Process Description
Louta Mine

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Table 1: Glossary of terms and abbreviations

TERM	DEFINITION
BOD	Basis of Design
TSM	Ton Dry merchant
TPY	Tons Per Year
TPH	Tons Per Hour
TBC	To Be Confirmed
TBD	To Be Defined
%v/v	Concentration by volume for volume percentage
%wt.	Fractional weight percentage
%w/v	Concentration by weight for volume percentage
%w/w	Concentration by weight for weight percentage
µm	Micrometer = 10^{-3} mm
ppm	Parts per million
RoM	Run of Mine
PSD	Particle Size Distribution
Mt/y	Million tons dry solids per year
No.	Number
OPEX (Costs)	Plant Operating Costs
CAPEX (Costs)	Plant Capital Costs
F_{100}	Plant feed top size
F_x	The feed size to a unit operation at which (x) weight % of the dry solid passes
P_x	The product size from a unit operation at which (x) weight % of the dry solid passes
°C	Degree Celsius
HSE	Health, Safety and Environnemental
min	Minutes
mm	Millimeter = 10^{3} meter

1 INTRODUCTION

This process description describes the Screening, Crushing and Reject Storage facilities for Louta Mine Project. It should be read in conjunction with the Overall Process Flow Diagram (01-PR-PFD-00002).

The screening, crushing and reject storage facilities consist of two parallel lines (Line A, Line B) and each line shall operate simultaneously. Phosphate Product and Phosphate Reject shall be produced by each individual line. Equipment configuration is identical for all two lines.

Product and Reject stockpiles are common for all two lines. Distribution towers have been utilized for storing product and reject materials in respective stockpile.

The following process description is for Line A. As Line B is identical with Line A, this process description is applicable for Line B.

