September 2011
Scoping Phase

Proposed extension of the Ash Disposal Facilities at Camden Power Station

DEA REF NO: 12/12/20/2300

Proponent: Eskom Generation

FINAL SCOPING REPORT

Project: 12670

ZITHOLELE CONSULTING

PURPOSE OF THIS DOCUMENT

Eskom is currently operating Camden Power Station as part of its electricity generation fleet. Throughout the operational life of the station, ash is being generated at the station. This ash is being disposed of in an authorised ash disposal site within Camden Power Station premises.

The current ash disposal site has been providing disposal services for the last since the establishment of the station. This ash disposal site is reaching the end of its capacity, and is has been predicted that as of the middle of 2014 a new ash disposal facility will be required.

To ascertain continued environmental responsible ashing, this Environmental Impact Assessment (EIA) process is being undertaken to identify and assess feasible sites for the ashing. As a means to comply with the necessary legal requirements, the new / extended ash disposal facility and associated structures must be appropriately designed and licensed, as ash disposal is listed as a waste disposal activity and therefore authorisation in terms of the NEM: WA (WMLA) legislation is required. An integrated EIA and WMLA are undertaken in line with the requirements of the NEMA (EIA) processes.

Eskom Generation has appointed Zitholele Consulting (Pty) Ltd, an independent company, to conduct the appropriate Environmental Impact Assessment (EIA) studies to evaluate the potential environmental and social impacts of the proposed project, and undertake the necessary waste licensing processes. The Environmental Assessment Practitioner (EAP) is Mr Konrad Kruger.

The first phase of an EIA is the Scoping Phase. During Scoping the potential site alternatives are evaluated against known environmental sensitivities, ensuring that only feasible alternatives are taken to the EIA phase. This report aims the detail the findings of the site selection/screening that was undertaken for this project.

According to the EIA Regulations, Interested and Affected Parties (I&APs) must have the opportunity to comment on the proposed project, and sites, and verify that all the issues raised during the Announcement Phase have been recorded and addressed. This is the main purpose of the Draft Scoping Report (DSR), which was available for comment for the period 18 July to 22 August 2011. Comments received was used to finalise the Final Scoping Report (FSR this report), which is hereby submitted to the Competent Authority (CA), the National Department of Environmental Affairs (DEA) for approval to proceed with the EIA. Commenting authorities will be the Department of Water Affairs as well as the local and district municipalities.

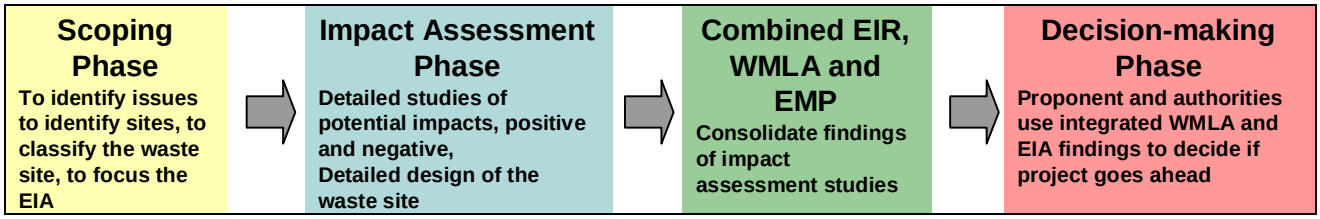
I&APs will also have an opportunity to comment on the findings of the EIA, which will be presented in a Draft Environmental Impact Report (EIR). After public review, the Draft EIR will be updated and submitted to the DEA for a decision about the project.

Summary of what the Final Scoping Report Contains

This report contains the following for approval by the Department of Environmental Affairs:

- The background and description to the proposed project, including alternatives
- An overview of the EIA process, including the public participation process
- An overview of the waste licensing process
- A description of the existing environment in the project area
- The potential environmental issues and impacts which have already been identified
- The Terms of Reference (ToR) for the specialist studies
- A list of comments raised and responses to date (Issues Trail Report)

AN EIA AND WMLA CONSISTS OF SEVERAL PHASES



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ABBREVIATIONS

CO_2 ..... Carbon Dioxide
DMR ..... Department of Mineral Resources
DEA ..... Department of Environmental Affairs
DWA ..... Department of Water Affairs
DWEA ..... Department of Water and Environmental Affairs (Ministry)
IEA ..... Integrated Environmental Authorisation
EAP ..... Environmental Assessment Practitioner
ECA ..... Environment Conservation Act
EIA ..... Environmental Impact Assessment
EIR ..... Environmental Impact Report
GNR ..... Government Notice Regulation
HDI ..... Historically Disadvantaged Individuals
I&APs ..... Interested and Affected Parties
IEM ..... Integrated Environmental Management
IEP ..... Integrated Energy Plan
ISEP ..... Integrated Strategic Electricity Planning
kV ..... Kilo Volts
MVA ..... Mega Volt Ampere
NEMA ..... National Environmental Management Act
NEM:WA ..... National Environmental Management: Waste Act
NERSA ..... National Energy Regulator of South Africa
NIRP ..... National Integrated Resource Plan
SIA ..... Social Impact Assessment
SO_2 ..... Sulphur Dioxide
SR ..... Scoping Report
ToR ..... Terms of Reference
WMLA ..... Waste Management License Application

