ESTABLISHMENT OF FOUR COAL-FIRED BOILERS AT TUBATSE CHROME

DRAFT BASIC ASSESSMENT REPORT

TUBATSE CHROME (PTY) LTD

TYPE OF DOCUMENT (VERSION)
PUBLIC

PROJECT NO.: 41100700
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QUALITY MANAGEMENT

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Date	March 2018			
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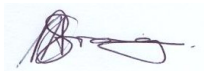
Signature				
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SIGNATURES

PREPARED BY

Liaan Pretorius
Environmental Consultant

REVIEWED BY

Ashlea Strong
Principal Consultant

Purpose and basis of preparation of this Report

This Draft Basic Assessment Report (Report) has been prepared by WSP Environmental Proprietary Limited (WSP) on behalf and at the request of Tubatse Chrome (Pty) Ltd. (Client).

Unless otherwise agreed by us in writing, we do not accept responsibility or legal liability to any person other than the Client for the contents of, or any omissions from, this Report.

To prepare this Report, we have reviewed only the documents and information provided to us by the Client or any third parties directed to provide information and documents to us by the Client. We have not reviewed any other documents in relation to this Report and except where otherwise indicated in the Report.

PRODUCTION TEAM

CLIENT

SHEQ Superintendent	Jacques Van Niekerk
Environmental Specialist	Zama Ramokgadi
Operations Manager	Clifford Dintwe

WSP

Principal Environmental Consultant	Ashlea Strong
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Associate: Air Quality	Nicola Enslin

LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF
ECONOMIC DEVELOPMENT, ENVIRONMENT & TOURISM

BASIC ASSESSMENT REPORT - EIA REGULATIONS, 2014

Basic Assessment report in terms of the Environmental Impact Assessment Regulations, 2014, promulgated in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended.

File Reference Number:	
	(For official use only)
NEAS Reference Number:	
Date Received:	
Due date for acknowledgement:	
Due date for acceptance:	
Due date for decision	

Kindly note that:

1. The report must be compiled by an independent Environmental Assessment Practitioner.

2. The report must be typed within the spaces provided in the form. The size of the spaces provided is not necessarily indicative of the amount of information to be provided. The report is in the form of a table that can extend itself as each space is filled with typing.

3. Where applicable **tick** the boxes that are applicable in the report.

4. The use of "not applicable" in the report must be done with circumspection because if it is used in respect of material information that is required by the Department of Economic Development, Environment and Tourism as the competent authority (Department) for assessing the application, it may result in the rejection of the application as provided for in the regulations.

5. An incomplete report may be returned to the applicant for revision.

6. Unless protected by law, all information in the report will become public information on receipt by the department. Any interested and affected party should be provided with the information contained in this report on request, during any stage of the application process.

7. The Act means the National Environmental Management Act (No. 107 of 1998) as amended.

8. Regulations refer to Environmental Impact Assessment (EIA) Regulations of 2016 (as amended).

9. The Department may require that for specified types of activities in defined situations only parts of this report need to be completed. No faxed or e-mailed reports will be accepted.

10. This application form must be handed in at the offices of the Department of Economic Development, Environment and Tourism:-

Postal Address:	**Physical Address**:
Central Administration Office Environmental Impact Management P. O. Box 55464 **POLOKWANE** 0700	Central Administration Office Environmental Affairs Building Cnr Suid and Dorp Streets **POLOKWANE** 0699

Queries should be directed to the Central Administration Office: Environmental Impact Management:-

For attention: Mr E. V. Maluleke

Tel: (015) 290 7138/ (015) 290 7167

Fax: (015) 295 5015

Email: malulekeev@ledet.gov.za

View the Department's website at http://www.ledet.gov.za/ for the latest version of the documents.

SECTION A: ACTIVITY INFORMATION

Has a specialist been consulted to assist with the completion of this section?

YES	

If YES, please complete the form entitled "Details of specialist and declaration of interest" or appointment of a specialist for each specialist thus appointed:

Any specialist reports must be contained in Appendix D.

An Air Quality Impact Assessment was undertaken by WSP Environmental (Pty) Ltd (WSP). The specialist report is included in Appendix D.

1. ACTIVITY DESCRIPTION

Describe the activity, which is being applied for, in detail[1]:

Tubatse Chrome (Pty) Ltd (Tubatse) is a chrome smelting operation situated in Steelpoort, Limpopo Province. Tubatse falls within the jurisdiction of the Greater Tubatse Local Municipality.

Tubatse was initially built as a three-furnace operation in 1975. The plant was expanded to five furnaces between 1989 and 1990, with the sixth furnace being built in 1996. The core business of the operation is the production of charge chrome using six Submerged Arc Furnaces (Figure 1 and Figure 2), one metal recovery plant, and a Pelletising and Sintering Plant.

Tubatse Chrome undergoes various operations including; Pelletizing and Sintering of chromite fines, Smelting and Reduction for the production of charge chrome, chrome recovery from slag, 30 MW Power Plants and Services to support the production process. Ferrochrome is produced as high carbon charge chrome, which is an alloy of chromium (50-52 %) and iron (34-38 %).

Figure 1: Tubatse West Plant

[1] Please note that this description should not be a verbatim repetition of the listed activity as contained in the relevant Government Notice, but should be a brief description of activities to be undertaken as per the project description.

Figure 2: Chrome Slag being removed from the smelting process

In order to reduce their electricity demand from the National Grid, Tubatse installed a power generation facility that was authorised to generate up to a design capacity of 30MW. Heat exchangers (boilers) (Figure 3) recover heat energy from hot furnace off-gas at the 6 furnaces (or heat recovery steam generator (HRSGs)). The HRSGs are arranged in the east and west plants, with HRSG 1, 2, 3 and 4 arranged in the east plant and HRSG 5 and 6 arranged in the west plant. Although the total design output of the six HRSGs is 148.74t/h, the total average steam output is 60t/h. The boilers generate steam from de-ionised water which is in turn piped to the power generation facilities to turn two 15MW turbines (Figure 4). The turbines are connected to generators which generate electricity for reuse at the plant (Figure 5). Cooled steam exits the turbines and is transferred to air-cooled condensers (Figure 6), where it returns to a liquid state and is re-circulated into the process. The power generation facility currently only generates approximately 10MW of electricity. The average generating capacity of system is currently around 7MW; only one 15MW steam turbine generator set is running and the other one is in idle state.

Figure 3: Heat Exchanger

Figure 4: Turbine (15MW)

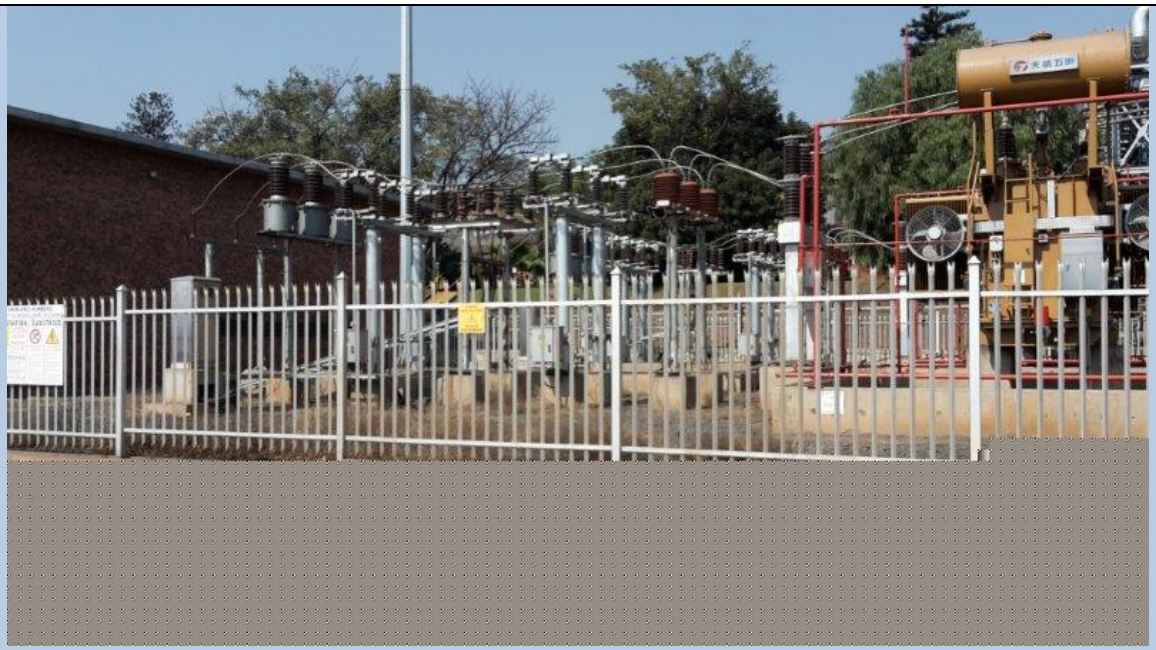

Figure 5: Tubatse's on-site Sub-station

Figure 6: Air Cooled Condenser

At present, the amount of steam produced is not sufficient to generate 30MW. The addition of the four coal-fired boilers (CFBs) will increase the amount of steam available to the Power Generation Plant. Tubatse have therefore proposed to establish four 25t/h CFBs which will generate sufficient steam to enable the existing power generation facility to operate at its full capacity (i.e. 30MW).

The main components of a CFB include:

- **Fuel input;**
- **CFB;**
- **Cyclone collector;**
- **Particulate control system; and**
- **Steam pipelines.**

Figure 7 outlines how a CFB works.

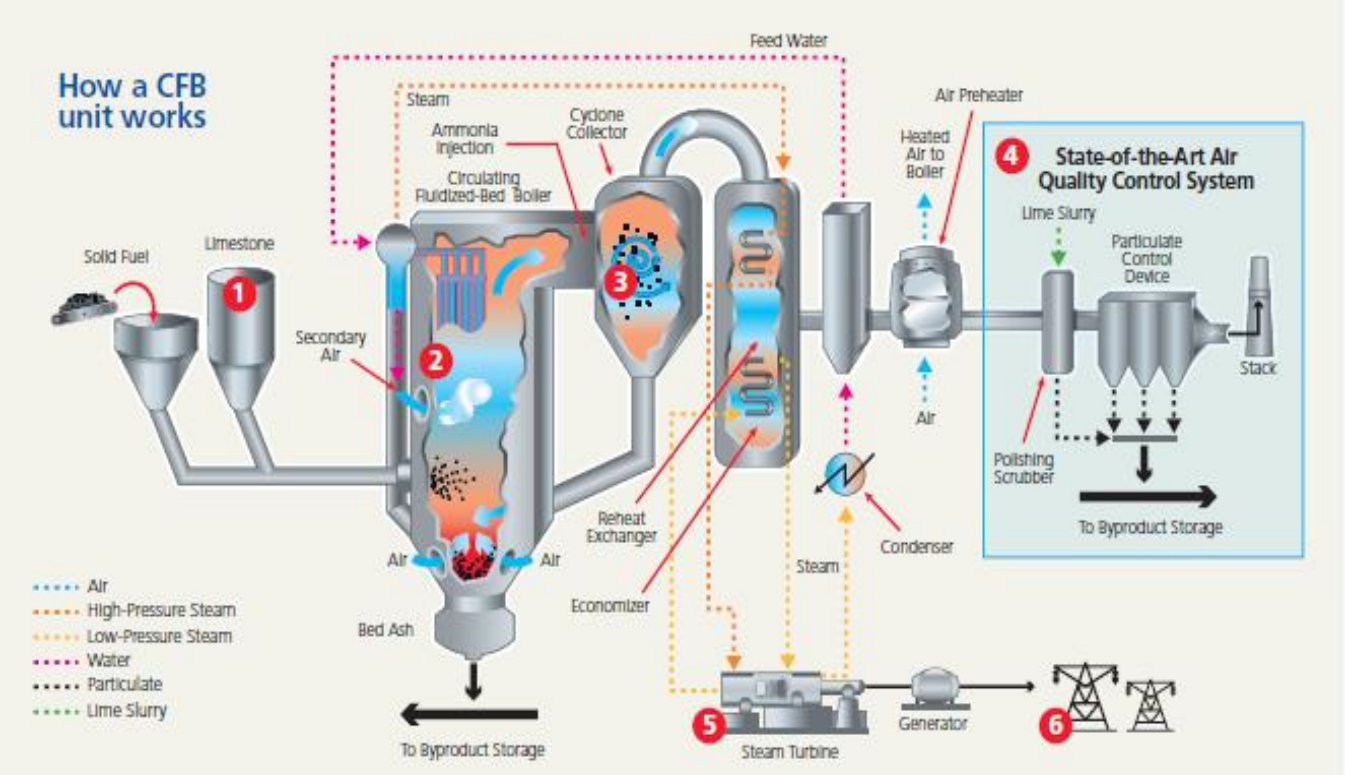

Figure 7: CFB Process Flow Diagram

- **<u>1 – Fuel Input:</u>**

  Crushed coal and limestone are fed into the combustion chamber of the boiler while air is blown in from the bottom to fluidise the mixture. The fluidised mixture burns at a relatively low temperature and produces heat. The limestone absorbs sulphur dioxide (SO_2) and the low-burning temperature limits the formation of nitrogen oxide (NOx) – two gases associated with the combustion of solid fuels.

- **<u>2 – CFB:</u>**

  Heat produced by the combustion process heats up the water in the water tubes and converts it to high-energy steam. Ammonia is injected into the boiler outlet to further reduce NOx emissions.

- **3 – Cyclone Collector:**

  The cyclone collector is used to return ash and unburned fuel (larger particles) to the combustion chamber for re-burning, making the process more efficient.

- **4 – Particulate Control System:**

  After combustion, lime is injected into the polishing scrubber to capture more SO_2. A particulate control device (in this case a bag filter) collects dust particles that escaped during the combustion process.

  The dust-laden process gas enters the bag filter horizontally and is spread across the entire filter cross-section in a uniform flow profile by a gas distribution screen. By applying high voltage to the electrodes located between the collection plates, an electric field is created that charges the dust/ash particles. Passing through the electric field, the charged particles are transported by electric field strength to the collecting plates, where they agglomerate with previously separated dust particles and finally are dislodged off by the mechanical rapping system. The dislodged dust particles drop into the filter hopper and are removed via the dust handling system, and disposed of at the ash disposal facility.

- **5 – Steam Turbine:**

  The steam generated in the CFB is used to turn the turbine which is connected to a generator which converts mechanical energy into electricity.

- **6 – Electricity Distribution:**

  The electricity produced from the process is routed through the on-site sub-station for use in the plant.

The following infrastructure will be applicable for each of the four proposed CFBs:

- **Boiler Area:**
  - **Main boiler plant house for one CFB unit;**
  - **Auxiliary plant buildings; and**
  - **Operational support buildings.**
- **Associated Infrastructure:**
  - **In-plant coal stock yard and storage;**
  - **Lime storage area;**
  - **Flue gas stack;**
  - **Coal conveyors; and**
  - **Water supply pipelines (temporary and permanent).**

Prior to the implementation of the Proposed Project, Tubatse are required to obtain environmental authorisation (EA) from the relevant competent authorities i.e. The Limpopo Department of Economic Development, Environment and Tourism (LEDET). The purpose of this application is to, on behalf of the applicant, Tubatse, apply for an environmental authorisation for the relevant listed activities under the National Environmental Management Act (Act 107 of 1998) (NEMA) as well as to apply for an amendment to their existing atmospheric emissions license (AEL) (Licence Number: 12/4/12L-S4/A1, Dated: 31 March

2015) in terms of the National Environmental Management Air Quality Act (Act 39 of 2004) (NEMAQA). The listed activities that are relevant to the Proposed Project are outlined in Table 1.

