



Centre for Environmental Rights

Advancing Environmental Rights in South Africa

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Copied to:

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Our ref: CER 12.4/RH NL
20 September 2018

Dear Rozanne

COMMENTS ON THE REVISED ATMOSPHERIC IMPACT REPORT AND ATMOSPHERIC EMISSION LICENCE APPLICATION FOR THE PROPOSED IPP THABAMETSI COAL-FIRED POWER STATION

1. We refer to the revised Atmospheric Impact Report (AIR), and a copy of the atmospheric emission licence (AEL) application (as submitted online) for the proposed Thabametsi independent power producer (IPP) coal-fired power station ("Thabametsi", with references to the "project" being inclusive of the power station's associated infrastructure and supplying mines), made available on 20 August 2018 for comment by 20 September 2018.
2. We confirm that, on 31 May 2018, we submitted comments on Thabametsi's initial atmospheric impact report ("initial AIR") – which had been published for comment on 2 May 2018 - on behalf of our clients Earthlife Africa¹ and groundWork.² We also point out that it was only the AIR that was made available for consideration and comment in May 2018, despite our correspondence to Savannah Environmental (Pty) Ltd ("Savannah") pointing out that the **full** AEL application – as submitted to the Department of Environmental Affairs (DEA) had to be made available as per section 38(3)(iiA) of the National Environmental Management: Air Quality Act, 2004 ("AQA").
3. We confirm that our clients stand by the comments of 31 May 2018 on the AIR ("the preliminary comments") – attached as **Annexure 1** for your ease of reference.³
4. We emphasise up front that:
 - 4.1. The Waterberg Bojanala Air Quality Priority Area is already out of compliance with National Ambient Air Quality Standards (NAAQS);⁴ and

¹ <http://earthlife.org.za/>.

² <http://www.groundwork.org.za/>.

³ The annexures (A and B) to the preliminary comments are not attached but can be made available again on request. Annexure C to the preliminary comments is again attached, for ease of reference, as Annexure 2 hereto.

⁴ The Waterberg Bojanala Air Quality Priority Area Air Quality Monitoring Overview from December 2016 to May 2018 confirms that "PM2.5 & PM10 exceeded in Thabazimbi, Mokopane and Xanadu"; "O3 exceeded in Xanadu station"; and "According to the NAAQS, the WBPA is in non-compliance".

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4.2. The AIR predicts further noncompliance with the NAAQS as a result of the cumulative impacts of the Thabametsi (which cumulative impacts – as shown below – are not correctly calculated and are understated).

On this basis alone, the AEL application must be refused. To license a polluting and unnecessary⁵ coal-fired power station project in a priority area where NAAQS are already exceeded, and where the power station is shown (even on underestimated calculations) to cause further noncompliance with NAAQS, would – our clients submit - be in clear conflict with the Constitutional rights to an environment not harmful to health or wellbeing.⁶

5. We hereby submit additional, supplementary comments on the revised AIR and the AEL application documents on behalf of our clients; which must be read with, and in addition to, the preliminary comments, as comments on the AEL application.

Comments on the Application Documents

6. We note that the AEL application appears to be made up of, *inter alia*:

6.1. Appendix A: Air Quality and Health Risk Specialist Study (“health risk study”), a 2013 study, which accompanied the environmental impact report (EIR) for the Thabametsi project’s environmental impact assessment (EIA) prior to the granting of the environmental authorisation to the project;

6.2. Appendix B documents, which make up the climate change and palaeontological impact assessments of 2016 and 2017 for the project (“appendix B documents”) – which assessments were required by the Minister of Environmental Affairs (“the Minister”) in her appeal decision of 7 March 2016, and which documents the Minister was ordered by the Pretoria High Court⁷ to consider as part of a court order to reconsider the appeal of Thabametsi’s environmental authorisation in 2017;

6.3. the (revised) AIR; and

6.4. a copy of the online application form (“application form”).

7. We note that the comments and responses reports (appendices BC5 and BC6 to the AEL application) pertain to the draft and final climate change and palaeontological impact assessment reports of 2016 and 2017 respectively, and **not** to the AIR or the preliminary comments of earlier this year. We have not yet received nor seen any comments or responses in respect of the preliminary comments. We trust that these comments and the preliminary comments will be responded to in due course. Our clients’ rights in this regard are reserved.

8. In the preliminary comments (at paragraph 11), we list the factors, that, in terms of section 39 of AQA, a licensing authority is required to take into account when considering an application for an AEL. We repeat that, in considering these factors for this application, it is relevant and necessary that the licensing authority give proper consideration to:

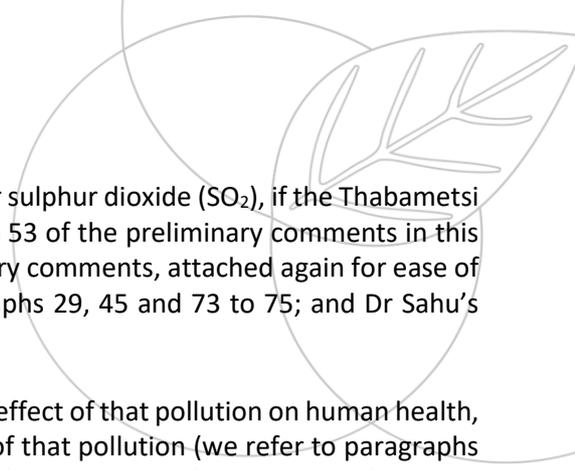
8.1. the Waterberg’s 2012 designation as an air quality priority area (the Waterberg-Bojanala Air Quality Priority Area) under section 18 of AQA, and the area’s **current⁸ and anticipated further non-compliance with**

⁵ See <https://cer.org.za/news/new-report-shows-that-two-coal-ipps-would-cost-sa-an-additional-r20-billion>.

⁶ Section 24, the Constitution of the Republic of South Africa.

⁷ Earthlife Africa Johannesburg v Minister of Environmental Affairs and Others (65662/16) [2017] ZAGPPHC 58; [2017] 2 All SA 519 (GP) (8 March 2017). Judgment available at <http://www.saflii.org/za/cases/ZAGPPHC/2017/58.pdf>.

