16 March 2023

2022 Calendar Year Annual Review and Safety Standards Report Tailings Dam 1 Aeris Tritton Mine

Tritton Resources Pty Ltd

PER2022-0315AB rev0

PER2022-0315AB		
Date	Revision	Comments
23/02/2023	A	Internal review, issued to client for review
16/03/2023	0	Final report

Table of Contents

Figures

Appendices

1 INTRODUCTION

This report presents the results and findings of the annual (surveillance) review of Tailings Dam 1 undertaken at Aeris Resources, Tritton Mine located west of Nyngan near Hermidale in NSW. The mine is operated by Tritton Resources Pty Ltd. The Annual Dams Safety Standards Report for the Tritton site will be completed separately on-line.

The annual review was undertaken by Chris Hogg, Senior Principal Tailings Engineer, CMW Geosciences Pty Ltd (CMW) and Ian Grieve, Consultant on Wednesday 8 February 2023 in the company of Jamie Barrow of Aeris Resources Tritton Mine. This is the eighteenth (18th) annual independent review of Tailings Dam 1 (TD1) undertaken by a specialist independent consulting organisation. This review covers activities and information pertaining to the 2022 calendar year. The previous surveillance review was undertaken in February 2022 that covered the 2021 calendar year.

The tailings dam was commissioned in December 2004, the first (1st) review was undertaken in January 2006 and covered the 2005 calendar year, subsequent reviews have been undertaken on an annual basis generally in January or February of each year which satisfied the then annual reporting requirements specified by the NSW Dams Safety Committee (NSW DSC). Reviews of tailings dams (or dams) are now covered by the Dams Safety Act 2015 No.26 and Dam Safety Regulation 2019.

The annual review was commissioned by Jamie Barrow of Aeris Resources Pty Ltd by way of a signed authority and purchase order 20226314.

1.1 2022 Surveillance Summary

The findings of this surveillance review are presented in the body of this report. Pertinent information has been summarised as:

- It has been concluded that the tailings dam is being operated and managed to an acceptable standard during the review period, with no reportable safety incidents.
- No reportable environmental incidents were advised.
- Stage 7 construction was proceeding at the time of the site visit, and the earthworks were approximately 50% complete. The spillway will be raised as the final phase of Stage 7 construction.
- There were no visible signs of distress (cracking) of the embankments.
- Surface erosion has continued to form rills on some embankment surfaces. Rill erosion was noted on the upper and lower slopes of the embankments (i.e. above and below intermediate benches). Several gullies and shallow erosion tunnels (which have partially collapsed) were noted emanating from the main embankment intermediate bench in the north east section of the facility. Erosion was less apparent along the remainder of the main embankment and other embankments. No changes to the erosion and sediment control procedure are required at this stage.
- All bores recorded groundwater level rises over 2022 and it was noted that 16 of 20 piezometers had readings which were the ‘highest’ recorded. The closest water level to the surface was recorded in PZH001 at 8.04 m (which is located near the main embankment northern abutment). The global rising of the groundwater appears to indicate ongoing groundwater mounding near TD1. The rises in water levels over the last two years appear to indicate possible recharge from above average annual rainfall.
- (Re-iterated for last year) It is recommended that the RAP document be reviewed by a hydrogeologist to assess whether pumping be recommenced from PB001 to assist in controlling the rate of rise of ground water.

1.2 2021 Surveillance Actions

Comments in respect to recommendations and actions from the 2021 surveillance review are outlined in Section 12.

1.3 Figures and Appendices

Figures 1 to 6 are attached to this document, behind the text. A site location plan is presented as Figure 1. Design details covering Stage 2 are presented as Figures 2 and 3. The location of the monitoring bores is shown on Figure 4. Figure 5 show guidelines for freeboard nomenclature. Survey information supplied is presented as Figures 6 and 7.

Photographs taken during the surveillance review are attached in Appendix A as Figures A1 to A7. Appendix B contains monitoring information including monitoring bore water levels, water quality information and copies of inspection sheets (daily log sheets) which are a requirement of the operations manual.

Appendix C contains stability information prepared for the design of embankment raises for Stages 6 and 7. Liquefaction potential plots of the tailings are also presented in Appendix C, these plots indicate the tailings have a low likelihood of liquefaction based on the seismic intensity assessed.

For completeness purposes, Appendix D contains drawings showing details of Stage 6 and 7.

2 GENERAL INFORMATION

The tailings dam is used to store milled mine waste (tailings slurry). Tailings slurry is deposited into the dam from a perimeter distribution system that fully encircles the dam. At the time of the February 2023 review, tailings slurry deposition was being undertaken from the northern side of TD1. Stage 7 construction to RL272 m was proceeding at the time of the site visit. The earthworks were approximately 50% complete.

The tailings deposition philosophy is based on the fact that when the tailings slurry is discharged there is a rapid decrease in velocity causing the coarser tailings solids fraction to settle out and then consolidate in close proximity to the embankment. Sloped beaches are formed that slope away from the perimeter embankment towards the water recovery pond and pump (refer to the photographs). Water liberated from the deposited slurry water flows down the sloped tailings beach away from the perimeter embankments and is concentrated around the recovery pump where it is pumped back to the processing plant.

2.1 General Details

The tailings dam is situated at the Aeris Resources, Tritton Mine which is located approximately 65km west of Nyngan on the Yarrandale Road, which joins the townships of Hermidale and Girilambone. The approximate centre of the tailings dam is at mine grid 20,200mN and 31,500mE or AMG 6,527,300mN and 474,500mE.

TD1 is a valley type storage facility where the main embankment has dammed a small valley in its upper reaches. Diversion channels and bunds were constructed upstream of the tailings dam as part of Stage 1 works to intercept and divert any runoff around the facility. TD1 is now surrounded by perimeter embankments and the catchment reporting into TD1 is from incident rainfall only.

There is one spillway associated with this tailings dam. The spillway has been designed to pass the 1:100 year average exceedance probability (AEP) rainfall event with an average flow depth of less than 0.5m and the PMP event at less than 1m depth. The spillway is located through the northern embankment and has an invert level at RL269.0m or 1m below the Stage 6 embankment crest. The spillway crest is yet to be raised. Views of the spillway are shown on Figure A8.

The 2018 design document for Stages 6 and 7 re-examined the consequence category (hazard rating). Based on the DSC3A and DSC3F Guidelines, the consequence category for TD1 has been assessed as 'Significant', based on Table 2 in the guide, with the following considerations:

- Population at risk (PAR): <1. Note if the PAR was >1 to 10, the consequence category would be the same.
- Receiving Environment: Rural / Productive.
- Severity of Damage or Loss: Medium – saline liquid and possible solids.

The consequence rating in accordance with the ANCOLD (2019) is also 'Significant'.

3 DESIGN AND CONSTRUCTION ACTIVITIES AND REPORTS

The following section provides a chronological summary of the history of the tailings dam, the information is included in each annual surveillance report for completeness and continuity purposes and remains unchanged except for the current year's activities.

3.1 Design History and Reports

The tailings dam was located and partially designed by Knight Piesold (KP) prior to Tritton Resources becoming the owners of the project. A geotechnical investigation was undertaken by SRE in November 2003, the associated geotechnical report was dated January 2004.

The original design by KP was reviewed and reassessed by SRE, based on changed production rates and life of mine projections, design information and assumptions are outlined in SRE's design report titled "*Design Report, Tailings Storage Facility 1, Tritton Copper Project*", Revision 1, dated 2 March 2004. The report required minor amendments following a review by the NSW DSC.

An Operations Manual co-authored by Coffey and Tritton Resources was submitted to the NSW DSC in July 2005. The operations manual was reviewed and revised by Tritton in conjunction with Coffey in 2011 and 2016 and by CMW Geosciences in 2018 and February 2021.

3.2 Stages 1 to 7 Design Reports

Table 1 summarises staged construction information. Stage 1 - SRE (2004) prepared and submitted design documentation covering the starter embankment (Stage 1) and staged upstream construction of the embankments, (Stages 2 to 5). The design was based on investigation and design information provided by others. SRE became part of Coffey in October 2003.

Stage 2 - Coffey (2006) prepared the Stage 2 embankment design and earthworks scope of works reports during 2006 titled "*Stage 2 Design Report, Tailings Storage Facility 1 Tritton Resources Limited*" - reference P6926.03-BB-stage 2 design report, dated 19 July 2006. Stage 2 earthworks were completed during 2007.

Stage 3 Coffey (2007) prepared embankment design and earthworks scope of works documentation during 2007, titled "*Stage 3 Design Report, Tailings Storage Facility 1 Tritton Resources Limited*", reference MH00100AD-Stage 3 design report Rev 1, dated March 2007. The Stage 3 earthworks specification document is titled "*Scope of Works - Stage 3, Embankment Raising by 2m to RL264.0m, Tailings Storage Facility 1 Tritton Copper Mine, Hermidale*" reference MH00100AD-AC-sowrep-Rev A, dated 20 June 2007. The Stage 3 earthworks commenced in December 2007 and were completed in 2011. A construction report covering Stage 3 activities was prepared by Barnson (engineering organisation) titled '*Construction Report Tritton Copper Mine, Stage 3 Tailings Storage Facility Works*', dated October 2011. Stage 3 as constructed details are presented in Appendix D.

Stage 4 (Coffey 2010) embankment design documentation and earthworks scope of works was prepared by Coffey during 2010 and is titled '*Stage 4 Design Report, Tailings Storage Facility 1 Tritton*

Copper Project', reference MINEWPER00100AN-Stage 4 design report Rev 0, dated August 2010. The Stage 4 design provides for embankment raising by 2m to RL266.0m. Stage 4 construction details are shown in Appendix D. The scope of works is titled '*Scope of Works - Stage 4, Embankment Raising by 2m to RL266.0m, Tailings Storage Facility 1 Tritton Copper Mine, Hermidale'*, reference MWP00100AN-AC-sowrep-Rev 0, dated 20 June 2010. A construction report covering Stage 4 activities was prepared by Barnson's titled '*Earthworks Quality Control Construction Report, Tritton Copper Mine, Stage 4 Tailings Storage Dam Facility Works'*, dated April 2015. The Stage 4 as constructed survey plan is presented in Appendix D.

Stage 5 (Coffey 2015) embankment design documentation and earthworks scope of works was prepared by Coffey during 2015 and is titled '*Stage 5 Design Report, Tailings Storage Dam 1 Straits Tritton Copper Mine'*, reference MWP00100AW-Stage 5 design report Rev 0, dated August 2015. The Stage 5 design provides for embankment raising by 1.5m to RL267.5m. Stage 5 construction details are shown in Appendix D. The scope of works outlining construction details is titled '*Scope of Works - Stage 5, Embankment Raising by 1.5m to RL267.5m, Tailings Storage Facility 1 Tritton Copper Mine, Hermidale'*, reference MINEWPER00100AW Rev 0, dated 10 August 2015.

The Stage 5 design (dated August 2015) was acknowledged by the NSW Dams Safety Committee in correspondence dated 26 October 2015 which also confirmed that a Type 3 surveillance review is required on an annual basis. A construction report covering Stage 5 activities was prepared by Barnson's titled '*Earthworks Quality Control Construction Report, Tritton Copper Mine, Stage 5 Tailings Storage Dam Facility Works'*, dated 2017. The Stage 5 as constructed survey plan is presented in Appendix D.

Stages 6 and 7 (CMW Geosciences 2018) embankment design documentation and earthworks scope of works was prepared by new consultants namely CMW Geosciences. The design report is titled '*Stages 6 and 7 Design Report, Tailings Dam 1, Tritton Mine'*, reference PER2017-0066AB Design Report Rev0, dated March 2018. The design provides for embankment raising in two stages by 4.5m from RL267.5m to RL272.0m. The design report includes electric friction probe results, laboratory test results and design information including stability and seepage analyses and liquefaction assessments. Stage 6 and 7 construction details presented in Appendix D. The Stage 6 and 7 design report was acknowledged by the NSWDSC in correspondence dated 21st March 2018.

Table 1 - Staged Construction Information

Stage	RL	Design report date	Start date of construction	End date of construction	Construction report
1	260.0m	2004	2004	2004	2004
2	262.0m	2006	2006	2007	2007
3	264.0m	2007	2007	2011	2011
4	266.0m	2010	2013	Early 2015	April 2015
5	267.5m	August 2015	Mid-2016	Late 2017	Late 2017
6	270.0m	March 2018	December 2018	December 2020	March 2021,
7	272.0m	March 2018	April, 2022	ongoing (Feb 2023)	n.a.