1 INTRODUCTION

1.1 Who is the proponent?

Eskom Holdings SOC (Ltd) is the main South African utility that generates, transmits and distributes electricity. Eskom supplies ~95% of the country's electricity, and ~60% of the total electricity consumed on the African continent. Eskom play a major role in accelerating growth in the South African economy by providing a high-quality and reliable supply of electricity.

1.2 Camden Ash Disposal Facilities Project

Eskom is currently operating Camden Power Station as part of its electricity generation fleet. Throughout the operational life of the station, ash is generated. This ash is being disposed of in an authorised ash disposal site within the Camden Power Station premises.

The current ash disposal site has been providing disposal services for the last 44 years. This ash disposal site is now reaching the end of its life and as of the middle of 2014 a new ash disposal facility will be required.

In order to establish a new ash disposal site within close proximity to the power station property and the current site, a site selection exercise in line with the Minimum Requirements for the Disposal of Waste by Landfill, Draft 3rd edition 2005 was undertaken to identify the most feasible site alternatives (only guideline document that covers site selection).

1.3 Context of this Report

This report is the Final Scoping Report (FSR), a key component of the integrated waste management license and environmental impact assessment process, for the proposed extension of the existing or establishment of a new ash disposal facility, at the Camden Power Station. This report was reviewed by stakeholders prior to finalisation and submission to the regulating authority, DEA.

1.4 Environmental Impact Assessment Practitioner (EAP) Details

In terms of the National Environmental Management Act (NEMA, No 107 of 1998) Environmental Impact Assessment (EIA) regulations, the proponent must appoint an Environmental Assessment Practitioner (EAP) to undertake the environmental assessment of an activity regulated in terms of the aforementioned Act. In this regard, Eskom appointed Zitholele Consulting to undertake the EIA for the proposed extension of the Camden ash disposal site, in accordance with the EIA Regulations promulgated and amended in June 2010 in terms of the NEMA. This process will also comply with the NEM Waste Act

requirements for licensing of waste disposal facilities as the proposed activity is listed in the waste regulations (R718 Category B).

Zitholele Consulting is an empowerment company formed to provide specialist consulting services primarily to the public sector in the fields of Water Engineering, Integrated Water Resource Management, Environmental and Waste Services, Communication (public participation and awareness creation) and Livelihoods and Economic Development.

Zitholele Consulting has no vested interest in the proposed project and hereby declares its independence as required by the EIA Regulations. The details of the EAP representatives are listed below.

Name:	Konrad Kruger
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Warren Kok, as Project Director

Warren Kok will be the designated Project Director on behalf of the controlling contractor: Zitholele. Warren will ensure regulatory compliance, quality assurance and overseeing the Technical Environmental Team. Warren will hold final responsibility for the compilation of the EIA / EMP Reports. Warren holds a B.Hon degree in Geography and Environmental Management from Rand Afrikaans University (2000) and a Higher Certificate in Project Management from Damelin. He is a certified Environmental Assessment Practitioner (EAP) who is registered with EAPASA. Warren has in excess of 10 years' experience in environmental consulting in South Africa. His experience spans both the public and private sector. The majority of his work experience has been gained in the mining sector in South Africa, where he has been responsible for undertaking and managing Integrated EIA Processes. Warren has successfully undertaken countless integrated EIA processes that require integration of the MPRDA, NEM:WA, WULA and NEMA regulatory processes. Many of these projects are considered landmark projects in South Africa's environmental mining sector and included several hazardous waste facilities. He is ideally skilled and experienced to manage this project to its conclusion. He is currently a Senior Environmental Scientist for Zitholele Consulting, responsible for overseeing and managing project teams in the Environmental Division, mentoring staff, liaising with clients and public stakeholders at all levels.

Konrad Kruger as Project Manager

Mr. Konrad Kruger graduated from the University of Pretoria with a BSc. in Environmental Science and BSc Honours in Geography in 2003. Over the past seven years Konrad has

been involved in a variety of environmental projects and has specialised in environmental management and auditing. Konrad has undertaken environmental authorisations for electrical generation and transmission, mining, conservation, residential as well as industrial developments. He is also an experienced ecologist and will provide expertise for this project in terms of soil surveys and wetland delineation.

