

“ANNEXURE A”

EARTHLIFE AFRICA

First Appellant

GROUNDWORK

Second Appellant

**NATIONAL AIR QUALITY OFFICER, DEPARTMENT OF
ENVIRONMENT, FORESTRY & FISHERIES**

First Respondent

THABAMETSI POWER COMPANY (PTY) LTD

Second Respondent

**APPEAL PURSUANT TO SECTION 43(2) OF THE NATIONAL ENVIRONMENTAL
MANAGEMENT ACT, 1998 AGAINST PROVISIONAL ATMOSPHERIC EMISSION LICENCE
ISSUED TO THABAMETSI POWER COMPANY (PTY) LTD ON 14 FEBRUARY 2019**

30 OCTOBER 2019

INTRODUCTION

1. This is an appeal to the Minister of Environment Forestry and Fisheries (“**the Minister**”), directed at the Director: Appeals and Legal Review of the Department of Environment Forestry and Fisheries, against the decision of the National Air Quality Officer to grant a Provisional Atmospheric Emission Licence (**PAEL**) in terms of section 41(1) of the National Environmental Management: Air Quality Act, (2004) (**AQA**), to Thabametsi Power Company (Pty) Ltd for operation of the Independent Power Producer (**IPP**) 630 MW Thabametsi coal-fired power station near Lephalale, Limpopo Province (“**Thabametsi**” or “**the project**”).

2. The PAEL¹ authorises solid fuel combustion installations as well as storage and handling of ore and coal for a period of twelve months from the date of commencement of the listed activities.
3. This appeal is lodged in terms of section 43(1) of the National Environmental Management Act, 1998 (**NEMA**), which provides that “*any person may appeal to the Minister against the decision taken by any person acting under a power delegated by the Minister under [NEMA] or a specific environmental management act.*”

PARTIES

4. The First Appellant is Earthlife Africa,² a registered non-profit company and an organisation that was founded in 1988 to mobilise civil society around environmental justice issues. Earthlife Africa is a registered interested and affected party (**I&AP**) in respect of the application process for the PAEL.
5. The Second Appellant, groundWork,³ is an environmental justice and non-profit organisation that works with South and Southern African communities on environmental justice and human rights issues focusing on coal, climate and energy justice, waste and environmental health. groundWork works with a number of community groups throughout South Africa, including: the Vaal Environmental Justice Alliance; South Durban Community Environmental Alliance; Mfuleni Community Environmental Justice Organisation; and South African Waste Pickers’ Association. groundWork is a registered I&AP in respect of the application process for the PAEL.
6. The Appellants have legal standing to bring the Appeal not only in terms of section 43 of NEMA, but also to enforce environmental laws (including “*a principle contained in Chapter 1, or of any provision of a specific environmental management Act, or of any other statutory*”

¹ Provisional Atmospheric Emission Licence as Contemplated in Section 43 of the National Environmental Management: Air Quality Act, 2004, (Act No. 39 of 2004), AEL/LP/TPC/09/10/2018.

² See <http://earthlife.org.za/>.

³ See <https://www.groundwork.org.za/>.

provision concerned with the protection of the environment or the use of natural resources”)⁴ in terms of NEMA section 32, in that they *inter alia* act: “(c) *in the interest of or on behalf of a group or class of persons whose interests are affected; (d) in the public interest; and (e) in the interest of protecting the environment.*”⁵

7. The First Respondent is the National Air Quality Officer (**NAQO**), cited in her official capacity as the decision-maker and signatory of the PAEL.
8. The Second Respondent is a private company – Thabametsi Power Company (Pty) Ltd. (“**Thabametsi**”), the Applicant and holder of the PAEL.

BACKGROUND

Description of the project

9. This appeal stems from Second Respondent’s atmospheric emission licence (**AEL**) application of 2018 for the proposed Thabametsi IPP coal-fired power station.
10. Thabametsi proposes that the power plant be built in “*two phases of 630 MW (Phase 1) and 570 MW (Phase 2)*”.⁶ The AEL application addresses only emissions from Phase 1 because “*only Phase 1 is selected by the Department of Energy under the Coal Baseload Independent Power Producer (IPP) Programme as a preferred bidder.*”⁷ It is thus only Phase 1 of the project that has been licensed by the PAEL.
11. The application also specifies that “*[t]he main source of emissions from the proposed Thabametsi Power Plant includes the two stacks, the coal and lime stockpiles and ash dump.*”⁸

⁴ NEMA section 32(1).

⁵ NEMA section 33(1)(c)-(d).

⁶ Part A, application form.

⁷ *Id.*

⁸ *Id.*

12. The site of the project is situated in the Lephalale Local Municipality, which falls under the Waterberg District Municipality in the Limpopo province.⁹ The project site falls within the Waterberg coalfields. It is noted that Exxaro Resources Limited (“**Exxaro**”) has been granted authorisation to develop a coal mine, the Thabametsi coal mine, which, it is envisaged, will supply the Thabametsi power station with coal.
13. The site is located in close proximity to the Grootegeluk coal mine – also operated by Exxaro.¹⁰ Two coal-fired power stations, namely Eskom’s Medupi and Matimba power stations, are situated within 15km of the project site.¹¹ In addition, other coal mining and coal-fired power generation projects are proposed within the broader area, as the project site is located within the Limpopo Coal, Energy and Petrochemical cluster, the Lephalale Local Municipality Industrial Corridor and the Waterberg coalfields.
14. The towns of Marapong, Onverwacht and Lephalale are in close proximity, all located less than 25km from the project site,¹² and it is recorded that the Lephalale Local Municipality has an average population density of 4.7 people per km².
15. The project would be located within the Waterberg Bojanala Priority Area, declared a priority area by the Minister in 2012 (GN 495), in terms of section 18 AQA, on the basis that “*ambient air quality within the Waterberg District Municipality ... may exceed ambient air quality standards in the near future*”. Already the area has a number of confirmed exceedances of the ambient air quality standards for ozone, sulphur dioxide and PM₁₀.¹³ In addition, the area is water-scarce and confirmed to be highly vulnerable to the impacts of climate change,¹⁴ which in turn will impact on the surrounding communities and environment, and on the efficiency and operability of the project itself.

⁹ Provisional License at 3.

¹⁰ *Id.*

¹¹ *Id.*

¹² *Id.*

¹³ See 2018 State of the Air Report at http://www.airqualitylekgotla.co.za/assets/2018_1.3_2018_state_of_air_report.pdf.

¹⁴ See LEDET Climate Change Response Strategy 2016 – 2020; and <https://www.sciencedirect.com/science/article/pii/S0254629917311985>.

The AEL application process

16. On 2 May 2018, the Second Respondent submitted a notification of the application for an AEL to the then Department of Environmental Affairs (now Department of Environment Forestry and Fisheries) (“**the Department**”), in relation to the proposed Thabametsi project.
17. The Appellants submitted comments on the Atmospheric Impact Report (**AIR**), which formed part of the AEL application, on 31 May 2018 (“**initial AIR comments**”). Thabametsi failed to make the full AEL application available for consideration and comment, despite the legal obligation in AQA to do so. The initial AIR comments are attached (without annexures) as **Annexure A1**. The initial AIR comments submitted, *inter alia*, that the AEL application should be refused because Thabametsi’s full application had not been made available for comment; the AIR failed to properly assess or reflect Thabametsi’s potential emissions; and Thabametsi had not met various AQA section 39 factors and requirements.¹⁵
18. On 20 August 2018, a revised AIR, this time with the application form and further application records, was made available for comment. Although no comments and response report in respect of the initial AIR comments was provided. The revised AIR expanded the project definition to include the power plant’s associated infrastructure and supplying mines. The Appellants submitted comments to the revised AIR, online application form, and health risk study on 20 September 2018 (“**supplementary AEL comments**”). The application form and health risk study had not been made available to the Appellants during the commenting period on the initial AIR. The supplementary AEL comments are attached (without annexures) as **Annexure A2**.
19. The supplementary AEL comments highlighted the following main concerns with the proposed project and AEL application: that the Waterberg Bojanala Priority Area is already out of compliance with Ambient Air Quality Standards, and on that basis alone the AEL

¹⁵ See initial AIR comments, para. 13.1-13.3.

must be refused; the health study is outdated and failed to adequately assess the health impacts of the project; and the AIR failed to include sufficient, verifiable information and to accurately account for the Thabametsi project's emissions or to adequately assess the cumulative impacts of the Thabametsi project. The initial AIR and supplementary AEL comments are referred to collectively as the "**AEL application comments**".