3.3 2004 Activities – Stage 1 Starter Embankment

Stage 1 construction (starter embankment) was completed to RL260.0m in September 2004, with a spillway invert at RL259.0m. Initial construction also comprised an underdrainage water interception system located immediately upstream of the main embankment, a downstream toe drain, collection sump and recovery pump. The catchment area was 330,000 m^2. Four monitoring bores were installed prior to commissioning in November 2004.

Coffey prepared a construction report[4] titled "*Stage 1 to RL260.0m Tailings Storage Facility 1 Construction Report, Tritton Copper Project*", dated 17 November 2004. The works were supervised on a full time basis with associated soil testing. Stage 1 as constructed details are presented in Appendix D.

3.4 2005 Activities

Activities included, installing additional spigot off-takes and valves to the tailings distribution line, the decant water recovery trench was increased in length with the recovery pump relocated further up the valley. These additional works were completed in September 2005.

3.5 2006 Activities – Stage 2

Stage 2 construction works commenced in October 2006 and were completed in early 2007 and entailed raising the embankments by 2m to RL262.0m and extending both abutments. A new saddle embankment was constructed along the northern abutment, the spillway invert was raised by 2m to RL261.1m. A low permeability clay layer was placed over the base of the Stage 2 area. Embankments and the clay blanket were constructed using compacted clayey borrow materials sourced from within the impoundment area.

3.6 2007 Activities – Stages 2 and 3

The Stage 2 works were completed in early 2007. A construction report was prepared by Barnson's, who provided testing and supervision services, titled "Construction Report Stage 2 Tailings Dam, Tritton Copper Mine, Straits Tritton Resources Limited" ref 10265, dated December 2007. As constructed details are presented in Appendix D.

Stage 3 embankment design is presented in Coffey's document, dated March 2007 while the scope of works is dated June 2007. Approval for Stage 3 construction was received from the DSC in late 2007. Stage 3 works commenced in early December 2007 and were completed in mid-2011. By the end of 2007, the main embankment had been raised by only 0.3m, while the northern saddle embankment raising had been raised by approximately 0.5m.

3.7 2008 Activities – Stage 3

Embankment raising by 2m to RL264.0m was continuing, the spillway invert was raised to RL263.0m, the decant trench was backfilled with low permeability clay materials and new areas of the tailings dam floor were covered with low permeability clayey material. The Stage 3 works in 2008 were under the supervision and testing regime of Tritton and Barnson personnel.

3.8 2009 Activities – Stage 3

New areas of the tailings dam floor were covered with compacted low permeability clay material; and construction of the Western Saddle Embankment to RL264.0m was completed. The downstream batter slope of the main embankment was seeded in mid-2009.

3.9 2010 Activities – Stage 3

New areas of the tailings dam floor were covered with low permeability compacted material, final trimming of the Western Saddle Embankment to RL264.0m was completed. An underground paste plant was constructed during 2010, it uses tailings as a feed product on a campaign basis. The plant was commissioned over the period November 2010 to mid-2011.

3.10 2011 Activities

The operations manual was revised and updated (rev 3) titled "*Straits Tritton Mines Tailings Dam 1 Operations and Maintenance Manual & DSC Emergency Action Plans Tritton Copper Mine*", Rev 3b dated 5 October 2011.

During 2011 the following activities were completed: Final trimming of the western saddle embankment, Stage 3 footprint areas were cleared of vegetation and topsoil and covered with low permeability compacted materials, refer to the plan presented in Appendix D.

The Stage 3 construction report was issued by Barnson's dated October 2011. The report was acknowledged by the DSC in correspondence dated 18 January 2012. A hydrogeological assessment was completed by SMEC, titled "Groundwater Assessment and Management Plan, November 2011". A new recovery bore PZH011 was installed on the southern abutment, west of the main embankment with an associated causeway. A long causeway was constructed to PZH012 as it was located inside the dam and was surrounded by tailings and water.

3.11 2012 Activities

Stage 4 construction activities commenced in late 2012, comprising vegetation and topsoil clearing and stockpiling, and an existing topsoil stockpile was relocated. The Stage 4 design report was submitted to the NSW DSC in mid-2010, with acknowledgement from the department received by Straits Tritton on 9 November 2010. The DSC made particular comment on the requirement of an Engineer's "Dam Construction Certificate", and the provision of a construction report containing as built drawings and photographs. The DSC also emphasised the need for appropriate construction supervision, with this is being undertaken by representatives from Straits, Neill's and Barnson's.

A detailed groundwater assessment was undertaken by EES to obtain information in respect to EPA amended licence conditions (U1) requiring a Remedial Action Plan and conceptual site model to be developed. This also included the installation of additional bores during 2012.

3.12 2013 Activities – Stage 4

Stage 4 construction continued during 2013, comprising vegetation and topsoil clearing and stockpiling. A low permeability layer was placed over cleared areas. Construction of the western saddle embankment was completed by late 2013. Setting out of the main embankment and the northern abutment was also completed.

3.13 2014 Activities – Stages 4 and 5

Stage 4 construction continued during 2014. The low permeability layer was continued to be placed over cleared areas. Construction of the main embankment was completed by mid-2014. The northern embankment including the spillway were all but complete by the end of 2014. The only active work area was the western end of the northern embankment which was expected to be completed by early 2015.

Monitoring bores PZH011, PZH012 and PB002, located inside the dam, were decommissioned in June 2014 (last readings May 2014) and were sealed by The Impax Group.

During late 2014 work commenced on a small section of the Stage 5 embankments, namely in the SW corner. These works were commenced to prevent the encroachment of tailings slurry in to this potential work area.

3.14 2015 Activities – Stages 4 and 5

Stage 4 construction was completed by mid-2015 and entailed placement of the low permeability layer over cleared areas. The western end of the northern embankment was completed in early 2015. A construction report was prepared by Barnson titled "*Earthworks Quality Control Construction Report*" dated April 2015.

Confirmation of the Stage 5 embankment design to RL267.5m was received from the DSC in correspondence dated 26 October 2015. A small section of the Stage 5 embankment in the SW corner was completed in mid-2015 and was undertaken to prevent the encroachment of tailings slurry in to this potential work area.

3.15 2016 Activities – Stage 5

Stage 5 construction commenced in mid-2016, entailing the placement of a low permeability layer over cleared areas, the excavation of cut-off trenches and the placement of embankment materials. Construction was being undertaken based on Coffey's design report dated August 2015. Construction was undertaken by Neill's, with earthworks supervision shared between Tritton personnel and Neill's, while compliance testing was undertaken by Barnson's.

3.16 2017 Activities – Stage 5

The Stage 5 construction commenced in mid-2016 and was completed by August 2017. Works completed during 2017 included the placement of a low permeability layer over cleared areas, the excavation of cut-off trenches and the placement of embankment materials. Construction was undertaken by Neill's, with earthworks supervision shared between Tritton personnel and Neill's, while compliance testing was undertaken by Barnson's.

A construction report was prepared by Barnson (2017) titled *'Earthworks Quality Control Construction Report, Stage 5 Works Embankment Raising by 1.5m to 267.5 Tailings Dam 1'*. During 2017 a geotechnical investigation of TD1 was undertaken that included electric friction cone probing, tailings sampling and specialist laboratory testing.

3.17 2018 Activities – Stage 6

The Stage 6 and 7 design report, prepared by CMW Geosciences, was submitted to the regulators on 5 March 2018 by Aeris Resources, the document was acknowledged by DSC on 21 March 2018. Stage 6 construction comprising a 2.5m lift to RL 270.0m, commenced in October 2018 concentrating on the northern and western sides of the facility. Works commenced include embankment crest preparation, cut off excavation and material placement. Construction was undertaken by Neill's, with earthworks supervision shared between Tritton and Neill's personnel, compliance testing was undertaken by Barnson's.

The downstream batter of the western saddle embankment was reprofiled and seeded in late 2018.

3.18 2019 Activities – Stage 6

Stage 6 works continued during 2019 along the northern ,eastern (main embankment) and western sides of the facility. These walls were within 300mm of design height and were awaiting final trim and gravel placement. Works were suspended in mid-November 2019 due to the severe drought, resulting in a lack of suitable water. General photos are present in Appendix A. Construction was

undertaken by Neill's, with earthworks supervision shared between Tritton and Neill's personnel, compliance testing was undertaken by Barnson's.

3.19 2020 Activities – Stage 6

Stage 6 works recommenced during mid 2020 when sufficient water was available and the contractor became available to complete the works. Work included gravel sheeting and the raising of the northern "spillway" embankment, windrows and pipe installation.

Other activities included an ARCADIS report dated 27th May 2020 requesting a variation to the EPA Licence in respect to the frequency (change to annually) of water sampling and testing from nominated piezometers PZH0001 to PZH023. DnA Environmental Rehabilitation Monitoring Report dated April 2021 covering in part the progress of rehabilitation to the tailings dam embankments. Revision for the Operations Manual and associated documents by CMW Geosciences.

3.20 2021 Activities – Stage 6

No construction activities were conducted on TD1 during 2021. Stage 6 was completed in December 2020 and Stage 7 is planned for commencement in 2022.

A construction report was prepared by Barnson (2021) titled *'Earthworks Quality Control Construction Report, Stage 6 Works Embankment Raising by 2.5m to 270.0 Tailings Dam 1'*.

Sources of tailings were a combination of ore from Tritton underground (estimated 70%) and satellite deposits (estimated 30%). There was reduced demand for fine aggregate for underground paste fill at the Tritton mine. Deposition of tailings was conducted at locations all around the TD1 perimeter to maintain an even filling of the TD. Extensions of the spigot lines were used to extend the exposed tailings beaches into the TD, particularly on the eastern side.

3.21 2022 Activities – Stage 7

Stage 7 construction was commenced in April 2022.

Sources of tailings were largely a combination of ore from Tritton (65%) and Murrawombie (35%) underground mines. Deposition of tailings was conducted at locations all around the TD1 perimeter to maintain an even filling of the TD. Extensions of the spigot lines were noted to extend over the exposed tailings beaches, on the eastern and north eastern sides of TD1.

4 INFORMATION PROVIDED

The following information and data pertaining to the compilation of this review was provided by Tritton Mine site personnel.

- Copies of Tritton generated dam monitoring information, levels of decant water pond and, daily and monthly inspection records (Word file 'Surveillance Info(2022)').
- A DXF file of a recent TD1 survey showing beach contours (file name 'Tritton Site TSF Contours 2021)'.
- Monitoring bore information including water levels and water quality for 2022 in 7 PDFs.
- Production tonnages and water return figures for 2022.
- Site Rainfall data for 2022 in a spreadsheet.
- Dams Safety NSW (2022), *'Audit Report Aeris Resources'*, rev 1, dated 21 November 2022.

Some previously supplied documents provided by Tritton Resources have been referenced to update this report. The following documents were provided as part of the 2021 review.

- Document titled, '*Determination of Development Application under Section 91 of the Unamended Environmental Planning and Assessment Act 1979*', including *'Conditions of Development Consent'*.
- NSW EPA, Licence 11254, Licence Variation, dated 8 June 2021.
- Barnson (2021) report titled '*Earthworks Quality Control Construction Report, Stage 6 Works Embankment Raising by 2.5m to 270.0 Tailings Dam 1'*.

4.1 Tailings Production

The ore being treated is primary ore sourced from the underground operations, the specific gravity of the ore averages 3.0. Production figures for the 2022 calendar year are outlined in the following sections. The total dry tonnes of tailings production was advised to be 1,283,451 (dry) tonnes. Discharge to the tailings dam totalled of 1,048,944 (dry) tonnes of solids or 82% of tailings production, the remaining 234,507 (dry) tonnes (18%) was directed to the paste plant for use underground. Table 2 summarises tailings production information since the commencement of operations in 2005.

