



environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

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NEAS Reference: DEA/EIA/0001416/2012

DEA Reference: 14/12/16/3/3/3/52

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Ms Deidre Herbst
Eskom Holding SOC Limited
P.O. Box 1091
JOHANNESBURG
2000

Fax No: 086-660-6092
Tel No: 011-800-3501
E-Mail: HerbstDL@eskom.co.za

PER FACSIMILE / MAIL

Dear Ms Herbst

APPLICATION FOR INTEGRATED ENVIRONMENTAL AUTHORISATION IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998: GN R. 543 AND NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE ACT, 2008 GOVERNMENT NOTICE 921: EXTENSION OF ASH DISPOSAL FACILITY AT TUTUKA POWER STATION MPUMALANGA PROVINCE

With reference to the above application, please be advised that the Department has decided to grant authorisation. The environmental authorisation (EA) and reasons for the decision are attached herewith.

In terms of regulation 10(2) of the Environmental Impact Assessment Regulations, 2010 (the Regulations), you are instructed to notify all registered interested and affected parties, in writing and within 12 (twelve) days of the date of the EA, of the Department's decision in respect of your application as well as the provisions regarding the submission of appeals that are contained in the Regulations.

Your attention is drawn to Chapter 7 of the Regulations, which prescribes the appeal procedure to be followed. This procedure is summarised in the attached document. Kindly include a copy of this document with the letter of notification to interested and affected parties.

Should the applicant or any other party wish to appeal any aspect of the decision a notice of intention to appeal must be lodged by all prospective appellants with the Minister, within 20 days of the date of the EA, by means of one of the following methods:

By post: Private Bag X447,
Pretoria, 0001; or
By hand: Environment House

M.S.

473 Steve Biko,
Arcadia,
Pretoria, 0083

If the applicant wishes to lodge an appeal, it must also serve a copy of the notice of intention to appeal on all registered interested and affected parties as well as a notice indicating where, and for what period, the appeal submission will be available for inspection, should you intend to submit an appeal.

Appeals must be submitted in writing to:

Mr Z Hassam Director: Appeals and Legal Review, of this Department at the above mentioned addresses or fax number. Mr Hassam can also be contacted at:

Tel: (012) 399 9356

Email: AppealsDirectorate@environment.gov.za

The authorised activities shall not commence within twenty (20) days of the date of signature of the authorisation. Further, please note that in terms of section 43(7) of the National Environmental Management Act, 1998, an appeal under section 43 of that Act will suspend the environmental authorisation or any provision or condition attached thereto. In the instance where an appeal is lodged, you may not commence with the activity until such time that the appeal is finalised.

Yours faithfully



Mr Sabelo Malaza

Chief Director: Integrated Environmental Authorisations

Department of Environmental Affairs

Date: 19/10/2015

CC: Mr D Brummer	Lidwala Specialist Solutions dbrummer@lidwala.com	Tel: 011-793-5486	Fax: 086-600-6757
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APPEALS PROCEDURE IN TERMS OF CHAPTER 7 OF THE NEMA EIA REGULATIONS, 2010 (THE REGULATIONS) AS PER GN R. 543 OF 2010 TO BE FOLLOWED BY THE APPLICANT AND INTERESTED AND AFFECTED PARTIES UPON RECEIPT OF NOTIFICATION OF AN ENVIRONMENTAL AUTHORISATION (EA)

APPLICANT	INTERESTED AND AFFECTED PARTIES (IAPs)
1. Receive EA from the relevant Competent Authority (the Department of Environmental Affairs [DEA]).	1. Receive EA from Applicant/Consultant.
2. Within 12 days of date of the EA notify all IAPs of the EA and draw their attention to their right to appeal against the EA in terms of Chapter 7 of the Regulations.	2. N/A.
3. If you want to appeal against the EA, submit a notice of intention to appeal within 20 days of the date of the EA with the Minister of Environmental Affairs (the Minister).	3. If you want to appeal against the EA, submit a notice of intention to appeal within 20 days of the date of the EA. with the Minister of Environmental Affairs (the Minister).
4. After having submitted your notice of intention to appeal to the Minister, provide each registered IAP with a copy of the notice of intention to appeal within 10 days of lodging the notice.	4. After having submitted your notice of intention to appeal to the Minister, provide the applicant with a copy of the notice of intention to appeal within 10 days of lodging the notice.
5. The Applicant must also serve on each IAP: <ul style="list-style-type: none"> • a notice indicating where and for what period the appeal submission will be available for inspection. 	5. Appellant must also serve on the Applicant within 10 days of lodging the notice, <ul style="list-style-type: none"> • a notice indicating where and for what period the appeal submission will be available for inspection by the applicant.
6. The appeal must be submitted in writing to the Minister within 30 days after the lapsing of the period of 20 days provided for the lodging of the notice of intention to appeal.	6. The appeal must be submitted to the Minister within 30 days after the lapsing of the period of 20 days provided for the lodging of the notice of intention to appeal.
7. Any IAP who received a notice of intention to appeal may submit a responding statement to that appeal to the Minister within 30 days from the date that the appeal submission was lodged with the Minister.	7. An Applicant who received notice of intention to may submit a responding statement to the appeal to the Minister within 30 days from the date that the appeal submission was lodged with the Minister.

NOTES:

1. **An appeal must be:-**
 - a) submitted in writing;
 - b) accompanied by:
 - a statement setting out the grounds of appeal;
 - supporting documentation which is referred to in the appeal; and
 - a statement that the appellant has complied with regulation 62 (2) or (3) together with copies of the notices referred to in regulation 62.



environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

Integrated Environmental Authorisation Issued in terms of
The National Environmental Management Act, 1998 and the Environmental Impact
Assessment Regulations 2010
And
The National Environmental Management: Waste Act, 2008 and Government Notice 921
of 2013

Extension of ash disposal facility for Tutuka Power Station, Mpumalanga Province

Gert Sibande District Municipality

Authorisation register number:	14/12/16/3/3/3/52
Last amended:	First Issue
Holder of integrated authorisation:	Eskom Holding SOC Limited
Location of activities:	MPUMALANGA PROVINCE: On portions 1, 2, 5, 25, 27 and 28 of the Farm Rouxland 348 IS, portions 1 and 6 of the Farm Mooimeisjesfontein 376 IS and portion 2 and Remander of the Farm Spioen kop 375 IS , within Lekwa Local Municipality

This authorisation does not negate the holder of the authorisation's responsibility to comply with any other statutory requirements that may be applicable to the undertaking of the activity.