⁸ The Waterberg Bojanala Air Quality Priority Area Air Quality Monitoring Overview from December 2016 to May 2018 confirms that “PM2.5 & PM10 exceeded in Thabazimbi, Mokopane and Xanadu”; “O3 exceeded in Xanadu station”; and “According to the NAAQS, the WBPA is in non-compliance”.



NAAQS; in particular the predicted non-compliance with NAAQS for sulphur dioxide (SO₂), if the Thabametsi power station becomes operational (we refer to: paragraphs 49 to 53 of the preliminary comments in this regard; the report of Dr Ranajit Sahu – annexure C to the preliminary comments, attached again for ease of reference as **Annexure 2**; our further comments below at paragraphs 29, 45 and 73 to 75; and Dr Sahu’s latest report on the revised AIR, attached as **Annexure 3**);

- 8.2. the pollution likely to be caused by the Thabametsi project and the effect of that pollution on human health, the environment, and the economy – including the external costs of that pollution (we refer to paragraphs 54 to 74 of the preliminary comments and the further comments below at paragraphs 28 to 35 and 76 to 79 in this regard). We point out that it is particularly concerning that the cumulative and health impacts have still not been adequately assessed in the application documents, despite our preliminary comments raising these concerns; and
 - 8.3. whether the applicant, Thabametsi Power Company (Pty) Ltd, is, in fact, a fit and proper person (we refer to paragraphs 75 to 77 of the preliminary comments in this regard).
9. Our clients **repeat the request made in the preliminary comments (paragraph 22) for access to the modelling data that should have been submitted with the application and should be made available as part of the application** – as is required by AQA and the Regulations regarding Air Dispersion Modelling GN 37804, 11 July 2014 (“the Air Dispersion Modelling Regulations”).
10. We submit below our clients’ further concerns with and objections to:
- 10.1. the application form;
 - 10.2. the health risk study;
 - 10.3. the appendix B documents; and
 - 10.4. the AIR – to be read with and in addition to the preliminary comments on the initial AIR of May 2018.

Objections to the application form

11. We note that the application form is comprised of various sections titled:

Part A: General Information;
Part B: Contact Information;
Part C: Raw Materials and Production;
Part D: Control Device;
Part E: Stack;
Part F: Emission Unit;
Part G: Reporting Group;
Part H: Activity and Emission;
Part I: Monitoring Management and Mitigation;
Additional Information

12. Our comments on the application form are primarily a reiteration of concerns already raised in relation to the AIR, as well as comments that specifically relate to: AQA Listed Activities not being properly addressed; and the proposed mitigation measures in the form.

Reiteration of objections to the AIR

13. Many of the comments already made, and made below, in relation to the AIR, also apply to the application form. Where issues have been highlighted and objections made in relation to the AIR and those issues also apply to the application form, the objections to the AIR must be read as objections to the application form as well.
14. As one example, the application form cites the *“main source of emissions from the proposed Thabametsi Power Plant”* as *“the two stacks, the coal and lime stockpiles and ash dump”*. We have always maintained – and continue to maintain – that the emissions from: the new Thabametsi mine to accompany this project; the emissions from the Grootegeluk mine, which will also supply this project; and the transportation of the coal and lime and other transportation for the project, must also be considered as emissions from the project. The cumulative impacts of the project must be considered and adequately assessed. We refer to our comments below at paragraphs 56 and 57 in this regard, and record that this should be amended on the application form.

AQA Listed Activities not adequately addressed in the application form

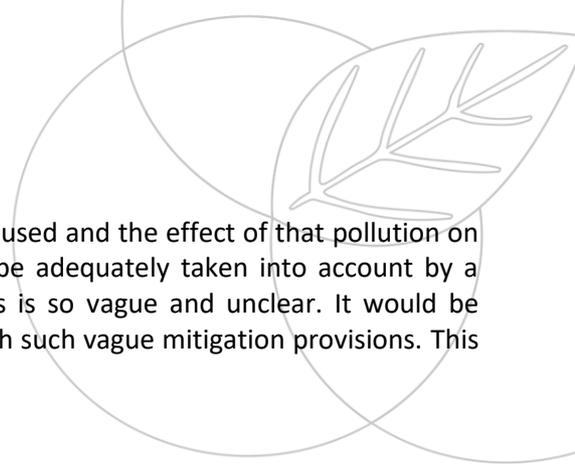
15. The proposed project activities include the storage and handling of coal. This is a listed activity under subcategory 5.1 of the Listed Activities which Result in Atmospheric Emissions which have or may have a Detrimental Effect on the Environment, including Health, Social Conditions, Economic Conditions, Ecological Conditions or Cultural Heritage GN 248 of 2010, under AQA (*“AQA Listed Activities”*).
16. The AQA Listed Activities states the dustfall limits for new plants as *“three months running average not to exceed limit value for adjacent land use according to dust control regulations promulgated in terms of section 32 of the NEM: AQA, 2004 (Act No. 39 of 2004), in eight principal wind directions.”*⁹
17. The application form simply cites the subcategory, but under *“Facility Wide Air Pollutant Emissions”* states, for subcategory 5.1., that the pollutant name is *“unknown #2”* and does not stipulate any emission standards or potential emission values.¹⁰ This is unacceptable.
18. The application form must include the prescribed emission limits as per the AQA Listed Activities and state the anticipated emissions of this activity.

Objections to the mitigation measures stipulated

19. In relation to Part I: Monitoring Management and Mitigation of the application form, our clients are highly concerned that the mitigation measures proposed in the application form are vague and fail to adequately indicate the reduction that is alleged would be achieved. For example, the mitigation measures proposed for dealing with dust from the ash dump and dust from the coal stockpile fail to quantify, or indicate with any specificity, the measure of dust reduction claimed to be achievable. This links with the concern highlighted above regarding the failure of the application form to specify the anticipated dust emissions and emission limits from the coal handling and storage (as a listed activity under the AQA Listed Activities). The application form should specify how much dust will still be emitted, even with and after implementation of, the proposed measures.
20. For the coal stockpiles, the application form states that *“[a]s a mitigation measure, water will be sprayed onto coal stockpiles occasionally to reduce dust generation”*. Similarly for the ash dump it refers to *“rising green walls”* a *“wet beach area”* and *“occasional wetting”* to *“reduce the amount of dust entrainment from the ash dump”*. What does *“occasional”* mean? How frequently will these steps be taken and what kind of reductions are envisaged? This is unacceptably vague, particularly as we are aware that water scarcity is a major concern in the area, and also that dust inhalation has significant risks and impacts for human health.