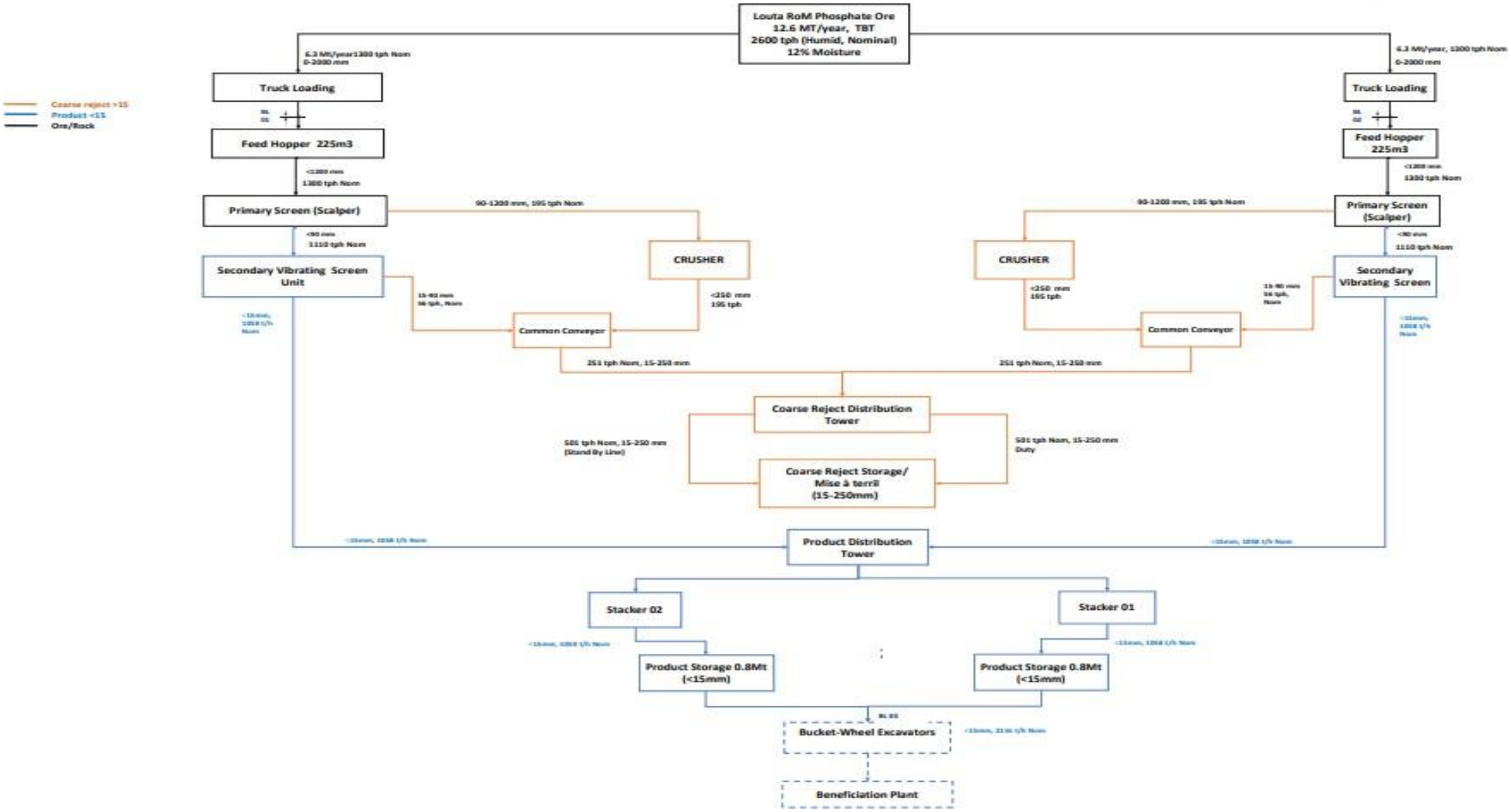
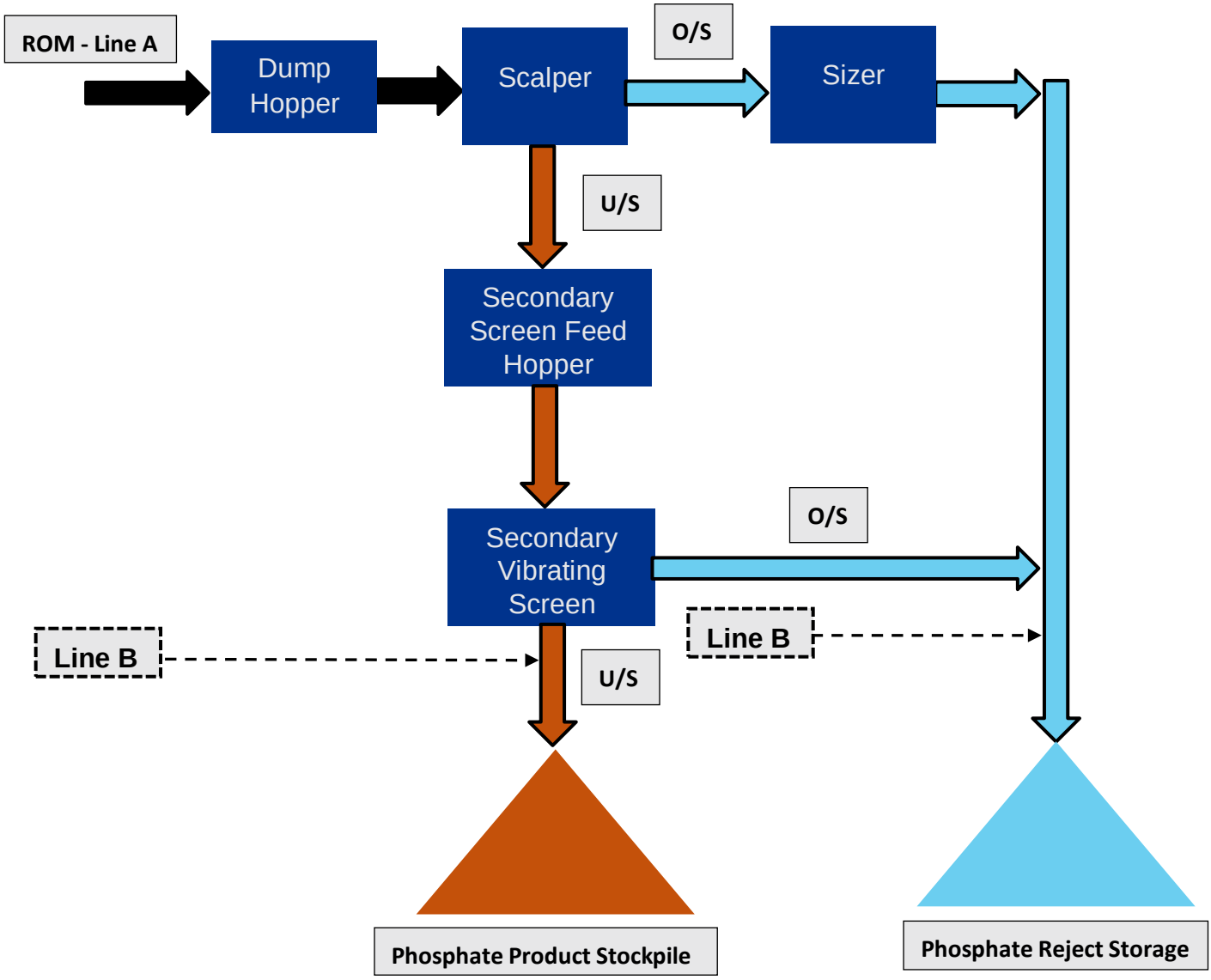


