

IN THE HIGH COURT OF SOUTH AFRICA
GAUTENG DIVISION, PRETORIA

Case number: 65662/16

In the matter between:

EARTHLIFE AFRICA JOHANNESBURG Applicant

and

THE MINISTER OF ENVIRONMENTAL AFFAIRS First Respondent

**CHIEF DIRECTOR: INTEGRATED
ENVIRONMENTAL AUTHORISATIONS,
DEPARTMENT OF ENVIRONMENTAL AFFAIRS** Second Respondent

**THE DIRECTOR: APPEALS AND LEGAL REVIEW
DEPARTMENT OF ENVIRONMENTAL AFFAIRS** Third Respondent

THABAMETSI POWER PROJECT (PTY) LIMITED Fourth Respondent

THABAMETSI POWER COMPANY (PTY) LIMITED Fifth Respondent

APPLICANT'S SUPPLEMENTARY AFFIDAVIT

I, the undersigned,

NICOLE LOSER

State under oath as follows:

- 1 I am an adult female attorney at the Centre for Environmental Rights and the attorney of record for the applicant in this matter. It is appropriate for me to depose to this affidavit in view of the nature of the issues raised and in view of the urgency of filing this affidavit.

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- 2 The facts contained in this affidavit are within my personal knowledge, unless the context indicates otherwise, and are to the best of my knowledge and belief both true and correct.

THE NEED FOR THIS SUPPLEMENTARY AFFIDAVIT

- 3 The applicant's replying affidavit was filed on Thursday 26 January 2017.
- 4 The day thereafter, on Friday 27 January 2017, the initial climate change impact report ("**report**") on the Thabametsi coal-fired power station was made publicly accessible for public review. I attach in this regard the email announcing the release of the report, marked "**PL42**".
- 5 I emphasise that the report was prepared by Savannah Environmental (Pty) Ltd, a firm appointed by Thabametsi to perform this task. In doing so, Savannah Environmental (Pty) Ltd has made use of the specialist studies prepared by Environmental Resources Management Southern Africa (Pty) Limited.
- 6 I submit that it is necessary to bring this report to this Court's attention. It is highly relevant to the determination of this matter.
- 7 First, as I explain below, the report contains at least three material conclusions:
- 7.1 The Thabametsi power station will have significant and "very large" greenhouse gas (GHG) emissions and climate change impacts.

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- 7.2 These GHG emissions compare unfavourably with other modern coal-fired power stations and are merely on par with Eskom's existing fleet of coal-fired power stations.
- 7.3 Climate change poses "high" risks to the power station over its lifetime that cannot be effectively mitigated.
- 8 Second, as I also demonstrate below, these conclusions directly contradict a number of claims made by the respondents in their answering affidavits and in the original environmental impact report.
- 9 I submit that it is appropriate and necessary for this supplementary affidavit to be filed and to form part of the papers before this Court.
- 9.1 The first time that the applicant or its attorneys had sight of the report was when it was released on Friday 27 January 2017, after the replying affidavit had already been filed. It was therefore not possible to deal with the report in the replying affidavit.
- 9.2 This affidavit has been served on the very next court day, Monday 30 January 2017.
- 9.3 To the extent that the respondents wish to file a supplementary answering affidavit, dealing strictly with the issues raised in this affidavit, the applicant has no objection to them doing so, provided that such affidavit is filed by Friday 3 February 2017. This timing is necessary so that the applicant can file heads of argument after sight of any such answering affidavit – a

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separate letter will be addressed to the respondents, and if necessary to the Deputy Judge President, in this regard.

THE NATURE OF THE REPORT

- 10 The report has been released for public comment, which closes on 27 February 2017. The applicant does not agree with all aspects of the report and reserves its rights to make detailed comments thereon in due course. Nevertheless, the conclusions reached in the report are highly relevant to this matter.
- 11 The report addresses climate change in two parts:
- 11.1 First, there is a detailed report, the Greenhouse Gas Assessment (Appendix D), on the likely GHG emissions from the Thabametsi coal-fired power station over its construction, operation and decommissioning (“**the GHG emissions report**”). I attach relevant excerpts of this GHG emissions report, marked “**PL43**”.
- 11.2 Second, there is a separate report on the resilience of the coal-fired power station to climate change, the Climate Change Resilience Assessment (Appendix F), assessing how climate change will impact the power station over its lifetime (“**the resilience report**”). This report is attached, marked “**PL44**”.
- 12 To avoid unnecessarily burdening these papers, I only attach relevant excerpts from these reports. The full reports are available to the public online¹ and will be

¹ The full report is accessible at <http://www.savannahsa.com/projects/project.php?project=438>.

