



environment & tourism

Department:
Environmental Affairs and Tourism
REPUBLIC OF SOUTH AFRICA

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Ref: 12/12/20/1014

Enquiries: Mr. W. Hector

Tel: 012 310 3001 Fax: 012 320 7539 E-mail: whector@deat.gov.za

Savannah Environmental (Pty) Ltd
Attention: Ms Karen Jodas
P O Box 148
SUNNINGHILL
2157

Tel: (011) 234-6621
Fax: 086 684 0547

Dear Madam

RE: APPLICATION FOR THE PROPOSED CONVERSION OF THE EXISTING ANKERLIG OPEN CYCLE GAS TURBINE (OCGT) POWER STATION TO A CLOSED CYCLE GAS TURBINE (CCGT) POWER STATION ON REMAINDER OF FARM 1395, CAPE TOWN: WESTERN CAPE

Your application form dated 1 August 2007 and received by this department on 20 August 2007 refers. The application has been assigned the reference number **12/12/20/1014**. Kindly quote this reference number in any future correspondence in respect of the application.

You may proceed to conduct environmental scoping in accordance with regulation 28 of Government Notice No. R.385 of 21 April 2006. Please note that the Scoping Report must be prepared in accordance with, and meet the requirements of, regulation 29 and 30 of Government Notice No. R.385 of 21 April 2006, omission of information may result in the Scoping Report being rejected.

Please note that the activity may not commence prior to an environmental authorization being granted by the Department.

Yours sincerely

Ms Pam Yako

Director – General

Department of Environmental Affairs and Tourism

Letter signed by: Mr Wayne Hector

Designation: Principal Environment Officer: Environmental Impact Evaluation: Parastatals

Date: 27 August 2007

Cc:
Ms D Herbst

Eskom Holdings Ltd

Fax: (011) 800-5410

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Ndzawulo ya Tindhaka & Mbango • Departement: Omgewingsake en Toerisme • Lefapha la Tikoloho le Bohanhlaudi • Lefapha la Bojanala
Kgoro ya Tikoloho le Boeti • UmNyango wezaBhuduluko nokuVakatiha • Umnyango Wazemvelo Nokuvakasha



environment & tourism

Department:
Environmental Affairs and Tourism
REPUBLIC OF SOUTH AFRICA

Private Bag X447, Pretoria, 0001 • Federe Building, 315 Pretorius Street, Pretoria, 0002. Tel: (+27 12) 310 3911 Fax: (+27 12) 322 2662

Ref: 12/12/20/1040

Enquiries: Mr. W. Hector

Tel: 012 310 3001 Fax: 012 320 7539 E-mail: whector@deat.gov.za

Savannah Environmental (Pty) Ltd
Attention: Ms Jo-Anne Thomas
P O Box 148
SUNNINGHILL
2157

Tel: (011) 234-6621
Fax: 086 684 0547

Dear Madam

RE: APPLICATION FOR THE PROPOSED CONSTRUCTION OF A 400KV TRANSMISSION POWER LINE BETWEEN THE ANKERLIG POWER STATION (LOCATED IN ATLANTIS) AND THE OMEGA SUBSTATION ON FARM GROOT OLIPHANTSKOP 81: WESTERN CAPE

Your application form dated 18 September 2007 and received by this department on 2 October 2007 refers. The application has been assigned the reference number **12/12/20/1040**. Kindly quote this reference number in any future correspondence in respect of the application.

You may proceed to conduct environmental scoping in accordance with regulation 28 of Government Notice No. R.385 of 21 April 2006. Please note that the Scoping Report must be prepared in accordance with, and meet the requirements of, regulation 29 and 30 of Government Notice No. R.385 of 21 April 2006, omission of information may result in the Scoping Report being rejected. Please submit 3 copies of the Scoping Report to this Department.

Please note that the activity may not commence prior to an environmental authorization being granted by the Department.