Table 2 - Tailings Production Parameters						
Year	Ore Production (tonnes)	Tailings Solids to Tailings Dam (tonnes)	Cumulative Tailings Solids to TD (tonnes)	Average Slurry Density (%)	Estimated Water Tonnage (tonnes)	Estimated Slurry Weight (tonnes)
2005	715,364	675,598	675,598	45	825,731	1,501,329
2006	818,460	727,038	1,402,636	50	727,038	1,454,076
2007	733,637	659,193	2,061,829	62	404,022	1,137,659
2008	886,676	804,925	2,866,754	62	493,341	1,298,266
2009	915,792	823,113	3,689,867	64	463,001	1,286,114
2010	971,258	892,801	4,582,668	67.6	465,514	1,358,315
2011	1,260,465	958,022	5,540,690	63	562,647	1,520,670
2012	1,242,496	875,870	6,415,560	62	536,824	1,412,694
2013	1,415,264	862,434	7,277,994	63	528,588	1,391,022
2014	1,538,480	1,156,629	8,434,623	64	650,604	1,807,233
2015	1,664,072	1,085,803	9,521,426	63	637,694	1,723,497
2016	1,657,133	1,134,544	10,656,070	62	637,694	1,723,497
2017	1,351,050	797,312	11,453,382	61	509,757	1,307,069
2018	1,629,231	938,024	12,391,306	62	574,918	1,528,979
2019	1,672,226	1,061, 504	13,452,810	63	623,423	1,684,927
2020	1,591,240	975,350	14,428,160	63	572,824	1,548,174
2021	1,550,539	1,114,820	15,542,980	62	683,277	1,798,097
2022	1,370,759	1,048,944	16,591,924	61	670.636	1,719,580

The tonnage of tailings solids deposited into the dam, from the time of commissioning, in December 2004, has been estimated at 16,591,924 dry tonnes. The paste plant was commissioned in 2011, a variable percentage of tailings are directed to the paste plant in campaigns. When the plant is not operating the full tailings stream is sent to the tailings dam, when the paste plant is operating small tonnages (volumes) of tailings are sometimes directed to the tailings dam.

5 SITE REVIEW

5.1 General

The site visit was undertaken on Wednesday 8 February 2023 by a CMW Senior Principal Tailings Engineer. The review involved a visual assessment of the TD1 dam and a walk over review of specific areas and the containment embankments (main, southern, northern and western), downstream batter slopes, downstream toe areas, spillway, spigotting operations, the water recovery systems and discussions with site personnel. Reference should be made to the photographs, presented in Appendix A, as figures A1 to A8.

The findings of the surveillance review are based on a visual review of the facility on the date specified above, site discussions and an assessment of information provided by the mine, the findings of the review are presented in the following sections of this report and are also summarised as bullet points in Section 1.1. Conclusions and recommendations are presented in Sections 11 and 12, respectively.

5.2 Main Valley Embankment

Tailings Dam 1 (TD1) is a valley type facility and was formed in Stage 1 by the construction of the main valley embankment.

No notable edge or embankment cracking was observed along the main embankment crest or the intermediate berm. No visual signs of distress in the form of slumping or cracking of the downstream batter slopes was noted where these areas were reviewed.

Rill erosion was noted on the upper and lower slopes of the embankments (i.e. above and below intermediate benches). Several gullies and shallow erosion tunnels (which have partially collapsed) were noted emanating from the main embankment intermediate bench in the north east section of the facility. Erosion was less apparent along the remainder of the main embankment and other embankments.

The intermediate berm has small bunds to limit water flow parallel to the wall. The intermediate berm has a downstream edge safety bund which is locally eroded. Some rip-rap armoured channels have been constructed to control water flows from the intermediate berm. These treatments have been only partially successful as water flows by-pass some of these structures (refer photos on Figure A7).

Piezometers on the wall were observed to be in good order and capped. Some piezometers surrounding the TD were observed and were also in good order and capped.

5.3 Northern and Western Embankments

Construction of the northern saddle embankment commenced as part of Stage 2 works and includes the spillway which traverses the embankment at right angles. Embankment construction works were in progress, refer to photos on Figure A5. The embankment was approaching the Stage 7 level of RL272 m.

The road crest through the spillway forms a smooth depression as designed. The tailings level at the spillway was lower than the adjacent spillway invert as expected and outlined by the operations manual. Based on survey provided by Aeris, there is approximately 3.7 m of freeboard from the decant pond to the spillway level (RL269.0m).

Construction of the western saddle embankment commenced in 2010 as part of Stage 3 works and was completed in early 2011. This embankment crest at the time of the site visit was between the RL 270.0 m (Stage 6 crest level) and RL272.0 m (Stage 7 crest level).

The water dam at the toe of the western wall is separated from the TD1 embankment by a berm formed at the level of the external roadway. The water level in the dam was well below the roadway level.

A small water dam is present to the northwest of the TD. The dam is separated from the toe of the TD by the external perimeter road.

5.4 Southern Embankment

Since the last annual review, a new embankment has been constructed on the southern side of TD1 to provide for future containment of tailings. The embankment crest was at the Stage 7 level of RL272 m ((refer photos on Figure A4).

5.5 Erosion Management

During 2018, an erosion and sediment control procedure was developed specifically for the tailings dam, the August 2018 document is titled "Erosion and Sediment Control Procedure – Tritton Tailings Dam 1 – Management Recommendations". The document comprises tabulated information under the following four headings Background and Scope – Management Objectives – Implementation – Reporting. It was advised that the following actions were implemented based on the development of the Procedure:

- Construction of perpendicular small intermediate berms at 100m centre along the downstream berm of the main embankment;
- Geotextile and rock protection to areas of observed erosion; and
- Use of jute mesh and coir logs to assist in sediment control.

Various erosion control trials are evident on parts of the outer wall of the TD. Where these trials include solid objects, such as logs or coir rolls it was observed that local increase of water velocity around the objects had led to minor local scouring.

5.6 Monitoring Bores and Piezometers

Numerous piezometers and monitoring bores have been installed to allow groundwater levels to be monitored. The original bore installations (PZH001 to PZH010) were located in areas outside any intended tailings inundation areas. Additional bores (PZH011to PZH019) have since been installed around the facility. Three additional piezometers were installed in the main embankment in 2022 (numbering to be confirmed).

Of note, bores PHZ011 and PZH012 were installed inside the dam and were decommissioned, due to access issues, in May 2014 following confirmation from the EPA. These two bores were sealed and are now covered by tailings. As a regular maintenance regime, instruments should be checked for missing or damaged caps and replaced, as necessary. Several bores are shown on Figure A3.

5.7 Future Embankment Raising

To date, Stages 1 to 6 have been constructed achieving a crest level of RL270.0m (Stage 6) and Stage 7 to RL 272.0 m is progressing. It is noted staged construction (Stage 7) has been approved by the EPA to RL 272.0. Table 3 summarises completed and planned staged embankment construction activities.

Table 3 - Staged Construction

	Stage 1-Starter	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6	Stage 7
RL	RL260.0 completed	RL262.0 completed	RL264.0 completed	RL266.0 completed	RL267.5 completed	RL270.0 completed	RL272.0
Period of Const'n	2004	2006/ 2007	Late 2007/ Early 2011	Mid 2014 to mid-2015	2016 to 2017	Oct 2018 to Dec 2020	Commenced April 2022

It is understood that Stage 7 construction is planned for completion in the 3rd quarter of 2023.

The Tritton mill and TD are strategically located for future mining in the district. It is understood that conceptual plans for future vertical or lateral expansion of the TD facility are being considered.

5.8 Water Recovery

5.8.1 Tailings Dam Surface Water Recovery System

Water liberated from the deposited tailings slurry is recovered via a floating pump located in the water recovery pond, refer to Figure A1. The float pump was located on the southern side of the decant access road. Recovered water is returned to the processing plant for reuse.

The decant pond appears to be larger in size compared to previous reviews, likely due to recent rainfall. The estimated decant pond area was between 1.5 and 2 ha. Decant water appeared clear. The decant access roadway has partially been raised except for the last 80 m or so.

The mine advised that a total of 276,740 m^3 (133,840 m^3 in 2021) of water was recovered via the pump system for reuse (mainly to the processing plant). Based on a calculated slurry water inflow of 670,636 m^3, the annual recovery was assessed at 41.3 %, i.e. water returned to the plant as a percentage of total water contained in the discharged tailings slurry. This compares to previous value of 19.6 % in 2021. It is understood that 2022 was a relatively wet year in central NSW (2022 recorded rainfall 487 mm, which is above average).

5.8.2 Return Water Sump

An underdrainage interception system was installed as part of the original construction. This system comprises two lines of slotted pipes surrounded by gravel which have been placed parallel to the inside toe of the main embankment and extend part way up either abutment. One pipe is located on natural ground while the other is located in a shallow trench. Collected water flows by gravity to the lowest point in the valley floor. At the low point, these pipes are connected to a solid pipe which is located under the main embankment that discharges water by gravity into a large diameter concrete sump located near the downstream toe of the main embankment (refer to Figure A2).

The underdrainage sump and pump structure were observed. Anecdotally, the underdrainage flow rate has increased when compared with recent previous surveillance reviews. Clear underdrainage water was observed flowing into the sump (refer Figure A3). Collected water is pumped over the main embankment and is discharge some distance from the embankment onto the tailings beach.

Flow rates and water clarity should be checked regularly (visually) and any significant changes referred to the designers for comment or assessment.

Toe drains located downstream of the main embankment direct any collected water (to date only rainfall) into the return water sump. The drains have recently been reprofiled and cleaned out. One of the drains needs to have its invert raised (backfilled with compacted clay) so water can flow by gravity into the (concrete) sump.

5.9 Tailings Beaches

Cyclic deposition is undertaken in a methodical manner and is managed to maintain the water pond around the pump recovery area. The high SG of the tailings has resulted in the formation of relatively steeply sloped beaches that slope away from the embankments towards the water recovery point. The beach slopes varied between 0.83% and 1.6% (average slope 1.2%) was determined based a 2021 contour survey.

5.10 Spigotting

The tailings delivery line is welded with Victaulic couplings and spigot off-takes tees located at regular intervals with a single emergency discharge point located at the southern end of the line near the main embankment. The tailings discharge arrangement comprises valved off-takes that are opened and closed in a systematic and cyclic manner to change the active discharge points.

Due to the steep beach slope infilling of the available storage area is further optimised by extending the spigot pipelines out over the tailings beach, with the line supported on empty 200 litre drums. This activity is an operational consideration in optimising the storage capacity of the facility by extending the storage life and extending the time frame between each embankment lift.

It is apparent that spigotting (deposition) has been undertaken in an acceptable manner due to the presence of well-formed sloped beaches and the fact the water pond was located away from the perimeter embankments and at the decant location. Spigotting was being undertaken from the northern side of TD1 around the time of the site visit, however deposition ceased during site reconnaissance due to plant shutdown.

5.11 Seepage

There were no visible signs of near surface seepage in the areas downstream of the embankments, in the way of seepage flows, wet or damp areas, soil discolouration, distressed or dead vegetation. Downstream areas are shown in some of the photographs which also show a variable coverage of vegetation.

5.12 Freeboard

The freeboard is the height difference between the embankment crest, the tailings beach level and the operating water level at the decant (water recovery point). Freeboard comprises four components which are represented schematically on Figure 5 of this report.

The mine has installed marker pegs adjacent to the embankments marking a 300mm encroachment height limited below the embankment crest so operators can more easily assess tailings deposition limits.

The following relating to TD1 freeboard has been assessed based on information provided to CMW by Aeris:

- Embankment crest RL270.0 m – Stage 6 level (Stage 7 construction in progress).
- Spillway invert RL269.0 m.
- Tailings beach level varies.
- Water level at the water recovery point was calculated at RL 265.3 m.
- Based on this information the Total Freeboard has been calculated at 4.7 m.
- Noting the EPA Licence requires a minimum freeboard of 1m.

Please note the mine has added 5,000 m to the local RL due to underground mining activities which may be present on some survey information.

The rainfall freeboard requirement, based on the ½ PMP rain event has been estimated at 0.26m. Rainfall collection into the tailings dam is by incident rainfall over the dam area. It has been estimated that the ½ PMP event will produce a water pond approximately 0.8m deep due to the sloped nature of the tailings beaches. The dam has a varying capacity dependent on the tailings filling rate and currently has sufficient capacity to contain the nominated PMP event.

The design includes a spillway which has been provided to allow excess water accumulations to be discharged such that the main embankment and the northern and western saddle embankments are

not overtopped. A summary of the freeboard criteria and the current status of the tailings dam at the Tritton Mine are outlined in Table 4.

Table 4 - Freeboard Criteria

	Beach Freeboard	Operational Freeboard	Environmental Containment Freeboard	Total Freeboard
DSC requirement	72 hour storm or 0.2m	0.3m	72 hour storm or 0.2m	AEP event
Status February 2023	4.0 m	0.3m	4.4 m	4.7 m
Operational freeboard:- At the main embankment, the tailings were higher compared to the invert level at the spillway. No issues are envisaged with this situation due to overall total freeboard.				