1.5 Objectives of the Scoping Report

This report addresses the requirements for Scoping and the Plan of Study (PoS) for the EIA as outlined in the NEMA regulations. The aim of this Final Scoping Report (FSR) is to:

- Indicate the methodology followed to select the site alternatives;
- Provide information to the authorities as well as Interested and Affected Parties (I&APs) on the proposed project as well as a description of the baseline environment;
- Indicate how I&APs have been afforded the opportunity to contribute to the project, verify that the issues they raised to date have been considered, and comment on the findings of the impact assessments;
- Define the Terms of Reference (ToR) for specialist studies to be undertaken in the Impact Assessment Phase of the EIA; and
- Present the findings of the Scoping Phase in a manner that facilitates decision-making by the relevant authorities.

2 LEGAL REQUIREMENTS

Environmental legislation in South Africa was promulgated with the aim of, at the very least, minimising and at the most preventing environmental degradation. The following Acts and Regulations are applicable to the Camden Ash Disposal Facilities Expansion Project:

2.1 The Constitution of the Republic of South Africa (Act 108 of 1996)

Section 24 of the Constitution states that: Everyone has the right

(a) to an environment that is not harmful to their health or well-being; and

(b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that-

- *prevent pollution and ecological degradation;*
- *promote conservation; and*
- *secure ecologically sustainable development and use of natural resources, while promoting justifiable economic and social development*

The current environmental laws in South Africa concentrate on protecting, promoting, and fulfilling the Nation's social, economic and environmental rights; while encouraging public participation, implementing cultural and traditional knowledge and benefiting previously disadvantaged communities.

Section 27 of the Constitution states that: Everyone has the right to health care, food, **water** and social security

(a) Everyone has the right to have access to

- *health care services, including reproductive health care;*
- *sufficient food and water; and*
- *social security, including, if they are unable to support themselves and their dependants, appropriate social assistance.*

(b) The state must take reasonable legislative and other measures, within its available resources, to achieve the progressive realisation of each of these rights.

(c) No one may be refused emergency medical treatment.

2.2 National Environmental Management: Waste Act (NEM:WA) (Act 59 of 2008)

With the recent proclamation (July 2009) of the National Environmental Management: Waste Act (NEM: WA) all waste related activities previously listed under the NEMA EIA regulations

have been repealed and are now listed in the ambit of the NEM:WA. The minister of Environmental Affairs published Regulation 718 in terms of Section 19 (1) of the NEM: WA. These regulations highlight the waste management activities that require environmental waste licensing. The regulations comprise two Categories, namely Category A, which identifies activities that require a Basic Assessment process and Category B, which identifies activities that require a full scoping and EIA process to be followed. In terms of these regulations the following activities require authorisation:

Regulation 718 - Category B

Activity 1:	The storage including the temporary storage of hazardous waste in lagoons
Activity 9:	The disposal of any quantity of hazardous waste to land.
Activity 11:	The construction of facilities for activities listed in Category B of Schedule 19(1) ~ GN R718.

As described in Regulation 718 "*a person who wishes to commence, undertake or conduct an activity listed under this Category, must conduct an environmental impact assessment process, as stipulated in the environmental impact assessment regulations made under section 24(5) of the National Environmental Management Act, 1998 (Act No. 107 of 1998) as part of a waste management license application".*

Therefore the proposed infrastructure requires the submission of a Waste Management License Application (WMLA) as well as a full Scoping and EIA to the National Department of Environmental Affairs.

2.3 National Environmental Management Act (Act 107 of 1998)

The EIA for this proposed project will be conducted in terms of the EIA Regulations that were promulgated in terms of Section 24 (5) of the NEMA, as amended. The NEMA can be regarded as the most important piece of general environmental legislation. It provides a framework for environmental law reform and covers three areas, namely:

- Land, planning and development;
- Natural and cultural resources, use and conservation; and
- Pollution control and waste management.

The law is based on the concept of sustainable development. The objective of the NEMA is to provide for co-operative environmental governance through a series of principles relating to:

- The procedures for state decision-making on the environment; and
- The institutions of state which make those decisions.
- The NEMA principles serve as:
- A general framework for environmental planning;
- Guidelines according to which the state must exercise its environmental functions; and
- A guide to the interpretation of NEMA itself and of any other law relating to the environment.

2.3.1 *What are the NEMA principles?*

Some of the most important principles contained in NEMA are that:

- Environmental management must put people and their needs first;
- Development must be socially, environmentally and economically sustainable;
- There should be equal access to environmental resources, benefits and services to meet basic human needs;
- Government should promote public participation when making decisions about the environment;
- Communities must be given environmental education;
- Workers have the right to refuse to do work that is harmful to their health or to the environment;
- Decisions must be taken in an open and transparent manner and there must be access to information;
- The role of youth and women in environmental management must be recognised;
- The person or company who pollutes the environment must pay to clean it up;
- The environment is held in trust by the state for the benefit of all South Africans; and
- The utmost caution should be used when permission for new developments is granted.

