SASOL MINING (PTY) LTD

Twistdraai Colliery Thubelisha Shaft

Licence Number: Ref No. MP 30/5/1/2/3/2/1 (138) EM) dated 17/01/2018

EXTERNAL AUDIT: ENVIRONMENTAL AUTHORISATION & ENVIRONMENTAL MANAGEMENT PROGRAMME

DECEMBER 2021

PREPARED FOR	PREPARED BY
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SASOL MINING (PTY) LTD

TWISTDRAAI COLLIERY THUBELISHA SHAFT

EXTERNAL ENVIRONMENTAL AUTHORISATION & ENVIRONMENTAL MANAGEMENT PROGRAMME AUDIT FOR TWISTDRAAI COLLIERY THUBELISHA SHAFT

SASOL MINING (PTY) LTD

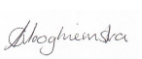
TWISTDRAAI COLLIERY THUBELISHA SHAFT

EXTERNAL ENVIRONMENTAL AUTHORISATION & ENVIROMENTAL MANAGEMENT PROGRAMME AUDIT FOR TWISTDRAAI COLLIERY

THUBELISHA SHAFT

DOCUMENT CONTROL SHEET

Report/Project Number:	**Twistdraai Colliery: Thubelisha Shaft**
Report/Project Title:	External Environmental Authorisation & Environmental Management Programme audit for Twistdraai Colliery Thubelisha Shaft

Revision Number	**Date of Issue**	**Status of Report**	**Originator**		**Checked**		**Approved**	
			Initials	Signature	Initials	Signature	Initials	Signature
00	*2022/05/09*	*1st Draft*	*DE*				*CH*	
01	*2022/08/03*	*Final*	*DE*				*CH*	

Executive Summary

MDT Environmental (Pty) Ltd (MDTE) was appointed by Sasol Mining (Pty) Ltd (Sasol) to conduct an External Environmental Authorisation & Environmental Management Programme audit of the Twistdraai Colliery Thubelisha Shaft.

The scope of the audit encompassed TCTS and in particular its surface operations where water is used for mining operations. The site audit and reconnaissance focused on the overall mining operations and all active sites.

The audit was conducted by Deon Esterhuizen on 13 December 2021, but due to inclement weather had to continue on 2 February 2022.

The site audit and reconnaissance focused on the overall mining operations and all active sites.

The audit was successfully completed, and the commitment from the TCTS employees, specifically from Sasol senior management at the Mine, is commendable.

A number of positive points were noted during the audit of which some are summarised below:

- The willingness, openness and transparency displayed by Sasol employees during the external audit.
- The priority time allocated to the external audit during the audit and providing additional information after the audit.
- The excellent control of environmental, health and safety matters on site.
- Extensive monitoring of the surface and groundwater resources.
- The active use of the ISOMETRIX system to record, address, follow up and closeout actions.

The overall EA compliance score is 88% and the EMPr compliance score is 94%.

To ensure improved compliance with the requirements of the EA and EMPr the Mine should:

- Continue to address fugitive coal dust as a diffuse source.
- A plan of all material storage areas, including topsoil is required, that should form part as the rehabilitation plan of the Mine and erosion identified should be investigated and rehabilitated with erosion protection mechanisms implemented.
- Design and implement an effective stormwater control system at the emergency / throw out stockpile area, and implement regular maintenance of all stormwater (clean and dirty) systems.
- Update the underground mining planned model and the approach to address the requirements of the EMPr.
- Effective incident management and reporting.

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LIST OF ACRONYMS & ABBREVIATIONS

BPG	Best Practice Guideline
CAR	Corrective Action Report
DWS	Department of Water and Sanitation
EC	Electrical Conductivity
EIAR	Environmental Impact Assessment Regulations, 2014, as amended
ELU	Existing Lawful Uses
EMP	Environmental Management Plan
EMPr	Environmental Management Programme
IWUL	Integrated Water Use Licence
IWULA	Integrated Water Use Licence Application
IWWMP	Integrated Water and Waste Management Plan
NEMA	National Environmental Management Act, 1998 (Act 107 of 1998)
NWA	National Water Act, 1998 (Act 36 of 1998)
PCDs	Pollution Control Dams
ROM	Run of Mine
RSIP	Rehabilitation Strategy and Implementation Plan
SEMA	Specific Environmental Management Act
SS	Suspended solids
TCTS	Twistdraai Colliery: Thubelisha Shaft
TOC	Total organic carbon
TDS	Total dissolved solids
TSS	Total suspended solids

WCWDMP	Water Conservation and Water Demand Management Plan
WML	Waste Management Licence
WUA	Water Use Authorisation
WUL	Water Use Licence
WwTW	Wastewater Treatment Works

1. INTRODUCTION

MDT Environmental (Pty) Ltd (MDTE) was appointed by Sasol Mining (Pty) Ltd, Twistdraai Colliery: Thubelisha Shaft (TCTS) to conduct an external audit on compliance with the conditions set in the Environmental Authorisation (EA) and Environmental Management Programme (EMPr). The EMPr and EA were approved in 2009, in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA) and the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA). The EMPr was amended in 2017 to incorporate two additional mining right areas as well as the construction of two ventilation shafts into its approved EMPr. The EMPr has been submitted to the DMRE for consideration and was approved on 29 July 2020. Therefore, the Environmental Audit was undertaken against the operational conditions within the existing and approved EMPr and EA dated 2020 for the TCTS operations. Additionally a Regulation 29 Amendment application was submitted to include additionally properties into the EMPr boundary. This Regulation 29 has since been approved (Ref No. MP 30/5/1/2/3/2/1 (138) EM) dated 17/01/2018. The audit was conducted by Deon Esterhuizen on 13 December 2021, but due to inclement weather had to continue on 2 February 2022.

1.1.1 Background

The TCTS was commissioned to replace Twistdraai Colliery's shafts as coal reserves of the latter were depleted:

- Central shaft decommissioned and shaft sealed in 2012;
- West Shaft decommissioned and shaft sealed in 2015;and
- East Shaft decommissioned in December 2017 and rehabilitated in June 2018

The life of mine (LOM) for TCTS extended to 2050.

The project which includes the Trichardtsfontein Mine, Vaalkop and TCTS is located between the town of Trichardt and Bethal in the province of Mpumalanga. The town of Evander is 17 km to the West and Secunda is 10 km South West of the Trichardtsfontein and TCTS mining area. Vaalkop is located 5 km southeast of Bethal and 17 km southwest of Trichardt. The consolidation project area and coal reserve are located within the Bethal Magisterial District, the Gert Sibande District Municipality (GSDM) and the Govan Mbeki Local Municipality (GMLM).

The mining method includes both bord-and-pillar and high extraction mining (stooping) in selected areas. Primary access to the underground reserves is achieved via a vertical main and materials shaft, with secondary access via an incline shaft at TCTS.

1.1.2 Audit Objectives, Scope and Criteria

The objective of the audit was to verify whether the TCTS complies to the requirements of the EA and EMPr (where applicable).

The scope of the audit encompassed TCTS and in particular its surface operations where water is used for mining operations. The site audit and reconnaissance focused on the overall mining operations and all active sites.

The audit was conducted by Deon Esterhuizen on 13 December 2021, but due to inclement weather had to continue on 2 February 2022.

The site audit and reconnaissance focused on the overall mining operations and all active sites. The audit included the following:

- The independent external audit was initiated with an opening meeting on 13 December 2021, during which the audit approach was discussed, and the audit schedule and focus areas confirmed.
- A site walk and visits to active areas and especially water-related features.
- A collection and review of audit evidence in terms of documentation and records.
- The audit culminated in a close-out meeting on 2 February 2022.

1.1.3 Audit Scope and Approach

The audit was conducted by an experienced external lead auditor and the audit approach was independent and holistic. The compliance to audit criteria – in this case the EA and EMPr, were verified by sample site inspections, collection of applicable documentation, records and reports as well as interactive discussions with the organisation's environmental staff and on-site employees.

The audit was a systematic review of the records and data presented by the auditee team to the external auditor. In the absence of evidence not being found or provided confirming compliance to a condition, a non-compliance was raised.

1.1.4 EA and EMPr External Auditor and Declaration of Independence

The EA and EMPr external Auditor was Deon Esterhuizen who also prepared the audit report. Below is a summary of his relevant experience:

Deon Esterhuizen has a M.Sc. degree in Environmental Management with 29 years of experience in water related projects, which include water resource management, water quality management, water use registration and licencing of water users, including project management of multi-disciplinary studies. He also has extensive experience in a wide-range of environmentally related projects, processes and applications for private, commercial and industrial clients, in addition to local, provincial and national government departments.

Water Resources

Key experience gained through his involvement in a number of water resources related projects, including ensuring the protection, development, conservation, management, use and control of the water resources in the Gauteng Region's area of responsibility in a sustainable manner as well as co-ordinate the management of the quality of the water resources of a specific catchment on an ongoing basis to achieve water resource objectives

during his employment at the Department of Water Affairs and Forestry. Specific focus areas include:

- Catchment Management Strategies & Plans
- Water Quality Management Plans
- Registration and Licensing of water users
- Assessing water requirements for basic human needs and riverine ecology
- Determining stream-flow assimilative capacity for pollution loads
- Water quality guidelines
- Industrial wastewater treatment and disposal

Environmental

Key experience gained through environmental related projects as a consultant at BKS (Pty) Ltd and ILISO Consulting (Pty) Ltd in the fields listed

below:

- Integrated Environmental Management (IEM) in general
- Environmental Impact Assessments (EIAs)
- Environmental Management Plans (EMPs)
- Environmental monitoring and auditing

Project Coordination & Management

Key experienced gained as the project leader and coordinator on a number of large, strategically important and multi-disciplinary projects for various clients, including international (Africa) projects.

External Reviewer

Key experienced gained as external reviewer for the Department of Water and Sanitation as well as other consulting firms.

Relevant Experience

- Annual IWUL Audit for Sasol Synfuels.
- Glencor Lydenburg Operations: External Audit of Integrated Water Use Licence
- Annual IWUL Audit for Sasol Thubelisha Mine and Sasol Mooikraal
- Sasol Sasolburg General Authorisation application for Section 21 (c) and (i) water uses as required ito the National Water Act
- Sasol Mining General Authorisation application for Section 21 (c) and (i) water uses as required ito the National Water Act
- Project Leader and Coordinator for providing consulting engineering services to assist the City of Tshwane with various flood management activities on an “as-and-when” basis for a three-year period. November 2011 – October 2014.
- Project Lead of the Environmental Team that formed part of a bigger team managed by SRK to prepare environmental and water use applications for City of Tshwane Flood Management Activities. 2008 – 2012.
- Project Manager Environmental Impact Assessment (EIA) for the installation of Solar Photovoltaic Power Plant at Eskom Arnot and Duvha Power Stations. October 2014 – Current.

- Water Use Licence Application Task leader - for the Mzimvubu Water Project for the construction of the Ntabelanga and Lalini Dam and associated infrastructure.
- Project Leader - Basic EIA for the construction of flood remedial measures on the Doringkloof Spruit.
- Environmental and Social Lead of the Olifants River Water Resources Development Project - Sub- Phases 2C. Responsible and accountable for the management of all environmental and social related tasks performed by two Environmental Monitors, two Social Monitors, and a Land Acquisition Team. This team was responsible to ensure that the Contractor executes the project within the guidelines of legislation, the environmental authorisation, the environmental management plan, and project specifications. Trans Caledon Tunnel Authority. January 2011 – Current.