Table 1: Applicable Listed Activities

Activity No	Listed Activity Description
NEMA: GNR 327 (07 April 2017; as amended), Listing Notice 1	
Activity 34	**The expansion or changes to existing facilities for any process or activity where such expansion or changes will result in the need for a permit or license or an amended permit or license in terms of national or provincial legislation governing the release of emissions or pollution.**
NEMA: GNR 324 (07 April 2017; as amended), Listing Notice 3	
Activity 12	**The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.** **e. Limpopo** **ii. Within critical biodiversity areas identified in bioregional plans**
NEM:AQA	
Section 23(1)	**Tubatse Chrome is required to amend their AEL with the addition of a new emissions point as well as their registration as a controlled emitter.**

WSP has been appointed as the independent environmental assessment practitioner (EAP), to manage the required basic assessment (BA) process. This process includes the consultation with parties that may be affected by, or have an interest in, the project.

2. FEASIBLE AND REASONABLE ALTERNATIVES

"alternatives", in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to—

(a) the property on which or location where it is proposed to undertake the activity;

(b) the type of activity to be undertaken;

(c) the design or layout of the activity;

(d) the technology to be used in the activity;

(e) the operational aspects of the activity; and

(f) the option of not implementing the activity.

Describe alternatives that are considered in this application. Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity could be accomplished in the specific instance taking account of the interest of the applicant in the activity. The no-go alternative must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed. The determination of whether site or activity (including different processes etc.) or both is appropriate needs to be informed by the specific circumstances of the activity and its environment. After receipt of this report the

Department may also request the applicant to assess additional alternatives that could possibly accomplish the purpose and need of the proposed activity if it is clear that realistic alternatives have not been considered to a reasonable extent.

Paragraphs 3 – 13 below should be completed for each alternative.

3. ACTIVITY POSITION

Three sites are proposed for the installation of the CFBs, all of which are within the Tubatse Plant boundary. The location of these proposed sites are indicated in Figure 8 (Also included in Appendix A). All three alternatives can be considered brownfield sites as they have either previously been or are currently being impacted.

- **Alternative 1 is utilised for stockpiling and is located behind the West Plant heat Exchangers. The site is surrounded by some vegetation which has been heavily impacted by the existing activities in the area.**

- **Alternative 2 is a large flat area located close to the R555. The area is sparsely vegetated and has a high density of alien vegetation. This site is the closest to the power generation facility and is the most preferred site from a technical point of view.**

- **Alternative 3 can be found on the far east of the plant. The area is vegetated with mostly indigenous species. This area has not been heavily impacted by existing activities.**

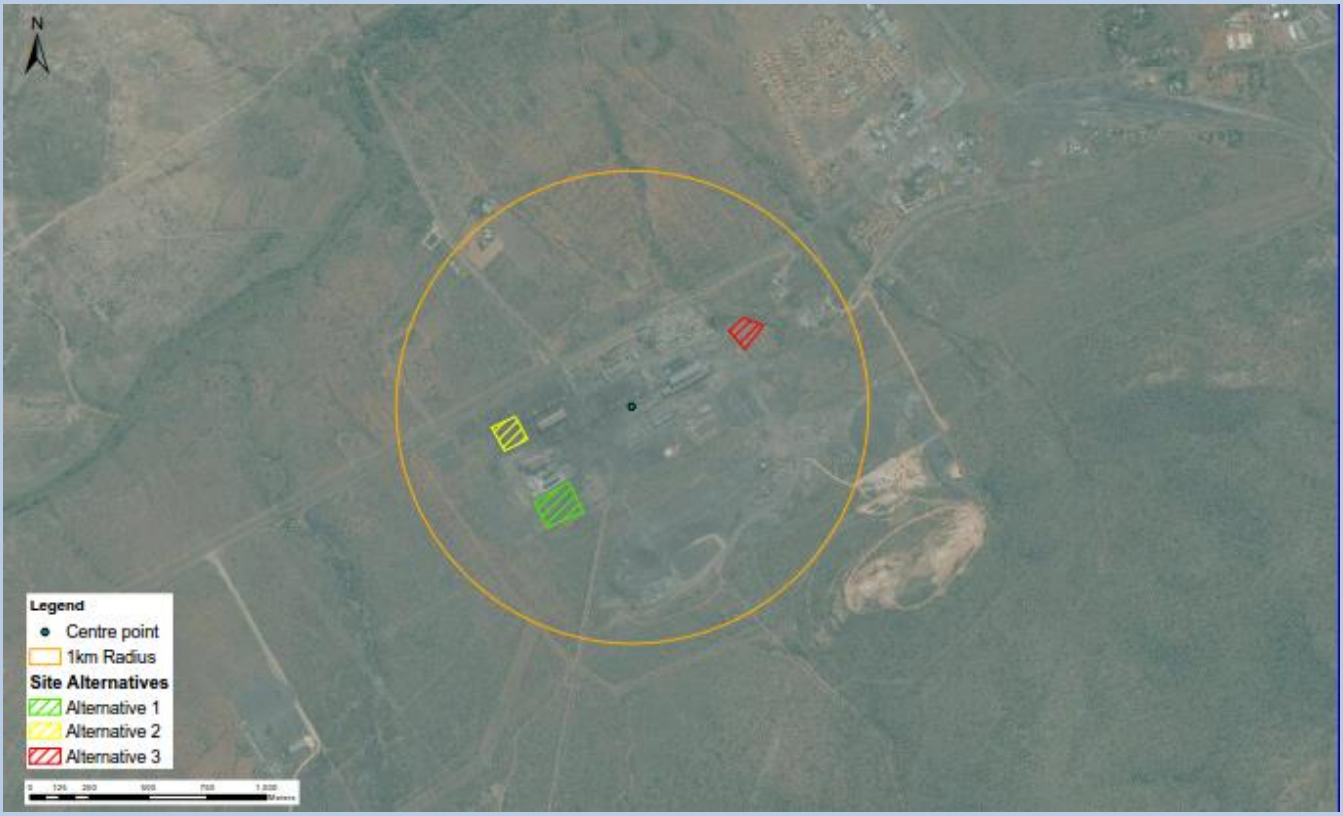

Figure 8: Locality Map indicating the locations of the 3 Alternatives

<u>No-Go Alternative:</u>

In the event that the Proposed Project is not implemented or established the status quo will remain. No additional emissions will be generated over and above the existing emissions from the smelting operation. However, Tubatse will continue to draw electricity from the National Electricity Grid while the existing power generation facility to generate electricity will continue at one third of its design capacity.

Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in degrees, minutes and seconds. The projection that must be used in all cases is the Hartebeeshoek 94 WGS84 spheroid in a national or local projection.

List alternative sites, if applicable.

Alternative:	**Latitude (S):**			**Longitude (E):**		
Alternative S1[2]	**24˚**	**44'**	**42.56"**	**30˚**	**11'**	**33.44"**
Alternative S2 **(Preferred)**	**24˚**	**44'**	**33.49"**	**30˚**	**11'**	**26.54"**
Alternative S3	**24˚**	**44'**	**20.77"**	**30˚**	**11'**	**59.83"**

In the case of linear activities:

Alternative:	**Latitude (S):**			**Longitude (E):**		
Alternative S1						
• Starting point of the activity	°	'	"	°	'	"
• Middle/Additional point of the activity	°	'	"	°	'	"
• End point of the activity	°	'	"	°	'	"
Alternative S2						
• Starting point of the activity	°	'	"	°	'	"
• Middle/Additional point of the activity	°	'	"	°	'	"
• End point of the activity	°	'	"	°	'	"
Alternative S3						
• Starting point of the activity	°	'	"	°	'	"
• Middle/Additional point of the activity	°	'	"	°	'	"
• End point of the activity	°	'	"	°	'	"

For route alternatives that are longer than 500m, please provide an addendum with co-ordinates taken every 250 meters along the route for each alternative alignment.

4. PHYSICAL SIZE OF THE ACTIVITY

Indicate the physical size of the preferred activity/technology as well as alternative activities/technologies (footprints):

Alternative:	**Size of the activity:**
Alternative A1[3]	**10 000 m²**
Alternative A2 **(Preferred)**	**10 000 m²**
Alternative A3	**10 000 m²**

or,

<u>for linear activities:</u>

[2] "Alternative S.." refer to site alternatives.

[3] "Alternative A.." refer to activity, process, technology or other alternatives.

Alternative:	Length of the activity:
Alternative A1	m
Alternative A2	m
Alternative A3	m

Indicate the size of the alternative sites or servitudes (within which the above footprints will occur):

Alternative:	Size of the site/servitude:
Alternative A1	**10 000 m²**
Alternative A2 **(Preferred)**	**10 000 m²**
Alternative A3	**10 000 m²**

5. SITE ACCESS

Does ready access to the site exist?	**YES**	**NO**
If NO, what is the distance over which a new access road will be built		m

Describe the type of access road planned:

All three alternative sites are easily accessible from existing internal access roads within the Tubatse Plant. The internal plant roads are either surfaced (tar, concrete or paving) or gravel roads

Figure 9: Surfaced Access Road

Include the position of the access road on the site plan and required map, as well as an indication of the road in relation to the site.

6. SITE OR ROUTE PLAN

A detailed site or route plan(s) must be prepared for each alternative site or alternative activity. It must be attached as Appendix A to this document.

The site or route plans must indicate the following:

6.1 the scale of the plan which must be at least a scale of 1:500;
6.2 the property boundaries and numbers of all the properties within 50 metres of the site;
6.3 the current land use as well as the land use zoning of each of the properties adjoining the site or sites;
6.4 the exact position of each element of the application as well as any other structures on the site;
6.5 the position of services, including electricity supply cables (indicate above or underground), water supply pipelines, boreholes, street lights, sewage pipelines, storm water infrastructure and telecommunication infrastructure;
6.6 all trees and shrubs taller than 1.8 metres;
6.7 walls and fencing including details of the height and construction material;
6.8 servitudes indicating the purpose of the servitude;
6.9 sensitive environmental elements within 100 metres of the site or sites including (but not limited thereto):
- rivers;
- the 1:100 year flood line (where available or where it is required by Department of Water Affairs);

- ridges;
- cultural and historical features;
- areas with indigenous vegetation (even if it is degraded or invested with alien species);

6.10 for gentle slopes the 1 metre contour intervals must be indicated on the plan and whenever the slope of the site exceeds 1:10, the 500mm contours must be indicated on the plan; and

6.11 the positions from where photographs of the site were taken.

The Site Plans are included in Appendix A.

7. SITE PHOTOGRAPHS

Colour photographs from the centre of the site must be taken in at least the eight major compass directions with a description of each photograph. Photographs must be attached under Appendix B to this form. It must be supplemented with additional photographs of relevant features on the site, if applicable.

The site photographs for all three alternative sites are included in Appendix B.

8. FACILITY ILLUSTRATION

A detailed illustration of the activity must be provided at a scale of 1:200 as Appendix C for activities that include structures. The illustrations must be to scale and must represent a realistic image of the planned activity. The illustration must give a representative view of the activity.

The facility illustrations for the proposed CFBs are included in Appendix C.

11. ACTIVITY MOTIVATION

9(a) Socio-economic value of the activity

What is the expected capital value of the activity on completion?	**Not yet Known**
What is the expected yearly income that will be generated by or as a result of the activity?	**Not yet Known**
Will the activity contribute to service infrastructure?	**NO**
Is the activity a public amenity?	**NO**
How many new employment opportunities will be created in the development phase of the activity?	**Not yet known**
What is the expected value of the employment opportunities during the development phase?	**Not yet known**

What percentage of this will accrue to previously disadvantaged individuals?	**Tubatse is an equal opportunity employer and due consideration of PDIs' will be taken during the recruitment process**
How many permanent new employment opportunities will be created during the operational phase of the activity?	**Approximately 29**
What is the expected current value of the employment opportunities during the first 10 years?	**Not yet known**
What percentage of this will accrue to previously disadvantaged individuals?	**Tubatse is an equal opportunity employer and due consideration of PDIs' will be taken during the recruitment process**

9(b) Need and desirability of the activity

Motivate and explain the need and desirability of the activity (including demand for the activity):

NEED:			
i.	Was the relevant municipality involved in the application?		**NO**
ii.	Does the proposed land use fall within the municipal Integrated Development Plan?		**NO**
iii.	If the answer to questions 1 and / or 2 was NO, please provide further motivation / explanation:		
	The Proposed Project is an internal project at Tubatse Chrome. No municipal approval is required.		

DESIRABILITY:			
i.	Does the proposed land use / development fit the surrounding area?	**YES**	
ii.	Does the proposed land use / development conform to the relevant structure plans, Spatial development Framework, Land Use Management Scheme, and planning visions for the area?	**YES**	
iii.	Will the benefits of the proposed land use / development outweigh the negative impacts of it?	**YES**	
iv.	If the answer to any of the questions 1-3 was NO, please provide further motivation / explanation:		
	Any attempt to reduce the plant's demand on the National Electricity Grid is considered a benefit to the surrounding community.		
v.	Will the proposed land use / development impact on the sense of place?		**NO**
vi.	Will the proposed land use / development set a precedent?		**NO**
vii.	Will any person's rights be affected by the proposed land use / development?		**NO**
viii.	Will the proposed land use / development compromise the "urban edge"?		**NO**
ix.	If the answer to any of the question 5-8 was YES, please provide further motivation / explanation.		
	The proposed project is situated within the Tubatse Plant boundary. The surrounding land use is already considered industrial.		

BENEFITS:			
i.	Will the land use / development have any benefits for society in general?	**YES**	
ii.	Explain:		
	The Proposed project will reduce the Plant's demand from the National Electricity Grid, which will		

	make an additional 20MW available for the surrounding areas.		
iii.	Will the land use / development have any benefits for the local communities where it will be located?	**YES**	
iv.	Explain:		
	The Proposed project will reduce the Plant's demand from the National Electricity Grid, which will make an additional 20MW available for the surrounding areas. There will also be limited employment opportunities during the construction and operational phases.		

10. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

List all legislation, policies and/or guidelines of any sphere of government that are applicable to the application as contemplated in the EIA regulations, if applicable:

Title of legislation, policy or guideline:	Administering authority:	Date:
The Constitution of the Republic of South Africa (No. 108 of 1996)	**National Government**	**18/12/1996**
GNR 543 of National Environmental Management Act (NEMA), Act 107 of 1998	**Department of Environmental Affairs and Tourism**	**18/06/2010**
GNR 327 (Govt Gazette 40772) NEMA, Act 107 of 1998 List of Activities requiring Environmental Authorisation through a Basic Assessment Process (Activity 34)	**Department of Environmental Affairs and Tourism**	**07/04/2017**
GNR 324 (Govt Gazette 40772) NEMA, Act 107 of 1998 List of Activities requiring Environmental Authorisation through a Basic Assessment Process (Activity 12)	**Department of Environmental Affairs and Tourism**	**07/04/2017**
National Environmental Management: Air Quality Act 39 of 2004	**Department of Environmental Affairs and Tourism**	**11/09/2005**
GNR 1210 (Govt Gazette 32816) NEM:AQA, Act 39 of 2004 National Air Quality Standards.	**Department of Environmental Affairs and Tourism**	**24/12/2009**
GNR 486 (Govt Gazette 35463) NEM:AQA, Act 39 of 2004 National Air Quality Standard for Particulate	**Department of Environmental Affairs and Tourism**	**29/06/2012**

Matter with Aerodynamic Diameter less than 2.5 micron metres ($PM_{2.5}$).		
GNR 893 (NEM:AQA, Act 39 of 2004) List of Activities which result in atmospheric emissions which have or may have a significant detrimental effect on the environment, including health, social conditions, economic conditions, ecological conditions or cultural heritage.	**Department of Environmental Affairs and Tourism**	**31/06/2010**
National Environmental Management Waste Act (NEMWA), Act 59 of 2008	**Department of Environmental Affairs and Tourism**	**03/07/2009**
Hazardous Substance Amendment Act (No. 53 of 1992)	**Ministry of Health**	**06/05/1992**
Occupation Health and Safety Act (No. 85 of 1993)	**Department of Labour**	**23/06/1993**

11. WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

11(a) Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase?	**YES**
If yes, what estimated quantity will be produced per month?	**12 m^3**

How will the construction solid waste be disposed of (describe)?

