caused by mining operations	All unauthorised entries to the operating site are investigated completed within 14 days, or as agreed with the Chief Inspector of Mines and demonstrate all reasonable and practical measures were in place to prevent entry (and injury, if applicable).	Monthly check of perimeter security fencing around operating site.

## 2 TRAFFIC

Proposed Outcome	Proposed Measurement Criteria	Proposed Leading Indicator Criteria
No adverse impacts offsite are caused by accidents, noise, dust and dragout by traffic from or to the mine operations that could have been reasonably prevented.	<p>Accumulation of dragout (aggregate, sand, dirt and other detritus) will be monitored through daily visual inspection of the mine entrance (Callington road interception) and reported by exception, to ensure DPTI standard intervention levels are not exceeded;</p> <ul style="list-style-type: none"> <li>1m<sup>2</sup> at intersection segments, curves, bicycle lanes, pedestrian crossings or walkways</li> </ul>	None proposed



	<ul style="list-style-type: none"> <li>10m<sup>2</sup> in other locations</li> </ul>	
No adverse impacts offsite are caused by accidents, noise, dust and dragout by traffic from or to the mine operations that could have been reasonably prevented.	B-double and Truck and Dog movements to and from ML 6229 will be monitored through control log data sheets to demonstrate compliance with agreed hours of operation.	None proposed
	Truck driver check sheets will be completed for every concentrate truck which leaves site to ensure that all loads on concentrate trucks entering public roads are covered.	None proposed
	Independent investigation of all recorded accidents resulting from mine traffic entry and exit demonstrates that the lessee could not have reasonably prevented the accident.	None proposed
No impacts to third party infrastructure caused by mining operations.	Investigation of all public infrastructure related complaints demonstrates that the Mine Operator did not cause or could not reasonably have prevented the incident from occurring; and all public infrastructure related complaints were acknowledged within 48 hours and closed out within 14 days to the satisfaction of the complainant or as agreed with the Chief Inspector of Mines.	Complaints hotline re: minor spillage on roads that drivers haven't identified. Investigate to see if damage originated from BIH vehicles.

### 3 VISUAL AMENITY

Proposed Outcome	Proposed Measurement Criteria	Proposed Leading Indicator Criteria
No public nuisance or amenity impacts caused by lighting from the mining operations	Out-door lighting of the processing facility audited by a suitably qualified independent person to demonstrate compliance with AS 4282-1997 'Control of the obtrusive effects of outdoor lighting'.	None proposed



No public nuisance or amenity impacts caused by lighting from the mining operations	Investigation of all visual amenity related complaints demonstrates that the Mine Operator did not cause or could not reasonably have prevented the incident from occurring; and all visual amenity related complaints were acknowledged within 48 hours and closed out within 7 days to the satisfaction of the complainant or as agreed with the Director of Mines. If complaints were not resolved the Mine Operator conducted further investigations to demonstrate that visual amenity complied with the outcome achievement values as agreed by the Director of Mines.	None proposed
No impact to visual amenity caused by rubbish from mining operations	Annual photo point monitoring at 2 locations around the MPL demonstrate that all areas are clean and rubbish free and visual amenity is improved in the long term (post closure).	None proposed