⁹ Subcategory 5.1.

¹⁰ P5, application form.



21. The section 39 AQA requirement to consider the pollution likely to be caused and the effect of that pollution on human health, the environment, and the economy, can certainly not be adequately taken into account by a decision-maker where the information concerning mitigation measures is so vague and unclear. It would be impossible to consider the extent of potential pollution to be caused with such vague mitigation provisions. This must be corrected.

Objections to the health risk study

22. In Earthlife Africa's 2015 appeal¹¹ of Thabametsi's environmental authorisation, one of the grounds of appeal was that the health impacts of the proposed power station had not been adequately considered in the EIA. The health risk study is the same inadequate specialist study that formed part of that EIA. We stand by our client's submission in the May 2015 appeal that the health risk study is not an adequate assessment of the health impacts of the Thabametsi project.

23. The Minister's March 2016 decision on Earthlife Africa's appeal stated that "***the Atmospheric Impact Report which will form part of the AEL application process, will provide details of the facility's impact on human health and the receiving environment. Since this application was not submitted as an integrated application, information in this regard will consequently be required during the AEL application process***" (emphasis added).¹² The Minister's decision therefore appears to acknowledge that the health risk report does not adequately assess the health impacts of the project, or at least confirms that there should be further assessment of the health impacts as she defers the proper assessment of health impacts to the AIR, which must "*provide details of the facility's impact on human health and the receiving environment.*" It is therefore concerning and unacceptable that:

23.1. the same inadequate health risk study in the EIA, has been included in the AEL application; and

23.2. the AIR does not adequately provide details or an updated acceptable assessment of the facility's impact on human health and the receiving environment, as required by the Minister in her 2016 appeal decision.

24. Our primary concerns with the health risk study of 2013 (which is now more than five years old) are that:

24.1. it is woefully out of date and cannot serve as an accurate, current, or comprehensive assessment of the health impacts of the project; and

24.2. the health risk study (like the AIR) fails to provide a proper assessment of the health impacts of the project.

The health risk study is outdated

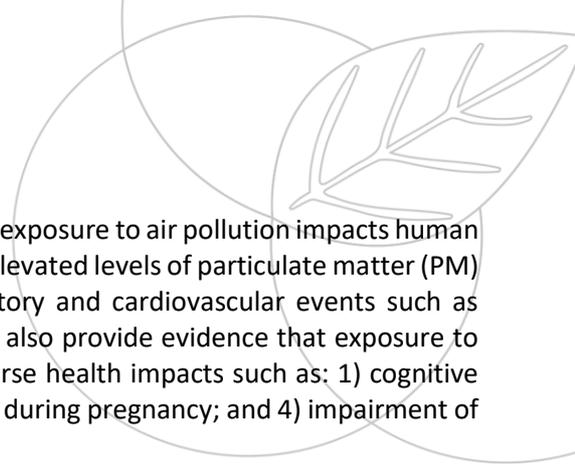
25. Given that more than five years have elapsed since the health risk study was conducted, it is enormously unlikely to be accurately reflective of: the current circumstances of the proposed project; the proposed project area, particularly in relation to air quality; or of the latest science and information concerning air pollution and health. As such, it should be altogether excluded from consideration as part of the AEL application.

26. The passage of five years is a very long period of time with respect to the scientific understanding of how exposure to air pollution impacts human health. For example, the Pubmed database¹³ administered by the U.S. National Library of Medicine shows that since 2013, **3648 studies** have been published in the scientific literature that match the search terms: "Epidemiologic" AND "Particulate matter."

¹¹ The appeal papers are available at <https://cer.org.za/programmes/pollution-climate-change/litigation/the-proposed-thabametsi-ipp-earthlife-africa-johannesburg-v-department-of-environmental-affairs-thabametsi-power-project-pty-ltd-and-others>.

¹² Page 17, Minister's appeal decision.

¹³ <https://www.ncbi.nlm.nih.gov/pubmed/>.



27. Many of these studies advance our understanding of the manner in which exposure to air pollution impacts human health. While evidence prior to 2013 firmly established that exposure to elevated levels of particulate matter (PM) in ambient air causes elevated rates of premature death from respiratory and cardiovascular events such as asthma attacks, heart attacks, and strokes, studies published since 2013 also provide evidence that exposure to elevated levels of PM and other air pollutants are a cause of other adverse health impacts such as: 1) cognitive decline, including dementia; 2) type 2 diabetes; 3) hypertensive disorders during pregnancy; and 4) impairment of kidney function.¹⁴

The health risk study fails to adequately assess health impacts

28. A further concern is that the health risk study fails to provide a quantitative assessment of health impacts associated with predicted increases in pollutant levels.

29. The AIR acknowledges that **there will be non-compliance with NAAQS – notwithstanding the fact that there is currently already noncompliance with the NAAQS¹⁵ - as a result of the cumulative impacts of the project.¹⁶ This will have significant and irreversible health impacts.** The revised AIR assumes that Thabametsi will become operational in 2023, two years earlier than previously assumed in the initial AIR. In its cumulative analysis for SO₂, the revised AIR includes the scenario in which the Medupi flue gas desulphurisation (FGD) retrofit to reduce SO₂ emissions would not be complete in 2023.¹⁷ It assumes that only the FGD retrofit on Medupi units 4, 5, and 6 would be complete by 2023, and that the FGD retrofit on the other Medupi units would not be complete until 2025.¹⁸ Not surprisingly, therefore, the revised AIR predicts significant additional SO₂ impacts when Thabametsi becomes operational in 2023, and Medupi's second FGD retrofit is not operational. In this regard, it is worth pointing out that Eskom only received its environmental authorisation for the FGD retrofit recently – on 6 September 2018 – and it is not yet clear whether any appeals of the authorisation will be instituted.