Solid waste generated as a result of the construction activities will be managed according to Tubatse's existing Waste Management Procedure. Waste streams could include:

- **Steel;**
- **Building rubble such as concrete, bricks etc.;**
- **General scrap and litter;**
- **Oily rags and contaminated PPE; and**
- **Contaminated soil.**

Where will the construction solid waste be disposed of (describe)?

After segregation, waste will be removed from site by the relevant contractor and disposed of in the correct manner as per the existing Waste Management Procedure. Waste classified as hazardous will be disposed of at the most appropriate hazardous landfill site.

Will the activity produce solid waste during its operational phase?	**YES**

If yes, what estimated quantity will be produced per month?

Domestic waste – 6 m^3
Ash – 2 800 t/a
Hazardous waste – 6 m^3

How will the solid waste be disposed of (describe)?

The proposed CFBs will generate ash. It is currently proposed that the ash will be sold (coarse ash to brick makers and fine ash to cement makers). Ash that is not sold, as proposed, will be disposed of at a adequately licensed hazardous waste facility.

Where will the solid waste be disposed if it does not feed into a municipal waste stream (describe)?

Ash that is not sold as proposed will be disposed of at a adequately licensed hazardous waste facility.

If the solid waste (construction or operational phases) will not be disposed of in a registered landfill site or be taken up in a municipal waste stream, then the applicant should consult with the department to determine whether it is necessary to change to an application for scoping and EIA.

Can any part of the solid waste be classified as hazardous in terms of the relevant legislation? **YES** [redacted]

If yes, inform the department and request a change to an application for scoping and EIA.

The ash from the boiler was classified as a hazardous waste after a desktop assessment, based on existing information, in terms of the National Environmental Management: Waste Act (NEM:WA) (as amended) as well as certain requirements under the Waste Classification and Management Regulations (Government Notice 634 of 2013, GN 634) together with the associated National Norms and Standards for the Assessment of Waste to Landfill Disposal (GN 635 of 2013) and the National Norms and Standards for Disposal of Waste to Landfill (GN 636 of 2013).

It is however recommended that a detailed toxicological assessment is undertaken once the CFBs are operational in order to more accurately classify the ash.

A Scoping and EIA is not required due to the fact that at this stage Tubatse are unlikely to store in excess of 80m^3 of ash at any one time prior to it being either sold or disposed of. In the event that, in the future, ash is required to be stored in volumes in excess of 80m^3, Tubatse will be required to register this storage in terms of Category C of GNR 921 of the NEMWA and will be required to comply with the Norms and Standards for the Storage of Waste (GNR 926).

Is the activity that is being applied for a solid waste handling or treatment facility? [redacted] **NO**

If yes, then the applicant should consult with the Department to determine whether it is necessary to change to an application for scoping and EIA.

11(b) Liquid effluent

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system? [redacted] **NO**

If yes, what estimated quantity will be produced per month? [redacted]

Will the activity produce any effluent that will be treated and/or disposed of on site? [redacted] **NO**

If yes, the applicant should consult with the Department to determine whether it is necessary to change to an application for scoping and EIA.

Will the activity produce effluent that will be treated and/or disposed of at another facility? [redacted] **NO**

If yes, provide the particulars of the facility:

Facility name:			
Contact person:			
Postal address:			
Postal code:			
Telephone:		Cell:	
E-mail:		Fax:	

Describe the measures that will be taken to ensure the optimal reuse or recycling of waste water, if any:

The feed water is converted to high-pressure steam in the boiler which is then used in the steam turbine. The steam becomes low-pressure steam after the turbine and it goes to the condenser where it is converted to feed water that is then sent back to the boiler. The water system is a closed-loop system.

11(c) Emissions into the atmosphere

Will the activity release emissions into the atmosphere?	**YES**
If yes, is it controlled by any legislation of any sphere of government?	**YES**

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.
If no, describe the emissions in terms of type and concentration:

The proposed CFBs are classified as a controlled emitter in terms of Section 23(1) of the National Environmental Management: Air Quality Act, 2004, applicable to any boiler with a design capacity equal to 10MW but less than 50MW net heat input per unit, based on the lower calorific value used; as such, the proposed CFBs will need to be registered on the controlled emitter's database and will need to comply with the emission standards given for Solid Fuel-Fired Small Boilers. The existing AEL will be amended to include this detail. The Air Quality Impact Assessment is included in Appendix D.

11(d) Generation of noise

Will the activity generate noise?	**NO**
If yes, is it controlled by any legislation of any sphere of government?	

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.
If no, describe the noise in terms of type and level:

Noise will be generated as a result of the construction activities as well as due to the additional vehicle movement on the site.

12. WATER USE

Please indicate the source(s) of water that will be used for the activity by ticking the appropriate box(es)

municipal	water board	groundwater	river, stream, dam or lake	other	the activity will not use water

If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate

the volume that will be extracted per month:

Initial:	**95.5 tons per hour**
Top up:	**9.55 tons per hour**

Does the activity require a water use permit from the Department of Water Affairs? YES **NO**

The additional water requirement will not require an amendment of Tubatse Chrome's existing 21(a) water allocation.

If yes, please submit the necessary application to the Department of Water Affairs and attach proof thereof to this application if it has been submitted.

13. ENERGY EFFICIENCY

Describe the design measures, if any, that have been taken to ensure that the activity is energy efficient:

The motivation for the project is to allow the plant to become more self-sufficient with regards to its energy requirement, thereby reducing its current demand on the National Electricity Grid.

Describe how alternative energy sources have been taken into account or been built into the design of the activity, if any:

There are no alternative energy sources applicable to the proposed project. The motivation for the project is to allow the plant to become more self-sufficient with regards to its energy requirement, thereby reducing its current demand on the National Electricity Grid.

SECTION B: SITE/AREA/PROPERTY DESCRIPTION

Important notes:

1. For linear activities (pipelines, etc) as well as activities that cover very large sites, it may be necessary to complete this section for each part of the site that has a significantly different environment. In such cases please complete copies of Section C and indicate the area, which is covered by each copy No. on the Site Plan.

Section C Copy No. (e.g. A):

2. Paragraphs 1 - 6 below must be completed for each alternative.

3. Has a specialist been consulted to assist with the completion of this section? **NO**

If YES, please complete the form entitled "Details of specialist and declaration of interest" for each specialist thus appointed:

All specialist reports must be contained in Appendix D.

Property description/physical address:	**The Farm Goudmyn 337 KT Portion 6 R555, Main Road, Steelpoort, 1133**
	(Farm name, portion etc.) Where a large number of properties are involved (e.g. linear activities), please attach a full list to this application.
	In instances where there is more than one town or district involved, please attach a list of towns or districts to this application.
Current land-use zoning:	**Industrial**
	In instances where there is more than one current land-use zoning, please attach a list of current land use zonings that also indicate which portions each use pertains to , to this application.

Is a change of land-use or a consent use application required? **NO**

Must a building plan be submitted to the local authority? **NO**

Locality map:

An A3 locality map must be attached to the back of this document, as Appendix A. The scale of the locality map must be relevant to the size of the development (at least 1:50 000. For linear activities of more than 25 kilometres, a smaller scale e.g. 1:250 000 can be used. The scale must be indicated on the map.) The map must indicate the following:

- an indication of the project site position as well as the positions of the alternative sites, if any;
- road access from all major roads in the area;
- road names or numbers of all major roads as well as the roads that provide access to the site(s);
- all roads within a 1km radius of the site or alternative sites; and
- a north arrow;
- a legend; and
- locality GPS co-ordinates (Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in degrees, minutes and seconds. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection)

1. GRADIENT OF THE SITE

Indicate the general gradient of the site.

Alternative S1:

Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5

Alternative S2 **(Preferred)**:

Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5

Alternative S3:

Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5

2. LOCATION IN LANDSCAPE

Indicate the landform(s) that best describes the site:

2.1 Ridgeline		2.6 Plain	
2.2 Plateau		2.7 Undulating plain / low hills	
2.3 Side slope of hill/mountain		2.8 Dune	
2.4 Closed valley		2.9 Seafront	
2.5 Open valley	**X**		

3. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

Is the site(s) located on any of the following (tick the appropriate boxes)?

	Alternative S1:	Alternative S2 (Preferred):	Alternative S3:
Shallow water table (less than 1.5m deep)	NO	NO	NO
Dolomite, sinkhole or doline areas	NO	NO	NO
Seasonally wet soils (often close to water bodies)	NO	NO	NO
Unstable rocky slopes or steep slopes with loose soil	NO	NO	NO
Dispersive soils (soils that dissolve in water)	NO	NO	NO
Soils with high clay content (clay fraction more than 40%)	NO	NO	NO
Any other unstable soil or geological feature	NO	NO	NO
An area sensitive to erosion	NO	NO	NO

If you are unsure about any of the above or if you are concerned that any of the above aspects may be an issue of concern in the application, an appropriate specialist should be appointed to assist in the completion of this section. (Information in respect of the above will often be available as part of the project information or at the planning sections of local authorities. Where it exists, the 1:50 000 scale Regional Geotechnical Maps prepared by the Council for Geo Science may also be consulted).

4. GROUNDCOVER

Indicate the types of groundcover present on the site:

The location of all identified rare or endangered species or other elements should be accurately indicated on the site plan(s).

Alternative S1

Natural veld - good condition[E]	**Natural veld with scattered aliens[E] (20%)**	Natural veld with heavy alien infestation[E]	Veld dominated by alien species[E]	Gardens
Sport field	Cultivated land	Paved surface	Building or other structure	**Bare soil (80%)**

Alternative S2 **(Preferred)**

Natural veld - good condition[E]	Natural veld with scattered aliens[E]	Natural veld with heavy alien infestation[E]	**Veld dominated by alien species[E] (30%)**	Gardens
Sport field	Cultivated land	Paved surface	Building or other structure	**Bare soil (70%)**

Alternative S3:

Natural veld - good condition[E]	**Natural veld with scattered aliens[E] (70%)**	Natural veld with heavy alien infestation[E]	Veld dominated by alien species[E]	Gardens
Sport field	Cultivated land	Paved surface	Building or other structure	**Bare soil (30%)**

If any of the boxes marked with an "[E] "is ticked, please consult an appropriate specialist to assist in the completion of this section if the environmental assessment practitioner doesn't have the necessary expertise.

5. LAND USE CHARACTER OF SURROUNDING AREA

Indicate land uses and/or prominent features that does currently occur within a 500m radius of the site and give description of how this influences the application or may be impacted upon by the application:

5.1 Natural area	**X**	5.22 School	
5.2 Low density residential		5.23 Tertiary education facility	
5.3 Medium density residential		5.24 Church	
5.4 High density residential		5.25 Old age home	
5.5 Medium industrial [AN]		5.26 Museum	
5.6 Office/consulting room		5.27 Historical building	
5.7 Military or police base/station/compound		5.28 Protected Area	
5.8 Spoil heap or slimes dam [A]	**X**	5.29 Sewage treatment plant [A]	
5.9 Light industrial		5.30 Train station or shunting yard [N]	
5.10 Heavy industrial [AN]	**X**	5.31 Railway line [N]	
5.11 Power station (existing Tubatse Power Generation Facility)	**X**	5.32 Major road (4 lanes or more)	
5.12 Sport facilities		5.33 Airport [N]	
5.13 Golf course		5.34 Harbour	
5.14 Polo fields		5.35 Quarry, sand or borrow pit	
5.15 Filling station [H]		5.36 Hospital/medical centre	
5.16 Landfill or waste treatment site		5.37 River, stream or wetland	
5.17 Plantation		5.38 Nature conservation area	
5.18 Agriculture		5.39 Mountain, koppie or ridge	

5.19 Archaeological site		5.40 Graveyard	
5.20 Quarry, sand or borrow pit		5.41 River, stream or wetland	
5.21 Dam or Reservoir		5.42 Other land uses (describe)	

If any of the boxes marked with an "N "are ticked, how will this impact / be impacted upon by the proposed activity?

If any of the boxes marked with an "An" are ticked, how will this impact / be impacted upon by the proposed activity?

If YES, specify and explain:	**The proposed CFBs will positively impact on the existing facilities by reducing the plant's external electricity demand by enabling the existing power generation facility to generate electricity up to its design capacity of 30MW.**
If NO, specify:	**The proposed CFBs are to be established within the existing Tubatse Plant Boundary. The existing activities will not impact on the proposed activities.**

If any of the boxes marked with an "H" are ticked, how will this impact / be impacted upon by the proposed activity.

If YES, specify and explain:	
If NO, specify:	

The following photos will provide some insight into the industrial land use character of the surrounding area.

6. CULTURAL/HISTORICAL FEATURES

Are there any signs of culturally or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including Archaeological or palaeontological sites, on or close (within 20m) to the site?	**NO**
If YES, explain:	
If uncertain, conduct a specialist investigation by a recognised specialist in the field to establish whether there is such a feature(s) present on or close to the site.	
Briefly explain the findings of the specialist:	
Will any building or structure older than 60 years be affected in any way?	**NO**
Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?	**NO**

If yes, please submit or, make sure that the applicant or a specialist submits the necessary application to SAHRA or the relevant provincial heritage agency and attach proof thereof to this application if such application has been made.

SECTION C: PUBLIC PARTICIPATION

1. ADVERTISEMENT

The person conducting a public participation process must take into account any guidelines applicable to public participation as contemplated in section 24J of the Act and must give notice to all potential interested and affected parties of the application which is subjected to public participation by—

(a) fixing a notice board (of a size at least 60cm by 42cm; and must display the required information in lettering and in a format as may be determined by the department) at a place conspicuous to the public at the boundary or on the fence of—

  (i) the site where the activity to which the application relates is or is to be undertaken; and

  (ii) any alternative site mentioned in the application;

(b) giving written notice to—

  (i) the owner or person in control of that land if the applicant is not the owner or person in control of the land;

  (ii) the occupiers of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;

  (iii) owners and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;

  (iv) the municipal councillor of the ward in which the site or alternative site is situated and any organisation of ratepayers that represent the community in the area;

  (v) the municipality which has jurisdiction in the area;

  (vi) any organ of state having jurisdiction in respect of any aspect of the activity; and

  (vii) any other party as required by the department;

(c) placing an advertisement in—

  (i) one local newspaper; or

  (ii) any official *Gazette* that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations;

(d) placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the local municipality in which it is or will be undertaken: Provided that this paragraph need not be complied with if an advertisement has been placed in an official *Gazette* referred to in subregulation 54(c)(ii); and

(e) using reasonable alternative methods, as agreed to by the department, in those instances where a person is desiring of but unable to participate in the process due to—

  (i) illiteracy;

  (ii) disability; or

  (iii) any other disadvantage.