## 4 GROUNDWATER

Proposed Outcome	Proposed Measurement Criteria	Proposed Leading Indicator Criteria
No adverse impact to the supply or quality of water caused by the mining operations to existing users and water dependant ecosystems	Groundwater will be sampled and analysed quarterly (where land access obtained), as per AS/NZS 5667.1:1998 standards and EPA Guidelines: Regulatory Monitoring and Testing, Groundwater Sampling, 2007, at bores RG1, RG2, RG3, RG4, RG8, RG11 and RG12 (note RG5 & RG6 are dry) located on and adjacent to the ML 6229 and proposed MPL boundary to demonstrate that the concentration of potential contaminants (Pb, Zn, As, Cd, Fe, Se, pH, EC and TDS) do not exceed maximum baseline values.	Groundwater will be sampled and analysed quarterly (where land access obtained), as per AS/NZS 5667.1:1998 standards and EPA Guidelines: Regulatory Monitoring and Testing, Groundwater Sampling, 2007, at bores RG1, RG2, RG3, RG4, RG8, RG11 and RG12, (note RG5 & RG6 are dry) ) located on and adjacent to the proposed MPL boundary to demonstrate that analytes (Pb, Zn, As, Cd, Fe, Se, pH, EC and TDS) are less than two standard deviations of the mean baseline values.
No contamination of natural water drainage systems, streams and rivers, groundwater, land and soils occurs either on or off site resulting from permanent disposal or temporary storage of mine ore or waste material	Survey markers (pegs) installed on the upstream slope of the TSF main embankment for estimation of pond area and Reduced Level (RL) indicators on the external wall (stair side) of the decant chute will be read monthly to ensure no head of water on the area of single lining, i.e. RL not to exceed 68m AHD or surface area not to exceed 15,000m <sup>2</sup> for a period of more than 180 days (or as per updated and approved TSF Operations and Maintenance Manual). RL will be measured until the 15,000m <sup>2</sup> area is reached and from then, all monitoring will be based on surface water area.	Monthly inspections of the survey markers (pegs) installed on the upstream slope of the TSF main embankment for estimation of pond area will demonstrate surface area is <12,000m <sup>2</sup> (80% of the 15,000m <sup>2</sup> limit) (or as per updated and approved TSF Operations and Maintenance Manual).
No contamination of natural water drainage systems, streams and rivers, groundwater, land and soils occurs either on or off site resulting from permanent	Reduced Level (RL) indicators on the external wall (stair side) of the TSF decant chute will be read monthly to ensure that the TSF maintains adequate capacity to manage a 1:1000 year storm event. The TSF shall be managed to ensure the following decant pond RL (m) are not exceeded if the surface area is less than 15,000m <sup>2</sup> :	None proposed.



disposal or temporary storage of mine ore or waste material.	<ul style="list-style-type: none"> <li>74.2 as of Aug 2015</li> <li>(or as per updated and approved TSF Operations and Maintenance Manual).</li> </ul> RL levels will be monitored monthly.	
No contamination of natural water drainage systems, streams and rivers, groundwater, land and soils occurs either on or off site resulting from permanent disposal or temporary storage of mine ore or waste material.	Standing Water Levels (SWL) will be monitored monthly as per AS/NZS 5667.1:1998 standards at groundwater monitoring bores TSF B, C and D .An independent expert will verify through annual analysis of the monthly data that no leakage from the TSF into the surrounding aquifer has been detected.	As per TSF operations manual, Six embankment monitoring bores (MB1 to MB6) located on the TSF main embankment will be monitored monthly to ensure no water is detected. If water is detected, it will be sampled for pH, EC, TDS, As, Cd, Pb, Zn, Mn and Fe, as per AS/NZS 5667.1:1998 standards, and results submitted to an independent expert for analysis.
No contamination of natural water drainage systems, streams and rivers, groundwater, land and soils occurs either on or off site resulting from permanent disposal or temporary storage of mine ore or waste material.	Groundwater monitoring bores TSF A, B, C and D (Figure 11 5) will be sampled and analysed monthly as per AS/NZS 5667.1:1998 standards for pH, EC, TDS, As, Cd, Pb, Zn, Mn and Fe. An independent expert will verify, through annual analysis of the monthly data that no leakage from the TSF into the surrounding aquifer has been detected.	Groundwater monitoring bores TSF A, B,C and D will be sampled and analysed monthly as per AS/NZS 5667.1:1998 standards for pH, EC, TDS, As, Cd, Pb, Zn, Mn and Fe, to demonstrate no change in quality beyond 2 standard deviation of the mean (Figure 11 5). If a change from the 2 standard deviation occurs, results are to be submitted to an independent expert for analysis.