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1. DECISIONS

The Department is satisfied, on the basis of information available to it and subject to compliance with the conditions of this integrated environmental authorisation (“the environmental authorisation”) that the applicant should be authorised to undertake the NEMA EIA and NEMWA listed activities specified below.

Details regarding the basis on which the Department reached this decision are set out in Annexure “I” to this environmental authorisation.

2. NEMA EIA AND NEMWA ACTIVITIES AUTHORISED

By virtue of the powers conferred on it by NEMA, the NEMA EIA Regulations, 2010, NEMWA and Government Notice 921 of November 2013 the Department hereby authorises –

ESKOM HOLDING SOC LIMITED

with the following contact details –

Ms Deidre Herbst

Eskom Holding SOC Limited

P.O. Box 1091

JOHANNESBURG

2000

Fax No: 086-660-6092

Tel No: 011-800-3501

E-Mail: HerbstDL@eskom.co.za

to undertake the following activities (hereafter referred to as "the activities"):

Listed activities	Activity/Project description
<p><u>GN R. 544 Item 9</u></p> <p><i>The construction of facilities or infrastructure exceeding 1000 meters in length for the bulk transportation of water</i></p> <p>(i) <i>with an internal diameter of 0.36 meters or more</i></p> <p>or</p> <p>(ii) <i>(ii) with a peak throughput of 120 litres per second or more</i></p>	<p>Water from ash disposal facility will be transported to the ash water return dams around the facility. Also, dirty water channels will collect the runoff from the emergency storage facility.</p>
<p><u>GN R. 544 Item 11:</u></p> <p><i>The construction of:</i></p> <p>(xi) <i>infrastructure or structures covering 50 square metres or more</i></p> <p><i>where such construction occurs within a watercourse or within 32 metres of a watercourse, measures from the edge of a watercourse , excluding where such construction will occur behind the development setback line</i></p>	<p>The ash disposal facility has a footprint of approximately 1100ha and will span across several wetlands.</p>
<p><u>GN R. 544 Item 18:</u></p> <p><i>The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic metres from:</i></p> <p>(i) <i>a watercourse;</i></p>	<p>Topsoil will be removed from identified wetland areas and the ash will be disposed in these areas.</p>
<p><u>GN R. 544 Item 22:</u></p> <p><i>The construction of a road, outside urban areas,</i></p> <p>(i) <i>with a reserve wider than 13,5 meters or,</i></p>	<p>Access road to the facility will be constructed.</p>
<p><u>GN R. 544 Item 24:</u></p> <p><i>The transformation of land bigger than 1000 square metres in size, to residential, retail, commercial, industrial or institutional use, where, at the time of the coming into effect of this Schedule or thereafter such land was zoned open space, conservation or had an equivalent zoning</i></p>	<p>Proposed site for development is currently agricultural land.</p>
<p><u>GN R. 544 Item 28:</u></p> <p><i>The expansion of or changes to existing facilities for any process or activity where such expansion or changes to will result in the need for a permit or license in terms of</i></p>	<p>The extension of ashing facilities will result in amendments to the AEL and WULA.</p>

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Listed activities	Activity/Project description
<p><i>national or provincial legislation governing the release of emissions or pollution, excluding where the facility, process or activity is included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No 59 of 2008 in which case that Act will apply.</i></p>	
<p><u>GN R. 544 Item 37:</u> <i>The expansion of facilities or infrastructure for the bulk transportation of water, sewage or storm water where:</i> <i>(a) the facility or infrastructure is expanded by more than 1000 metres in length; or</i> <i>(b) where the throughput capacity of the facility or infrastructure will be increased by 10% or more–</i></p>	<p>The existing infrastructure transporting the leachate to the AWRD will be expanded in order to cater for the new increased capacity.</p>
<p><u>GN R. 544 Item 39:</u> <i>The expansion of:</i> <i>(i) canals,</i> <i>(ii) channels,</i> <i>(v) bulk storm water outlet structures</i> <i>within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, where such expansion will result in an increased development footprint but excluding where such expansion will occur behind the development setback line.</i></p>	<p>The expansion of the existing infrastructure will take place within wetland areas.</p>
<p><u>GN R. 544 Item 40:</u> <i>The expansion of:</i> <i>(iv) Infrastructure by more than 50 square metres</i> <i>within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, but excluding where such expansion will occur behind the development setback line.</i></p>	<p>The ash disposal facility will span across several wetland areas.</p>
<p><u>GN R. 544 Item 47:</u> <i>The widening of a road by more than 6 meters or the lengthening of a road by more than 1 kilometre where no reserve exists, where the existing reserve is wider than 13,5 meters or where the existing road is wider than 8</i></p>	<p>Roads that form part of the service infrastructure around the facility be expanded to accommodate the expanded facility.</p>

Listed activities	Activity/Project description
<i>meters.</i>	
<p><u>GN R. 544 Item 49:</u> <i>The expansion of facilities or infrastructure for the bulk transportation of dangerous goods in solid form, outside an industrial complex or zone, by an increased throughput capacity of 50 tons or more per day.</i></p>	<p>The expansion of the facility may increase throughput capacity by 50 tons or more per day.</p>
<p><u>GN R. 545 Item 6:</u> <i>The construction of facilities or infrastructure for the bulk transportation of dangerous goods in solid form, outside an industrial complex, using funiculars or conveyors with a throughput capacity of more than 50 tons per day</i></p>	<p>The ash disposal facility will be expanded and the ash will be transported by a conveyor.</p>
<p><u>GN R. 545 Item 15:</u> <i>Physical alteration of undeveloped, vacant or derelict land for residential, retail, commercial, recreational, industrial or institutional use, where the total area to be transformed is 20 hectares or more</i></p>	<p>Vacant land bigger than 20ha will be transformed for the expansion of the ash disposal facility.</p>
<p><u>GN R. 545 Item 26:</u> <i>Commencing of an activity, which requires an atmospheric emission license in terms of section 21 of the National Environmental Management: Air Quality Act 2004 (Act 39 of 2004), except where such commencement requires basic assessment in terms of Notice R544 of 2010</i></p>	<p>This activity is applicable for the service infrastructure.</p>
<p><u>GN R. 546 Item 4:</u> <i>The construction of a road wider than 4 meters with a reserve less than 13.5 meters outside urban areas, in:</i> <i>aa) A protected area identified in terms of NEMPAA, excluding conservancies;</i> <i>(bb) National Protected Area Expansion Strategy Focus areas;</i> <i>(dd) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;</i> <i>(ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;</i> <i>(hh) Areas within 10 kilometres from national parks or</i></p>	<p>This activity is applicable for the service infrastructure.</p>