This report has been prepared according to the requirements of Section 34 of the Environmental Impact Assessments Regulations, 2014, as amended. I, Deon Esterhuizen, the undersigned, declare the findings of this report free from influence or prejudice.

……..

Deon Esterhuizen: Professional Natural Scientist (RN: 400154/09)

Director: MDT Environmental (Pty) Ltd

1.1.5 Methodology

The audit was a systematic review of the records and data presented by the TCTS employees to the External Auditor. In the absence of evidence, a finding was raised.

To ensure consistency of findings and reporting, it was agreed that the Auditor would use the Sasol ISOMETRICS spreadsheet. This approach also allows for the active closeout of audit findings by the relevant and responsible parties.

The main result is that only compliant or non-compliant findings can be raised. This ensures a very conservative approach and was accepted by all.

The spreadsheet also makes provision for risk categories, with high risk findings summarised below:

- Competent Authority reporting requirements
- Stormwater management
- Water quality and quantity exceedances
- Design requirements of pollution prevention facilities
- Activities not authorised in terms of the NWA
- Pollution of surface and ground water resources, including the potential for pollution
- Impact on stakeholders / neighbours
- Closure financial liabilities
- Freeboard requirements for pollution control facilities
- Undermining activities within regulated zone of water resources

1.1.6 Disclaimer

Although care is taken to audit as comprehensively as possible, auditing is done on a sample basis and based on conditions as they were found on the day of the audit. There could thus be other non-conformances not observed during the audit, or a finding could be a once off occurrence.

2. INDEPENDENT EXTERNAL AUDIT RESULTS

An excel based audit checklist was developed by Sasol and used to capture the results of the audit. The assessment criteria were discussed earlier. The criteria ensures that the assessment is objective and removes any bias.

Considering the risk categories discussed above, the following areas require attention / intervention by TCTS, specifically considering the EA and EMPr conditions:

- Diffuse Sources of Pollution – Fugitive Dust.
- Management of Soil – overburden, subsoil, and topsoil.
- Management of Potential Surface Impacts at the Emergency Stockpile.
- Water Management Strategy.

The details of each risk category are discussed below.

The audit checklists that were completed for the audit is attached as **Appendix A**.

2.1.1 Diffuse Sources of Pollution – Fugitive Dust

The EMPr requires that:

- 6.2.1.1 (c) The drop heights when loading onto trucks and at tipping points should be minimised.
- 6.2.2.1 (c) The coal bunker design includes a cover and water sprays to prevent coal dust dispersion.
- 6.2.2.1 (d) Ensure bi-weekly inspections of dust suppression equipment on the bunker and transfer stations and replace faulty components.
- 6.2.3.1 (a) Drop heights should be minimised when offloading materials.

The Mine does monitor dust and reports against legal standards. The Mine complies fully with the set standards, but evidence (see photographic record) still suggests that fugitive coal dust escapes at the bunker area. Although the coal bunker and transfer areas include a cover and water sprays, fugitive dust is still evident outside the dirty containment areas. This diffuse source may impact on the water environment, and the ability of vegetation to grow optimally.

The photographic evidence below that although full compliance has not been achieved, significant progress has been made to contain and control coal escaping from the contained areas.

	
Coal and coal dust spillages at the conveyor system, but with clear evidence of cleaning activities	Further evidence of coal and coal dust spillages. Effort has been made to contain these spillages
	
Overfull containment structures	Large areas have been cleaned by the Mine at the Coal bunker area, but further work is required

2.1.1 Management of Soil – overburden, subsoil, and topsoil

Various conditions are found in the EMPr that requires the stripping, storing, rehabilitation and general management of all stockpiles created during the development of the Mine and its infrastructure such as ventilation shafts. Some of these are:

- 6.7.1.1(d) The soils stripped for the ventilation shafts should be stripped and conserved for rehabilitation.
- 6.7.1.1 (h)The stockpiles should be vegetated to reduce the risk of erosion, and to reinstitute the ecological processes within the soil.

- 6.7.1.1 (f) If erosion occurs on the site or on the stockpiles, corrective actions must be taken to minimise any further erosion from taking place.
- 6.11.2.3 (d2) The vegetation of the soil/overburden stockpile and covering them with soil to minimise rainfall infiltration and mobilisation of dissolved metals.
- 6.11.2.3 (d3) Implementation of a lime cover on overburden stockpiles to neutralise acidity.

Stockpiles, specifically at the bunker area have been, vegetated, but significant evidence of construction material was still visible on surface. The mine has to confirm what material is stockpiled where on the Mine – Soil Management Plan. It should be noted that any material removed from the incline shaft should possibly be characterized, classified and licenced ito the National Environmental Management Waste Act, 2008 (Act 59 of 2008)(NEMWA).

No evidence was provided that the overburden stockpile was covered with a layer of “soil”. Anecdotal evidence during the site visit (see photographic record) shows no or limited soil cover of the overburden stockpile. There was also no evidence provided that a lime cover on overburden stockpiles was placed.

In summary, a plan of all material storage areas, including topsoil is required, that should form part as the rehabilitation plan of the Mine.

Erosion was observed at the overburden stockpile as shown below. The Mine has investigated the erosion and developed protection mechanisms to prevent the continued deterioration. A contractor has been appointed to rectify and rehabilitate the erosion. The main stockpile area was also visited during the audit and it was found that the same or worse conditions exist at this stockpile, and requires intervention.

	
Cleaned and rehabilitated areas	Areas that still require cleaning and rehabilitation

Overburden stockpile at main shaft

Erosion at the above stockpile area

Erosion of overburden stockpile

Lack of alien vegetation control

Cirsium vulgare or Spear thistle, Scotch thistle is a Category 1 b alien. And a person in control of a Category 1 b Listed Invasive Species must control the listed invasive species in compliance with sections 75(1), (2) and (3) of the Act.

2.1.2 Management of Potential Surface Impacts at Emergency Stockpile

The Mine has initiated the construction of a cutoff stormwater canal and has shared the design drawings with the auditor. A design report that confirms that this cutoff trench is designed for the 1:50 year flood was shared with the auditor, but it specifically does not include; addressing super critical stormwater flows; creating a level platform, effective diversion of upstream clean stormwater and flow attenuation. The new canal will divert contaminated stormwater to the existing contaminated runoff facilities and Pollution Control Dams (PCDs), but the design does not address how the additional flows would impact on the ability of the current facilities to cater for the additional flows.

2.1.3 Water Management Strategy

In terms of the EMPr the mine must limit the extent of pillar extraction to target only areas with a low potential for water ingress. This implies excluding all floodplain areas and areas within the 1:100 flood line, all areas with a **thin soil cover** that have a significant catchment draining to them, and as far as is practical, the mine must avoid **rocky outcrops**. It was also noted that the mine areas currently designated for pillar extraction do contain some percentage of thin cover and rocky outcrop.

Furthermore, the percentage of pillar extraction mining will also be lower initially, with the final target of around 50% of the total area mined achieved largely in the last few years of mining.

These areas, as highlighted above, are currently not part of the underground mining planned model and the approach as described above is also not incorporated in the mine plan for Thubilisha.

2.1.4 Incident Management

An incident register was shared with the external auditor. This incident register recorded three minor and three moderate incidents during January 2021. One minor and one moderate incidents were reported for December 2021. The external auditor was also provided with a presentation that is used internally to make Sasol management aware of these incidents, but none of these were recorded in the incident register for Thubilisha Mine.

Furthermore, the incident, evidenced in the photographic record below, of contaminated runoff from the conveyor system into a tributary of the Debeer Spruit, was not included in the report shared with the External Auditor.

<table>
<tr><td>  </td><td>  </td></tr>
<tr><td>Evidence of contaminated runoff (red line) from conveyor belt.</td><td>Attempt at blocking flow entering the tributary of the De Beer Spruit shown in red.</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Evidence of contaminated runoff – red arrow.</td><td>Material to be used to rehabilitate area when it is dried out.</td></tr>
</table>

Sasol has a bespoke ISOMETRIX system to record, address, follow up and closeout actions, including incidents, and promotes the active use of the system. For incidents, the system includes fields such as risk source, risk classification, hazard rating, and others to ensure that a systematic process is used to record, address and report on incidents. It appears that this incident was not investigated and closed out on the system, nor captured on the separate spreadsheet.

3. CONCLUSION & RECOMMENDATIONS

The audit was successfully completed, and the commitment from the TCTS employees, specifically from Sasol senior management at the Mine, is commendable.

A number of positive points were noted during the audit of which some are summarised below:

- The willingness, openness and transparency displayed by Sasol employees during the external audit.
- The priority time allocated to the external audit during the audit and providing additional information after the audit.
- The excellent control of environmental, health and safety matters on site.
- Extensive monitoring of the surface and groundwater resources.
- The active use of the ISOMETRIX system to record, address, follow up and closeout actions. .

The overall EA compliance score is 88% and the EMPr compliance score is 94%.

To ensure improved compliance with the requirements of the EMPr the Mine should:

- Continue to address fugitive coal dust as a diffuse source.
- A plan of all material storage areas, including topsoil is required, that should form part as the rehabilitation plan of the Mine and erosion identified should be investigated and rehabilitated with erosion protection mechanisms implemented.
- Design and implement an effective stormwater control system at the emergency / throw out stockpile area, and implement regular maintenance of all stormwater (clean and dirty) systems.
- Update the underground mining planned model and the approach to address the requirements of the EMPr.
- Effective incident management and reporting.

APPENDIX A: AUDIT CHECKLISTS

Business Unit	Owner	Conditions	Audit compliance status / Answer	Audit comments
Mining -> Thubelisha Colliery	Carol Hooghiemstra	4.1 This exemption is valid for the life of mine from the date of issuance and should be read in conjunction with the conditions of integrated water that had been or could be issued to the exemptee, which supersedes the requirements of the Exemption	C	
Mining -> Thubelisha Colliery	Carol Hooghiemstra	4.2 The responsibility for complying with the provisions of the exemption is vested in the exemptee and may not be ceded to any other person or body.	C	
Mining -> Thubelisha Colliery	Carol Hooghiemstra	4.3 Any incident that causes or may cause water pollution must immediately be reported to the Provincial Head or his or her representative.	NC	An incident register was shared with the auditor. This incident register recorded three minor and three moderate incidents during January 2021. One minor and one moderate incidents were reported for December 2021. The presentation of the incidents to management listed four (4) minor incidents - spreadsheet to be updated. For August 2021 six minor and two moderate incidents were reported to management, but none of these were recorded in the incident register for Thubilisha. Photographic evidence of one incident close out was provided to the auditor. The incident, evidenced in the photographic record, of contaminated runoff into a tributary of the Debeer Spruit, was not included in the report shared with the Auditor, nor was evidence shared that this incident was submitted to the DWS. This incident would be considered significant and reportable due it reaching the watercourse.
Mining -> Thubelisha Colliery	Carol Hooghiemstra	4.4 The Exemption, must immediately inform the Provincial Head of any change in its name, address and/or premises and legal status.	C	
Mining -> Thubelisha Colliery	Carol Hooghiemstra	4.5 In this Exemption, Provincial Head means the Provincial Head: Mpumalanga of the Department of Water and Sanitation, who may be contacted (Nelspruit) 013 759 7300	C	
Mining -> Thubelisha Colliery	Carol Hooghiemstra	5.1 A more detailed Geotechnical Assessment detailing the different methodologies to be employed to prevent any subsidence events	C	JMA report dated 2017 was specifically developed to address these conditions. It appears though, from the biannual monitoring reports, that the identified additional monitoring boreholes are not monitored.
Mining -> Thubelisha Colliery	Carol Hooghiemstra	5.2 Clarity must be given on the relationship between the geological structures (dolerite dykes) and possible leaking of the wetlands	C	JMA report dated 2017 was specifically developed to address these conditions. It appears though, from the biannual monitoring reports, that the identified additional monitoring boreholes are not monitored.
Mining -> Thubelisha Colliery	Carol Hooghiemstra	5.3 Clarity must be given on which aquifers are found in the area and weather the aquifers and groundwater is linked to the wetlands	C	JMA report dated 2017 was specifically developed to address these conditions. It appears though, from the biannual monitoring reports, that the identified additional monitoring boreholes are not monitored.