20. Many of these objections persist and are raised as grounds of appeal as set out below.

The PAEL and reasons

21. On 14 February 2019, the Second Respondent was issued with the PAEL. The Appellants did not become aware of the issuance of the PAEL until July 2019, when the Second Respondent filed its answering affidavit in the North Gauteng High Court review application challenging Thabametsi's environmental authorisation (under case number 21559/18), and therein confirmed that the PAEL had been issued.¹⁶

22. In August of 2019, the Appellants wrote to Thabametsi's attorneys, the NAQO, and the Department's Promotion of Access to Information Act, 2000 (**PAIA**) Administrator, requesting access to a copy of the PAEL.

23. The First Respondent - the NAQO - initially disputed the legal obligation in terms of section 40(4)(b) AQA to make the PAEL available to I&APs – which the Appellants' attorneys, in turn, in a letter of 8 August 2019, advised was an incorrect interpretation of AQA. The Appellants' simultaneously, in the letter of 8 August, requested written reasons for the NAQO's decision to issue the PAEL. The letter of 8 August is attached as **Annexure A3**.

24. On 7 October 2019, the Appellants received a copy of the PAEL from the Department, and the First Respondent's reasons for the decision to issue the PAEL ("**the reasons**"). The reasons are dated 10 July 2019 – approximately one month before the Appellants had sent

¹⁶ Please see paragraph 138 of the Answering Affidavit of Kazuaki Shibuya of Thabametsi Power Company dated 4 July 2019.

the request for reasons. The PAEL and reasons are attached as **Annexures A4** and **A5** respectively.

25. The Department's letter stated the following bases for granting the PAEL:

25.1. the emission limits authorised by the PAEL comply with minimum emission standards (**MES**) for its activity category under section 21 of the AQA;

25.2. Thabametsi will install Circulating Fluidised Bed (**CFB**) boiler units, a "*technology that is said to have the ability to achieve lower emission of pollutants*"¹⁷ – the "*best practicable environmental option*". Thabametsi gave a presentation to the Department's senior technical specialists "*regarding the workings of this new technology, as part of the assessment of the application, whereupon clarification was provided*";¹⁸

25.3. a satisfactory environmental impact assessment (**EIA**) had been followed, which led to the granting of the environmental authorisation, and no separate EIA process is required before issuance of the PAEL;

25.4. the AEL application had been subject to public participation, and the issues raised and objections lodged during the public participation process had been, in the Department's view, "*adequately addressed*";

25.5. the application was consistent with section 37 of the AQA, and included information on monitoring, management, and mitigation as well as air quality dispersion modeling results; and

¹⁷ Reasons for the Decision to Issue the PAEL (July 10, 2019) at 1.

¹⁸ Reasons for the Decision to Issue the PAEL at 1-2.

25.6. The information provided in Thabametsi’s application supported a determination that *“the potential negative impacts of the facility in the receiving environment would be minimal and manageable.”*¹⁹

26. All of the above reasons are disputed – as addressed in the grounds of appeal below.

27. The Appellants have, to the best of their ability, endeavoured to comply with regulation 4 of the NEMA Appeal Regulations (GNR 993 of December 2014).

28. Given the failure to adequately notify the Appellants of the PAEL issuance in accordance with AQA and the Appeal Regulations, and the legal requirements for procedural fairness enshrined in section 33 of the Constitution of the Republic of South Africa (“**the Constitution**”) and in the Promotion of Administrative Justice Act, 2000 (**PAJA**), it would be in the interests of justice that any alleged late filing of this appeal be condoned. To the extent that there is any delay in complying with the relevant timeframes, we submit that there is minimal, if any, prejudice to the other parties, and the balance of convenience favours the Appellants.

GROUND OF APPEAL

29. It is the Appellants’ submission that the decision to grant the PAEL to Thabametsi must be set aside by the Minister for the following reasons, which are set out in more detail below:

29.1. Contrary to provisions of AQA, the Regulations Regarding Air Dispersion Modelling and the 2017 National Framework for Air Quality Management, the First Respondent failed to adequately assess the air quality impacts of the project by:

29.1.1. granting the PAEL based on the findings of the revised AIR even though it omitted crucial data and modelling information; and

¹⁹ Reasons for the Decision to Issue the PAEL at 3.

- 29.1.2. granting the PAEL based on air modelling that grossly understates the likely impacts of the project.
- 29.2. In contravention of AQA, the 2017 National Framework for Air Quality Management and Regulations Regarding Air Dispersion Modelling, the First Respondent failed to adequately assess the cumulative impacts of the project by:
- 29.2.1. failing to consider any fugitive emissions as part of the project's cumulative impacts;
 - 29.2.2. failing to consider emissions from surrounding mines, including from coal fires; and
 - 29.2.3. failing to adequately assess emissions from the Medupi and Matimba coal-fired power stations.
- 29.3. Approving the PAEL despite existing and confirmed anticipated breaches of the National Ambient Air Quality Standards, contravenes section 39(a) of the AQA.
- 29.4. The First Respondent failed to adequately assess the health impacts of the project in contravention of section 39(b) of the AQA. The health risk study is deficient in two main respects:
- 29.4.1. the health risk study does not provide an up-to-date assessment of the health impacts of the project; and
 - 29.4.2. the health risk study fails to provide a detailed and quantitative assessment of health impacts from increases in pollutant levels.

- 29.5. The mitigation and monitoring measures identified in the PAEL are inadequate and First Respondent violated section 39(c) of AQA by approving the PAEL when the proposed control technology, operating conditions, and monitoring requirements do not constitute the best practicable environmental option available for mitigating emissions – in that, *inter alia*:
- 29.5.1. the AIR and consequently the PAEL do not accurately account, or provide, for the sufficient abatement of particulate matter (**PM**), sulphur dioxide (**SO₂**) or oxides of nitrogen (**NO_x**) emissions associated with the project;
 - 29.5.2. the PAEL provides no support for the effectiveness of proposed control technology and operating conditions;
 - 29.5.3. subcritical CFB boilers are an outdated technology; and
 - 29.5.4. the monitoring requirements in the PAEL are inadequate.
- 29.6. The First Respondent's decision to grant the PAEL is not consistent with AQA; NEMA; or the Constitution.
- 29.7. The Second Respondent is not a fit and proper person under Section 49 of the AQA.
- 29.8. The First Respondent's granting of the PAEL constitutes administrative action which materially and adversely affects the rights and legitimate expectations of interested and affected parties and which must therefore comply with the PAJA. The Appellants submit that the administrative action does not comply with the provisions of PAJA, by virtue of:
- 29.8.1. its unlawfulness;

29.8.2. the fact that irrelevant factors were taken into account and relevant factors not considered;

29.8.3. the fact that the decision is not rationally connected to the information before the First Respondent in making the decision or to the reasons given for it by the First Respondent; and

29.8.4. the fact that the decision is so unreasonable that no reasonable person could have granted the PAEL.

30. The expert report of Dr Ranajit Sahu is relied on in support of this appeal. The report provides an expert analysis of the PAEL. It is referenced in various sections of this appeal, and is attached as **Annexure A6**. Dr Sahu's previous reports, which accompanied the AIR comments, are attached to this report as **Attachments A, B and C**.

Ground 1: the First Respondent failed to adequately assess the air quality impacts and direct emissions of the entire project

31. Granting the PAEL based on an AIR that omitted crucial data and modelling information, as well as grossly understates the likely impacts of the project, contravenes:

31.1. section 39 of AQA;

31.2. The AQA Regulations Regarding Air Dispersion Modelling (GN R533) of 11 July 2014 ("**the Modelling Regulations**"), which includes a Code of Good Practice for air dispersion modelling ("**the Code of Practice**");²⁰ and

²⁰ At <http://extwprlegs1.fao.org/docs/pdf/saf138477.pdf>.