Yours sincerely

Ms Pam Yako

Director – General

Department of Environmental Affairs and Tourism

Letter signed by: Mr Wayne Hector

Designation: Principal Environment Officer: Environmental Impact Evaluation: Parastatals & Nationals

Date: 3 October 2007

Cc:

Ms F Havenga

Ms R Gelderbloem

Eskom Holdings Ltd

City of Cape Town

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Muhasho wa zwa Vhupo na Vhuendelamshango • LiTiko le Tesimondzawo netekuVakasha • Isebe lemiCimbi yokusilNgongileyo noKhenketho Ndzawulo ya Tinkhaka & Mbango • Departement: Omgewingsake en Toertsmo • Lefapha la Tikoloho le Bohantlaidi • Lefapha la Bojanale Kgoro ya Tikologo le Boeti • UmNyango wezeBhuduluko nokuVakatjha • Umnyango Wezemvelo Nokuvakasha

DRAFT MINUTES

**PROPOSED ANKERLIG CONVERSION PROJECT & ASSOCIATED
400 KV TRANSMISSION POWER LINE BETWEEN ANKERLIG POWER
STATION AND OMEGA SUBSTATION, WESTERN CAPE PROVINCE**

**MEETING WITH THE DEPARTMENT OF ENVIRONMENTAL AFFAIRS AND
TOURISM (DEAT) AND THE WESTERN CAPE DEPARTMENT OF
ENVIRONMENTAL AFFAIRS AND DEVELOPMENT PLANNING (DEA&DP)**

**HELD AT DEAT, FEDSURE FORUM, PRETORIA
THURSDAY 27 SEPTEMBER 2007
at 10h00**

AUTHORITY CONSULTATION MEETING No.1

PRESENT

An attendance register is attached in Appendix A. Apologies were received from Alvan Gabriel of the Western Cape Department of Environmental Affairs and Development Planning (DEA&DP).

1. WELCOME AND INTRODUCTIONS

Jo-Anne Thomas welcomed all to the meeting and thanked all for their attendance. She explained that Savannah Environmental have been appointed as the independent environmental consultants for the proposed Ankerlig Power Station conversion project and the Ankerlig-Omega 400 kV transmission power line.

Everyone was provided an opportunity to introduce themselves.

2. PURPOSE OF THE MEETING

Jo-Anne Thomas explained that the purpose of the meeting was to:

- » Provide DEAT with an overview of the proposed Ankerlig Power Station conversion project and the Ankerlig-Omega 400 kV transmission power line project

- » Provide an overview of the EIA process and the public participation process to be followed for the proposed project.

3. ESKOM STRATEGIC PRESENTATION REGARDING THE PROPOSED PROJECT

A presentation providing an overview of the technical aspects of the proposed project was given by Mr Albert van der Walt of Eskom Project Development Division (PDD). This presentation is included in Appendix B.

The following points were noted:

- » The initial OCGT units at Ankerlig were constructed for peaking power and to improve the reserve margin.
- » The OCGT power station at Atlantis is currently fuelled with diesel. This is an expensive fuel source.
- » Power generated by converting the Open Cycle Gas Turbines to Combined Cycle Gas Turbines (CCGTs) at Atlantis and Mossel Bay will assist Eskom meet the electricity generation demands in the medium-term (i.e. up to 2014).
- » The first unit of the new coal fired power station being constructed by Eskom in the Lephalale area (Medupi Power Station) is expected to begin operating in 2012, with subsequent units coming online at intervals of between 6-9 months.
- » The current challenge facing Eskom is the supply of sufficient electricity generation capacity to meet the increasing demand. Additional generation capacity is required and Eskom are considering ways and plant which makes sense to meet this demand in the short- and long-term. The following must be considered in determining the most suitable option/s:
 - * Cost of construction & the cost of fuel
 - * Lead time for construction.
- » Costs and construction lead times for all options are increasing as there is a world-wide demand for components and material (especially steel).
- » Advantages of the conversion of the existing Open Cycle Gas Turbine (OCGT) units to Combined Cycle Gas Turbine (CCGT) units include:
 - * Additional capacity can be obtained for the same amount of fuel, therefore resulting in improved efficiency of the plant. The conversion will increase the electricity generation capacity of the power station by approximately 50%.
 - * The CCGT units are established by utilising the exhaust heat from the gas turbines to produce steam and generate additional electricity.
 - * The capital costs associated with gas turbines is significantly less than the capital cost to build coal fired power stations.
 - * Gas turbines have a shorter lead time for supply and construction compared to other options currently being considered, and Eskom can

therefore get the units on the ground and in operation in the shortest time.

