

TECHNICAL MEMORANDUM

PROJECT NAME: Kendal 30Year New Ash Disposal Facility
Project

PROJECT NO: 12935

TO: Ms Emmy Molepo

DATE: 18 March 2016

FROM: Mr. Nevin Rajasakran

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SUBJECT Design Considerations to avoid wetlands.

18 March 2016

12935

DOCUMENT CONTROL SHEET

Project Title: Kendal 30 Year New Ash Disposal Facility Project

Project No: 12935

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DOCUMENT APPROVAL

ACTION	DESIGNATION	NAME	DATE	SIGNATURE
Prepared	Project Engineer	N Rajasakran	18/03/16	
Reviewed	Project Manager	T Oosthuizen	18/03/16	
Approved				

RECORD OF REVISIONS

Date	Revision	Author	Comments

1 INTRODUCTION

Zitholele Consulting (ZC) has been appointed by Eskom SOC Ltd. to undertake Environmental Authorisation processes for the proposed Kendal 30 Year Ash Disposal Facility (ADF) project. A site selection process was undertaken and the outcome revealed Site H as the preferred site, as it is the site least affected by mining, closest to the Kendal Power Station and partially owned by Eskom. Conceptual engineering design ensued on this site.

Due to several restrictions on the site footprint, the new ADF as well as appurtenant infrastructure is proposed on top of wetlands and a pan. This could not be avoided in meeting the design objectives that is accommodating ash within the footprint. The proposed layout of the site is shown on Figure 1. This proposal was presented to the Department of Water and Sanitation (DWS) in August 2014, who advised that a wetland offset study should be undertaken.

The wetland offset study was initiated and has been partially completed by the appointed Specialist: Wetland Consulting Services. Eskom, in reviewing the proposed offset targets, requested ZC to revisit the design and motivate what efforts were made to avoid the wetlands. This request was made in a meeting on 02 March 2016 with the respective parties. During this meeting three wetland areas of particular importance were highlighted to be prioritised. These are:

- Hillslope Seepage Wetland to the North East of Site H on which PCD 1 is proposed;
- Hillslope Seepage Wetland to the South West of Site H on which PDC 5 & 6 is proposed; and
- The pan located on the Southern edge of Site H.

This technical memorandum documents the implications on the project if the above-mentioned wetlands are to be avoided.

2 PROJECT OBJECTIVE

The objective of the Kendal 30 year ADF Project is to supplement the disposal area for ash from when the existing ADF has reached its capacity, until the end of year 2058. This means that the new 30-year ADF should accommodate ash generated at Kendal Power Station for a period of 27 years, commencing in year 20313.

3 SITE RESTRICTIONS

The new 30-year ADF site is located to the immediate north-west of the power station, across Road 686. The site is bounded by Road 686 to the east, Route R555 and a railway line to the

north, transmission and distribution lines to the south and mining activities to the west. These restrictions defined the site boundary.

In order to place Site H in this position, gravel road D1390 as well as a Transnet fuel pipeline will already have to be deviated.

4 SITE FEASIBILITY

Several wetlands and a pan are contained within the site boundary. However, in order to ensure that the site is feasible for ash disposal until 2058, the total footprint contained within the site boundary would be taken up which meant that several wetlands would be compromised.

There are several pollution control dams and clean water dams proposed for the development. Due to the site topography, and design optimisation avoiding massive earthworks (and hence high capital costs) to drain the site unnaturally, some of these dams were positioned on top of the wetlands, which are the localised low points.

5 TECHNICAL IMPLICATIONS OF WETLAND AVOIDANCE

A technical assessment was done to look at the impacts of the new 30year ADF as well as the appurtenant infrastructure if some of the wetlands and the pan were avoided. The pan and wetland to the east of the facility was determined as priority features to be avoided. A buffer of two hundred meters was created outside the pan and fifty metres outside the hillslope seepage wetlands delineation. The size of the buffers were not informed by scientific modelling, but were merely used as a starting point for the remodelling. The new ADF was then remodelled in order to determine the volume that can be accommodated within this new footprint. The operational philosophy of the stacking system, was also required to be changed, as to now accommodate the much narrower approach to the facility. The revised layout is shown on Figure 2.

The airspace modelling revealed that 18 percent less volume may be accommodated in the modified footprint. This roughly translates to 5 years lost in ash disposal.

Dams 1, 5 and 6 were also moved out of the wetlands. Dams 5 and 6 have now become significantly deeper due to the levels required to drain into them which will have an impact on the categorisation with the dam safety office. The requirements for dam safety will also be more stringent due to the significantly deeper dam. The deeper dam will need to be constructed at a much higher costs due to the hardness of the material to be excavated.

6 CONCLUSION

The new 30year ADF will lose 5 years' of storage space if the geometry is modified to accommodate the wetlands and pan. Eskom will have to find another storage area for the ash for the period of 5 years. Construction works will entail a higher capital costs due to the additional bulk earthworks that is required.