Listed activities	Activity/Project description
<p><i>world heritage Sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve.</i></p>	
<p><u>GN R. 546 Item 16:</u></p> <p><i>The construction of infrastructure outside urban areas in sensitive areas covering 10 square meters or more where such construction occurs within a watercourse or within 32 meters of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line outside urban areas, in:</i></p> <p><i>(aa) A protected area identified in terms of NEMPAA, excluding conservancies;</i></p> <p><i>(bb) National Protected Area Expansion Strategy Focus areas;</i></p> <p><i>(dd) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;</i></p> <p><i>(ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;</i></p> <p><i>(hh) Areas within 10 kilometres from national parks or world heritage Sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve.</i></p>	<p>The expansion of the ash disposal facility will transcend a couple of areas identified as wetlands.</p>
<p><u>GN R. 546 Item 19:</u></p> <p><i>The widening of a road by more than 4 meters or lengthening of a road by more than 1 kilometre, outside urban areas, in:</i></p> <p><i>aa) A protected area identified in terms of NEMPAA, excluding conservancies;</i></p> <p><i>(bb) National Protected Area Expansion Strategy Focus areas;</i></p> <p><i>(dd) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;</i></p> <p><i>(ff) Critical biodiversity areas or ecosystem service areas</i></p>	<p>This activity is applicable for the service infrastructure.</p>

Listed activities	Activity/Project description
<p><i>as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;</i> <i>(hh) Areas within 10 kilometres from national parks or world heritage Sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve.</i></p>	
<p><u>GN R. 546 Item 24:</u> <i>The expansion of infrastructure where the infrastructure will be expanded by 10 square meters or more where such construction occurs within a watercourse or within 32 meters of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line outside urban areas, in:</i> <i>(aa) A protected area identified in terms of NEMPAA, excluding conservancies;</i> <i>(bb) National Protected Area Expansion Strategy Focus areas;</i> <i>(dd) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;</i> <i>(ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;</i> <i>(hh) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve.</i></p>	<p>The ash disposal facility will be expanded by 10 square metres affecting upon the wetland.</p>
<p><u>GN R. 921 Category A Item 13:</u> <i>The expansion of a waste management activity listed in Category A or B of this schedule which does not trigger an additional waste management activity in terms of this schedule.</i></p>	<p>The ash disposal facility will be expanded to accommodate the ash disposal requirements for the next 41 years.</p>
<p><u>GN R. 921 Category B Item 7</u> <i>The disposal of any quantities of hazardous waste to</i></p>	<p>The ash is classified as Type 3 hazardous waste.</p>

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Listed activities	Activity/Project description
<i>land.</i>	
<u>GN R. 921 Category B Item 10</u> <i>The construction of facilities for activities listed in Category B of this schedule (not in isolation to associated activity).</i>	Construction of the expanded ash disposal facility.
<u>GN R. 921 Category C Item 2</u> <i>The storage of hazardous waste at the facility that has the capacity to store in excess of 80m³ of Type 3 hazardous waste.</i>	The emergency storage facility will be extended within the footprint of the power station.

as described in the Environmental Impact Assessment Report (EIR) dated December 2014 at:

Alternative S1	Coordinates	
	SOUTH	EAST
A	29° 24' 56.88"	26° 45' 48.28"
B	29° 25' 5.91" 2	26° 45' 50.31"
C	29° 25' 32.51"	26° 45' 55.12"
D	29° 25' 35.11"	26° 45' 58.82"
E	29° 25' 46.17"	26° 46' 34.85"
F	29° 25' 52.34"	26° 46' 51.43"
G	29° 25' 34.76"	26° 46' 59.83"
H	29° 25' 35.20"	26° 47' 21.76"
J	29° 25' 31.64"	26° 47' 27.10"
K	29° 25' 21.68"	26° 47' 30.59"
L	29° 25' 3.69"	26° 47' 2.84"
M	29° 24' 45.47"	26° 47' 10.60"
N	29° 24' 45.93"	26° 47' 33.98"
P	29° 23' 55.72"	26° 47' 28.63"
Q	29° 23' 27.26"	26° 47' 33.23"
R	29° 23' 28.34"	26° 46' 36.09"
S	29° 24' 46.60"	26° 46' 49.00"
T	29° 25' 3.64"	26° 46' 50.80"
U	29° 25' 6.19"	26° 46' 41.83"
V	29° 24' 51.93"	26° 46' 37.48"

for the extension of ash disposal facility for Tutuka Power Station On portions 1, 2, 5, 25, 27 and 28 of the Farm Rouxland 348 IS, portions 1 and 6 of the Farm Mooimeisjesfontein 376 IS and portion 2 and Remainder of the Farm Spioen kop 375 IS within Lekwa Local Municipality in the Mpumalanga Province, hereafter referred to as "the property".