2. CONTENT OF ADVERTISEMENTS AND NOTICES

A notice board, advertisement or notices must:

(a) indicate the details of the application which is subjected to public participation; and

(b) state—

  (i) that the application has been submitted to the department in terms of these Regulations, as the case may be;

  (ii) whether basic assessment or scoping procedures are being applied to the application, in the case of an application for environmental authorisation;

  (iii) the nature and location of the activity to which the application relates;

  (iv) where further information on the application or activity can be obtained; and

  (v) the manner in which and the person to whom representations in respect of the application may be made.

3. PLACEMENT OF ADVERTISEMENTS AND NOTICES

Where the proposed activity may have impacts that extend beyond the municipal area where it is located, a notice must be placed in at least one provincial newspaper or national newspaper, indicating that an application will be submitted to the department in terms of these regulations, the nature and location of the activity, where further information on the proposed activity can be obtained and the manner in which representations in respect of the application can be made, unless a notice has been placed in any *Gazette* that is published specifically for the purpose of providing notice to the public of applications made in terms of these Regulations.

Advertisements and notices must make provision for all alternatives.

Advertisement:	
Publication name	**Steelburger / Lydenburg News**
Date published	**15 March 2018**
Advert	**Proof of publication to be included in the Final BAR. A copy of the advert is included in Appendix G.**
Site Notice	
Site notice positions	**Site Notices were placed at the Tubatse Plant entrance and at each of the three alternatives sites. Photographs and GPS co-ordinates of each notice location will be included in the Final BAR. A copy of the site notice is included in Appendix G.**
Date placed	**13 March 2018**
General Notifications	
General Notification	**A general project notification was emailed to the I&AP Database on 13 March 2018. A copy of the notification letter is included in Appendix G. The I&AP Database is included in Appendix G.** **No comments were received as a result of this notification.**
Draft Report Review	**The BAR was placed at the following public places for review from 15 March 2018 to 20 April 2018:** • **Tubatse Chrome Security Office** • **Mapodile Public Library** • **Burgersfort Public Library** • **WSP Website - http://www.wsp-pb.com/en/WSP-Africa/What-we-do/Services/All-Services-A-Z/Technical-Reports/** **General project notices, informing the public about the Draft BAR review period were erected in relevant public places in Steelpoort and Burgersfort.** **In addition, the emails and sms's were sent to the database notifying them of the availability of the Draft BAR for public review. A copy of the notification letter is included in Appendix G.**

4. DETERMINATION OF APPROPRIATE MEASURES

The practitioner must ensure that the public participation is adequate and must determine whether a public meeting or any other additional measure is appropriate or not based on the particular nature of each case. Special attention should be given to the involvement of local community structures such as Ward Committees, ratepayers associations and traditional authorities where appropriate. Please note that public concerns that emerge at a later

stage that should have been addressed may cause the department to withdraw any authorisation it may have issued if it becomes apparent that the public participation process was inadequate.

To date no comments have been received from stakeholders. At this stage a public meeting is not deemed necessary.

5. COMMENTS AND RESPONSE REPORT

The practitioner must record all comments and respond to each comment of the public before the application is submitted. The comments and responses must be captured in a comments and response report as prescribed in these Regulations and be attached to this application. The comments and response report must be attached under **Appendix E**.

To date no comments have been received from stakeholders. At this stage a public meeting is not deemed necessary. Any comments received during the Draft BAR review period will be included in a comment and response report which will be included in the Final BAR.

6. AUTHORITY PARTICIPATION

Please note that a complete list of all organs of state and or any other applicable authority with their contact details must be appended to the basic assessment report or scoping report, whichever is applicable.

Authorities are key interested and affected parties in each application and no decision on any application will be made before the relevant local authority is provided with the opportunity to give input.

Name of Authority informed:	Comments received (Yes or No)
Mr Gerhard Celliers **Department Of Water Affairs And Forestry** **Email: cilliersg@dwaf.gov.za** **Tel: 012 808 9554** **Cell: 082 880 3964**	**Not at this stage.**
Cllr Nkosi Mahlake **Greater Tubase Local Municipality** **Email: pnmalekane@tubatse.gov.za** **Tel: 013 231 7815** **Cell: 082 305 9043**	**Not at this stage.**

Name of Authority informed:	Comments received (Yes or No)
Mr. Bigman Maloa **Department of Agriculture Limpopo** **Email: maloab@agric.limpopo.gov.za** **Tel: 015 294 3147** **Cell: 082 887 4422**	**Not at this stage.**
Dr Matome Masipa **Department Of Health & Social Development** **Email: dr.mdmasipa@dhw.norprov.gov.za** **Tel: 015 293 6000** **Cell: 083 259 7833**	**Not at this stage.**
Mr Petrus Mosehla **South African Nation Civic Organisation** **Cell: 079 295 9605**	**Not at this stage.**
Mr Frans Krige **Mpumalanga Tourism and Parks Authority – Dullstroom** **Cell: 084 232 2902**	**Not at this stage.**
Mrs Juliet Makhari **Limpopo Department of Economic Development, Environment and Tourism** **Email: MukhariGJ@ledet.gov.za** **Tel: 015 290 7072** **Cell: 084 613 4073**	**Not at this stage.**

7. CONSULTATION WITH OTHER STAKEHOLDERS

Note that, for linear activities, or where deviation from the public participation requirements may be appropriate, the person conducting the public participation process may deviate from the requirements of that subregulation to the extent and in the manner as may be agreed to by the department.

Proof of any such agreement must be provided, where applicable.

Has any comment been received from stakeholders?	[redacted]	NO

Stakeholders were emailed a notification letter in 13 March 2018 and have been informed of the Draft BAR review period. To date no comments have been received from stakeholders. At this stage a public meeting is not deemed necessary. Any comments received during the Draft BAR review period will be included in a comment and response report which will be included in the Final BAR.

If "YES", briefly describe the feedback below (also attach copies of any correspondence to and from the stakeholders to this application):

[redacted]

SECTION D: IMPACT ASSESSMENT

The assessment of impacts must adhere to the minimum requirements in the EIA Regulations, 2016 (as amended), and should take applicable official guidelines into account. The issues raised by interested and affected parties should also be addressed in the assessment of impacts.

1. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

List the main issues raised by interested and affected parties.

To date no comments have been received from stakeholders. At this stage a public meeting is not deemed necessary. Any comments received during the Draft BAR review period will be included in a comment and response report which will be included in the Final BAR.

Response from the practitioner to the issues raised by the interested and affected parties (A full response must be given in the Comments and Response Report that must be attached to this report as Annexure E):

To date no comments have been received from stakeholders. At this stage a public meeting is not deemed necessary. Any comments received during the Draft BAR review period will be included in a comment and response report which will be included in the Final BAR.

2. IMPACTS THAT MAY RESULT FROM THE PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL, DECOMMISSIONING AND CLOSURE PHASES AS WELL AS PROPOSED MANAGEMENT OF IDENTIFIED IMPACTS AND PROPOSED MITIGATION MEASURES

List the potential direct, indirect and cumulative property/activity/design/technology/operational alternative related impacts (as appropriate) that are likely to occur as a result of the planning and design phase, construction phase, operational phase, decommissioning and closure phase, including impacts relating to the choice of site/activity/technology alternatives as well as the mitigation measures that may eliminate or reduce the potential impacts listed.

Methodology – Rating of Impacts

The significance of the potential environmental impacts was evaluated according to their severity, duration, extent and probability. Furthermore, cumulative impacts were also taken into consideration. The Hacking Impact Assessment Methodology has been used for the rating of the impacts. This system derives environmental significance on the basis of the consequence of the impact on the environment and the likelihood of the impact occurring. Consequence is calculated as the average of the sum of the ratings of severity, duration and extent of the environmental impact. Likelihood considers the probability of an environmental impact occurring. The following tables are applicable:

Severity

	Negative	Positive
High	• Substantial deterioration. • Death, illness or injury.	• Substantial improvement.
Medium	• Moderate deterioration. • Discomfort.	• Moderate improvement.
Low	• Minor deterioration. • Nuisance or minor irritation	• Minor improvement.

Extent	
High	• Widespread / Far beyond site boundary • Regional / National
Medium	• Fairly widespread / Beyond site boundary • Local
Low	• Localised / Within site boundary • Site
Duration	
High	• Permanent / Beyond Closure • Long Terms
Medium	• Reversible over life time of the project • Medium-term
Low	• Quickly reversible (Less that the project life) • Short-term
Probability	
High	• Definite • Continuous
Medium	• Possible • Frequent
Low	• Unlikely • Seldom

Alternative 1, 2 and 3

The impacts below are discussed in more detail in the significance rating tables (Table 2 to Table 5).

<u>Direct impacts:</u>

- **Planning and Design Phase**
  - **No impacts anticipated**
- **Construction Phase**
  - **Biodiversity - vegetation clearance**
  - **Noise**
  - **Air Quality – dust**
  - **Social – Job creation (positive impact)**
  - **Waste generation and spills**
  - **Water and Soil Contamination**
- **Operational Phase**
  - **Noise**
  - **Air Quality**
  - **Waste – Generation and Spills**
  - **Social – Job Creation**

- **Water and Soil Contamination**

- **Decommissioning Phase**
  - **Noise**
  - **Air Quality – Dust**
  - **Social – Job Creation (positive impact)**
  - **Waste generation and spills**
  - **Water and Soil Contamination**

Indirect impacts:

- **Planning and Design Phase**
  - **No impacts anticipated**
- **Construction Phase**
  - **No impacts anticipated**
- **Operational Phase**
  - **Social - Job Creation (positive impact)**
- **Decommissioning Phase**
  - **No impacts anticipated**

Cumulative impacts:

- **Planning and Design Phase**
  - **No cumulative impacts anticipated**
- **Construction Phase**
  - **Air Quality**
- **Operational Phase**
  - **Air Quality**
- **Decommissioning Phase**
  - **No cumulative impacts anticipated**

Table 2: Significance Rating Table for Planning and Design Phase

Potential Impact	Severity	Extent	Duration	Consequence	Probability	Confidence	Status	Significance
Planning and Design Phase								
Nature of the Phase	The Planning and Design Phase will be limited to site visits and planning meetings. The proposed project involves the establishment of four 25t/h CFBs within the boundaries of the existing Tubatse Chrome Plant near Steelpoort in the Limpopo Province. The project, however, does require the existing AEL to be amended.							
Direct Impacts								
No direct impacts are anticipated during this phase.								
Indirect Impacts								
The only indirect impact that this project will have is the requirement to amend the existing AEL which therefore triggered this Basic Assessment Process.								
Cumulative Impacts								
No cumulative impacts are anticipated during this phase.								

Table 3: Significance Rating Table for Construction Phase

Potential Impact	Severity	Extent	Duration	Consequence	Probability	Confidence	Status	Significance
Construction Phase								
Nature of the Phase	**During the construction phase the CFBs and their associated infrastructure will be constructed within the boundaries of the existing Tubatse Chrome site near Steelpoort. The proposed Power Plant shall comprise, but not limited to, the following main equipment:** • **CFB Steam Generator** ○ **Top supported, natural circulating, drum type, CFB fired, balanced draught, reheat boilers;** ○ **Draft system;** ○ **Coal feeding, crushing, coal bunkers and combustion system;** ○ **Fuel oil system;** ○ **Bed material handling and feeding system;** ○ **Limestone sorbent crushing and screening handling and feed systems;** ○ **Bag house filter equipment and its accessories;** ○ **Ash discharge from main furnace, boiler gas pass hoppers, and filter systems; and** ○ **Ash conditioning, discharge conveyors and hoppers for truck transport to ash storage area.** • **Station Mechanical Systems:** ○ **Water supply and treatment systems;** ○ **Effluent handling and all waste water treatment system, consistent with zero effluent;** ○ **Limestone and fluid bed sand management make up and control system;** ○ **Limestone primary crusher plant;** ○ **Limestone secondary crusher plant, on site location;** ○ **Ash handling system, ash conditioning systems, ash conveying and ash unloading facilities inside the Power Plant;** ○ **Coal handling equipment from No.1 transfer tower;** ○ **Fuel oil supply and storage system;** ○ **Station hoisting equipment;** ○ **Compressed air system;** ○ **Auxiliary steam;** ○ **Dust suppression system;** ○ **Fire detection and fighting system;** ○ **Station drainage system;**								

Potential Impact		Severity	Extent	Duration	Consequence	Probability	Confidence	Status	Significance
	○ Temporary pipework for steam purge and acid clean; and ○ All associated pipework, valves and mechanical auxiliaries and connections. • Instrumentation and Control Systems ○ Distributed control system During construction, the contractor will utilise existing laydown areas. The existing site workshop will be used to do most of the fabrication and sub-assemblies prior to the construction.								
Direct Impacts									
Alternative S1									
Noise (C-N)	Nature of the Impact	The construction activities will result in some additional noise that may affect workers on site. The noise could result from increased construction traffic, welding, grinding, materials handling etc.							
	Without Mitigation	Medium	Medium	Low	Medium	Medium	High	Negative	Medium
	With Mitigation	Low	Low	Low	Low	Medium	High	Negative	Medium
	Mitigation Measures	Ensure that all workers are issued with and use the correct PPE, especially with regards to ear plugs. In addition, all construction areas should be designated as noisy areas. Construction vehicles and equipment must be monitored and maintained in good working condition.							
Waste Generation (C-WG)	Nature of the Impact	Construction waste will be generated during the construction of the CFBs. This waste will include steel, concrete, oil, cables, general litter etc.							
	Without Mitigation	Medium	Low	Medium	Medium	High	High	Negative	Medium
	With Mitigation	Low	Low	Low	Low	Low	High	Negative	Low
	Mitigation Measures	All waste must be managed and disposed of in accordance with Tubatse's existing waste management procedures							
Poor Housekeeping (C-PH)	Nature of the Impact	Construction activities will result in the generation of litter.							
	Without Mitigation	Medium	Low	Medium	Medium	High	High	Negative	Medium
	With Mitigation	Low	Low	Low	Low	Low	High	Negative	Low
	Mitigation Measures	• The litter must be disposed in the portable waste bins on site and later disposed at a relevant landfill site. • The Construction workers must be inducted and trained about the housekeeping by ECO							
Soil Contamination (C-SC)	Nature of the Impact	Soil contamination could result from the spillage of hazardous substances such as fuel, oil, cement etc.							
	Without Mitigation	Medium	Low	Medium	Medium	High	High	Negative	Medium
	With Mitigation	Low	Low	Low	Low	Low	High	Negative	Low
	Mitigation Measures	• Mixing of hazardous substances should be conducted in a manner that will not impact on the soil surface. • All hand mixing to be undertaken on an impermeable surface within a demarcated area. • Drip trays (or other suitable method) must be placed under construction machinery (while standing) to avoid soil contamination. • Contaminated soil must be excavated and disposed of at a suitable hazardous waste landfill site.							