## 5 SURFACE WATER

Proposed Outcome	Proposed Measurement Criteria	Proposed Leading Indicator Criteria
<p>No adverse impact to the supply or quality of water caused by the mining operations to existing users and water dependant ecosystems.</p> <p>No adverse impacts on soil quality or quantity caused by mining operations.</p>	<p>If a spill of fuel, oil or hazardous chemical occurs outside bunded areas, it will be reported and remediated within 48 hours. Any remediated spills out of the operational zone will be soil tested as per AS 4482.1,1997 standards, and tested for As, Cd, Cu, Pb, Mn, Hg, Ni and Zn to ensure no levels higher than the topsoil stockpile baseline maximum.</p>	<p>Monthly review of weekly waste management site inspections records, focusing on storage of waste and hazardous materials, will indicate less than 5 occurrences a month of incorrectly disposed or stored waste.</p>
<p>No adverse impact to the supply or quality of water caused by the mining operations to existing users and water dependant ecosystems.</p> <p>No adverse impacts on soil quality or quantity caused by mining operations.</p>	<p>During high rainfall events which generate runoff, turbidity will be measured at the Front Entrance (pre-wetland), visitors viewing area, overflow point of the sediment dam, and exit point at the Evaporation Pan (Figure 12-11) as per sampling method AS/NZS 5667.1:1998 standards to ensure the NTU does not exceed ANZECC/ARMCANZ (2000) guidelines of 50NTU.</p>	<p>After high rainfall events which generate runoff, records from visual inspections of silt traps, the silt retention dam and surface drainage systems on the proposed MPL demonstrate that silt volume is no more than 50% of trap capacity volume and there is no breach in walls</p>



<p>No adverse impact to the supply or quality of water caused by the mining operations to existing users and water dependant ecosystems.</p> <p>No adverse impacts on soil quality or quantity caused by mining operations.</p>	<p>During high rainfall events which generate runoff, turbidity, pH and salinity will be measured at the pre-swale location (Figure 11-5), as per sampling method AS/ NZS 5667.1:1998 standards to ensure the NTU does not exceed ANZECC/ARMCANZ (2000) guidelines of 50NTU, and demonstrate that water quality remains within historical control data for pH 8.23 and EC of 11,400 uS/ cm.</p>	<p>Quarterly surface water monitoring will occur if water is flowing into the pre-swale location (Figure 11-5) as per sampling method AS/ NZS 5667.1:1998 standards to ensure the NTU does not exceed ANZECC/ARMCANZ (2000) guidelines of 50NTU, and demonstrate that potential contaminants (pH, EC) less than two standard deviations of the mean control data values control values of pH 8.39 and EC of 6,441.93 uS/cm.</p>
<p>No adverse impact to the supply or quality of water caused by the mining operations to existing users and water dependant ecosystems.</p> <p>No adverse impacts on soil quality or quantity caused by mining operations.</p>	<p>Triplicate samples to be taken when water is running from the Front Entrance (pre-wetland), visitors viewing area, Pre-Swale, overflow point of the sediment dam, and exit point at the Evaporation Pan (Figure 12-11). Samples to be measured as per AS/NZS 5667.1:1998 standards. A paired t-test will demonstrate that turbidity at these sites is not significantly different from the mean of the triplicate samples taken at Hogben or greater than the mean of the triplicate samples taken at Hogben. If the samples obtained at the pre-wetland location, visitors viewing area or silt dam overflow are significantly different from and greater than the mean of the triplicate samples taken at Hogben, verification will be undertaken to determine whether water is in fact leaving the Mineral Lease/MPL, in order to ascertain the source of the potential contamination.</p>	<p>After high rainfall events which generate runoff, records from visual inspections of silt traps, the silt retention dam and surface drainage systems on ML 6229 and MPL (Figure 12-11) demonstrate that silt volume is no more than 50% of trap capacity volume and there is no breach in walls.</p> <p>After high rainfall events which generate runoff, visual inspections of all sloped areas, ore and topsoil stockpiles will occur to ensure no evidence of sediment loss through erosion (formation of rills and gullies)</p>
<p>No adverse impact to the supply or quality of water caused by the mining operations to existing users and water dependant ecosystems.</p> <p>No adverse impacts on soil quality or quantity caused by mining operations.</p>	<p>Triplicate surface water samples will be taken during rain events where there is a potential for discharge into the Angas River from MPL. Samples will be taken, as per AS/NZS 5667.1:1998, where the Angas River flows at one potential discharge location (Croser) and one upstream control sample point (Hogben). A paired t-test will demonstrate that potential contaminants (Pb, Zn, Cd, pH, TDS, SO<sub>4</sub>, EC and turbidity) at Croser are not significantly different (p-value ≤ t-test value) from the mean of the samples taken at Hogben at that point in time over a consecutive period no less than 5 years.</p> <p>If the samples at Croser are significantly different and greater than the mean of the triplicate samples from Hogben, verification will be undertaken to determine</p>	<p>Triplicate surface water samples will be taken quarterly, as per AS/NZS 5667.1:1998, where the Angas River flows at one potential discharge location (Croser) and one upstream control sample point (Hogben). A paired t-test will demonstrate that potential contaminants (Pb, Zn, Cd, pH, TDS, SO<sub>4</sub>, EC and turbidity) at Croser are not significantly different (p-value ≤ t-test value) from the mean of the samples taken at Hogben at that point in time .</p>