30. Even if there were no evidence of NAAQS being exceeded as a result of the Thabametsi project (which is clearly not the case), the failure to conduct a comprehensive, quantitative health study, would still not be justified. The health risk study (like the AIR) concludes that the proposed project would not cause adverse health impacts, solely on the basis of (incorrectly) predicted ambient levels of pollutants being in compliance with NAAQS. However, this assumes that compliance with the NAAQS is sufficient evidence to negate any health impacts. This is incorrect. We have already explained in the preliminary comments – at paragraphs 56 to 71 – why mere alleged compliance with NAAQS cannot constitute a comprehensive and quantitative assessment of the actual anticipated impacts of the project's emissions on people's health. This is also addressed further below, in relation to the objections to the revised AIR.

31. **The predicted incremental increases of pollutant levels (even though the health risk study is outdated and the amounts underestimated) would still cause quantifiable increases in adverse health effects. A rational decision**

¹⁴ See, for example, Ailshire, J. A., & Clarke, P. (2014). Fine particulate matter air pollution and cognitive function among US older adults. *Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, 70(2), 322-328; Power, M. C., Adar, S. D., Yanosky, J. D., & Weuve, J. (2016). Exposure to air pollution as a potential contributor to cognitive function, cognitive decline, brain imaging, and dementia: a systematic review of epidemiologic research. *Neurotoxicology*, 56, 235-253; and Renzi, M., Cerza, F., Gariazzo, C., Agabiti, N., Cascini, S., Di Domenicantonio, R., ... & Cesaroni, G. (2018). Air pollution and occurrence of type 2 diabetes in a large cohort study. *Environment international*, 112, 68-76.

¹⁵ The Waterberg Bojanala Air Quality Priority Area Air Quality Monitoring Overview from December 2016 to May 2018 confirms that "PM2.5 & PM10 exceeded in Thabazimbi, Mokopane and Xanadu"; "O3 exceeded in Xanadu station"; and "According to the NAAQS, the WBPA is in non-compliance".

¹⁶ Pii, AIR.

¹⁷ Revised AIR, p. ii. "For the cumulative assessment it is assumed that Thabametsi Power Station will become operational in 2023. Therefore, the planned 2023 emissions from Matimba and Medupi Power Stations are used. The current emissions from Matimba Power Station apply and it is assumed that the FGD retrofit will be operational on Units 4, 5 and 6 at Medupi Power Station by November 2023."

¹⁸ Revised AIR, p. ii. "The FGD retrofit on all units at Medupi is planned to be complete in November 2025."

as to whether to grant an AEL for the project requires an understanding of the magnitude of these health effects, regardless of whether predicted ambient levels of pollutants would remain in compliance with the NAAQS.

32. The World Health Organisation (WHO) has confirmed that, for PM, there is no threshold for acceptable exposure levels. In other words, even at very low levels, exposure to PM results in adverse health impacts.¹⁹ The health risk study, however, simply concludes that the impacts associated with PM₁₀ have a “low significance”.²⁰
33. **Without a detailed, quantitative analysis of what the health impacts of the project will be, it cannot simply be concluded that the health impacts would be minimal.**
34. For the reasons set out above, the health risk study is fatally flawed.
35. The required consideration of the section 39 AQA requirements to take into account the pollution being or likely to be caused and the effect or likely effect of that pollution on the environment, including health, social conditions, economic conditions, cultural heritage and ambient air quality (s39(b)), require the licensing authority to take into account that an outdated health risk report has been provided, which not only is not accurate, but does not provide any useful quantitative or detailed assessment of the likely health impacts of the project on surrounding communities. **On this basis, the licensing authority should disregard and refuse to accept the report, and call for a proper and full quantitative assessment of the health risks of the project.**

Objections to the appendix B documents

36. Our clients have already commented on the appendix B documents, namely the climate change and palaeontological impact assessment records.²¹
37. We record that the climate change impact assessment reports and the Minister’s decision to uphold the environmental authorisation for the Thabametsi project, after having allegedly considered these reports, are currently the subject of High Court review proceedings, instituted by our clients against the Minister, officials at DEA and Thabametsi Power Company (Pty) Ltd, under case number 21559/18.²²
38. We will not – for purposes of these AEL application comments - comment again on the appendix B records, nor is it clear why the appendix B records (relating to the climate change and palaeontological impact assessments) form part of the AEL application, as these particular assessments give no consideration to air quality and human health impacts that would be caused by the project – despite our clients’ repeated submissions that these impacts must form part of a climate change impact assessment.
39. In the preliminary comments, we pointed out that climate change affects many of the determinants of health, ranging from the quality of air to the safety and security of food and water supplies,²³ and it is already resulting in

¹⁹ WHO Air quality guidelines for particulate matter, ozone, nitrogen dioxide and sulfur dioxide Global update 2005 at p9, available at:

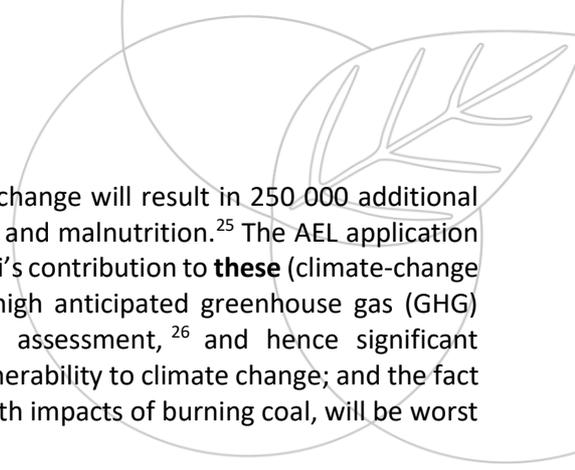
http://apps.who.int/iris/bitstream/handle/10665/69477/WHO_SDE_PHE_OEH_06.02_eng.pdf;jsessionid=0EE7C1034DDFBFA33093015019A00B41?sequence=1.

