

# APPENDIX B4

## CONVEYOR CONCEPT REPORT

# BIRD IN HAND GOLD PROJECT

## MINING LEASE PROPOSAL MC 4473



ABN | 66 122 765 708  
Unit 7 / 202-208 Glen Osmond Road | Fullarton SA 5063



TERRAMIN AUSTRALIA LIMITED

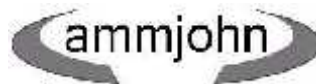
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**Terramin Australia Limited:**  
**Bird in Hand Gold Project**  
**Conveyor Concept Report**  
**June 2016**

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16<sup>th</sup> June 2016



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## 1 Introduction

The following meetings were held with Terramin.

1. 12 April 2016 – Site Inspection at Bird in Hand Mine Lease  
Joe Ranford, Kath Laughton, Isaac Mathwin and Peter Cockburn
2. 21 April 2016 – Preliminary Flow Diagram Review at Terramin Office  
Joe Ranford, Kath Laughton, Isaac Mathwin and Peter Cockburn
3. 11 May 2016 – Model Review at ammjohn Office  
Joe Ranford, Kath Laughton, Peter Thorley and Peter Cockburn
4. 27 May 2016 – Project Alignment Meeting at Terramin Office  
Joe Ranford, Kath Laughton, Isaac Mathwin, Peter Cockburn and other project internal stakeholders

## 2 Criteria

The following are the principle criteria for considering options.

1. Minimize noise and dust
2. Not to impact the visual amenity of the neighbors
3. Avoid significant trees
4. The material size from the mine for both Ore and Waste is no greater than 300mm
5. Hold up to 5 days of mined Ore at site waiting for transport – based on the Terramin Scoping Study, Preliminary Mine Plan the average ore production over 5 days is 1,700T – the bin has an active volume of 1,000m<sup>3</sup> / 1,800T. Note, the Scoping Study identifies a period when the maximum Ore Production over 5 days is 3,000T
6. Waste to be transported across the site to a dedicated dump
7. Require lump of 25mm to 75mm to be screened from waste stream for return as fill underground

### 3 Concept Summary

The following identifies key aspects of the concept shown in the attachment.

1. Both the Ore and Waste dump points have a volume to hold approximately 2 mine truck loads. This will provide a bed of material for the next load – this will assist with the noise reduction.
2. Apron feeders are used to control the level in the Ore and Waste dump points.
3. The Ore and Waste dump point will have an inclined grizzly arrangement to separate over-size material. This material will land adjacent to the apron feeder for recovery later.
4. The Ore loading to the road trucks is provided by 2 bins mounted along the road center line, each bin is mounted on weigh cells to control the loading of the road trucks. These bins will be refilled from the storage bin at a slow rate after discharging to a truck to reduce noise/dust emission.
5. The conveyors are in trenches constructed of vertical retaining walls, in preference to tunnels. The preliminary width of the trenches is 2,800mm – this is based on 1,200mm for conveyor/idler frame and 800mm on both sides for maintenance access.
6. A mesh covering the conveyor trenches may assist with the visual amenity. A cost effective material might be shade clothe.
7. A transfer point is used so that the Waste dump point and the screened material storage bin can be separated.
8. Waste material to the dump is transported on CV<sub>3</sub> and CV<sub>4</sub> to the waste stacker.
9. When screened material is to be returned to the mine, CV<sub>4</sub> is reversed in direction. Screened material is loaded into a hopper on CV<sub>4</sub> by FEL, the material then travels to the transfer point and drops onto CV<sub>5</sub>, which discharges into a bin at the “go line”. To change the direction of CV<sub>4</sub> requires that the waste conveyors are emptied of material. This reversal will likely take 10 to 15 minutes to implement.
10. The Screened material bin is located between the Ore and Waste dump point to reduce the visual impact.
11. The alignment of the conveyors at the transfer point is to limit the visual sight lines along the conveyor trench. Which could be further limited with the use of a covering,

for example shade clothe.

12. A screen at the Waste stacker is to separate 25mm to 75mm material for the purpose of using as aggregate in the underground backfill process. A short inclined conveyor is used to stack this material. An FEL would then be used to recover material and load into a hopper on the conveyor (CV4).
13. A grasshopper conveyor (short, mobile) to feed the main stacker to allow flexibility in the Waste stockpile shape.
14. The main Waste stacker will slew, luff and extend – this is to allow flexibility in the Waste stockpile shape and will assist in the mitigation of noise/dust. A dust suppression system may be necessary, depending on mined material properties and will be investigated later.

At the Alignment meeting, the Ore storage bin was presented as above ground, see views in the Appendix. This was raised at the meeting and it was proposed that the bin could be lowered to reduce visual impact. This will be investigated in the future but will require substantial ground/earth works. It is expected that the greatest cost impact will be the additional civil works, whilst the mechanical equipment will likely remain similar to that proposed.

## 4 Power Consumption Estimate

The following list of equipment is an estimate of the consumption power, shown by motor frame size.