5.13 Spillway

TD1 is now surrounded by perimeter embankments and the catchment reporting into TD1 is from incident rainfall only. The tailings dam has an incident catchment area of 136 ha (RL270.0m). The estimated inflow volume from a 0.5 probable maximum flood (PMF), 3 hour event (0.26 m), assuming a runoff coefficient of 1.0 has been determined at 353,600 m^3. Based on these figures at least 4 (four) 0.5 PMF events can be stored on TD1 before any spillway discharge would occur.

The current spillway is located through the northern embankment. The spillway has been designed to pass a 0.5 PMF event and has a design capacity of 14 m^3/sec.

The final intended location of the spillway is on the southern/eastern side of the dam excavated through natural ground, refer to the Stage 6 and 7 Design Report.

5.14 Design Rainfall Events

Rainfall design information was provided by the Bureau of Meteorology Hydro-meteorological Advisory Service, Melbourne (BMHAS).

The dam and spillway have been designed to contain and discharge flood events of at least the ½ PMP event. To model this both IDF curves and PMP rainfall event calculations were obtained from the Bureau of Meteorology Hydro-meteorological Advisory Service and confirmed by calculation.

The 1 in 100 year ARI (average recurrence interval) 72-hour rainfall event equates to 191 mm of rainfall. This amount of rain could produce a maximum volume of water assessed at 259,760 m^3 assuming a conservative runoff coefficient of 1.0 over the full area of the catchment (136 ha). The 3 hour ½ PMP event indicates a rainfall of 260 mm thus a total of 353,600 m^3 of water could be expected to accumulate from this rainfall event assuming a runoff coefficient of 1.0. A rainfall event of this severity (PMF event) would cause major flooding and disruption to the surrounding area. Based on recent survey (refer Figure 7) the estimated available capacity was assessed to be approximately of 1,661,300 m^3 (to 0.3 m below spillway) which is currently sufficient to contain the above PMP event, noting this is not a volume available for tailings storage due to freeboard requirements.

Based on the above information it has been recommended that the dam be operated with a minimum operational freeboard of between 250 mm to 300 mm to adequately contain the projected ½ PMP rainfall event. This 250 mm freeboard is in addition to the water storage capacity available in the depressed cone area surrounding the water recovery point, refer also to section 5.8. The recent survey confirms there is adequate freeboard capacity. It should be further noted that the design spillway invert is 1.0 m lower than the embankment crest.

It was advised that the site can typically expect 2,000 mm of evaporation during the year with monthly figures ranging from 40 mm in the winter period to 350 mm in summer.

6 TAILINGS PROPERTIES

6.1 2006 Review

As part of the 2006 design review, hand held pocket penetrometer tests were undertaken along the beach area adjacent to the main embankment. Only those areas where safe access was available were tested, which ranged from dry hard areas to soft damp areas. The values obtained were used to assist in determining or confirming strength parameters for the stability analyses that were undertaken for the Stage 3 design report reference Coffey "*Design Report – Stage 3 Tailings Storage Facility 1 Tritton Resources Limited"* dated March 2007, reference MH00100AD Rev 1.

The penetrometer results obtained, ranged from 0.75kg/cm^2 in areas of recent deposition that had only partially dried to 4kg/cm^2 in areas where dried tailings beach areas were present, noting that overnight rain had wet all beach areas. The mine regularly relocates the tailings slurry deposition point away from the embankment prior to the commencement of any staged construction to allow all tailings areas to dry and gain strength.

The mine also sample and test the tailings discharge in respect to grading. A 2006 averaged particle size distribution indicates a P_{60} of 33µm, P_{70} of 57µm a P_{80} of 91µm and a P_{90} of 147µm. These values are consistent with the design values estimated prior to commissioning. Two tube samples were obtained from the beach area near the main embankment in January 2007. Test results are summarised in Table 5.

Table 5 – 2007 Tailings Laboratory Results

	Sand fraction > 75 microns	Silt/ clay fraction < 75 microns	Dry Density	Cohesion	Phi
Tube 1	34%	66%	1.72t/m^3	3kPa	20.5°
Tube 2	25%	75%	1.87t/m^3	5kPa	22.5°

The laboratory gradings are within the limits advised for average particle sizes measured as a discharge from the processing plant with due allowance for segregation when the tailings are deposited. The strength parameter information supplemented existing information and was used in the Stage 3 design assessment. The previous stability analyses use a lower cohesion value but a higher phi value for the tailings.

6.2 Stage 6 and 7

A geotechnical investigation was performed by Barnson Pty Ltd in September 2017, which was based on a scope prepared by CMW Geosciences Pty Ltd, setting out minimum requirements. The investigation comprised the following:

- Sampling of existing borrow areas comprising Sheather's Pit, Yarran Pit and Existing Dam Stockpile;
- Undisturbed tube sampling of in-situ tailings from the tailings beaches adjacent to the CPT probe locations (i.e. at the surface of the tailings);
- Laboratory testing comprising: particle size distribution (PSD) tests, standard compaction (SMDD) tests, undrained triaxial tests, Atterberg limits determinations, laboratory constant head permeability tests and moisture content tests; and

- Truck mounted Cone Penetration Testing (CPT) through the deposited tailings stored in TD1 at 6 locations.

The CPT testing was conducted by Probedrill Pty Ltd based on a CMW Geosciences scope. The CPT results and interpretation of the CPT results are referenced or included in Section 8 of this report. The results of the CPT testing indicated the tailings were typically soft to firm silty sands / sandy silts with intermittent layers of firm to stiff clayey silt / silty clay.

The results of the classification tests on the tailings samples indicated the samples were a non-plastic sandy silt.

The results of the consolidated undrained triaxial testing on the tailings materials gave an average of the results of cohesion, 0 kPa and angle of internal friction of 37.2^{o}. An inferred angle of internal friction of 30^{o} from the CPT probing was utilised in stability analyses. From the triaxial testing of undisturbed tube samples of near surface tailings, the dry densities varied between 1.60 t/m^3 to 1.89 t/m^3 with an average of 1.73 t/m^3 (i.e. similar to densities recorded in previous sampling and testing regimes in 2007).

7 GROUNDWATER MONITORING

As part of the start-up operation of TD1, four (4) monitoring bores were installed at various locations around the perimeter of the dam at the completion of the Stage 1 embankment in mid-2004, which was before the dam was commissioned in December 2004. Three embankment piezometers (PZH005 to PZH007) were installed in May 2007.

A further five (5) piezometers/bores (PZH008 to PZH012 and PB001) were installed in September 2007. PZH013, PZH014 and PZH015 were installed in 2010, while PZH016 and PZH017 were installed in 2011/2012. A pumping bore (PB002) was installed in 2011 near PZH011.

PZH006 and PZH007 have shallow holes drilled adjacent to them, extending to a depth of at least 15m. Bores located in the valley immediately downstream of the main embankment include PZH010, PZH002, PZH013 and PZH015, refer to Figure 4. Bores PZH001 and PZH003 are also located adjacent to the main embankment but on the northern and southern abutments, respectively.

Three additional piezometers were installed in the main embankment in 2022 (Numbers PZ5, PZ6 and PZ7).

A total of twenty (20) monitoring bores are read, the approximate locations are shown on Figure 4. No bores are now pumped based on approvals from the regulators. Installation details are summarised in Table 6.

Table 6 - Monitoring Bore Installation Information							
Bore number	Easting	Northing	RL(m)	Depth (m)	Year Installed	Initial water level (RLm)	Initial water level-depth (m)
PZH001	474,405* (31,753)	6,528,393 (20,800)	264.487 (5,262)	90	2004	186.84	Dry*
PZH002	474,614* (31,915)	6,528,016 (20,420)	254.412 (5,262)	90	2004	186.66	61.5
PZH003	474,838* (31,980)	6,527,350 (19,665)	267.995 (5,267)	90	2004	181.50	Dry*
PZH004	473,302* (30,540)	6,527,591 (20,180)	269.521 (5,267)	90	2004	187.47	Dry*
PZH005	474,471	6,528,181	264.784	N/A	2007	230.68	34.17
PZH006D	474,548	6,527,994	264.588	N/A	2007	214.97	49.65
PZH006S	474,548	6,527,994	264.588	N/A	2008	248.12	16.34
PZH007D	474,625	6,527,811	264.817	N/A	2007	195.40	69.45
PZH007S	474,625	6,527,811	264.817	N/A	2008	252.71	12.66
PZH008	474,364	6,528,516	262.422	100	2007	202.28	60.22
PZH009	474,315	6,528,385	263.016	100	2007	211.06	52.02
PZH010	474,517	6,528,212	258.169	100	2007	207.20	51.05
PZH011D	474,490	6,527,559	264.205	100	2007	225.73	38.17
PZH011S	474,490	6,527,559	264.205	4.5	2007	Dry	Dry
PZH012	474,490	6,527,559	264.205	100	2007	200.20	38.17
PZH013	474,683	6,527,976	254.609	40	2010	Dry	Dry
PZH014	474,579	6,528,579	256.722	73	2010	197.10	59.62
PZH015	474,813	6,527,889	256.081	73	2010	187.93	68.15
PZH016	473,598	6,527,569	N/A	N/A	2012	N/A	N/A
PZH017	473,742	6,527,949	N/A	N/A	2012	N/A	N/A
PZH018	474,137*	6,528,676*	N/A	N/A	2012	N/A	N/A
PZH019	474,700*	6,526,889*	N/A	N/A	2012	N/A	N/A
PZH020	N/A	N/A	N/A	N/A	2012	N/A	N/A
PZH021	474,724*	6,528,613*	N/A	N/A	2012	N/A	N/A
PZH022	472,786*	6,526,984*	N/A	N/A	2012	N/A	N/A
PZH023	473,480*	6,525,879*	N/A	N/A	2012	N/A	N/A
PB001	474,396	6,528,406	263.920	110	2007	N/A	43.78
PB002	474,491*	6,527,527*	N/A	N/A	2011	N/A	N/A

Note:
(*) – Dry but the holes were moist and natural ingress of water may have occurred with time after their installation, rather than them being affected by seepage from the tailings dam.
(#) – Digitised (approximated) from bore location map (EES, 2013) and map received 4 February 2016.
N/A – Information not available to CMW.

Table 7 provides a broad summary of the general location of the bores (piezometers) in respect to the orientation of the TD.

Table 7 - General Monitoring Bore Location

Southern Abutment	Below Main Embankment	Northern Abutment	In Main Embankment	West side of TD	South side of TD	Comments
PB002#	PZH002	PB001	PZH005	PZH004*	PZ019*	(*) - Some distance from the tailings dam (TD)
PZH003	PZH010	PZH001	PZH006S	PZH012#		
PZH011S#	PZH013	PZH008	PZH006D	PZH016		(#) - decommissioned in June 2014
PZH011D#	PZH015	PZH009	PZH007S	PZH017		
		PZH014*	PZH007D	*		
		PZH021*				

Notes are as per Table 6

During 2022, groundwater levels and groundwater quality were measured on a quarterly basis. An assessment of the monitoring bore water level and quality information is presented in the following sections.

7.1 Water Levels

In 2022, water level readings were taken in 17 monitoring points located in the vicinity of the tailings dam. Tabular and graphical plots covering 2022 are presented in Appendix B. Water level trends for the bores are summarised in Table 8 for the 2022 calendar year, while historical trends since installation are summarised in Table 9. The three additional piezometers installed in the main embankment in 2022, were all dry (this data does not appear in Table 8 and 9).

7.1.1 Groundwater Trends for the 2022 Calendar Year

Table 8 outlines trends determined for water level changes determined for the 2022 calendar year.

Table 8 - Water Level Changes - 2022 Calendar Year			
Monitoring Bore Number	Nov/Dec 2021 Reading (mbgl)	Nov/Dec 2022 Reading (mbgl)	Water Level Change During 2022 (m)
PZH001	9.18	8.04	+1.14
PZH002	34.42	25.42	+9.0
PZH003	62.86	58.72	+4.14
PZH005	14.13	8.59	+5.54
PZH006D	38.15	31.59	+6.56
PZH007D	42.39	35.11	+7.28
PZH008	17.22	14.97	+2.25
PZH009	12.83	10.74	+2.09
PZH011	decommissioned	decommissioned	N/a
PHZ012	decommissioned	decommissioned	N/a
PZH013	-	36.59	-
PZH014	46.24	42.57	+3.67
PZH015	50.39	48.62	+1.77
PZH017	43.07	39.96	+3.11
PZH018	20.62	13.74	+6.88
PZH019	93.76	92.07	+1.69
PZH020	73.27	71.03	+2.24
PZH021	48.27	44.94	+3.33

Note: N/a – Not applicable, mbgl = metres below ground level

The following water level trends have been assessed for the period December 2021 to December 2022.