Potential Impact		Severity	Extent	Duration	Consequence	Probability	Confidence	Status	Significance
		• All hazardous substances to be stored in appropriately bunded facilities where applicable							
Erosion and Topsoil Loss (C-ETL)	Nature of the Impact	The construction of the CFBs will require vegetation clearance which could lead to erosion and topsoil loss.							
	Without Mitigation	Medium	Low	Medium	Medium	High	High	Negative	Medium
	With Mitigation	Low	Low	Low	Low	Low	High	Negative	Low
	Mitigation Measures	Vegetation clearance must be limited to within the site boundaries.							
Water Contamination (C-WC)	Nature of the Impact	Water contamination could result from the spillage of hazardous substances such as fuel, oil, cement etc.							
	Without Mitigation	Medium	Medium	Medium	Medium	High	High	Negative	Medium
	With Mitigation	Low	Low	Low	Low	Low	High	Negative	Low
	Mitigation Measures	• Mixing of hazardous substances should be conducted in a manner that will not impact on the soil surface. • All hand mixing to be undertaken on an impermeable surface within a demarcated area. • Drip trays (or other suitable method) must be placed under construction machinery (while standing) to avoid soil contamination. • Contaminated soil must be excavated and disposed of at a suitable hazardous waste landfill site. • All hazardous substances to be stored in appropriately bunded facilities where applicable							
Vegetation Loss (C-VL)	Nature of the Impact	The construction activities will require the site to be cleared of vegetation. The Tubatse site is located within the Sekhukhune Plains Bushveld which is characterised by predominantly short, open to closed thornveld with an abundance of Aloe species and other succulents. It is noted that two protected tree species can be typical of this vegetation type including *Acacia erioloba* and *Combretum imberbe*. Alternative 1 is highly degraded with approximately 20% of the site being vegetated.							
	Without Mitigation	Medium	Low	High	Medium	High	High	Negative	Medium
	With Mitigation	Low	Low	Low	Low	Low	High	Negative	Low
	Mitigation Measures	• A suitably qualified ecologist must walk the site prior to construction to ensure that there are no species of special concern. • All exposed soil must be re-vegetated at the end of the construction phase. • Construction activities must be limited to within the site boundary and laydown areas.							
Habitat Loss (C-HL)	Nature of the Impact	The construction activities will require the site to be cleared of vegetation. This will result in a loss of habitat for fauna species.							
	Without Mitigation	Medium	Low	High	Medium	High	High	Negative	Medium
	With Mitigation	Low	Low	Low	Low	Low	High	Negative	Low
	Mitigation Measures	• All exposed soil must be re-vegetated at the end of the construction phase. • Construction activities must be limited to within the site boundary and laydown areas.							
Social – Job Opportunities (C-SJO)	Nature of the Impact	Temporary job opportunities will be created for the local community during the construction phase.							
	Without Mitigation	Medium	Medium	Medium	Medium	High	High	Positive	Medium
	With Mitigation	High	Medium	Medium	Medium	High	High	Positive	Medium

Potential Impact		Severity	Extent	Duration	Consequence	Probability	Confidence	Status	Significance
	Mitigation Measures	Ensure that the contractor is required to utilise a relevant percentage of local labour							
Social – general impacts (C-SGI)	Nature of the Impact	The construction phase will result in a number of negative social impacts such as the influx of workers into the local area, safety and security, HIV etc..							
	Without Mitigation	Medium	Medium	Medium	Medium	High	High	Negative	Medium
	With Mitigation	Low	Low	Low	Low	Low	High	Negative	Low
	Mitigation Measures	• Ensure that the contractor is required to utilise a relevant percentage of local labour. • Sufficient ablution facilities must be available on site for construction workers. • All construction activities to be limited to within the site boundaries.							
Air Quality – Beyond Site Boundary (TSP) (C1-TSP)	Nature of the Impact	Emissions during construction are associated with land clearing, drilling and blasting, ground excavation, cut and fill operations and heavy vehicle traffic on temporary roads.							
	Without Mitigation	Med	Med	Low	Med	Low	Low	Neutral	Low
	With Mitigation	Low	Med	Low	Low	Low	Low	Neutral	Low
	Mitigation Measures	• Dust suppression techniques must be implemented as required. • Speed limits on site must be enforced to limit the levels of dust pollution.							
Air Quality – Beyond Site Boundary (PM_{10}) (C1-PM_{10})	Nature of the Impact	Emissions during construction are associated with land clearing, drilling and blasting, ground excavation, cut and fill operations and heavy vehicle traffic on temporary roads.							
	Without Mitigation	Low	Med	Low	Low	Low	Low	Neutral	Low
	With Mitigation	Low	Low	Low	Low	Low	Low	Neutral	Low
	Mitigation Measures	• Dust suppression techniques must be implemented as required. • Speed limits on site must be enforced to limit the levels of dust pollution.							
Air Quality – Beyond Site Boundary ($PM_{2.5}$) (C1-$PM_{2.5}$)	Nature of the Impact	Emissions during construction are associated with land clearing, drilling and blasting, ground excavation, cut and fill operations and heavy vehicle traffic on temporary roads.							
	Without Mitigation	Low	Med	Low	Low	Low	Low	Neutral	Low
	With Mitigation	Low	Low	Low	Low	Low	Low	Neutral	Low
	Mitigation Measures	• Dust suppression techniques must be implemented as required. • Speed limits on site must be enforced to limit the levels of dust pollution.							
Air Quality – Impact at Sensitive Receptors (TSP) (C2-TSP)	Nature of the Impact	Emissions during construction are associated with land clearing, drilling and blasting, ground excavation, cut and fill operations and heavy vehicle traffic on temporary roads.							
	Without Mitigation	Low	Med	Low	Low	Low	Low	Neutral	Low
	With Mitigation	Low	Low	Low	Low	Low	Low	Neutral	Low
	Mitigation Measures	• All construction vehicles must be kept in good working order and maintained according to the relevant standards. • Limit the speed of construction vehicles.							
Air Quality – Impact at Sensitive Receptors	Nature of the Impact	Emissions during construction are associated with land clearing, drilling and blasting, ground excavation, cut and fill							

Potential Impact		Severity	Extent	Duration	Consequence	Probability	Confidence	Status	Significance
(PM_{10}) (C2-PM_{10})		operations and heavy vehicle traffic on temporary roads.							
	Without Mitigation	Low	Med	Low	Low	Low	Low	Neutral	Low
	With Mitigation	Low	Low	Low	Low	Low	Low	Neutral	Low
	Mitigation Measures	• All construction vehicles must be kept in good working order and maintained according to the relevant standards. • Limit the speed of construction vehicles.							
Air Quality – Impact at Sensitive Receptors ($PM_{2.5}$) (C2-$PM_{2.5}$)	Nature of the Impact	Emissions during construction are associated with land clearing, drilling and blasting, ground excavation, cut and fill operations and heavy vehicle traffic on temporary roads.							
	Without Mitigation	Low	Low	Low	Low	Low	Low	Neutral	Low
	With Mitigation	Low	Low	Low	Low	Low	Low	Neutral	Low
	Mitigation Measures	• All construction vehicles must be kept in good working order and maintained according to the relevant standards. • Limit the speed of construction vehicles.							
Alternative S2									
Noise (C-N)	Nature of the Impact	The construction activities will result in some additional noise that may affect workers on site. The noise could result from increased construction traffic, welding, grinding, materials handling etc.							
	Without Mitigation	Medium	Medium	Low	Medium	Medium	High	Negative	Medium
	With Mitigation	Low	Low	Low	Low	Medium	High	Negative	Medium
	Mitigation Measures	Ensure that all workers are issued with and use the correct PPE, especially with regards to ear plugs. In addition, all construction areas should be designated as noisy areas. Construction vehicles and equipment must be monitored and maintained in good working condition.							
Waste Generation (C-WG)	Nature of the Impact	Construction waste will be generated during the construction of the CFBs. This waste will include steel, concrete, oil, cables, general litter etc.							
	Without Mitigation	Medium	Low	Medium	Medium	High	High	Negative	Medium
	With Mitigation	Low	Low	Low	Low	Low	High	Negative	Low
	Mitigation Measures	All waste must be managed and disposed of in accordance with Tubatse's existing waste management procedures.							
Poor Housekeeping (C-PH)	Nature of the Impact	Construction activities will result in the generation of litter.							
	Without Mitigation	Medium	Low	Medium	Medium	High	High	Negative	Medium
	With Mitigation	Low	Low	Low	Low	Low	High	Negative	Low
	Mitigation Measures	• The litter must be disposed in the portable waste bins on site and later disposed at a relevant landfill site. • The Construction workers must be inducted and trained about the housekeeping by ECO							
Soil Contamination (C-SC)	Nature of the Impact	Soil contamination could result from the spillage of hazardous substances such as fuel, oil, cement etc.							
	Without Mitigation	Medium	Low	Medium	Medium	High	High	Negative	Medium
	With Mitigation	Low	Low	Low	Low	Low	High	Negative	Low
	Mitigation Measures	• Mixing of hazardous substances should be conducted in a manner that will not impact on the soil surface.							

Potential Impact		Severity	Extent	Duration	Consequence	Probability	Confidence	Status	Significance
		• All hand mixing to be undertaken on an impermeable surface within a demarcated area. • Drip trays (or other suitable method) must be placed under construction machinery (while standing) to avoid soil contamination. • Contaminated soil must be excavated and disposed of at a suitable hazardous waste landfill site. • All hazardous substances to be stored in appropriately bunded facilities where applicable.							
Erosion and Topsoil Loss (C-ETL)	Nature of the Impact	The construction of the CFBs will require vegetation clearance which could lead to erosion and topsoil loss.							
	Without Mitigation	Medium	Low	Medium	Medium	High	High	Negative	Medium
	With Mitigation	Low	Low	Low	Low	Low	High	Negative	Low
	Mitigation Measures	Vegetation clearance must be limited to within the site boundaries.							
Water Contamination (C-WC)	Nature of the Impact	Water contamination could result from the spillage of hazardous substances such as fuel, oil, cement etc.							
	Without Mitigation	Medium	Medium	Medium	Medium	High	High	Negative	Medium
	With Mitigation	Low	Low	Low	Low	Low	High	Negative	Low
	Mitigation Measures	• Mixing of hazardous substances should be conducted in a manner that will not impact on the soil surface. • All hand mixing to be undertaken on an impermeable surface within a demarcated area. • Drip trays (or other suitable method) must be placed under construction machinery (while standing) to avoid soil contamination. • Contaminated soil must be excavated and disposed of at a suitable hazardous waste landfill site. • All hazardous substances to be stored in appropriately bunded facilities where applicable							
Vegetation Loss (C-VL)	Nature of the Impact	The construction activities will require the site to be cleared of vegetation. The Tubatse site is located within the Sekhukhune Plains Bushveld which is characterised by predominantly short, open to closed thornveld with an abundance of Aloe species and other succulents. It is noted that two protected tree species can be typical of this vegetation type including *Acacia erioloba* and *Combretum imberbe*. Alternative 2 is highly degraded with approximately 30% of the site being vegetated with scattered aliens.							
	Without Mitigation	Medium	Low	High	Medium	High	High	Negative	Medium
	With Mitigation	Low	Low	Low	Low	Low	High	Negative	Low
	Mitigation Measures	• A suitably qualified ecologist must walk the site prior to construction to ensure that there are no species of special concern. • All exposed soil must be re-vegetated at the end of the construction phase. • Construction activities must be limited to within the site boundary and laydown areas.							
Habitat Loss (C-HL)	Nature of the Impact	The construction activities will require the site to be cleared of vegetation. This will result in a loss of habitat for fauna species.							
	Without Mitigation	Medium	Low	High	Medium	High	High	Negative	Medium
	With Mitigation	Low	Low	Low	Low	Low	High	Negative	Low
	Mitigation Measures	• All exposed soil must be re-vegetated at the end of the construction phase. • Construction activities must be limited to within the site boundary and laydown areas.							

Potential Impact		Severity	Extent	Duration	Consequence	Probability	Confidence	Status	Significance
Social – Job Opportunities (C-SJO)	Nature of the Impact	Temporary job opportunities will be created for the local community during the construction phase.							
	Without Mitigation	Medium	Medium	Medium	Medium	High	High	Positive	Medium
	With Mitigation	High	Medium	Medium	Medium	High	High	Positive	Medium
	Mitigation Measures	Ensure that the contractor is required to utilise a relevant percentage of local labour							
Social – general impacts (C-SGI)	Nature of the Impact	The construction phase will result in a number of negative social impacts such as the influx of workers into the local area, safety and security, HIV etc..							
	Without Mitigation	Medium	Medium	Medium	Medium	High	High	Negative	Medium
	With Mitigation	Low	Low	Low	Low	Low	High	Negative	Low
	Mitigation Measures	• Ensure that the contractor is required to utilise a relevant percentage of local labour. • Sufficient ablution facilities must be available on site for construction workers. • All construction activities to be limited to within the site boundaries.							
Air Quality – Beyond Site Boundary (TSP) (C1-TSP)	Nature of the Impact	Emissions during construction are associated with land clearing, drilling and blasting, ground excavation, cut and fill operations and heavy vehicle traffic on temporary roads.							
	Without Mitigation	Med	Med	Low	Med	Low	Low	Neutral	Low
	With Mitigation	Low	Med	Low	Low	Low	Low	Neutral	Low
	Mitigation Measures	• Dust suppression techniques must be implemented as required. • Speed limits on site must be enforced to limit the levels of dust pollution.							
Air Quality – Beyond Site Boundary (PM_{10}) (C1-PM_{10})	Nature of the Impact	Emissions during construction are associated with land clearing, drilling and blasting, ground excavation, cut and fill operations and heavy vehicle traffic on temporary roads.							
	Without Mitigation	Low	Med	Low	Low	Low	Low	Neutral	Low
	With Mitigation	Low	Low	Low	Low	Low	Low	Neutral	Low
	Mitigation Measures	• Dust suppression techniques must be implemented as required. • Speed limits on site must be enforced to limit the levels of dust pollution.							
Air Quality – Beyond Site Boundary ($PM_{2.5}$) (C1-$PM_{2.5}$)	Nature of the Impact	Emissions during construction are associated with land clearing, drilling and blasting, ground excavation, cut and fill operations and heavy vehicle traffic on temporary roads.							
	Without Mitigation	Low	Med	Low	Low	Low	Low	Neutral	Low
	With Mitigation	Low	Low	Low	Low	Low	Low	Neutral	Low
	Mitigation Measures	• Dust suppression techniques must be implemented as required. • Speed limits on site must be enforced to limit the levels of dust pollution.							
Air Quality – Impact at Sensitive Receptors (TSP) (C2-TSP)	Nature of the Impact	Emissions during construction are associated with land clearing, drilling and blasting, ground excavation, cut and fill operations and heavy vehicle traffic on temporary roads.							
	Without Mitigation	Low	Med	Low	Low	Low	Low	Neutral	Low
	With Mitigation	Low	Low	Low	Low	Low	Low	Neutral	Low

Potential Impact		Severity	Extent	Duration	Consequence	Probability	Confidence	Status	Significance
	Mitigation Measures	• All construction vehicles must be kept in good working order and maintained according to the relevant standards. • Limit the speed of construction vehicles.							
Air Quality – Impact at Sensitive Receptors (PM_{10}) ($C2\text{-}PM_{10}$)	Nature of the Impact	Emissions during construction are associated with land clearing, drilling and blasting, ground excavation, cut and fill operations and heavy vehicle traffic on temporary roads.							
	Without Mitigation	Low	Med	Low	Low	Low	Low	Neutral	Low
	With Mitigation	Low	Low	Low	Low	Low	Low	Neutral	Low
	Mitigation Measures	• All construction vehicles must be kept in good working order and maintained according to the relevant standards. • Limit the speed of construction vehicles.							
Air Quality – Impact at Sensitive Receptors ($PM_{2.5}$) ($C2\text{-}PM_{2.5}$)	Nature of the Impact	Emissions during construction are associated with land clearing, drilling and blasting, ground excavation, cut and fill operations and heavy vehicle traffic on temporary roads.							
	Without Mitigation	Low	Low	Low	Low	Low	Low	Neutral	Low
	With Mitigation	Low	Low	Low	Low	Low	Low	Neutral	Low
	Mitigation Measures	• All construction vehicles must be kept in good working order and maintained according to the relevant standards. • Limit the speed of construction vehicles.							
Alternative S3									
Noise (C-N)	Nature of the Impact	The construction activities will result in some additional noise that may affect workers on site. The noise could result from increased construction traffic, welding, grinding, materials handling etc.							
	Without Mitigation	Medium	Medium	Low	Medium	Medium	High	Negative	Medium
	With Mitigation	Low	Low	Low	Low	Medium	High	Negative	Medium
	Mitigation Measures	Ensure that all workers are issued with and use the correct PPE, especially with regards to ear plugs. In addition, all construction areas should be designated as noisy areas. Construction vehicles and equipment must be monitored and maintained in good working condition.							
Waste Generation (C-WG)	Nature of the Impact	Construction waste will be generated during the construction of the CFBs. This waste will include steel, concrete, oil, cables, general litter etc.							
	Without Mitigation	Medium	Low	Medium	Medium	High	High	Negative	Medium
	With Mitigation	Low	Low	Low	Low	Low	High	Negative	Low
	Mitigation Measures	All waste must be managed and disposed of in accordance with Tubatse's existing waste management procedures							
Poor Housekeeping (C-PH)	Nature of the Impact	Construction activities will result in the generation of litter.							
	Without Mitigation	Medium	Low	Medium	Medium	High	High	Negative	Medium
	With Mitigation	Low	Low	Low	Low	Low	High	Negative	Low
	Mitigation Measures	• The litter must be disposed in the portable waste bins on site and later disposed at a relevant landfill site. • The Construction workers must be inducted and trained about the housekeeping by ECO							
Soil Contamination (C-SC)	Nature of the Impact	Soil contamination could result from the spillage of hazardous substances such as fuel, oil, cement etc.							