Conveyors:

- CV<sub>1</sub> – 11kW
- CV<sub>2</sub> – 22kW
- CV<sub>3</sub> – 22kW
- CV<sub>4</sub> – 22kW
- CV<sub>5</sub> – 22kW
- CV<sub>6</sub> – 5.5kW
- CV<sub>7</sub> – 5.5kW
- CV<sub>8</sub> – 11kW
- CV<sub>9</sub> – 22kW

Feeders:

- AF<sub>1</sub> – 11kW
- AF<sub>2</sub> – 11kW
- AF<sub>3</sub> – 11kW

Product Screen is 22kW.

Road truck loading bin is 5.5kW.

To this should be added any lighting and General Purpose power requirements, which we would suggest could be 20kW.

An estimated total power consumption would be 225kW.

These power consumptions are the estimated steady state operating, based on conservative equipment information from previous projects. A detailed investigation and calculation will be done in the future to identify the other motor parameters, in particular the start up demand from either a normal start or Black start.

## 5 Budget Estimate

The budget estimate for the project as described above is \$5,720,000.

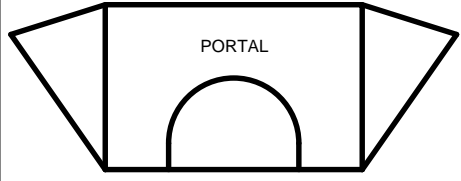
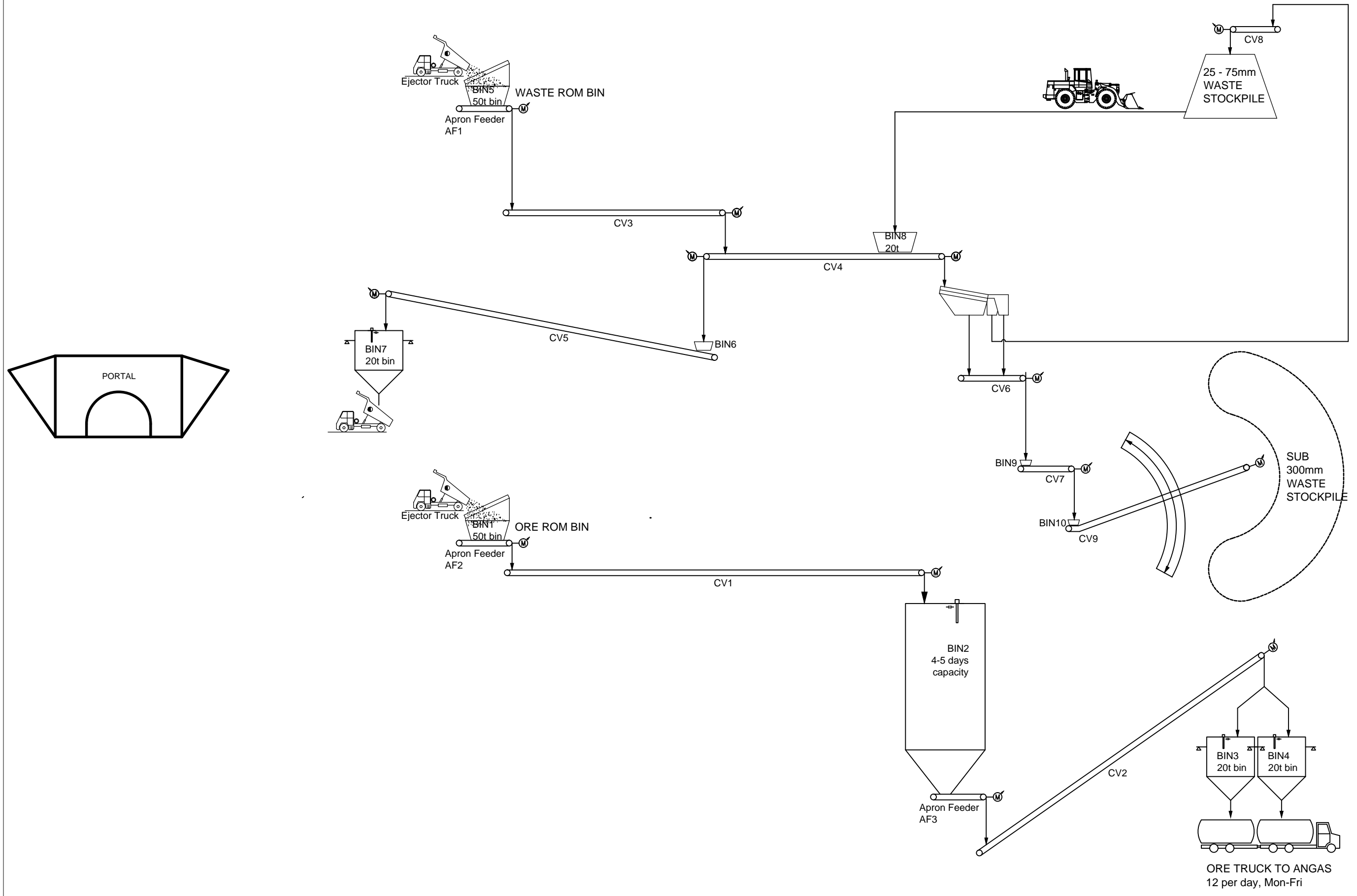
The basis of this estimate is:

- Mechanical equipment costing from similar projects
- Civil costing based on a unit rate of \$1500/m<sup>3</sup> for “free dig” excavation and construction of a “simple” foundation
- Electrical costing is 16% of equipment capital estimate
- EPCM is 10% of equipment capital estimate
- A Contingency of 20% has been allowed

If a contractor was engaged to provide screened material from the waste stockpile and transport the screened material to the proposed location of the screened material truck loading bin near the “go-line”, then the reversing/return conveyor and bins associated with the return of the screened material could be removed. This would potentially reduce the above estimate to \$4,590,000. The basis of estimate remains as shown above.