The proposed development has the following specifications:

- Capacity of airspace ~158million m³; and
- Ground footprint of ~800Ha (Ash disposal facility & pollution control canals)

3. SCOPE OF AUTHORISATION

- 3.1 Authorisation is granted for the extension of ash disposal facility for Tutuka Power station within site co-ordinates as indicated above. Site Alternative A for ash disposal is hereby approved.
- 3.2 Authorisation of the activities is subject to the conditions contained in this authorisation, which form part of the environmental authorisation and are binding on the holder of the environmental authorisation.
- 3.3 The Department shall by written notice to the holder of an environmental authorisation suspend with immediate effect an environmental authorisation if suspension of the authorisation is necessary to prevent harm or further harm to the environment.
- 3.4 The activities must commence within a period of five (5) years from the date of issue. If commencement of the activity does not occur within that period, the environmental authorisation lapses and a new application for an environmental authorisation must be made for the activities to be undertaken. Commencement with one activity listed in terms of this authorisation constitutes commencement of all authorised activities.
- 3.5 The holder of the environmental authorisation shall be responsible for ensuring compliance with the conditions contained in this environmental authorisation. This includes any person acting on the holder's behalf, including but not limited to, an agent, servant, contractor, sub-contractor, employee, consultant or person rendering a service to the holder of the authorisation.
- 3.6 Any changes to, or deviations from, the project description set out in this authorisation must follow the amendment processes as prescribed in Chapter 4 (Parts 1-3) of the NEMA EIA Regulations, 2010 and be approved, in writing, by the Department before such changes or deviations may be effected. In assessing whether to grant such approval or not, the Department may request such information as it deems necessary to evaluate the significance and impacts of such changes or deviations and it may be necessary for the holder of the authorisation to apply for further authorisation in terms of the regulations.

4. NOTIFICATION OF AUTHORISATION AND RIGHT TO APPEAL

- 4.1 The holder of the authorisation must notify every registered interested and affected party, in writing and within 12 (twelve) calendar days of the date of this environmental authorisation, of the decision to authorise the activity.
- 4.2 The notification referred to must –
- 4.2.1 specify the date on which the authorisation was issued;
- 4.2.2 inform the interested and affected party of the appeal procedure provided for in Chapter 7 of the Environmental Impact Assessment (EIA) Regulations, 2010;
- 4.2.3 advise the interested and affected party that a copy of the authorisation will be furnished on request; and
- 4.2.4 give the reasons for the decision.
- 4.3 The holder of the authorisation must publish a notice –
- 4.3.1 informing interested and affected parties of the decision;
- 4.3.2 informing interested and affected parties where the decision can be accessed; and
- 4.3.3 drawing the attention of interested and affected parties to the fact that an appeal may be lodged against this decision in the newspaper(s) contemplated and used in terms of regulation 54(2)(c) and (d) and which newspaper was used for the placing of advertisements as part of the public participation process.
- 4.4 The holder of the environmental authorisation must, in writing, within 12 days of the date of the decision on the application–
- (a) notify all registered interested and affected parties of–
- (i) the outcome of the application; and
- (ii) the reasons for the decision;
- (b) draw the attention of all registered interested and affected parties to the fact that an appeal may be lodged against the decision in terms of Chapter 7 of the NEMA EIA Regulations, 2010 if such appeal is available in the circumstances of the decision;
- (c) draw the attention of all interested and affected parties to the manner in which they can access the decision; and
- (d) publish a notice–
- (i) informing interested and affected parties of the decision;
- (ii) informing interested and affected parties where the decision can be accessed; and
- (iii) drawing the attention of interested and affected parties to the fact that an appeal may be lodged against the decision in terms of Chapter 7 of the NEMA EIA Regulations, 2010, if such appeal is available under the circumstances of the decision; in the

newspapers contemplated in regulation 54(2)(c) and (d) of the NEMA EIA Regulations, 2010 and which newspaper was used for the placing of advertisements as part of the public participation process.

5. MANAGEMENT OF THE ACTIVITY

- 5.1. The detailed final development layout map must be submitted to the Department for written approval prior to commencement of the activities. All available biodiversity information must be used in the finalisation of the layout map. Existing infrastructure must be used as far as possible e.g. roads. The site layout plan must indicate the following:
 - 5.1.1. Position of the continuous ash disposal facility and associated infrastructure;
 - 5.1.2. Foundation footprint;
 - 5.1.3. Internal roads indicating width;
 - 5.1.4. Wetlands, drainage lines, rivers, stream and water crossing of the facility's associated infrastructure;
 - 5.1.5. All sensitive features e.g. heritage sites, wetlands, pans and drainage channels that will be affected by the facility and associated infrastructure;
 - 5.1.6. All existing infrastructure on the site, especially roads;
 - 5.1.7. Soil heaps (temporary for topsoil and subsoil and permanently for excess material);
 - 5.1.8. Temporary construction laydown areas;
 - 5.1.9. Buildings, including accommodation; and,
 - 5.1.10. All "no-go" and buffer areas.; and
 - 5.1.11. A map combining the final layout plan superimposed (overlain) on the environmental sensitivity map with the co-ordinates of all associated infrastructure.
- 5.2. The Environmental Management Programme (EMPr) submitted as part of the Application for EA is hereby approved. This EMPr must be implemented and adhered to.
- 5.3. Should there be changes in the operation and management of the authorised activities; the EMPr must be amended to accommodate those changes and be submitted to this Department for written approval before implementation incorporated as part of the EMPr. Once approved, the EMPr must be implemented and adhered to.
- 5.4. The approved EMPr and operational EMPr for the disposal facility must be implemented and strictly enforced during all phases of the project. It shall be seen as a dynamic document and shall be included in all contract documentation for all phases of the development.

- 5.5. Changes to the EMPr and the operational EMPr for the disposal facility which are environmentally defensible, shall be submitted to this Department for acceptance before such changes could be effected.
- 5.6. The Department reserves the right to request amendments to the EMPr and the operational EMPr for the disposal facility should any impacts that were not anticipated or covered in the EIR be discovered.
- 5.7. The provisions of the approved EMPr and the operational EMPr for the disposal facility including the mitigation measures identified in the EIR and specialist' studies shall be an extension of the conditions of this EA and therefore noncompliance with them would constitute non-compliance with the EA.
- 5.8. The ash management system must be managed and operated:
 - 5.8.1. In accordance with an approved EMPr, that inter alia identifies and minimises risks of pollution, including those arising from operations, maintenance, accidents, incidents and non-conformances and those drawn to the attention of the holder of the environmental authorisation as a result of complaints;
 - 5.8.2. By sufficient persons who are competent in respect of the responsibilities to be undertaken by them in connection with the operation of the activities.
- 5.9. The holder of authorisation must maintain and ensure continued functioning of a Monitoring Committee for the normal operative lifetime of the site operational process and for a period of at least two years after the closure of the site, or at such longer period as may be determined by the Department.
- 5.10. The Monitoring Committee must formulate terms of reference and code of conduct, according to the Minimum Requirements, Second Edition 1998 by Department of Water Affairs and Forestry or its successor.
- 5.11. The Monitoring Committee must be comprised of relevant interested and affected parties.
- 5.12. The Monitoring Committee must meet at least twice a year and not later than 30 days after the external audit report specified in Condition 17.4.4 has been submitted according to Condition 17.4.4. (c).
- 5.13. The holder of authorisation must keep minutes of all the meetings of the Monitoring Committee and distribute these minutes to all members of the Monitoring Committee within 14 days after the meeting.

