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12949-83-Let-006-WML Variation Notification
Our ref: CER12.5/RH/MK

Date: 19 April 2018

Dear Sirs

**COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT REPORT AND WASTE MANAGEMENT LICENCE VARIATION APPLICATION FOR THE PROPOSED RETROFITTING OF A FLUE GAS DESULPHURISATION SYSTEM AT MEDUPI POWER STATION, LEPHALALE, LIMPOPO PROVINCE**

1. We act for groundWork and Earthlife Africa (ELA) ("our clients"). Our clients are interested and affected parties (I&APs) in Eskom's integrated environmental authorisation process for the Medupi Power Station Flue Gas Desulphurisation (FGD) Retrofit Project ("the FGD Retrofit Project").

2. In this document, our clients submit their comments on the Draft Environmental Impact Report (DEIR) as well as on the Application for Variation on the Waste Management Licence ("the WML Variation Application") for the proposed retrofit project. As per the stakeholder notification letter issued on 19 February 2018, the deadline for public comment was Thursday 5 April 2018. On behalf of our clients, CER submitted a formal request for an extension on 4 April 2018, with reasons. In response, Zitholele Consulting (Pty) Ltd. granted the extension to 19 April 2018, in an email dated 5 April 2018.

3. Our clients have submitted comments in several earlier phases of this consultation process, including:

   3.1. comments on the Draft Scoping Report (DSR), dated 12 December 2014;
   3.2. comments on the Final Scoping Report (FSR), dated 13 July 2015; and
   3.3. comments on the first Medupi FGD Retrofit Environmental Impact Assessment (EIA) Bridging Document Report, dated 31 October 2016.

4. As you are no doubt aware, environmental authorisations have to give effect to the general objectives of the environmental management objectives.[1] These general objectives include, among others: the integration of

[1] Section 24 (1) of NEMA

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National Environmental Management Act, 1998 (NEMA) section 2 principles in all decision-making, and to "***identify actual and potential impacts on the environment****, socio-economic conditions and cultural heritage, the risks and consequences and alternatives and options for mitigation of activities* ***with a view to minimising negative impacts, maximising benefits and promoting compliance*** *with the principles of environmental management* ***set out in section 2***"; "*to ensure that the* ***effects of activities on the environment receive adequate consideration before actions are taken in connection with them***" (emphasis added); and "*ensure adequate and appropriate opportunity for public participation*".[2] Furthermore "*authorisations obtained under any other law for an activity listed or specified in terms of this Act does not absolve the applicant from obtaining authorisation under [NEMA] unless authorisation has been granted in the manner contemplated in section 24L*" (section 24L deals with integrated environmental authorisations).[3]

5. In other words, the applicant cannot defer important considerations relevant to the EIA in a piecemeal fashion, irrespective of whether other legal provisions apply. The applicant is still bound, by the provisions of NEMA, to consider all effects of activities before actions are taken. Instead, the applicant proposes, through the bridging documents, to exclude the most important aspects of FGD project from the EIA process, until a later stage.

6. Despite certain challenges with FGD, it is currently the most effective abatement technology available for sulphur dioxide ($SO_2$), and the positive impacts of FGD far outweigh its challenges. In any event, it is essential for Eskom to retrofit FGD in order to meet the new plant sulphur dioxide ($SO_2$) minimum emission standards (MES), and to comply with the terms of its loan agreement with the World Bank. However, Eskom has continually resisted retrofitting FGD on any of its plants – except Medupi - through applications to postpone compliance with the MES. Numerous such applications apparently to follow, as Eskom attempts never to comply with the new plant $SO_2$ MES set in terms of the section 21 of the National Environmental Management: Air Quality Act, 2004 (AQA), apart from at Medupi (eventually) and at Kusile.[4]

7. Some of the primary concerns associated with FGD in general are: the availability of water and limestone necessary for the project; using the least resource-intensive technologies; the minimisation of waste streams and by-products, such as gypsum, coal ash/ash disposal facility (ADF), salts and sludge; and the transport associated with the aforementioned products, amongst others. Since these concerns were outlined in the initial DSR many years ago, adequate measures should have been identified and taken by the applicant to address these issues.

8. Throughout the process, however, the applicant has not produced the necessary documentation to address these primary concerns, and now seeks to address most of these issues through other channels[5] at a later stage, such as through Water Use Licence Applications (WULAs), Waste Management Licence (WML) Applications, under "gaps in knowledge", through a registration process in terms of Norms and Standards for the Storage of Waste, or other means. For instance, currently: limestone, and, in particular, high purity limestone, is not secured;[6] water for the full project is yet to be secured; the market availability of gypsum has not been established; the ADF site is now in a 1/100 year floodline area;[7] and, in the event, that various waste need to be disposed of, the disposal is only catered for 5 years in respect of Salt and Sludge waste;[8] and 20 years in respect of the ADF. This is despite the fact that the lifespan of the project is 50 years. Management of wastewater and effluent runoff from Pollution Control Dams (PCD) will apparently be further dealt with in WULA.[9] As indicated above, the purpose of EIA is for the decision-maker to be able to consider the full implication of the project **before actions are taken. This piecemeal approach to the EIA process is contrary to the requirements of our legislation.**

[2] Section 2, section 23(2)(a), (b), (c) and (e) of NEMA.
[3] Section 24(8)(a)
[4] Kusile has FGD integrated into its design, as we have, on numerous occasions, recommended be done for as many Medupi units as possible.
[5] DEIR, pgs 17-21.
[6] DEIR, pg 57.
[7] DEIR, pg 140
[8] DEIR, pg 66.
[9] DEIR pgs 19-20.

9. The environmental assessment practitioner (EAP) recommends that this environmental authorisation (EA) will be subject to the implementation of mitigation measures in the environmental management programme (EMPr) and DEIR, that construction must commence within 5 years, and Eskom must continue to investigate water-saving measures and waste reduction relating to ash and gypsum. Whilst this is welcomed, these conditions can be used to further delay implementation of the FGD project, delay or defer unsolved waste and water issues, and at the same time allow for unabated $SO_2$ to continue, which is contrary to section 24 of the Constitution, the AQA and the MES, and NEMA (including the section 2 NEMA Principles). As stated in the DEIR "*one of the most significant air quality impacts of coal fired electricity generation is the emission of SO2 to the atmosphere. SO2 reacts with other compounds in the environment to form particles that are a risk to human health. These small particles penetrate the tissue of the lungs and can cause emphysema and bronchitis and can aggravate existing heart disease. Evidence has been documented of a connection between short term SO2 exposure and adverse respiratory symptoms including bronchoconstriction and aggravated asthma.*"[10] "*SO2 contributes to the formation of acid rain which damages the forests, crops buildings, fences and acidifies lakes, streams and rivers, making them unsuitable for aquatic life*."[11]

10. The FGD retrofit project has already been significantly delayed, and the impact of this delay is that Medupi continues to operate with unabated $SO_2$ emissions to the detriment of air quality in the area and to the continued detriment to the health of the impacted communities. In the circumstances, **until such time as a complete assessment of its impacts is undertaken, and the FGD project is finalised and ready to commence, Eskom should halt the construction of the last 3 units**.