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made available to this Court if required. The respondents have access to these reports.

“VERY HIGH” EMISSIONS AND “SIGNIFICANT” IMPACT

13 The GHG emissions report confirms that the Thabametsi coal-fired power station will have “*very large*” greenhouse gas emissions which will in turn have a “*significant*” climate change impact.

13.1 The GHG emissions report estimates that the coal-fired power station will generate over 8.2 million tonnes of CO₂ per year and over 246 million tonnes of CO₂ over its lifetime. This is summarised at page 1 of the GHG emissions report as follows:

“Total Scope 1 and 2 GHG emissions during the construction of the 1 200 MW plant are estimated to be 261 707 tCO₂e, and total GHG emissions from decommissioning the plant are estimated to be 3 736 tCO₂e. Annual GHG emissions for the final 1 200 MW plant are estimated to be 8 191 067 t CO₂e (8.2 Mt CO₂e), assuming a baseload supply scenario. Assuming the same load factor and operating patterns, and not including any decrease in thermal efficiency over time, total (cumulative) estimated operational emissions over the 30 year lifetime of the 1 200 MW plant are in the range of 246 Mt CO₂e. As such, operational emissions account for 99.89% of total GHG emissions over the lifetime of the plant. The plant's thermal efficiency is 36.25%, and its GHG emissions intensity factor is estimated to be 1.02 t CO₂e per MWh generated.”

13.2 The GHG emissions report confirms that these emissions are “Very Large”, judged by international standards, and will constitute between 1.9% and 3.9% of South Africa’s total greenhouse gas emissions. This appears at page 2 of the GHG emissions report:

“Based on South Africa's current and future projected national GHG emissions, the project's GHG emissions during operations are expected to comprise 1.4 -2.1 % of South Africa's national

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emissions in 2020, rising to 1.9 - 3.9% in 2050. The magnitude of the project's emissions (8.2 million t CO₂e per year) is Very Large based on a GHG magnitude scale drawing from various international lender organisation standards including standards set by the International Finance Corporation (IFC), European Bank for Reconstruction and Development (EBRD) and Equator Principles (EP)."

- 13.3 The GHG emissions report concludes that the Thabametsi power station will result in "significant GHG emissions and therefore climate change impacts", as appears from page 59 of the GHG emissions report.
- 14 I point out that these conclusions directly contradict the brief and unsubstantiated statements made in Thabametsi's original environmental impact report. The original report dismissed these climate change impacts as being "small" and "relatively low":

"The magnitude of indirect impacts associated with the operational scenarios relates to the relative contribution to acidification and global warming. While quantification of the relative contribution of the Thabametsi Power Station is difficult, the contribution is considered to be relatively small in the national and global context. The significance of the Indirect impacts is therefore anticipated to be low for all operational scenarios."

- 15 I further point out that the original environmental impact report failed to quantify likely carbon dioxide (CO₂) emissions from the power station, in contrast with the detailed analysis that is now available in the report.

THABAMETSI'S EMISSIONS COMPARE UNFAVOURABLY WITH MODERN COAL-FIRED POWER STATIONS

- 16 The GHG emissions report also concludes that Thabametsi will produce significantly more GHG emissions than other modern coal-fired power stations, measured in terms of tonnes of CO₂ emitted per megawatt hour (CO₂/MWH).