- No groundwater level falls were recorded in the bores over 2022.
- All bores recorded groundwater level rises over 2022. The largest water level rise during 2022 was +9 m in PZH002 which is located downstream of the main embankment. The water rise in PZH001, which is located in the northern abutment of main embankment, was +1.14 m (i.e. rate of rise in this bore had slowed over 2022) .
- The other piezometers located in the main embankment PZH005 and PZH006 all recorded water level variations over 2022 between +5.54 m (rise) and -+6.56 m (rise), respectively.
- The three recently installed piezometers on the main embankment at RL270 m were all dry to their installed depth of 15m.
- The closest water level to the surface was recorded in PZH001 at 8.04 m (which is located near the main embankment northern abutment), while the deepest measurement was recorded in PZH019 at 92.07 m.

- PZH002 is located downstream of the main embankment (refer to Figure 4) in the lowest point of the valley. The groundwater table in this bore was recorded at 25.42 mbgl (34.421 mbgl in 2021). During the year, the water level records indicated a water level rise of +9.0 m. It was noted that previous years recorded falls in water level (fall of -0.31 m in 2021).

Groundwater reviews were previously undertaken by Earth Environmental Science (EES) in 2012 and 2013. The latter report (EES) concluded that groundwater migrates in an easterly direction. Mounding is restricted to the TD footprint with a sharp gradient to the east. The 2022 water level monitoring data indicated water level rises in all instruments, it is suggested that a review be undertaken in respect to the recommencement of pumping from selected instruments.

7.1.2 Trends since Installation (variable dates) to 2022

Table 9 outlines historical trends determined for water level changes since regular readings were commenced which in some bores was March 2005 (or when installed) to December 2022. The following historical water level trends are noted.

- Overall groundwater level rises have been recorded in the all the bores.
- The largest water level rise since installation has been recorded in PZH001 of + 68.47 m (noting that the groundwater was at 8.04 mbgl in December 2022). The water level has risen in the bore during both 2021 and 2022.
- Previously PZH020 was the only bore that had recorded a fall since installation. This bore has now recorded a small rise in level since installation of +1.08 m. The groundwater levels observed at PZH020 are likely to be representative of deeper groundwater regime that may not be connected hydraulically to the upper groundwater regime situated underneath the tailings dam.

Table 9 - Water Level Changes Since Installation			
Monitoring Bore Number	Initial Reading (m)	Nov/Dec 2021 Reading	Change (m) Since Installation to Nov/Dec 2022
PZH001	77.65 (03/2005)	9.18	+69.61
PZH002	61.5 (03/2005)	34.42	+36.08
PZH003	86.5 (03/2005)	62.86	+27.78
PZH005	34.17 (06/2007)	14.13	+25.58
PZH006D	49.65 (06/2007)	38.15	+18.06
PZH007D	69.45 (06/2007)	42.39	+34.34
PZH008	60.22 (10/2007)	17.22	+45.25
PZH009	52.02 (10/2007)	12.83	+41.28
PZH011	38.17 (10/2007)	decommissioned	N/a
PZH012	62.01 (10/2007)	decommissioned	N/a
PZH014	59.62	46.24	+17.05
PZH015	67.15	50.39	+18.53
PZH017	77.86 (09/2012)	43.07	+37.9
PZH018	37.059 (01/2013)	20.62	+23.32
PZH019	102.08 (09/2012)	93.76	+10.01
PZH020	72.115 (01/2013)	73.27	+1.08
PZH021	60.91 (01/2013)	48.27	+15.97

Note: N/a – Not applicable.

7.2 Groundwater Quality

Routine monthly water samples are taken from the decant pond (TSW02) and process water dam (TSW09). There were four (4) rounds of groundwater sampling from fifteen (15) monitoring bores in 2022. There are no prescribed water quality criteria outlined in the regulatory guidelines which only specify that the sampling and testing regime be undertaken on a yearly basis (changed from quarterly).

The following 2022 water quality trends are summarised for the bores, and tables are presented in Appendix B.

- The lowest pH reading of 7.27 was recorded in PZH008 (03/2022), the highest reading of 8.23 was recorded in PZH019 (11/2022).
- The lowest TDS reading was 3,820 mg/l in PHZ007 (03/2022) whilst the highest reading was 19,600mg/l in PZH018 (01/2022).
- Sulphate as SO_4 2- varied between 721 mg/l in PZH007 (03/2022) to 2,810 mg/l in PZH009 (09/2022).
- Copper readings ranged from <0.001mg/l to a high of 0.306 mg/l in PZH017 (09/2022).
- Lead readings were mostly <0.001mg/l to 0.043 mg/l (PZH007, 12/2022).

The information was provided in tabular and graphical formats for the bores. The results were generally similar to recent years with no discernible trends for the analytes that were tested for the bores.

The following 2022 water quality trends are summarised for the decant water pond (TWS02).

- The pH readings ranged from 3.03 (04/2022) to 4.21 (10/2022).
- The TDS readings ranged from 3,160 mg/l (10/2022) to 8,240 mg/l (02/2022).

The decant water quality is typically characterised by a pH between 3 and 4 and a TDS of less than 6,000 mg/L.

8 STABILITY ANALYSES

8.1 Method of Analysis

Stability analyses were undertaken to assess the stability of the TD1 embankment up to an intended Stage 7, with a crest RL272.0m (i.e. 20m embankment height). The analyses were undertaken in general accordance with ANCOLD (2012). The analyses presented in the CMW (2018) Design Report were reviewed as part of this surveillance review. Note the crest is currently between RL270 m and RL272 m, the Stage 6 level and the stability analyses presented below are for a future embankment raise to the Stage 7 level (RL272.0m).

The computer software package ‘Slide’ was utilised to undertake the analyses. Slide is a two-dimensional slope stability program for evaluating the safety factor of circular and non-circular failure surfaces in soil and rock slopes. The stability of the slip surfaces for static loading was assessed using vertical slice limit equilibrium methods and simplified Bishop method.

The following cases were examined in the stability analyses:

- Case 1: Static Analysis - Downstream failure of the TD embankment, future crest level of RL272m (20m embankment height) under drained condition based on limit equilibrium method.
- Case 2: Static Analysis - Downstream failure of the TD embankment, future crest level of RL272m (20m embankment height) under undrained condition based on limit equilibrium method.

A post-seismic analysis was not required as the tailings have been assessed as non-liquefiable at the design earthquake loads. In addition, in compliance with ANCOLD (2012) and in lieu of pseudo static analyses, a deformation assessment was performed (refer Section 8.5). The phreatic surface adopted in the cases was an assumed 'worst' case phreatic surface emanating from a pond near the embankment and a saturated toe, noting that these conditions have never been experienced at the dam. The phreatic surface inferred and modelled in the stability analyses within the embankment was at least 1.5 m to 2 m above the measure level in the highest piezometer, PZH005 refer to Section 7. Furthermore, the phreatic surface inferred from the CPT plots (CPT3 and CPT4 located adjacent to the highest embankment profile) was located approximately 9m below the tailings surface (Sept. 2017).

ANCOLD (2019) was referenced with respect to earthquake design. The analyses conducted generally comply with the requirements of ANCOLD (2019).

8.2 Parameters

The parameters adopted in the analyses were based the geotechnical investigation undertaken by Barnson's (CMW scope) and the 2017 CPT data interpretation (refer to Appendix C). Table 10 provides a summary of the strength parameters used in the stability analyses.

Table 10 Summary of Strength Parameters*

Material Type	Bulk Density (kN/m³)	Undrained	Effective Strength Parameter *	
		Cohesion Su (kPa)	Cohesion C' (kPa)	Friction Angle Φ' (Degrees)
Tailings (Drained)	18	-	0	30
Tailings (Undrained)	18	40	-	-
Embankment	18.5	-	5	30
Foundation	18.5	-	25	33
Bedrock	18.5	-	25	33

8.3 Results of the Stability Analyses

The results of the stability analyses for the various cases examined are summarised in Table 11, with the computer printouts presented in Appendix C.

Table 11 - Results of Stability Analyses

Case	Factor of Safety	Recommended Minimum Factors of Safety*
1	2.14	1.5
2	1.51	1.5

*Note: Recommended factors of safety in accordance with ANCOLD (2012).

The stability analyses indicate that the cases examined have adequate factors of safety (FOS) for the drained and undrained conditions under an assumed worst case scenario (i.e. elevated phreatic surface) when compared with the recommended minimum factors of safety in ANCOLD (2019). The

actual FOS are expected to be higher than the values quoted in the above table when modelling a lower phreatic surface as inferred from current (2022) piezometer readings.

8.4 General Comments in Respect to Stability

The tailings dam has been designed to provide temporary water storage following extreme storm events. If water does extend to the embankment, which is considered very unlikely, it is anticipated this will be a temporary occurrence given 'continuous' water removal from the tailings dam. The tailings dam should be operated in such a manner as to ensure that the `normal' return water pond is kept a minimum of 200m away from the main embankment and perimeter embankments at all times.

8.5 Deformation Analysis

Figure 6 in ANCOLD (2012) provides guidance on deformation assessment dependent on whether liquefaction occurs. Based on the liquefaction assessment carried out, liquefaction of the tailings forming the foundation of the upstream embankment raises is unlikely for the design earthquake loads that have been assessed. A preliminary assessment of embankment deformation due to an earthquake was estimated using the Swaisgood (2003) method. This method utilises an empirical formula based on observed crest settlement resulting from analysed 'real' earthquakes, with no liquefaction.

Permanent displacements or settlements, expected for a 20m high embankment, were estimated for a Magnitude 6 earthquake, corresponding to a loading of 0.08g for 1 in 1,000 AEP MDE event. The MDE (or Safety Evaluation Earthquake, SEE) adopted is as per ANCOLD (2019) for Significant consequence facilities.

From the analysis, it is concluded that for the highest embankment section (worst case), the deformation due to an MDE event is likely to be in the order of 35mm. Such deformation is within acceptable criteria when compared with the operational freeboard of 300mm.

8.6 Liquefaction

8.6.1 General

Liquefaction is a complex process that typically occurs in loose, saturated coarse silt to fine grained sandy soils whereby dynamic loading, such as from an earthquake, results in the build-up of pore water pressures. When the pore water pressure exceeds the overburden stress, the effective stress reduces to zero and the soil inter-granular contact stresses reduce to zero resulting in a loss of shear strength. At this point, the soil is said to have liquefied and behaves like a fluid.

If liquefaction of the deposited tailings underlying the upstream embankment raise occurs, the reduction in saturated strength may result in failure or settlement of the upstream embankment into the liquefied tailings.

Static liquefaction can also occur in tailings storage facilities triggered by factors such as slope instability and high rates of tailings / construction rates of rise. Given the relatively low rate of construction and filling rate, static liquefaction is not considered likely to be an issue for TD1.

This section provides assessment of cyclic liquefaction occurring in the deposited tailings that provide the foundation for the upstream raise from RL 259.7 to RL 269.5.

The cyclic liquefaction assessment was carried out using Geologismiki software, CLiq, using the recent CPTU data (2017). CLiq outputs provide consistent output results by applying the National Centre for Earthquake Engineering Research (NCEER) method (Youd et al, 2001; Robertson & Wride, 1998). It also includes the latest assessment procedure developed by Robertson (2010) which is applicable to all soil types combining a check for cyclic liquefaction (sands) and cyclic softening (clays).

8.6.2 Input Parameters

The earthquake parameters relied upon for this assessment were based on a Maximum Design Earthquake (MDE) for a Significant consequence category (ANCOLD, 2012) as presented in Section 3.2. The following cases were examined for liquefaction assessment:

Case 1

- Design Earthquake Magnitude = 5.5;
- Maximum Design Earthquake (MDE), 1:475-year, Peak Ground Acceleration (PGA) = 0.06g (ref: AS 1170.4-2007) (SEE in ANCOLD 2019 is the same); and
- Phreatic surface at top of tailings (never expected to occur).

Case 2

Case 2 examined a Significant consequence category storage (refer DSC3F Guidelines).

- Design Earthquake Magnitude = 6;
- MDE, 1: 1,000-year, Peak Ground Acceleration (PGA) = 0.08g (ref: AS 1170.4-2007); and
- Phreatic surface at top of tailings (never expected to occur).

Case 3

Case 3 examined a Significant consequence category storage (refer DSC3F Guidelines).