²⁰ P2, health risk report.

²¹ The comments on the draft and final reports can be accessed at <https://cer.org.za/wp-content/uploads/2016/07/ELA-Comments-on-draft-CCIA-PIA-27-2-17.pdf> and <https://cer.org.za/wp-content/uploads/2016/07/ELA-Comments-on-Final-Thabametsi-CCIA-PIA-31-7-17.pdf> respectively.

²² Case no 21559/18 with court papers available at <https://cer.org.za/programmes/pollution-climate-change/litigation/the-proposed-thabametsi-ipp-earthlife-africa-johannesburg-v-department-of-environmental-affairs-thabametsi-power-project-pty-ltd-and-others>.

²³ Watts N et al., 2015. Healthy and climate change policy responses to protect public health. The Lancet. 386 (10006). [http://www.thelancet.com/journals/lancet/article/PIIS01406736\(15\)608546/](http://www.thelancet.com/journals/lancet/article/PIIS01406736(15)608546/).



many premature deaths worldwide.²⁴ The WHO estimates that climate change will result in 250 000 additional premature deaths per year by 2030 from heat stress, diarrhoea, malaria and malnutrition.²⁵ The AEL application and climate change impact assessment was required to assess Thabametsi's contribution to **these** (climate-change related) health impacts as well, particularly given: Thabametsi's very high anticipated greenhouse gas (GHG) emissions, as outlined in Thabametsi's own climate change impact assessment,²⁶ and hence significant contribution to the effects of climate change; South Africa's extreme vulnerability to climate change; and the fact that poor and marginalised communities, already suffering from the health impacts of burning coal, will be worst affected by these impacts.²⁷

40. Thabametsi's climate change impact assessment, in its current form, does not consider Thabametsi's anticipated contribution to, and exacerbation of, climate change-related health impacts for the communities in the area. This is one of our clients' major concerns with the climate change impact assessment, as is evident from our comments on the climate change impact assessment, as reflected in appendices B5 and B6. Including Thabametsi's current climate change impact assessment, which does not consider Thabametsi's impacts on and contribution to climate-related health and air quality impacts, is not a relevant addition to the AEL application. **The climate change impact assessment must be amended or a further climate-health study conducted** as recommended above.

Objections to the AIR

41. In respect of the AIR, we reaffirm the objections made in paragraphs 10 to 77 of the preliminary comments. We record that full consideration must be given to those comments (insofar as they are still applicable to the revised AIR) in considering and/or responding to the comments on the AIR. Paragraph 5.5.4 of the National Framework for Air Quality Management under AQA sets out what must be in an AIR and expressly requires that it contain *"detailed information on point source and fugitive emissions ..."*. The further detail of these requirements is set out in the Regulations Prescribing the Format of the Atmospheric Impact Report, 2013 (as amended in 2015) under AQA ("the AIR Regulations").
42. Our clients' main concerns with the initial AIR, and objections to the granting of an AEL to Thabametsi, as set out in the preliminary comments, were:
- 42.1. the failure to include sufficient, verifiable information in the AIR and to accurately calculate and account for the Thabametsi project's emissions;
 - 42.2. the failure to adequately assess the cumulative impacts of the Thabametsi project; and
 - 42.3. the failure to adequately assess the health impacts of the Thabametsi project.
43. The, now revised, AIR has not addressed these concerns, despite Savannah having the opportunity to do so after we pointed these issues out in the preliminary comments in May 2018.
44. Dr Ranajit Sahu conducted an analysis of the initial AIR in May 2018 – which analysis accompanied the preliminary comments (attached to those comments marked A). Dr Sahu has also analysed the revised AIR. His expert report is attached as **Annexure 3**. Dr Sahu's report states:

²⁴ DARA and the Climate Vulnerable Forum. 2012. Climate Vulnerability Monitor 2nd Edition. A Guide to the Cold Calculus of a Hot Planet. <http://daraint.org/wpcontent/uploads/2012/09/CVM2ndEdFrontMatter.Pdf>.

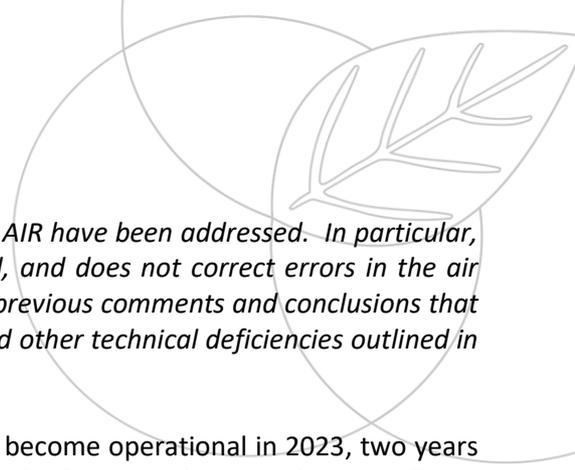
²⁵ World Health Organization (WHO). 2014a. Quantitative risk assessment of the effects of climate change on selected causes of death, 2030s and 2050s.

http://apps.who.int/iris/bitstream/10665/134014/1/978924157691_eng.pdf?ua=1.

²⁶ See page 19 of the summary report, available at <https://cer.org.za/wp-content/uploads/2016/07/Thabametsi-Final-Summary-Report-Jun17.pdf>.

²⁷ Page 8, National Climate Change Response White Paper, available at

https://www.environment.gov.za/sites/default/files/legislations/national_climatechange_response_whitepaper.pdf.



“None of the deficiencies I highlighted in my review of the April 2018 AIR have been addressed. In particular, the revised AIR does not include sufficient verifiable technical detail, and does not correct errors in the air pollutant emissions rates used to calculate emissions. I stand by my previous comments and conclusions that the AIR is under-predicting all Thabametsi’s impacts, due to these and other technical deficiencies outlined in my previous comments.”

