SASOL MINING (PTY) LTD

SASOL MINE CLOSURE
COST ESTIMATE UPDATE REPORT – FY20
APPENDIX N: IMPUMELELO

Report No.: JW068/20/H066-401 – Rev 7

March 2020

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DOCUMENT APPROVAL RECORD

Report No.: JW068/20/H066-401 – Rev 7

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<td>Maria Heyneke</td>
<td>February 2020</td>
<td></td>
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<tr>
<td>Prepared</td>
<td>Civil Engineer</td>
<td>Blaine Haupt</td>
<td>February 2020</td>
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<tr>
<td>Reviewed</td>
<td>Project Manager</td>
<td>Konrad Kruger</td>
<td>26 February 2020</td>
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<tr>
<td>Approved</td>
<td>Technical Director</td>
<td>Gareth Simpson</td>
<td>26 February 2020</td>
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RECORD OF REVISIONS AND ISSUES REGISTER

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APPENDIX N

IMPUMELELO

APPENDIX N - Table of Contents

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INTRODUCTION

Jones & Wagener Engineering and Environmental Consultants were appointed by Sasol Mining to update the closure cost estimates for infrastructure at all their operational coal mining operations in Mpumalanga (Secunda), Free State (Sasolburg) and Limpopo (Waterberg district).

The purpose of this appointment is to update the 2019 Financial Year (FY19) closure estimates to FY20 values and to include documentation required for auditing purposes.

This report is Appendix N to the main report (report number JW054/20/H066-401) and covers the Impumelelo Area of Responsibility.

Revision 0 - 2 (FY15 update) notes:

The required changes to the FY14 costing estimates were indicated by the relevant Planning Manager.

This report was revised to accommodate the changes made to the cost estimates for Sasol Mining’s 2015 Financial Year.

Update sheet: notes

Section 5: Auditing documentation

The following documents are relevant:

a) Approved water use license (WUL) and conditions:

   The applicable WUL is Licence no. 08/C12D/ABCEFGIJ/2160 dated 2013/04/12, valid for 20 years from the issued date.

   No additional costs were included in the closure cost estimate as a result of requirements of the WUL.

b) Directives pertaining to remediation and water resource impact

   No directives.

c) Environmental legal compliance audit report(s)

   No report.

d) EMP performance assessment reports (last report)


   No additional costs were included in the closure cost estimate as a result of requirements of the report.

e) Environmental monitoring information

No additional costs were included in the closure cost estimate as a result of requirements of the report.

f) Operational procedures (ISO 14001) developed for operational level rehabilitation
Not applicable.

Revision 3 (FY16 update) notes:
The required changes to the FY15 costing estimates were indicated by the relevant Planning Manager. This information formed the basis of changes made to the costing model for FY16.

Additions since the previous assessment were added to the photo report and the provision cost model.

Revision 4 (FY17 update) notes:
The required changes to the FY16 costing estimates were indicated by the relevant Planning Manager. This information formed the basis of changes made to the costing model for FY17.

This report was revised to accommodate the changes made to the cost estimates for Sasol Mining’s 2017 Financial Year.

Scope-of-work Update sheet: notes
Section 2b: Demolitions / removals
None.

Section 2c: Additions
None.

Section 3: Cash flow
No changes.

Revision 5 (FY18 update) notes:
The required changes to the FY17 costing estimates were indicated by the relevant Planning Manager. This information formed the basis of changes made to the costing model for FY18.

This report was revised to accommodate the changes made to the cost estimates for Sasol Mining’s 2018 Financial Year.

Scope-of-work Update sheet: notes
Section 2b: Demolitions / removals
None.

Section 2c: Additions
There were two additions to the Infrastructure at Impumelelo Mine:

- IMP1-041 – Since the previous cost estimate updates, construction of Ventilation Shaft 2 (Raskop) was completed. The cost estimate has been updated to include the closure and rehabilitation of the shaft;

- IMP1-030 – Additionally the substation associated with Raskop ventilation shaft was constructed the cost estimate was updated to include the demolition of the substation;

- IMP1-095 – Storage units were constructed since the previous cost estimate update. The area associated with the storage units was estimated from recent aerial image of the site; and

- IMP1-096 – Raskop downcast shaft was added. No drawing or photograph was provided the concrete slab was measured off the aerial photography. A length of 10m at 157kg/m³ was assumed for the steel structure on surface. The methodology for closing the shaft was assumed to be the same as that of the other ventilation shafts at Impumelelo.

