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TECHNICAL MEMORANDUM

PROJECT NAME: **DEVELOPMENT OF THE KENDAL 30 YEAR ASH DISPOSAL FACILITY**

PROJECT NO: **12935**

TO:	**Department of Environmental Affairs**
DATE:	**13 November 2018**
FROM:	**Zitholele Consulting (Pty) Ltd**
EMAIL	**kendal30@zitholele.co.za**
SUBJECT	**Amended Wetland Offset Strategy Report**

DOCUMENT CONTROL SHEET

Project Title: **Amended Wetland Offset Strategy Report and Additional Information to the Final Environmental Impact Assessment Report**

Project No: **12935**

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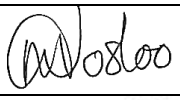
DOCUMENT APPROVAL

ACTION	DESIGNATION	NAME	DATE	SIGNATURE
Prepared	EAP	Mathys Vosloo	13/11/2018	
Reviewed	EAP	Tebogo Mapinga	14/11/2018	
Approved	Project Manager	Emmy Molepo	14/11/2018	

RECORD OF REVISIONS

Date	Revision	Author	Comments
13/11/2018	0	Mathys Vosloo	Draft report for client review
14/11/2018	1	Mathys Vosloo	Draft report finalised for public review

1 INTRODUCTION

On 06 April 2017, the Department of Environmental Affairs (DEA) issued the applicant for the above-mentioned project, Eskom Holdings SOC Ltd, with a letter (Appendix A) in which it rejected the Final Environmental Impact Assessment Report (FEIAr), pending the submission of an Amended Wetland Offset Strategy and additional information relating to the application.

Subsequent to the receipt of this letter, the applicant commissioned the wetland specialist involved during the EIA to undertake further studies to investigate additional wetland offset areas that could be considered in the wetland offset strategy for the above-mentioned project.

2 AMENDED WETLAND OFFSET STRATEGY REPORT

An Amended Wetland Offset Strategy Report was compiled by Wetland Consulting Services (WCS) and completed in November 2018. This report is appended to this technical memorandum as Appendix B.

Considerable work had previously been undertaken towards the realization of an offset strategy for the proposed Kendal 30-year ADF prior to the Amended Wetland Offset Strategy. Two previous reports were compiled, that detailed attempts to identify suitable target wetlands for the required offset strategy, namely:

2016 – The initial study focussed on quantifying offset targets and identifying possible target wetlands. The main criteria used to identify target wetlands were that the target wetlands had to include pan/depression wetlands and hillslope seepage wetlands (to ensure a like-for-like offset), and that target wetlands had to be located within either of the affected quaternary catchments, within a 10km radius of the proposed Kendal 30-year ADF, or within land owned by Eskom on the Mpumalanga Highveld. Four pan wetland systems/clusters were identified and investigated in the field for rehabilitation opportunities and possible offset gains quantified. One of the selected sites was found to be fatally flawed, with the other three sites providing various opportunities for rehabilitation gains. The site providing the most gains, in terms of both water resources and ecosystem conservation targets, was, however, located on privately owned land, and therefore deemed not suitable for the practical implementation of the offset, as security of tenure could not be assured and the risk was deemed high. The remaining two sites, although located, for the most part, at different power station properties, on Eskom-owned land, provided insufficient gains to meet the required offset target, and could potentially also, in future, be targeted for further infrastructure development associated with their respective existing Power Stations. The outcomes of this study were presented to the DWS but rejected based on the mentioned concerns.

2018 – Upon rejection of the first draft conceptual report, a further site selection process to identify possible additional target wetlands for the offset was undertaken in early 2018. To avoid the difficulties experienced previously relating to landownership, it was decided to focus purely on Eskom-owned land on the Mpumalanga Highveld. Numerous land holdings were investigated at a desktop level for extent and type of wetlands. The focus was on identifying a single larger cluster

of wetlands rather than a number of smaller fragmented systems, and this strategy would assist in sustainable maintenance of the offset. Although a possibly suitable area was identified, it was subsequently determined that future mining activities within and adjacent to the wetlands would render the wetlands unsuitable as a sustainable offset.

Thus, both attempts at producing a feasible wetland offset strategy did not yield positive results, hence this further study was undertaken.

During the initial study in 2016, wetland offset calculations using the SANBI & DWS (2016) indicated the following targets as being applicable to the Kendal 30-year ADF:

- The required Water Resources offset target for impacts associated with the proposed Kendal 30-year ADF Project would be 63.5 hectare equivalents.
- 78.6 hectare equivalents would be required for the Ecosystem Conservation offset target.