6. ENVIRONMENTAL CONTROL OFFICER (ECO)

- 6.1 The holder of this authorisation must appoint an independent Environmental Control Officer (ECO) with experience or expertise in the field for the construction phase of the development. The ECO will have the responsibility to ensure that the conditions referred to in this authorisation are implemented and to ensure compliance with the provisions of the EMPr.
- 6.2 The ECO must be appointed before commencement of any authorised activity.
- 6.3 Once appointed, the name and contact details of the ECO must be submitted to the Director: Compliance Monitoring of the Department.
- 6.4 The ECO must remain employed until all rehabilitation measures, as required for implementation due to construction damage, are completed and the site is ready for operation.
- 6.4.1 The ECO must:
- 6.4.2 Keep record of all activities on site, problems identified, transgressions noted and a schedule of tasks undertaken by the ECO.
- 6.4.3 Keep and maintain a detailed incident (including spillage of bitumen, fuels, chemicals, or any other material) and complaint register on site indicating how these issues were addressed, what rehabilitation measures were taken and what preventative measures were implemented to avoid re-occurrence of incidents/complaints.
- 6.4.4 Keep and maintain a daily site diary.
- 6.4.5 Keep copies of all reports submitted to the Department.
- 6.4.6 Keep and maintain a schedule of current site activities including the monitoring of such activities.
- 6.4.7 Obtain and keep record of all documentation, permits, licences and authorisations such as waste disposal certificates, hazardous waste landfill site licences etc. required by this facility.
- 6.4.8 Compile a monthly monitoring report.

7. WASTE MANAGEMENT CONTROL OFFICER (WMCO)

- 7.1 The applicant must designate a Waste Management Control Officer (WMCO) in writing, who will monitor and ensure compliance and correct implementation of all conditions and provisions as stipulated in the environmental authorisation and approved EMPr related to the ash disposal facility.

- 7.2 The WMCO must report any non-compliance with any environmental authorisation conditions or requirements or provisions of NEMWA to the Department through the means reasonably available.
- 7.3 The duties and responsibility of the WMCO should not be seen as exempting the holder of the environmental authorisation from the legal obligations in terms of the NEMWA.

8. RECORDING AND REPORTING TO THE DEPARTMENT

- 8.1 The holder of this authorisation must keep all records relating to monitoring and auditing on site and make it available for inspection to any relevant and competent authority in respect of this development.
- 8.2 All records and/or reports required or resulting from activities relating to this environmental authorisation must:
- 8.2.1 be legible;
 - 8.2.2 be submitted as required and must form part of the external audit report;
 - 8.2.3 if amended, the record and/or report must be amended in such a way that the original and any subsequent amendments remain legible and are easily retrievable; and
 - 8.2.4 be retained in accordance with documented procedures which are approved by the Department.
- 8.3 All documentation e.g. audit/monitoring/compliance reports and notifications, required to be submitted to the Department in terms of this authorisation, must be submitted to the Director: Compliance Monitoring at the Department.
- 8.4 Records demonstrating compliance with conditions of this EA must be maintained for five years.
- 8.5 The holder of the environmental authorisation must keep records and update all the information referred to in Annexure II and submit this information to the Department on an annual basis.

9. ENVIRONMENTAL AUDIT REPORT FOR CONSTRUCTION

- 9.1 The holder of the authorisation must submit an environmental audit report to the Department within 30 days of completion of the construction phase (i.e. within 30 days of site handover) and within 30 days of completion of rehabilitation activities.
- 9.2 The environmental audit report must:
- 9.2.1 Be compiled by an independent environmental auditor;
 - 9.2.2 Indicate the date of the audit, the name of the auditor and the outcome of the audit;

- 9.2.3 Evaluate compliance with the requirements of the approved EMPr and this environmental authorisation;
- 9.2.4 Include measures to be implemented to attend to any non-compliances or degradation noted;
- 9.2.5 Include copies of any approvals granted by other authorities relevant to the development for the reporting period;
- 9.2.6 Highlight any outstanding environmental issues that must be addressed, along with recommendations for ensuring these issues are appropriately addressed;
- 9.2.7 Include a copy of this authorisation and the approved EMPr;
- 9.2.8 Include all documentation such as waste disposal certificates, hazardous waste landfill site licences etc. pertaining to this authorisation for waste streams that will be generated during construction; and
- 9.2.9 Include evidence of adherence to the conditions of this authorisation and the EMPr where relevant such as training records and attendance records.

10. COMMENCEMENT OF ACTIVITIES

- 10.1 The authorised activity shall not commence within twenty (20) days of the date of signature of the authorisation.
- 10.2 An appeal under section 43 of the National Environmental Management Act (NEMA), Act 107 of 1998 (as amended), suspend an environmental authorisation or exemption, or any provisions or conditions attached thereto.
- 10.3 Should you be notified by the Minister of a suspension of the authorisation pending appeal procedures, you may not commence with the activity until such time that the Minister allows you to commence with such an activity in writing.
- 10.4 The holder of this authorisation must obtain a Water Use Licence from the Department of Water and Sanitation (DWS) prior to the commencement of the project should the holder impact on any wetland or water resource. A copy of the license must be submitted to the Chief *Director: Integrated Environmental Authorisations* at the Department.
- 10.5 The holder of this authorisation must obtain Atmospheric Emission Licence from relevant authority prior to commencement of the project should the project trigger listed activities in terms of the National Environmental Management: Air Quality Act 39 of 2004. The copy of the licence obtained must be included in the first audit submitted to the Department.