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- 17 According to the GHG emissions report, the Thabametsi coal-fired power station will merely be on par with Eskom's existing fleet of coal-fired power stations and is predicted to perform only marginally better than Eskom's three oldest coal-fired power stations. These facts are summarised in the conclusion to the GHG emissions report, at page 59, where the authors state:

"The Project has relatively high emissions intensity (1.02 t CO₂ per MWh generated) compared to coal-fired power plants, and a similar emissions intensity to that of Eskom's current fleet (1.01 t CO₂) and coal-fired power plants specifically (1.04 t CO₂ in 2010-11). However, the emissions intensity of the plant represents an improvement on the three oldest Eskom coal-fired power plants that are due to be decommissioned before 2025: Camden (1.24 t CO₂ / MWh), Hendrina (1.18 t CO₂ / MWh), and Arnot (1.09 t CO₂ per MWh)"

- 18 The report further explains that Thabametsi's relatively high GHG emissions stem from several technological limitations in this proposed coal-fired power station. In particular, the Thabametsi coal-fired power station will not be able to make use of one of the leading emissions mitigation techniques: carbon capture and storage (CCS). Pages 45 – 46 of the GHG emissions report state the following:

"The Thabametsi plant will be using subcritical steam conditions, which restricts the potential thermal efficiency of the plant to less than 38%, compared to the 42% or greater thermal efficiencies that can be achieved by plants using other high efficiency technologies such as (ultra) supercritical steam and IGCC. Emissions performance (kg CO₂e emitted per kWh generated) is similarly low for subcritical plants relative to these alternative, high efficiency technologies;

The plant's thermal efficiency (36.25%) is at the higher end of the range for subcritical plants based on the IEA analysis; however, the calculated emissions intensity of 1.02 kg CO₂e/kWh is higher compared to some other subcritical plants; and

Whilst the use of CCS to capture and store CO₂ emitted from the plant can bring about significant improvements in GHG performance (very low emissions per kWh generated), CCS is more favourable for higher efficiency (>40% thermal efficiency) plants operating under supercritical or

ultra-supercritical steam conditions. Furthermore, CCS has not yet been demonstrated in South Africa and therefore does not represent a commercial reality as yet. As such the use of such technologies is not considered feasible for the Project.”

19 I point out that these conclusions undermine claims made by the respondents in their answering affidavits. The respondents touted the Thabametsi coal-fired power station as a “*newer, cleaner and more efficient*” power station that will result in substantially lower carbon emissions when compared with existing coal-fired power stations.

19.1 In its answering affidavit, at paragraph 116.1, Thabametsi claimed that:

“Thabametsi's power station will use newer, cleaner energy generation technology that will contribute to South Africa's emission-reducing goals. The commissioning of the Thabametsi power station, will enable older carbon inefficient coal-fired power stations to be decommissioned without impairing the country's energy security.”

19.2 The first to third respondents made claims to a similar effect at paragraph 140.3 of their answering affidavit:

“South Africa commits to replacing its inefficient fleet of ageing coal-fired power plants with clean and high efficiency technology going forward. The latter includes newer, cleaner and more efficient coal-fired power stations, such as the Thabametsi station.” (paragraph 140.3)

20 The GHG emissions report demonstrates that these claims are, at the very least, overstated. It makes clear that the Thabametsi coal-fired power station will merely be on par with Eskom's existing fleet of coal-fired power stations and is predicted to perform only marginally better than Eskom's three oldest coal-fired power stations which were, at one stage, due to be decommissioned.²

² As is pointed out in paragraph 124 of the replying affidavit, this planned decommissioning now appears to be in doubt in light of Eskom's plans.

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“HIGH” RISKS THAT CANNOT BE MITIGATED

- 21 The resilience report assesses the impact that climate change will have on the Thabametsi power station over its lifespan. This report was previously attached, marked as annexure “PL44”.
- 22 The resilience report identifies 12 risks associated with climate change. Five of these risks are marked “high”, indicating that they have a high probability of occurring and will have severe impacts. As summarised in the executive summary to this report, these “high” risks include:
- 22.1 higher temperatures in the region impacting on the efficiency of the power station;
 - 22.2 increasing water scarcity in the region affecting the operation of the plant and depriving local communities of water
 - 22.3 the risk of extreme weather events resulting in floods; and
 - 22.4 water shortages in the region depriving local communities of water.
- 23 These risks are captured in the table appearing at pages xi – xii of the resilience report.
- 24 The resilience report concludes that the greater risk of water scarcity in the region, aggravated by the Thabametsi coal-fired power station, cannot be effectively mitigated.