After conclusion of the second desktop assessment in 2018, it was decided in consultation with DWS that the wetlands immediately adjacent and downstream of the proposed Kendal 30-year ADF should form the focus of the proposed wetland offset strategy. Such an approach has numerous advantages, including the following:

- Rehabilitation gains will be realised in the same wetland systems and, thus, by the same water users as are likely to be impacted by the proposed Kendal 30-year ADF;
- Target wetlands will share the same characteristics as the impacted wetlands, allowing for a like-for-like offset; and
- Proximity of the offset wetlands to the Kendal 30-year ADF will allow for easier management and monitoring of the offset.

The identified wetlands cover a total of 927.31 hectares, which includes 67 hectares of dams. The bulk of wetland habitat (roughly 71 %) has been typed as Seep wetlands, with most of the remainder consisting of channelled and unchannelled valley bottom wetlands. Only a single Pan/Depression wetland of 4.77 hectares was identified. The wetlands were found to be in a moderately modified (PES category C) to largely modified (PES category D) condition and of Moderate to High importance and sensitivity.

Opportunities for rehabilitation and improving wetland habitat identified within the wetlands indicate the wetlands as suitable targets for such a wetland offset strategy. In terms of the water resources and ecosystem services target requirement of 71 ha-eq., the 4 wetland systems identified adjacent to the proposed Kendal 30-year ADF have the potential to realise 47.3 ha-eq. in gains, resulting in achieving approximately 75% of the target. These calculations include an adjustment factor of 0.66 to account for inherent risk of failure in rehabilitation interventions, as per the requirements of the wetland offset guidelines (SANBI & DWS, 2016). In terms of the ecosystem conservation target of 78.6 ha-eq, it is clear that the four (4) wetlands systems identified adjacent to the proposed Kendal 30-year ADF, together, would far exceed this target, potentially realising almost 470 ha-eq. if these wetlands can be adequately secured and conserved.

The predicted gains are dependent on the full implementation of recommended rehabilitation interventions and management measures. A number of the proposed management measures required to improve wetland habitat in the selected target wetlands (e.g. withdrawing cultivation, fire management, livestock management, etc.) impose landuse limitations that might not be acceptable to land owners. Failure to implement such measures will result in reduced rehabilitation gains. A number of further possible risk and challenges are identified and highlighted in the report, the most significant of which is the need to secure land for the offset from Third Parties.

3 ADDITIONAL INFORMATION REQUESTED BY THE DEA

Additional information as requested in the letter dated 06 April are discussed in the sections below:

3.1 Report on investigation of the re-creation pan

The DEA letter requested the following information related to re-creation of pan habitat to be submitted to the department: “The report on the investigation of the re-creation pan.”

The possibility of investigating the re-creation of an artificial pan was briefly discussed in a consultation meeting held with the DWS on 31 May 2016 and 23 January 2017. Minutes of these meetings have been included as Appendix C to this letter.

Upon initial consideration of these options by Eskom and the wetland specialist, the logistics related to recreating such artificial habitat and contractual agreements between an existing mining operationand Eskom posed significant challenges to successful implementation. Such challenges include reaching an agreement on acceptance and apportionment of liability between Eskom and an identified mining operation, creating significant impact to water resources in another catchment through landscaping a vast area to mimic the artificial pan and associated catchment, as well as cost in creating and maintaining such an artificial system elsewhere. A professional opinion on the potential to re-create an artificial pan habitat (Appendix D) was provided by the wetland specialist (Wetland Consulting Services) who have developed the Wetland Offset Strategy for the Kendal 30 year ADF project. The wetland specialist concluded that the impact associated with the loss of the pan wetland at Kendal is better addressed through wetland offset activities that aim to protect and rehabilitate existing pan wetlands on the Highveld, guided by the SANBI & DWS (2016) wetland offset guidelines, rather than through an attempt to recreate pan habitat.

Based on this understanding a decision was therefore reached to focus efforts on maximising avoidance of impacts on wetlands, rehabilitation of existing wetlands and developing an effective offset strategy that would include investigating direct compensation methods in the event that offset targets could not be reached. No further investigation into creating artificial pan habitat was therefore conducted.

3.2 Water losses and discharges back to the natural system

The DEA letter requested the following information related to water losses to the system to be submitted to the department: “*The water losses and discharges back to the natural system must*

be investigated and reported upon. Clarity must be given on the wetland offsetting regarding the investigation requested."

A discussion relating to potential water losses in a consultation meeting held with the DWS on 31 May 2016 and 23 January 2017. Minutes of these meetings have been included as Appendix C to this letter.

Water losses from the proposed ash disposal facility (ADF) footprint were qualitatively assessed in the surface water impact assessment and surface water-groundwater interactions study, included as part of the groundwater impact assessment study undertaken by Golder Associates. These reports were included as Appendixes to the Final Environmental Impact Report (FEIR) initially submitted to the DEA. These reports are still available for download from Zitholele Consulting's website: http://www.zitholele.co.za/environmental/ under heading "EIA for Kendal 30 Year ADF". These documents have been included as Appendix F and G, respectively.