Figure 1: Overall LOUTA Mine BFD

2 INDICATIVE BLOCK FLOW DIAGRAM



3 PRIMARY CRUSHING PLANT (PFD 01-PR-PFD-00002)

Feed to the primary crushing circuit is received as ROM ore direct from the mine by haulage trucks and tip directly into the ROM Feed Dump Hopper TR01-A. There will be provision for dumping material into the hopper from two sides of the dump hopper. The capacity of dump hopper is around 225 m3. The ROM dump hopper is fitted with a static grizzly screen to prevent oversize (>1200mm) material reaching the Scalper Apron Feeder FE01-A. There are Two no. of Rock Breaker above the static grizzly over the dump hopper. Out of these two Rock Breaker, one shall be utilized to break up the +1200mm material accumulated on the static grizzly and the other one to clean the dumper from material due to higher moisture.

The Scalper Apron Feeder (FE01-A) after receiving the material from dump hopper discharges onto the Scalper SC01-A. Scalper segregates materials 90-1200mm and feeds Primary Sizer CR01-A. The Primary sizer produces a product of <250mm and discharges onto the Crusher Discharge Feeder FE02-A. This crusher discharge feeder in turn discharges material onto the Crusher Product Conveyor CS01-A. Fines Spillage Conveyor CF01-A has been provided to collect spillage from Scalper Feeder FE01-A through chute.

The undersize material of <90mm from the Scalper SC01-A temporarily stored into the Secondary Screen Feed Hopper TR02-A. Undersize material from the scalper discharges on the Scalper Discharge Belt Feeder EX01-A which in turn feeds Primary Screen Undersize Conveyor CP01-A. Conveyor CP01-A stores material in the Secondary Screen Feed Hopper TR02-A. The capacity of Secondary Screen Feed Hopper TR02-A is 143 m^3which will provide a residence time of 32.4 minutes.

Depending on the layout, flexibility could be there for taking out the Scalper undersize material (<90) from Scalper Discharge Belt Feeder EX01-A and feed Primary Screen Undersize Conveyor in Line B (CP01-B).

Dust suppression is provided for the Dump Hopper by means of dry mist dust suppression. The mist is generated by atomizing water sprays with compressed air. The sprays are fed from a Spray Water Storage Tank. This tank is fed by means of road tanker deliveries and discharged to the spray system by Spray Water Pump. Compressed air is supplied by the separately installed compressor package. The dry mist suppression for the dump hopper is intermittent and only operated when the dump hopper is being fed.

Air chock/unclogging system has been envisaged for Dump Hopper and Scalper undersize chute which will be further detailed during next phase of engineering.

Maintenance provision for the Primary Crusher is provided by the Hoist BR01-A.

4 SECONDARY SCREENING (PFD 01-PR-PFD-00002)

The Secondary Screen Feed Hopper TR02-A is equipped with three no. of Secondary Screen Vibrating Feeder FE03-A/ FE04-A/ FE05-A and discharges onto the Secondary Screen SC02-A/ SC03-A/ SC04-A. Double deck vibrating screens have been envisaged for secondary screening. Out of these three vibrating feeder and secondary screen, three set of feeder and screen shall be in operating mode and one set shall be in standby mode.