45. As mentioned above, the revised AIR now assumes that Thabametsi will become operational in 2023, two years earlier than previously assumed, in its cumulative analysis for SO₂.²⁸ **As such, the revised AIR predicts significant additional SO₂ impacts, and non-compliance with NAAQS, when Thabametsi becomes operational in 2023 and Medupi’s FGD retrofit is not yet complete or operational.**
46. We therefore stand by the recommendation of the preliminary comments that the application should be refused due to, *inter alia*:
- 46.1. fatal flaws and shortcomings in the AIR, which result in the impacts of Thabametsi’s emissions not being properly assessed or reflected; and
 - 46.2. various section 39 AQA factors and requirements not being met.
47. Below, we provide further and additional submissions to explain the following continued objections to the AIR:
- 47.1. the emissions are not correctly calculated and reflected in the AIR and crucial modelling data are missing;
 - 47.2. the AIR fails to properly take into account emissions from fugitive sources;
 - 47.3. there are further cumulative emissions missing from the AIR, which were not properly assessed, and full consideration must be given to the non-compliance with NAAQS as a result of the cumulative emissions; and
 - 47.4. the health impacts of the project have not been adequately assessed.

Incorrect calculation of emissions and missing data

48. We note that the Table 11 and 12 values, which were used in the modelling, have not been corrected from the initial AIR, despite our comments in the preliminary comments.
49. As advised in the preliminary comments, **the modelling should be based on emissions at the limit values of the MES, at constant rates. This is not what has been done in the AIR.** To illustrate, the error in this approach, in Table 11 of the AIR, the AIR apparently assumed a “*maximum emission [stack] concentration*” of 0.7 mg/Nm₃ for PM₁₀ (particulate matter) instead of the MES limit of 50 mg/Nm₃. In other words, an emission concentration less than 1/70th (0.7/50) of the regulated emission concentration was apparently assumed for modelling impacts. The stack PM₁₀ concentration of 0.7 mg/Nm₃, in the AIR, appears to correspond to the annual emission rate (per stack) of 17.6 tons/annum, Table 12 of the AIR. If the AEL were to be granted, the plant would be licensed to operate at a stack concentration of 50 mg/Nm₃, a value **70 times greater than that used in the AIR modelling.** Similar comments apply to the emission rates assumed for SO₂ and nitrogen oxides (NO_x): for SO₂, a concentration of 269.2 mg/Nm₃ is assumed, compared with the MES value of 500 mg/Nm₃; for NO_x, a value of 262.2 mg/Nm₃ is assumed, compared with the MES value of 750 mg/Nm₃, with corresponding (per stack) emission rates of 7288.1

²⁸ Revised AIR, p. ii, “*For the cumulative assessment it is assumed that Thabametsi Power Station will become operational in 2023. Therefore, the planned 2023 emissions from Matimba and Medupi Power Stations are used. The current emissions from Matimba Power Station apply and it is assumed that the FGD retrofit will be operational on Units 4, 5 and 6 at Medupi Power Station by November 2023*” and “*the FGD retrofit on all units at Medupi is planned to be complete in November 2025.*”

tons per year and 7099.4 tons per year for SO₂ and NO_x respectively. These are gross miscalculations, which render the findings of the AIR incorrect.

50. In the preliminary comments, we pointed out that crucial data and modelling information have been omitted from the AIR, as stated above, this information has still not been provided. The result is that the findings of the AIR cannot be relied upon. In the preliminary comments (at paragraph 18) we state that the DEA Code of Practice (“the Code of Practice”), Appendix A to the Air Dispersion Modelling Regulations requires, in chapter 7, that the following must be submitted with an AIR: input and output files for models; input and output files for pre-processors; input and output files for post-processors; digital terrain files; and plot files.
51. The Code of Practice also states that “*the report (AIR) shall include a description of electronic files*” and “*the report shall include a discussion on deviations from the modelling protocol*”.²⁹
52. Section 3.3 of the Code of Practice sets out requirements for the calculation of emission rates – these have not been complied with.
53. Section 5 of the Regulations states that “*a relevant authority must refuse to accept air dispersion modelling results, if any person or organ of state fails to comply with the Code of Practice for Air Dispersion Modelling as contained in Appendix*” (emphasis added).
54. The information provided in the AIR is incorrect; and it has not been correctly calculated in accordance with the requirements of the Air Dispersion Modelling Regulations. **On this basis alone the AEL application must be refused.**
55. Furthermore, the necessary modelling data, which has been omitted, must be included in the application as required by the Code of Practice, and, as such, must be made available to interested and affected parties.

Fugitive emissions for the project

56. Table 14 of the AIR lists which fugitive emissions have been included for assessment of the project’s impact on air quality. It includes: “*material handling – coal yard; materials handling – lime stockpile; material handling – ash dump; wind erosion – coal yard; wind erosion – lime stockpile; and wind erosion – ash dump*”.
57. Conspicuously missing from the list are fugitive emissions from the proposed Thabametsi coal mine and the Grootegeluk mine, which are intended to supply Thabametsi, as well as emissions from the transportation of the coal and lime to the power station site.
58. These are integral components of the project and must therefore be considered as part of the assessment of the project’s fugitive emissions.

Cumulative impacts

59. The fact that cumulative emissions of SO₂ from just Thabametsi, Matimba, and Medupi power stations would bring ambient air out of compliance with NAAQS, is a significant concern. This alone should result in the application being refused.
60. Notwithstanding this, the cumulative impacts of the proposed power station have still not been properly assessed. Below we address the main issues of: the failure to consider **any** fugitive emissions of the power station project in considering cumulative impacts, and in particular (again missing from the assessment) the emissions of the surrounding mines in the cumulative emissions scenario; and the continued incorrect reflection of the emissions for Medupi and Matimba.

²⁹ See 7.3, at page 75.

Failure to consider any fugitive emissions in the cumulative impacts scenario

61. There is still a fundamental flaw in the AIR's assessment of the cumulative scenario. The AIR addresses and models the air quality impacts of two scenarios: 1) Thabametsi alone and; 2) a cumulative scenario involving Thabametsi, the Matimba Power Station, and the Medupi Power Station. For the Thabametsi alone scenario, it presents predictions about long-term (annual) PM₁₀ levels,³⁰ and then it also makes predictions about long-term (annual) PM₁₀ levels for the cumulative scenario.³¹ The predicted long-term (annual) PM₁₀ levels are, arbitrarily, lower in the cumulative scenario than in the Thabametsi alone scenario. This cannot be correct. What seems to be left out of the cumulative scenario are fugitive emissions (i.e. emissions from the coal and lime stockpiles, ash dump, site roads and vehicles, coal conveyors and transfer towers, coal and limestone crushers, material handling activities, mines etc.).