- 31.3. the 2017 National Framework for Air Quality Management in the Republic of South Africa²¹ (“**the 2017 National Framework**”) (GN 1144) of 26 October 2018.²²
32. Section 39 of AQA requires a licensing authority to take into account various factors in considering an application for an AEL, including applicable emission standards and “*the pollution being or likely to be caused by the carrying out of the listed activity applied for and the effect or likely effect of that pollution on the environment, including health, social conditions, economic conditions, cultural heritage and ambient air quality*”.²³
33. The Code of Practice supplements the Modelling Regulations with procedures and protocols that ensure consistency in assessment of potential emissions.²⁴ It 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. According to the Code of Practice, “*the report [AIR] shall include a description of electronic files*” and “*the report shall include a discussion on deviations from the modelling protocol.*”²⁵
34. Regulation 5 of the Modelling 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).²⁶
35. The 2017 National Framework is designed to achieve the objectives of the AQA. The National Framework “*provides mechanisms, systems and procedures to promote holistic and integrated air quality management through pollution prevention and minimisation at source, and through impact management with respect to the receiving environment*

²¹ Government Notice 1144, of Government Gazette no 41996 of 26 October 2018.

²² At https://saaqis.environment.gov.za/Pagesfiles/2017_National_Framework.pdf.

²³ S39(b).

²⁴ Section 1.1, page 2, Code of Practice for Air Dispersion Modelling in Air Quality Management in South Africa, 2014, available at <https://cer.org.za/wp-content/uploads/2010/03/Air-dispersion-modelling.pdf>.

²⁵ Section 7.3, page 75, Code of Practice.

²⁶ Definitions, Code of Practice.

*from local scale to international issues.*²⁷ It applies broadly and “**binds** all organs of state in all spheres of government” (emphasis added).²⁸

36. The First Respondent failed to comply with the obligations set out in AQA, the Code of Practice and the 2017 National Framework through accepting the AIR and granting the PAEL despite:

36.1. a flawed revised AIR that omitted crucial data and modelling information; and

36.2. air modelling that grossly understates the likely impacts of the project.

The omission of crucial data and modelling information

37. The revised AIR excludes data and modelling information required by the Code of Practice, and no such data has been made available publicly or to Appellants.

38. An applicant for an AEL has an obligation, under section 38(3) of AQA, to “*bring the application to the attention of relevant organs of state, interested persons and the public*”. As the AEL application records made available did not include these data, the presumption is that they were not made available to the First Respondent as part of the application.

39. A May 2018 report by Dr. Ranajit Sahu, which accompanied the initial AIR comments, attached as **Attachment 2** to the **Annexure A6** Sahu report, explains that “*[w]ithout a thorough discussion of how all of the meteorological data was processed, validated, and otherwise used in the analysis, including all inputs and assumptions made by the analyst, the predictions made in the AIR cannot be assumed to be reliable.*”²⁹ The Department has not addressed this issue in the PAEL nor has the NAQO addressed this in the reasons.

²⁷ Paragraph 1.3, page 1, 2017 National Framework for Air Quality Management in South Africa, available at https://saagis.environment.gov.za/Pagesfiles/2017_National_Framework.pdf.

²⁸ Paragraph 1.3, page 2, 2017 National Framework.

²⁹ Sahu May 2018 report, p. 3. Sahu October 2019 Comments, p. 1.

40. Moreover, failure to provide the Appellants and the First Respondent access to the modelling files and data, in addition to being in contravention of the Code of Practice, also contravenes AQA. As stated above, AQA requires that a competent authority take into account the pollution likely to be caused. This could not have been done, with gaps in the accessible data.
41. Given the potential for considerable impacts on human health and the environment arising from the project, it is crucial that all data be publicly accessible to enable the protection of fundamental human rights. In this regard, the constitutional rights of access to information;³⁰ as well as to an environment not harmful to health and wellbeing and to have the environment protected for the benefit of present and future generations³¹ are infringed by the failure to make necessary data available. The Supreme Court of Appeal's 2014 judgment in *Company Secretary of ArcelorMittal South Africa v Vaal Environmental Justice Alliance*,³² bears relevance. Here the court held that "*Corporations operating within our borders... must be left in no doubt that, in relation to the environment in circumstances such as those under discussion, there is no room for secrecy and that constitutional values will be enforced*" (emphasis added).
42. By failing to provide input data files, the AIR did not comply with the Code of Practice and the First Respondent did not fully consider the requisite section 39 AQA considerations. Furthermore, these non-disclosures violate the Appellants' constitutional rights. As such the First Respondent should not have granted a PAEL based on the AIR.

Granting the PAEL based on air modelling that grossly understates the likely impacts of the project

43. Section 3.3 of the Code of Practice notes that "*emissions must include any other operating requirements relating to atmospheric discharges, including non-point source*

³⁰ S32, the Constitution of RSA, 1996.

³¹ S24, the Constitution of RSA, 1996.

³² (69/2014) [2014] ZASCA 184 (26 November 2014).

or fugitive emissions. **The maximum emission rates must be based on emissions standards as stipulated in Section 21 of the AQA**” (emphasis added).³³

44. As required by section 3.3 of the Code of Practice, the revised AIR modelling should have been based on emissions at the limit values of the new plant MES limits, at constant rates. Instead, the revised AIR relies on each pollutant’s “*maximum emission concentrations*” – the AIR’s prediction of the plant’s likely emissions as opposed to the maximum of what the plant is legally permitted to emit - in calculating emission rates.³⁴ This is in breach of the legal requirements in the Code of Practice and also results in modelling that does not capture true potential emissions from the power station. For example, in Table 11 of the revised AIR, the AIR adopted a “*maximum emission [stack] concentration*” of 0.7 mg/Nm³ for PM₁₀ instead of the MES limit of 50 mg/Nm³.³⁵ 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.³⁶
45. The PAEL allows the plant to operate at a stack concentration of 50 mg/Nm³, a value 70 times greater than that used in the AIR modelling, meaning that the AIR has significantly understated the project’s potential emissions in its modelling of the project’s potential impacts. Similarly, the maximum emission concentrations for SO₂ and NO_x are about half and a third of the applicable MES limits in the PAEL, respectively.³⁷ The project is permitted to emit up to the values provided in the PAEL (the MES limit values). For purposes of modelling and understanding the project’s emissions, notwithstanding that this is what is required by the law, it is crucial that the projected emissions are based on the MES values allowed by the PAEL, as the “worst case” scenario for the project, particularly since, as

³³ Section 3.3, page 24, Code of Practice.

³⁴ Revised AIR at page 11 (20 August 2018).

³⁵ Table 11, Revised AIR at page 11.

³⁶ Table 12, Revised AIR at page 11.

³⁷ Table 11, Revised AIR at page 11.

demonstrated below, there are major flaws in the assumptions for the project emissions and emissions abatement.

46. The AIR further understates the anticipated emissions of the project by only accounting for some, but not all, of the fugitive emissions directly associated with the project. This too, is in contravention of section 3.3 of the Code of Practice. The unaccounted fugitive emissions include those from the haul roads that will be used to transport coal (in the event of conveyor malfunctions), limestone, and ash for example.
47. By relying on “*maximum emission concentrations*” that do not reflect the higher stack concentrations at which the plant is in fact licensed to operate, and by selectively accounting for fugitive emissions, the revised **AIR significantly understated the potential air pollution impacts of the project**. As such, the First Respondent’s grant of the PAEL was based on a fatally flawed analysis that is contrary to law, in particular section 39(a) of AQA.
48. These issues were raised in the AEL application comments,³⁸ yet the Department has not addressed these issues in the PAEL or in the First Respondent’s reasons for the decision to issue the PAEL.

Ground 2: the First Respondent failed to adequately assess the cumulative impacts of the project

49. Contrary to the requirements of AQA; the 2017 National Framework; and Code of Practice, the First Respondent granted the PAEL even though the AIR did not consider any fugitive emissions, emissions from surrounding mines, emissions from the Medupi and Matimba plants, and the cumulative impacts of the project operating at full capacity alongside these existing plants and other harmful air emission sources.

³⁸ Paragraph 49 of the supplementary AEL comments.

50. An adequate assessment of “*the pollution being or likely to be caused by the carrying out the listed activity applied for and the effect or likely effect of that pollution*” – as required by section 39(2) AQA, undoubtedly also requires consideration, by a licensing authority, of cumulative emissions, and the additive contribution of a listed activity to existing emissions and/or to additional emission sources linked with the activity. Indeed this is confirmed by the 2017 National Framework.