The National Department Environmental Affairs (DEA) is the Competent Authority (CA) responsible for issuing environmental authorisation for the proposed project. The Mpumalanga Department of Economic Development, Environment and Tourism (MDEDET) is a key commenting authority along with the Department of Water Affairs (DWA).

2.3.2 *Environmental Impact Assessment Regulations: 543-546 of 18 June 2010*

Even though the main activity of the proposed ash dam triggers the NEM: WA, certain proposed activities (see below) are also listed activities in terms of NEMA regulations. These are described below.

A Scoping and Environmental Impact Report (S&EIR) are applicable to all projects likely to have significant environmental impacts due to their nature or extent, activities associated with potentially high levels of environmental degradation, or activities for which the impacts cannot be easily predicted. In comparison a Basic Assessment (BA) is required for projects with less significant impacts or impacts that can easily be mitigated. The difference between the processes relates to the nature of the proposed development in terms of its potential impact on the environment, and this is reflected in the level of detail that information is collected in as well as the level of interaction with I&APs.

In terms of Government Notice Regulation (GNR) 545, Activity 8, 15 and 19, a Scoping and Environmental Impact Reporting (S&EIR) comprising both Scoping and Impact Assessment, is necessary for the proposed of the Camden Ash Disposal facilities. This main activity is listed as follows:

<u>In terms of Government Notice (GN) R. 545 of 2010, the following listed activities require that a full EIA be undertaken and are applicable to this proposed project:</u>

Activity 8: The construction of facilities or infrastructure for the transmission and distribution of electricity with a capacity of 275kV or more, outside an urban area or industrial complex.

Activity 15: Physical alteration of undeveloped, vacant or derelict land for residential, retail, commercial, **industrial** or institutional use where the total area to be transformed is 20 hectares or more;

Activity 19: The construction of a dam where the highest part of the dam wall, as measured from the toe of the wall to the highest part of the wall, is 5 metres or higher, or where the high water mark of the dam covers an area of 10 hectares or more.

<u>In terms of Government Notice (GN) R. 544 of 2010, the following listed activities require that a Basic Assessment be undertaken for the proposed project (these activities having a lesser impact than those of the activities requiring an EIA will result in one EIA being undertaken for the proposed project):</u>

Activity 9: The construction of facilities or infrastructure exceeding 1000 metres in length for the bulk transportation of water, sewage or storm water –

i) With an internal diameter of 0.36 metres or more; or

ii) With a peak throughput of 120 litres per second or more.

Activity 22: The construction of a road outside urban areas

i) With a reserve wider than 13,5 metres;

ii) Where no reserve exists where the road is wider than 8 metres, or

iii) For which an EA was obtained for the route determination in terms of Activity 5 of GN 387 of 2006 or Activity 18 of GN 545 of 2010.

Activity 24: The transformation of land bigger than square 1000 metres in size, to residential, retail commercial, industrial or institutional use, where at the time of coming into effect of this Schedule or thereafter such land was zoned as open space, conservation or has an equivalent zoning.

Activity 27: The decommissioning of existing facilities or infrastructure, for:

ii) Electricity transmission and distribution with a threshold of more than 132kV;

Activity 29: The expansion of facilities for the generation of electricity where:

i) The electricity output is increased by 10 MW or more, excluding where such expansion takes place on the original development footprint;

ii) Regardless the increased output of the facility, the development footprint will be increased by 1 hectare or more.

Activity 37: The expansion of facilities or infrastructure for the bulk transportation of water, sewage or storm water where –

i) The facility or infrastructure is expanded by more than 1 000 metres in length; or

ii) Where the throughput capacity of the facility or infrastructure will be increased by 10% or more.

Activity 38: The expansion of facilities for the transformation and distribution of electricity where the expanded capacity will exceed 275kV and the development footprint will increase.

Activity 47: The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre

i) With a reserve wider than 13,5 metres;

ii) Where no reserve exists where the road is wider than 8 metres,

iii) Excluding widening or lengthening inside urban areas.

Therefore, for the proposed project, a Scoping and EIA has to be undertaken. NEMA provides for a single integrated process for all the listed activities on site. Since the project comprises activities that require both a Basic Assessment and EIA levels of investigation, all activities will be assessed to the detail required for a Scoping and EIA process.

2.4 Environment Conservation Act (Act 73 of 1989)

The Environment Conservation Act (ECA) is a law that relates specifically to the environment. Although most of this Act has been replaced by the NEMA there are still some important sections that remain in operation. These sections relate to:

- Protected natural environments;
- Special nature reserves;
- Limited development areas;
- Regulations on noise, vibration and shock; and
- EIA.

2.5 Additional Acts and Frameworks

In addition to the ECA, NEMA and NEM: WA, the following Acts have some bearing on the proposed activities:

The National Heritage Resources Act (No. 25 of 1999)

The proposed construction of the waste disposal site comprises certain activities (e.g. changing the nature of a site exceeding 5 000m^2 and linear developments in excess of 300m) that require authorisation in terms of Section 38 (1) of the Act. Section 38 (8) of the Act states that, if heritage considerations are taken into account as part of an application process undertaken in terms of the ECA, there is no need to undertake a separate application in terms of the National Heritage Resources Act. The requirements of the National Heritage Resources Act have thus been addressed as an element of the EIA process, specifically by the inclusion of a Heritage Assessment.