- » The conversion project will not require any changes to the existing plant. The conversion will require the addition of a heat recovery steam generator (HRSG) within the existing footprint of the power station.
- » There are currently 4 units constructed at Ankerlig. An additional 5 units are currently under construction (in terms of the recent Authorisation received from WC DEA&DP). All nine units at Ankerlig are expected to be operational by end-2008.
- » OCGT units are best suited for peaking generation capacity (i.e. for peak periods in the morning and evenings). CCGT units will have to be operated for longer periods in order to obtain the benefits of the additional power generated. It is expected they would be utilised as mid-merit capacity (i.e. during the daytime from about 6am to about 10pm on week days).
- » This conversion project is one of the few options which Eskom has to meet the additional power generation requirements in the mid-term (i.e. by 2011).
- » Fuel options which are being considered for the CCGT include:
 - * Liquid fuel (diesel/kerosene), as is currently being used for the OCGT – coupled to oil price and limited in supply.
 - * Natural gas – proven reserves off the West Coast within the Kudu and Ibubhesi gas fields. The Kudu gas fields have approximately 20 years of natural gas supply.
 - * LNG – liquefied natural gas imported from international sources via ship.
- » The lifespan of the gas turbines is expected to be ~25 years.
- » The additional power generated at the power station through the CCGT will be transmitted to the grid via a 400 kV transmission power line between Ankerlig Power Station and Omega Substation. Depending on the alignment identified, this power line will be approximately 24 km in length.
- » Omega Substation is still to be constructed. Preliminary studies indicate that this will be the only requirement for the integration of the additional generation capacity at Ankerlig associated with this project.

4. ENVIRONMENTAL IMPACT ASSESSMENT & PUBLIC PARTICIPATION PROCESS

4.1. EIA process for Ankerlig conversion project and Ankerlig-Omega 400 kV transmission power line

- » Two applications have been submitted as Eskom require two authorisations, i.e. one for the power station conversion (Eskom Generation) and one for the power line (Eskom Transmission).
- » It was agreed that one report could be submitted considering both aspects of the project.

- » It was agreed that a single public participation process could be undertaken where both aspects of the project would be discussed and issues captured.

4.2. Consideration of alternatives

- » The power station is on an existing site within which the conversion would be accommodated. Therefore, no location alternatives will be considered. Alternatives to be considered include:
 - * Fuel source (i.e. liquid fuel vs. gas). Eskom are to use liquid fuel in the immediate term until such time as natural gas becomes available. Comparison of impacts will be undertaken specifically in terms of air quality impacts
 - * Cooling alternatives (i.e. dry cooling vs. wet cooling).
 - * Water resource options. This will involve a) a water resource analysis in order to determine the source and availability of water in the area, and b) identification of the best option for water in the power station (process water and cooling water, if required). If sea water is identified as the best option, an additional application will be submitted for a water pipeline and desalination plant.

4.3. Public consultation process

- » From experience, it is known that holding of public meetings in the Atlantis area are not always the best approach. Therefore, consultation will largely be undertaken through the holding of focus group meetings.
- » One public meeting will be held during the scoping phase in order to provide the broader community with an opportunity to participate.

5. GENERAL

5.1. Programme and Timeframes

- » It was agreed that, should the Scoping Report be made available to the public at the end of November 2007, a 6-week review period would be provided in order to allow sufficient time for public review and comment.
- » Submission of the EIA to DEAT is expected to be ~mid-2008.

5.2. Communication channels between Consultant, Competent Authority and Commenting Authority

- » DEAT are the Competent Authority for this project.
- » DEA&DP are the Commenting Authority for the project. DEA&DP have indicated that they will comment on final reports only. The final report will be

submitted to DEAT and DEA&DP at the same time. Comments from DEA&DP will be submitted directly to DEAT.

- » Other authorities/stakeholders who must be consulted include:
 - * DWAF
 - * Heritage Western Cape
 - * DEAT: Marine and Coastal Management (should sea water abstraction be required)
 - * CapeNature (especially for the power line)
 - * WESSA

5.3. Information requirements and site visit by Authorities

- » A site visit will be undertaken once the final Scoping Report is submitted to DEAT, which is scheduled towards the end of January 2008.
- » Eskom is currently finalising the process of purchasing the property where the Ankerlig power station is located. A letter to this effect was submitted with the application form. No consent form was submitted as Eskom will be the landowner.
- » No consent form required for the power line (in terms of the EIA Regulations). A list of the potentially affected farms within the study area was provided with the application form.
- » Information available from other EIAs undertaken for the power station and in the Atlantis area will be used as baseline data for this EIA.