51. Paragraph 5.5.3.2 of the 2017 National Framework notes that:

*“The AQA is effects-based legislation, with the result that activities that result in atmospheric emissions are to be determined with the objective of achieving health-based ambient air quality standards. **Each new development proposal with potential impacts on air quality must be assessed not only in terms of its individual contribution, but in terms of its additive contribution to baseline ambient air quality i.e. cumulative effects must be considered**”³⁹ (emphasis added).*

52. Section 2.3.11 of the Code of Practice states that “*[a]ll levels of assessments **must** consider the background concentrations of air contaminants. The intent is to compare the ambient air quality to the cumulative impact of new emissions and existing baseline conditions*” (emphasis added).⁴⁰ In accordance with the Modelling Regulations, the First Respondent must refuse to accept air dispersion modelling results where the analysis conducted does not comply with the Code of Practice.⁴¹

53. The First Respondent failed to adequately assess the cumulative impacts of the project through, *inter alia*:

³⁹ Paragraph 5.5.3.2, page 73-74, 2017 National Framework.

⁴⁰ Section 2.3.11, page 18, Code of Practice.

⁴¹ Definitions, Code of Practice.

- 53.1. failing to consider any fugitive emissions from sources within the same airshed, as part of the project's cumulative impacts;
- 53.2. failing to consider emissions from surrounding mines, including from coal fires; and
- 53.3. failing to adequately assess emissions from the Medupi and Matimba plants.

The failure to consider any fugitive emissions as part of the project's cumulative impacts

54. Section 3.4.2 of the Code of Practice on fugitive sources requires modelers to “*report the impacts **from all sources** as well as the impacts from fugitive sources of the facility under consideration*” (emphasis added).⁴²
55. The revised AIR fails to properly account for all fugitive emissions, from all sources, as required. Although Table 14 identifies fugitive emissions from material handling and wind erosion from the coal yard, lime stockpiles, and ash dump,⁴³ this list notably excludes 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.⁴⁴
56. The revised AIR's assessment of the cumulative air quality impacts likewise appears to omit fugitive emissions. The predicted long-term (annual) PM₁₀ levels are inexplicably lower in the cumulative scenario⁴⁵ than in the Thabametsi alone⁴⁶ scenario. For example, the predicted 99th percentile 24-hour PM₁₀ concentration is 2.5 µg/m³ in the cumulative scenario, compared with 3.86 µg/m³ in the Thabametsi alone scenario. If the full scope of

⁴² Section 3.4.2, page 26, Code of Practice.

⁴³ Table 14, Revised AIR at page 13.

⁴⁴ Sahu May 2018 report, p. 5. The Department has not addressed this issue in the PAEL or in its Reasons for the Decision to Issue the PAEL. Sahu October 2019 Comments, p. 1.

⁴⁵ Revised AIR, p. 48.

⁴⁶ Revised AIR, p. 29.

fugitive cumulative emissions had been properly accounted for, this would not be the case, notwithstanding that this conclusion appears arbitrary and flawed, as it is.

57. The AIR's cumulative analysis excludes "*low-level emissions*" from "*stockpiles, ash dumps, and ... mine activities*" because they are "*released close to ground-level and have little or no buoyancy*."⁴⁷ This omission is in direct contravention of section 3.4.2, which requires modelling to capture fugitive emissions from **all sources** in the area. As such, the Second Respondent had an obligation to fully account for these emissions, and the First Respondent had an obligation to consider the fugitive emissions from, not only the project components, but also from activities linked to the project and surrounding sources such as the Medupi and Matimba plants – the revised AIR contained no information necessary for such an evaluation.
58. In accordance with the Modelling Regulations, the First Respondent should have rejected the air dispersion modelling results as non-compliant with the Code of Practice. The First Respondent has not addressed this issue in the PAEL or in the reasons for the decision to issue the PAEL.

Failing to consider emissions from surrounding mines, including from coal fires

59. The revised AIR fails to take into account emissions from existing and new mines in the area, including fires from the mines, which are frequent and give rise to significant emissions of fine PM (2.5). Exxaro's existing Grootegeluk coal mine is located within 10 km of the proposed project site, and is a significant source of PM emissions.⁴⁸
60. Further, the project will be accompanied by a new coal mine, the proposed Thabametsi mine, which will be another contributor to air pollutant emissions in the project vicinity.⁴⁹

⁴⁷ Revised AIR, p. 45.

⁴⁸ Revised AIR, Figure 1 at p. 4.

⁴⁹ Revised AIR, p. 1.

61. In South Africa, coal mines are prone to spontaneous combustion causing coal fires. An assessment of coal mines in South Africa shows that all mines tested have either a medium or high risk of spontaneous combustion.⁵⁰ 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.”⁵¹

62. With respect to the project, the risk of coal fires at the Grootegeluk coal mine are not merely academic. 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*

⁵⁰ 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.

⁵¹ *Id.*

*for preventing or containing the problems was ever formulated” (emphasis added).*⁵²

63. Emissions from coal fires cause severe impacts to air quality. As shown above, 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). As a result, these emissions contribute to “*the cumulative impact of new emissions and existing baseline conditions*”, both of which must be evaluated in the AIR pursuant to section 2.3.11 of the Code of Practice.
64. The First Respondent has not addressed this issue in the PAEL or in the reasons for the decision to issue the PAEL.
65. Failure to account for such emissions renders the revised AIR non-compliant with the Code of Practice. The First Respondent was required under the Modelling Regulations to reject the AIR findings and refuse the application.

Failing to adequately assess emissions from the Medupi and Matimba plants

66. As confirmed above, and in terms of AQA and the 2017 National Framework, the First Respondent was required to evaluate “*the effect of the project’s pollution on the environment*”⁵³ and the project’s “*additive contribution to baseline ambient air quality*,”⁵⁴ – this requires full and accurate consideration of the project’s emissions **in combination with** existing pollution from the Matimba and Medupi coal plants, in addition to the mines and other sources as addressed above.

⁵² Adamski, S. A. (2003). The prevention of spontaneous combustion in back-filled waste material at Grootgeluk Coal Mine.

⁵³ S39(b), AQA.

⁵⁴ Paragraph 5.5.3.2, page 74, 2017 National Framework.

67. In respect of Matimba, the revised AIR **underestimated emissions, for modelling purposes by 35%-66%**.⁵⁵ The AIR should have relied on the maximum permitted production rates along with the plant operating at the maximum stack concentrations, in accordance with Matimba's AEL. It did not do this.
68. In respect of Medupi, the AIR relies on an assumption that all units of the plant will have been fitted with flue gas desulphurisation (**FGD**) by 2025, presumably on the basis of its legal obligations to comply with the MES by April 2025. Eskom has indicated that it only intends to retrofit Medupi with FGD at each unit 6 years after the commissioning of each unit,⁵⁶ and none of its units have yet been retrofitted with FGD. Although an environmental authorisation for the retrofitting of FGD at Medupi was granted in September 2018, it is unclear whether the authorisation has been challenged on appeal. The variation of Medupi's FGD waste management licence was refused in March 2019. Under these circumstances, the AIR's assumption that all units of the Medupi plant will be retrofitted with FGD by 2025, are unrealistic and cannot be relied upon. This disguises the significant contributions to cumulative emission rates and ambient concentrations of Medupi, for the project.
69. Reliance on the AIR's incorrect analysis of potential emissions from neighboring plants in issuing a PAEL is inconsistent with AQA and the 2017 National Framework.

Ground 3: approving the PAEL despite existing and confirmed anticipated breaches of Ambient Air Quality Standards contravenes section 39(a) of the AQA

70. Section 39(a) of the AQA requires that the licensing authority take into account "*any applicable minimum standards set for ambient air and point source emissions that have been determined*" when considering an atmospheric emission license application.⁵⁷

⁵⁵ Paragraph 36.1 of the initial AEL comments and paragraph 71 of the supplementary AEL comments.

⁵⁶ See <http://www.eskom.co.za/OurCompany/SustainableDevelopment/EnvironmentalImpactAssessments/medupi/Final%20DSR/App-D8-CRR.pdf> at page 1.

⁵⁷ Section 39(a) AQA.