Department of Environmental Affairs and Tourism[1] Integrated Environmental Management Information Series

The Department of Environmental Affairs (DEA) Information Series of 2002 and 2006 comprise 23 information documents. The documents were drafted as sources of information about concepts and approaches to Integrated Environmental Management (IEM). The IEM is

[1] The Department of Environmental Affairs and Tourism is now referred to as the Department of Environmental Affairs.

a key instrument of the NEMA and provides the overarching framework for the integration of environmental assessment and management principles into environmental decision-making. The aim of the information series is to provide general guidance on techniques, tools and processes for environmental assessment and management.

3 PROJECT DESCRIPTION AND ALTERNATIVES CONSIDERED

3.1 Project Location

The proposed project is located at the existing Camden Power Station 12 km from Ermelo in the Mpumalanga Province. Please refer to Figure 3-1 for an illustration of the location of the site.

3.2 Project Description

The proposed project is the extension of ash disposal facilities and associated infrastructure for the Camden Power Station. The ash disposal facility as well as its infrastructure is briefly described below.

3.2.1 *Proposed Ash Disposal Site*

The following components of the ash disposal site are being taken into consideration:

- The lifespan of the facility;
- Footprint of the facility (groundspace);
- Height of the facility (airspace);
- Type of waste (ash and brine) to be disposed as well as the volumes (waste stream analysis); and
- Geotechnical, hydrogeological conditions and foundation design.

Footprint and lifespan of the facility

The new ash disposal site will need to cater for an estimated 12,86 million m^3 of ash up to 2023 plus 5 years contingency. It is estimated that the extension / new site will be in the order of 100 ha depending on the height of the facility. Additional structures *inter alia* ash water return dams and channels, roads and fences will increase the footprint by an estimated 20 ha. The design of the facility will be completed during the EIA phase.

Height of the facility

According to Eskom policy the height of a facility and the rate of rise are critical to ensure that an ash disposal site is operated safely. Figure 3-2 provides a photograph of the current disposal site from its highest point. The available footprint will influence the height of the new facility.