The surface water impact assessment concluded that water resources falling within the footprint of the ADF and associated infrastructure will be lost, however except for the pan there are very limited surface water resources on the site. Loss of flow at the outlet of catchment B20F and B20E due to construction within the footprint of Site H is therefore expected to be **very low**. The study further concluded that construction activities will not contribute significantly to the loss of streams/ altered flow in the area.

The surface water-groundwater interaction study was commissioned to predict the impacts on groundwater flow, including surface seepages and spring discharges resulting from the development of the ADF. The study included development and calibration of a site-specific 3D numerical groundwater flow model which were able to simulate surface seepages to the pan and spring discharges potentially feeding the hill slopes and valley bottom wetlands.

The surface water-groundwater interaction study concluded that the relative reduction for wetlands or pans receiving groundwater leakage, with the exception of the pan and wetlands to be covered by the ADF or immediately downstream of the ADF, are insignificant. From the results it's evident that the pan only receives insignificant volumes of groundwater (net inflow of 0.03 l/s), but appears to be predominately driven by rainfall run-off and shallow interflow.

Furthermore, in order to ensure that wetlands and pans not covered by the ADF or immediately downstream of the ADF receive sufficient water inflow, the stormwater management philosophy incorporated into the design of the ADF include the following principles:

- The separation of the runoff draining south-easterly towards the extended ash dam (i.e. from the area upslope of the ADF) and runoff generated from within the footprint of the extended ADF;
- The diversion of "clean" surface runoff generated from the upslope contributing catchments away from the extended ADF, thereby isolating the ash dam as "dirty areas" in accordance with the requirements GN 704 in terms of the National Water Act, 1998;
- Containment of all "clean" surface runoff generated from the rehabilitated areas of the ADF to clean water holding dams, with a "test and release" philosophy if the water meets the release standards;

- Containment of all “dirty” surface runoff generated from within the “dirty” catchment, conveyance and discharge into a dedicated pollution control dam sized in accordance with the requirements GN 704 in terms of the National Water Act, 1998.

Lastly, the proposed wetland offset strategy incorporated potential water losses into the calculation of the requires wetland offset targets. The quantification of flow reductions to inform the rehabilitation interventions will therefore be investigated during the next phase of the wetland offset which deals with the development of the wetland offset implementation plan.

3.3 Design Drawings for the proposed facility

The DEA letter requested that “*The design drawings for the proposed ash disposal facility must be in accordance with containment barrier design as described in Regulation 636, National Norms and Standards for Disposal of Waste to landfill dated 23 August 2013. The design drawings must be approved in writing by the Responsible Authority before construction and disposal may commence. A meeting must be arranged with the DWS Engineer by contacting Malise Neo at neom@dws.gov.za*”

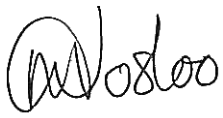
The design drawings that was included with the Draft Environmental Impact Assessment Report (DEIAr) and Final Environmental Impact Assessment Report (FEIAr) was indeed prepared in accordance with containment barrier design as described in Regulation 636, National Norms and Standards for Disposal of Waste to landfill dated 23 August 2013 as is evident from the design report and accompanying drawings that was submitted with the FEIAr to the DEA and is still available on Zitholele Consulting’s website: http://www.zitholele.co.za/environmental/ under heading “EIA for Kendal 30 Year ADF”. Furthermore the liner system designed for the proposed ADF is a Class C liner a stipulated National Norms and Standards for Disposal of Waste to landfill.

Furthermore, it is the understanding of the client and design engineers that the request for the design drawings to be approved in writing by the Responsible Authority before construction and disposal may commence refer to the detailed engineering design for the facility after an Environmental Authorisation has been issued. It was therefore understood that the meeting proposed by the DEA with the DWS Engineer referred to presentation of the detailed engineering designs prior to construction commencing.

Zitholele Consulting, however, did present the Conceptual Engineering Design to Mr. Kelvin Legge in April 2015. Minutes to this meeting is provided in Appendix E. No official communication has however been received from DWS in spite of several follow ups by the engineering team.

4 CONCLUSION

The Amended Wetland Offset Strategy Report presented here represent the proposed strategy the applicant has committed to in order to develop a wetland offset that would be applicable to the regulating authorities. This strategy, however, represent only the phase on the process. The next phase that represent the development of the detailed wetland offset implementation plan and environmental approval is considered the critical phase. It is in this phase where the feasibility and the success of implementation of the proposed offset will be determined, and additional offset options that could aid in reaching the anticipated offset targets will be investigated.



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