	<p>whether surface water is leaving the proposed MPL. Sampling will cease if closure criteria has been satisfied and when the TSF has been rehabilitated as per the approved TSF closure design. Sampling will be undertaken once if possible within a 24 month period prior to Mineral Lease surrender document submission.</p>	
<p>No adverse impact to the supply or quality of water caused by the mining operations to existing users and water dependant ecosystems.</p> <p>No adverse impacts on soil quality or quantity caused by mining operations.</p>	<p>Triplicate surface water samples will be taken during rain events where there is a potential for discharge into the Angas River from MPL. Samples will be taken, as per AS/NZS 5667.1:1998, where the Angas River flows at one potential discharge location (Croser) and one upstream control sample point (Hogben). A paired t-test will demonstrate that potential contaminants (Pb, Zn, Cd, pH, TDS, SO<sub>4</sub>, EC and turbidity) at Croser are not significantly different (p-value ≤ t-test value) from the mean of the samples taken at Hogben at that point in time over a consecutive period no less than 5 years.</p> <p>If the samples at Croser are significantly different and greater than the mean of the triplicate samples from Hogben, verification will be undertaken to determine whether surface water is leaving the proposed MPL.</p> <p>Sampling will cease if closure criteria has been satisfied and when the TSF has been rehabilitated as per the approved TSF closure design.</p> <p>Sampling will be undertaken once if possible within a 24 month period prior to Mineral Lease surrender document submission.</p>	<p>None proposed.</p>





## 6 SOIL AND LAND QUALITY

Proposed Outcome	Proposed Measurement Criteria	Proposed Leading Indicator Criteria
No adverse impacts on soil quality or quantity caused by mining operations	Annual photo monitoring of all topsoil stockpiles located on the proposed MPL, will show vegetation establishment and no signs of erosion (formation of rills, gullies or other evidence of topsoil loss).	All topsoil stockpiles located on ML 6229 will be annually sampled, to AS 4482.1-2005 standards, and tested for As, Cd, Cu, Pb, Mn, Hg, Ni, Zn, pH, EC, and exchangeable cations Na, Mg, and Ca. Any results higher than the topsoil baseline maximum (Appendix L1) for any analyte will be investigated and appropriate actions taken.
No adverse impacts on soil quality or quantity caused by mining operations	Annual survey of topsoil available / stockpiled for closure demonstrates that there is no loss of existing (pre-mining) topsoil.	A materials balance of topsoil available / stockpiled for closure demonstrates requirements are met or identifies a deficiency.
No adverse impacts on soil quality or quantity caused by mining operations  No adverse impact to the supply or quality of water caused by the mining operations to existing users and water dependant ecosystems	If a spill of fuel, oil or hazardous chemical occurs outside bunded areas, it will be reported and remediated within 48 hours. Any remediated spills out of the operational zone will be soil tested as per AS 4482.1,1997 standards, and tested for As, Cd, Cu, Pb, Mn, Hg, Ni and Zn to ensure no levels higher than the topsoil stockpile baseline maximum.	Monthly review of weekly waste management site inspections records, focusing on storage of waste and hazardous materials, will indicate less than 5 occurrences a month of incorrectly disposed or stored waste.
No adverse impacts on soil quality or quantity caused by mining operations  No adverse impact to the supply or quality of water caused by the mining operations to existing users and water dependant ecosystems	Records will be kept of volumes of putrescible waste taken off-site to demonstrate disposal of all potentially polluting waste taken to an approved EPA site and in accordance with the site's Waste Management Plan (Appendix B3)	None proposed.
No adverse impacts on soil quality or quantity caused by mining operations  No adverse impact to the supply or quality of water caused by the mining operations to existing users and water dependant ecosystems	Provision of a report once prior to entering closure monitoring phase by a suitably qualified site contamination consultant verifies that a site contamination assessment and if required remediation in accordance with the NEPM and relevant EPA guidelines (excluding the TSF) has occurred, ensuring there is no unacceptable risk to human health or the environment as a result of the contamination when compared with relevant baseline concentrations and relevant NEPM investigation levels.	None proposed.