6. CLOSURE

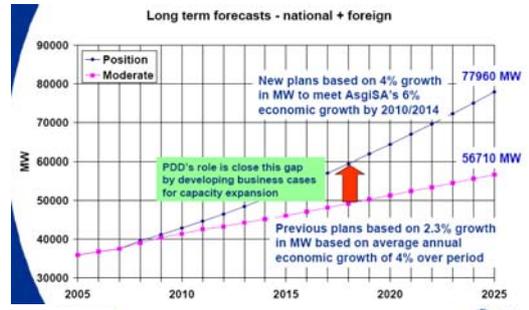
The meeting closed at 11:30.

**APPENDIX A:
ATTENDANCE REGISTER**

**APPENDIX B:
PRESENTATION**

Eskom medium term supply options
 Environmental Impact assessment for
 Conversion of OCGTs to CCGTs

Electricity supply requirements



Key challenges – Demand and supply

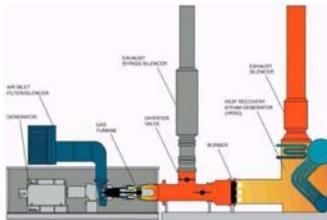
- ❑ South Africa has reached the end of its surplus generation capacity
- ❑ **1st challenge:** Avoiding mismatch between demand and supply
 - ⊕ Excess capacity - stranded resources
 - ⊕ Capacity shortage - constrained economic growth
- ❑ **2nd challenge:** Correct choice of capacity to be constructed from an array of available options that differ dramatically in terms of:
 - ⊕ Cost (construction and operating)
 - ⊕ Lead time to construction
 - ⊕ Environmental impact
 - ⊕ Operating characteristics

Ankerlig under construction



The Technology

- An OCGT (open cycle gas turbine)
 - Exhausts the heat from a gas turbine to the atmosphere
- A CCGT (combined cycle gas turbine) has a distinct advantage over an OCGT
 - The higher plant efficiency (approx 20%)
- A CCGT has an additional steam turbine and combustion chamber which uses the exhaust steam from the gas turbine.
- There are effectively two thermodynamic cycles at work.



Potential generation and fuel sources

Eskom Open Cycle Gas Turbine opportunities:

- Ankerlig - Atlantis [(4 + 5 Units) x 150MW]
- Gourikwa – Mosselbay [(2 + 3 Units) x 150MW]
- Approximately 50% additional capacity if converted to CCGT
- OCGTs are best suited for peaking power (low capital cost / low load factor / high fuel cost)
- CCGTs must run at mid-merit and base load factors for the steam cycle to be effective (increased capital cost for better efficiency)

Potential Fuel Sources:

- Liquid fuel (diesel / Kerosene etc)
- Natural gas (Proven sources Kudu and Ibhusesi)
- LNG

Key advantages:

- Time to implement
- Reduced CO2 emissions compared to coal generation

Ankerlig potential as a flexible supply option: mitigates medium term energy constraints and is evaluated as a competitive long term supply option

- **Project Tango is expected to:**
 - deliver power to before the winter of 2011 and reduce the contingent capacity as identified.
 - reduce the risk of paying an expensive diesel fuel bill by running the OCGT's at higher than expected load factors
 - Provide a competitive mid-merit supply option over the project life cycle
- **The proposed project configuration allows for an extraordinary flexible operating regime, for example, the gas can be used to operate:**
 - the OCGTs in peak mode
 - The CCGTs in 2-Shift mode
 - The CCGTs in base-load mode
 - Combinations of the above

Kudu gas to power option



Key Infrastructure:

- Fuel sources
- Kudu Power Station
- Gas Pipeline from Uubvelei to Ankerlig (690 km)
- Ankerlig Power Station conversion of nine OCGTs

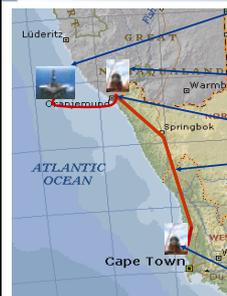
Operating Regime

- The pipeline will enable the project to store gas and to produce electricity during times when electricity is more valuable.
- The CCGTs will be available as a peaking, mid-merit or base-load supply options

Kudu challenges

- The implementation of a gas pipeline from Uubvelei in Namibia to Ankerlig will require a direct intervention by Eskom. This is not core business for Eskom and the regulatory requirements will need to be managed.
- Large capital amounts may have to be committed by various parties before the necessary Records of Decision (RoDs) for the various project components are available.
- The large amount of agreements and regulatory approvals that will be required for a final investment decision, targeted for April 2008 will be a challenge.