Number of conditions compliant:	**7**
Number of conditions non-compliant:	**1**
Number of conditions not applicable:	**0**
Total number of conditions:	**8**
Percentage compliance:	**88%**

Business Unit	Conditions	Audit compliance status / Answer	Audit comments
Mining -> Thubelisha Colliery	6.2.1.1 (a) Site clearing must be done in phases and use of suppressants and binders on exposed areas to reduce dust generation;	C	Construction of the Mine has been completed.
Mining -> Thubelisha Colliery	6.2.1.1 (b) The area of disturbance at all times must be kept to a minimum and no unnecessary clearing, digging or scraping must occur, especially on windy days (with wind speed ≥ 5.4 m/s);	C	Construction of the Mine has been completed.
Mining -> Thubelisha Colliery	6.2.1.1 (c) The drop heights when loading onto trucks and at tipping points should be minimised;	C	During the previous aufit the drop heights from the bunker area creates fugutive coal dust that is clearly evident outside the "dirty" runoff area. This contaminated area has been cleared and rehabilitated and the fugitive dust concern addressed.
Mining -> Thubelisha Colliery	6.2.1.1 (d) Dust suppression must take place on exposed surfaces; and	C	No dust suppression was noticed during the audit, or confirmed and supported by evidence that the same is taking place, but dust monitoring results show that these are within legal limits.
Mining -> Thubelisha Colliery	6.2.1.1 (e) Set maximum speed limits on site and to have these limits enforced	C	Maximum speed limits are set, but not necessarily enforced.
Mining -> Thubelisha Colliery	6.3.1.1 (a)Restricting construction activities to daylight hours (06:00 – 18:00); and	C	Construction of the Mine has been completed.
Mining -> Thubelisha Colliery	6.3.1.1 (b)Switching off equipment when not in use.	C	
Mining -> Thubelisha Colliery	6.3.1.1 (a)Restricting construction activities to daylight hours (06:00 – 18:00); and	C	Duplication?
Mining -> Thubelisha Colliery	6.3.1.1 (b)Switching off equipment when not in use.	C	Duplication?
Mining -> Thubelisha Colliery	6.7.1.1 (a) If possible soil should be removed during dry months, as to reduce compaction;	C	Construction of the Mine has been completed.
Mining -> Thubelisha Colliery	6.7.1.1 (b) Only clear vegetation when and where necessary;	C	Construction of the Mine has been completed.
Mining -> Thubelisha Colliery	6.7.1.1 (c) Only the designated access routes are to be used;	C	Access control is enforced strictly.

Mining -> Thubelisha Colliery	6.7.1.1(d) The soils stripped for the ventilation shafts should be stripped and conserved for rehabilitation;	C	Evidence was provided that the soils were stripped and conserved for rehabilitation. The stockpile area requires erosion and alien vegetation maintenance.
Mining -> Thubelisha Colliery	6.7.1.1 (h)The stockpiles should be vegetated to reduce the risk of erosion, and to reinstitute the ecological processes within the soil;	NC	Stockpiles, specifically at the bunker area have been, vegetated, but significant evidence of construction material was still visible on surface. The mine has to confirm what material is stockpiled where on the Mine. It should be noted that any material removed from the incline shaft should possibly be classified and licenced ito the National Environmental Management Waste Act. The Mine has initiated the appointment of a contractor to address the erosion at the bunker area. Another stockpile area was investigated which also requires erosion and alien vegetation management.
Mining -> Thubelisha Colliery	6.7.1.1 (j) Ensure designed storm water management are in place.	C	
Mining -> Thubelisha Colliery	6.7.1.1 (e) Topsoil stockpiles are to be kept to a maximum height of 3 m at a 2:5:1 slope;	C	
Mining -> Thubelisha Colliery	6.7.1.1 (f) If erosion occurs on the site or on the stockpiles, corrective actions must be taken to minimise any further erosion from taking place;	NC	The Mine has addressed previous findings related to erosion, but further evidence was noticed onsite of erosion that requires urgent intervention.
Mining -> Thubelisha Colliery	6.7.1.1(g)The handling of the stripped topsoil should be minimised to ensure the soil's structure does not deteriorate significantly	C	Construction of the Mine has been completed.
Mining -> Thubelisha Colliery	6.7.1.1 (i) Compaction of the removed soil should be avoided by prohibiting traffic on stockpiles	C	Construction of the Mine has been completed.
Mining -> Thubelisha Colliery	6.8.1.1 (a)The footprint area should be kept as small as possible;	C	Construction of the Mine has been completed.
Mining -> Thubelisha Colliery	6.8.1.1 (b) Existing access roads should be used to reach the site for clearing and vehicles should not be allowed to traverse natural areas or leave the demarcated road;	C	Construction of the Mine has been completed.
Mining -> Thubelisha Colliery	6.8.1.1 (c) An alien invader management plan should be implemented, whereby the disturbed site is monitored quarterly for at least two years to ensure that alien invasion does not take place.	NC	No evidence was provided that the site was monitored quarterly for two years to ensure that alien vegetation invasion does not take place. Evidence during the audit showed alien invasion is taking place. An Alien invasive plan was provided but significant areas were found with alien vegation seeding.
Mining -> Thubelisha Colliery	6.10.1.1 (a) Clearing of vegetation must be limited to the development footprint area, and the use of existing access roads must be prioritized so as to minimize construction of new access roads in these areas;	C	Construction of the Mine has been completed.
Mining -> Thubelisha Colliery	6.10.1.1 (b) If possible, construction activities must be prioritised to the dry months of the year to limit mobilisation of sediments, dust generation and hazardous substances (oil, diesel, etc.) from construction vehicles used during site clearing;	C	Construction of the Mine has been completed.

Mining -> Thubelisha Colliery	6.10.1.1 (c) Dust suppression with water on the haul roads and cleared areas must be undertaken to limit dust. During dry times, this could be undertaken on a daily basis where there is visible dust being generated;	C	Construction of the Mine has been completed.
Mining -> Thubelisha Colliery	6.10.1.2 (a) Construction work closer to the streams should be suspended during heavy rains to avoid erosion and sedimentation of the streams and unnecessary vehicle movement should be avoided.	C	Construction of the Mine has been completed.
Mining -> Thubelisha Colliery	6.10.1.2 (b) Designs should avoid the causing of erosion or spillages of material during the construction phase.	C	Construction of the Mine has been completed.
Mining -> Thubelisha Colliery	6.10.1.2 (a) Construction work closer to the streams should be suspended during heavy rains to avoid erosion and sedimentation of the streams and unnecessary vehicle movement should be avoided.	C	Construction of the Mine has been completed.
Mining -> Thubelisha Colliery	6.10.1.2 (b) Designs should avoid the causing of erosion or spillages of material during the construction phase.	C	Construction of the Mine has been completed.
Mining -> Thubelisha Colliery	6.10.1.3 (a) All fuel storage areas should be appropriately bunded to ensure that leakages can be contained. Spill kits should be in place and construction workers should be trained in the use of spill kits, to contain and immediately clean up any potential leakages or spills;	C	All fuel storage areas are appropriately bunded.
Mining -> Thubelisha Colliery	6.10.1.3 (b) Vehicles should regularly be maintained as per the mine's developed maintenance program. This should also be inspected on a daily basis before use to ensure there are no leakages underneath	C	Daily checklists were provided showing that vehicles are maintaned regularly to the Auditor.
Mining -> Thubelisha Colliery	6.10.1.3 (c) Mobile chemical ablutions for construction workers and general waste bins should be provided and be maintained as per the developed mine's maintenance schedule; and	C	Construction of the Mine has been completed.
Mining -> Thubelisha Colliery	6.10.1.3 (d) No dirty water should be allowed off site and into a stream.	C	
Mining -> Thubelisha Colliery	6.10.1.3 (a) All fuel storage areas should be appropriately bunded to ensure that leakages can be contained. Spill kits should be in place and construction workers should be trained in the use of spill kits, to contain and immediately clean up any potential leakages or spills;	C	See note above.
Mining -> Thubelisha Colliery	6.10.1.3 (b) Vehicles should regularly be maintained as per the mine's developed maintenance program. This should also be inspected on a daily basis before use to ensure there are no leakages underneath	C	Duplication?
Mining -> Thubelisha Colliery	6.10.1.3 (c) Mobile chemical ablutions for construction workers and general waste bins should be provided and be maintained as per the developed mine's maintenance schedule; and	C	Duplication?
Mining -> Thubelisha Colliery	6.10.1.3 (d) No dirty water should be allowed off site and into a stream.	C	Duplication?
Mining -> Thubelisha Colliery	6.11.1.1 (a) Minimise and keep the footprint as small as possible;	C	Duplication?

Mining -> Thubelisha Colliery	6.11.1.1 (b) Buffer zones (100 m wetlands and 100 m riparian);	C	The Mine's underground development takes into account the wetland and riparian buffers.
Mining -> Thubelisha Colliery	6.11.1.1 (c) Revegetation of the construction footprint as soon as possible;	C	This was completed, but not necessarily successful in all areas.
Mining -> Thubelisha Colliery	6.11.1.1 (d) Storm water should be diverted from construction activities and managed in such a manner to disperse runoff and prevent the concentration of storm water flow;	C	
Mining -> Thubelisha Colliery	6.11.1.1 (e) Construction should take place during the dry season to minimise runoff	C	Construction of the Mine has been completed.
Mining -> Thubelisha Colliery	6.11.1.1 (f) Sequential removal of the vegetation (not all vegetation immediately).	C	Construction of the Mine has been completed.
Mining -> Thubelisha Colliery	6.11.1.2 (a) Storm water must be diverted from construction activities and managed in such a manner to disperse runoff and prevent the concentration of storm water flow;	C	Construction of the Mine has been completed.
Mining -> Thubelisha Colliery	6.11.1.2 (b) Approved barrier systems to minimise contaminated seepage and runoff from entering the local aquatic systems;	C	Required barrier systes are in place where required.
Mining -> Thubelisha Colliery	6.111.2 (c) Ensure correct waste management; and	NC	The Mine has initiated corrective action but waste management onsite is still not in compliance with the Norms and Standards.
Mining -> Thubelisha Colliery	6.11.2.2 (d) Ensure correct storage systems are used for the storage of hazardous products when constructing.	C	Construction of the Mine has been completed.
Mining -> Thubelisha Colliery	6.12.1.1 (a) Site clearance and construction activities should take place above the water table, at the unsaturated zone, (if possible); no impact on the groundwater level will then be expected.	C	Construction of the Mine has been completed.
Mining -> Thubelisha Colliery	6.12.1.1 (b) Site clearance should be kept to a minimum area and short duration.	C	Construction of the Mine has been completed.
Mining -> Thubelisha Colliery	6.12.1.1 (c) If trenches are going to be excavated below the water level, dewatering of the aquifer to lower the water table locally should be considered to ensure that the construction takes place above the groundwater level. Since the groundwater is not expected to be polluted at this stage, the utilisation of the water for activities such as dust suppression or irrigation will not cause	C	Construction of the Mine has been completed.
Mining -> Thubelisha Colliery	6.12.1.1 (d) Install monitoring boreholes as recommended in Section 8.1.7.	C	The Mine has installed and is sampling the monitoring boreholes.
Mining -> Thubelisha Colliery	6.2.2.1 (a) Enclosure of tipping points and crusher;	C	
Mining -> Thubelisha Colliery	6.2.2.1 (b) Use of water spray to prevent coal dust dispersion;	C	Water spray is used for cleaning on the conveyor belts.
Mining -> Thubelisha Colliery	6.2.2.1 (c) The coal bunker design includes a cover and water sprays to prevent coal dust dispersion; and	C	