11. The following comments address specific aspects of the FGD Retrofit Project. However, at the outset, we emphasise the following comments, which remain unaddressed by Eskom, despite being raised before:

    11.1. Our clients maintain that the FGD Retrofit Project is mandatory for the operation of Medupi. It is required for compliance with the new plant MES for $SO_2$, and for ensuring an environment that is not harmful to residents' health and well-being in terms of section 24 of the Constitution. In addition, Eskom is likely to apply again for postponement of the 2020 $SO_2$ MES since according to the DEIR, Eskom can only comply with the new plant standards in 2030. Furthermore, Eskom has re-applied for the previously-rejected postponement of the 2015 MES; which we, as members of the Life After Coal Campaign,[12] have wholly and unequivocally objected to.[13]

    11.2. The EA process for the FGD Retrofit Project has been substantially delayed, as evidenced by the Bridging Reports, and the current plans are for Medupi only to be fully fitted with FGD by 2026 (with each unit retrofitted 6 years after it becomes operational). It furthermore aims to comply with the 2020 MES standards only by 2030. **As we have consistently maintained, FGD should have been included in Medupi's initial design plan and at least, once construction started, integrated into as many units as possible (rather than retrofitting it 6 years after each becomes operational).** We also highlight that the FGD Retrofit Project for Medupi was a financing condition from Eskom's loan agreement with the World Bank. This agreement envisaged that **all FGD units would be installed and fully operational by 31 December 2021**.

    11.3. The following documentation or information must be required in the EIA process to adequately address the FGD primary concerns, including: co-commissioning (integrating FGD into the design of the 3 remaining units) study; FGD Commissioning Schedule Study; Water Minimisation Study; Gypsum Market Investigation

[10] DEIR, pg 11.
[11] DEIR, pg 6.
[12] Life After Coal (LAC) is a joint campaign that aims to discourage investment in new coal-fired power stations and mines, to accelerate the retirement of South Africa's existing coal infrastructure, and to encourage and enable a just transition to renewable energy systems for the people.
[13] See the submissions on the Background Information Document at https://cer.org.za/wp-content/uploads/2016/07/170224-Life-After-Coal-Campaign-submissions.pdf

and Ash Market Investigation to minimise waste; and transport impacts (from waste or materials required for FGD). Such documentation should be made available to stakeholders as soon as a comment process begins in any part of EIA process.

11.4. A **flue gas cooler should be incorporated into the base case FGD design** instead of a design alternative.

11.5. The FGD system should be operated and maintained as an essential part of each power generation unit, and a **bypass should not be included**.

11.6. Waste streams should be separated at the outset with separate on-site facilities for each waste stream. Socially-responsible market availability investigations (including level of toxicity of each waste stream) should be conducted for each waste stream, before any decisions in relation to waste management and use can be made. Co-disposal of ash, gypsum, salts and sludge in the ADF, as well as transportation of waste for disposal should be avoided.

12. Whilst the abovementioned comments were already included at the DSR stage in 2014, most of these recommendations were disregarded without an adequate justification or explanation, and for this reason the same comments are reiterated in relation to the DEIR.

13. In light of the above introductory statements, we address the following specific issues in this submission:

13.1. FGD technology selection and use of a flue gas cooler in the wet FGD process
13.2. Water supply for operation of the FGD Retrofit Project
13.3. Waste Management and resale of by-products
13.4. Impact of the plant's operation on the surrounding water systems
13.5. Delay in implementation of the FGD and the need for co-commissioning of FGD
13.6. Objection to a separate WML variation process

**FGD technology selection and use of a flue gas cooler in the wet FGD process**

14. The Medupi FGD Technology Selection Study Report referenced in the DSR and submitted with the FSR, dated 14 May 2014 ("the 2014 TSSR"), recommended that "*Eskom construct WFGD [wet FGD] systems*."[14] This study also evaluated two methods for installing an inlet gas cooler to reduce water consumption in the absorber, by up to 29%, namely a "regenerative heat exchanger" and *"a single pass cooler for the flue gas* [which] *will limit the pressure drop to within the capability of the existing plant ID fan.*", the latter being the preferable option.

15. It was noted in the 2014 TSSR that this method of achieving inlet gas cooling would, for the six units at Medupi, achieve a "***total reduction in the process water to the FGD is approximately 29 percent of the water required by the WFGD system without a cooler***"[15] (our emphasis).

16. In addition to the total reduction of 29% water consumption, the TSSR report indicated that "*the inclusion of a flue gas cooler results in very minor FGD process changes and* ***no significant change in the size or type of FGD process equipment required***" [16] (our emphasis).

17. The 2014 TSSR also estimated the capital, operating, and total levelised annual cost for three options – WFGD (Option 1), WFGD+Gas Cooler (Option 2), and Dry FGD (Option 3)[17] - and found that "***the additional capital cost***

[14] TSSR 2014, pg 19.
[15] TSSR 2014, pg 10.
[16] TSSR 2014, pg 11.
[17] TSSR 2014, Tables 2 and 4.

***for the WFGD with Inlet Gas Cooling option is generally offset by the reduced operating cost associated with the lower water consumption rate****, such that there is no significant difference in total life-cycle costs. These* ***two alternatives are considered equal on an overall technical and economic basis***"[18] (our emphasis).

18. Whilst the report did not specifically recommend the inclusion of the inlet gas cooler, the 2014 TSSR noted that "*the reduced water consumption provides significant savings in this critical resource and is the reason for inclusion of this modification in this phase of the technology assessment.*" [19]

19. The EIA Clean Coal Centre Report concluded that the use of a cooler at the inlet to the wet scrubber is common practice in Europe and Japan, and mentioned that "*the evaporative water losses can be reduced by some 40–50% when the flue gas is cooled before it enters the wet scrubber, a common practice in Europe and Japan.*"[20]

20. It should be borne in mind that, there were various "process area arrangement drawings", and datasheets attached to the 2014 TSSR report, to which the public had no access. This is unacceptable - these should be made available immediately for comment. In any event, having considered these process area arrangement drawings, as well as other considerations outlined above, the 2014 TSSR does not report any **impediments or caveats in regard to achieving the estimated operating and maintenance costs of the WFGD + cooler option - i.e. using the water cooled inlet gas cooler - and gives no indication that there is limited space on the premises for the inlet gas cooler equipment, its operation, or maintenance**.

21. In the previous DSR and FSR submissions, therefore, our clients have strongly argued that **given the approximately 30% decrease in water consumption, as well as the added advantage of relative cost neutrality, that the flue gas cooler must be included**. However, Eskom has stated in the DEIR and the accompanying 2018 TSSR, that such cooler is not feasible, without providing adequate and rational reasons for this decision.