62. The AIR states:

“Low-level emissions result from sources such as residential fuel burning, wind entrained dust from stockpiles, ash dumps and from mine activities. In contrast to elevated emission sources, low-level emissions are released close to ground-level and have little or no buoyancy. As a result, their spatial impact is generally limited, particularly in winter and at night when the atmosphere is more stable. They generally influence local air quality rather than regionally.

The cumulative assessment therefore considers the elevated sources from the proposed Thabametsi Power Plant, the Matimba Power Station and the Medupi Power Station, i.e. stack emissions of particulates, NO_x and SO₂.”³²

63. It is not permissible for the applicant to exclude so-called “low-level emissions” from “stockpiles, ash dumps and from mine activities” from the cumulative impact assessment scenario simply because the applicant claims that such fugitive emissions are “released close to ground-level and have little or no buoyancy.” Aside from being factually incorrect (the results presented in the AIR show fugitive emissions from the Thabametsi coal ash dump and stockpiles extending a significant distance), the applicant cannot exclude these fugitive emissions because the AIR Regulations expressly require the consideration of fugitive emissions in an AIR, and, furthermore, failing to take these emissions into account would not provide an accurate or correct picture of the project’s cumulative emissions.

64. The failure of the cumulative impact assessment to take into account emissions from fugitive sources results in nonsensical and inaccurate information being presented, in which the cumulative emissions scenario reflects pollutant levels that are *lower than* levels associated with the Thabametsi power plant project itself – as explained above. A cumulative assessment would be in error if it did not also take into account fugitive emissions from all three facilities (Medupi and Matimba’s fugitive emissions included). Intentionally leaving out the fugitive emissions is arbitrary and renders the AIR fatally flawed.

65. This was addressed in the preliminary comments, but we again confirm that the AIR is fatally flawed for the failure to properly account for cumulative emissions.

Failure to consider emissions from the surrounding mines, including fires from the mines

66. The AIR fails to take into account emissions from the mines in the area, including fires from the mines, which are frequent and give rise to significant emissions of fine PM.

³⁰ See figure 9 of the AIR.

³¹ See figure 19 of the AIR.

³² P45, AIR.

67. As mentioned, above, the proposed Thabametsi project will be accompanied by a coal mine, the proposed Thabametsi Coal Mine.³³ Exxaro's existing Grootegeluk mine is also within 10km of the proposed site for Thabametsi. The emissions of both of these mines need to be taken into account. In South Africa, coal mines have a high propensity for experiencing spontaneous combustion causing coal fires. A recent assessment of coal mines in South Africa shows that all mines tested have either a medium or high risk of spontaneous combustion.³⁴ The authors of the study, from the University of the Witwatersrand, reached the following conclusions:

"The risk of spontaneous combustion is well known in the South African coal mining industry. In the coming years it is very possible that the incidence of spontaneous combustion will increase from current levels, due to factors such as an increased rate of mining, re-working of previously mined seams, more stooping and total extraction for underground mines, and higher stripping ratios for surface mines, leading to more spoils. It is also fairly certain that coal mining will face tougher environmental emissions legislation in the near future."

68. With respect to the Thabametsi project, the risk of coal fires is not merely academic: the Grootegeluk coal mine near Lephalale in the Limpopo Province, which is within 10km of the Thabametsi project, is faced with coal fires. According to a Doctoral Dissertation published in 2003:

*"Grootegeluk Mine has been in operation since 1980. The total tonnage of coal and waste mined, about 54Mt per year, coupled with a 50 per cent yield of clean coal product from about 34Mt raw coal production per year means that the mine produces large amounts of waste material. The waste material consists of the overburden, inter-burden and plant discard material. The plant discards and inter-burden waste were stacked, in the past, on discard dumps. The relatively high carbon content of this material makes it liable to burn. Since 1980 spontaneous combustion has caused major pollution problems for the Grootegeluk Mine. Many tests were carried out during the 1980's to determine the factors that contribute to the spontaneous combustion phenomenon. No successful method for preventing or containing the problems was ever formulated."*³⁵

69. Emissions from coal fires cause severe impacts to air quality. Coal fires generate large amounts of emissions of pollutants at ground-level that substantially exceed the rate of stack emissions from coal-fired power plants (which rates are still substantial).

70. These fire emissions, and potential future emissions from Grootegeluk, and potentially from Thabametsi mine once built, must be considered.

The emissions for Medupi and Matimba are still incorrect

71. As stated in the preliminary comments, the emissions for Matimba have been understated (see paragraph 36.1 of the preliminary comments). This remains the case in the revised AIR, and must be corrected.³⁶

72. As also stated in the preliminary comments, in relation to Eskom's Medupi power station, it is assumed that all units of the plant will have been fitted with FGD by 2025. This is **not** correct, as Eskom has indicated that it only intends to retrofit Medupi with FGD at each unit six years after the commissioning of each unit,³⁷ and intends to apply for a further postponement of the new plant minimum emission standards (MES) in light of its inability to

³³ Confirmed on p1, AIR.

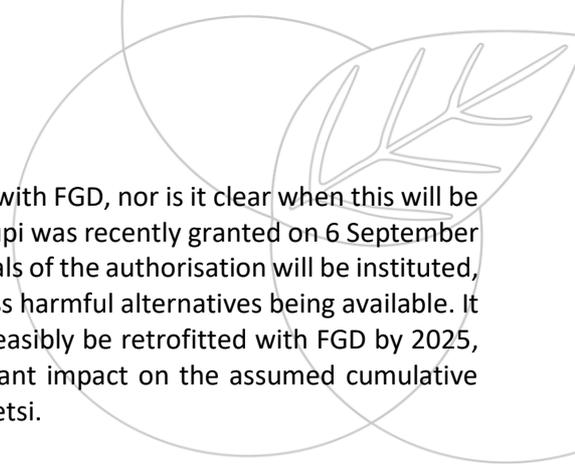
³⁴ Genc, B., & Cook, A. (2015). Spontaneous combustion risk in South African coalfields. Journal of the Southern African Institute of mining and metallurgy, 115(7), 563-568.