11. NOTIFICATION TO AUTHORITIES

- 11.1 Fourteen (14) days written notice must be given to the Department that the activity will commence. Commencement for the purposes of this condition includes site preparation. The notice must include a date on which it is anticipated that the activity will commence. This notification period may coincide with the Notice of Intent to Appeal period, within which construction may not commence.
- 11.2 After construction of the site or further development within the site, the EA holder shall notify the Chief Director: Integrated Environmental Authorisations thereof and the Registered Professional Engineer shall submit a certificate or alternatively a letter to the Chief Director: Integrated Environmental Authorisations that the construction of the site or further development within the site, as proposed by the EA holder and approved by the Chief Director: Integrated Environmental Authorisations is in accordance with recognised civil engineering practice and the requirements in this EA before disposal may commence on the site. If the Chief Director: Integrated Environmental Authorisations is satisfied with the construction of the site or any further development within the site and has given written permission, the EA holder may use the site or any further development within the site for the disposal of waste.

12. OPERATION OF THE ACTIVITY

- 12.1 Fourteen (14) days written notice must be given to the Department that the activity operational phase will commence.
- 12.2 The holder of this authorisation must compile an operational EMP for the operational phase of the activity or alternatively, if the holder has an existing operational environmental management system, it must be amended to include the operation of the authorised activity.

13. SITE CLOSURE AND DECOMMISSIONING

- 13.1 Should the activity ever cease or become redundant, the applicant shall undertake the required actions as prescribed by legislation at the time and comply with all relevant legal requirements administered by any relevant and competent authority at that time.

14. LEASING AND ALIENATION OF THE SITE

- 14.1 Should the holder of the environmental authorisation want to alienate or lease the site, he/she shall notify the Department in writing of such an intention at least 120 days prior to the said transaction. Should the approval be granted, the subsequent holder of the environmental authorisation shall remain liable to compliance with all licence conditions.

15. TRANSFER OF ENVIRONMENTAL AUTHORISATION

- 15.1 Should the holder of the environmental authorisation transfer holdership of this environmental authorisation due to a change of ownership [as provided for in terms of S24E(c) of NEMA], he/she must apply in terms of Section 52 of NEMWA.
- 15.2 Should the transfer of holder ship of this environmental authorisation mentioned above be for any reason other than the change of ownership in the property, the holder of this environmental authorisation must inform the Department of any change in ownership in the property and must request an amendment to this environmental authorisation to reflect such change in ownership.
- 15.3 Any subsequent holder of an environmental authorisation shall be bound by conditions of this environmental authorisation.

16. INVESTIGATIONS

- 16.1 If, in the opinion of the Department, pollution, nuisances or health risks may be or are occurring on the site, the holder of the environmental authorisation must initiate an investigation into the cause of the problem or suspected problem, including such investigations as identified by the Department related to the risks posed. Such investigation must include the monitoring of water quality variables at those monitoring points and at such frequency as may be specified by Director: Department of Water and Sanitation.
- 16.2 Should the investigation carried out as per conditions 16.1 above reveal any unacceptable levels of pollution, the holder of the environmental authorisation must submit mitigation measures to the satisfaction of the relevant Department.

17. SPECIFIC CONDITIONS RELATED TO THE DISPOSAL FACILITY

- 17.1 Site Security and Access Control

- 17.1.1 The holder of the environmental authorisation must ensure effective access control to the waste management facility to prevent unauthorised entry. Weatherproof, durable and legible signs in at least three official languages applicable in the area must be displayed at each entrance to the site. The signs must indicate the risks involved in entering the site as well as the person responsible for the operation of the site.
- 17.2 Permissible waste
- 17.2.1 Any portion of the site which has been constructed or developed according to the Class C containment barrier designed in terms of Regulation 636, National Norms and Standards for Disposal of Waste to Landfill, dated 23 August 2013 and approved in writing by the Chief Director: Integrated Environmental Authorisations, may be used for the disposal of Type 3 waste according to Regulation 634 Waste Classification and Management Regulations, dated 23 August 2013.
- 17.2.2 The holder of the environmental authorisation must take all reasonable steps to ensure that only waste classified, accepted and treated as indicated in the conceptual design report and drawings for ESKOM Tutuka Power Station dated 13 February 2015 as prepared by Alan Robinson Consulting Civil & Geotechnical Engineers may be disposed on site.
- 17.3 Construction and commissioning of activities
- 17.3.1 Construction and further development within the proposed waste disposal site must be carried out under the supervision of a Registered Professional Engineer. Any development on the site must adhere to a Class C containment barrier design as described in Regulation 636, National Norms and Standards for Disposal of Waste to Landfill dated 23 August 2013. The design reports, drawings and liners must be approved in writing by the Chief Director: Integrated Environmental Authorisations before construction may commence.
- 17.3.2 The Licence Holder must present the waste barrier, leachate collection system and the service life prediction to the Chief Director: Integrated Environmental Authorisations for approval on the 15 of October 2015.
- 17.3.3 Construction and further development within the site must be carried out under the supervision of a Professional Civil Engineer, registered under the Engineering Profession of South Africa Act, 2000 (Act 46 of 2000).
- 17.3.4 The holder of the authorisation must ensure that Construction Quality Assurance (CQA) takes place during construction, all construction material must comply with relevant South African National specifications, or any prescribed management practice or standards which ensure relevant performance. Details of quality assurance during construction must be provided; this must