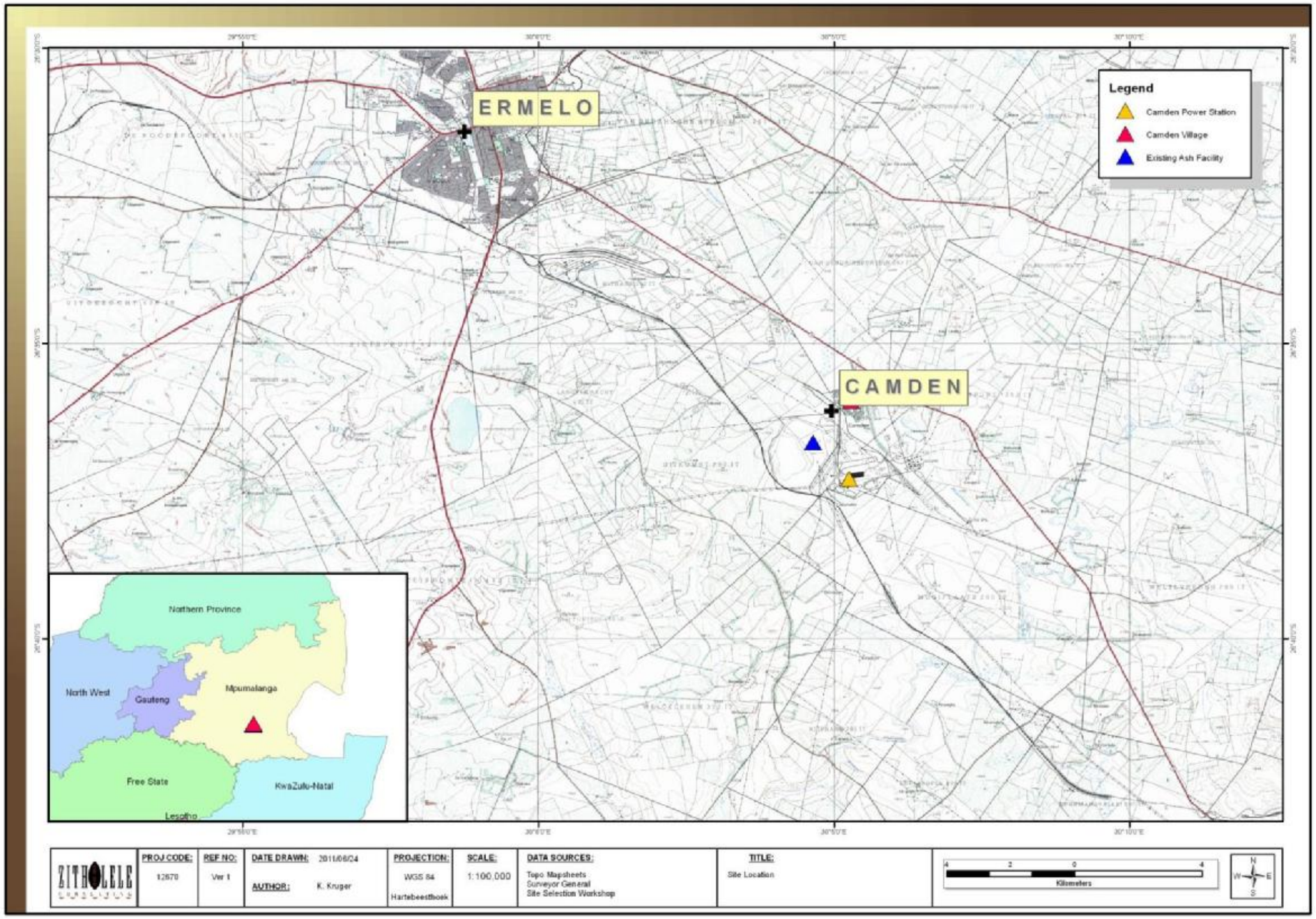

Figure 3-1: Camden Location

Figure 3-2: View of the sides of the existing ash disposal site.

Sources of Waste to be disposed

The waste that requires disposal on the ash disposal facilities originates from two main sources:

- Camden Power Station: fly ash and coarse ash from coal burning operations; and
- Camden Power Station Reverse Osmosis (RO) water treatment plant: brine salts;

The ash and brine received by the current site is transported via pipelines to the ash disposal site from the various source areas. It should be noted that the ash is a wet ash and this slurry is pumped to an ash dam, from where the water enters the ash return water dam (De Jagers pan) before recycling to the plant. The power station is in the process of constructing the reverse osmosis plant mentioned above. Once operational some of the water will be transported to the RO plant for treatment prior to entering the power station. The pipelines (Figure 3-3) are placed strategically throughout the source areas in the power station and the RO plant.

Figure 3-3: Transport (red) and disposal (yellow) of ash to current ash dam.

Volumes of ash to be disposed

The volumes of ash vary from month-to-month, however a detailed register of all the ash disposed at the existing facility is kept at the power station. The current site receives a maximum of 3 421 000m^3 of slurry a year. The RO plant is not yet operational and statistics on the volume of waste is still being gathered. It is anticipated that the new site will have to take the same consistency and composition of ash for the estimated life of the facility, which is estimated for another 17 years (12 years plus 5 years contingency), three years has also been allowed for decommissioning, thus a 20 year life span is anticipated.

Character of Waste to be disposed

In order to adequately understand the interaction between the ash and the brine within the disposal facility, the characteristics of these wastes streams needs to be determined. This information will be obtained by undertaking a waste analysis and classification study according to the DWAF: Minimum Requirements guidelines, as well as pending DEA waste regulations during the EIA phase.

Geotechnical Conditions and Foundation Design

A geotechnical investigation will be undertaken in order to establish whether the extension / new site can be constructed on the geological conditions that prevail on site. This in turn will influence the foundation design of the disposal facility.

Capping of the Ash Disposal Site

The permit / license for the existing ash dam requires rehabilitation of the facility through capping with soil material in order to cover the waste, and successful re-vegetation of rehabilitated areas of the site (refer Figure 3-4). This process has to date been very successful as illustrated below. More detailed information on the capping and closure of the facility will be generated through the EIA.

Figure 3-4: Existing ash disposal site with capped and rehabilitated area in the foreground

3.2.2 *Proposed Associated Infrastructure*

The following associated infrastructure is envisioned for the proposed ash disposal site.

Ash Return Water Dams and trenches/drains

Water draining from the wet ash disposal site will be recycled via a system consisting of a return water dam/s and drains that collect the runoff from the dump prior to pumping the water to the RO plant, from where it will be pumped to the power station for reuse. The capacity requirements, as well as the liner conditions will be determined by an engineering investigation that will be undertaken during the EIA phase

Pipelines

Ash is currently transported via pipelines from the power station to the ash disposal facility. This practice will be continued. The extension or rerouting of these pipelines to accommodate the new facility will be addressed in the EIA. The rehabilitation of existing pipelines, where required, will also be addressed in the EIA phase.

Access Roads and Fencing

An access road is proposed to link the site with one of the existing roads in the area. It is envisioned that the access road and the disposal site will be fenced off for safety and security reasons.

Access Control

In order to ensure safety and to prevent illegal dumping the site will require access control through a security guard. This person can also be the existing security guards on site.

