TETRA TECH

350 Indiana Street, Suite 500
Golden, CO 80401
Tel (303) 217-5700 **Fax** (303) 217-5705
www.tetratech.com

Technical Memorandum

To: Andrew Harley

From: April Hussey

Company: Tetra Tech

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Re: Preliminary Waste Rock Management Plan Evaluation

Project #: 114-311285

CC: file

1.0 Waste Rock Management Plan – Production Schedule

This technical memorandum discusses preliminary waste rock management plan for the Mt Todd Waste Rock Dump (WRD) for the Base Case mining scenario. MDA associates has developed a schedule of waste rock development, by ktonne, separated by rock classified as potentially acid generating (PAG), non-PAG, and undefined as presented in Table 1.

Table 1: Annual Mine Production Schedule – Base Case – Waste Rock

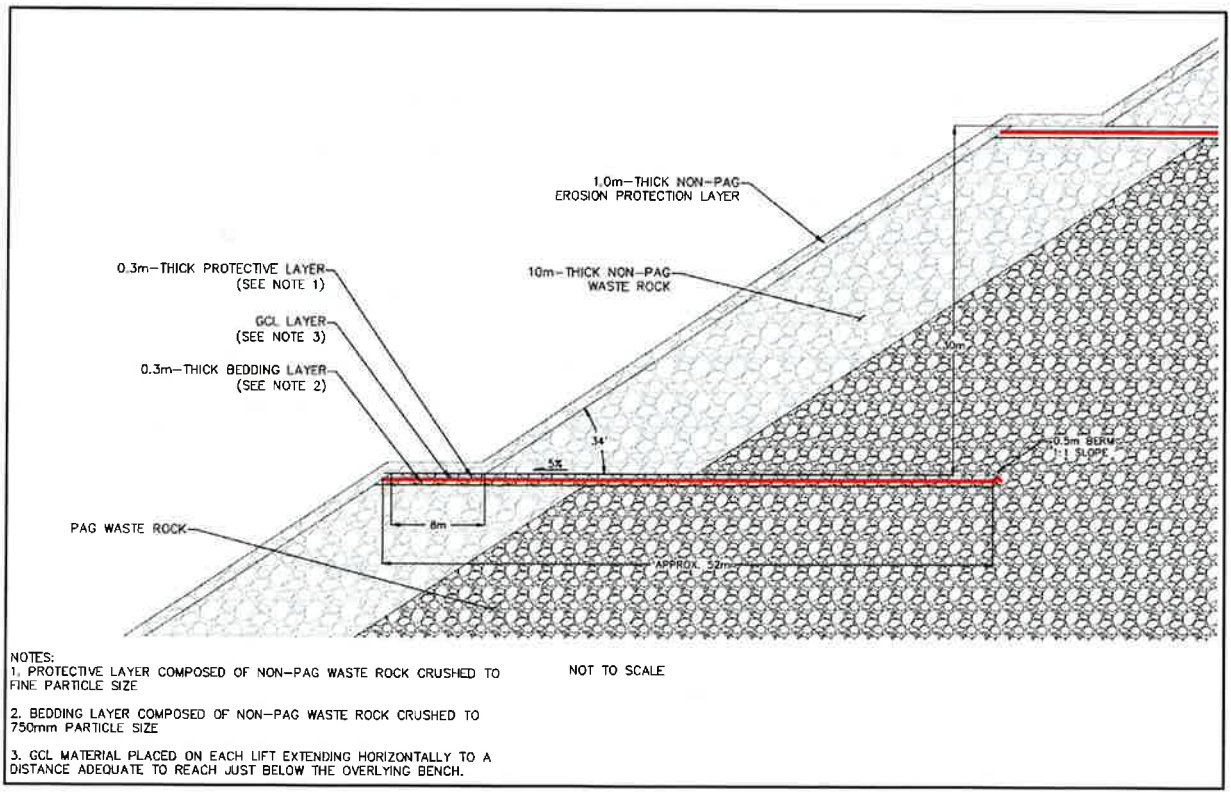
	Pre Prod	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9
Non-PAG Waste (ktonne)	5,621	15,844	19,882	39,510	23,763	26,479	45,906	27,350	15,617	8,116
PAG Waste (ktonne)	14,392	13,622	23,174	22,292	26,512	26,187	18,680	20,449	21,727	21,779
Undefined Waste (ktonne)	4,748	4,337	12,234	16,425	21,333	5,662	6,693	6,606	8,139	8,814