<p>No adverse impacts on soil quality or quantity caused by mining operations</p> <p>No adverse impact to the supply or quality of water caused by the mining operations to existing users and water dependant ecosystems</p>	<p>Triplicate surface water samples will be taken during rain events where there is a potential for discharge into the Angas River from MPL. Samples will be taken, as per AS/NZS 5667.1:1998, where the Angas River flows at one potential discharge location (Croser) and one upstream control sample point (Hogben). A paired t-test will demonstrate that potential contaminants (Pb, Zn, Cd, pH, TDS, SO<sub>4</sub>, EC and turbidity) at Croser are not significantly different (p-value ≤ t-test value) from the mean of the samples taken at Hogben at that point in time over a consecutive period no less than 5 years.</p> <p>If the samples at Croser are significantly different and greater than the mean of the triplicate samples from Hogben, verification will be undertaken to determine whether surface water is leaving the proposed MPL.</p> <p>Sampling will cease if closure criteria has been satisfied and when the TSF has been rehabilitated as per the approved TSF closure design.</p> <p>Sampling will be undertaken once if possible within a 24 month period prior to Mineral Lease surrender document submission.</p>	<p>Triplicate surface water samples will be taken quarterly, as per AS/NZS 5667.1:1998, where the Angas River flows at one potential discharge location (Croser) and one upstream control sample point (Hogben). A paired t-test will demonstrate that potential contaminants (Pb, Zn, Cd, pH, TDS, SO<sub>4</sub>, EC and turbidity) at Croser are not significantly different (p-value ≤ t-test value) from the mean of the samples taken at Hogben at that point in time .</p>
<p>No adverse impacts on soil quality or quantity caused by mining operations</p> <p>No adverse impact to the supply or quality of water caused by the mining operations to existing users and water dependant ecosystems</p>	<p>During high rainfall events which generate runoff, turbidity will be measured at the <b>Front Entrance</b> (pre-wetland), <b>visitors viewing area</b>, overflow point of the <b>sediment dam</b>, and exit point at the <b>Evaporation Pan</b> (Figure 12 11) as per sampling method AS/NZS 5667.1:1998 standards to ensure the NTU does not exceed ANZECC/ARMCANZ (2000) guidelines of 50NTU.</p>	<p>After high rainfall events which generate runoff, records from visual inspections of silt traps, the silt retention dam and surface drainage systems on the proposed MPL demonstrate that silt volume is no more than 50% of trap capacity volume and there is no breach in walls</p>
<p>No adverse impact to the supply or quality of water caused by the mining operations to existing users and water dependant ecosystems</p>	<p>During high rainfall events which generate runoff, turbidity, pH and salinity will be measured at the <b>pre-swale</b> location (Figure 11-5), as per sampling method AS/ NZS 5667.1:1998 standards to ensure the NTU does not exceed ANZECC/ARMCANZ (2000) guidelines of 50NTU, and demonstrate that water quality remains within historical control data for pH 8.23 and EC of 11,400 uS/ cm.</p>	<p>Quarterly surface water monitoring will occur if water is flowing into the <b>pre-swale</b> location (Figure 11-5) as per sampling method AS/ NZS 5667.1:1998 standards to ensure the NTU does not exceed ANZECC/ARMCANZ (2000) guidelines of 50NTU, and demonstrate that potential contaminants (pH, EC) less than two standard deviations of the mean control data values control values of pH 8.39 and EC of 6,441.93 uS/cm.</p>