**Section 3: Cash Flow**

The demolition date for infrastructure at the Impumelelo shaft was changed to January 2051.

**Revision 6 (FY19 update) notes:**

The required changes to the FY18 costing estimates were indicated by the relevant Planning Manager. This information formed the basis of changes made to the costing model for FY19.

This report was revised to accommodate the changes made to the cost estimates for Sasol Mining's 2019 Financial Year.

**Declaration Sheet (previously Scope of Work/Update Sheet): notes**

**Section 2b: Demolitions / removals**

In 2016 the conveyors were moved from the business units to SCS, however the conveyor under IMP1-046 was mistakenly captured under inventory number IMP1-046 instead of IMP1-076 and was never moved. Upon review of the model for FY19, it was picked up that the conveyor had never been removed from the Impumelelo costing therefore, it was decided to remove the conveyor from the model.

**Section 2c: Additions**

No additions were added to the model. However, photos were added to the structures which were still under construction in FY18.

**Section 3: Cash Flow**

None

**Revision 7 (FY20 update) notes:**

The required changes to the FY20 costing estimates were indicated by the relevant Planning Manager in the Sasol Mining Financial Provision Closure Declaration FY20 as shown below.
This report was revised to accommodate the changes made to the cost estimates for Sasol Mining's 2020 Financial Year.

The Mine Closure Department requested that an allowance for the compilation of the closure application and submission thereof (IMP1-098) be included. The cost for the Secunda mining right has been equally split between Impumelelo, Thubelisha, Shondoni and Syferfontein as these are the mines that will be operational up and till the closure of the mining right.

*Declaration Sheet (previously Scope of Work/Update Sheet): notes*

**Section 2a: Assumptions**
None.

**Section 2b: Demolitions / removals**
None.

**Section 2c: Additions**
Sasol behavioural awareness signs concrete plinths added in December 2019 (IMP1-097).

**Section 3: Cashflow**
None.

**Section 4: Additional Changes**
None.

**Section 5: Regulatory Conditions**
None.

**Section 6: Recommendations from Specialist Reports**
None.

**Section 7: Standard Operating Procedure**
None.
Revision 7 (FY20 update) signed closure declaration by Business Unit:

**SASOL MINING FINANCIAL PROVISIONING: CLOSURE DECLARATION FY20**

The purpose with this sheet is to give planning managers the opportunity to record changes that need to be incorporated in Sasol Mining's Closure Provision model for the 2019 financial year.

- This form can either be completed using Excel and then printed, or printed and completed by hand.
- Additional lines may be inserted if more space is required.

1) **BUSINESS UNIT (Select from Drop Down List)**

   IMP - Brandpunt Impumelelo
   IMP1 - Impumelelo Shaft
   Last update: 2019/03/30

2) **MANAGER INPUT**

   a) **Assumptions**
   
   The assumptions made in the Sasol Mine Closure Cost Estimate Update Report (JW066/19/0742) and in the relevant Site-specific reports (Appendices to the main report) have been incorporated in the costing model.

   If any of these assumptions needs to be changed, or additional assumptions are required, indicate in the space below. If no changes are required, comment "No changes".

   No Changes

   b) **Demolitions / removals**

   Indicate in the space below the item numbers of all items demolished since the previous assessment.

<table>
<thead>
<tr>
<th>Item no.</th>
<th>Description</th>
<th>Date demolished</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No items demolished</td>
<td></td>
</tr>
</tbody>
</table>

12/0/2019
3) CASH FLOW

Cash-flow information must be updated. Managers are requested to review the demolition dates included in the Provision Model (on sheet "Inventory") and make changes as required. Indicate below if any changes need to be incorporated in the update.

a) Changes required to demolition dates?
   b) If yes, are the changes attached herewith?
   c) Format of attachment?