Mining -> Thubelisha Colliery	6.2.2.1 (d) Ensure bi-weekly inspections of dust suppression equipment on the bunker and transfer stations and replace faulty components.	NC	No evidence was provided to the Auditor of biweekly inspections.
Mining -> Thubelisha Colliery	6.2.2.2 (a) Mitigation measures such as: use of electrostatic precipitators to remove fine particles is recommended if ambient levels are exceeding regulatory standards;	C	Ambient dust level results were provided to the Auditor.
Mining -> Thubelisha Colliery	6.2.2.2 (b) Use of Catalytic Converters is recommended if the levels of toxic gases are in exceedance of the regulatory standards; and	C	
Mining -> Thubelisha Colliery	6.2.2.2 (c) Use of gas scrubbers to remove particulates and/or gases from emissions being released form the ventilation shafts if regulatory standards are exceeded.	C	
Mining -> Thubelisha Colliery	6.3.2.1 (a) The ventilation fan diffuser outlets should be installed horizontally and directed north.	C	
Mining -> Thubelisha Colliery	6.3.2.2 (a) Ensure regular inspections of the conveyor line are undertaken on a weekly basis and replace faulty rollers and other faulty components resulting in excessive noise. This should be undertaken not only from an environmental perspective but also from an operational perspective;	C	Weekly inspections of the conveyor belts do take palce.
Mining -> Thubelisha Colliery	6.3.2.2 (b) Mining related machines and vehicles to be serviced to the designed requirements of the machinery/vehicles to ensure noise suppression mechanisms are effective e.g. installed exhaust mufflers;	C	
Mining -> Thubelisha Colliery	6.3.2.2 (c) Investigate all noise complaints promptly and advise the complainant of the outcome(s).	C	No recent noise complaints were received by Sasol. Sasol's complaints are handeld centrally by SMRD.
Mining -> Thubelisha Colliery	6.4.2.1 (a) Where feasible, promote the creation of employment opportunities for women and youth;	C	The auditor was provided with evidence of employment opportunities for women and youth.
Mining -> Thubelisha Colliery	6.4.2.1 (b) Sasol Mining procurement and/or contracts department (or similar) to establish a monitoring system to ensure that the subcontractors honour the specified local employment policy. This can be stipulated in contractor agreements;	C	Construction of the Mine has been completed.
Mining -> Thubelisha Colliery	6.4.2.1 (c) If required, the local resident status of applicants should be verified in consultation with community representatives and local government;	C	Construction of the Mine has been completed.
Mining -> Thubelisha Colliery	6.4.2.1 (d) Ensure that existing employees have access to pertinent skills training and are able to improve their professional proficiencies throughout their employment with Sasol. This will assist with self-improvement and provide an opportunity for employees to achieve professional’s goals	C	A skills training programme was provided to the Auditor.
Mining -> Thubelisha Colliery	6.4.2.1 (e) In addition, it is recommended that local employment opportunities that may arise be maximised as far as possible, by intensifying efforts in the SLP, which are aimed at developing scarce skills.	C	SLP provided. Provided, although outdated.

Mining -> Thubelisha Colliery	6.4.2.1 (f) All operational personnel will be housed in surrounding towns. Strict security controls will be placed on interactions between personnel and farm labourers, that might promote theft of farm produce.	C	Construction of the Mine has been completed.
Mining -> Thubelisha Colliery	6.4.2.2 (a) Recruitment to be coordinated by Sasol Mining in accordance with recruitment policy;	C	
Mining -> Thubelisha Colliery	6.4.2.2 (b) Promotion of female and youth employment; and	C	Duplication?
Mining -> Thubelisha Colliery	6.4.2.2 (c) Effective implementation of training and skills development initiatives.	C	Duplication?
Mining -> Thubelisha Colliery	6.4.2.2 (d) The Social and Labour Plan and Corporate Social Investment policies followed by the mine could further boost local communities and the local economy by assisting communities to make most use of the additional money coming into the community through wages.	C	Duplication?
Mining -> Thubelisha Colliery	6.4.2.3 (a) Recruitment to be coordinated by Sasol Mining in accordance with recruitment policy;	C	Recruitment policy provided, and statistics to support compliance with the policy.
Mining -> Thubelisha Colliery	6.4.2.3 (b) Promotion of female and youth employment;	C	Duplication?
Mining -> Thubelisha Colliery	6.4.2.3 (c) Effective implementation of training and skills development initiatives; and	C	Duplication?
Mining -> Thubelisha Colliery	6.4.2.3 (d) Where possible, maximise the extent of short-term employment (over and above the full time employees and contractors) through piecemeal work and the like.	C	Construction of the Mine has been completed.
Mining -> Thubelisha Colliery	6.4.2.4 (a) Public awareness campaigns regarding subsidence; and	NC	No public awareness programmes regarding subsidence provided to the Auditor.
Mining -> Thubelisha Colliery	6.4.2.4 (b) Investment in development to secure housing options for employees, and thereby reassuring public.	C	
Mining -> Thubelisha Colliery	6.4.2.4 (c) Set up a security working group with surrounding farmers	NC	No evidence provided of a functioning security group witin surrounding farmers. It was found onsite that neigboring farmers lock access gates to vent shafts and other mine infrastructure, which demonstrates that no working relationship exists with neighboring farmers.
Mining -> Thubelisha Colliery	6.4.2.5 (a) The details of Sasol Mining's' proposed LED programmes must be designed and implemented in consultation with both community representatives and municipal management to ensure that the actual needs of communities are met;	C	Evidence in presentation format was provided to the Auditor.
Mining -> Thubelisha Colliery	6.4.2.5 (b) All LED projects must include a monitoring and evaluation plan, to ensure that the effectiveness of each project is tracked and aligned to its intended objectives. Identified areas for improvement should be incorporated into the following years planning	C	Monitoring and evaluation plan was provided to the Auditor.
Mining -> Thubelisha Colliery	6.4.2.6 (a) Ensure regular communication with stakeholders; and	C	Sasol participates actively in the catchment forums.
Mining -> Thubelisha Colliery	6.4.2.6 (b) Any unintended (factual) damage and/or losses that are incurred by impacted persons must be addressed on a case-by-case basis, in accordance with South African.	C	All claims dealt with by SMRD.
Mining -> Thubelisha Colliery	6.4.2.7 (a) Ensure theft is prohibited at the mine and warn workers of the consequence of stealing;	C	
Mining -> Thubelisha Colliery	6.4.2.7 (b) Transporting workers to and from site after their shifts;	C	
Mining -> Thubelisha Colliery	6.4.2.7 (c) Advise workers not to buy anything from farm workers; and	C	
Mining -> Thubelisha Colliery	6.4.2.7 (d) All communication with farmers will be undertaken through the Sasol Mineral Rights Department (SMRD).	C	
Mining -> Thubelisha Colliery	6.4.2.8 (a) The mine should be maintained during its lifetime so as to minimise the risk of mine personnel being injured as result of failed machinery etc.;	C	

Mining -> Thubelisha Colliery	6.4.2.8 (b) Operational health and safety programmes should be implemented;	C	
Mining -> Thubelisha Colliery	6.4.2.8 (c) All mine employees should be issued with the appropriate personal protective equipment (PPE) and educated regarding the risks involved in mining activities;	C	
Mining -> Thubelisha Colliery	6.4.2.8 (d) Unauthorised access to the mine and future construction sites must be prevented through appropriate fencing and security to be erected/ established at the start of operation and maintained throughout the life of the proposed project;	C	
Mining -> Thubelisha Colliery	6.4.2.8 (e) Ensure that diversions are clearly marked and sign posted, especially for night time;	C	
Mining -> Thubelisha Colliery	6.4.2.8 (f) Pylons and metal structures should be galvanised so as to weather to a matt grey finish rather than be painted silver. If pylons and metal structures are to be painted it is recommended that a neutral matt finish be used; and	C	
Mining -> Thubelisha Colliery	6.4.2.8 (g) Down lighting should be implemented to minimise light pollution at night.	C	
Mining -> Thubelisha Colliery	6.5.2.1 (a) Cracks larger than 5 cm will be rehabilitated as soon as possible in the following manner:	C	No evidence of cracks at Thubilisha.
Mining -> Thubelisha Colliery	6.5.2.1 (a1) Topsoil will be cleared around cracks and a mixture of ash and subsoil will be pushed into the void;	C	
Mining -> Thubelisha Colliery	6.5.2.1(a2) The topsoil will be spread over the rehabilitated area;	C	
Mining -> Thubelisha Colliery	6.5.2.1 (a3) A 2:3:1(25) NPK fertiliser will be applied at a rate of 250kg/ha over the area and worked into the substrate.	C	
Mining -> Thubelisha Colliery	6.5.2.1 (b) The following seed mix will be broadcast over the prepared area:	C	
Mining -> Thubelisha Colliery	6.5.2.1 (b1) Cynodon dactylon @ 2 kg/ha	C	
Mining -> Thubelisha Colliery	6.5.2.1 (b1) Digitaria eriantha @ 3 kg/ha	C	
Mining -> Thubelisha Colliery	6.5.2.1 (b1) Eragrostis curvula @ 4 kg/ha	C	
Mining -> Thubelisha Colliery	6.6.2.1 (a) Develop a project specific Fossil Finds Procedure as a condition of authorisation; (Implement the procedure found in ?)	C	Construction of the Mine has been completed.