- also include conformation that construction will be supervised by a registered professional engineer.
- 17.3.5 Works must be constructed and maintained on a continuous basis by the holder of environmental authorisation to divert and drain from the Site in a legal manner, all runoff water arising on land adjacent to the Site, which could be expected as a result of the estimated maximum precipitation during a period of 24 hours with an average frequency of once in fifty (50) years (hereinafter referred to as the "estimated maximum precipitation"). Such works must, under the said rainfall event, maintain a freeboard of 0.8m above full supply level.
- 17.3.6 Works must be constructed and maintained on a continuous basis by the holder of authorisation to divert and drain from the working face of the Site, all runoff water arising on the Site, which could be expected as a result of the estimated maximum precipitation and to prevent such runoff water from coming into contact with leachate from the Site. Such works must, under the said rainfall event, maintain a freeboard of 800mm and be lined to the satisfaction of the Chief Director: Integrated Environmental Authorisations, to prevent pollution to groundwater.
- 17.3.7 Runoff water referred to in condition 17.3.5 must comply with the quality requirements of the General and Special Standard, prescribed in terms of section 21(1)(a) of the Water Act, 1956 (Act 54 of 1956) as published in Government Notice 991 of 18 May 1984, or with such quality requirements as may from time to time be determined by the Chief Director: Integrated Environmental Authorisations and must be drained from the Site in a legal manner.
- 17.3.8 Runoff water referred to in condition 17.3.7 which does not comply with the quality requirements applicable in terms of condition 17.3.8 and all sporadic leachate from the Site must, by means of works which must be constructed and maintained on a continuous basis by the Licence Holder and be lined as approved by the Chief Director: Integrated Environmental Authorisations, to prevent pollution to groundwater –
- 17.3.9 be treated to comply with the aforementioned standard and discharged in a legal manner; and/or
- 17.3.9.1 be evaporated in lined dams as approved by the competent authority; and/or
- 17.3.9.2 be discharged into any convenient sewer if accepted by the authority in control of that sewer.
- 17.3.9.3 The Site must be constructed in accordance with recognised civil engineering practice to ensure that it remains stable.
- 17.3.10 The slope of the sides of the Site must be constructed in such a manner that little or no erosion occurs.
- 17.3.11 Any development which occurs within 1: 100 year flood line and/or within 500m from the boundary of a wetland would require a water use licence in terms of section 40 of the National Water Act, 1998.

17.4 Environmental auditing and reporting

17.4.1 The Department reserves the right to audit and/or inspect the Site at any time and at such frequency as the Department may decide, or to have the Site audited or inspected.

17.4.2 The holder of environmental authorisation must make any records or documentations available to the Department upon request, as well as any other information the Department may require.

17.4.3 Internal Audits

(a) Internal audits must be conducted quarterly by the holder of the environmental authorisation in order to audit compliance with conditions related to this environmental authorisation and the approved EMPr, and on each audit occasion an official report must be compiled by the relevant auditor to report the findings of the audits, which must be made available to the external auditor specified in condition 17.4.4.

17.4.4 External Audits

(a) The holder of the environmental authorisation and approved EMPr must appoint an independent external auditor to audit the site bi-annually subject to the environmental authorisation and this auditor must compile an audit report documenting the findings of the audit, which must be submitted by the holder of the environmental authorisation.

(b) The audit report must-

- (i) Specifically state whether conditions and requirements related to this environmental authorisation are adhered to;
- (ii) Include an interpretation of all available data and test results regarding the operation of the site and all its impacts on the environment;
- (iii) Specify target dates for the implementation of the recommendations by the holder of the environmental authorisation to achieve compliance;
- (iv) Contain recommendations regarding non-compliance or potential non-compliance and must specify target dates for the implementation of the recommendations by the holder of the environmental authorisation and whether corrective action taken for the previous audit non conformities was adequate;
- (v) Show results graphically and conduct trend analysis; and
- (vi) Include the information required in Annexure II.

(c) The audit report must be finalised within 60 days of the finalisation of the external audit. Each external audit report must be submitted to the Director within 30 days from the date on which the external auditor finalised the audit report

17.4.5 Reporting

- (a) The holder of the environmental authorisation must, within 24 hours, notify the Director of the occurrence or detection of any incident on the site, or incidental to the operation of the site, which has the potential to cause, or has caused pollution of the environment, health risks, nuisance conditions or water pollution.
- (b) The holder of the environmental authorisation must, within 14 days inform the Department from the occurrence or detection of any incident referred to in condition 16.1, must within 14 days period of time specified by the Department submit an action plan, which must –
 - (i) Correct the impact resulting from the incident;
 - (ii) Prevent the incident from causing any further impact; and
 - (iii) Prevent a recurrence of a similar incident to the satisfaction of the Department.
- (c) In the event that measures have not been implemented within 21 days of the incident, or within the time period identified by the Department, or the measures which have been implemented are inadequate, the Department may implement the necessary measures at the cost and risk of the holder of the environmental authorisation.
- (d) The holder of the environmental authorisation must keep an incident report and complaints register, which must be made available to the external auditor, representatives of this Department and Department of Water and Sanitation for the purpose of audit.
- (e) The Department must be notified as soon as the holder of this environmental authorisation becomes aware of the following incidents:
 - (i) Any malfunction, breakdown or failure of equipment or techniques, accident or fugitive emission which has caused, is causing or may cause significant pollution;
 - (ii) The breach of this environmental authorisation; and
 - (iii) Any significant adverse environmental and health effects.
- (f) The information required in terms of conditions 17.7, 17.8 and 17.8 must be reported to the Department in a yearly report. The information must also be included into a trend report, which must contain a graphical presentation of all results obtained graphical presentation of all results obtained previously at any specific point, as well as an interpretation and discussion of the results of each monitoring occasion.

17.5 General operation and impact management of waste management activities

17.5.1 Waste, which is not permissible from the authorised development, must be dealt with according to relevant legislation or the Department's policies and practices.

17.5.2 The holder of environmental authorisation must prevent spillages. Where the spillages occur, the holder of authorisation must ensure the effective and safe cleaning of such spillages.