4) ADDITIONAL CHANGES

Indicate in the space below any additional changes required to the Provision Model for the business unit.

No Changes

5) REGULATORY CONDITIONS

Extract from regulatory conditions applicable to the business unit, all conditions requiring financial provision to be made?

No regulatory changes that require financial provisioning

6) RECOMMENDATIONS FROM SPECIALIST REPORTS

Attach a summary of recommendations from relevant specialist reports that may have an impact on closure provision, in the format shown below.

<table>
<thead>
<tr>
<th>Report no.</th>
<th>Recommendation(s)</th>
<th>Action agreed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No additional recommendations</td>
<td></td>
</tr>
</tbody>
</table>

12/6/2019
7) STANDARD OPERATING PROCEDURE (SOP)

Indicate in the space below any changes required to the Standard Operating Procedures for mine closure.

No changes

Planning Manager:  
Name:  
Signature:  
Date:  

Financial Manager:  
Name:  
Signature:  
Date:  

12/6/2019
APPENDIX N.2

EMP AREA OF RESPONSIBILITY
Brandspruit Impumelelo

EMP detail (farm portion, date submitted) Refer to the attached report

Decommissioning activities

7.2.1.3 Decommissioning Phase

It is not anticipated that any further impacts will be incurred during the Decommissioning Phase as a result of the clearing of land (for construction purposes) on any of the Environmental Aspects (geology, topography, soil, land capability, land use, vegetation, animal life, surface water, groundwater, air, noise, sites of archaeological and cultural interest, sensitive landscapes, visual aspect regional and socio-economic aspects and Interested and affected parties).

Land will however need to be cleared as part of the rehabilitation activities associated with the proposed Impumelelo Mine; this is further discussed in Part 6.2.8. Some of the impacts described above will be partially or fully reversed as a result of rehabilitation activities; this will be further discussed in Part 7.2.6.

Geology

7.2.6.3.1 Geology

Ground previously utilised within the surface land use area will be cleaned to allow for rehabilitation activities. Surface geological strata may be altered as a result of the clearing of land and removal of redundant infrastructure. Waste rock from the rock stockpile will be used to fill the shaft voids. This means that the rock removed from underground will be returned, but the geological strata will not return to their original state, and will forever remain altered from their pre-mining status.

Topography

7.2.6.3.2 Topography

The decommissioning and removal of redundant infrastructure, the removal of stockpiled materials, the use of stockpiled materials for backfilling and rehabilitation, and rehabilitation of these surface land use areas will reduce the previously incurred impacts on topography. During this phase it is the intention to return the topography to close to its pre-mining state, where possible, through surface rehabilitation. The incline shaft area will be backfilled with suitable stockpiled materials and sealed in order to be made safe. No significant permanent impact on topography is anticipated where shafts, stockpiles and all other redundant infrastructure are properly rehabilitated.

Pre-mining land capability and land use

7.2.6.3.4 Land capability

During the Decommissioning Phase, redundant infrastructure will be removed and the surface land use areas (including the conveyor route) will be rehabilitated. Land capability will alter as rehabilitation takes place, and be returned to "agricultural". Specific rehabilitation activities are not anticipated to impact upon the land capability, therefore the impact will be indirect. The land capability will be altered to as close as possible to its pre-mining state.

Post mining Land capability

7.2.6.3.5 Land use

While rehabilitation takes place, the land use of the surface land use area will remain mining and related activities, however the rehabilitation will enable the pre-mining land use to be reinstated at a later stage. During the Decommissioning Phase, redundant infrastructure in the surface land use area will be removed and the surface land use areas rehabilitated. The surface land use area will be rehabilitated based on the planned end land use. Depending on the end land use and the long term water management strategy for the area some of the infrastructure (including some buildings, roads, servitudes and certain water management infrastructure) may be utilised after decommissioning and Closure of the mine.

Vegetation

7.2.6.3.6 Vegetation

During the Decommissioning Phase rehabilitation of all surface land use areas will take place, including the re-establishment of vegetation. Once all relevant surface land use areas have been decommissioned, rehabilitation will include the ripping of soil and placement of topsoil. Seed reflecting the surrounding natural vegetation or the vegetation of the indigenous to the local area should be sown in order to ensure that the resulting vegetation cover is representative of the study area. The rehabilitated and surrounding area should be carefully monitored to ensure that no invader plant species become established, as these species are often the pioneer plants in disturbed areas.