## 7 GEOCHEMISTRY

Proposed Outcome	Proposed Measurement Criteria	Proposed Leading Indicator Criteria
No contamination of natural water drainage systems, streams and rivers, groundwater, land and soils occurs either on or off site resulting from permanent disposal or temporary storage of mine ore or waste material	Survey markers (pegs) installed on the upstream slope of the TSF main embankment for estimation of pond area and Reduced Level (RL) indicators on the external wall (stair side) of the decant chute will be read monthly to ensure no head of water on the area of single lining, i.e. RL not to exceed 68m AHD or surface area not to exceed 15,000m <sup>2</sup> for a period of more than 180 days (or as per updated and approved TSF Operations and Maintenance Manual). RL will be measured until the 15,000m <sup>2</sup> area is reached and from then, all monitoring will be based on surface water area.	Monthly inspections of the survey markers (pegs) installed on the upstream slope of the TSF main embankment for estimation of pond area will demonstrate surface area is <12,000m <sup>2</sup> (80% of the 15,000m <sup>2</sup> limit) (or as per updated and approved TSF Operations and Maintenance Manual).
	Standing Water Levels (SWL) will be monitored monthly as per AS/NZS 5667.1:1998 standards at groundwater monitoring bores TSF A, B, C and D (Figure 11-5) An independent expert will verify through annual analysis of the monthly data that no leakage from the TSF into the surrounding aquifer has been detected.	Groundwater monitoring bores TSF A, B,C and D will be sampled and analysed monthly as per AS/NZS 5667.1:1998 standards for pH, EC, TDS, As, Cd, Pb, Zn, Mn and Fe, to demonstrate no change in quality beyond 2 standard deviation of the mean (Figure 11-5). If a change from the 2 standard deviation occurs, results are to be submitted to an independent expert for analysis.
	Groundwater monitoring bores TSF A, B, C and D (Figure 11-5) will be sampled and analysed monthly as per AS/NZS 5667.1:1998 standards for pH, EC, TDS, As, Cd, Pb, Zn, Mn and Fe. An independent expert will verify, through annual analysis of the monthly data that no leakage from the TSF into the surrounding aquifer has been detected.	Six embankment monitoring bores (MB1 to MB6) located on the TSF main embankment will be monitored monthly to ensure no water is detected. If water is detected, it will be sampled for pH, EC, TDS, As, Cd, Pb, Zn, Mn and Fe, as per AS/NZS 5667.1:1998 standards, and results submitted to an independent expert for analysis.
Post mine completion all mining operations left in a stable, non-polluting state indefinitely	An independent and suitably qualified expert (to the Mining Regulator's satisfaction) will verify in a report once after completion of construction works that the TSF landform has been constructed to design.	None proposed.
Post mine completion all mining operations left in a stable, non-polluting state indefinitely	Final binding agreement with the relevant SA Government entity (to the Minister's satisfaction) which may be registerable or noted on the relevant title(s) to protect the TSF and a 10m buffer from development as per ML 6229 Lease Condition 69. Final draft to be completed prior to surrender of lease (Appendix S16).	None proposed.