22. In terms of the assessment of technology alternatives, the DEIR states the following:

> *"The Scoping Report concluded that the selection of the wet FGD technology was undertaken prior to this EIA and technology alternatives and is therefore the preferred SO2 reduction technology.*
>
> *Although water from the MCWAP scheme has been allocated to the Medupi FGD project, Eskom proposed to investigate further water savings, most notably the edition of inlet gas cooler Technology. The use of inlet gas cooler Technology is dependent on whether it will be feasible for implementation based on an acceptable cost-benefit analysis. Eskom commissioned a cost benefit analysis of the Wet FGD, Dry FGD – Circulating Fluidized Bed (CFB) technology, and Wet FGD with flue gas cooling technology. This report was finalised on 9 January 2018 and is included as Appendix C-1 to this DEIR."*[21]

23. Specifically related to the inlet gas cooler technology, the DEIR appears, on the basis of the 2018 TSSR, to reject the inlet gas cooler for a number of reasons. However, in looking at the DEIR, together with the updated 2018 Technology Selection Study Report ("the 2018 TSSR"), it appears that the concerns outlined therein appear to contradict the 2014 TSSR, and/or the findings are unsubstantiated. Even if they were substantiated, this cannot and should not give rise to the conclusion that "For these reasons the WFGD with flue gas cooling is therefore not considered to be a feasible option at Medupi".[22] The claimed concerns related to the inlet gas cooler technology, as well as the reason for rejecting each of the concerns will be discussed:

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[18] TSSR 2014, pgs 19-20.
[19] TSSR, pg 10.
[20] Carpenter, AM, 2012, Low Water FGD Technologies. EIA Clean Coal Centre https://www.usea.org/sites/default/files/112012_Low%20water%20FGD%20technologies_ccc210.pdf.
[21] DEIR, pgs 70-71.
[22] DEIR, pg 73

*Claims as to lack of feasibility in the implementation*

23.1. Eskom reportedly visited five power plants overseas using a gas cooler (three in Europe and two in China) as part of the process of evaluating the inlet gas cooler technology.[23] Apparently, "*all three power stations in Europe experienced significant challenges with operation and maintenance of the gas cooler infrastructure, to the extent that all three power stations from Europe visited by Eskom during a benchmarking exercise advised against the installation of the system due to the problematic operation that it provides. WFGD with flue gas cooling is therefore not considered as a feasible option for Medupi*."

23.2. This visit report gives some specific details of the operational and maintenance experience of three European plants which are fitted with inlet absorber coolers, located downstream (after) the particulate filters, as well as two Chinese plants - which are apparently both relatively-recent installations with coolers installed upstream (before) the particulate filter. These visits have, it is indicated, given rise to the conclusion that the inlet gas cooler technology should be discarded.

23.3. Whilst some details were provided for the three European plants, virtually no details were provided for the Chinese plants. Further, vital details pertaining to: how these plants were chosen, their respective commissioning dates, their sizes (unit capacities), how the problems were resolved, including a comparison of the inlet cooler gas technologies in comparison to the Medupi proposed technology, among others, is not detailed. More specific details pertaining to the photographs should be given, such as: whether the photographs are from the same plant; and whether they reflect current experience or an historical record. I&APs should also be advised whether the European plants recommend that Eskom does not install the inlet gas cooler, and explanations should be provided as to why the European plants have not abandoned (bypassed) their systems on the basis of their operational and maintenance experiences. In respect of the Chinese plants, given that these account for two of the five plants included in the benchmarking assessment, particularly, the more recent installations, this appears to be a critical omission in the comparative assessment. On behalf of our clients, we request a copy of the full site visit reports and outcomes for the China-based plants, for consideration. At the very least, stakeholders should be provided with the same level of detail that is presented on the three plants located in Europe i.e. visuals and "advice" received from operators in China.[24]

23.4. In the circumstances, the full site visit report from the respective plants (particularly in relation to the Chinese plants) should be provided to verify the information provided in the DEIR and 2018 TSSR. This should contain sufficient details such as: methodologies for the selection of the five plants; the respective commissioning dates; the full specification of each of the plants; dates, and nature of the problem experienced, as well as how it was resolved, amongst others, should be made available. Independent data from the 5 respective plants should also be provided to support these assertions.

*Claims as to lack of space on the premises for inlet gas cooler*

23.5. Eskom appears to argue that there is a lack of space for the proper maintenance of an inlet gas cooler.[25]

23.6. However, the argument of a lack of space appears to be somewhat speculative. "*Although the real estate may be found to install the cooler itself,* ***space is conceptually not available*** *to install all the maintenance provisions that is required to service the plant appropriately*"[26] (emphasis added). It would appear that Eskom has not done a detailed engineering study of the design and layout of the inlet gas cooler to establish whether or not a layout with adequate maintenance provisions is possible. We recommend that such a detailed study be done to provide a properly-informed basis for evaluating the inlet gas cooler option.

[23] DEIR, pg 72.
[24] See page 20 of the DEIR – "*All three power stations in Europe advised against the installation of the system due to the problematic operation that it provides*."
[25] DEIR, pg72.
[26] TSSR 2018, pg25.

23.7. The availability of space was also not listed as an impediment in the 2014 TSSR, having considered the same process area arrangement drawings as the 2018 TSSR. No explanation is given for this.

*Claims as to increased cost and construction difficulties due to the material selection and weight of the cooler*:

23.8. The 2018 TSSR states that "*elements such as the cooler's weight contributes to the overall cost and considerations such as deep piling for founding conditions which may require blasting at Medupi on an already generating unit*."[27] Again, positing possible construction difficulties such as the need for blasting on an "already generating unit" is speculative. The nature and extent of possible construction difficulties should be established through a detailed engineering study. In any case, we point out that, if Eskom had co-constructed the FGD together with the main boiler units, no such construction difficulties would have arisen. It is reasonable to assume that the additional cost of the cooler has been included in the TSSR cost estimate.

23.9. As mentioned previously, in the 2014 TSSR, when calculating the overall costs between the WFGD and WFGD with inlet gas cooler, the Levelised Annual Costs (LAC), which account for capital, operational and financing costs, were found to be relatively equal. Based on the 2018 TSSR comparative cost estimates, the capital cost of the installed cooler is marginally higher (by R440 000 or 2.5%) than that of the WFGD without the cooler, but the recurring annual operating costs are lower (by R42 000 or 3.5%).[28] On this basis, the LACs for the two options (FGD with and without the cooler) may similarly be expected to be negligible. The possible need for additional engineering work has been identified, but this has yet to be confirmed. In either case, whether additional engineering work is required or not, our clients submit that this cannot be used, in isolation, as the basis for rejecting the cooler option.

*Claims as to increased $CO_2$ emissions*:

23.10. The DEIR and 2018 TSSR states that "*installation of the flue gas cooler will also reduce the power output of the unit due to increased pressure drop and pumping for water recirculation. This will increase the relative CO2 per megawatt sent out from the generating unit, which is contradicting to the objective of the FGD plant*."[29] Whilst this is true, the need for abating $SO_2$ still remains. If Eskom is desirous of reducing both the $SO_2$ and $CO_2$, it should **consider not finalising construction of the last 3 units, as $CO_2$ emissions will be reduced at least for the last 3 units. This would then reduce both $SO_2$ and $CO_2$ emissions**.

*Claims as to increased downtime due to maintenance:*

23.11. Eskom indicates that the downtime of the Medupi plant may increase due to the need to periodically clean the flue gas cooler, decreasing overall plant availability, which is counter to the objective of the plant.[30]

23.12. The indicated downtime of about five days every two years to clean the tubes, should be seen in the context of Eskom's target planned average maintenance downtime 10%,[31] equivalent to 36 days per year. Even if Medupi initially operates with lower planned maintenance downtime, a tube cleaning schedule requiring 5 days every two years could be accommodated within these planned downtime periods, with no additional loss of production.