Kudu gas option - Site and Environmental



- **Upstream Development:** EIA complete, land for gas processing secured by Upstream Developers – construction can commence
- **Kudu Power Station:** EIA complete and RoD available, KPS site secured by NamPower
- **KPS transmission integration:** Servitudes for transmission in Namibia secured by NamPower. RoD for Kudu – Juno line pending. Aggeneis line required instead (EIA process still to be initiated)
- **Pipeline in Namibia (~35km):** Route not yet determined and land must still be secured. Land acquisition and EIA not considered critical in this region of Namibia
- **Pipeline in South Africa (~665km):** Preliminary route selection performed by PetroSA (info available to Eskom). Approval to negotiation options to secure a servitude prior to RoD being available to be obtained from DEAT.
- **Ankerlig conversion of OCGTs to CCGTs:** Site for additional plant available and secured at Ankerlig. EIA Consultant for conversion has been appointed.
- **Ankerlig transmission integration:** Transmission integration studies indicate that an additional 400kV line from Ankerlig to Omega (~24km) will be required.

Thank you

Verwysing
Reference
Isalathiso

E12/2/3/5-A2/15-WJ012/08



Navrae
Enquiries
Imibuzo

Alvan Gabriel

Date of Issue 19/02/2007

*Departement van Omgewingsake en Ontwikkelingsbeplanning
Department of Environmental Affairs and Development Planning
ISEbe leMicimbi yeNdalo esiNgqongileyo noCwangciso loPhuhliso*

The Director
Department of Environmental Affairs and Tourism
Private Bag X447
PRETORIA
0001

Attention: Mr. W. Hector

Tel: (012) 310 3659

Fax: (012) 320 7539

Dear Sir

COMMENTS: DRAFT SCOPING REPORT FOR THE PROPOSED CONVERSION OF THE EXISTING ANKERLIG OPEN CYCLE GAS TURBINE ("OCGT") POWER STATION TO A COMBINED CYCLE GAS TURBINE ("CCGT").

The abovementioned document received by the Department on 30 January 2008 and the meeting held at Ankerlig Power Station on 13 February 2008 refer.

The Directorate: Integrated Environmental Management (Region B2) has the following comments:

1. Due to the critical status of water resources in the Western Cape, the installation of water saving devices will become mandatory in all new developments. It is therefore recommended that the use of these devices be incorporated in the proposed activity wherever possible. In addition, the water resource options considered must be based on long term, sustainable options. Any facility that will be utilised to provide water (such as the Witzand Water Treatment Works) must provide the most recent and 'up-to-date audit of the facility and this information must be included in the Environmental Impact Assessment Report. Further, the assessment of the required water storage on site must include sufficient quantities such that a 'buffer quantity' is worked into the quantity of water stored, to accommodate water requirements in the event of emergency situations where water supply to the facility is interrupted;
2. It is noted that while the Scoping Report informs that the conversion of the facility may generate more power for the same amount of fuel used, the proposed upgrade

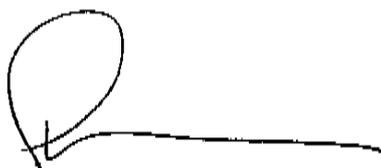
*Department of Environmental Affairs & Development Planning
Directorate: Integrated Environmental Management (Region B)*

includes the storage of additional fuel (an additional 43.2 million litres). It is understood that this requirement is related to expected longer operating hours or a mid-merit operating regime. In view of this, the additional storage of fuel on site must include adequate buffer quantities which address a worst case scenario in the event that fuel supply to the facility is interrupted;

3. It is noted that the bypass stack height of the upgraded facility is expected to be 60m. This is 30m higher than the existing stacks on site. It is further noted that the final bypass stack height will be informed by the air dispersion modelling to be conducted and that this height will be amended accordingly in subsequent documentation;
4. In view of the increased visual impacts that will be presented by the upgraded facility, largely due to the closer proximity to the R307 and additional lighting that will be utilised, further options must be investigated to minimise the visual impacts presented. This may include the raising of boundary berms, the use of colour coding for structures and infrastructure where possible and additional use of vegetation;
5. It is further noted that (as discussed at the aforementioned meeting) the Option A route for the proposed transmission power lines will be amended to run adjacent to the Atlantis-Koeberg 1 and Koeberg-Stikland 1 transmission power lines along its entire length.