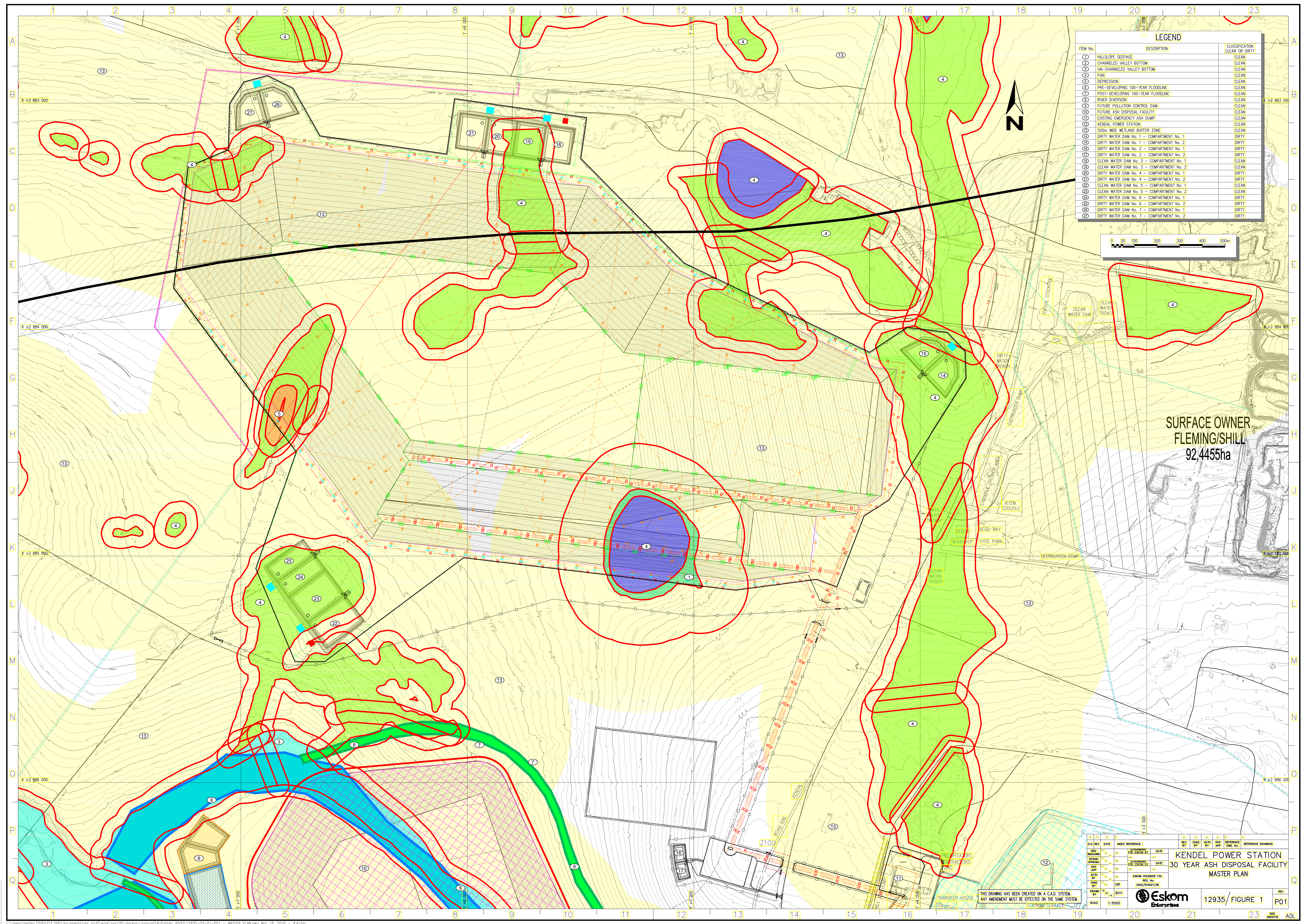


Nevin Rajasakran PrEng PrCPM
Project Engineer

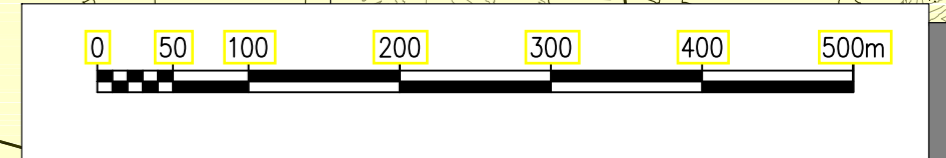


Tania Oosthuizen
Project Manager

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ITEM No.	DESCRIPTION	CLASSIFICATION CLEAN OR DIRTY
1	HILLSLOPE SEPPAGE	CLEAN
2	CHANNELED VALLEY BOTTOM	CLEAN
3	UN-CHANNELED VALLEY BOTTOM	CLEAN
4	PAN	CLEAN
5	DEPRESSION	CLEAN
6	PRE-DEVELOPING 100-YEAR FLOODLINE	CLEAN
7	POST-DEVELOPING 100-YEAR FLOODLINE	CLEAN
8	RIVER DIVERSION	CLEAN
9	FUTURE POLLUTION CONTROL DAM	CLEAN
10	FUTURE ASH DISPOSAL FACILITY	CLEAN
11	EXISTING EMERGENCY ASH DUMP	CLEAN
12	KENEL POWER STATION	CLEAN
13	500m WIDE WETLAND BUFFER ZONE	CLEAN
14	DIRTY WATER DAM No. 1 - COMPARTMENT No. 1	DIRTY
15	DIRTY WATER DAM No. 2 - COMPARTMENT No. 2	DIRTY
16	DIRTY WATER DAM No. 3 - COMPARTMENT No. 1	CLEAN
17	CLEAN WATER DAM No. 3 - COMPARTMENT No. 2	CLEAN
18	DIRTY WATER DAM No. 4 - COMPARTMENT No. 1	DIRTY
19	DIRTY WATER DAM No. 4 - COMPARTMENT No. 2	DIRTY
20	CLEAN WATER DAM No. 5 - COMPARTMENT No. 1	CLEAN
21	CLEAN WATER DAM No. 5 - COMPARTMENT No. 2	CLEAN
22	DIRTY WATER DAM No. 6 - COMPARTMENT No. 1	DIRTY
23	DIRTY WATER DAM No. 7 - COMPARTMENT No. 1	DIRTY
24	DIRTY WATER DAM No. 7 - COMPARTMENT No. 2	DIRTY



SURFACE OWNER
FLEMING/SHILL
 92,4455ha

REV	DATE	BY	CHKD	APPD	REF	DESCRIPTION
01	18/03/2016	NR	BVV	NR		ISSUED FOR PERMITS
02	18/03/2016	NR	BVV	NR		ISSUED FOR PERMITS