24. As indicated above, the claimed impediments to the inlet gas cooler were not mentioned in the 2014 TSSR. Those mentioned in the 2018 TSSR should be verified through independent information as discussed above. Even if

[27] TSSR 2018, pg25.
[28] 2018 TSSR, Tables 5 and 8.
[29] DEIR, pg 73.
[30] TSSR 2018, pg 25.
[31] "*Our 80:10:10 strategy strives for 80% plant availability by 2019/20, requiring unplanned maintenance to be limited to 10% on average, while performing an average of 10% planned maintenance*."- Eskom IR 2017, pg 45.

these impediments are verified, they are not insurmountable and themselves are not a bar against the technology, and therefore Eskom's conclusion to reject this technology is not accepted.

25. Specifically related to the space and/or weight issue which, it is claimed, would hinder construction and maintenance, if Eskom insists that space or weight issues are a bar to the technology, it should conduct detailed engineering studies (by an appropriately skilled and experienced person) to assess the layout and maintenance access problem. In this regard, we point out that Black and Veatch are Eskom's engineering consultants on this project and appear to have signed off site arrangement drawings (and other associated drawings) from 15 April 2013 to 22 August 2014, and issued their 2014 TSSR in May 2014, which indicated no such impediments. In fact, the 2014 TSSR report indicated that "*the inclusion of a flue gas cooler results* ***in very minor FGD process changes and no significant change in the size or type of FGD process equipment required*****"**[32] (our emphasis). Eskom should explain what has changed in the interim. Should the reason be based on the 2018 TSSR report, the full report and findings of both the European and Chinese plants as well as independently verified data from the plants should be provided. If Eskom continues to insist that space/weight is an issue, they should provide detailed evaluation or studies, including feasible options for overcoming any difficulties. Resolving potential layout and construction problems has long-term benefits and should not be used as a basis for rejection of the scrubber inlet cooler option.

26. Throughout the DSR and FSR process, our clients submitted that water use is one of the most significant impacts relating to the project, and as such, water minimisation intervention to reduce reliance on the Moloko and Crocodile Water Augmentation Project (MCWAP) scheme by about 30% should be fully supported. Whilst this was not included in the DEIR, the 2018 TSSR seem to indicate[33] that further water savings are achievable through operating the plant at 90 °C. **It appears that water savings of 36% are achievable at 90°C, compared with 28% when operating at 100 °C. The inlet gas cooler operating at 90 °C would save as much as 2.4 cubic metres of water per annum (Mm³/a) Mm³/a compared to WFGD, compared with a saving of 1.86Mm³/a when operating at 100°C - a difference of 0.5Mm³/a.[34] It is not clear why this was not stated in the DEIR itself, and should be further investigated and the DEIR should be amended accordingly.** As indicated in the previous submission, the 2010 EIA Regulations require the applicants to identify and investigate reasonable and feasible alternatives and the cooler is reasonable, feasible and necessary. It should furthermore be considered as integrated into the basic design.

27. As stated in the FSR comments, rejecting the gas cooler, which would save 30% (and potentially up to 40%), would be in direct contravention of Eskom's water policy, which states that it "*will ensure all its new water containing infrastructure are designed, maintained and operated in a manner that water will be utilised effectively and efficiently and to ensure environmental duty of care*".[35] It would also be contrary to the duty of care under section 28 of NEMA.

28. The water impacts will now be discussed in detail below.

**Water supply for operation of the FGD Retrofit Project**

29. The first 3 units of the Medupi FGD Retrofit Project rely on the availability of water from the phase 1 of MCWAP (MCWAP1). The last three units would be dependent on MCWAP phase 2 (MCWAP2), which is now approximately 9 years behind schedule.[36] Securing water through MCWAP2 will be conducted separately through Eskom's application for the bulk water use licence application for Medupi and Matimba, expected to be submitted to the Department of Water and Sanitation (DWS) before the end of April 2018.[37]

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[32] TSSR 2014, pg 11
[33] TSSR 2018, Table 10.
[34] TSSR 2018, Table 10.
[35] FSR comment, pg 9; Eskom Water Management Policy April 2013, pg7.
[36] DEIR, pg13.
[37] DEIR, pg 18.

30. Water security for this project is a critical aspect, and as a result, our clients have continuously requested a water minimisation study, to identify how to decrease the need for water. As indicated in the FSR comments, the 2012 Department of Water Affairs and Forestry's Report on the Crocodile West River Reconciliation Strategy, which was submitted as an annexure to the FSR, has indicated that the demand is already exceeding supply, and there are likely to be shortages of up to 16 million $m^3$ of water per year by 2025.[38] Despite this, no overall water minimisation study has been conducted to date.

31. Medupi requires 15.4 $Mm^3/a$, which includes the 6 FGD units, and the total water allocation from MCWAP1 is 10.9$Mm^3/a$. The difference of 4.5$Mm^3/a$ will be derived from MCWAP 2. "*Currently the power station has a total water allocation of 10.9 $Mm^3/a$, which is sourced from Mokolo Dam via Phase1 of the MCWAP. This allocation of 10.9 $Mm^3/a$ will be enough to operate the MPS* [Medupi Power Station] *as well as 3 (three) x FGD units. The water shortfall of 4.5 million $m^3/a$ will be sourced via Phase 2A of the MCWAP once implemented by DWS, and will cater for, amongst other requirements, for (sic) the remaining 3 (three) x FGD units*."[39] As stated above, although not indicated in the DEIR, it was indicated in the 2018 TSSR that, if the Medupi is equipped with WFGD with an inlet gas cooler, and is operated at 90 °C, there would be 36% water requirement.[40] If this is the case, **FGD will not be dependent on MCWAP 2, and such technological option should not be dismissed**.

32. The DSR in respect of MCWAP 2 was distributed for comment on 1 March 2018, and our clients submitted comment on 11 April 2018.[41] The report indicates that the DWS proposes spending R13 billion to transfer 75$Mm^3/a$ water from the Crocodile West catchment to the Mokolo catchment. The bulk of the water will be utilised for proposed coal mines and coal-fired power plants. On 11 April 2018, our clients submitted comments on the MCWAP 2 scoping report, indicating that this project is not required, as the energy demand forecast on which MCWAP was based is outdated and significantly inflated. Most recent studies[42] indicate that no new coal is required. The report also indicated that MCWAP 2 had not conducted a Climate Change Impact Assessment (CCIA), and current research indicates that due to climate change, there will be an increase in evaporation rates and uncertainty with regard to water supply - which includes the Limpopo basin. A report by B Udall[43] indicates that "*South African water and infrastructure planners and government should prepare for significant Mokolo and Crocodile (West) River flow reductions and refrain from action that will increase the risks of undesired outcomes. Maladaptive actions would include increasing the demands on these already over-allocated water systems, and contributing to additional warming by increasing emission of greenhouse cases through the construction of long-lasting, new coal fired power plants*."[44]

33. In light of the uncertainty of water availability from MCWAP2 and possible climate change impacts on the water resource, it is vital that the water minimisation study be conducted, and future water needs be settled as part of the EIA process. The best-case scenario would be not to construct the last 3 units, which are not needed and projected not to be required in the future. Any FGD technology would also need to be the least water-intensive option, as future water security is likely to be heavily impacted by climate change.