## Appendices – Flow Diagram & Model Views





AMENDMENTS	BY	APPR	DATE
D ADDED NAMING INFORMATION FROM MODEL	IM		15.06.16
C ADDED ADDITIONAL CONVEYOR FOR ORE LINE	IM		21.04.16
B ADDED GRIZZLIES	IM		18.04.16
A INITIAL FOR REVIEW	IM		15.04.16

**ammjohn**

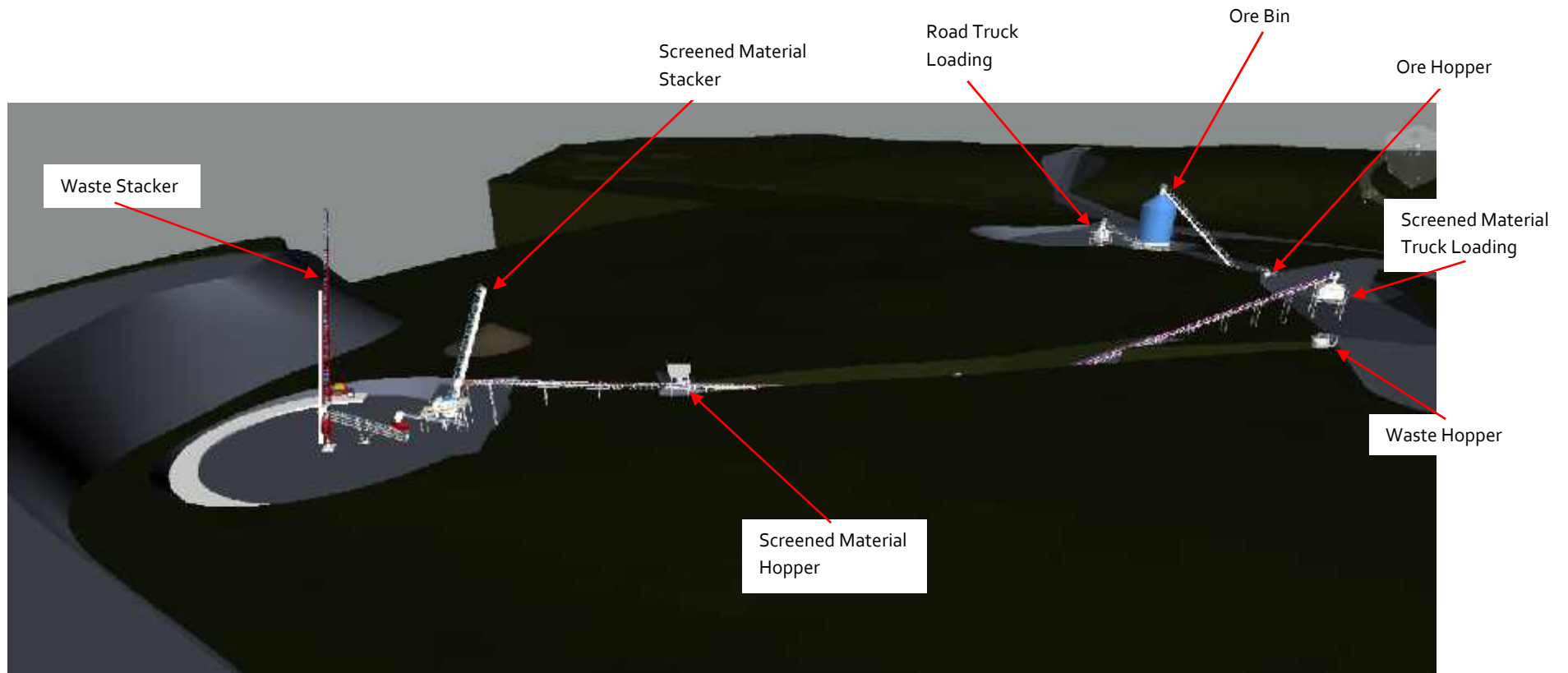
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Drawn	IM	Date	15.06.16
Checked		Date	
Scale	NTS		

Title **CONCEPT PROCESS FLOW DIAGRAM  
BIRD IN HAND PROJECT**

Site / Customer	TERRAMIN	Revision	<b>D</b>
Drawing No.		Sheet No.	<b>1 of 1</b>



View from above Bird in Hand Road, looking West

Ore Bin

Screened Material Truck Loading

Waste Stacker



View from Bird in Hand Winery vineyard, looking North-East