Storm Water Drainage and Monitoring Boreholes

As part of the site design, ongoing monitoring of the site storm water drainage features will be undertaken and additional monitoring boreholes will be installed for monitoring. As part of the conceptual designs a stormwater management plan will be developed to ensure that stormwater is adequately addressed.

Relocation of existing Service Infrastructure

The area around Camden Power Station is criss-crossed with service infrastructure including transmission powerlines, conveyor belts and various pipelines. As part of the EIA phase the rerouting of any of these services will be investigated and potential corridors for the services will be identified.

Rehabilitation of Redundant Infrastructure

As a result of this project some of the existing infrastructure may be made redundant, for example pipelines carrying waste to the existing facility. Such infrastructure will be identified during the EIA phase of the project, and rehabilitation measures will be determined. The rehabilitation of these facilities will be addressed in the EMP generated for this project.

3.2.3 *Construction area*

The construction area for the ash disposal site will be the footprint of the disposal site, up to the developed day walls, as well as any additional features required as part of the construction i.e. an access road, new pipelines, and areas to be rehabilitated. At this stage the full size of the site and its works is estimated to be in the order of 120 – 125 ha depending on site specific conditions. The exact surface area is still to be determined by the design of the facility. Construction activities will be limited to the areas mentioned above.

3.2.4 *Major Activities of the Overall Project*

The major phases for the proposed project (including the EIA), prior to and after construction, are explained in the table below.

Table 3-1: Major phases for the proposed project.

NO.	PHASE	ACTIVITY DETAILS
	PRECONSTRUCTION PHASE	
1	Scoping	As part of the undertaking of an EIA a technical team identified three site alternatives for the proposed project. An environmental team was commissioned to undertake a screening exercise in the area to determine the most feasible alternative from an environmental perspective to take into the EIA.
2	EIA	An EIA is being undertaken to ensure that all environmental, social and cultural impacts are identified and to ensure that stakeholders have the opportunity to raise issues and concerns. This is necessary to obtain Environmental Authorisation from the competent authority in this case the Department of Environmental Affairs (DEA);
3	Property acquisition (if required)	Purchase of property if the chosen site is not on existing Eskom property.
4	Structure foundation investigation	Investigations will be undertaken to ensure that the foundation specifications are in line with the underlying geology.
5	Approval from authorities	
6	Appeal	Once authorities have issued their decision an appeal process will commence. During this phase both the proponent and other stakeholders have the opportunity to appeal the decisions, or conditions thereof.
	CONSTRUCTION PHASE	
1	Site establishment	The first stage of the construction phase is the establishment of contractors on site. This must be undertaken in line with the conditions of Environmental Authorisation.
2	Relocation of services	The relocation of services is imperative, and will be undertaken during the initial phases of the project to ensure that the supply of services is not interrupted.
1	Structures	**Fencing** - Provide a safe and secured waste disposal area to restrict access and prevent injuries to livestock.
		Formation and lining - Provide a ground formation/lining compacted to the correct standard on which to build the ash disposal site.
		Drainage - Provide water drainage channels within the site.
2	Rehabilitate facilities made redundant.	Rehabilitation of facilities that are made redundant, such as pipelines / pump stations that will no longer be required, due to the implementation of this project.
3	Rehabilitate the construction area	The area where construction activities have taken place must be rehabilitated to minimise environmental degradation by following the Environmental Management Plan that is compiled in conjunction to the EIA.
	OPERATIONAL PHASE	
1	Operations at new ash disposal site	Once all construction activities are complete, and the facility is deemed operational, disposal will commence at the new site in line with the requirements of the Environmental Authorisation. It should be noted that waste disposal at the new facility will only commence once the available airspace at the current facility has been fully utilised.

NO.	PHASE	ACTIVITY DETAILS
2	Rehabilitation and closure of existing ash dam.	Once the airspace has been fully utilised and the new ash disposal facility is operational, the rehabilitation of the existing facility will commence. This phase will overlap with operational phase of the new facility, as final rehabilitation and closure of the current facility cannot be undertaken until the new facility is up and running.
DECOMMISSIONING AND CLOSURE PHASE		
1	Decommissioning of the ash site and its infrastructure	Once the ash disposal site is no longer in use and is no longer required a decommissioning process may commence.

3.3 Alternatives Considered

Alternatives being assessed for the construction of the Camden ash disposal site can be divided into the following categories:

- Waste Disposal alternatives;
- Site alternatives;
- Operation alternatives; and
- The No-Go (no development) alternative.

These are discussed in the sections below.

3.3.1 *Waste Disposal Alternatives / Waste Hierarchy*

The waste management hierarchy is an internationally accepted guide to prioritise waste management options and aims to achieve optimal environmental results, and is also a General Duty of a Holder of Waste in NEMWA. The first priority should be to prevent the generation of waste. If not possible, waste should be minimised or re-used as far as possible. Refer to Figure 3-5 for an illustration of the waste hierarchy.