As a direct result of the re-establishment of vegetation in all previously disturbed areas, there will be an increase in habitat for fauna. This will be further discussed in Part 7.2.6.3.7.

Surface water

7.2.6.3.8 Surface water

Any areas of subsidence that may have developed during the underground mining of coal will be rehabilitated in such a way as to ensure that they are free draining, allowing surface water to flow along natural flow paths. Depending on the long-term water management strategy, some surface infrastructure may be left intact during and after the Decommissioning Phase. Some of the impacts on surface water as a result of infrastructure will remain. If the pollution control dams are left intact after mining has stopped, some water will still be lost to the catchment, and contained in the pollution control dams. A decrease in infiltration and increase in surface runoff will remain for all surface land use areas that are left intact after the completion of mining (such as roads, and any buildings that remain).

Redundant infrastructure will be decommissioned and the ground rehabilitated. Topsoil will be placed and then vegetated. Once topsoil has been placed, there will be an increase in erosion until the surface has been vegetated. Erosion of soil will increase the sediment load of the surface water, decreasing its quality. Once vegetation has taken hold on the topsoil, the likelihood of erosion will decrease, and therefore the water quality will improve. The removal of the redundant infrastructure will result in an initial disturbance of the surface land use area, potentially altering water flow paths. It is however the intention that the natural flow paths will be re-established on completion of the rehabilitation activities.

The catchment yield may be altered as some areas that were previously managed as dirty water management areas will be decommissioned and rehabilitated. There will be less surface area that is compacted after rehabilitation, and so the effects of impaction will be less severe as they were during the preceding phases. Backfilling of the incline shaft and sealing of other shafts will reduce the risk of ingress of surface water and thus ensure that clean surface water runoff remains available for the catchment. In the event of any spillages in or around the surface land use areas as a result of the rehabilitation of land, surface water may become polluted with hydrocarbons, if not mitigated. Spillages should be cleaned immediately so as to minimise spreading of pollutants, and the affected areas rehabilitated.
<table>
<thead>
<tr>
<th>Mine description</th>
<th>Brandspruit Impumelelo</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMP detail (farm portion, date submitted)</td>
<td>Refer to the attached report</td>
</tr>
</tbody>
</table>

**Groundwater**

The possible additional impacts on groundwater during this phase are dependent on the end groundwater management strategy to be developed for implementation. Pumping of groundwater will cease when mining operations at the proposed Impumelelo Mine are completed. This will mean that the cone of depression will dissipate. Once mining is completed, and water is allowed to move freely in the underground mine workings, water coming into contact with any remaining carbonaceous material will become polluted. This groundwater flow will carry pollutants with it, developing a pollution plume, the potential extent of which is quantified in Part 2.6 of the geohydrological study. Groundwater users may be adversely affected by the decrease in water quality in the pollution plume, if not sufficiently mitigated. The possibility of decanting within the mine boundary area exists, and may occur approximately 64 years after mining has ceased (depending on the rainfall received) (Refer also to Appendix D3 and Appendix D4). A groundwater management strategy will be developed to manage the decant and prevent the discharge of poor quality water into the receiving environment. In the event of any spillages in or around the surface land use areas as a result of therehabilitation of land, groundwater may become polluted with hydrocarbons, if not mitigated. Spillages should be cleaned immediately so as to minimise spreading of pollutants, and the affected areas rehabilitated.

**Sensitive landscapes**

Sensitive landscapes will continue to be affected by any infrastructure that is left intact after mining and related activities are completed at the end of the Operational Phase. Any impacts as a result of infrastructure which is left after mining is completed will be permanent. Sensitive landscapes will be affected by rehabilitation activities. Removal of infrastructure such as the conveyor belt, roads and certain water management infrastructure may affect sensitive landscapes within the area. The structure and functioning of the wetlands may alter partially back to their pre-mining status.