34. Our clients do not understand why Eskom refuses to conduct a water minimisation study, and reiterates that this should be investigated and undertaken.

[38] FSR comment, pg6; Department of Water Affairs and Forestry's Report, 2012, Crocodile West River Reconciliation Strategy, pgs 4-5
[39] DEIR, pg 66
[40] Table 6 & 10 of 2018 TSSR
[41] https://cer.org.za/wp-content/uploads/2018/04/MCWAP-2-SCOPING-REPORT-COMMENTS-11-4-18.pdf
[42] http://meridianeconomics.co.za/documents/.
[43] https://cer.org.za/wp-content/uploads/2018/03/Udall-Mokolo-Crocodile-Rivers-Analysis-Notarized-.pdf
[44] Comments on MCWAP 2, pg13-15.

**Waste Management and resale of by-products**

35. Our clients have submitted upfront in comments on the DFR and FSR that it would be important to conduct and finalise updated assessments of large-scale commercial uptake and resale of gypsum and ash. Whilst the 2009 Gypsum Market report was included in the FSR, the same Gypsum Market Report is not included in the DEIR, and nor is the report updated. This should be rectified. However, after three years, (and almost 9 years after the 2009 Gypsum Market Report was published) this has still not been adequately assessed, and one can only presume that Eskom plans to dispose of gypsum and ash together. This our clients have submitted, and continue to submit, is unacceptable and negligent behaviour, contrary to NEMA and the section 2 principles.

36. In addition to NEMA (particularly the section 2 principles, section 28 duty of care principles, sections 23 and 24 set out above), section 16 of the National Environmental Management Waste Act, 2008 (NEMWA) also provides for the following general duty in respect of waste management:

> *"(1) A holder of waste must, within the holder's power, take all reasonable measures to-*
> *(a)* ***avoid the generation of waste and where such generation cannot be avoided, to minimise the toxicity and amounts of waste that are generated****;*
> *(b)* ***reduce, re-use, recycle and recover waste****;*
> *(c) where waste must be disposed of, ensure that the waste is treated and disposed of in an environmentally sound manner;*
> *(d) manage the waste in such a manner that it does not endanger health or the environment or cause a nuisance through noise, odour or visual impacts;*
> *(e) prevent any employee or any person under his or her supervision from contravening this Act; and*
> *(f) prevent the waste from being used for any unauthorised purpose*" (our emphasis).

37. In other words, waste generation should be prevented as a first measure, and if it cannot be avoided, should be minimised. Disposal is the last measure.

38. The DEIR describes an important change in the scope of the EIA application, namely that whilst "*the handling, treatment and conveyance of gypsum and effluent from the gypsum dewatering plant*" is included in the scope, the disposal of the gypsum on the existing ADF is now not included in the EIA, but will be addressed in the ADF WML amendment application. The DEIR further anticipates that "*gypsum storage facility will accommodate 100% of the total gypsum production for three days, but it is anticipated that only 20% of the Gypsum will be required from commercial sales. Eskom is currently investigating markets for gypsum resale. This will have a significant impact on the amount of gypsum that will require disposal…There will be no facilities for gypsum recovery from the storage building to be loaded onto trucks. Use of gypsum will be subjected to quality assessments, which will be done at the storage facility. If the quality is not usable, the gypsum will be taken for disposal. In the event that no large-scale commercial offtake of gypsum is secured, gypsum…will be mixed with ash and will be disposed together on the footprint of the existing authorised ADF*."[45]

39. Our clients have maintained, in the earlier comments on the DSR and FSR, that gypsum should not be mixed and 'co-disposed' with the ash. A market research feasibility for gypsum and coal ash was previously recommended.

40. As indicated previously in the DSR and FSR comments, the potential benefits of gypsum could be: the potential revenue/ income to Eskom; the avoidance of the costs and impacts associated with gypsum disposal in the landfill; the avoidance of the need to mine new gypsum; and that the potential for the very significant expansion and stimulation of the SA market for the products that use gypsum as a raw material, particularly in the building and construction sectors, has potentially very significant economic and social benefits. The potential social benefits of low-cost high quality gypsum may include the retrofitting of plasterboard ceilings in 'RDP' housing to improve their

[45] DEIR, pg 64.

energy efficiency. This is supported by Eskom's Gypsum Market Study of 2009 submitted with the FSR,[46] which stated that:

40.1. "*environmental and economic best practice tends to steer that implementation towards producing commercially viable gypsum instead of opting for long term disposal. Gypsum waste dumps form significant ecological risk factors and the global trend by synthetic gypsum producers, is towards dump avoidance*";[47]

40.2. "*gypsum is currently utilised in three main sectors in South Africa: Construction, building related applications and agriculture. Most of the technical difficulties in producing commercially viable FGD gypsum have been addressed internationally and the operating changes required to utilise the material in commercial applications are quite well established*";[48]

40.3. "*the FGD technology employed by Eskom and the quality of the gypsum produced are critical to the effective growth of the gypsum market in Southern Africa, particularly the existing plasterboard sector of the market which shows the most potential for sustained growth. The introduction of FGD gypsum, of the correct quality, into this growing sector would facilitate further optimisation of FGD gypsum usage and increase the potential for sustainable FGD gypsum market growth in South Africa. In addition, the potential for a new gypsum utilisation sector to be developed in the mining field, exists*;"[49] and

40.4. per capita consumption of gypsum in SA is low at 3.3 kg, by comparison with the USA (45.9 kg) and the United Kingdom (22.4 kg), and the study identified several new potential applications for gypsum in SA. As mentioned, the main market sectors for wet FGD gypsum are plasterboard (for ceilings and dry-walling), plasters, cement manufacture, agriculture and mining. The 2007 market for gypsum was approximately 1.2 million tons (Figure 3, sum of all sectors).[50]

41. The potential for a large increase in the market exists, depending on the availability of the product gypsum. The Medupi FGD plant would produce up to 1.7 Mt per year once all FGD units are operational.[51] Whilst Eskom is of the view that it will be unable to sell the gypsum, since Kusile's gypsum would flood the market, the Gypsum Market Research Study estimates that the **demand will exceed what Kusile plant would produce by 1 million tons per annum**.[52]

42. As mentioned above, Eskom states that the use of gypsum will be dependent on quality assessments, and should the quality not be usable, the gypsum will be taken for disposal. To maximise the value and market for FGD gypsum, it should be of consistent quality and above 95% purity (for the plasterboard sector). This implies that the limestone used in the FGD process should have a purity of greater than 93-95%.[53] The gypsum processing and handling systems, including temporary and longer-term storage facilities, should also preserve the quality of the gypsum for future sales. Importantly, Eskom should secure limestone of the requisite quality, with purity greater than 95% if possible, to maximise the gypsum sales potential. However, not all identified markets require high quality gypsum. The cement and agricultural sectors would accept gypsum of lower purity. Eskom should therefore clarify what methodology it uses to conduct quality assessments, and what quality gypsum would be deemed not for sale and disposable.