Potential Impact		Severity	Extent	Duration	Consequence	Probability	Confidence	Status	Significance
	Without Mitigation	Medium	Low	Medium	Medium	High	High	Negative	Medium
	With Mitigation	Low	Low	Low	Low	Low	High	Negative	Low
	Mitigation Measures	• Mixing of hazardous substances should be conducted in a manner that will not impact on the soil surface. • All hand mixing to be undertaken on an impermeable surface within a demarcated area. • Drip trays (or other suitable method) must be placed under construction machinery (while standing) to avoid soil contamination. • Contaminated soil must be excavated and disposed of at a suitable hazardous waste landfill site. • All hazardous substances to be stored in appropriately bunded facilities where applicable							
Erosion and Topsoil Loss (C-ETL)	Nature of the Impact	The construction of the CFBs will require vegetation clearance which could lead to erosion and topsoil loss.							
	Without Mitigation	Medium	Low	Medium	Medium	High	High	Negative	Medium
	With Mitigation	Low	Low	Low	Low	Low	High	Negative	Low
	Mitigation Measures	Vegetation clearance must be limited to within the site boundaries.							
Water Contamination (C-WC)	Nature of the Impact	Water contamination could result from the spillage of hazardous substances such as fuel, oil, cement etc.							
	Without Mitigation	Medium	Medium	Medium	Medium	High	High	Negative	Medium
	With Mitigation	Low	Low	Low	Low	Low	High	Negative	Low
	Mitigation Measures	• Mixing of hazardous substances should be conducted in a manner that will not impact on the soil surface. • All hand mixing to be undertaken on an impermeable surface within a demarcated area. • Drip trays (or other suitable method) must be placed under construction machinery (while standing) to avoid soil contamination. • Contaminated soil must be excavated and disposed of at a suitable hazardous waste landfill site. • All hazardous substances to be stored in appropriately bunded facilities where applicable							
Vegetation Loss (C-VL)	Nature of the Impact	The construction activities will require the site to be cleared of vegetation. The Tubatse site is located within the Sekhukhune Plains Bushveld which is characterised by predominantly short, open to closed thornveld with an abundance of Aloe species and other succulents. It is noted that two protected tree species can be typical of this vegetation type including *Acacia erioloba* and *Combretum imberbe*. Approximately 70% of the Alternative 3 site is vegetated.							
	Without Mitigation	High	Low	High	High	High	High	Negative	High
	With Mitigation	Medium	Low	Medium	Medium	Medium	High	Negative	Medium
	Mitigation Measures	• A suitably qualified ecologist must walk the site prior to construction to ensure that there are no species of special concern. • All exposed soil must be re-vegetated at the end of the construction phase. • Construction activities must be limited to within the site boundary and laydown areas.							
Habitat Loss (C-HL)	Nature of the Impact	The construction activities will require the site to be cleared of vegetation. This will result is a loss of habitat for fauna species.							
	Without Mitigation	Medium	Low	High	Medium	High	High	Negative	Medium

Potential Impact		Severity	Extent	Duration	Consequence	Probability	Confidence	Status	Significance
	With Mitigation	Medium	Low	Medium	Medium	Medium	High	Negative	Medium
	Mitigation Measures	• All exposed soil must be re-vegetated at the end of the construction phase. • Construction activities must be limited to within the site boundary and laydown areas.							
Social – Job Opportunities (C-SJO)	Nature of the Impact	Temporary job opportunities will be created for the local community during the construction phase.							
	Without Mitigation	Medium	Medium	Medium	Medium	High	High	Positive	Medium
	With Mitigation	High	Medium	Medium	Medium	High	High	Positive	Medium
	Mitigation Measures	Ensure that the contractor is required to utilise a relevant percentage of local labour							
Social – general impacts (C-SGI)	Nature of the Impact	The construction phase will result in a number of negative social impacts such as the influx of workers into the local area, safety and security, HIV etc.							
	Without Mitigation	Medium	Medium	Medium	Medium	High	High	Negative	Medium
	With Mitigation	Low	Low	Low	Low	Low	High	Negative	Low
	Mitigation Measures	• Ensure that the contractor is required to utilise a relevant percentage of local labour. • Sufficient ablution facilities must be available on site for construction workers. • All construction activities to be limited to within the site boundaries.							
Air Quality – Beyond Site Boundary (TSP) (C1-TSP)	Nature of the Impact	Emissions during construction are associated with land clearing, drilling and blasting, ground excavation, cut and fill operations and heavy vehicle traffic on temporary roads.							
	Without Mitigation	Med	Med	Low	Med	Low	Low	Neutral	Low
	With Mitigation	Low	Med	Low	Low	Low	Low	Neutral	Low
	Mitigation Measures	• Dust suppression techniques must be implemented as required. • Speed limits on site must be enforced to limit the levels of dust pollution.							
Air Quality – Beyond Site Boundary (PM_{10}) (C1-PM_{10})	Nature of the Impact	Emissions during construction are associated with land clearing, drilling and blasting, ground excavation, cut and fill operations and heavy vehicle traffic on temporary roads.							
	Without Mitigation	Low	Med	Low	Low	Low	Low	Neutral	Low
	With Mitigation	Low	Low	Low	Low	Low	Low	Neutral	Low
	Mitigation Measures	• Dust suppression techniques must be implemented as required. • Speed limits on site must be enforced to limit the levels of dust pollution.							
Air Quality – Beyond Site Boundary ($PM_{2.5}$) (C1-$PM_{2.5}$)	Nature of the Impact	Emissions during construction are associated with land clearing, drilling and blasting, ground excavation, cut and fill operations and heavy vehicle traffic on temporary roads.							
	Without Mitigation	Low	Med	Low	Low	Low	Low	Neutral	Low
	With Mitigation	Low	Low	Low	Low	Low	Low	Neutral	Low
	Mitigation Measures	• Dust suppression techniques must be implemented as required. • Speed limits on site must be enforced to limit the levels of dust pollution.							
Air Quality – Impact at Sensitive Receptors	Nature of the Impact	Emissions during construction are associated with land clearing, drilling and blasting, ground excavation, cut and fill							

Potential Impact		Severity	Extent	Duration	Consequence	Probability	Confidence	Status	Significance
(TSP) (C2-TSP)		operations and heavy vehicle traffic on temporary roads.							
	Without Mitigation	Low	Med	Low	Low	Low	Low	Neutral	Low
	With Mitigation	Low	Low	Low	Low	Low	Low	Neutral	Low
	Mitigation Measures	• All construction vehicles must be kept in good working order and maintained according to the relevant standards. • Limit the speed of construction vehicles.							
Air Quality – Impact at Sensitive Receptors (PM_{10}) (C2-PM_{10})	Nature of the Impact	Emissions during construction are associated with land clearing, drilling and blasting, ground excavation, cut and fill operations and heavy vehicle traffic on temporary roads.							
	Without Mitigation	Low	Med	Low	Low	Low	Low	Neutral	Low
	With Mitigation	Low	Low	Low	Low	Low	Low	Neutral	Low
	Mitigation Measures	• All construction vehicles must be kept in good working order and maintained according to the relevant standards. • Limit the speed of construction vehicles.							
Air Quality – Impact at Sensitive Receptors ($PM_{2.5}$) (C2-$PM_{2.5}$)	Nature of the Impact	Emissions during construction are associated with land clearing, drilling and blasting, ground excavation, cut and fill operations and heavy vehicle traffic on temporary roads.							
	Without Mitigation	Low	Low	Low	Low	Low	Low	Neutral	Low
	With Mitigation	Low	Low	Low	Low	Low	Low	Neutral	Low
	Mitigation Measures	• All construction vehicles must be kept in good working order and maintained according to the relevant standards. • Limit the speed of construction vehicles.							
Indirect Impacts									
No indirect impacts are anticipated during this phase.									
Cumulative Impacts									
Air Quality – Beyond Site Boundary (TSP) (C1-TSP)	Nature of the Impact	Cumulative emissions during construction are associated with land clearing, drilling and blasting, ground excavation, cut and fill operations and heavy vehicle traffic on temporary roads as well as the emissions from the existing operating activities.							
	Without Mitigation	Med	Med	Low	Med	Low	Low	Neutral	Low
	With Mitigation	Low	Med	Low	Low	Low	Low	Neutral	Low
	Mitigation Measures	• Dust suppression techniques must be implemented as required. • Speed limits on site must be enforced to limit the levels of dust pollution.							
Air Quality – Beyond Site Boundary (PM_{10}) (C1-PM_{10})	Nature of the Impact	Cumulative emissions during construction are associated with land clearing, drilling and blasting, ground excavation, cut and fill operations and heavy vehicle traffic on temporary roads as well as the emissions from the existing operating activities.							
	Without Mitigation	Low	Med	Low	Low	Low	Low	Neutral	Low
	With Mitigation	Low	Low	Low	Low	Low	Low	Neutral	Low
	Mitigation Measures	• Dust suppression techniques must be implemented as required.							

Potential Impact		Severity	Extent	Duration	Consequence	Probability	Confidence	Status	Significance
		• Speed limits on site must be enforced to limit the levels of dust pollution.							
Air Quality – Beyond Site Boundary ($PM_{2.5}$) (C1-$PM_{2.5}$)	Nature of the Impact	Cumulative emissions during construction are associated with land clearing, drilling and blasting, ground excavation, cut and fill operations and heavy vehicle traffic on temporary roads as well as the emissions from the existing operating activities.							
	Without Mitigation	Low	Med	Low	Low	Low	Low	Neutral	Low
	With Mitigation	Low	Low	Low	Low	Low	Low	Neutral	Low
	Mitigation Measures	• Dust suppression techniques must be implemented as required. • Speed limits on site must be enforced to limit the levels of dust pollution.							
Air Quality – Impact at Sensitive Receptors (TSP) (C2-TSP)	Nature of the Impact	Cumulative emissions during construction are associated with land clearing, drilling and blasting, ground excavation, cut and fill operations and heavy vehicle traffic on temporary roads as well as the emissions from the existing operating activities.							
	Without Mitigation	Low	Med	Low	Low	Low	Low	Neutral	Low
	With Mitigation	Low	Low	Low	Low	Low	Low	Neutral	Low
	Mitigation Measures	• All construction vehicles must be kept in good working order and maintained according to the relevant standards. • Limit the speed of construction vehicles.							
Air Quality – Impact at Sensitive Receptors (PM_{10}) (C2-PM_{10})	Nature of the Impact	Cumulative emissions during construction are associated with land clearing, drilling and blasting, ground excavation, cut and fill operations and heavy vehicle traffic on temporary roads as well as the emissions from the existing operating activities.							
	Without Mitigation	Low	Med	Low	Low	Low	Low	Neutral	Low
	With Mitigation	Low	Low	Low	Low	Low	Low	Neutral	Low
	Mitigation Measures	• All decommissioning vehicles must be kept in good working order and maintained according to the relevant standards. • Limit the speed of decommissioning vehicles.							
Air Quality – Impact at Sensitive Receptors ($PM_{2.5}$) (C2-$PM_{2.5}$)	Nature of the Impact	Cumulative emissions during construction are associated with land clearing, drilling and blasting, ground excavation, cut and fill operations and heavy vehicle traffic on temporary roads as well as the emissions from the existing operating activities.							
	Without Mitigation	Low	Low	Low	Low	Low	Low	Neutral	Low
	With Mitigation	Low	Low	Low	Low	Low	Low	Neutral	Low
	Mitigation Measures	• All decommissioning vehicles must be kept in good working order and maintained according to the relevant standards. • Limit the speed of decommissioning vehicles.							