- Design Earthquake Magnitude = 6;
- MDE, 1: 1,000-year, Peak Ground Acceleration (PGA) = 0.08g (ref: AS 1170.4-2007); and
- Phreatic surface 4m below top of tailings, similar to stability analyses presented in Section 8. The phreatic surface from the CPT plots (CPT3 and 4 adjacent the highest embankment) was inferred to be approximately 9m below the tailings surface (Sept. 2017).

The CPT probes and thus results were performed through deposited tailings to depths of between 5m and 15m. The probes were located adjacent to the embankments around the facility in the area where future upstream embankment construction would occur. The details of the locations of the CPTU's and the results are presented in Appendix C.

8.6.3 Results

The CPT results identified that the tailings generally comprise layers of silty sand and sandy silt with intermittent layers of clayey silt and silty clay.

The FoS for liquefaction is assessed based on a ratio of the cyclic resistance ratio, determined by CPT strength profile, and the cyclic stress ratio, determined by the earthquake event.

The phreatic surface adopted in Cases 1 and 2 assumed a surface at the top of the tailings, with all tailings material been fully saturated. Case 3 assumed a phreatic surface 4m below the top-surface. Noting however that is NOT the actual case with TD1 with the phreatic surface being well below the tailings beach surface generally in excess of 12m depth or not being present at all in the tailings profile.

A summary of the liquefaction assessment results is presented in Table 12.

Table 12: Summary of Liquefaction Assessment Results					
CPTU	**Average Cone Tip Resistance, q_c (MPa)**	**Description of tailings**	**Factor of Safety for liquefaction potential (Case1)**	**Factor of Safety for liquefaction potential (Case 2)**	**Factor of Safety for liquefaction potential (Case 3)**
CPTU01	0.5 to 2.5	Soft to firm silty sand/sandy silt intermittent layers of firm clayey silt/ silty clay	>1.5	Generally >1 with several discrete layers just below <1	>1.5
CPTU02	0.9 to 3.8	Soft to firm silty sand/sandy silt intermittent layers of stiff clayey silt/ silty clay	>1.5	Generally >1 with several discrete layers just below <1	>1.2
CPTU03	2.1 to 4.9	Soft to firm silty sand/sandy silt intermittent layers of stiff clayey silt/ silty clay	>1.5	Generally >1 with several discrete layers just below <1	>1.0
CPTU04	1.1 to 3.5	Soft to firm silty sand/sandy silt intermittent layers of stiff clayey silt/ silty clay	>1.5	Generally >1 with several discrete layers just below <1	>1.0
CPTU05	0.4 to 2.5	Soft to firm silty sand/sandy silt intermittent layers of firm clayey silt/ silty clay	>1.5	Generally >1 with several discrete layers just below <1	>1.5
CPTU06	0.4 to 3.5	Soft to firm silty sand/sandy silt intermittent layers of firm clayey silt/ silty clay	>1.5	Generally >1 with several discrete layers just below <1	>1.3

Based on the results of the liquefaction assessment summarised in Table 12, the tailings material is generally considered to be non-liquefiable for the earthquake loads adopted. Only in the Case 2 'worst case' scenario, was there potential for liquefaction in discrete minor (thin) layers, with the Factor of Safety for liquefaction just below 1. It is important to highlight that for the assessment a worst-case scenario has been considered, with the tailing material fully saturated below surface level. Provided operational practices, particularly regarding water management (i.e. that water pond is located around the water recovery point well away from the perimeter embankments), as described in this TD Design Report, Operations Manual and Annual Review, are followed, it is considered the tailings underlying the proposed upstream raise have a low risk of liquefaction (refer to Case 3).

9 MANAGEMENT OF THE TAILINGS DAM

The overall management of the tailings dam was assessed as being of an adequate standard, however the documentation relating to dam safety procedures needs to be updated, refer to Section 9.1 and 9.2.

Spigotting has been undertaken in an adequate and orderly manner with a relatively even build-up of tailings immediately adjacent to the perimeter embankments. Where steep beaches have developed, the spigots off-take pipes have been extended across the tailings beach to utilise available capacity.

There was an acceptably sized water pond on the dam which assists in reducing possible seepage, the pond was located away from the perimeter embankments. Copies of inspection sheets are included in Appendix B.

There are several pipes that occasionally discharge water into the dam (the return water sump and underground water). These pipes have been extended further out onto the tailings beaches such that water flows to the decant pond.

Safety and regulatory signs have been installed adjacent to the gated entrances to the tailings dam to warn the public that access is prohibited.

9.1 Operations Manual

An operations manual has been in use since the tailings dam was commissioned in 2004. A draft operations manual was in use until November 2005. The draft document was reviewed in October 2005 by operational staff and Coffey and was updated to a finalised document to reflect actual site operational procedures. The manual covers general operational considerations as well as inspection forms which are filled out by various staff members, refer to Appendix B. The operations manual also contains an Emergency Action Plan. The following provides a summary of the operations manual revisions that have been undertaken since the commissioning of the tailings dam.

- Rev 1 was issued in Draft in 2004.
- Rev 2 was issued in July 2005.
- Rev 3a was issued May 2011 as draft.
- Rev 3b was issued in September 2011 following receipt of client comments.
- Rev 3 entailed an overall review and text revisions as required. In particular, the following changes are noted: Updating to comply with DSC guidelines and Adoption of MOP requirements and in particular water management and environmental sampling.
- Rev 4 reviewed and revised as required, dated May 2016
- Rev 5 reviewed and revised as required, dated June 2018
- Rev 6 reviewed and revised as required, dated February 2021

The Operations Manual document needs to be reviewed and changed following this surveillance review in order to address comments by NSW Dams Safety Audit, dated November 2022.

10 DOCUMENTATION REVIEW

10.1 New NSW Dam Safety Act

During 2019, there were changes in NSW dam safety legislation, which included enactment of the Dams Safety Act 2015 and new Dams Safety Regulations 2019. The legislation changes include the Tritton tailings dam, TD1.

The following additional documentation is required for TD1:

- Compile a safety management system (DSMS) document that complies with the Dams Safety Regulation 2019, Part 5. The DSMS document is an over arching document separate to the operations manual and emergency plan.
- Complete a compilation of a risk plan report. Risk assessments have been performed, however these need to be reviewed and then documented in a report (it is understood the plan needs to be completed by the end of 2025). This report will likely be compiled when design work for further raising of TD1 is performed.

10.2 Other Documents

TD1 is operated in accordance with NSW EPA licence 11254, last amended 8 June 2021. The following points were noted:

- The table in Section P1.2 stipulates the groundwater monitoring points.
- Section Q4 stipulates tailings storage facility operating conditions, including:
  - A minimum stormwater storage capacity of a 1:100 year AEP 72 hour storm event.
  - A minimum freeboard from the embankment crest to the decant pond level of 1 m.
  - The floor of TD1 to be lined with a clay layer of a permeability of not more than 10^{-9} m/s.
- Section M2 provides requirements for monitoring concentration of pollutants in monitoring bores . Frequency of monitoring is provided in a table. Note: 14 monitoring locations are monitored yearly and 5 monitoring locations are monitored quarterly.

The operation of TD1 conforms to these licence requirements.

Reference to the document on '*Conditions of Development Consent'* indicates that TD1 (Tailings Storage Facility, Section 9 to 13) is being operated and monitored in general accordance with this development consent.

11 CONCLUSIONS

There were no observations made in respect to the tailings dam that required urgent attention in that they could affect the short term integrity of the dam, however, several items do need to be actioned as outlined in the recommendations section of this report.

The Tailings Dam (TD1), at the time of the visit and review on the February 2023, was being managed adequately with respect to tailings deposition. The following comments are made:

- Records confirm that regular inspections of the dam are being undertaken by mine personnel. Random copies of inspection sheets are included with this report in Appendix B.
- Embankment raising and extensions are being undertaken in a timely manner.
- The water pond was considered to be of an acceptable size.
- Piezometer water level and water quality information has continued to be regularly monitored (refer to Appendix B). Piezometer water level and water quality information is submitted as part of Aeris' EPL and AEMR reporting regimes to several regulators.
- Provided the operations and maintenance manual procedures continue to be followed and the specified freeboard criteria is maintained, Tailings Dam 1 can be safely operated.
- All bores recorded groundwater level rises over 2022 and it was noted that 16 of 20 piezometers had readings which were the 'highest' recorded. The closest water level to the surface was recorded in PZH001 at 8.04 m (which is located near the main embankment northern abutment). The global rising of the groundwater appears to indicate ongoing groundwater mounding around TD1. The rises in water levels over the last two years appear to indicate recharge from above average rainfall but there also may be some contribution from TD1 seepage.
- There were no visible signs of seepage.

12 RECOMMENDATIONS

The following recommendations are made as part of this surveillance review:

- Water level rises were recorded in bore PZH001 and PZH005 over 2022, and continued water level rises, in time may lead to stability concerns relating to the northern section of the main embankment. (Re-iterated for last year) It is recommended that the RAP document be reviewed by a hydrogeologist to assess whether pumping be recommenced from PB001 to assist in controlling the rate of rise of the ground water table, or to assess if pumping at other locations may be required.
- The points raised by the government audit which are still outstanding should be actioned in a timely manner. The points raised (pertain to procedural matters rather than safety issues).

The following comments are provided on the status of recommendations from last year's review.

- Erosion control trials should continue, however, the use of solid objects (i.e. erosion protection devices should be free draining) with potential to promote scouring should be avoided. In the rehabilitation of embankment slopes observation of the embankment face during inspections should be considered. No changes to the erosion and sediment control procedure are required at this stage. *CMW comment: No action required at this stage.*
- The Stage 7 embankment will pass over a current small dam on the south perimeter of the TD. Foundation preparation for Stage 7 should ensure that silt from settlement in the dam is removed and replaced with appropriate granular fill or material to comply with 10^{-9} m/s if in the floor of the dam. *CMW Comment: It was noted that a new containment embankment has been constructed on the southern side of TD1.*

- During Stage 7 construction, ensure that the spillway is maintained at the current level until the final phase of Stage 7 construction. *CMW comment: at the time of the site visit this was being maintained.*
- Future plans developed for underground mining below and near the TD should include consideration of the risk of interaction between underground workings and the TD especially any hydrogeological and hydraulic links which may provide preferred flow paths for slurry water. This should also include a review of the location of any exploration, sterilisation and monitoring bore/piezometer boreholes. *CMW comment: a plan of the underground workings was provided and shows the existing underground encroaching on the north west corner of TD1. Future workings will be located to the south of TD1. An internal risk assessment (by Aeris) is understood to have been conducted and this assessment concluded that there was low risk of a hydraulic link between TD1 and underground mines.*
- It is recommended that a conceptual cover design for TD1 be developed to ensure rehabilitation objectives and proposed final land use is included in the TD1 design. *CMW comment: no action required at this time, plans are underway for expansion of tailings storage at Tritton.*

13 REFERENCES AND REPORTS

The following provides a summary of standards, references and reports that are applicable to the Tritton Mine Tailings Dam. Some of these documents have been used in the preparation of this surveillance report.

ANCOLD (1994). "Guidelines on Dam Safety Management".

ANCOLD (2019). "Guidelines on Tailings Dams Planning, Design, Construction, Operation and Closure".

ANCOLD (2019). "Guidelines for Design of Dams and Appurtenant Structures for Earthquake".

ARCADIS (2020) "Request for Variation to Environmental Protection Licence No. 11254 Tritton Copper Mine (M1544)

Barnson (2011). "Construction Report Stage 3".

Barnson (2015). "Construction Report Stage 4".

Barnson (2017). "Construction Report Stage 5". Barnson (2021). "Construction Report stage 6".

Coffey Geosciences Pty Ltd (2004). DRAFT Operations Manual report titled "Tailings Storage Facility Operations and Maintenance Manual & DSC Emergency Action Plan" dated November 2004.

Coffey Geosciences Pty Ltd (2004). Construction Report titled "Stage 1 to RL260.0m Tailings Storage Facility Construction Report Tritton Copper Project", reference PS6253.02-AG-construction report rev 2, dated 17 November 2004.

Coffey Geosciences Pty Ltd surveillance reports (2005, 2006). Reference P6926.02-AC-surv1-rev 2 dated 27 June 2006 and MH00100AC-surv2rep, dated June 2007.

Coffey Geosciences Pty Ltd (2006). Design Report titled "Stage 2 Design Report Tailings Storage Facility 1, Tritton Resources Limited", reference P6926.03-BB-stage 2 design report, dated 19 July 2006.

Coffey Mining Pty Ltd (2007). Design Report titled "Design Report Stage 3 Tailings Storage Facility 1, Tritton Resources Limited", reference MH00100AD-stage 3 design report rev 1, dated March 2007.