Mining -> Thubelisha Colliery	6.6.2.1 (b) Develop and implement a project specific Conservation Management Plan as a condition of authorisation.	NC	No Conservation Management Plan was provided to the Auditor. An action has been included in the IWWMP to develop one.
Mining -> Thubelisha Colliery	6.6.2.1 (c) Carefully monitor the extent and nature of subsidence around grave locations. Where uneven settlement is indicated graves in the vicinity should be relocated immediately following statutory procedures.	C	No graves were identified onsite that require protection.
Mining -> Thubelisha Colliery	6.6.2.1 (d) In the event of uneven subsidence around graves that could result in their rupture and exposure and dislocation of gravestones, relocate them following statutory procedures.	C	
Mining -> Thubelisha Colliery	6.7.2.1 (a) Topsoil stockpiles are to be kept to a maximum height of 3 m at a 2:5:1 slope angle and away from drainages lines and surface water;	C	Construction of the Mine has been completed.
Mining -> Thubelisha Colliery	6.7.2.1 (b) Only the designated access routes are to be used	C	Construction of the Mine has been completed.
Mining -> Thubelisha Colliery	6.7.2.1 (c) If erosion occurs, corrective actions must be taken to minimise any further erosion from taking place	C	Construction of the Mine has been completed.
Mining -> Thubelisha Colliery	6.7.2.1 (a) Topsoil stockpiles are to be kept to a maximum height of 3 m at a 2:5:1 slope angle and away from drainages lines and surface water;	C	Construction of the Mine has been completed.
Mining -> Thubelisha Colliery	6.7.2.1 (b) If erosion occurs, corrective actions must be taken to minimise any further erosion from taking place.	C	Construction of the Mine has been completed.
Mining -> Thubelisha Colliery	6.7.2.1 (c) Rehabilitation of cracks once identified and areas where vegetation is affected by ponding, where practicable ;	C	The Mine has an active subsidence monitoring programme.
Mining -> Thubelisha Colliery	6.7.2.2 (b) Subsided areas can be backfilled and re-shaped to match the original topography to mitigate ponding and waterlogging conditions depending on the degree of the collapse and available soil material, where practicable;	C	No subsidence experienced at the Mine to date.
Mining -> Thubelisha Colliery	6.7.2.2 (c) Planning for free drainage of ponded areas, where practicable;	C	
Mining -> Thubelisha Colliery	6.7.2.2 (d) Compensate the farmers for loss of productive land.	C	All complaints from farmers are dealt with via SMRD.
Mining -> Thubelisha Colliery	**6.7.2.2 (e) Monitoring of undermined areas** to **assess the effects of subsidence** at surface. Annual surface surveys will be undertaken over mined out areas to establish the degree of subsidence; and	C	Annual surface surveys are undertaken by the mine.

Mining -> Thubelisha Colliery	6.7.2.2 (f) Failing these mitigation measures, the only other alternative will be to compensate the farmers for loss of productive land.	C	
Mining -> Thubelisha Colliery	6.7.2.2 (a) Rehabilitation of cracks once identified and areas where vegetation is affected by ponding, where practicable ;	C	Duplication?
Mining -> Thubelisha Colliery	6.7.2.2 (b) Subsided areas can be backfilled and re-shaped to match the original topography to mitigate ponding and waterlogging conditions depending on the degree of the collapse and available soil material, where practicable;	C	Duplication?
Mining -> Thubelisha Colliery	6.7.2.2 (c) Planning for free drainage of ponded areas, where practicable;	C	Duplication?
Mining -> Thubelisha Colliery	6.7.2.2 (d) Compensate the farmers for loss of productive land.	C	Duplication?
Mining -> Thubelisha Colliery	**6.7.2.2 (e) Monitoring of undermined areas** to **assess the effects of subsidence** at surface. Annual surface surveys will be undertaken over mined out areas to establish the degree of subsidence; and	C	Duplication?
Mining -> Thubelisha Colliery	6.7.2.2 (f) Failing these mitigation measures, the only other alternative will be to compensate the farmers for loss of productive land.	C	Duplication?
Mining -> Thubelisha Colliery	6.7.2.2 (g1) Monitoring of undermined **areas to assess the effects of subsidence**;	C	Duplication?
Mining -> Thubelisha Colliery	6.7.2.2 (g2) Improving drainage where ponding occurs	C	Duplication?
Mining -> Thubelisha Colliery	6.7.2.2 (g3) Rehabilitation of cracks and areas where vegetation is affected by ponding.	C	Duplication?
Mining -> Thubelisha Colliery	6.7.2.3 (a) Rehabilitation of cracks once identified and areas where vegetation is affected by ponding;	C	
Mining -> Thubelisha Colliery	6.7.2.3 (b) Subsided areas can be backfilled and re-shaped to match the original topography to mitigate ponding and waterlogging conditions depending on the degree of the collapse and available soil material;	C	Duplication?
Mining -> Thubelisha Colliery	6.7.2.3 (c) Planning for free drainage of ponded areas; and	C	Duplication?
Mining -> Thubelisha Colliery	6.7.2.3 (d) Monitoring of undermined areas to assess the effects of subsidence at surface	C	Duplication?

Mining -> Thubelisha Colliery	6.7.2.3 (a) Rehabilitation of cracks once identified and areas where vegetation is affected by ponding;	C	Duplication?
Mining -> Thubelisha Colliery	6.7.2.3 (b) Subsided areas can be backfilled and re-shaped to match the original topography to mitigate ponding and waterlogging conditions depending on the degree of the collapse and available soil material;	C	Duplication?
Mining -> Thubelisha Colliery	6.7.2.3 (c) Planning for free drainage of ponded areas; and	C	Duplication?
Mining -> Thubelisha Colliery	6.7.2.3 (d) Monitoring of undermined areas to assess the effects of subsidence at surface	C	Duplication?
Mining -> Thubelisha Colliery	6.8.2.1.(a) A comprehensive geotechnical investigation should be undertaken for the following: Provide appropriate design parameters for pillar and overburden stability, in line with the actual geotechnical rock mass properties, and indicate any areas (undermining of the natural ecosystems) that may fall outside of these design parameters.	C	A comprehensive geotechnical investigation was compeleted and a copy provided to the Auditor.
Mining -> Thubelisha Colliery	6.8.2.1.(b) Following the geotechnical investigation, where required **a provision** must be made for the rehabilitation of these areas in the event of a possible risk of subsidence / intersection collapse.	C	
Mining -> Thubelisha Colliery	6.8.2.1.(c) The edge of the wetlands and a 100 m buffer must be demarcated near where the areas of high risk or definite subsidence area located and the ventilation shafts to reduce the risk of being impacted on from subsidence;	C	These are demarcated on a Mine wide scale.
Mining -> Thubelisha Colliery	6.8.2.1.(d) Discipline anyone caught poaching wildlife on the site	C	The Mine has a disciplinary process in line with South Africa's prevailing laws.
Mining -> Thubelisha Colliery	**6.8.2.1.(e) Sensitive landscape monitoring** must be carried out to ensure no unnecessary impact to these areas is realised; and if so that a remedy is put in place as soon as possible;	C	Sensitive landscapes are defined, and buffers included.
Mining -> Thubelisha Colliery	6.8.2.1.(f) The highest possible safety factor prescribe by the Rock Engineer must be used;	C	Pillar safety factors are determined per planned panel.
Mining -> Thubelisha Colliery	6.8.2.1.(g) No high extraction mining to be done within 100 m from watercourses;	C	No high extratction mining is undertaken within 100m of water courses.
Mining -> Thubelisha Colliery	6.8.2.1.(h) Monitoring should take place for excessive inflow into the underground workings;	C	A comprehensive surface and groundwater monitoring programme is in place.
Mining -> Thubelisha Colliery	6.8.2.1.(i) If any plant SSC are recorded, these should be translocated with the involvement of a qualified botanist. The donor habitat should resemble the receiving habitat and the species/populations should be monitored monthly after translocation for up to one year; and	C	Construction of the Mine has been completed.

Mining -> Thubelisha Colliery	6.8.2.1 (j) If any important fauna species (SSC) are identified (as listed in the expected species lists) that have not been included in the site-specific species lists, this should be reported to the Environmental Control Officer on site and the provincial authority (MPTA) for their reference. Further to this, measures should be undertaken to ensure that negative impacts to the species in question are not imposed due to the development.	C	Construction of the Mine has been completed.
Mining -> Thubelisha Colliery	6.8.2.1 (k1) Monitoring of undermined areas to assess the effects of subsidence;	C	
Mining -> Thubelisha Colliery	6.8.2.1 (k2) Improving drainage where ponding occurs;	C	
Mining -> Thubelisha Colliery	6.8.2.1 (k3) Rehabilitation of cracks and areas where vegetation is affected by ponding;	C	
Mining -> Thubelisha Colliery	6.8.2.1 (k4) Implementing a weed control programme in affected areas.	C	The Mine has a plan in place.
Mining -> Thubelisha Colliery	6.9.2.1 (a) No mitigation measures will reduce the impact of definite subsidence. In this case, a wetland offset strategy would need to be compiled.	C	No subsidence experienced at the Mine to date.
Mining -> Thubelisha Colliery	6.9.2.2 (a) The highest safety factor as prescribed by the Rock Engineers must be adhered to.	C	Duplication?
Mining -> Thubelisha Colliery	6.9.2.2 (b) A geotechnical study would need to be compiled to determine the exact risk of subsidence;	C	Duplication?
Mining -> Thubelisha Colliery	6.9.2.2 (c) Wetland monitoring must be carried out to ensure no unnecessary impact to wetlands is realised; and if so that a remedy is put in place as soon as possible.	C	A detailed wetland monitoring programme is in place.

Mining -> Thubelisha Colliery	6.9.2.2 (d) A wetland offset strategy may need to be compiled.	C	Not required at this stage.
Mining -> Thubelisha Colliery	6.10.2.1 (a) As proposed in the project activities, ensure that all the dirty water emanating from the dirty water areas is contained for re-use within the mine, to prevent discharge into the environment;	C	The mine has properly designed and constructed PCDs, with required cutt off drains to ensure that all dirty water collected on the Mine is contained and reused.
Mining -> Thubelisha Colliery	6.10.2.1 (a) As proposed in the project activities, ensure that all the dirty water emanating from the dirty water areas is contained for re-use within the mine, to prevent discharge into the environment;	C	Duplication?
Mining -> Thubelisha Colliery	6.10.2.1 (b) Use of storage compartments underground to store dirty water;	C	The Mine has only now started construction of underground storage compartments.
Mining -> Thubelisha Colliery	6.10.2.1 (c) All pollution control dams must be maintained and is required to operate with a 0.8 m freeboard and able to contain a 1:100 year flood event;	C	The PCDs are designed for these events. Furthermore, the Mine has a Scada system to manage levels, pumps, etc.
Mining -> Thubelisha Colliery	6.10.2.1 (d) All surface water pollution control structures will be inspected on a three monthly basis and maintenance work carried out as required. Furthermore, all structures (e.g. dams) registered in terms of the National Water Act will be maintained in accordance with the Act.	C	Structured inspection and maintenance plan in place.
Mining -> Thubelisha Colliery	6.10.2.1 (e) The mines water balances and management of the water balance must be regularly updated and monitored. This should be updated as specified in the IWUL or if on an annual basis;	C	These are managed daily and updated yearly.
Mining -> Thubelisha Colliery	6.10.2.1 (f) The wash bays and workshops are be equipped with oil skimming facilities to remove oil and grease from the wash down water;	C	A dedicated oil separation plant has been constructed and is in use.
Mining -> Thubelisha Colliery	6.10.2.1 (g) Clean run-off must be directed around these facilities, and directed back to the clean water catchment;	C	Clean runoff is directed from these facilities in compliance with R704.
Mining -> Thubelisha Colliery	6.10.2.1 (h) The emergency coal stockpile area at Thubelisha must ensure that dirty water from the stockpile area is contained and the seepage is minimised (No dirty water is permitted to be discharged to the clean water environment);	NC	Erosion at the coal stockpile area as a result of super critical stormwater flow must be addressed through ensuring a level platform, effective diversion of clean stormwater and flow attenuation. The Mine has initiated the construction of a cutoff stormwater canal and has shared the design drawings with the auditor. No design report that confirms that this cutoff trench is designed for the 1:50 year flood as per the R704 was shared with the auditor, nor does the work include; addressing super critical stormwater flows; creating a level platform, effective diversion of upstream clean stormwater and flow attenuation. The new canal will divert contaminated stormwater to the exisiting contaminated runoff facilities and PCDs, but the design does not address how the additional flows would impact on the ability of the current facilities to cater for the additional flows.
Mining -> Thubelisha Colliery	6.10.2.1 (i) No discharge of polluted water should be planned for or allowed;	C	
Mining -> Thubelisha Colliery	6.10.2.1 (j) Where subsidence will occur during operation, measures to rehabilitate the surface area should be implemented as soon as possible to avoid impoundment of surface water; and	C	