Table 4: Significance Rating Table for Operational Phase

Potential Impact		Severity	Extent	Duration	Consequence	Probability	Confidence	Status	Significance
Operational Phase									
Nature of the Phase	During the operational phase the CFBs will generate steam that will be piped to the existing power generation facility to enable the facility to generate electricity up to its existing design capacity of 30MW. A built bag filter will remove the ash from the flue gas prior to the gas being emitted from the stack. It is proposed that all ash generated by the facility will either be sold to the cement and/or brickmaking industries or will be disposed of at the Tubatse hazardous Waste Facility. No alternatives assessment was undertaken for the operational phase as the impacts are identical regardless of the site position. Due to the fact that the CFBs are only available with a pollution abatement system, the Air Quality Impact Assessment only assessed the impacts of the CFBs with mitigation measures in place.								
Direct Impacts									
Waste - Generation (O-WG)	Nature of the Impact	The CFBs will generate ash as a result of the process.							
	Without Mitigation	Medium	Medium	Medium	Medium	Medium	High	Negative	Medium
	With Mitigation	Low	Low	Low	Low	Low	High	Negative	Low
	Mitigation Measures	Ash generated by the CFBs must either be sold to the cement or brickmaking industry or transported to the Tubatse Hazardous landfill site for disposal.							
Waste – Spillage (O-WS)	Nature of the Impact	Spillage of filtered ash could occur during the handling of waste							
	Without Mitigation	Medium	Low	High	Medium	High	High	Negative	Medium
	With Mitigation	Medium	Low	Medium	Medium	Medium	High	Negative	Medium
	Mitigation Measures	Ensure that a procedure is in place in the event that a spillage occurs.							
Water Contamination – Spillage (O-WCS)	Nature of the Impact	The spillage of hazardous substances such as fuel oil, petrol, diesel etc. could result in water contamination.							
	Without Mitigation	Medium	Medium	Medium	Medium	Medium	High	Negative	Medium
	With Mitigation	Low	Low	Low	Low	Low	High	Negative	Low
	Mitigation Measures	• Drip trays (or other suitable method) must be placed under operational machinery (while standing) to avoid water contamination. • Contaminated soil must be excavated and disposed at registered landfill site. • All hazardous substances to be stored in appropriately bunded facilities where applicable. • Relevant inspection procedures must be in place to ensure pipelines and storage facilities are well maintained.							
Water Contamination – Stock yards (O-WCSY)	Nature of the Impact	The storage of coal and lime in stock yards could result in water contamination.							
	Without Mitigation	Medium	Medium	Medium	Medium	Medium	High	Negative	Medium
	With Mitigation	Low	Low	Low	Low	Low	High	Negative	Low
	Mitigation Measures	• Coal and lime stock yards must be located on impermeable surfaces. • Stockyard must be bunded with relevant sumps and pumps that link to the existing Tubatse dirty water system.							
Noise (O-N)	Nature of the Impact	Noise may result from the operational vehicle movement. Noise is however not expected to exceed the limits outlined in							

Potential Impact		Severity	Extent	Duration	Consequence	Probability	Confidence	Status	Significance
		the SANS 10103:2008 guidelines.							
	Without Mitigation	Medium	Low	Medium	Medium	Medium	High	Negative	Medium
	With Mitigation	Low	Low	Low	Low	Low	High	Negative	Low
	Mitigation Measures	• In order to ensure that the ambient noise does not exceed the required limits it is recommended that all machinery and equipment is maintained in good working order and operating within allowable legal limits. • Tubatse must also ensure that all employees continue to wear the relevant PPE for noisy areas.							
Soil Contamination – Spillage (O-SCS)	Nature of the Impact	The spillage of hazardous substances such as fuel oil, petrol, diesel etc. could result in soil contamination.							
	Without Mitigation	Medium	Medium	Medium	Medium	Medium	High	Negative	Medium
	With Mitigation	Low	Low	Low	Low	Low	High	Negative	Low
	Mitigation Measures	• Drip trays (or other suitable method) must be placed under operational machinery (while standing) to avoid water contamination. • Contaminated soil must be excavated and disposed at registered landfill site. • All hazardous substances to be stored in appropriately bunded facilities where applicable. • Relevant inspection procedures must be in place to ensure pipelines and storage facilities are well maintained.							
Soil Contamination – Stock yards (O-SCSY)	Nature of the Impact	The storage of coal and lime in stock yards could result in soil contamination.							
	Without Mitigation	Medium	Medium	Medium	Medium	Medium	High	Negative	Medium
	With Mitigation	Low	Low	Low	Low	Low	High	Negative	Low
	Mitigation Measures	• Coal and lime stock yards must be located on impermeable surfaces. • Stockyard must be bunded with relevant sumps and pumps that link to the existing Tubatse dirty water system.							
Air Quality – Impact beyond Site Boundary (All pollutants) (O1-AP)	Nature of the Impact	The operation of the CFBs will result in the emission of pollutants which may impact on human health beyond the site boundary.							
	Without Mitigation	-	-	-	-	-	-	-	-
	With Mitigation	Low	Low	Low	Low	Low	Low	Neutral	Low
	Mitigation Measures	• It is recommended that existing and proposed mitigation techniques are maintained and that abatement machinery is regularly serviced according to supplier specifications; and • It is recommended that dust fallout monitoring is continued to ensure compliance							
Air Quality – Impact at Sensitive Receptors (All pollutants) (O2-AP)	Nature of the Impact	The operation of the CFBs will result in the emission of pollutants which may impact on human health at sensitive receptors.							
	Without Mitigation	-	-	-	-	-	-	-	-
	With Mitigation	Low	Low	Low	Low	Low	Low	Neutral	Low
	Mitigation Measures	• It is recommended that existing and proposed mitigation techniques are maintained and that abatement machinery is regularly serviced according to supplier specifications; and • It is recommended that dust fallout monitoring is continued to ensure compliance							
Indirect Impacts									

Potential Impact		Severity	Extent	Duration	Consequence	Probability	Confidence	Status	Significance
Social – Job creation (O-SJC)	Nature of the Impact	The sale of ash to the cement and brickmaking industry may result in job opportunities for the local communities.							
	Without Mitigation	Medium	Medium	Medium	Medium	Medium	High	Positive	Medium
	With Mitigation	High	Medium	Medium	Medium	High	High	Positive	Medium
	Mitigation Measures	It is proposed that ash generated by the CFBs are sold to the local cement and brickmaking industry. Ensure that local HDI companies or individuals are considered for any opportunities that may be created.							
Cumulative Impacts									
Air Quality – Impact Beyond Site Boundary (PM_{10}) (O1-PM_{10})	Nature of the Impact	The operation of the CFBs together with the existing plant will result in additional PM_{10} emissions which may impact human health beyond the site boundary. PM_{10} concentrations are predicted to be non-compliant (having more than 4 exceedences per annum) with the daily average standard approximately 120m beyond the site boundary. However, daily average PM_{10} concentrations are predicted to be compliant at all receptor locations. Annual average PM_{10} concentrations are compliant with the annual average standard at all receptors and across the study area. Predicted PM_{10} concentrations are compliant with the daily and annual average standard at all receptors and across the study area.							
	Without Mitigation	-	-	-	-	-	-	-	-
	With Mitigation	Medium	Low	Low	Low	Low	Low	Neutral	Low
	Mitigation Measures	• It is recommended that existing and proposed mitigation techniques are maintained and that abatement machinery is regularly serviced according to supplier specifications; and • It is recommended that dust fallout monitoring is continued to ensure compliance							
Air Quality – Impact Beyond Site Boundary ($PM_{2.5}$) (O1-$PM_{2.5}$)	Nature of the Impact	The operation of the CFBs together with the existing plant will result in additional $PM_{2.5}$ emissions which may impact on human health beyond the site boundary. Daily and annual average $PM_{2.5}$ concentrations are predicted to be compliant at all receptor locations and across the study area, for all scenarios.							
	Without Mitigation	-	-	-	-	-	-	-	-
	With Mitigation	Low	Low	Low	Low	Low	Low	Neutral	Low
	Mitigation Measures	• It is recommended that existing and proposed mitigation techniques are maintained and that abatement machinery is regularly serviced according to supplier specifications; and • It is recommended that dust fallout monitoring is continued to ensure compliance							
Air Quality – Impact Beyond Site Boundary (NO_2) (O1-NO_2)	Nature of the Impact	The operation of the CFBs together with the existing plant will result in additional NO_2 emissions which may impact on human health beyond the site boundary. Annual and hourly average NO_2 concentrations are predicted to be compliant at all receptor locations and across the study area.							
	Without Mitigation	-	-	-	-	-	-	-	-
	With Mitigation	Low	Low	Low	Low	Low	Low	Neutral	Low
	Mitigation Measures	• Due to the low predicted NO_2 concentrations no NO_2 mitigation is required.							
Air Quality – Impact Beyond Site Boundary (SO_2) (O1-SO_2)	Nature of the Impact	The operation of the CFBs together with the existing plant will result in additional SO_2 emissions which may impact on human health beyond the site boundary. Daily and hourly average SO_2 concentrations are predicted to be non-compliant with the daily and hourly average standards approximately 360 and 140 m beyond the site boundary, respectively. However, it is noted that daily and							

Potential Impact		Severity	Extent	Duration	Consequence	Probability	Confidence	Status	Significance
		hourly average concentrations are compliant at each of the receptor locations.							
	Without Mitigation	-	-	-	-	-	-	-	-
	With Mitigation	Medium	Low	Low	Low	Low	Low	Neutral	Low
	Mitigation Measures	• Due to the low predicted SO_2 concentrations no SO_2 mitigation is required. However it is recommended that existing and proposed mitigation techniques are maintained and that abatement machinery is regularly serviced according to supplier specifications							
Air Quality – Impact at Sensitive Receptors (PM_{10}) (O2-PM_{10})	Nature of the Impact	The operation of the CFBs together with the existing plant will result in the additional PM_{10} emissions which may impact on human health at sensitive receptors. PM_{10} concentrations are predicted to be non-compliant (having more than 4 exceedences per annum) with the daily average standard approximately 120 m beyond the site boundary. However, daily average PM_{10} concentrations are predicted to be compliant at all receptor locations. Annual average PM_{10} concentrations are compliant with the annual average standard at all receptors and across the study area. Predicted PM_{10} concentrations are compliant with the daily and annual average standard at all receptors and across the study area.							
	Without Mitigation	-	-	-	-	-	-	-	-
	With Mitigation	Low	Low	Low	Low	Low	Low	Neutral	Low
	Mitigation Measures	• It is recommended that existing and proposed mitigation techniques are maintained and that abatement machinery is regularly serviced according to supplier specifications; and • It is recommended that dust fallout monitoring is continued to ensure compliance							
Air Quality – Impact at Sensitive Receptors ($PM_{2.5}$) (O2-$PM_{2.5}$)	Nature of the Impact	The operation of the CFBs together with the existing plant will result in the additional $PM_{2.5}$ emissions which may impact on human health at sensitive receptors. Daily and annual average $PM_{2.5}$ concentrations are predicted to be compliant at all receptor locations and across the study area, for all scenarios.							
	Without Mitigation	-	-	-	-	-	-	-	-
	With Mitigation	Low	Low	Low	Low	Low	Low	Neutral	Low
	Mitigation Measures	• It is recommended that existing and proposed mitigation techniques are maintained and that abatement machinery is regularly serviced according to supplier specifications; and • It is recommended that dust fallout monitoring is continued to ensure compliance							
Air Quality – Impact at Sensitive Receptors (NO_2) (O2-NO_2)	Nature of the Impact	The operation of the CFBs together with the existing plant will result in the additional NO_2 emissions which may impact on human health at sensitive receptors. Annual and hourly average NO_2 concentrations are predicted to be compliant at all receptor locations and across the study area.							
	Without Mitigation	-	-	-	-	-	-	-	-
	With Mitigation	Low	Low	Low	Low	Low	Low	Neutral	Low
	Mitigation Measures	• It is recommended that existing and proposed mitigation techniques are maintained and that abatement machinery is regularly serviced according to supplier specifications							
Air Quality – Impact at Sensitive Receptors (SO_2) (O2-SO_2)	Nature of the Impact	The operation of the CFBs together with the existing plant will result in the additional SO_2 emissions which may impact on human health at sensitive receptors. Daily and hourly average SO_2 concentrations are predicted to be non-compliant with the daily and hourly average standards approximately 360 and 140 m beyond the site boundary, respectively. However, it is noted that daily and							

Potential Impact		Severity	Extent	Duration	Consequence	Probability	Confidence	Status	Significance
		hourly average concentrations are compliant at each of the receptor locations.							
	Without Mitigation	-	-	-	-	-	-	-	-
	With Mitigation	Low	Low	Low	Low	Low	Low	Neutral	Low
	Mitigation Measures	• It is recommended that existing and proposed mitigation techniques are maintained and that abatement machinery is regularly serviced according to supplier specifications							

Table 5: Significance Rating Table for Decommissioning Phase

Potential Impact		Severity	Extent	Duration	Consequence	Probability	Confidence	Status	Significance
Decommissioning Phase									
Nature of the Phase	The decommissioning phase of this project would involve the removal of the CFBs. This would involve the stripping of all materials, associated buildings, structures and concrete slabs. The impact would be closely related to those identified for the construction phase although it is likely that more waste may be generated. In terms of this project it is considered unlikely that the CFBs would be decommissioned in the very near future and that decommissioning would co-inside with the decommissioning of the Tubatse Plant as a whole. Decommissioning impacts are likely to be the same regardless of the site location.								
Direct Impacts									
Noise (D-N)	Nature of the Impact	The decommissioning activities will result in some additional noise that may affect workers on site. The noise could result from increased decommissioning traffic, welding, grinding, materials handling etc.							
	Without Mitigation	Medium	Medium	Low	Medium	Medium	High	Negative	Medium
	With Mitigation	Low	Low	Low	Low	Medium	High	Negative	Medium
	Mitigation Measures	Ensure that all workers are issued with and use the correct PPE, especially with regards to ear plugs. In addition, all decommissioning areas should be designated as noisy areas. Decommissioning vehicles and equipment must be monitored and maintained in good working condition.							
Waste Generation (D-WG)	Nature of the Impact	Decommissioning waste will be generated during the construction of the CFBs. This waste will include steel, concrete, oil, cables, general litter etc.							
	Without Mitigation	Medium	Low	Medium	Medium	High	High	Negative	Medium
	With Mitigation	Low	Low	Low	Low	Low	High	Negative	Low
	Mitigation Measures	All waste must be managed and disposed of in accordance with Tubatse's existing waste management procedures							
Poor Housekeeping (D-PH)	Nature of the Impact	Decommissioning activities will result in the generation of litter.							
	Without Mitigation	Medium	Low	Medium	Medium	High	High	Negative	Medium
	With Mitigation	Low	Low	Low	Low	Low	High	Negative	Low
	Mitigation Measures	• The litter must be disposed in the portable waste bins on site and later disposed at a relevant landfill site. • The decommissioning workers must be inducted and trained about the housekeeping by ECO							
Soil Contamination (D-SC)	Nature of the Impact	Soil contamination could result from the spillage of hazardous substances such as fuel, oil, cement etc.							
	Without Mitigation	Medium	Low	Medium	Medium	High	High	Negative	Medium
	With Mitigation	Low	Low	Low	Low	Low	High	Negative	Low
	Mitigation Measures	• Mixing of hazardous substances should be conducted in a manner that will not impact on the soil surface. • All hand mixing to be undertaken on an impermeable surface within a demarcated area. • Drip trays (or other suitable method) must be placed under decommissioning machinery (while standing) to avoid soil contamination. • Contaminated soil must be excavated and disposed of at a suitable hazardous waste landfill site. • All hazardous substances to be stored in appropriately bunded facilities where applicable							

Erosion and Topsoil Loss (D-ETL)	**Nature of the Impact**	The decommissioning of the CFBs will require vegetation clearance which could lead to erosion and topsoil loss.							
	Without Mitigation	Medium	Low	Medium	Medium	High	High	Negative	Medium
	With Mitigation	Low	Low	Low	Low	Low	High	Negative	Low
	Mitigation Measures	Vegetation clearance must be limited within the site boundaries.							
Water Contamination (D-WC)	**Nature of the Impact**	Water contamination could result from the spillage of hazardous substances such as fuel, oil, cement etc.							
	Without Mitigation	Medium	Medium	Medium	Medium	High	High	Negative	Medium
	With Mitigation	Low	Low	Low	Low	Low	High	Negative	Low
	Mitigation Measures	• Mixing of hazardous substances should be conducted in a manner that will not impact on the soil surface. • All hand mixing to be undertaken on an impermeable surface within a demarcated area. • Drip trays (or other suitable method) must be placed under decommissioning machinery (while standing) to avoid soil contamination. • Contaminated soil must be excavated and disposed of at a suitable hazardous waste landfill site. • All hazardous substances to be stored in appropriately bunded facilities where applicable							
Social – Job Opportunities (D-SJO)	**Nature of the Impact**	Temporary job opportunities will be created for the local community during the decommissioning phase.							
	Without Mitigation	Medium	Medium	Medium	Medium	High	High	Positive	Medium
	With Mitigation	High	Medium	Medium	Medium	High	High	Positive	Medium
	Mitigation Measures	Ensure that the contractor is required to utilise a relevant percentage of local labour							
Social – general impacts (D-SGI)	**Nature of the Impact**	The decommissioning phase will result in a number of negative social impacts such as the influx of workers into the local area, safety and security, HIV etc..							
	Without Mitigation	Medium	Medium	Medium	Medium	High	High	Negative	Medium
	With Mitigation	Low	Low	Low	Low	Low	High	Negative	Low
	Mitigation Measures	• Ensure that the contractor is required to utilise a relevant percentage of local labour. • Sufficient ablution facilities must be available on site for construction workers. • All construction activities to be limited to within the site boundaries.							
Air Quality – Beyond Site Boundary (TSP) (D1-TSP)	**Nature of the Impact**	Emissions during decommissioning are associated with the demolition of the CFBs infrastructure as well as heavy vehicle traffic on temporary roads.							
	Without Mitigation	Med	Med	Low	Med	Low	Low	Neutral	Low
	With Mitigation	Low	Med	Low	Low	Low	Low	Neutral	Low
	Mitigation Measures	• Dust suppression techniques must be implemented as required. • Speed limits on site must be enforced to limit the levels of dust pollution.							
Air Quality – Beyond Site Boundary (PM_{10}) (D1-PM_{10})	**Nature of the Impact**	Emissions during decommissioning are associated with the demolition of the CFBs infrastructure as well as heavy vehicle traffic on temporary roads.							
	Without Mitigation	Low	Med	Low	Low	Low	Low	Neutral	Low
	With Mitigation	Low	Low	Low	Low	Low	Low	Neutral	Low

