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Short-term geological modelling for improved mine planning at Isibonelo Colliery

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ISIBONELO COLLIERY PROPOSED SHORT TERM MODELLING PROCEDURE

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1 Aim

The aim of this procedure is to prescribe a methodology for undertaking short term geological modelling at Isibonelo Colliery and other ACSA opencast operations to assist with generation of information required for short-term mine planning and input put into geotechnical designs. The procedure shall be reviewed every three years or earlier in the evet of a trigger action.

2 Scope

This procedure and its documented standards will apply to Isibonelo Colliery and other ACSA opencast operations

3 Definitions

Term	Definition
Mine Activity Engineer	The mining engineers appointed to conduct short-term planning on truck and shovel, drill and blast and dragline activities
Section	This is an area of responsibility allocated to a specific person.

4 Abbreviations

Abbreviation	Explanation
UAV	Unmanned Aircraft Vehicle (Drone)
STM	Short term Model
MAE	Mine Activity Engineer
ACSA	Anglo American Coal South Africa

5 Procedure description

Activity	Description	Frequency	Relevant Document/s	Application Support
R = Recommend A = Agree I = Input D = Decide E = Execute				
Identify Highwall To Be Mapped/or drill bench where pre-split holes are ready	The Geologist must identify the highwall to be geologically mapped. These would be: • Any new cut/strip or new box cut • Any working face that has been exposed inclusive of in pit and softs highwall • If for down hole wireline logging identify the pre-split holes. **RI Geology Manager** **DE Production Geologist**	Ad Hoc	**Input Doc:** Highwall Mapping procedure	Manual
Check Availability of Highwall both in pit and softs to be mapped	Check for the availability of the area to be mapped / drill bench for wireline logging. **RI Geology Manager** **DE Production Geologist**	Ad Hoc	**Input Doc:** Highwall Mapping procedure	Manual
Arrange for Highwall Mapping / Drone flyover or wireline logging	1.Arrange for mapping with the survey department if total station or drone flyover (with service provider) process or 2. Arrange with mining and MAE (drill &blast) if wireline logging pre-split holes The following shall be notified at least a day in advance • Survey Manager • Production Foreman • Mine Overseer (APS) • Section Manager (Pit Superintendent) **RI Geology Manager** **DE Production Geologist**	Ad Hoc	**Input Doc:** Highwall Mapping procedure	Manual
Determine Working Area Safe for Highwall Mapping/or Wireline logging	Permission must be obtained from the Production Foreman to enter the pit for purposes of mapping the highwall or commence wireline logging The person to perform the mapping or wireline logging shall ensure that the area is safe before proceeding by conducting SLAM. **D Production Foreman** **ER Geologist**	Ad Hoc	**Input Doc:** A1: SLAM (Stop Look Assess Manage)	Manual
Drone flyover or Total station mapping commence/Wireline logging starts	1. Drone highwall face mapping commence or Total station pickups until whole area is covered 2. Wireline logging commence and complete the holes planned	Ad Hoc	**Input Doc:** Highwall Mapping procedure	Manual

Activity	Description	Frequency	Relevant Document/s	Application Support
R = Recommend A = Agree I = Input D = Decide E = Execute				
	D Production Foreman **R Production Geologist** **E Service provider**			
Data processing by the service providers done off site	1.The drone flyover service provider processes the data offsite and hands over the 3-D model to Geology and Survey within 5days of completion of field work 2. If total station data, the surveyor send it to geology for further processing. 3.Wireline logs are sent to Geology within 24 hours of completion of field work. **DER Service Provider/Surveyor**	Ad Hoc		Semi-automated: Agisoft or 3DRippler - Electronic Data(model)
Analyse and interpret Geology from the3-D model in the appropriate software and deliver STM information to mine planning and rock engineering	1.Upon receiving the data /or 3-D model import into the modelling software (Minescape Stratmodel), then view and validate the model. 2. Extrapolate the required information e. g. surfaces, lithologies and structures then output in compatible format for onward transmission to the stakeholders (mine planning, rock engineering etc) to use in short-term planning and designs respectively. NB information received to be signed off by recipient as acknowledgement of receipt. 3. Geologist interpolate the wireline logs and provide a csv file to MAE (drill &blast) for drill bench design. **RI Geology Manager** **DE Production Geologist**	Ad Hoc		Semi-automated: MicroStation -Electronic Data(model)
Forward short-term model data to Resource Evaluation Depart for annual updates.	Periodically send updated short-term model information to Resource Evaluation department for Resource Geology Specialist to incorporate during the annual resource model updating. **RI Geology Manager** **DE Production Geologist**	Ad Hoc		Manual
Archive the STM	Save the STM in the directory for geology with restricted access that no unauthorised can tamper with the model**.** **RI Geology Manager** **DE Production Geologist**	As and when		Semi-automated: -Electronic Data (model

6 Reference

DOC No AATC 009616	Highwall and low wall mapping procedure

7 Revision

Version No.	Reason for Change	Date
00	New Document	08.06.2018

8 Appendices: None