## 8 GEOTECHNICAL HAZARDS

Proposed Outcome	Proposed Measurement Criteria	Proposed Leading Indicator Criteria
No contamination of natural water drainage systems, streams and rivers, groundwater, land and soils occurs either on or off site resulting from permanent disposal or temporary storage of mine ore or waste material	Survey readings of the position and elevation (i.e. x, y, z coordinates) of all installed Fifteen settlement/movement monuments on TSF embankments shall be obtained at monthly intervals and be audited annually to demonstrate TSF embankments are geotechnically stable.	None proposed.
No contamination of natural water drainage systems, streams and rivers, groundwater, land and soils occurs either on or off site resulting from permanent disposal or temporary storage of mine ore or waste material	Survey markers (pegs) installed on the upstream slope of the TSF main embankment for estimation of pond area and Reduced Level (RL) indicators on the external wall (stair side) of the decant chute will be read monthly to ensure no head of water on the area of single lining, i.e. RL not to exceed 68m AHD or surface area not to exceed 15,000m <sup>2</sup> for a period of more than 180 days (or as per updated and approved TSF Operations and Maintenance Manual). RL will be measured until the 15,000m <sup>2</sup> area is reached and from then, all monitoring will be based on surface water area.	Monthly inspections of the survey markers (pegs) installed on the upstream slope of the TSF main embankment for estimation of pond area will demonstrate surface area is <12,000m <sup>2</sup> (80% of the 15,000m <sup>2</sup> limit) (or as per updated and approved TSF Operations and Maintenance Manual).
Post mine completion all mining operations left in a stable, non-polluting state indefinitely	An independent and suitably qualified expert (to the Mining Regulator's satisfaction) will verify in a report once after completion of construction works that the TSF landform has been constructed to design.	None proposed.
Post mine completion all mining operations left in a stable, non-polluting state indefinitely	Final binding agreement with the relevant SA Government entity (to the Minister's satisfaction) which may be registerable or noted on the relevant title(s) to protect the TSF and a 10m buffer from development as per ML 6229 Lease Condition 69. Final draft to be completed prior to surrender of lease (Appendix S16).	None proposed.



## 9 AIR QUALITY

Proposed Outcome	Proposed Measurement Criteria	Proposed Leading Indicator Criteria
No public nuisance impacts to local residents from dust, air emissions and/or odour caused by mining operations	Dust levels collected from two HVAS dust samplers, labelled as Western/Lot 8 and Northern/Sec Gate, shown in Figure 14-1, located on the proposed MPL will be sampled over a 24 hour period every six days as per AS, 3580.9.3:2003 standards. Data will demonstrate World Health Organisation guidelines for Total Solid Particulates are less than 120 micrograms/m <sup>3</sup> and Lead content is less than 0.5 micrograms/m <sup>3</sup> .  If these levels are obtained for 12 months post-closure, monitoring will no long be required.	None proposed.
No public nuisance impacts to local residents from dust, air emissions and/or odour caused by mining operations	PM <sub>10</sub> dust levels collected from the HVAS "Northern/Sec Gate" shown in Figure 14-1, will be sampled over a 24hour period every six days as per AS, 3580.9.3:2003 standards. Data will demonstrate compliance with EPP Air criteria of 50 µg/m <sup>3</sup> per 24 hour period with <5 days exceedances per year.  If these levels are obtained for 12 months post-closure, monitoring will no long be required.	None proposed.
No public nuisance impacts to local residents from dust, air emissions and/or odour caused by mining operations	Investigation of all dust related complaints demonstrates that the Mine Operator did not cause or could not reasonably have prevented the incident from occurring; and all dust related complaints were acknowledged within 24 hours and closed out within 14 days to the satisfaction of the complainant or as agreed with the Chief Inspector of Mines. If complaints were not resolved the Mine Operator conducted dust monitoring to demonstrate that dust emissions complied with the outcome achievement values as agreed by the Chief Inspector of Mines.	None proposed.
No public nuisance impacts to local residents from dust, air emissions and/or odour caused by mining operations	Dust generated from the mining lease during operation activities, measured Twelve static Dust Deposition Gauges located on and off the mining lease shown in Figure 14-1 demonstrates average dust deposition at sensitive receivers is in accordance with the Air Quality Impact Assessment using standardised monitoring techniques and demonstrates that annual average does not exceed 4 g/m <sup>2</sup> to ensure no nuisance impacts to local residents from dust generated by processing or closure activities.  If these levels are obtained for 12 months post-closure, monitoring will no long be required.	Twelve static Dust Deposition Gauges located on and off the mining lease shown in Figure 14-1, will be monitored monthly for total insoluble solids (TIM) as per AS 3580.10.1-1991 standards. This will demonstrate that total insoluble solids are less than Australian best practice deposition levels of 4g/m <sup>2</sup> /month.  Any exceedance of 4g/m <sup>2</sup> /month to be investigated with reference to meteorological data and onsite activities to ascertain whether the source is likely to be Terramin's activities.