71. Section 40(2) of AQA states that “*any decision by a licensing authority to grant an application must be consistent with— ... (i) any ambient air quality or emission standards that have been determined in terms of this Act.*”
72. National Ambient Air Quality Standards (**NAAQS**) were published in terms of section 9 of the AQA, on 24 December 2009 for various substances, including for PM₁₀ (particles with aerodynamic diameter less than 10 micro metres, and on 29 June 2012, for PM_{2.5} (particles with aerodynamic diameter less than 2.5 micro metres). The NAAQS establish national standards for ambient air quality, including the permissible amount or concentration of each such substance or mixture of substances in ambient air.
73. The NAAQS are health-based standards, intended to provide safe daily exposure levels for the majority of the population – including the very young and elderly. Although they have been criticised as being woefully weak – weaker even than the outdated World Health Organisation (**WHO**) recommended standards, which are being updated.
74. Paragraph 5.4.3.2 of the 2017 National Framework for Air Quality Management reiterates that “*the setting of ambient air quality standards is mandatory*” to “*uphold the constitutional right to an environment that is not harmful to health and well-being.*”⁵⁸
75. The revised AIR confirms that SO₂ emissions from the project will exceed the NAAQS:
- 75.1. “*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...*”

⁵⁸ Section 5.4.3.2, page 53, 2017 National Framework.

75.2. *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...*

75.3. *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...*

75.4. *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...*

75.5. *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.*

75.6. *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" (emphasis added).⁵⁹*

76. Even if all six units at the Medupi plant could be retrofitted by 2025 (which is disputed on the basis that it is highly unlikely, as indicated above), the project would still have become operational two years before such pollution control technology could be installed at Medupi. The revised AIR thus **predicts and explicitly confirms exceedances of the NAAQS** for SO₂, as a result of the Thabametsi project coming online.⁶⁰

⁵⁹ Revised AIR, p. 59-60.

⁶⁰ Sahu September 2018 report, p. 2. The Department has not addressed this issue in the PAEL or in its Reasons for the Decision to Issue the PAEL. Sahu October 2019 Comments, p. 1.

77. Moreover, the Department's 2017 and 2018 State of the Air Report⁶¹ and recent monitoring data from Lephalale⁶² confirm that ambient air in the Waterberg Bojanala Priority Area is already out of compliance with PM₁₀, SO₂, and ozone (formed in the atmosphere from volatile organic compounds and NO_x) NAAQS in certain areas.⁶³ These findings on ambient air data do not include the recent coal-feed problems being experienced at Medupi, which is being supplied with coal by trucks (generating enormous fugitive dust and PM₁₀ impacts in the process), because the coal conveyor supplying Medupi is broken.⁶⁴ Any additional levels of increased pollutant mass into the atmosphere in the area will only further exacerbate the ambient air pollution problems in the region.
78. It is not permissible to approve, nor can there be any justification for approving, another coal plant like Thabametsi when emissions from existing sources in the Waterberg Bojanala Priority Area have already resulted in multiple exceedances of the NAAQS.⁶⁵
79. The First Respondent should have refused the Second Respondent's application for an AEL based on the anticipated non-compliance with the NAAQS pursuant to section 39(a) of the AQA.

Ground 4: the First Respondent did not adequately take into account the health impacts of the project, in contravention of section 39(b) of the AQA

80. Granting the PAEL when the Second Respondent failed to provide an up-to-date and quantitative assessment of health impacts contravenes section 39(b) of the AQA.
81. In the First Appellant, Earthlife Africa's, 2015 appeal of Thabametsi's environmental authorisation, one of the grounds of appeal was that the health impacts of the proposed

⁶¹ See http://www.airqualitylekgotla.co.za/assets/2017_1.3-state-of-air-report-and-naqi.pdf and http://www.airqualitylekgotla.co.za/assets/2018_1.3_2018_state_of_air_report.pdf.

⁶² Sahu October 2019 Comments at p.6.

⁶³ Sahu October 2019 Comments at pp.6-7.

⁶⁴ *Ibid.*

⁶⁵ *Ibid.*

power station had not been adequately considered in the EIA. The health risk study submitted, along with the Second Respondent's application for an AEL is the same inadequate specialist study that was part of the project's EIA.

82. The Minister's March 2016 decision⁶⁶ on Earthlife Africa's appeal of Thabametsi's environmental authorisation stated, in response to the appeal ground that the health impacts of the project had not been adequately assessed in the health risk study (the same health risk study that forms part of this AEL application), 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).⁶⁷
83. The Minister's decision 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.*"
84. Section 39(b) of the AQA also requires a licensing authority to consider "*the pollution being or likely to be caused by the carrying out of the listed activity applied for and the effect or likely effect of that pollution on the environment, including health, social conditions, economic conditions, cultural heritage and ambient air quality*" (emphasis added).⁶⁸
85. In light of the Minister's March 2016 EIA decision and section 39(b) of the AQA, the health risk study of 2013 is insufficient in two main respects:

⁶⁶ Minister's Appeal Decision of 2016 is available at <https://cer.org.za/wp-content/uploads/2014/06/Thabametsi-Appeal-Decision.pdf>.

⁶⁷ Page 17, Minister's appeal decision.

⁶⁸ Section 39(b) AQA.

- 85.1. it does not provide an up-to-date assessment of the health impacts of the project;
and
- 85.2. it fails to provide a detailed and quantitative assessment of health impacts from increases in pollutant levels.

The Health Risk Study does not provide an up-to-date assessment of the health impacts of the project

86. In the five years that have elapsed since the health risk study was conducted, scientific understanding of how exposure to air pollution impacts human health has progressed.
87. The Pubmed database 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.”⁶⁹
88. The WHO has confirmed that ambient air pollution is a major cause of death and disease globally and the recent estimate is that 4.2 million premature deaths are linked to ambient air pollution. The WHO advises that pollutants with the strongest evidence for public health concern, include PM, O₃, NO₂ and SO₂.⁷⁰
89. While evidence prior to 2013 firmly established that exposure to elevated levels of 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.⁷¹

⁶⁹ <https://www.ncbi.nlm.nih.gov/pubmed/>.

⁷⁰ <https://www.who.int/airpollution/ambient/health-impacts/en/>

⁷¹ 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-

The health risk study fails to provide a detailed and quantitative assessment of health impacts from increases in pollutant levels

90. The health risk study concludes that:

“The human health risk for development of acute and chronic adverse effects from exposure to PM₁₀ from the stack, stockpile and ash dump and SO₂ and NO₂ from the stacks, is low at all three communities of concern (Lephalale, Onverwacht and Marapong) as well as the other off-site sensitive receptor areas investigated.”⁷²

91. However, this conclusion appears to be based solely on anticipated compliance with the NAAQS for PM₁₀, NO₂, and SO₂, rather than an assessment of actual potential impacts of all of the project’s emissions on human health. The study notes:

“In all cases considered, predicted ambient concentrations resulting from the Thabametsi Power Station are compliant with the current and future national ambient standards. The impacts associated with PM₁₀ from the coal stockpile and ash dump have a low significance⁷³

“In all cases considered (varying stack heights), predicted ambient concentrations resulting from the Thabametsi Power Station are compliant with national ambient standards and no exceedance of the standard is predicted . . . The impacts associated with NO₂ have a low significance ...⁷⁴

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.

⁷² Health Risk Report, p. 64.

⁷³ Health Risk Report, p. 63.

⁷⁴ Health Risk Report, p. 63.

*No exceedance of the [national ambient] standard is predicted in residential areas around the site when stacks are 150 m high . . . The impacts associated with SO₂ have a low significance.*⁷⁵

92. As noted above, the power station will operate in an area that is in non-compliance with several NAAQS. The highly-flawed AIR likely underestimates the potential air emissions from the power plant (appeal ground 1), and the cumulative impacts of the project (which have not been adequately assessed, as indicated above (appeal ground 2)), including from the coal mines associated with it and the Medupi and Matimba power stations, would likely further violate the NAAQS, and pose significant health risks.
93. In addition, mere compliance with the NAAQS does not preclude adverse health impacts. For example, the 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.⁷⁶ A study of the project's impacts on human health must go broader than merely assessing compliance with NAAQS.
94. Moreover, the health risk study does not analyse the full life-cycle of the health impacts of the project throughout the proposed plant's lifespan, even though each step in the coal life cycle generates pollution that can affect health, namely:
 - 94.1. mining: fugitive dust from excavation, loading and unloading, and stock piling contributes to harmful particulate emissions – mine haul roads being a massive contributor in South Africa⁷⁷ - and emissions from combustion in mines;
 - 94.2. transport: fuel emissions contribute to local air pollution;

⁷⁵ Health Risk Report, p. 64.