Mining -> Thubelisha Colliery	6.10.2.1 (k) Water quality monitoring should continue on the existing and newly proposed monitoring points to ensure detection of impacts.	C	Water quality is continuing according to the approved plan.
Mining -> Thubelisha Colliery	6.10.2.2 (a) There is no mitigation for the loss of catchment yield. However, the area to be stooped is assumed to be approximately 30 km^2 and makes up 8% of the total quaternary catchment of 371 km^2.	C	
Mining -> Thubelisha Colliery	6.10.2.2 (b) The mine will limit the extent of pillar extraction to target only areas with low potential water ingress. This implies excluding	C	
Mining -> Thubelisha Colliery	6.10.2.2 (b1) All floodplain areas and areas within 100 m of a watercourse or 1: 100 year flood line whichever is greatest	C	
Mining -> Thubelisha Colliery	6.10.2.2 (b2) All areas with a thin soil cover that have a significant catchment draining to them.	NC	These areas are currently not part of the underground mining planned model.
Mining -> Thubelisha Colliery	6.10.2.2 (c) As far as is practical, the mine will avoid rocky outcrops, although the areas currently designated for pillar extraction do contain some percentage of thin cover and rocky outcrop.	NC	These are also not demarcated on the surface plan and incorporated in the mine plan.
Mining -> Thubelisha Colliery	6.10.2.2 (d) Clean water from upstream should be diverted around these areas and report to the natural streams.	C	From which areas?
Mining -> Thubelisha Colliery	6.10.2.2 (e) The surface of stooped areas will be inspected to ensure they remain free draining. This will involve the use of surface teams undertaking civil works such as cutting drains where required to ensure areas of settlement can drain. Sasol Mining has developed a range of strategies for stooped areas based on	C	
Mining -> Thubelisha Colliery	6.10.2.2 (f) The percentage decrease in MAR amounts to 8 % for B11C quaternary catchment (where the proposed new mining areas are located). Therefore, the loss in MAR for the quaternary catchment is considered to be of moderately low significant.	C	
Mining -> Thubelisha Colliery	6.10.2.3 (a) Pillar extraction will only be undertaken after a detailed survey of surface cover and potential inflows, so that the target areas can be better defined and remedial measures implemented timeously.	C	
Mining -> Thubelisha Colliery	6.10.2.3 (b) Any subsided areas mined by pillar extraction will be made free draining on surface so as to minimise possible surface inflows.	C	No subsidence experienced at the Mine to date.
Mining -> Thubelisha Colliery	6.10.2.3 (c) The footprint of the dirty areas (such as the shafts) will be minimised as far as impractical so as to limit the impact on catchment yield.	C	
Mining -> Thubelisha Colliery	6.10.2.4 (a) All water make from the workings and runoff from dirty areas to be pumped to the relevant dirty water management dams.	C	
Mining -> Thubelisha Colliery	6.10.2.4 (b) Maintain freeboard in all dams as per legal requirement	C	Scada system ensure water level management at all PCDs.
Mining -> Thubelisha Colliery	6.10.2.4 (c) All surface water pollution control structures will be inspected on a three monthly basis and maintenance work carried out as required. Furthermore, all structures (e.g. dams) registered in terms of the Water Act will be maintained in accordance with	C	
Mining -> Thubelisha Colliery	6.10.2.4 (d) Implement water quality monitoring upstream and downstream of the site at sampling sites used in the baseline study and for the following constituents: Electrical Conductivity, pH, TDS, SS, Cl, SO4, Na, F, Fe, Al, Mn, Zn, Total Alkalinity, Ca, Mg, K, Total Hardness	C	

Mining -> Thubelisha Colliery	6.10.2.5 (a) The water management strategy is as follows: The **mine will limit the extent of pillar extraction to target only areas with a low potential water ingress**. This implies excluding all floodplain areas and areas within the 1:100 flood line, all areas with a thin soil cover that have a significant catchment draining to them. As far as is practical, the mine will avoid rocky outcrops, although the areas currently designated for pillar extraction do contain some percentage of thin cover and rocky outcrop.	NC	Area with thin soil cover that has a significant catchment are currently not part of the planning model for the Mine. The same applies to rocky areas.
Mining -> Thubelisha Colliery	6.10.2.5 (b) In these areas (targeted for pillar extraction), a **more detailed survey of the soil cover** will be undertaken prior to undermining to avoid the high risk areas such as rock outcrop.	NC	No detailed survey of soil cover undertaken.
Mining -> Thubelisha Colliery	6.10.2.5 (c) The areas mined by pillar extraction will be made free draining by means of rehabilitation on surface where necessary.	C	
Mining -> Thubelisha Colliery	6.10.2.5 (d) Underground storage compartments identified in the Surface Water specialist report will be prepared for safe dirty water storage.	C	The Mine is currenlty prepared underground storage compartments.
Mining -> Thubelisha Colliery	6.10.2.5 (e) The percentage of pillar extraction mining will also be lower initially, with the final target of around 50% of the total area mined achieved largely in the last few years of mining.	NC	This approach is not incorporated in the Mine plan.
Mining -> Thubelisha Colliery	6.10.2.5 (f) The mine will maximise the reuse of water, in continuous miners.	C	
Mining -> Thubelisha Colliery	6.10.2.5 (g) At the start of the shaft sinking, the mine will construct the water management dams at the shafts to allow containment and reuse of water from the dirty catchment areas.	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.10.2.5 (h) Calibration of the water balance will be undertaken during the mining to ensure that the system is adequately sized. The management may be modified to take account of:	C	Done annually.
Mining -> Thubelisha Colliery	6.10.2.5 (i) The actual rainfall experienced over the mining period;	C	Done annually.
Mining -> Thubelisha Colliery	6.10.2.5 (j) The actual storage capacity generated;	C	Done annually.
Mining -> Thubelisha Colliery	6.10.2.5 (k) The extent to which the modelled water balance is verified over the life of the mine;	C	Done annually.
Mining -> Thubelisha Colliery	6.10.2.5 (l) Possible changes in mine planning and mine sequencing over the life of the mine; and	C	Done annually.
Mining -> Thubelisha Colliery	6.10.2.6 (a) Mitigation of the loss of yield during the operational phase will be undertaken as follows: The area of disturbance at the adits will be kept to as small a footprint as is practical.	C	
Mining -> Thubelisha Colliery	6.10.2.6 (b) The surface of stooped areas will be inspected to ensure they remain free draining. This will involve the use of surface teams undertaking civil works such as cutting drains where required to ensure areas of settlement can drain. Sasol Mining has developed a range of strategies for stooped areas based on their	C	
Mining -> Thubelisha Colliery	6.10.2.7 (a1) The risk of higher than expected inflows during the operational phase. § Use of storage underground;	C	
Mining -> Thubelisha Colliery	6.10.2.7 (a2) The risk of higher than expected inflows during the operational phase. § Re-use of dirty water;	C	

Mining -> Thubelisha Colliery	6.10.2.7 (a3) The mine water balance will be managed as detailed below: § Use of the water management containment facilities with a lower than 2% risk of spilling in any one year; and	C	
Mining -> Thubelisha Colliery	6.10.2.7 (a4) The mine water balance will be managed as detailed below: § Provision for monitoring of the water balances and management of the water balance, as well as downstream river qualities to ensure that the above is achieved, has been detailed in	C	
Mining -> Thubelisha Colliery	6.10.2.7 (a5) The mine water balance will be managed as detailed below: Over the life of the mine, any discharge from the mine would be in accordance with any water use licence that may be issued to the	C	
Mining -> Thubelisha Colliery	6.10.2.7 (b1) All of the facilities are located within areas designated dirty water areas. The facilities include the following: § Dirty areas are characterised by the cutting-off of clean water upstream of the area, and provision of canals and dams to collect and contain the dirty water for flood events up to 24hr 1:50 year event;	C	
Mining -> Thubelisha Colliery	6.10.2.7 (b2) The mine water balance will be managed as detailed below: § Storage facilities have been provided to ensure a 2% or lower risk of spilling for the life of the project;	C	
Mining -> Thubelisha Colliery	6.10.2.7 (b3) The mine water balance will be managed as detailed below: § The wash bays and workshops will be equipped with oil skimming facilities to remove oil and grease from the wash down water;	C	
Mining -> Thubelisha Colliery	6.10.2.7 (b4) The mine water balance will be managed as detailed below: § Clean run-off will be directed around these facilities, and directed back to the clean water catchment. Groundwater monitoring will also occur in the vicinity of these structures.; and	C	
Mining -> Thubelisha Colliery	6.10.2.7 (b5) The emergency coal stockpile area will be engineered with measures to contain seepage and minimise ingress to the groundwater system.	NC	See previous notes.
Mining -> Thubelisha Colliery	6.10.2.7 (c1) The following measures additional mitigation measures are proposed: § The conveyor belt must be enclosed at specific river crossings where the impact is considered to be significant (If any). This specifically refers to where the conveyer belt is proposed to cross major river courses.	C	
Mining -> Thubelisha Colliery	6.10.2.7 (c2) The following measures additional mitigation measures are proposed: § Belt turnovers and scrapers will be employed;	C	
Mining -> Thubelisha Colliery	6.10.2.7 (c3) The following measures additional mitigation measures are proposed: § The conveyor grades will be kept gentle over the river crossings to minimise potential collection of water at the low point on the conveyor should wet coal be placed on to the conveyor belt; and	C	
Mining -> Thubelisha Colliery	6.10.2.7 (c4) The following measures additional mitigation measures are proposed: Regular inspections of stream crossings and the remainder of the conveyor servitude will be undertaken and any coal spillages cleaned up.	C	
Mining -> Thubelisha Colliery	6.11.2.1 (a) No mitigation measures will be able to prevent subsidence where the depth of mining is shallower than 100 m	C	
Mining -> Thubelisha Colliery	6.11.2.2 (a) Complete a geotechnical study to identify high risk subsidence areas and avoid or mitigate to support them;	C	The geotechnical study has been completed and shared with the auditor.
Mining -> Thubelisha Colliery	6.11.2.2 (b) Ensure sufficient pillar support and safety factors to prevent subsidence of undermined wetland/aquatic areas;	C	
Mining -> Thubelisha Colliery	6.11.2.2 (c) The highest safety factor possible (at least 2) must be used for areas of shallow mining (confirm with geotechnical study);	C	

Mining -> Thubelisha Colliery	6.11.2.2 (d) Underground mining should avoid aquifers especially due to the proposed high extraction near aquatic and wetland systems. Punctured aquifers could lead to the dewatering of aquatic/wetland systems;	C	
Mining -> Thubelisha Colliery	6.11.2.2 (e) Mining should not occur above 100 m below aquatic/wetland areas or within the 100 m wetland buffer zones (confirm with geotechnical study if areas can be mined shallower than 100 m without the risk of subsidence); and	C	
Mining -> Thubelisha Colliery	6.11.2.2 (f) Monitoring should take place for excessive inflow into the underground workings.	C	
Mining -> Thubelisha Colliery	6.11.2.3 (a) Clean and dirty water storm water management: Clean water should be managed in a manner according to the Department of Water and Sanitation Best Practice Guidelines;	C	
Mining -> Thubelisha Colliery	6.11.2.3 (a) Barrier systems, including synthetic, clay and geological/natural or other approved mitigation methods to minimise contaminated seepage and runoff from entering the local aquatic systems;	C	
Mining -> Thubelisha Colliery	6.11.2.3 (b) Storm water management plan must be implemented to ensure clean storm water is diverted away from the surface operations and dirty water stored in the existing Pollution Control Dam (PCD);	C	
Mining -> Thubelisha Colliery	6.11.2.3 (c) The emergency stockpile should be managed to minimise infiltration of contaminants to the groundwater. Mitigation methods that should be considered include:	NC	This facility has no means to reduce or eliminate impact on groundwater.
Mining -> Thubelisha Colliery	6.11.2.3 (d1) Management of the stockpile shape to control the ease with which water can run off from the facility.	C	
Mining -> Thubelisha Colliery	6.11.2.3 (d2) The vegetation of the soil/overburden stockpile and covering them with soil to minimise rainfall infiltration and mobilisation of dissolved metals.	NC	No evidence provided that overburden stockpile was covered with a layer of soil. Anecdotal evidence during the site visit (see photographic record) shows no or limited soil cover of the overburden stockpile.