- 17.5.3 The holder of environmental authorisation must prevent the occurrence of nuisance conditions or health hazards.
- 17.5.4 The holder of environmental authorisation must ensure that all personnel who work with hazardous waste are trained to deal with these potential hazardous situations so as to minimise the risks involved. Records of training and verification of competence must be kept by the Authorisation Holder.
- 17.5.5 No effluent must be discharged into any storm water drain or furrow, whether by commission or by omission.
- 17.6 Water quality management
- 17.6.1 All runoff water (storm water) arising as a result of precipitation on land adjacent to the site must be prevented and diverted from entering the site and drained from the site.
- 17.6.2 Uncontaminated runoff water must be diverted away from the contaminated runoff.
- 17.6.3 Uncontaminated runoff water must under any circumstances be used to dilute leachate emanating from the Site.
- 17.7 Water quality monitoring
- 17.7.1 The Licence Holder must ensure that the following outstanding information is submitted to the Chief Director: Integrated Environmental Authorisations prior to the construction of the site:
- 17.7.1.1 A groundwater monitoring programme and network must be established up gradient and down gradient of the site which must be maintained by a Groundwater Specialist so that unobstructed sampling can take place.
- 17.7.1.2 A surface water monitoring plan for all the identified water resources within the site which must be compiled in consultation with the Department of Water and Sanitation.
- 17.7.1.3 A geohydrological report which includes a hydrocensus and geophysical study.
- 17.7.2 Monitoring boreholes must be equipped with lockable caps. The Department and Department of Water and Sanitation reserves the right to take water samples at any time and to analyse these samples or have them analysed.
- 17.8 Detection Monitoring
- 17.8.1 Groundwater and surface water quality monitoring must be conducted –
- (a) for variables listed in Annexure III – bi-annually
 - (b) for variables listed in Annexure IV – annually
- or such frequency as may be determined by the Chief Director: Integrated Environmental Authorisations.

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- 17.8.2 The leachate detection system must be monitored on a daily basis for possible leakages. Should a leak or failure be suspected or detected during monitoring or at any time, it must be regarded as an incident and be addressed to the satisfaction of the Chief Director: Integrated Environmental Authorisations.
- 17.8.3 Inspections of liners, where liners are accessible must be performed monthly. Liners must be repaired or replaced when inspection tests show deterioration/leakage and these corrective actions shall be performed to the satisfaction of the Chief Director: Integrated Environmental Authorisations.
- 17.8.4 Investigative Monitoring
- 17.8.4.1 If, in the opinion of the competent, a water quality variable at any monitoring point referred to in condition 17.8.1 above shows an increasing trend, the environmental authorisation shall initiate a monthly monitoring programme.
- 17.9 Methods analysis
- 17.9.1 The holder of environmental authorisation shall carry out all tests in accordance with methods prescribed by and obtainable from the South African Bureau of Standards (SABS), referred to in the Standards Act, 2008 (Act 08 of 2008), analyse the samples taken under the monitoring programmes specified in conditions 17.7, 17.8 and 17.8.
- 17.9.2 The holder of environmental authorisation shall only use another method of analysis if written proof that the method is at least equivalent to the SABS method, is submitted to the Chief Director: Integrated Environmental Authorisations.

Date of environmental authorisation: 19/10/2015


Mr Sabelo Malaza

Chief Director: Integrated Environmental Authorisations
Department of Environmental Affairs

Annexure I: Reasons for Decision

1. Key factors considered in making the decision

All In reaching its decision, the Department took, *inter alia*, the following into consideration -

- a) The information contained in the EIR dated December 2014;
- b) The mitigation measures included in the EIR dated December 2014; and the EMPr;
- c) The comments received from the Directorate: Authorisations & Waste Disposal Management and comments from interested and affected parties as included in the EIR dated December 2014; and
- d) The objectives and requirements of relevant legislation, policies and guidelines, including section 2 of the National Environmental Management Act, 1998 (Act No. 107 of 1998).

2. Conclusions

After consideration of the information and factors listed above the Department reached the following conclusions:

- a) The extension of the disposal facility will take place next to the already existing ash disposal facility.
- b) The identification and assessment of impacts are detailed in the EIR dated December 2014; and sufficient assessment of the key identified issues and impacts have been completed.
- c) The procedure followed for impact assessment is adequate for the decision-making process.
- d) The proposed mitigation of impacts identified and assessed adequately curtails the identified impacts.
- e) A sufficient public participation process was undertaken and the applicant has satisfied the minimum requirements as prescribed in the EIA regulations, 2010, for public involvement.

In view of the above, the Department is satisfied that, subject to compliance with the conditions contained in the environmental authorisation, the activities will not conflict with the general objectives of integrated environmental management laid down in Chapter 5 of the National Environmental Management Act, 1998 and that any potentially detrimental environmental impacts resulting from the activity can be mitigated to acceptable levels. The environmental authorisation is accordingly granted.

ANNEXURE II

INFORMATION WHICH SHALL BE SUBMITTED ON AN ANNUAL BASIS CONDITION 8.5

* = Indicate with an X. Please print legibly.

NAME OF SITE: _____	DATE OF REPORT: _____ (y/m/d)
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1. Registered owner(s) of property on which the disposal facility is situated:

Name	Telephone	
Postal Address	Fax	
	Postal Code	

2. Operator in control of the disposal facility:

Name	Telephone	
Identity number	Tel. After hours	
Educational Qualifications		
Other Relevant competencies:		

3. Indicate the type of waste and approximate quantities of ash disposed during the year:

Type of waste (Specify)	Quantity (m ³ annum ⁻¹)
TOTAL	

4. Indicate the type of waste and approximate quantities of ash reused, recycled during the year:

Type of waste	Quantity (m ³ annum ⁻¹)	reused, treated or disposed
TOTAL		

I, the undersigned, declare that the information stated above is to my knowledge a true reflection of the status at the _____ effluent treatment facility.

Signature: _____

Name: _____

Capacity: _____

Place: _____

Date _____

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ANNEXURE III

WATER QUALITY VARIABLES REQUIRED FOR DETECTION MONITORING

Monitor at bi-annual intervals for:

Alkalinity (P.Alk)

Calcium (Ca)

Dissolved Oxygen

Chloride (Cl)

Chromium

Electrical Conductivity (EC)

Fluoride (F)

Iron (Fe)

Magnesium (Mg)

Manganese (Mn)

Mercury (Hg)

Nitrate (NO₂)

Nitrate (NO₃-N)

pH

Potassium (K)

Selenium

Silicon (Si)

Sodium (Na)

Sulphate (SO₄)

Total Dissolved Solids (TDS)

ANNEXURE IV

WATER QUALITY VARIABLES REQUIRED FOR DETECTION AND INVESTIGATIVE MONITORING

Chromium

Electrical Conductivity (EC)

Iron (Fe)

Manganese (Mn)

Selenium

Sodium (Na)

Sulphates (SO₄)

Total Dissolved Solids (TDS)