Secondary screen has been utilized for segregation of oversize material (i.e., 15-90mm) from the feed material. Secondary Screen lower deck undersize (-15 mm) is the product of the crushing & screening plant and discharges on the Secondary Screen Undersize Belt Feeder EX02-A. The undersize belt feeder feeds Secondary Screen Undersize Conveyor CP02-A for storing the material in Product Stockpile through Distribution Tower T01.

The Secondary Screen Undersize Conveyor CP02-A is equipped with the Belt Overband Magnet which discharges tramp metal into a Conveyor Magnet Rejects Bin via the Conveyor Reject Chute. The Belt Conveyor CP02-A is also equipped with a metal detector and a belt weighing scale for monitoring the rate of production.

Dust suppression system has been considered for all transfer point.

Air chock/unclogging system has been considered for Secondary Screen Feed Hopper TR02-A which will be further detailed during next phase of engineering

Maintenance provision for the Secondary Screening Area is provided by the Hoist TT04-A.

5 PHOSPHATE REJECT HANDLING & STORAGE (PFD 01-PR-PFD-00002)

The Secondary Screen Oversize (15-90 mm) is sent to the Phosphate Reject Storage Stockpile. The Secondary Screen discharges the oversize on the Secondary Screen Oversize Belt Feeder CS04-A. The oversize belt feeder CS04-A feeds Common Coarse Rejects Conveyor CS02-A. This Rejects conveyor also collects products from Primary Sizer CR01-A. Finally, the reject material stored into the Phosphate Reject Storage through Distribution Tower T02, Coarse Reject Conveyor CS03-A and Stacking arrangement.

There are two different Phosphate Reject Storage. Two no. of Coarse Reject Conveyors (CS03-A/B) have been utilized for storing rejects in the respective stockpile. Out of these two conveyors, one no. of conveyor (CS03-A) is in duty condition and shall have a capacity of 501 TPH. The second conveyor (CS03-B) is in standby mode

and have a capacity of 501 TPH. Flexibility has been considered for feeding these reject conveyors by the rejects produced by any operating line. This flexibility shall be accomplished through Distribution Tower TR02.

Dust suppression system has been considered for all transfer point.

Maintenance provision for the Phosphate Reject Handling & Storage Area is provided by the Hoist TT01-A/ TT02-A.

6 PHOSPHATE PRODUCT HANDLING & STORAGE TO STOCKPILE (PFD 01-PR-PFD-00002)

The product of the crushing & screening plant is the Secondary Screen lower deck undersize (-15 mm) material. This product is stored in the Phosphate Product Storage Stockpile by Secondary Screen Undersize conveyor CP02-A.

There are two no. of product storage stockyard equipped with two no. of stackers. Out of these two stackers are dedicated for individual stockyard. Each stacker has a capacity of 1058 TPH.

Procut stockyard is designed to accommodate total material of 0.8MT equivalent to 15 days autonomy.

The product material could be discharged on any one of the Phosphate Product conveyors CB02-A/B and Stackers ST01/02 through distribution tower T01. The material from distribution tower T01 could be sent to beneficiation plant. Product material is stored into the stockpile by Phosphate Product Conveyors CB02-A/B and Stacker ST01/02.

Maintenance provision for the Phosphate Product Handling & Storage Area is provided by the Crane TT05.

7 GENERAL

Line B is designed to operate simultaneously along with Line A and has similar equipment configuration as shown in PFD: 01-PR-PFD-00002.

The common coarse reject conveyor CS02-B (PFD 01-PR-PFD-00002) transfers reject material from Line B is respectively to the Distribution Tower T02. Further stacking of material in reject stockpile accomplished by coarse reject conveyor CS03-A/B.

The secondary screen undersize conveyor CP02-B (PFD 01-PR-PFD-00002) convey Phosphate Product of <15mm to the Distribution Tower T01. The product finally stored in three Phosphate Product Storage stockpile by Stacker 01/02.

Bypass arrangement have been introduced for taking away the Phosphate Product Material to the Beneficiation Plant. The mode of feeding beneficiation plant shall be finalized during next phase of engineering.