⁷⁶ 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.

⁷⁷ Approximately half of the particulate matter in the Highveld Priority Area is attributable to mine haul roads. See page x, <http://www.saaqis.org.za/documents/HIGHVELD%20PRIORITY%20AREA%20AQMP.pdf>.

94.3. coal combustion: air-borne pollutants include: PM, SO₂, NO_x, carbon dioxide, mercury, arsenic, chromium, nickel, other heavy metals, acid gases (HCL, HF), hydrocarbons (PAHs) and varying levels of uranium and thorium in fly ash; and

94.4. coal ash: pollutants in the fly ash are dispersed by wind and contaminate the air through ‘fugitive dust’ landfills that leak fly ash waste and contaminate water supplies.

95. The study also fails to consider relevant baseline health data from clinics in the surrounding communities or to assess the harmful impacts from other pollutants such as mercury or organochlorines, which would be emitted by the project. Only those from SO₂, PM, and NO_x are discussed.

96. Even assuming compliance with the NAAQS, the predicted incremental increases of pollutant levels — including those of pollutants omitted entirely from the health impact analysis — would cause quantifiable increases in adverse health effects. Section 39(a) of the AQA requires an understanding of the magnitude of these health effects, apart from their compliance with the NAAQS.

97. The First Respondent should not have granted a PAEL when the Second Respondent failed to provide an accurate, up-to-date, and comprehensive health risk study for consideration and comment. This is in flagrant disregard of the section 24 constitutional right to an environment not harmful to health or wellbeing.

Ground 5: the mitigation measures identified in the PAEL do not constitute the best practicable environmental option available as required by section 39(c) of the AQA

98. In considering an application for an AEL, section 39(c) requires a licensing authority to take into account whether the applicant has adopted “*the best practicable environmental options available . . . to prevent, control, abate or mitigate*” pollution from the proposed activity.⁷⁸

⁷⁸ S39(c) AQA.

99. The AIR underestimates the impact of the project and, the First Respondent failed to adequately consider and, as such, to require, in the PAEL, pollution abatement technology that will adequately mitigate and monitor emissions from the project.
100. Section 43(1) of AQA states that a PAEL must specify: “*operating requirements relating to atmospheric discharges, including non-point source or fugitive emissions*”; “*point source emission measurement and reporting requirements*”; “*on-site ambient air quality measurement and reporting requirements*”; and “*any other matters which are necessary for the protection or enforcement of air quality*”.⁷⁹
101. The PAEL, and the measures proposed in it, would not adequately monitor, prevent, control, abate or mitigate pollution from the proposed activity, in that, *inter alia*:
- 101.1. PM, SO₂ and NO_x emissions would not be adequately controlled;
- 101.2. The PAEL provides no support for the effectiveness of the proposed control measures;
- 101.3. the proposed subcritical boilers are outdated and not the best practicable environmental option; and
- 101.4. the monitoring requirements in the PAEL are inadequate.
102. The PAEL, and the First Respondent’s decision to issue it, therefore do not meet the requirements of AQA.

⁷⁹ S43(1)(h), (i), (j) and (m), AQA.

The PAEL does not accurately account for and control all PM, SO₂ and NO_x emissions associated with the project

103. The PAEL fails to account for the impact of PM emissions from transportation of coal and limestone to the Thabametsi power plant.⁸⁰ Given that completely covering the conveyors will not likely be possible due to safety and flammability concerns, the PAEL should have specified alternative measures to control emissions produced during transportation.⁸¹

104. In relation to SO₂, the actual removal rates are anticipated to be far lower (down to 50% or similar) in practice compared with the assumed 95%,⁸² yet this is not addressed in the PAEL.

105. Further, the alleged measures to abate and address NO_x in the AEL are inadequate and flawed – as addressed below.⁸³ It therefore cannot be assumed that NO_x emissions will be sufficiently abated.

The PAEL provides no support for the effectiveness of proposed control technology and operating conditions

106. The PAEL states that fabric filters will remove “*more than 99% of the particulates (or ash) . . . from the flue gas stream*” and have “*an availability of 100%*”.⁸⁴ Yet, the PAEL provides no bases for these assurances. Importantly, it does not identify any measures to prevent leakage from the fabric filters, a common issue with this type of control device.⁸⁵

107. Similarly, the PAEL provides no technical or engineering support to show that 95% of SO₂ emissions from the project will be absorbed by limestone or dolomite mixed in with the coal

⁸⁰ Sahu October 2019 Comments at B.i, p3.

⁸¹ Sahu October 2019 Comments at p.3 - 4.

⁸² Sahu October 2019 Comments at p.3 - 4.

⁸³ Sahu October 2019 Comments at p.4.

⁸⁴ PAEL at 6, Section 5.1; Sahu October 2019 Comments on the Provisional Atmospheric Emissions License (PAEL) Issued to Thabametsi Power Company (Pty) Ltd. At p3.

⁸⁵ Sahu October 2019 Comments at p.4.

in the fluidisation phase.⁸⁶ The CFB boiler units' ability to remove SO₂ depends on several factors including the "*level, type and form of sulfur in the coal, the reactivity of the limestone that will be used, the size distribution of the coal and limestone that will be used, and the residence times of the coal and limestone particles in the CFB.*"⁸⁷ Depending on the design aspects of the CFB boilers, the removal rate may actually be closer to 50%, as opposed to the stipulated 95%.⁸⁸ This level of variance and uncertainty renders the proposed mitigation measure in the PAEL unacceptable and inadequate.

108. In relation to NO_x abatement, the temperature at which coal combustion occurs will not eliminate NO_x emissions. The PAEL makes two contradictory statements about NO_x:

108.1. "*Coal combustion takes place in this suspended condition at a temperature of 760°C to 927°C to prevent the formation of nitrogen oxide (NO_x)*" (emphasis added),⁸⁹ and

108.2. "*NO_x is produced from thermal fixation of atmospheric nitrogen in the combustion flame and from oxidation of nitrogen bound in the coal. The quantity of NO_x produced is directly proportional to the temperature of the flame*" (emphasis added).⁹⁰

109. The PAEL thus initially claims that burning coal at 760°C to 927°C will **prevent** NO_x formation but then notes on the same page that thermal fixation of atmospheric nitrogen and oxidation of nitrogen bound in the coal will **produce** NO_x emissions.⁹¹ The latter is correct, in that even in these CFB boilers, NO_x will be produced by both thermal oxidation of nitrogen in the air used as the oxidant for coal, as well as from the nitrogen present in coal. It is, however, not correct that the "*quantity of NO_x produced is directly proportional*

⁸⁶ PAEL at 5, Section 5.1; Sahu October 2019 Comments at p.4.

⁸⁷ Sahu October 2019 Comments at p.4.

⁸⁸ Sahu October 2019 Comments at p.4.

⁸⁹ PAEL at 6.

⁹⁰ PAEL at 6.

⁹¹ Sahu October 2019 Comments at p.4.

to the temperature of the flame”.⁹² NOx formation increases much faster – at an exponential rate – as the temperature increases.⁹³

110. More effective and preferred control technology in this instance would be (Selective Non-Catalytic Reduction (SNCR)) for the abatement of NOx associated with the project.⁹⁴ Yet, this has not been put forward as a requirement in the PAEL.

Subcritical CFB Boilers are an outdated technology

111. The reasons justifying the issuance of the PAEL state:

“1.2. Pollution Prevention Measures: Best Practicable Environmental Option The applicant proposes to utilize a modern technology in form of Circulating Fluidized Bed (CBD) boiler units....The technology is said to have the ability to achieve lower emission of pollutants...”

112. This is not correct. CFB boilers are not new technology as claimed in the reasons. CFB boilers were first used in the United States well over 40 years ago.⁹⁵ There are now supercritical forms of these CFB boilers, which are much more thermally efficient than the sub-critical CFB units proposed at Thabametsi.⁹⁶ These supercritical boilers can generate electricity using less coal, thereby producing fewer pollutants for the same quantity of electricity generated.⁹⁷

113. Given the availability and demonstrated effectiveness of supercritical CFB boilers, it cannot be said that Thabametsi proposes utilising “*the best practicable environmental options available . . . to prevent, control, abate or mitigate*” pollution from the proposed activity. On this basis alone, the requirement of section 39(c) has not been met.