Coffey Mining Pty Ltd. Numerous Surveillance Reports (2007 to 2016).

Coffey Mining Pty Ltd (2010). Design Report titled "Stage 4 Design Report Tailings Storage Dam 1, Straits Tritton Copper Mine", reference MWP00100AN-stage 4 design report rev 1, dated 30 August 2010.

Coffey Mining Pty Ltd (2015). Design Report titled "Stage 5 Design Report Tailings Storage Dam 1, Straits Tritton Copper Mine NSW", reference MWP00100AW-Stage 5 Design Report Rev 0, dated 10 August 2015.

CMW Geosciences Pty Ltd (2018). "Raising of TD1, Stages 6 and 7 Tritton Mine, NSW DSC Design Report" ref PER2017-0066AB Design Report dated 9 March 2018.

CMW Geosciences Pty Ltd (various dates). Annual Calendar Year Surveillance Reports.

CMW Geosciences Pty Ltd (2018). "TD1 Tailings Excavation Tritton Mines, NSW, Operational Guidelines", dated 6 June 2018.

Dams Safety Committee guidelines, proformas and documents.

DnA Environmental (2021) “2020 Tritton Copper Mine Rehabilitation Monitoring Report”

Environmental Earth Sciences (2013). “Conceptual Site Hydrogeological Model for ML1544 Tailings Storage Facility” Tritton Copper Mine, dated 26 March 2013.

Environmental Strategies (2013). “Remedial Action Plan Tailings Storage Facility (ML1544)”, dated 26 June 2013.

Kevin Morgan and Associates (2009). Report titled “Evaluation of Monitoring Data Tailings Impoundment Piezometers Tritton Mine”.

SMEC report (2008). “Tritton Copper Mine Tailings Storage Facility, Groundwater Investigation, project no. 3001442, dated 4 February 2008.

SMEC (2011). “Tritton Copper Mine Tailings Storage Facility – Groundwater Assessment and Management Plan” dated 3 November 2011 rev 2 ref 30011076.

Soil & Rock Engineering Pty Ltd (2004). Geotechnical Investigation report titled “Tailings Storage Facility Geotechnical Investigation, Tritton NW of Nyngan, NSW”, reference mkd6253_01tsfrep, dated 15 January 2004.

Soil & Rock Engineering Pty Ltd (2004). Design Report titled “Design Report Tailings Storage Facility 1 Tritton Copper Project, Revision 1”, reference ig6253_01_2003 arep.doc, dated 2 March 2004, rev 1.

Tritton Mine. Reports titled “Tailings Storage Facility Operations and Maintenance Manual & DSC Emergency Action Plan” Rev 2, Rev3, Rev3a, Rev 4 various dates.

Straits Tritton Mines (Aeris Resources) (2018), document titled “Erosion and Sediment Control Procedures - Tritton Tailings Dam 1 – Management Recommendations”.

Straits Tritton Mines revised Operations Manual tilted “Tailings Dam 1 Operations and Maintenance Manual & DSC Emergency Action Plans”, Tritton Mine Rev 5, dated June 2018.

- NSW Department of Planning Tritton Copper Mine DA 41/98 MOD 4: Notice of Modification, Section 96(2) of the Environmental Planning & Assessment Act 1979, dated 19 December 2007.
- Department of Planning Notice of Modification DA41/98 MOD3, dated 21 December 2007.
- Mining Operations Plan Conditions of Development Consent Appendix I, II and III, undated copy.
- Dams Safety NSW (2022), *‘Audit Report Aeris Resources’*, rev 1, dated 21 November 2022.

For and on behalf of
CMW Geosciences Pty Ltd

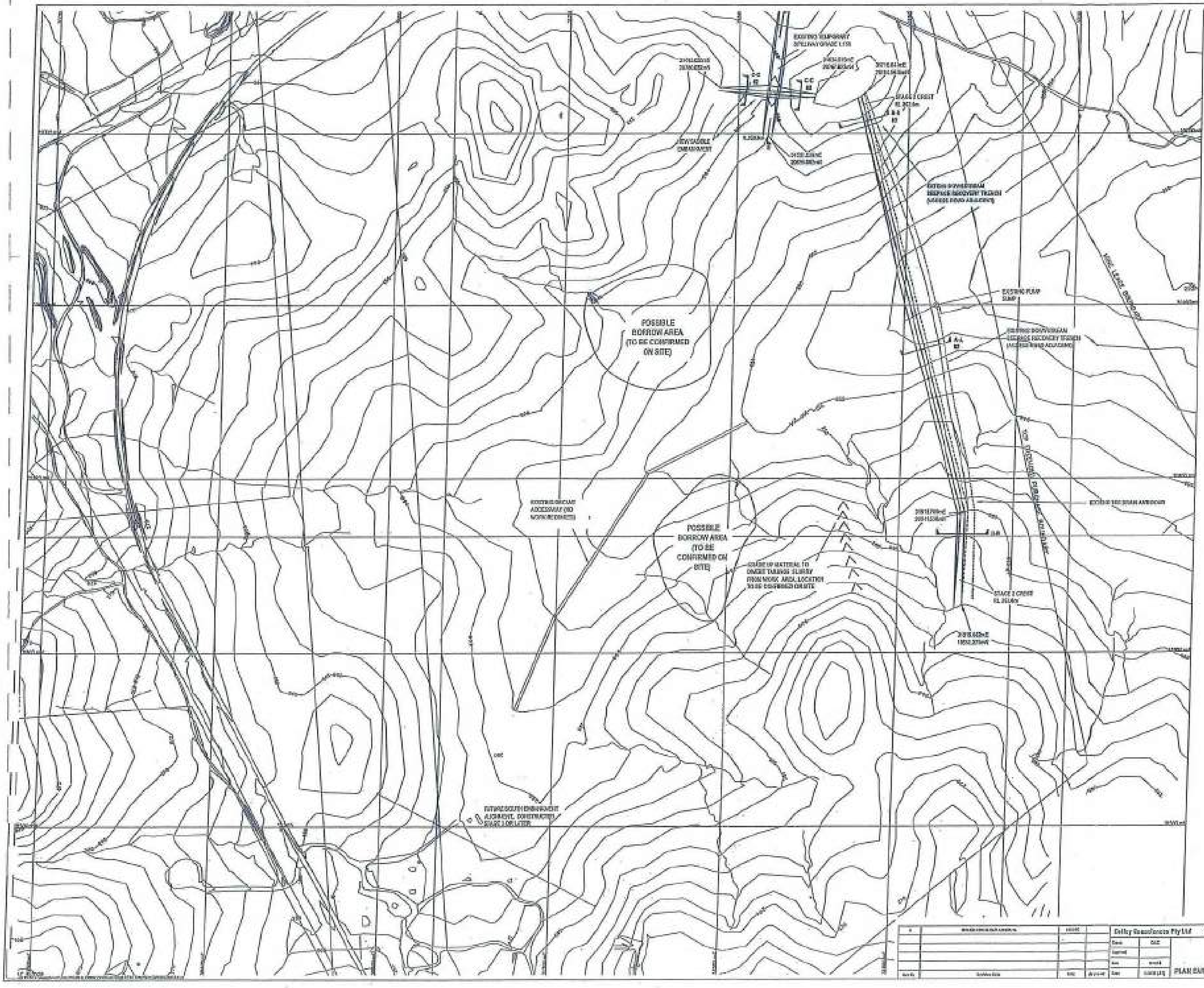
Christopher Hogg
Principal Tailings Engineer

Distribution: 1 copy to Aeris Resources (electronic)
Original held by CMW Geosciences Pty Ltd

Tritton Resources Limited

PROJECT LOCATION PLAN

FIGURE 1



NOTES.
1. ALL WORKS TO BE CONSTRUCTED TO THE SCOPE OF WORKS DOCUMENT, RSP
2. FOR SECTIONS AND DETAILS REFER TO DRAWING

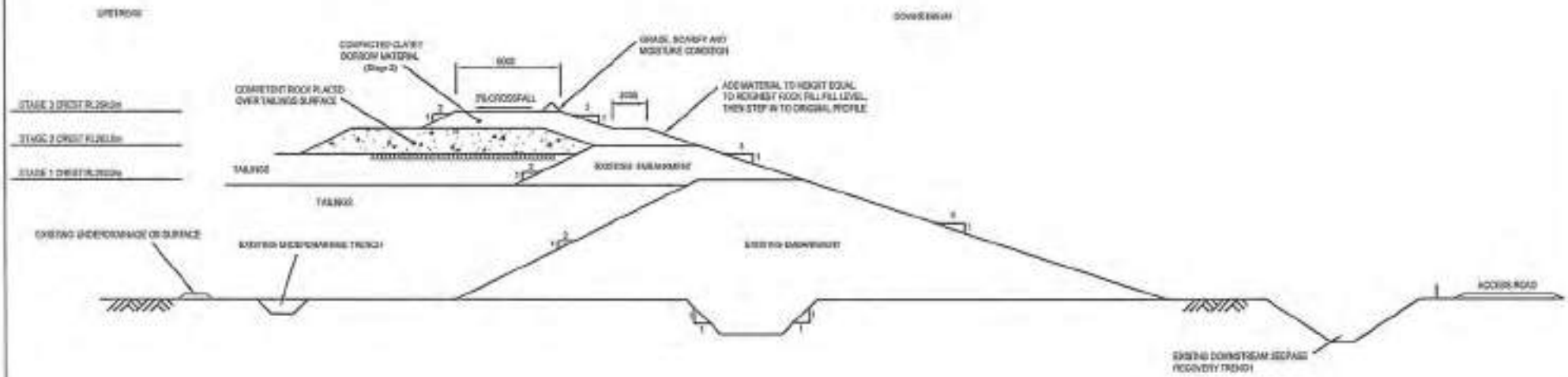
Coffey

FIGURE 2

Coffey Geosciences Pty Ltd

TRITON RESOURCES LIMITED
TRITON COPPER PROJECT
TAILINGS STORAGE FACILITY 1
PLAN EARTHWORKS - STAGE 3 (RL268.0m TO RL262.0m)

P6025/03/01



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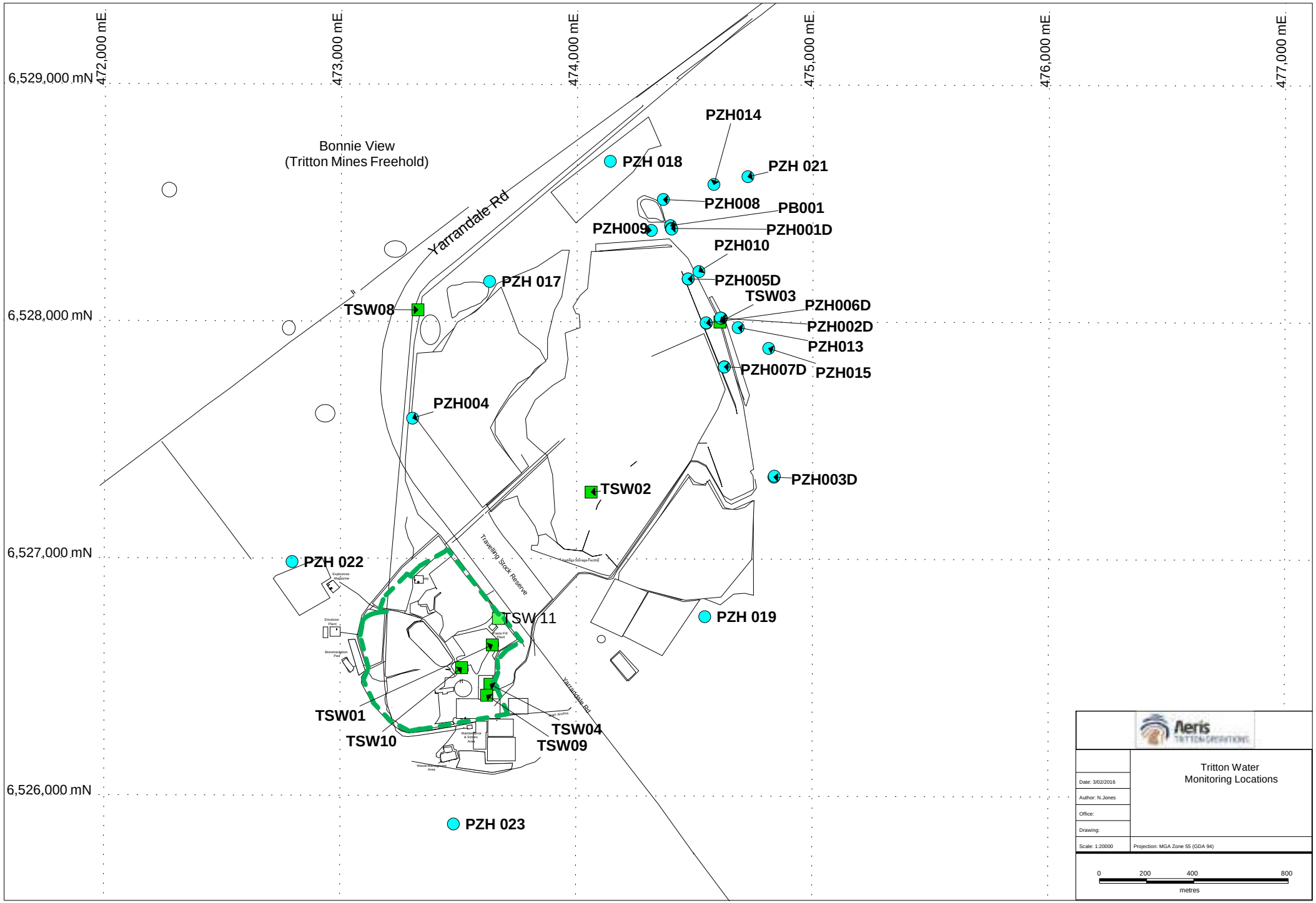
coffey mining
SPECIALISTS FROM BOARDROOM TO MINE FACE