03	18/03/2016	NR	BVV	NR		ISSUED FOR PERMITS
04	18/03/2016	NR	BVV	NR		ISSUED FOR PERMITS
05	18/03/2016	NR	BVV	NR		ISSUED FOR PERMITS
06	18/03/2016	NR	BVV	NR		ISSUED FOR PERMITS
07	18/03/2016	NR	BVV	NR		ISSUED FOR PERMITS
08	18/03/2016	NR	BVV	NR		ISSUED FOR PERMITS
09	18/03/2016	NR	BVV	NR		ISSUED FOR PERMITS
10	18/03/2016	NR	BVV	NR		ISSUED FOR PERMITS
11	18/03/2016	NR	BVV	NR		ISSUED FOR PERMITS
12	18/03/2016	NR	BVV	NR		ISSUED FOR PERMITS
13	18/03/2016	NR	BVV	NR		ISSUED FOR PERMITS
14	18/03/2016	NR	BVV	NR		ISSUED FOR PERMITS
15	18/03/2016	NR	BVV	NR		ISSUED FOR PERMITS
16	18/03/2016	NR	BVV	NR		ISSUED FOR PERMITS
17	18/03/2016	NR	BVV	NR		ISSUED FOR PERMITS
18	18/03/2016	NR	BVV	NR		ISSUED FOR PERMITS
19	18/03/2016	NR	BVV	NR		ISSUED FOR PERMITS
20	18/03/2016	NR	BVV	NR		ISSUED FOR PERMITS
21	18/03/2016	NR	BVV	NR		ISSUED FOR PERMITS
22	18/03/2016	NR	BVV	NR		ISSUED FOR PERMITS
23	18/03/2016	NR	BVV	NR		ISSUED FOR PERMITS

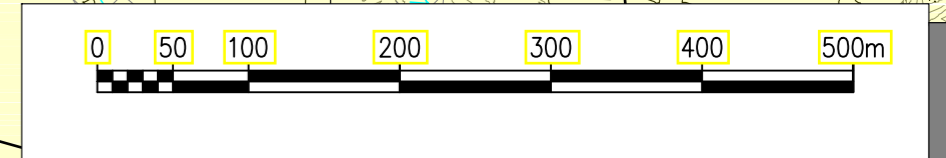
KENEL POWER STATION
30 YEAR ASH DISPOSAL FACILITY
MASTER PLAN



12935 / FIGURE 1
 PO1



ITEM No.	DESCRIPTION	CLASSIFICATION
1	HILLSLOPE SEEPAGE	CLEAN
2	CHANNELLED VALLEY BOTTOM	CLEAN
3	UN-CHANNELLED VALLEY BOTTOM	CLEAN
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001	18/03/2016	ISSUED FOR PERMIT	001	18/03/2016	ISSUED FOR PERMIT

KENDEL POWER STATION
30 YEAR ASH DISPOSAL FACILITY
MASTER PLAN

ESKOM HOLDINGS LTD.
 2002/201927/06

SCALE: 1:5000

12935 / FIGURE 2