- 24.1 The resilience report acknowledges that Lephalale is a semi-arid region, receiving only 401mm of precipitation each year, compared with the global average of 860mm per year (page vii).
- 24.2 It further notes that models show that climate change could result in decreased precipitation and longer periods of drought (page viii).
- 24.3 It indicates that the Thabametsi coal-fired power station will rely on the Mokolo Crocodile Water Augmentation Project (MCWAP) for its water supply, which will occur in two phases. The first phase (MCWAP-1) involves piping water from the Mokolo Dam. The second phase (MCWAP-2) will involve piping surplus water from the Crocodile River catchment area (page x).
- 24.4 The report goes on to acknowledge that there is substantial uncertainty about whether these phases of the MCWAP will be able to provide sufficient water for the Thabametsi coal-fired power station as climate change increases in pace. Page 54 of the resilience report concludes that:

“Increasing water stress in the Mokolo / Limpopo WMA North , and the Crocodile (West) WMA, associated with increasing water demand in the context of limited water supplies, could be exacerbated by climate change impacts such that the project experiences water shortages. The Mokolo dam (water source for Phase 1) is fully allocated and will need to operate at 'high risk' levels until 2019 when the water transfer infrastructure from the Crocodile (West) catchment, via MCWAP-2, is available. MCWAP-2 will rely on run-off from industrial users in the highly developed Crocodile River catchment, including those around the metropolitan areas of Johannesburg, Pretoria and Midrand, and there is some uncertainty in relation to the surplus that will be available from this catchment versus future demand in the Lephalale area. Current reconciliation plans do not provide for ecological flows and do not factor in climate change impacts, compounding this risk.”

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24.5 In this light, the report concludes that these risks of water scarcity cannot be fully mitigated, as Thabametsi will have limited control over the MCWAP water supply. As a result, the risk will remain “High” even with all mitigation and abatement strategies in place. This is reflected in the table at pages 51 to 53 of the resilience report:

Risk	Risk (Present)	Risk (2050s)	Residual Risk (2050s, after adaptation)	Notes in relation to residual risk scoring	
3a	Lower than normal precipitation levels and increased drought result in water shortages *	High	High	High	Residual risk remains high due to limited site-level control over broader water risk context
3b	Lower than normal precipitation levels and increased drought create water quality issues *	Medium	High	High	Residual risk remains high due to limited site-level control over broader water risk context
6b	Dry spells / drought events affect communities and threatens social license to operate	Medium	High	Medium	Assumes community funds / engagement activities help to build positive relations but doesn't negate concerns / perception of industrial users in the catchment

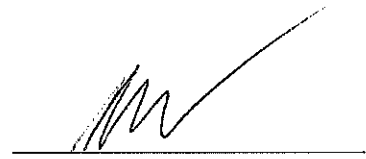
25 The report's findings directly contradict the first to third respondents' denials that these climate change impacts needed to be fully analysed. They also contradict the first to third respondents' contention *“that there is no basis for the claim that the Thabametsi power station will aggravate any existing [water] problems significantly”* (paragraph 67).

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CONCLUSION

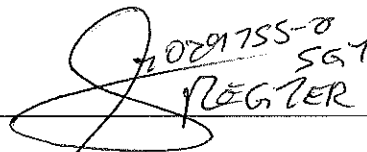
26 I submit that all of the impacts and risks ought to have been fully assessed and considered before the environmental authorisation was granted. The report shows that these risks are highly relevant. It also demonstrates the inadequacies of the original environmental impact assessment and the Minister's appeal decision, as none of these impacts and risks were assessed in any detail or at all until now.

27 The applicant therefore prays that this affidavit be admitted and persists in seeking the relief set out in the Notice of Motion.



NICOLE LOSER

Signed and sworn before me at 11:50 on this the 30th day of JANUARY 2017, the deponent having acknowledged that she knows and understands the contents of the affidavit, that she has no objection to taking the prescribed oath and that she considers such oath to be binding on her conscience.


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 SGT
 REGISTER
COMMISSIONER OF OATHS
EX OFFICIO: SGT
FULL NAMES: C. REGISTER
ADDRESS: 93 VICTORIA ROAD.
WOODSTOCK.

2017-01-30
 WOODSTOCK
 JUDICIAL OFFICER
 LAND MANAGEMENT SURVIVOR