³⁵ Adamski, S. A. (2003). The prevention of spontaneous combustion in back-filled waste material at Grootegeluk Coal Mine.

³⁶ P46, AIR.

³⁷ See

<http://www.eskom.co.za/OurCompany/SustainableDevelopment/EnvironmentalImpactAssessments/medupi/Final%20DSR/App-D8-CRR.pdf> at page 1.



comply with the standards, as none of its units have yet been retrofitted with FGD, nor is it clear when this will be done. An environmental authorisation for the retrofit of FGD at Medupi was recently granted on 6 September 2018. However, as mentioned above, it is not yet clear whether any appeals of the authorisation will be instituted, particularly given the water-intensive type of FGD to be used - despite less harmful alternatives being available. It is unrealistic and inaccurate to presume that all units of Medupi could feasibly be retrofitted with FGD by 2025, given the circumstances. These miscalculations will have a very significant impact on the assumed cumulative emission rates (and the cumulative ambient concentrations) for Thabametsi.

Non-compliance with NAAQS

73. Even with the inaccuracies in the calculation of the project's cumulative emissions, the AIR confirms that there will be non-compliance with NAAQS for SO₂:

"In 2023 ambient 1-hour cumulative SO₂ concentrations are predicted to exceed the NAAQS over an area to the south of the Medupi and Matimba Power Stations. In this area the limit value of the 1-hour SO₂ standard is exceeded at one sensitive receptor to the south of Medupi..."

In 2025, following the completion of the FGD retrofit on all six units at Medupi, the 1-hour SO₂ concentrations are predicted to be dramatically reduced and comply with the NAAQS..."

In 2023 ambient 24-hour cumulative SO₂ concentrations are predicted to exceed the NAAQS over an area to the south of the Medupi and Matimba Power Stations. In this area the limit value of the 24-hour SO₂ standard is exceeded at seven sensitive receptor points close to and to the south of the Medupi and Matimba Power Stations..."

In 2025, following the completion of the FGD retrofit on all six units at Medupi Power Station, the 24-hour SO₂ concentrations are predicted to be dramatically reduced and comply with the NAAQS."

In 2023 ambient annual average SO₂ are predicted to exceed the NAAQS over a relatively small area south of Medupi Station. The stack emissions at the Thabametsi Power Station are predicted to contribute a maximum of 2.5 µg/m³ to the predicted cumulative annual average SO₂ ambient concentrations."

In 2025, following the completion of the FGD retrofit on all six units at Medupi Power Station, the annual average SO₂ concentrations are predicted to be dramatically reduced and comply with the NAAQS."³⁸

74. Even if the FGD retrofit could be completed for all units of Medupi by 2025 (which, as shown above, is highly unlikely), the AIR now assumes that the Thabametsi Power Station will become operational in 2023, whereas the initial AIR assumed it would become operational in 2025. Therefore, the AIR predicts additional exceedances of NAAQS for SO₂.³⁹
75. Consideration of the section 39 AQA requirements to take into account the applicable minimum standards (s39(a)) and the pollution being or likely to be caused and the effect or likely effect of that pollution on the environment, including health, social conditions, economic conditions, cultural heritage and ambient air quality (s39(b)), would require the licensing authority to give serious consideration to these confirmed anticipated breaches of NAAQS – even on inaccurate calculations of the cumulative emissions. This must weigh heavily against the application, and should result in the application being refused.

³⁸ P59 – 60, AIR.

³⁹ See p2 of Sahu report, September 2018.

Health impacts

76. As stated above in relation to the health risk report and as already stated in the preliminary comments (paragraphs 54 to 74), the health impacts have not been adequately assessed.
77. The AIR states, in relation to NAAQS that “[b]eing a health based standard, ambient concentrations below the standard imply that air quality poses an acceptable risk to human health, while exposure to ambient concentrations above the standard implies that there is an unacceptable risk to human health.”⁴⁰
78. In the preliminary comments and above, we explain why this approach is flawed and incorrect. The assumption that an assessment of compliance with NAAQS equates to an assessment of the health impacts is simply incorrect. Firstly, as made clear in these and the preliminary comments, there is no “safe” exposure level for air pollutants, and certainly South Africa’s lenient NAAQS could in any event not serve as the indicator for “safe” levels of air pollution (see paragraph 65 of the preliminary comments). Secondly, even if a risk is viewed to be “acceptable” this does not exempt the assessment from at least assessing in detail and explaining what that risk is and how community members may be affected – what impacts they can expect to see and the likelihood of these impacts materialising. **The AIR and the health study report need to quantitatively explain these risks and possible impacts irrespective of alleged compliance with NAAQS (which compliance is in any event disputed).**
79. As detailed above and in the preliminary comments, consideration of the section 39 AQA requirements to take into account the pollution being or likely to be caused and the effect or likely effect of that pollution on the environment, including health, would require the licensing authority to give serious consideration to the failure to adequately assess the health impacts of the project and also to consider that the health impacts (particularly from a cumulative perspective) are likely to be significant. This must weigh heavily against the application and should result in the application being refused.

Conclusion

80. The concerns with, and fatal flaws in, the AIR as highlighted above and in the preliminary comments still stand and also extend to the other AEL application documents, as addressed above.
81. The revision of the expected date of operation for the Thabametsi project to allow for two years of operation prior to completion of the Medupi FGD retrofit (assuming that the retrofit takes place by 2025, which is unlikely) will result in additional exceedances of NAAQS for SO₂ and consequently cause even greater health impacts than previously expected, in a priority area where NAAQS are already not being complied with.
82. In the circumstances, our clients strongly submit that the AEL application must be refused.

Yours faithfully

CENTRE FOR ENVIRONMENTAL RIGHTS

per: 

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⁴⁰ P16, AIR.