Mining -> Thubelisha Colliery	6.11.2.3 (d3) Implementation of a lime cover on overburden stockpiles to neutralise acidity.	NC	No evidence provided that a lime cover on overburden stockpiles was placed.
Mining -> Thubelisha Colliery	6.11.2.4 (a) Clean storm water must be diverted from operational sites and managed in such a manner to disperse runoff to prevent an accumulation of storm water flow that may carry contaminants from the site to aquatic systems;	C	
Mining -> Thubelisha Colliery	6.11.2.4 (b) Ensure correct waste management	NC	Waste management onsite is not in compliance with the Norms and Standards, but the Mine has initiated extensive measures to ensure compliance.
Mining -> Thubelisha Colliery	6.11.2.4 (c) Ensure correct storage systems are used for the storage of hazardous products throughout the project life.	C	
Mining -> Thubelisha Colliery	6.12.2.1 (a) Dewatering should be conducted by abstracting groundwater ingress into mine voids during operation;	C	
Mining -> Thubelisha Colliery	6.12.2.1 (b) Contaminated mine water should be stored in pollution control dams.	C	
Mining -> Thubelisha Colliery	6.12.2.1 (c) If subsidence occurs during operation, it should be rehabilitated as soon as possible to minimise water and oxygen inflow from the atmosphere, as these components enable AMD reactions;	C	
Mining -> Thubelisha Colliery	6.12.2.1 (d) Nitrate-based explosives can contaminate water thus no underground water should be discharged unless it meets standards to minimise ground and surface water contamination, alternatively nitrate-based explosives should not be used;	C	
Mining -> Thubelisha Colliery	6.12.2.1 (e) In order to prevent subsidence during the bord-and-pillar mining phase, it is required that a safety factor that provides sufficient pillar stability is applied, Sasol intends to apply a safety factor of 2 which has been observed sufficient for providing stability for the bord-and-pillar mining;	C	
Mining -> Thubelisha Colliery	6.12.2.1 (f) The mine should be monitored on an annual basis for subsidence and areas of subsidence should be rehabilitated by backfilling with waste rock and topsoil thereafter revegetated;	C	
Mining -> Thubelisha Colliery	6.12.2.1 (g) Groundwater level and quality monitoring should be conducted on quarterly basis during operation, with special attention given to the subsidence areas. The monitoring frequency can be reduced post-closure depending on the trend of the monitoring results;	C	Latest monitoring programme and results were provided to the Auditor.
Mining -> Thubelisha Colliery	6.12.2.1 (h) Affected receptors (if proven through monitoring) should be compensated;	C	Certain farmers receive potable water from the Mine.
Mining -> Thubelisha Colliery	6.12.2.1 (i) Groundwater monitoring should be conducted to assess the time series water level and water quality trends; and	C	
Mining -> Thubelisha Colliery	6.12.2.1 (j) Numerical model should be updated every five years based on groundwater monitoring results.	C	

Mining -> Thubelisha Colliery	6.12.2.2 (a) Dewatering should be conducted by abstracting groundwater ingress into mine voids during operation;	C	
Mining -> Thubelisha Colliery	6.12.2.2 (b) Contaminated mine water should be stored in pollution control dams and reused for mine processing;	C	
Mining -> Thubelisha Colliery	6.12.2.2 (c) Groundwater monitoring should be conducted to assess the time series water level, water quality impacts and trends; and	C	
Mining -> Thubelisha Colliery	6.12.2.2 (d) Numerical model should be updated every five years based on groundwater monitoring results	C	
Mining -> Thubelisha Colliery	6.12.2.3 (a) If subsidence is formed during operation, it should be rehabilitated as soon as possible to minimise water and oxygen inflow from the atmosphere.	C	
Mining -> Thubelisha Colliery	6.12.2.3 (b) Nitrate-based explosives can contaminate water thus no underground water should be discharged unless it meets standards to minimise ground and surface water contamination, alternatively nitrate-based explosives should not be used.	C	
Mining -> Thubelisha Colliery	6.12.2.3 (c) Groundwater monitoring should be conducted to assess the time series water level, water quality impacts and trends; and	C	
Mining -> Thubelisha Colliery	6.12.2.3 (d) Numerical model should be updated every five years based on groundwater monitoring results.	C	
Mining -> Thubelisha Colliery	6.12.2.4 (a) Monitor water levels of boreholes. Boreholes within 1km of high extraction mining will be monitored more carefully prior to mining.	C	Evidence was provided that monitoring is done "more carefully" of all boreholes within 1km of high extration panels.
Mining -> Thubelisha Colliery	6.12.2.4 (b) In neutral to alkaline pH-environments, no significant heavy-metal mobilization will take place. Only Al, Fe and Mn will be analysed in these samples (usually required by DWAF). The recommended variables to analyse for are: pH, EC, TDS, Ca, Mg, Na, K, Cl, SO4, NO3, Total Alkalinity, F, Fe, Al	C	
Mining -> Thubelisha Colliery	6.12.2.4 (c) In acidic pH-environments, significant heavy-metal mobilization can be expected. The recommended variables to analyse for are: pH, EC, TDS, Ca, Mg, Na, K, Cl, SO4, NO3, Total Alkalinity, F, Fe, Al and Mn and full range of heavy metals	C	
Mining -> Thubelisha Colliery	6.12.2.4 (d) All of the parameters mentioned above, as well as a full range of heavy metals. An ICP-scan will give a semi-quantitative indication of heavy metals that are mobilized at significant levels. After this scan, a list of heavy-metal variables can be added to the provided list, for regular monitoring.	C	
Mining -> Thubelisha Colliery	6.12.2.5 (a) Investigate losses and supply external users with another borehole or alternative water supply to replace water lost	C	
Mining -> Thubelisha Colliery	6.12.2.6 (a) Influxes encountered during the intersection of dykes in the underground mine can usually be plugged (grouted), or the influx water can be pumped away and dealt with as part of the mine water balance.	C	
Mining -> Thubelisha Colliery	6.12.2.6 (b) Pillar extraction should be limited to areas where the groundwater balance impacts are minimal.	C	

Mining -> Thubelisha Colliery	6.12.2.7 (a) Maintain adequate pillar safety factors to prevent surface subsidence when utilising board and pillar mining.	C	
Mining -> Thubelisha Colliery	6.12.2.8 (a) Berms that divert clean storm water away from the shaft areas must be constructed.	C	
Mining -> Thubelisha Colliery	6.12.2.8 (a1) Storm water within the shaft areas must be pumped to the dirty water dams.	C	
Mining -> Thubelisha Colliery	6.12.2.8 (b) Water pumped from mine workings will be monitored and stored in pollution control facilities if its quality deteriorates such that it has a significant impact on the quality of water in the dirty water dam (i.e. >200mS/m conductivity or 1500mg/l TDS).	C	
Mining -> Thubelisha Colliery	6.12.2.8 (b1) Overburden and coal stockpiles must have drainage diverting berms constructed up gradient in order to prevent clean drainage water for flowing through.	NC	The Auditor was not provided with a plan for all stockpiles at the Mine. A stockpile area was inspected during the audit, which shows that these facilities require maintenance in terms of alien vegetation control, erosion, and stormwater management.
Mining -> Thubelisha Colliery	6.12.2.8 (b2) Any surface run-off from coal stockpiles must be captured and treated as polluted water.	C	
Mining -> Thubelisha Colliery	6.12.2.8 (b3) Toe drains at the dirty water dams will intercept most of the seepage originating from the dams.	C	Seepage monitoring and collection system in place at the PCDs, and an annual dam safety audit completed for these facilities.
Mining -> Thubelisha Colliery	6.12.2.8 (b4) Groundwater monitoring must be implemented in order to determine the quantity and quality of infiltration from the dams and possibly the other facilities.	C	
Mining -> Thubelisha Colliery	6.12.2.8 (b5) The monitoring system must be implemented as soon as commissioning of the infrastructure takes place	C	
Mining -> Thubelisha Colliery	6.12.2.8 (b6) This will ensure that boreholes can be placed optimally in terms of the different facilities.	C	
Mining -> Thubelisha Colliery	6.2.3.1 (a) Drop heights should be minimised when offloading materials;	C	
Mining -> Thubelisha Colliery	6.2.3.1 (b) The dismantling area disturbed must be kept to a minimum;	C	
Mining -> Thubelisha Colliery	6.2.3.1 (c) Limit rehabilitation activities to non-windy days, where possible;	C	
Mining -> Thubelisha Colliery	6.2.3.1 (d) Rehabilitation must be undertaken in accordance with rehabilitation plan (Appendix O); and	C	The rehabilitation plan in Appendix O was provided to the Auditor. This plan is dated 2017, and at that stage not all specialist studies were completed. No updated rehabilitation plan was shared with the Auditor, but an updated RSIP was shared with the Auditor.
Mining -> Thubelisha Colliery	6.2.3.1 (e) Dust suppression on exposed surfaces must be implemented including haul roads.	C	Not part of the scope of this audit.

Mining -> Thubelisha Colliery	6.3.3.1 (a) Restricting decommissioning activities to daylight hours (06:00 – 18:00);	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.3.3.1 (b) Switching off equipment when not in use	C	
Mining -> Thubelisha Colliery	6.4.3.1 (a) Develop alternative and sustainable livelihoods for instance through LED programmes listed in the Mine's SLP;	C	A detailed SLP for the Sasol Mining Secunda Complex was povided to the Auditor. Although the majority of the projects listed as LED projects were scheduled to be completed in 2020, with no updated programme included.
Mining -> Thubelisha Colliery	6.4.3.1 (b) During the life of mine workers are given the opportunity to better and formalise their skills in order to aid their attempts to find alternative employment;	C	Formal training prorgamme in place.
Mining -> Thubelisha Colliery	6.4.3.1 (c) The Mine's SLP should provide strategies and measures that reduce job loss through redeployment at other operations;	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.4.3.1 (d) Where feasible alternatives to save jobs/avoid downscaling should be investigated beforehand, including LED, potential redeployment at other operation;	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.4.3.1 (e) In addition to this it is vital that at all times but particularly towards the end of mine life that issues around retrenchment are dealt with in a transparent manner. All workers must know where they stand with regard to employment, what processes will be followed in the event of retrenchment and what services are available to them in this regard.	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.4.3.1 (f) Proactively assess and manage the social and economic impacts on individuals, regions and economies where; retrenchment and/or closure of the mine are certain. In particular through promoting economic diversification, portable skills development and local economic development where possible;	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.4.3.1 (g) Ensure open discussions with relevant government departments to ensure the closure process is correctly followed; and	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.4.3.1 (h) Rehabilitation must be undertaken in accordance with rehabilitation plan.	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.4.3.1 (i) Employees of the mine will receive certified training in re-skilling and counselling in preparation for the closure of the mine. These measures will be put into practice two years before mine closure - as job shedding may commence around that time. Employment opportunities at other mines should be made known to workers that are in line for retrenchment. Alternatively,	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.7.3.1 (a) Rehabilitate according to the rehabilitation plan;	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.7.3.1 (b) Return the land conditions capable of supporting prior land use or uses equal than prior land use to the extent feasible or practical.	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.7.3.1 (c) Contour slopes to minimise erosion and run-off;	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.7.3.1 (d) Plant native vegetation to prevent erosion and encourage self-sustaining development of a productive ecosystem such as *Cynodon dactylon, eragrostis tef, eragrostis chloromelas, chloris gayana, digitaria eriantha* and *panicum* ;	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.7.3.1 (e) Remove buildings to foundation level. All rubble to be relocated to a specified approved rubble dump or used as backfilling in shafts, etc.	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.7.3.1 (f) Use waste rock for backfill and followed by topsoil of 0.3 m to the extent feasible	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.7.3.1 (g) Compacted areas are to be ripped to loosen the soil and vegetation cover re-instated;	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.7.3.1 (h) Inventory of hazardous waste materials stored on site should be compiled and arrange complete removal;	C	Not part of the scope of this audit.