[46] FSR, Appendix J, Over the Moon, 3 April 2009, PED Marketability Study Report.
[47] FSR, Appendix J, Over the Moon, 3 April 2009, PED Marketability Study Report, pg 3.
[48] FSR, Appendix J, Over the Moon, 3 April 2009, PED Marketability Study Report, pg 3.
[49] FSR, Appendix J, Over the Moon, 3 April 2009, PED Marketability Study Report, pg 3.
[50] FSR, Appendix J, Over the Moon, 3 April 2009, PED Marketability Study Report, figure 3.
[51] TSSR, table 3.
[52] FSR comment page 10; FSR, Appendix J, Over the Moon, 3 April 2009, PED Marketability Study Report, pg 52.
[53] FSR comment page 10; FSR, Appendix J, Over the Moon, 3 April 2009, PED Marketability Study Report, pg 22.

43. It is also concerning to note, however, that the limestone has not yet been secured and its quality not identified. The DEIR indicates that limestone will be purchased offsite and transported to Medupi by rail and/or road, either from Lime Acres in the Northern Cape, or Pienaarsrivier or Marble Hall in Limpopo. However, apparently, "*confirmation of the Limestone source was not available at the time of compilation of the Environmental Impact report*". It is unacceptable that Eskom has not yet considered or finalised the availability of lime - which is an essential ingredient for the FGD. In this regard, a limestone quality, cost and availability report should be produced, be made available to interested and affected parties for consideration and comment.

44. In spite of our repeated earlier representations and the positive gypsum market assessment, Eskom has not included the construction of facilities for the temporary storage of gypsum or of facilities for the rail dispatch of gypsum in the scope of the project. Furthermore, we previously commented in the DSR and FSR that the impact of traffic on the air quality will need to be addressed, as the proposed transport method for limestone and waste (salts and sludge) will be undertaken by trucks. It was estimated that for the plant, approximately 13 trips will be made for waste and 69 trips for limestone per day.[54] These impacts have not adequately been addressed.

45. Eskom has not developed, updated or presented a plan for the marketing and sale of gypsum, nor assessed the availability. They also have not secured the high quality lime which would ensure high quality gypsum, nor considered the transport impacts associated therewith. The statement in the DEIR, that "*given demand and off-take potential from commercial off-takers, infrastructure to convey gypsum from the gypsum transfer house 1 to the gypsum storage building and rail way yard for transport of large volumes of gypsum via rail will be constructed at a future date*,"[55] confirms that the scope does not include facilities for the dispatch of gypsum.

46. The DEIR appears to still be based on Eskom's preferred option that envisages the co-disposal of gypsum with the ash, which would immediately render the gypsum unrecoverable and of no sales value, destroying a potentially valuable resource. "*In the event that no large-scale commercial offtake of gypsum is secured, gypsum from transfer house 1 will be conveyed to the existing overland ash conveyor. In this conveyor system, the gypsum will be mixed with ash and will be disposed together on the footprint of the existing authorised ADF*."[56]

47. The licensing of the gypsum storage facility has now been deferred to the "ADF WML amendment application", rather than the submission of a new WML for the separate storage of gypsum that is surplus to immediate sales requirements. The amendment proposes to co-dispose gypsum and ash, rather than design a separate gypsum storage facility. Eskom appears to have made provision in the plant layout for future facilities for exporting gypsum directly from the processing facility,[57] but the construction of these facilities is apparently not included in the scope of the project, implying that the *de facto* preferred option is the 100% co-disposal of all gypsum on the ADF.[58] Eskom should confirm that that the gypsum facilities required for the sale of gypsum are included in the scope of the project.

48. The other major concern is that there is no provision in the design and construction for separating the gypsum from the ash so that it can be reclaimed and sold as a by-product. It would appear that this has been done only to the extent of handling, treating, and including separate conveyance equipment from the gypsum processing facility to "the existing ADF". But of greater concern is that all gypsum surplus to sales will be stored together with the ash, rendering it unrecoverable for future sales if and when the market for gypsum develops.

49. Our clients reiterate that Eskom should again be asked to include in the project scope facilities to store the gypsum separately from the ash, to enable recovery of stored gypsum for future sales. It appears that a full gypsum market analysis and an analysis of the potential to increase demand for the product and expand the off-take has not yet

[54] DEIR, pg 110.
[55] DEIR, pg 64.
[56] DEIR, pg 64.
[57] DEIR Figures 6-7, 6.8, 6.16.
[58] DEIR, pg 41.

been done. As noted above, the detail of the gypsum storage facility has now been deferred to the "ADF WML amendment application" and reference to a single storage facility implies that in future gypsum and ash will be stored together, rather than on separate facilities. Eskom appears to have made provision for exporting gypsum directly from the processing facility, but for disposing of all surplus gypsum on the ADF.

50. Our clients submit that the licensing of the gypsum disposal as an amendment to the existing licence is therefore not acceptable, as the two are interlinked.

**Impact of the FGD plant's operation on the surrounding water systems**

51. The main report indicates that the floodline study established that 1:100 year floodline encroaches on the ADF footprint; however, that this will not be considered in the EIA and will be addressed in the WML amendment. [59] Further, "*if sound engineering flood control and prevention measures are not put in place, the contents of the ADF are likely to be washed away into the receiving environment in the event of a 1:100 flood*."[60] Some of the major constituents of concern (not mentioned in the DEIR) which would emanate from the ADF according to the specialist report, would be fly ash trace concentrations of metals and other substances that are known to be detrimental to health in sufficient quantities. Potentially toxic trace elements in coal include: arsenic, beryllium, cadmium, barium, chromium, copper, lead, mercury, molybdenum, nickel, selenium, uranium, vanadium, and zinc.[61] The proposed mitigation measure is to reduce the footprint and increase the height of ADF, and implement a stormwater management plan. It is not clear if these will be sufficient measures to mitigate pollution due to flooding. In fact, it is uncertain if the impact assessment was adequately conducted since the ADF footprint will be excluded from the EIA, and instead, addressed in the separate WML application for variation. It is unclear how the specialist report reached its conclusion, given that the final footprint and impact of the ADF is unknown, and is excluded from the EIA process. It is therefore important that this is fully investigated in the EIA and not separated considered in the WML process.

52. In respect of the potential flooding, it appears that the gypsum offtake structure may be a problem after high rainfall events, and the specialist report suggests concrete bunding and central depression to prevent spillage.

53. The Surface Water Assessment specialist report seem to contain rainfall data only from 1903-2000. Since the report was compiled in 2018, rainfall data from 2000-2018 should also be included. The raw data used to compile the report should also be made available.

54. It is concerning to note that the Surface Water Specialist report indicates that "t*he recommendations from the report are that based on the re-designation of the catchments areas from clean to dirty (see Figure 14 and Figure 15), 20% of the total dirty water catchment areas will now be added to the dirty water system. It is therefore* ***anticipated that the existing Dirty Water Dam (102 00 m3 capacity) will have insufficient capacity to store the new dirty water runoff volumes (Figure 16). Additional dirty water storage will be required. This was not been sized as it was not part of the scope***"[62] (our emphasis).