	Y10	Y11	Y12	Y13	Total
Non-PAG Waste (ktonne)	956	0	0	0	229,044
PAG Waste (ktonne)	21,204	2,554	0	0	232,572
Undefined Waste (ktonne)	5,704	38	0	0	100,733

2.0 Waste Rock Management Approach

PAG waste rock will be encapsulated within a 10-m thick non-PAG waste rock rind. As rock is produced from the pit, a sufficient quantity of non-PAG rock will be set aside for use in constructing the embankments of the TSF1 raise and TSF2, as well as non-PAG rock to be used in reclamation and closure activities, and in constructing the 10-m thick non-PAG waste rock rind on the WRD. The remaining waste rock will be placed in lifts within the final footprint of the WRD. As each lift is constructed, the 10-m thick rind will be installed to fully encapsulate the PAG, non-PAG, and undefined rock in the center of the WRD. The non-PAG rind will be placed only on the slopes of the WRD that are final, outer perimeter slopes, and on the final top surface of the WRD. Following placement of the non-PAG rind on a full lift, a geosynthetic clay liner (GCL) will be placed above the rind to reduce infiltration of water. The GCL cover will then be overlain with a 0.3m thick protective layer and a 1-m thick erosion protection layer of large cobbled rocks. Additional discussion of the cover performance and design is provided elsewhere. Figure 1 shows a typical cross section of the WRD demonstrating the configuration of the encapsulated waste rock, non-PAG waste rock rind, and cover system.

Figure 1: Typical Waste Rock Rind Construction and Cover



Based on the material balance calculations performed by MDA, a sufficient quantity of non-PAG rock is present to meet the quantity requirements for this material for the TSF embankment construction, reclamation and closure needs, and development of the WRD rind. Due to the schedule on which non-PAG rock is produced from the pit, some double-handling of rock material will be required. Non-PAG rock will be stockpiled in sufficient quantity, and will later be distributed as needed on-site.

3.0 Waste Rock Categorization during Construction and WRD Rind Construction Sequencing

Categorization of the waste rock produced from the Pit during operations will be delineated in more detail as additional phases (definitive feasibility study, permitting, construction, etc.) of the project are developed. Protocols for the categorization of waste rock as non-PAG or PAG may include, but are not limited to, visual categorization, for rock types known to be PAG or non-PAG which may be distinguished by sight by trained engineers, geologists or geochemists, or sampling.

As the design of the WRD includes near angle of repose slopes, construction of the WRD rind to specified thicknesses throughout its length on each 30-m tall lift will require intentional planning. Conceptually, waste rock to be encapsulated will be placed in layers within each lift (multiple layers with each 30-m tall lift). The outer edge of waste rock to be encapsulated will be offset within the final footprint perimeter to allow for the addition of the rind and cover system to be constructed within the final feature footprint. After each layer of waste rock is placed, the non-PAG rind will constructed through end-dumping material and select grading of material off the crest of each layer to fill in any layers which may not meet the 10-m thick requirement. If end-dumping of material results in unacceptable sorting of the rind material, construction of the rind using compacted lifts 0.5-m thick from the base to the crest of the layer may be employed. Methods for constructing the rind will be further refined during future phases of the project.

Construction of the WRD rind will be completed annually on slopes that meet final grades. At this stage in the project, specific locations for annualized construction of the rind have not been identified, as a spatial year by year build-out of the WRD has not been completed. This year by year build-out of the WRD will be developed as part of further phases of the project.

4.0 Allowances for Acid Rock Drainage

During construction of the WRD, non-encapsulated surfaces of PAG rock will be exposed to storm water. These surfaces will include top surfaces which will be overlain by additional waste rock in subsequent years, and side slopes which do not meet the final grades designed for the WRD. As rock exposed to stormwater may be PAG, a seepage collection system will be integrated into the design of the WRD. Collected seepage will be routed to the project water treatment plant for treatment and discharge according to permitted limits.