**Visual aspects**

As the mine is decommissioned and rehabilitation takes place, relevant buildings will be removed and land rehabilitated, based on the end land use. This will initially increase the visual impact as land is cleared, however as rehabilitation proceeds, the visual impact will be decreased. Any visual impacts that occur as a result of any infrastructure to be left in place will remain throughout the Decommissioning Phase and will result in a permanent visual impact. Visual impacts as a result of dust generation will continue throughout the Decommissioning Phase, however, they should become less as the decommissioning and rehabilitation progresses.
The following assumptions were made with relation to the Impumelelo mine closure cost model:

1) Impumelelo:

- The construction of the mine facilities was in progress during the evaluation on 18 January 2016. Some facilities could not be measured in detail and construction drawings were used where possible. Future additions will be included as construction is completed.

- All facilities will be demolished. No facilities remain for use by Sasol or external parties.

- Building rubble will be discarded in the Man & Material and ventilation shafts, within free-haul distance.

- Contractor's camp site and other temporary facilities are excluded.
APPENDIX N.4

LAYOUT AND LOM DRAWINGS
# APPENDIX N.5

## DETAILED COST BREAKDOWN

### Table 1: Changes in cost estimation from FY19 to FY20

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<th>P&amp;G's changes during the year</th>
<th>Mar. 2020</th>
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</thead>
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<td></td>
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<td>P&amp;G's (FY19)</td>
<td>Total incl. P&amp;G's (FY19)</td>
<td>rates update before PPI</td>
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<td>IMP1 - Impumelelo</td>
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<td>R 50 882 361</td>
<td>R 10 176 472</td>
<td>R 61 058 834</td>
<td>R 470 595</td>
</tr>
<tr>
<td>Totals</td>
<td></td>
<td>R 50 882 361</td>
<td>R 10 176 472</td>
<td>R 61 058 834</td>
<td>R 470 595</td>
</tr>
</tbody>
</table>

### Table 2: Summary of FY20 cost estimation

| Sum of Amount | 01 - Demantling of processing plant and related structures | 02A - Demolition of steel building and structures | 02B - Demolition of reinforced concrete buildings and structures | 02C - Demolition of brick office building and structures | 03 - Rehabilitation of access roads | 07 - Sealing of shafts, sumps and inclines | 09A - Rehabilitation of overburden and spoils | 10 - General service of general works, fooling, paving and fencing | 12 - Roofing | 13 - Water management (separating clean and dirty, managing polluted water, managing the impact on groundwater, including treatment, when required) | 14 - 2 to 3 years of maintenance and aftercare | 15 - Miscellaneous items | P&G - P&G | Grand Total |
|---------------|----------------------------------------------------------|-----------------------------------------------|----------------------------------------------------------|-----------------------------------------------|-----------------------------------------------|-----------------------------------------------|-----------------------------------------------|-----------------------------------------------|-----------------------------------------------|-----------------------------------------------|-----------------------------------------------|-----------------------------------------------|-----------------------------------------------|
| IMP - Brandspruit | R 484 404 | R 479 161 | R 9 352 732 | R 10 415 779 | R 5 294 538 | R 9 006 388 | R 1 894 694 | R 11 180 684 | R 271 710 | R 4 653 502 | R 29 | R 402 691 | R 463 750 | R 10 780 013 | R 64 680 075 |
| Grand Total      | R 484 404 | R 479 161 | R 9 352 732 | R 10 415 779 | R 5 294 538 | R 9 006 388 | R 1 894 694 | R 11 180 684 | R 271 710 | R 4 653 502 | R 29 | R 402 691 | R 463 750 | R 10 780 013 | R 64 680 075 |

### Table 3: Cash flow (post-closure maintenance included)

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<th>Sum of Amount</th>
</tr>
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</tr>
<tr>
<td>IMP1 - Impumelelo Shaft</td>
<td>R 64 680 075</td>
</tr>
<tr>
<td>01/01/2051</td>
<td>R 64 680 075</td>
</tr>
<tr>
<td>Grand Total</td>
<td>R 64 680 075</td>
</tr>
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GENERAL MANAGER  
MINE MANAGER  
FINANCIAL MANAGER  

DATE  
DATE  
DATE