55. The specialist report, as well as the DEIR, indicate that the Medupi site and the ADF site would decrease the Sandloop River tributary catchment area by almost 50%, from approximately 44.km2 to mere 18.7km2. The impacts would include the total runoff from Sandloop into the Mokolo system. Further, the mitigation measures regarding the catchment loss is "limited". The DEIR reports that "*the mitigation with regards to catchment loss is limited and the residual impact risk remains High. Efforts should be centred on minimising catchment loss by minimizing the PCD, coal stockpile and other associated infrastructure to as small an area as possible.*"[63]

[59] DEIR, pg 40.
[60] DEIR, pg174.
[61] DEIR: Annexure G4 - Surface Water Impact Assessment Report, pg 20.
[62] DEIR: Annexure G4 - Surface Water Impact Assessment Report, pg 27.
[63] DEIR, pg 173.

56. The DEIR reports that "*the prominent impact feature that was identified during the construction phase is the loss of catchment area contributing to storm water runoff due to the need to separate and contain contaminated "dirty" water. Associated with this is an expected increase in flood peaks and pollution through contaminated runoff. Mitigation measures for the loss of catchment area and decreased water input to wetland areas is limited resulting in an impact significance rating of HIGH. Impacts related to pollution run-off and increased flood peaks can be mitigated to MODERATE to LOW impact significance levels* ".[64]

57. If not mitigated, it is reported in the DEIR that the potential surface water quality impacts will affect the downstream water users. However health impacts as a result of the contamination are not considered, and impacts to the surface water are largely claimed to be "low". This is due to the fact that an existing impact is already occurring on site, a Storm Water Management System (SWMS) has been implemented on the development site, and the surface water specialist concluding that the SWMS appears to be well operated and maintained, therefore the existing impact is rated as "low".

58. The loss of wetlands and watercourses on site at Medupi and the ADF location will remain a very high impact; however the impact could apparently be reduced through mitigation. It is not clear, however, how these residual negative impacts will be remedied.

59. Waste management issues pertaining to disposal of ash and gypsum appear in various specialist reports pertaining to water. As such, these issues are interrelated, these should be fully investigated in the current EIA process and should not be dealt with in a piecemeal fashion.

**Inadequacy of DEIR due to missing documents and/or information**

60. We have previously indicated in comments on the FSR and DSR that the public participation process and access to documents has been less than desirable during this EIA process. As mentioned in paragraph 4.3 above, the following information was previously requested to be included in the assessment: co-commissioning (integrating FGD into the design of the 3 remaining units) study; FGD Commissioning Schedule Study; Water Minimisation Study; an updated Gypsum Market Investigation and Ash Market Investigation to minimise waste; and transport impacts (from waste or materials required for FGD). Such documentation should be made available to stakeholders as soon as a comment process begins in any part of EIA process. These are still not available, and therefore the information available for comment and decision-making is incomplete. As discussed above, in addition to these reports, investigation related to lime quality and sourcing should also be assessed and finalised.

61. In addition to the above, the following information is missing from the DEIR, and should be made available:

    61.1. Pages 36-37 of the DEIR refers to various design reports which were reported to be considered. However, there were not attached to the DEIR.

    61.2. Appendices D1-12, which refer to various designs and drawing, were not attached to the DEIR, as well as appendix F2.

    61.3. The figures and drawings mentioned in the report should be provided as separate documents to enable enlargement of the figures and drawings.

62. With regard to air pollution, whilst the specialist report briefly considers the health impacts, this is insufficient for the present purposes. It is recommended that a full health impact study be undertaken, which includes health impacts for operation of the plant without the FGD for 6 years after commissioning each unit. In addition,

[64] DEIR, pg 171.

Annexure B attached to the Specialist Atmospheric Impact Report should be considered in the main report, as well as the DEIR.

**Delay in implementation of the FGD and the need for co-commissioning of FGD**

63. As previously indicated, it is not clear why the rest of Medupi construction should not be abandoned, given that the electricity is no longer required. Alternatively, it is unclear why Eskom repeatedly refuses to consider the co-commissioning of the FGD retrofit. To date, this issue has not been adequately addressed.

64. In addition to the above, Eskom seeks to delay and/or avoid the most pertinent issues pertaining to the FGD retrofit; such as Waste Management and Minimisation, Water Minimisation, and conducting Ash and Gypsum Market feasibility study, Health Impact Assessment among others. The fact that these may be guided by different legislation does not mean that these should still not be considered in the EIA. In fact, a failure to consider these would defeat the whole purpose of the EIA. These pertinent issues would include:

    64.1. production, storage and disposal (through sales or otherwise) of gypsum , ash, salt, and sludge;
    64.2. securing water – water apparently has only been secured for the first 3 FGD units, and securing water MCWAP 2 is not definite. Furthermore, the most suitable technology which would minimise water by 30-40% (the gas cooler) is not being considered as viable;
    64.3. management and disposal of polluted water - all the components have been deferred to other processes;
    64.4. salt and sludge waste is only catered for the first 5 years;
    64.5. high quality lime required for high quality gypsum production has not been not secured;
    64.6. ash disposal is only possible for the next 20 years and also situated within the 1: 100 year floodline;
    64.7. in relation to the FGD structure, there is a: claim of "no space", but no specialist engineering attached; and
    64.8. the timeline for the FGD retrofit is vague and unenforceable, and merely states that FGD has to begin construction in 5 years, and that Medupi will comply with $SO_2$ MES for new plants by 2030; and[65]
    64.9. the impacts on health.

**Objection to a separate WML variation process**

65. As indicated above, according to NEMA, the applicant cannot defer important considerations relevant to the EIA in a piecemeal fashion, irrespective of whether other legal provisions apply. The applicant is still bound, by the provisions of NEMA, to consider all effects of activities before actions are taken. Our clients have therefore stated above that the most significant considerations resulting from FGD installation should not be deferred at a later stage outside of the EIA, as it is contrary to NEMA.

66. With regard to minimising and handling waste, our clients - in the DSR and FSR comments - repeatedly stated that:

    66.1. Co-disposal of gypsum should be considered as a last resort;
    66.2. gypsym should be stored separately from other wastes, thereby minimising contamination, allowing for possible future recovery;
    66.3. salt and sludge co-disposal with other waste streams should be avoided. They should be stored separately and managed appropriately in accordance with the law;
    66.4. disposal of FGD by-products to Holfontein Landfill Facility should be avoided due to distance costs and environmental impacts; and
    66.5. only three possible disposals should be considered, namely: separate onsite facilities for each waste (preferred); disposal of ash, gypsum, salts and sludge in the ADF, each with its own compartment for future respective recoveries, if appropriate and permissible; disposal of ash, gypsum salts sludge in the ADF with ash and gypsum each in their own compartment, and salt and sludge combined into a third compartment.

[65] DEIR, pg 67-68.

67. These comments, however, seem largely to have been ignored and/or inadequate or inappropriate responses have been provided.