Mining -> Thubelisha Colliery	6.7.3.1 (i) Seal the shaft by placing concrete plugs;	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.7.3.1 (j) Ensure proper storm water management designs are in place to ensure no erosion or ponding occurs, where practicable;	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.7.3.1 (k) Conduct soil contamination assessment to assess if any remediation is require prior to future land use development;	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.7.3.1 (l) Only designated access routes are to be used to reduce any unnecessary compaction;	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.7.3.1 (m) The topsoil should be shaped taking the pre-mining landscape into consideration, where practicable;	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.7.3.1 (n) The rehabilitated areas must be assessed twice a year for compaction, erosion and fertility; and	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.7.3.1 (o) Monitoring for subsidence must be done annually.	C	Not part of the scope of this audit.
Mining -> Thubelisha	6.7.2.3 (a) Rehabilitate according to the rehabilitation plan;	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.7.2.3 (b) Return the land conditions capable of supporting prior land use or uses equal than prior land use to the extent feasible or practical.	C	Not part of the scope of this audit.
Mining -> Thubelisha	6.7.2.3 (c) Contour slopes to minimise erosion and run-off;	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.7.2.3 (d) Plant native vegetation to prevent erosion and encourage self-sustaining development of a productive ecosystem such as *Cynodon dactylon, eragrostis tef, eragrostis chloromelas, chloris gayana, digitaria eriantha* and *panicum* ;	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.7.2.3 (e) Use waste rock for backfill and followed by topsoil of 0.3 m to the extent feasible	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.7.2.3 (f) Compacted areas are to be ripped to loosen the soil and vegetation cover re-instated;	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.7.2.3 (g) Ensure proper storm water management designs are in place to ensure no erosion or ponding occurs, where practicable;	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.7.2.3 (h) Only designated access routes are to be used to reduce any unnecessary compaction;	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.7.2.3 (i) Monitoring of undermined areas to assess the effects of subsidence;	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.7.2.3 (j) Improving drainage where ponding occurs;	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.7.2.3 (k) Rehabilitation of cracks and areas where vegetation is affected by ponding.	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.8.3.1 (a) An alien invasive plant management plan should be implemented.	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.8.3.1 (b) Riparian habitat and river biomonitoring must be carried out during rehabilitation to ensure these areas are not impacted upon; and if they are remedial action must be implemented. Transects should be set up through representative sites and monitored on an annual basis;	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.8.3.1 (c) Should there be decant, the water will need to be treated with active or passive treatment and a Rehabilitation Plan will need to be compiled to rectify any damages.	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.8.3.1 (d) Rehabilitation must be undertaken in accordance with rehabilitation plan;	C	Not part of the scope of this audit.

Mining -> Thubelisha Colliery	6.9.3.1 (a) Wetland monitoring must be carried out on wetlands that could possibly be impacted on by activities during rehabilitation to ensure no unnecessary impact to wetlands is realised; and if so that a remedy is put in place as soon as possible. Transects should be set up through representative sites and monitored on an annual basis;	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.9.3.1 (b) Groundwater and wetlands must be monitored post-mining for potential decant (3) years or until the system has stabilised).	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.9.3.1 (c) Decant should not be allowed to discharge into a wetland system. The decant can be collected and stored in PCD's as a short term mitigation measure;	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.9.3.1 (d) Investigation into long term solutions for decant management needs to be conducted, should this water not be to the correct standards;	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.9.3.1 (e) Wetland Rehabilitation Plan will need to be compiled to rectify any damages should decant impact on wetlands;	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.9.3.1 (f) Monitoring groundwater levels and decant (rate and quality) quarterly.	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.10.3.1 (a) Use of accredited contractors for removal or demolition of infrastructures; this will reduce the risk of waste generation and accidental spillages;	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.10.3.1 (b) Rehabilitated and backfilled areas (where subsidence has occurred) must be seeded as soon as possible to avoid siltation due to erosion;	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.10.3.1 (c) Surface inspection on the fully rehabilitated areas must be undertaken to ensure a surface profile that allows good drainage. This will ensure improvement or increased catchment yield to the surrounding streams.	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.10.3.1 (d) Rehabilitation must be undertaken in accordance with rehabilitation plan (Appendix O);	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.10.3.2 (a) Should decant occur, decant should be collected and stored in a PCD as a short term solution;	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.10.3.2 (b) Long term management solutions for decant should be investigated;	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.10.3.2 (c) Water quality monitoring must continue to enable the detection of decant when it occurs so immediate mitigation measures can be implemented. Monitoring should continue for as long as decant is taking place.	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.11.3.1 (a) Decant should not be allowed to discharge into the associated aquatic systems. The decant can be collected and stored in PCD's as a short term mitigation measure; and	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.11.3.1 (b) Investigation into long term solutions for decant management needs to be conducted.	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.11.3.2 (a) Avoid rehabilitation or unimpeached areas;	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.11.3.2 (b) Stay within already impacted areas and avoid activity within the 100 m buffer zones	C	Not part of the scope of this audit.

Mining -> Thubelisha Colliery	6.11.3.2 (c) Commence the phase during the dry season to limit runoff.	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.11.3.3 (a1) All infrastructures will be removed and sold or disposed of as legally required	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.11.3.3 (a2) All contaminated soil and rubble will be removed to the bottom of the shafts.	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.11.3.3 (a3) Fill material from roads and hard parks will be removed to the bottom of the shafts, soils replaced, scarified and revegetated	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.11.3.3 (a4) All stockpiles of spoils will be placed in shaft voids, soils replaced and revegetated as set out in the operation phase above	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.11.3.3 (a5) The shafts will be sealed according to DME specifications.	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.11.3.3 (a6 Electrical and water supplies to the mining area will be terminated and made safe.	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.11.3.4 (a) Previously disturbed areas will be monitored for the establishment of invasive alien plants. Environmentally friendly control methods will be used for the invasive species found	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.11.3.5 (a) Surface surveys will be undertaken over mined out areas to establish the degree of subsidence and the success of the re-establishment of surface drainage and vegetation on rehabilitated areas. Remedial rehabilitation will be undertaken as required	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.12.3.1 (a) Areas of subsidence should be rehabilitated as soon as possible to reduce permeability and therefore reduce the probability of decant migration through preferential groundwater flow pathways formed during subsidence.	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.12.3.1 (b) The mine should be monitored on an annual basis for subsidence and areas of subsidence should be rehabilitated by backfilling with waste rock and topsoil thereafter revegetated.	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.12.3.1 (c) Groundwater level and quality monitoring should be conducted on a quarterly basis during operation, with special attention given to the subsidence areas. The monitoring frequency can be reduced post-closure depending on the trend of the monitoring results	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.12.3.2.(a) Impact to receptors such as private boreholes and surface water bodies (if proven through monitoring) should be compensated.	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.12.3.2.(b) Update numerical model every 5 years post closure to calibrate with monitoring results.	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.12.3.3 (a) Decant should be collected and stored in a PCD as a short term solution;	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.12.3.3 (b) Long term management solutions for decant should be investigated;	C	Not part of the scope of this audit.

Mining -> Thubelisha Colliery	6.12.3.3 (c) Monitoring groundwater levels and decant (rate and quality) quarterly.	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.12.3.4 (a) All infrastructure, except dirty water dams buildings of use to future landowners, will be removed and sold or disposed of as legally required.	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.12.3.4 (a1) All contaminated soil and rubble will be removed to the bottom of the shafts.	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.12.3.4 (a2) Fill material from roads and hard parks will be removed to the bottom of the shafts, soils replaced, scarified and revegetated.	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.12.3.4 (a3) All stockpiles of spoils will be placed in shaft voids, soils replaced and revegetated as set out in the operation phase above.	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.12.3.4 (a4) The shafts will be sealed according to DME specifications. Electrical and water supplies to the mining area will be terminated and made safe.	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.12.3.4 (b) Previously disturbed areas will be monitored for the establishment of invasive alien plants. Environmentally friendly control methods will be used for the invasive species found	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.12.3.4 (c)Surface surveys will be undertaken over mined out areas to establish the degree of subsidence and the success of the re-establishment of surface drainage and vegetation on rehabilitated areas. Remedial rehabilitation will be undertaken as required.	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.10.3.3 (a) All of the catchments draining to the water management dams will be rehabilitated and clean water directed past the dams. The water quality in the dams will be monitored to assess the impact of residual contamination on any direct inflow into the dam.	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.10.3.3 (b) Seepage qualities will be monitored to assess whether there are any impacts associated with seepage through the dam basin or the dam wall. If, as expected, the impacts are negligible, all of the water management dams will be left for possible future use if required. If there is seepage from the dam, then the dams will be removed and all contaminated material will be excavated	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.10.3.3 (c) Decant is only expected about 30 years from closure. However, the recovery of water levels in the mine will be monitored through strategically placed boreholes and measures put in place at least five years before decant levels are reached to pump out dirty water and treat it. Reverse osmosis technology as is currently being applied in Secunda could be employed to address decant. The actual treatment technology is likely to be both different and cheaper based on the rate of technological	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.10.3.3 (d) Implement water quality monitoring upstream and downstream of the site at sampling sites used in the baseline study and for the following constituents: Electrical Conductivity, pH, TDS, SS, Cl, SO4, Na, F, Fe, Al, Mn, Zn, Total Alkalinity, Ca, Mg, K, Total Hardness.	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.10.3.3 (e) Investigate losses and supply external users with another borehole or alternative water supply to replace water lost.	C	Not part of the scope of this audit.
Mining -> Thubelisha Colliery	6.10.3.3 (f) Monitor water levels and water quality constituents in external users boreholes within 250 m of the various pits and monitoring boreholes. Constituents will include: Water level, E.coli, pH, EC, TDS, Ca, Mg, Na, K, F, Talk, Cl, SO4, NO3, Fe, Al, Mn	C	Not part of the scope of this audit.
	Number of conditions compliant:	**333**	
	Number of conditions non-compliant:	**20**	
	Number of conditions not applicable:	**0**	

Total number of conditions:	**353**
Percentage compliance:	**94%**