⁹² PAEL at 6.

⁹³ Sahu October 2019 Comments at p.4.

⁹⁴ *Id.*

⁹⁵ Sahu October 2019 Comments at p.5.

⁹⁶ *Id.*

⁹⁷ *Id.*

Monitoring requirements in the PAEL are inadequate

114. The requirements for monitoring of the actual pollutant emissions from the CFB boilers are grossly inadequate. Section 7.4 of the PAEL shows the following (for the first boiler, the others being identical):

7.4. Point source – emission monitoring and reporting requirements

Point Source Code	Activity	Polluted	Emission Sampling / Monitoring Method	Sampling Frequency	Sampling Duration	Parameters to be Measured	Parameters to be Reported	Reporting Frequency
EU001	SA0101	PM	As per NEM:AQA Schedule A (31 October 2018)	daily	As per selected method	PM	PM	Quarterly
	SA0101	SO ₂	As per NEM:AQA Schedule A (31 October 2018)	daily	As per selected method	SO ₂	SO ₂	Quarterly
	SA0101	NO _x	As per NEM:AQA Schedule A (31 October 2018)	daily	As per selected method	NO _x	NO _x	Quarterly

115. Continuous Emissions Monitors (**CEMs**) should be required for each of the three pollutants and for exhaust flow. CEMs are used extensively in coal-fired power plants throughout the world, including in South Africa (at least for SO₂ and NO_x).⁹⁸ Yet, there is no mention of CEMs in condition 7.4 above.

116. The “daily” sampling frequency makes no sense because emissions from the plant can and will vary considerably on much shorter time-scales – making daily snap-shot measurements meaningless.⁹⁹ CEMs typically measure emissions on a minute-by-minute basis and report hourly average concentration or hourly mass emissions. This is best practice.

117. Thabametsi should be required to use CEMs to ensure PM, SO₂, and NO_x emissions do not exceed acceptable levels.

118. In summary, the PAEL conditions for monitoring and mitigation are inadequate and the First Respondent violated section 39(c) of AQA by approving the PAEL when the proposed control technology, operating conditions, and monitoring requirements do not constitute the best practicable environmental option available for mitigating emissions.

⁹⁸ Sahu October 2019 comments, p.7.

⁹⁹ Ibid.

Ground 6: the Second Respondent is not a fit and proper person in terms of section 49 of AQA

119. In considering an application for an AEL, a licensing authority must consider “*whether the applicant is a fit and proper person as contemplated in section 49.*”¹⁰⁰
120. Section 49 notes that the licensing authority “*must take into account all relevant facts*” in conducting this inquiry.¹⁰¹
121. Japanese company Marubeni – the 100% shareholder in Axia Power Holdings B.V, which owns 24.5% shares in Thabametsi Power Company (Pty) Ltd – has previously been fined USD 88 million for bribes to officials and politicians. In 2014, Marubeni entered into a plea of guilty for its participation in the scheme to pay bribes to high-ranking government officials in Indonesia to secure a lucrative power project.¹⁰²
122. The “responsible person” cited in the AIR is the Vice President of Marubeni. The same individual, Kazuaki Shibuya, of Marubeni, is designated as the responsible officer in the PAEL. It is submitted that Marubeni’s criminal conviction is a relevant fact in terms of section 49 of the AQA and heavily weighed against approval of the PAEL, especially when Marubeni would be fully responsible for the operation and maintenance of the project. At the very least, the First Respondent should have addressed this objection in its reasons document.
123. The First Respondent should not have granted the PAEL when the “responsible person” listed in the revised AIR, and now in the PAEL, is not a fit and proper person under the AQA.

¹⁰⁰ Section 39(f) AQA.

¹⁰¹ Section 49 AQA.

¹⁰² See <https://www.justice.gov/opa/pr/marubeni-corporation-agrees-plead-guilty-foreign-bribery-charges-and-pay-88-million-fine>.

Ground 7: the First Respondent’s decision to grant the PAEL is not consistent with AQA; NEMA; or the Constitution

124. Section 40 of AQA states that “[a]ny decision by a licensing authority to grant an application **must be consistent** with — ... [AQA] and any other applicable national or provincial legislation; ... the national environmental management principles set out in section 2 of the National Environmental Management Act” (emphasis added).¹⁰³

125. As shown above, under the preceding grounds of appeal, the First Respondent’s decision to issue the PAEL contravenes AQA in many respects. As such, section 40 of AQA is also contravened.

126. Furthermore, granting the PAEL despite significant health and air quality impacts, contravenes the constitutional right to a healthy environment and the environmental management principles under section 2 of NEMA.

127. Section 24 of the Constitution provides that:

“Everyone has the right—

- (a) To an environment that is not harmful to their health or well-being; and*
- (b) To have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that—*
 - (i) Prevent pollution and ecological degradation;*
 - (ii) Promote conservation; and*
 - (iii) Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.”*

128. The provisions of NEMA give effect to section 24 of the Constitution.

128.1. Section 2 of NEMA sets out the environmental management principles that must “serve as guidelines by reference to which any organ of state must exercise any

¹⁰³ S40(2)(a) and (d), AQA.

function when taking any decision in terms of [NEMA] or any statutory provision concerning the protection of the environment” and must “guide the interpretation, administration and implementation of [NEMA], and any other law concerned with the protection or management of the environment.”

128.2. Section 2(2) of NEMA stipulates that *“environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably.”*

128.3. Section 2(3) of NEMA requires that development be socially, environmentally and economically sustainable.

128.4. Section 2(4)(a) of NEMA provides that:

“sustainable development requires the consideration of all relevant factors including, but not limited to, the following: ...

(vii) that a risk averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions; and

(viii) that negative impacts on the environment and on people’s environmental rights be anticipated and prevented, and where they cannot altogether be prevented, are minimised and remedied.”

128.5. Section 2(4)(b) of NEMA requires as follows: *“environmental management must be integrated, acknowledging that all elements of the environment are linked and interrelated, and it must take into account the effects of decisions on all aspects of the environment and all people in the environment by pursuing the selection of the best practicable environmental option”*. The best practicable environmental option is that *“option that provides the most benefit or causes the least damage to the environment as a whole, at a cost acceptable to society, in the long term as well as in the short term.”*¹⁰⁴

¹⁰⁴ <http://blueandgreentomorrow.com/2015/03/17/un-backing-fossil-fuel-divestment-campaign>.

128.6. Section 2(4)(c) states that “[e]nvironmental justice must be pursued so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons”.

128.7. Section 2(4)(p) of NEMA provides that “the cost of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects must be paid by those responsible for harming the environment.”

129. For the reasons stated above, air emissions from the proposed Thabametsi power station and associated coal mines would significantly threaten the fundamental rights of communities in the area and would not be consistent with the NEMA section 2 environmental management principles.

130. In relation to the principle of environmental justice (section 2(4)(c)), the project would:

130.1. exacerbate air pollution and contribute to further non-compliance with NAAQS in a designated priority area. Importantly, the competent authority cannot rely on the project’s AIR to determine potential violations of the NAAQS because, for the many reasons discussed above, it is deficient and consequently likely underestimates the actual pollution from the power plant and its associated infrastructure and supply mines (see discussion in paragraphs 43 to 69); and

130.2. disproportionately negatively affect communities living in the vicinity, as a result of, *inter alia*, anticipated harmful atmospheric emissions of pollutants such as PM, including dust, SO₂, NO_x, and mercury.

- 130.2.1. A report prepared by Dr. Michael Holland in 2017 found that 2 239 deaths annually were attributable to health impacts from coal-fired generation in South Africa, specifically as a result of lung cancer, ischaemic heart disease, chronic obstructive pulmonary disease, stroke, and lower respiratory infection.¹⁰⁵
- 130.2.2. There is ample evidence that exposure to fine PM (PM_{2.5}) over many years can increase risk of developing, and dying from, cardiovascular disease. Short-term exposure can lead to heart attacks, ischemic stroke, and abnormal heart rhythms.¹⁰⁶
- 130.2.3. SO₂ emissions from coal power plants increase the incidence and severity of respiratory symptoms of those living in the surrounding area, particularly in asthmatic children. Inhaling these emissions causes airway inflammation and hyper-responsiveness, aggravated bronchitis, and decreased lung function in vulnerable adults and children.¹⁰⁷
- 130.2.4. High levels of NO₂ may contribute to the development of asthma and increase susceptibility to respiratory infections. Asthmatic individuals, as well as children and the elderly are particularly sensitive to the health effects of NO₂. Moreover, NO₂ reacts with other chemicals in the air to form other pollutants like particulate matter and ozone, which also have harmful impacts on the respiratory system.¹⁰⁸

¹⁰⁵ Mike Holland 2013, "Health impacts of coal fired power plants in South Africa" at page 15, available at <https://lifeaftercoal.org.za/wp-content/uploads/2017/04/Annexure-A4.pdf>.