68. In the WML Variation Application, the applicant states that the "*power station will incorporate wet limestone FGD technology which will be retrofitted after 6 years of each Unit's commissioning, to manage SOx emissions. The FGD plant will produce gypsum, salts and sludge as by-products, which need to be disposed of in an environmentally sustainable manner*."[66] Instead of conducting the waste minimisation study, including market studies, and particularly for the largest waste streams, gypsum and ash, to eradicate need for the increase in waste disposal facilities, the application provides as follows:

    68.1. for the co-disposal of ash and gypsum on a Class C barrier, which "*will be implemented at the facility from the 4 year area onwards. It is proposed that, in the first years of FGD operation, the gypsum from the FGD plant will also be disposed on the Ash Disposal Facility (ADF). With the disposal of ash and the gypsum, the ADF will be referred to as the Waste Disposal Facility (WDF). In terms of the same legislation, salts and sludge classified as Type 1 wastes and would be disposed on a Class A barrier system;*"[67]

    68.2. to co-dispose gypsum and ash on the ADF;[68]

    68.3. to increase the height of ADF to 60-72m to minimise the ADF footprint, which encroaches on wetlands;[69]

    68.4. to construct associated infrastructure for conveyance and disposal of gypsum, one of which would include a temporary gypsum loading area and storage area for saleable gypsum;[70]

    68.5. to construct, "*depending on the offtake potential from commercial off-takers, infrastructure to convey gypsum from the gypsum transfer house 1 to the gypsum storage building and railway yard for transport of large volumes of gypsum via rail will be constructed at a future date;*"[71] and

    68.6. "*The gypsum storage facility will accommodate 100% of the total gypsum production for three days, but it is anticipated that only 20% of the gypsum may be required for commercial sales. This will have a significant impact on the amount of gypsum that will require disposal…In the event that there are no large sale commercial offtake of gypsum is secured, gypsum from transfer will be…mixed with ash and disposed together*."[72]

69. The motivation provided in the Variation Application is that, on 23 August 2013, DEA promulgated the National Norms and Standards for the Assessment of Waste for Landfill Disposal and National Norms and Standards for Disposal of Waste to Landfill, by which the applicant determined "***through conservative theoretical waste assessment***"[73] that gypsum and ash would be classified as Type 3 waste. This was despite the fact that FGD waste has not yet been generated by Medupi.

70. However, according to the Bridging Document,[74] the reasoning is as follows:

[66] WML Variation Application for ADF, pg1.
[67] WML Variation Application for ADF, pg1.
[68] WML Variation Application for ADF, pg1.
[69] WML Variation Application for ADF, pg1-2.
[70] WML Variation Application for ADF, pg2.
[71] WML Variation Application for ADF, pg3.
[72] WML Variation Application for ADF, pg5.
[73] WML Variation Application for ADF, pg4.
[74] Medupi FGD retrofit EIA Bridging Document, 30 September 2016.

70.1. "*During the project initiation and clarification of the scope of the project, it was indicated that the ADF would only have capacity to accommodate wastes for the first 20 years of power station operation. Therefore, the following activity was identified as additional scope for inclusion in the integrated authorisation application: · New disposal facilities for the disposal of gypsum, ash, salts and sludge for year 21 to year 50 post commissioning*."[75]

70.2. "*Since the current ADF was deemed to only have capacity to accommodate the disposal of ash for the first 20 years of the Medupi Power Station operation, a second facility would need to be established. Eskom had earmarked an area to the south of the existing authorised ADF. The proposed new facilities would be greenfield areas with a footprint of about 600 hectares to accommodate the disposal of ash, gypsum, salts and sludge*."[76]

70.3. "*At this stage it was agreed that the Site Screening process would need to be revisited. This rework would constitute a delay in the EIA process of at least 12 months. A decision needed to be made regarding the rework of the Site Screening and this was workshopped between the client and Zitholele Consulting in order to find the most effective solution. The decision took the project schedule into account as well as commitments of the power station to other authorisation and license conditions. A decision was reached in July 2016 to review the scope of the current EIA in order to fast track the application for authorisation and licensing of the FGD retrofi*t."[77]

70.4. "*The installation of the appropriate FGD technology is time critical, and the application for an integrated authorisation must be accelerated in order for the power station to remain compliant to the AEL conditions. Should the EIA scope remain unchanged, there is a significant risk of a delay to the overall project development process, due to the site screening for disposal sites, which needs to be reinitiated. For this reason, the decision has been made to split the current EIA into two (2) separate environmental authorisation processes*."[78]

71. In other words, it would appear from the Bridging Report that, in order for Eskom to meet "time sensitive" deadlines (meeting the MES by 2025 was cited; however, Eskom also has World Bank contractual deadlines), it attempts to defer and delay the consideration of the waste impacts in relation to the FGD - which should be considered in the initial EIA - to another platform, in order to "fast track" the EIA. Furthermore, it seems to be paying lip service to minimising waste, since the Variation Application, the Bridging Report, and various designs in the DEIR seem to indicate that Eskom is in favour of co-disposing of ash, salts, and gypsum, and finding an alternative site or expanding the original waste disposal site to accommodate this. This is contrary to NEMA, NEMWA, and the Constitution. If Eskom wished to expedite the process, it could easily have conducted and finalised the waste minimisation study and market study for the various waste streams, as well as finalised investigation for sourcing the high quality lime. Eskom, to date, appears to have dragged its feet and not considered the minimisation of waste as a serious option, since marketability and uptake studies for gypsum and ash have not been completed for over 4 years since the initial DSR. High quality lime also has not yet been secured. Furthermore, their Gypsum Market Study of 2009 was not included in the DEIR.

72. As mentioned previously, in order to significantly minimise its impacts, the last 3 units of Medupi - which are no longer required - should be abandoned. Three units already built should have FGD fitted as soon as possible, before 6 years of operation. However, our clients vehemently object to this "*fast tracking process*", which undermines the EIA process by approaching the EIA in a piecemeal fashion. Such processes are contrary to legislation. Furthermore, the WML Variation Application is deficient in that it appears that the applicant unilaterally determined the classification of certain waste times ***through a conservative theoretical waste assessment.*** The accuracy of this (scientific and legal) should be investigated.

[75] Medupi FGD retrofit EIA Bridging Document, 30 September 2016, pg 2.
[76] Medupi FGD retrofit EIA Bridging Document, 30 September 2016, pg 2.
[77] Medupi FGD retrofit EIA Bridging Document, 30 September 2016, pg 3.
[78] Medupi FGD retrofit EIA Bridging Document, 30 September 2016, pg3.

73. Furthermore, and more importantly, all efforts should be directed to minimise the waste instead of expanding the capacity for the current waste disposal sites.

**Conclusion**

74. As stated at the outset, there is no doubt that FGD Retrofit Project is mandatory for the operation of Medupi, so that it will comply with the 2020 MES for $SO_2$, and so that it does not impact on human health and wellbeing, contrary to section 24 of the Constitution. This should be done with the minimisation of the need for water in mind, with the least impact on surrounding ground and surface water, and should minimise waste as much as possible.

75. For the reasons set out above, the DEIR does not contain all material information required in terms of NEMA and the EIA Regulations. Furthermore, the EIA has inappropriately deferred a number of considerations as outside the scope of the EIA, when they clearly need to be considered in the EIA. Even though other legislations might apply, NEMA makes clear that these factors and impacts must also be considered in the EIA. Our clients furthermore strongly object to the WML Variation Application being separated from the EIA process, as it is an integral part. These fundamental deficiencies should be addressed, prior to the FEIR being made available for comment.

Yours faithfully

**CENTRE FOR ENVIRONMENTAL RIGHTS**

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