This Department reserves the right to revise or withdraw comments or request further information from you based on any information received.

Yours faithfully



HEAD OF DEPARTMENT

**COPIES TO: MS. J. THOMAS (SAVANNAH ENVIRONMENTAL)
MR. R. GELDERBLOEM (CITY OF CAPE TOWN)**

**FAX: (086) 684 0547
FAX: (021) 938 8075**

21 February 2008

Dept of Cultural Affairs and Sport
Heritage Western Cape
Private Bag X9067
CAPE TOWN
8001

Attention: Zwelibanzi G Shiceka

**ENVIRONMENTAL IMPACT ASSESSMENT FOR THE PROPOSED
CONVERSION OF THE EXISTING ANKERLIG OPEN CYCLE GAS TURBINE
(OCGT) POWER STATION TO A COMBINED CYCLE GAS TURBINE (CCGT)
POWER STATION**

DRAFT SCOPING REPORT

As discussed, please find herewith the Draft Scoping Report for the proposed Ankerlig Power Station Conversion and Transmission Integration Project (DEAT Ref Nos. 12/12/20/1014 (power station conversion) and 12/12/20/1037 (transmission power line)), as well as four (4) copies of the Heritage Scoping Study undertaken for the proposed project. The EIA process is being undertaken in accordance with the requirements of the National Environmental Management Act (NEMA; Act No. 107 of 1998).

As discussed, the proposed power station conversion is proposed to be undertaken on the existing power station site within Atlantis and will not impact on any additional land. Therefore, no heritage study has been undertaken for this component of this site. The attached heritage study is for the proposed transmission power line between the power station and the Omega Substation.

Please forward any comments on this draft report to me for inclusion in the EIA phase of the process.

Kind regards

Jo-Anne Thomas

cc. Nico Gewers – Eskom

21 February 2008

DEA&DP
Air Quality Management
Private Bag x9086
Cape Town
8000

Attention: Hans Linde

**ENVIRONMENTAL IMPACT ASSESSMENT FOR THE PROPOSED
CONVERSION OF THE EXISTING ANKERLIG OPEN CYCLE GAS TURBINE
(OCGT) POWER STATION TO A COMBINED CYCLE GAS TURBINE (CCGT)
POWER STATION**

DRAFT SCOPING REPORT

As discussed at the key stakeholder workshop on 13 February 2008, please find herewith the Draft Scoping Report for the proposed Ankerlig Power Station Conversion and Transmission Integration Project (DEAT Ref Nos. 12/12/20/1014 (power station conversion) and 12/12/20/1037 (transmission power line)). The EIA process is being undertaken in accordance with the requirements of the National Environmental Management Act (NEMA; Act No. 107 of 1998).

This Draft Scoping Report represents the outcome of the Scoping Phase of the EIA process and contains the following sections:

Chapter 1 provides background to the proposed power station conversion and transmission integration project and the environmental impact assessment process.

Chapter 2 provides the strategic context for energy planning in South Africa.

Chapter 3 describes the components of the proposed project (project scope).

Chapter 4 outlines the process which was followed during the Scoping Phase of the EIA process, including the consultation program that was undertaken and input received from interested parties.

Chapter 5 describes the existing biophysical and socio-economic environment.

Chapter 6 presents the evaluation of environmental impacts associated with the power station conversion.

Chapter 7 presents the evaluation of environmental impacts associated with the proposed transmission power line.

Chapter 8 presents the conclusions of the scoping evaluation.

Chapter 9 describes the Plan of Study for EIA.

Chapter 10 provides a list of references and information sources used in undertaking the studies for this Draft Scoping Report.

An air quality specialist scoping report is contained as Appendix J of this report.

Please forward any comments on this draft report to me for inclusion in the EIA phase of the process.

Kind regards

Jo-Anne Thomas

cc. Nico Gewers – Eskom