## 10 NOISE

Proposed Outcome	Proposed Measurement Criteria	Proposed Leading Indicator Criteria
No public nuisance impacts from noise, vibration and air over pressure caused by mining operations	All noise complaints will be investigated and a response provided to the complainant within two working days. All noise complaints and associated actions will be recorded in a data base. Detail will include; complainants contact details, reason for complaint, time and date of noise issue, time and date of complaint, when and how the issue was actioned and the time and date the issue was closed out.	None proposed.
No public nuisance impacts from noise, vibration and air over pressure caused by mining operations	Noise levels dB(A) will be measured quarterly for seven consecutive days (24 hours a day), at two on-site noise loggers, located east (mill side) and west (boxcut) of the operation and demonstrate compliance with EPA noise limits as defined in 'Environment Protection (noise) Policy 2007' and successors. (Currently at the nearest residence; Day time $L_{eq,15 \text{ min}}$ of 57dB(A) from 7 am to 10pm Night time $L_{eq,15 \text{ min}}$ of 50dB(A) from 10pm to 7am. This model will be confirmed on an annual basis by an independent expert).	Noise levels at the nearest residence will be less than 47 dBA $L_{eq,15 \text{ min}}$ during the day (7am - 10pm) and less than 40 dBA $L_{eq,15 \text{ min}}$ at night (10pm - 7am).

## 11 FAUNA AND PESTS

Proposed Outcome	Proposed Measurement Criteria	Proposed Leading Indicator Criteria
No net adverse impacts from the mining operations on the native fauna.	All native fauna deaths or injuries on-site will be reported and an investigation will be undertaken to demonstrate it could not have reasonably been prevented.	None proposed.
No introduction of new species of declared weeds or pests (including feral animals), or sustained increase in abundance of existing declared weed or pest species caused by mining operations.	An annual winter weed and pest survey using step point monitoring and photo documentation to demonstrate there has not been a significant increase in weeds, pests and disease from the previous survey.	None proposed.
No introduction of new species of declared weeds or pests (including feral animals), or sustained increase in abundance of existing declared weed or pest species caused by mining operations.	An annual winter weed and pest survey using step point monitoring and photo documentation to demonstrate there has not been a significant increase in weeds, pests and disease from the previous survey.	None proposed.



## 12 VEGETATION AND WEEDS

Proposed Outcome	Proposed Measurement Criteria	Proposed Leading Indicator Criteria
No introduction of new species of declared weeds or pests (including feral animals), or sustained increase in abundance of existing declared weed or pest species caused by mining operations	An annual winter weed and pest survey using step point monitoring and photo documentation to demonstrate there has not been a significant increase in weeds, pests and disease from the previous survey.	None proposed
No permanent loss of abundance, condition or diversity of native vegetation (as defined by Native Vegetation Act 1991) caused by mining operations	Annual monitoring through visual inspection and photo documentation of the remnant native vegetation located within the proposed MPL will demonstrate no clearance of remnant native vegetation post-construction.	None proposed

## 13 HERITAGE

PROPOSED OUTCOME	PROPOSED MEASUREMENT CRITERIA	PROPOSED LEADING INDICATOR CRITERIA
No impact to aboriginal sites, remains or objects caused by mining operations without prior authorisation under the Aboriginal Heritage Act 1988.	Records will be kept of all complaints and any artefacts discovered related to Aboriginal or European heritage and an investigation will be undertaken to demonstrate no inappropriate actions by the mine operator.	None proposed.