Drawn	PP
Approved	IG
Date	24/09/07
Scale	NTS

TRITTON RESOURCES LIMITED
TRITTON COPPER PROJECT
TAILINGS STORAGE FACILITY 1
TYPICAL EMBANKMENT CROSS SECTION

Original Size	A4
Project no:	MH00100AD
Drawing	FIGURE 3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6,526,000 mN
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TSW02
PZH003D
PZH 022
Travelling Stock Reserve
TSW 11
PZH 019
TSW01
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TSW09
PZH 023
Tritton Water
Monitoring Locations
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Projection: MGA Zone 55 (GDA 94)
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metres

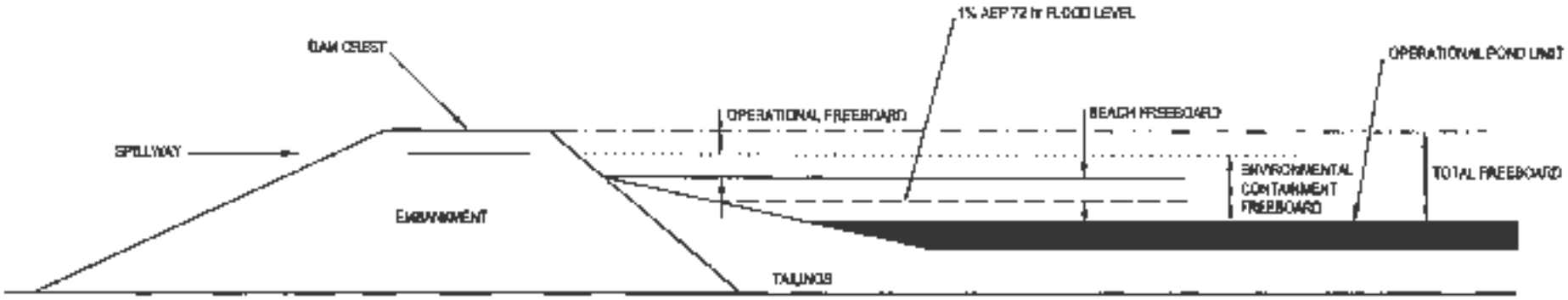
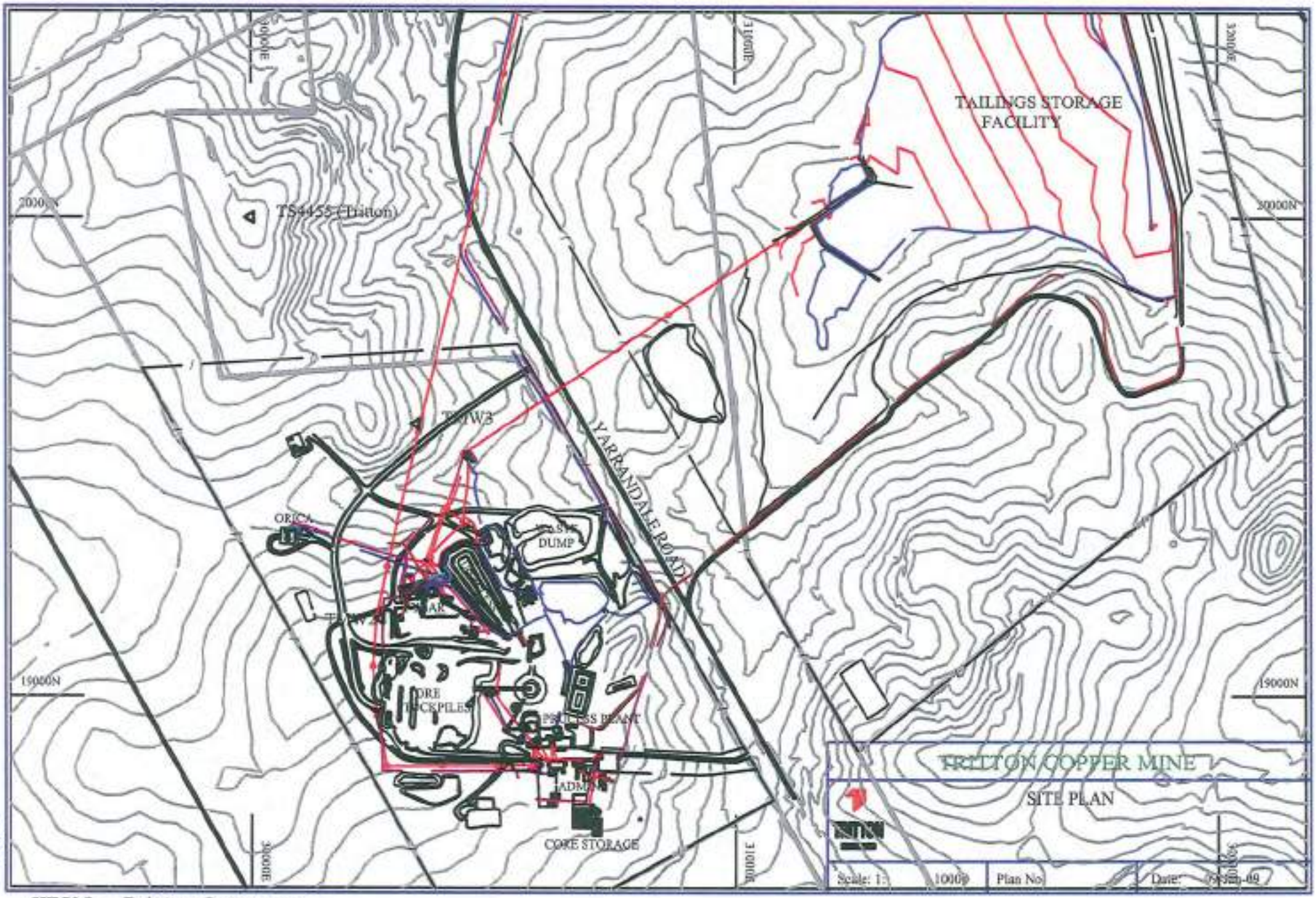


Figure 5

Drawn	MF	coffey	Client:	**AERIS TRITTON OPERATIONS**	
Approved	IG		Project:	**TRITTON COPPER PROJECT** **TAILINGS DAM 1**	
Date	24/03/2017		Title:	**FREEBOARD**	
Scale	NTS		Project no: **PERGE199655**	Figure no: **7**	Rev:
Original size	A4				

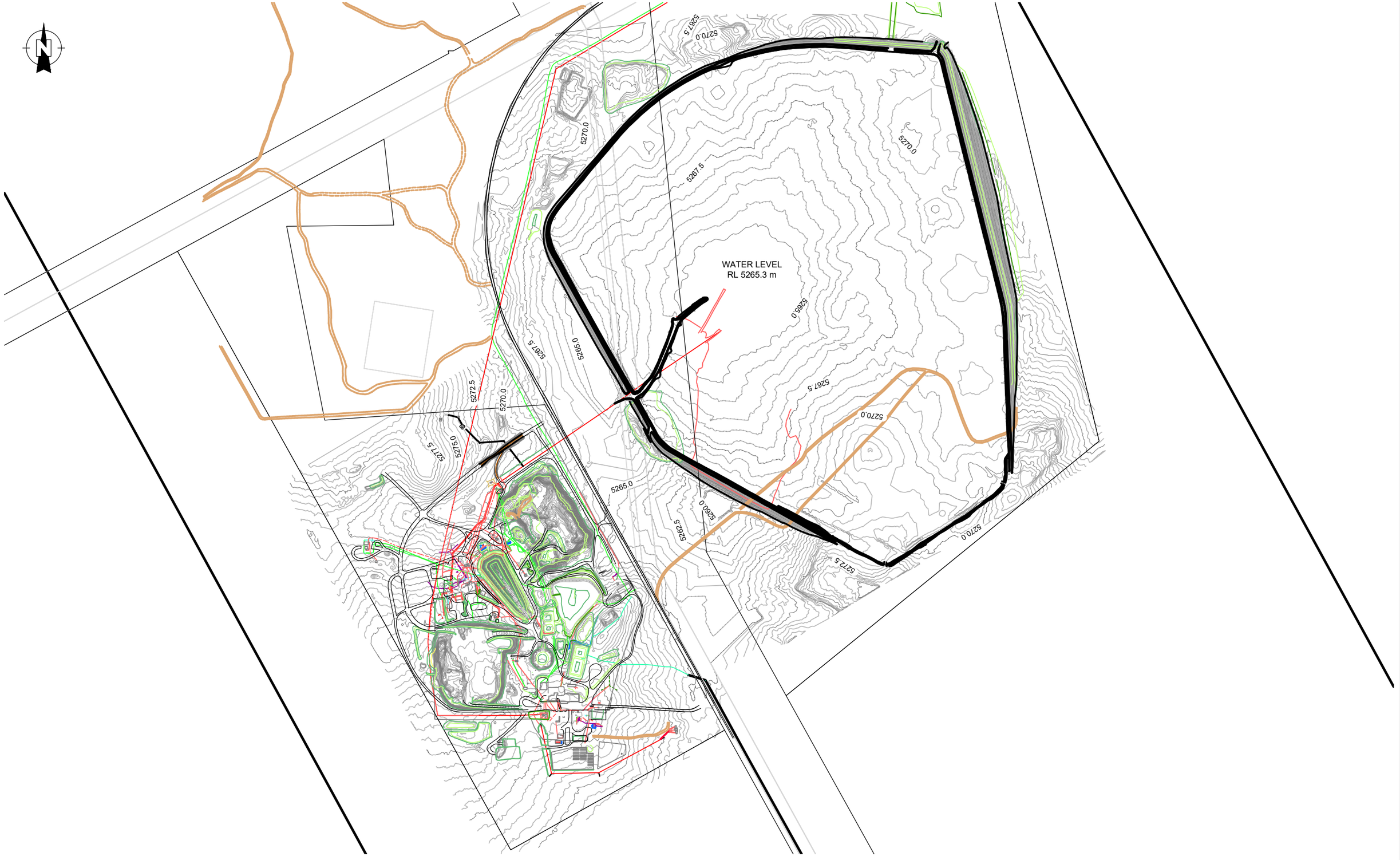
F:\MINE\Projects\Straits Tritton Copper\MINEWPER00100AW_Stage 5 Design and Documentation\9. Figures\MINEWPER100AW Fig 7.pdf



rp_03

SURPAC - Tritton Resources

Figure 6



NOTES:

1. CONTOURS GENERATED FROM: Tritton Site TSF Contours 2021.DXF
2. COORDINATE SYSTEM: LOCAL MINE GRID

1:10 000 0 100 200 300 400 500 m

CMW Geosciences
Great People | Practical Solutions

CLIENT: **TRITTON RESOURCES PTY LTD**		DRAWN: DE	PROJECT: PER2022-0315
PROJECT: **ANNUAL SURVEILLANCE REVIEW TD1 TRITTON MINE**		CHECKED: CH	FIGURE: 07
		REVISION: A	SCALE: 1:10,000
TITLE: **AS BUILT PLAN**		DATE: 07.03.23	SHEET: A3 L