¹⁰⁶ "Healthy Heart Toolkit: Resources for Health Professionals", available at <https://www.epa.gov/air-research/healthy-heart-toolkit-resources-health-professionals>.

¹⁰⁷ US EPA 2017. Integrated Science Assessment For Sulfur Oxides – Health Criteria, available at https://ofmpub.epa.gov/eims/eimscomm.getfile?p_download_id=533653.

¹⁰⁸ "Basic Information about NO₂", available at <https://www.epa.gov/no2-pollution/basic-information-about-no2>.

130.2.5. According to the United Nations, coal-fired power plants are responsible for 26 percent of global mercury emissions.¹⁰⁹ When deposited in waterways, mercury from these plants is converted to methyl-mercury, which makes its way through the aquatic food chain.¹¹⁰ Methyl-mercury-contaminated fish, if consumed by pregnant women, can lead to developmental effects on their offspring, such as delayed neurodevelopment, as well as subtle changes in vision, memory, and language.¹¹¹

131. The First Respondent has failed to apply the risk averse and cautious approach (the so-called 'precautionary principle') demanded by section 2 of NEMA, in that the First Respondent granted the PAEL without comprehensive health and air quality impact assessments – both of which are clearly required to be assessed under the AQA (see discussion in paragraphs 70 to 97 above). This means that the PAEL was granted without, *inter alia*, adequate information about the full implications of the project for health and air quality.

132. Coal-fired power stations, including those using sub-critical boiler technology like Thabametsi, are particularly polluting and fall far short of being the best practicable environmental option as required under section 2(4)(b) of NEMA, especially when their health and air quality impacts are considered.

133. As stated above, coal-fired power stations impact significantly upon the health of those living in close proximity to them – and this comes at significant cost. The Holland report referred to above, quantifies the costs of the health effects of air pollution from coal-fired power stations at \$2.37 billion annually. A recent study in the EU considered lost IQ costs due to mercury exposure. The IQ benefits from controlling mercury pollution were translated

¹⁰⁹ Pacyna, J. et al. 2010. *Study On Mercury Sources and Emissions and Analysis of Cost and Effectiveness of Control Measures: UNEP Paragraph 29 Study*. United Nations Environment Programme.

¹¹⁰ Lippmann, M. et al. 2003. *Environmental Health Science: Recognition, Evaluation, and Control of Chemical and Physical Health Hazards*. New York, Oxford University Press.

¹¹¹ World Health Organization 2007. *Exposure to Mercury: A Major Public Health Concern*. Public Health and Environment.

into economic impacts based on the calculated current life-time income benefits from a higher IQ level. The report states that there is little doubt that global benefits substantially exceed USD 20 billion.¹¹² The total annual benefits of exposure prevention within the EU were estimated at more than 600 000 IQ points per year, corresponding to a monetary economic benefit.¹¹³ Contrary to section 2(4)(p) of NEMA, the additional cost burdens of these health impacts are borne by those affected, and ultimately, the state,¹¹⁴ instead of falling on “*those responsible for harming the environment*”, in this instance, Thabametsi.

Ground 8: the First Respondent’s granting of the PAEL is in contravention of PAJA

134. Section 33 of the Constitution recognises that everyone has the right to administrative action that is lawful, reasonable and procedurally fair. PAJA seeks to give effect to this right.

135. The First Respondent’s decision to issue the PAEL for the project constitutes administrative action.

136. Section 6(2) of PAJA provides that a court or tribunal has the power to judicially review administrative action if, *inter alia*:

136.1. irrelevant considerations were taken into account or relevant considerations were not considered;

136.2. the action itself contravenes a law or is not authorised by an empowering provision;

¹¹² Bellanger, M et al. 2013, “Economic benefits of methylmercury exposure control in Europe: Monetary value of neurotoxicity prevention” *Environ Health*. 2013; 12:3. available at: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3599906/>.

¹¹³ <http://ec.europa.eu/environment/integration/research/newsalert/pdf/321na5.pdf>.

¹¹⁴ See 79 Bellanger, M et al. 2013, “Economic benefits of methylmercury exposure control in Europe: Monetary value of neurotoxicity prevention” *Environ Health*. 2013; 12:3. available at: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3599906>.

- 136.3. the action itself is not rationally connected to the information before the administrator;
and
- 136.4. the exercise of the power or the performance of the function authorised by the empowering provision, in pursuance of which administrative action was purportedly taken, is so unreasonable that no reasonable person could have so exercised the power or performed the function.

*Irrelevant considerations were taken into account or relevant considerations were not considered*¹¹⁵

137. As already mentioned, it is submitted that the First Respondent failed to taken into account a number of relevant considerations such as:

- 137.1. the cumulative impacts of the project and other developments in the region;
- 137.2. the air quality impacts of the project; and
- 137.3. the health impacts of the project.

*The action itself contravenes a law or is not authorised by an empowering provision*¹¹⁶

138. As already demonstrated above, the decision to issue the PAEL is in direct contravention of a number of provisions of AQA, as well as section 24 of the Constitution, and NEMA.

*The action itself is not rationally connected to the information before the administrator*¹¹⁷

139. The AIR indicates that emissions from the project will result in exceedances of the NAAQS.

¹¹⁵ Section 6(2)(e)(iii) PAJA.

¹¹⁶ Section 6(2)(f)(i) PAJA.

¹¹⁷ Section 6(2)(f)(ii)(bb) PAJA.

140. Furthermore, the reasons provided by the First Respondent show little or no attempt by the First Respondent to engage with the AQA section 39 considerations; the material issues that should have been apparent from the AEL application; or the concerns placed before her by the Appellants in the AEL comments.

141. In granting the PAEL, the First Respondent demonstrates that she failed to give adequate consideration to the above information, as well as other relevant considerations, in the revised AIR. As a result, this decision is not rationally connected to the information that was before the First Respondent.

The exercise of the power or the performance of the function authorised by the empowering provision, in pursuance of which administrative action was purportedly taken, is so unreasonable that no reasonable person could have so exercised the power or performed the function¹¹⁸

142. In the circumstances, it is submitted that the decision to issue the PAEL is unreasonable for the reasons stated in the grounds above, including that it:

142.1. fails to recognise cumulative impacts on air quality from the project and neighbouring developments;

142.2. fails to assess and take into account health impacts from increased pollutant levels;

142.3. fails to apply the principles and provisions of NEMA and to give recognition to the duty to uphold the constitutional right to an environment not harmful to health or well-being;¹¹⁹ and

142.4. authorises emissions from the project despite acknowledging that they will lead to exceedances of the NAAQS.

¹¹⁸ Section 6(2)(h) PAJA.

¹¹⁹ Section 24 of the Constitution of the Republic of South Africa 108 of 1996.

CONCLUSION

143. The First Respondent's decision to grant the PAEL for the project is unlawful, in that it:

143.1. fails to comply with AQA, the Modelling Regulations and the 2017 National Framework;

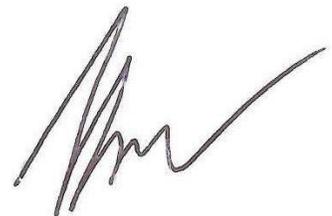
143.2. is inconsistent with NEMA, in particular the section 2 principles;

143.3. constitutes unlawful and unfair administrative action under PAJA; and

143.4. fails to give effect to the constitutional environmental right, along with other fundamental rights enshrined in the Bill of Rights.

144. The conditions attached to the First Respondent's decision to grant the PAEL are insufficient to prevent harmful air pollution.

145. For all of these reasons, the Appellants submit that the appeal should succeed and that the PAEL granted to Thabametsi by the First Respondent should be set aside.



CENTRE FOR ENVIRONMENTAL RIGHTS

Attorneys for the Appellants

Per: Nicole Loser