	Mitigation Measures	• Dust suppression techniques must be implemented as required. • Speed limits on site must be enforced to limit the levels of dust pollution.						
Air Quality – Beyond Site Boundary ($PM_{2.5}$) (D1-$PM_{2.5}$)	**Nature of the Impact**	Emissions during decommissioning are associated with the demolition of the CFBs infrastructure as well as heavy vehicle traffic on temporary roads.						
	Without Mitigation	Low	Med	Low	Low	Low	Low	Neutral	Low
	With Mitigation	Low	Low	Low	Low	Low	Low	Neutral	Low
	Mitigation Measures	• Dust suppression techniques must be implemented as required. • Speed limits on site must be enforced to limit the levels of dust pollution.						
Air Quality – Impact at Sensitive Receptors (TSP) (D2-TSP)	**Nature of the Impact**	Emissions during decommissioning are associated with the demolition of the CFBs infrastructure as well as heavy vehicle traffic on temporary roads.						
	Without Mitigation	Low	Med	Low	Low	Low	Low	Neutral	Low
	With Mitigation	Low	Low	Low	Low	Low	Low	Neutral	Low
	Mitigation Measures	• All construction vehicles must be kept in good working order and maintained according to the relevant standards. • Limit the speed of construction vehicles.						
Air Quality – Impact at Sensitive Receptors (PM_{10}) (D2-PM_{10})	**Nature of the Impact**	Emissions during decommissioning are associated with the demolition of the CFBs infrastructure as well as heavy vehicle traffic on temporary roads.						
	Without Mitigation	Low	Med	Low	Low	Low	Low	Neutral	Low
	With Mitigation	Low	Low	Low	Low	Low	Low	Neutral	Low
	Mitigation Measures	• All decommissioning vehicles must be kept in good working order and maintained according to the relevant standards. • Limit the speed of decommissioning vehicles.						
Air Quality – Impact at Sensitive Receptors ($PM_{2.5}$) (D2-$PM_{2.5}$)	**Nature of the Impact**	Emissions during decommissioning are associated with the demolition of the CFBs infrastructure as well as heavy vehicle traffic on temporary roads.						
	Without Mitigation	Low	Low	Low	Low	Low	Low	Neutral	Low
	With Mitigation	Low	Low	Low	Low	Low	Low	Neutral	Low
	Mitigation Measures	• All decommissioning vehicles must be kept in good working order and maintained according to the relevant standards. • Limit the speed of decommissioning vehicles.						
Indirect Impacts								
No indirect impacts are anticipated during this phase.								
Cumulative Impacts								
No cumulative impacts are anticipated during this phase.								

3. ENVIRONMENTAL IMPACT STATEMENT

Taking the assessment of potential impacts into account, please provide an environmental impact statement that summarises the impact that the proposed activity and its alternatives may have on the environment after the management and mitigation of impacts have been taken into account, with specific reference to types of impact, duration of impacts, likelihood of potential impacts actually occurring and the significance of impacts.

Alternative A (Alternative Site 2) (preferred alternative)

The proposed project involves the establishment of four CFBs at the Tubatse Chrome Plant near Steelpoort in the Limpopo Province. The CFBs will generate steam to be utilised in the existing power generating facility in order to enable the facility to generate its full generating capacity of 30MW.

Three alternative sites were identified within the boundary of the Tubatse Plant. The preferred site (Alternative Site 2) is located in close proximity to the existing Tubatse power generation facility and is easily accessible. This close proximity enables easy linkage to the power facility for steam pipelines etc. The preferred site is a highly degraded site which is sparsely vegetated with both indigenous and alien species.

The impact assessment of all phases indicates potential impacts associated with the proposed project can be mitigated and reduced from medium to low levels. The most notable impacts include:

- **The loss of vegetation and top soil due to vegetation clearance;**
- **Erosion due to vegetation clearance;**
- **Noise from construction vehicles;**
- **Soil and water contamination from hazardous substances and the storage of coal and lime;**
- **Air quality impacts due to the additional emissions from the boiler as well as dust and exhaust emissions; and**
- **Social impacts such as job creation, safety and security issues and the influx of workers.**

Emissions associated with construction activities for the proposed plant, and potential decommissioning was qualitatively assessed.

All the identified impacts were classified as medium prior to the implementation of mitigation and management measures. Pollutants associated with construction and decommissioning activities are typically TSP, PM_{10} and $PM_{2.5}$. Heavy construction is a source of dust emissions that can have a substantial, temporary impact on the local air quality situation.

Subsequent to the implementation of mitigation the significance of all the impacts was reduced. Mitigation and management measures are outlined in the EMPr.

The findings of the Air Quality Impact Assessment include:

- **Impacts associated with the construction and decommissioning phases are likely to be low, as associated particulate emissions result in localised concentrations and are limited to the duration of the construction and remediation period. Should there be reason for concern, emissions can be effectively reduced with the use of wet suppression and wind speed reduction mitigation techniques.**
- **For Scenario 1 (Existing Plant) point sources are the main source of NO_2, SO_2, PM_{10} and $PM_{2.5}$ emissions. Currently, wind erosion (17%) and crushers (13%) are the second and third highest**

contributors to PM_{10} emissions, while all other fugitive sources have negligible contributions.

- **For Scenarios 5, 6 and 7 (Proposed Plant) point sources are still predicted to be the main source of NO_2 and SO_2 contributions, with an increase in percent PM_{10} and $PM_{2.5}$ emissions. Following the expansion, crushers (13%) become the second highest contributors to PM_{10}, while wind erosion emissions decrease to 9%. All other fugitive sources have negligible contributions.**

<u>PM_{10} and $PM_{2.5}$ Concentrations</u>

- **Ambient PM_{10} concentrations are predicted to be non-compliant (having more than 4 exceedances per annum) with the daily average standard approximately 120 m beyond the site boundary for Scenarios 1, 5, 6 and 7. However, daily average PM_{10} concentrations are predicted to be compliant at all sensitive receptor locations. Annual average PM_{10} concentrations are compliant with the annual average standard at all sensitive receptors and across the study area for Scenarios 1, 5, 6 and 7. For the remaining scenarios (2, 3 and 4), predicted PM_{10} concentrations are compliant with the daily and annual average standard at all receptors and across the study area**
- **Daily and annual average $PM_{2.5}$ concentrations are predicted to be compliant at all sensitive receptor locations and across the study area, for all scenarios.**
- **Particulate emissions associated with the crusher appear to be the main contributor to ambient concentrations, with fugitive emissions from materials handling and storage having the second highest contribution. Overall, particulate concentrations associated with proposed CGBs and BADD are lower than those estimated in the original AQIA (WSP, 2016) including the (then proposed) coal-fired boiler.**

<u>SO_2 Concentrations</u>

- **Daily and hourly average SO_2 concentrations are predicted to be non-compliant with the daily and hourly average standards approximately 360 and 140 m beyond the site boundary, respectively, for scenarios 1, 5, 6 and 7. However, it is noted that daily and hourly average concentrations are compliant at each of the receptor locations for scenarios 1, 5, 6 and 7. For scenarios 2, 3 and 4, daily and hourly average concentrations are very low and thus compliant at all receptors and across the study area. Annual average concentrations are predicted to be compliant at all receptor locations and across the study area for all scenarios.**
- **Point sources are noted as the main contributor to ambient SO_2 concentrations, with negligible changes observed with the addition of the proposed boilers. Overall, SO_2 concentrations associated with proposed Chain Grate Boilers (CGBs) and Bag Adsorption Desulphurization Device (BADD) are lower than those estimated in the original AQIA (WSP, 2016) including the (then proposed) coal-fired boiler.**

<u>NO_2 Concentrations</u>

- **Annual and hourly average NO_2 concentrations are predicted to be compliant at all receptor locations and across the study area, for all scenarios. Overall, NO_2 concentrations associated with proposed CGBs and BADD are lower than those estimated in the original AQIA (WSP, 2016) including the (then proposed) coal-fired boiler.**

Since construction and decommissioning phases are associated with temporary emission sources, impacts are expected to be medium to low. Though potential impacts are likely to be localised, these may be effectively reduced with the use of wet suppression and wind speed reduction mitigation techniques. As such, impacts are expected to be low for the construction and decommissioning phases post mitigation. Incremental impacts associated with the proposed expansion at site alternatives 1, 2 and 3 only (Scenarios 2, 3 and 4), are expected to be low. Cumulative NO_2 and $PM_{2.5}$ impacts associated with the

proposed plant (Scenarios 5, 6 and 7) are predicted to be low. Cumulative SO_2 and PM_{10} impacts associated are expected to be medium beyond the site boundary and low at sensitive receptors.

The National Environmental Management Act: Biodiversity Act (Act No. 10 of 2004) provides for the management and protection of the country's biodiversity within the framework established by NEMA. Furthermore, it provides for the protection of species and ecosystems in need of protection, sustainable use of indigenous biological resources and equity and bioprospecting. The Tubatse Plant is located within the Sekhukhune Plains Bushveld and although the land is currently zoned for industrial use, the plant falls within Ecological Support Areas 1 and 2 and Critical Biodiversity Areas 1 and 2.

***Acacia erioloba* and *Combretum imberbe* are two trees that can be associated with this veld type. Due to the degraded nature of the preferred site, these trees were not specifically noted, however, it is recommended that a suitably qualified vegetation specialist undertakes a site walkover prior to the clearance of any vegetation in order to verify whether or not these trees are present.**

It is the opinion of the EAP that there are no fatal flaws associated with this proposed project at this site.

This Basic Assessment Report contains adequate information to allow the Competent Authority to make an informed decision. The EAP therefore recommends that the application for Environmental Authorisation should be approved on condition that the recommended mitigation measures stated herein are effectively implemented.

No-go alternative (compulsory)

In the event that the Proposed Project is not implemented or established the status quo will remain. No additional emissions will be generated over and above the existing emissions from the smelting operation. However, Tubatse will continue to draw electricity from the National Electricity Grid while the existing power generation facility will continue generating electricity at one third of its design capacity.

Alternative B (Alternative Site 1)

Alternative Site 1 is utilised for stockpiling and is located behind the West Plant Heat Exchangers. The site is surrounded by some vegetation which has been heavily impacted by the existing activities on the area. It was noted that the Tubatse Plant is located within the Sekhukhune Plains Bushveld. *Acacia erioloba* and *Combretum imberbe* are two trees that can be associated with this veld type. This site is more vegetated than the preferred site.

This site is further away from the existing power generating facility, thereby making the integration of new pipelines more complex from a technical point of view.

This site is not considered preferred.

Alternative C (Alternative Site 3)

Alternative 3 can be found on the far east of the plant. The area is vegetated with mostly indigenous species. This area has not been heavily impacted by existing activities.

It was noted that the Tubatse Plant is located within the Sekhukhune Plains Bushveld. *Acacia erioloba* and *Combretum imberbe* are two trees that can be associated with this veld type. The possibility of identifying these protected species on the site is considered higher than the other two alternative sites.

This site is also at the furthest point from the existing power generating facility, thereby making the

integration of new pipelines more complex from a technical point of view.

This site is not considered preferred.

For more alternatives please continue as alternative D, E, etc.

SECTION E. RECOMMENDATION OF PRACTITIONER

Is the information contained in this report and the documentation attached hereto sufficient to make a decision in respect of the activity applied for (in the view of the environmental assessment practitioner)?	YES	NO

If "NO", indicate the aspects that should be assessed further as part of a Scoping and EIA process before a decision can be made (list the aspects that require further assessment):

If "YES", please list any recommended conditions, including mitigation measures that should be considered for inclusion in any authorisation that may be granted by the department in respect of the application:

It is recommended that the proposed establishment of the CFBs at Tubatse Chrome be approved.
It is further recommended that the project should proceed in line with the existing procedures in place at Tubatse Chrome together with the implementation of the mitigation measures outlined attached EMPr.

Is an EMPr attached?	YES	NO

The EMPr must be attached as **Appendix F**.

SECTION F: APPENDIXES

The following appendixes must be attached as appropriate:

Appendix A: Site plan(s)

Locality Maps are included in Appendix A

Appendix B: Photographs

Photographs of the three Alternative sites have been included in Appendix B.

Appendix C: Facility illustration(s)

Facility Illustrations currently available have been included in Appendix C.

Appendix D: Specialist reports

The Air Quality Impact Assessment is included in Appendix D.

Appendix E: Comments and responses report

No comments have been received to date. The Comment and Responses Report will be included in the Final BAR.

Appendix F: Environmental Management Programme (EMPr)

The EMPr is included in Appendix F

Appendix G: Other information

- **Notification Letter**
- **I&AP database**
- **Advertisement (Proof of publication will be included in the Final BAR)**
- **Site Notices (Proof of erection will be included in the Final BAR)**

SECTION G: DECLARATION BY THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

I, _____ declare that I –

(a) act as the independent environmental practitioner in this application;
(b) do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the Environmental Impact Assessment Regulations, 2016 (as amended);
(c) do not have and will not have a vested interest in the proposed activity proceeding;
(d) have no, and will not engage in, conflicting interests in the undertaking of the activity;
(e) undertake to disclose, to the competent authority, any material information that has or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the Environmental Impact Assessment Regulations, 2006;
(f) will ensure that information containing all relevant facts in respect of the application is distributed or made available to interested and affected parties and the public and that participation by interested and affected parties is facilitated in such a manner that all interested and affected parties will be provided with a reasonable opportunity to participate and to provide comments on documents that are produced to support the application;
(g) will ensure that the comments of all interested and affected parties are considered and recorded in reports that are submitted to the Department in respect of the application, provided that comments that are made by interested and affected parties in respect of a final report that will be submitted to the Department may be attached to the report without further amendment to the report;
(h) will keep a register of all interested and affected parties that participated in a public participation process; and
(i) will provide the Department with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not.

Signature of the Environmental Assessment Practitioner:

WSP Environmental (Pty) Ltd
Name of company:

12 March 2018
Date:

Appendix A:

Site plan(s)

Locality Maps are included in Appendix A

Appendix B:

Photographs

Photographs of the three Alternative sites have been included in Appendix B.

Appendix C:

Facility illustration(s)

Facility Illustrations currently available have been included in Appendix C.

Appendix D:

Specialist reports

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Appendix E:

Comments and responses report

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Appendix F:

Environmental Management Programme (EMPr)

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Appendix G:

Other information

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