Ash from coal-fired power stations provides a unique challenge to waste minimisation. Ash in its various forms can be utilised in the building industry as a cement extender or aggregate[2]. Although the ash is generated in large volumes, the classification of the ash according to legislation has posed several challenges as the ash was not considered when the classifications were developed. Using the leaching analysis, ash is mostly classified as hazardous according to the Minimum Requirements, which prevents the use/recycling of the ash prior to the delisting of the ash by the Department for a specific use. In addition the sheer volume of ash produced by power stations far exceeds the potential market for

[2] South African Coal Ash Association, http://www.coalash.co.za/index.htm.

recycled ash products. At present there is no feasible recycling or reuse alternative for the ash being produced at Camden Power Station.

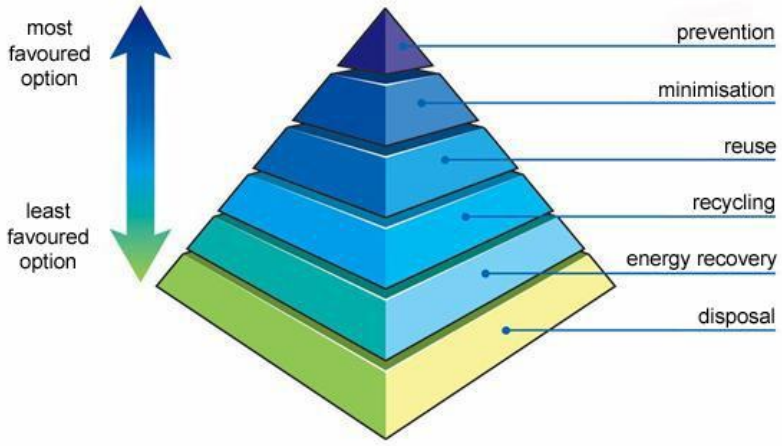

Figure 3-5: Waste Hierarchy

The Camden Ash Disposal Facility will form an integral part of the handling, re-use and disposal of water and waste at the Camden Power Station operations. The ash disposal facility is the last resort in the ash waste stream as it is a final disposal facility. Water from the wet ashing process is recycled via ash water return dams, from where the water is pumped to the power station and re-used in the process of ash transportation rather than using clean water. In the case of the ash, the waste disposal is currently the most feasible alternative for the Camden power station. However ongoing investigation by Eskom into potential use of ash in other areas should not be excluded as a future option.

3.3.2 *Site Alternatives*

Initial Site Identification

A site selection exercise was undertaken in line with the requirements of the Minimum Requirements (draft 3rd edition, 2005). The initial technical conditions utilised to identify potential sites were:

- It should be able to link into existing ash disposal infrastructure;
- It must be within a 10 km radius of the existing site to minimise travelling distance of the ash;
- Had to have a minimum footprint size of 120 ha (including associated infrastructure) to accommodate a worse case growth rate in waste volumes over the next 20 years.

Four site alternatives were identified during a screening workshop hosted at the power station that met the aforementioned criteria. The workshop was undertaken by the consultants (environmental, geotechnical and engineering) and Eskom personnel (site engineer, environmental manager station and environmental advisor head office). Using topographic maps, site knowledge and aerial photographs of the site the alternatives shown in the map below where identified. Once the workshop was completed the sites where visited to confirm their feasibility. The alternatives are illustrated in Figure 3-6 below. These four sites were then evaluated in more detail according to the Minimum Requirements, where the sites have to be ranked according to selection criteria. The first of these are fatal flaws, followed by economic, environmental and public criteria. Each of these is described in more detail below.

Fatal Flaw Identification

Fatal flaws are features that would prevent the site alternative being utilised for an ash disposal site. These were adapted from the Minimum Requirements (3rd edition) and are shown in Table 3-2 below.

Table 3-2: Fatal Flaws used in the site selection

Ranking Component	
Fatal Flaws	500m from an airfield
	Within the 1:100 year flood line
	Areas in close proximity to significant surface water bodies
	Unstable/undermined areas
	Sensitive ecological and/or historical areas
	Areas of flat gradients, shallow or emergent ground water
	Areas within the secure power station area (National Keystone Infrastructure)
	Areas characterized by shallow bedrock with little soil cover
	Areas in close proximity to land-uses that are incompatible with disposal sites
	Areas immediately upwind of a residential area in the prevailing wind direction(s).
	Areas over which servitudes are held that would prevent the establishment of a ash disposal facility e.g. Eskom, Transnet, Water Board

These flaws have been identified by the Department of Water Affairs (DWA) in their Minimum Requirements Document. Of the flaws mentioned above Alternative 4 was within a 1:100 year floodline. Although unconfirmed, it is suspected to be in close proximity to an area of historical undermining. Alternative 4 is therefore considered to be fatally flawed. For the sake of completeness the site was however ranked against all other criteria.

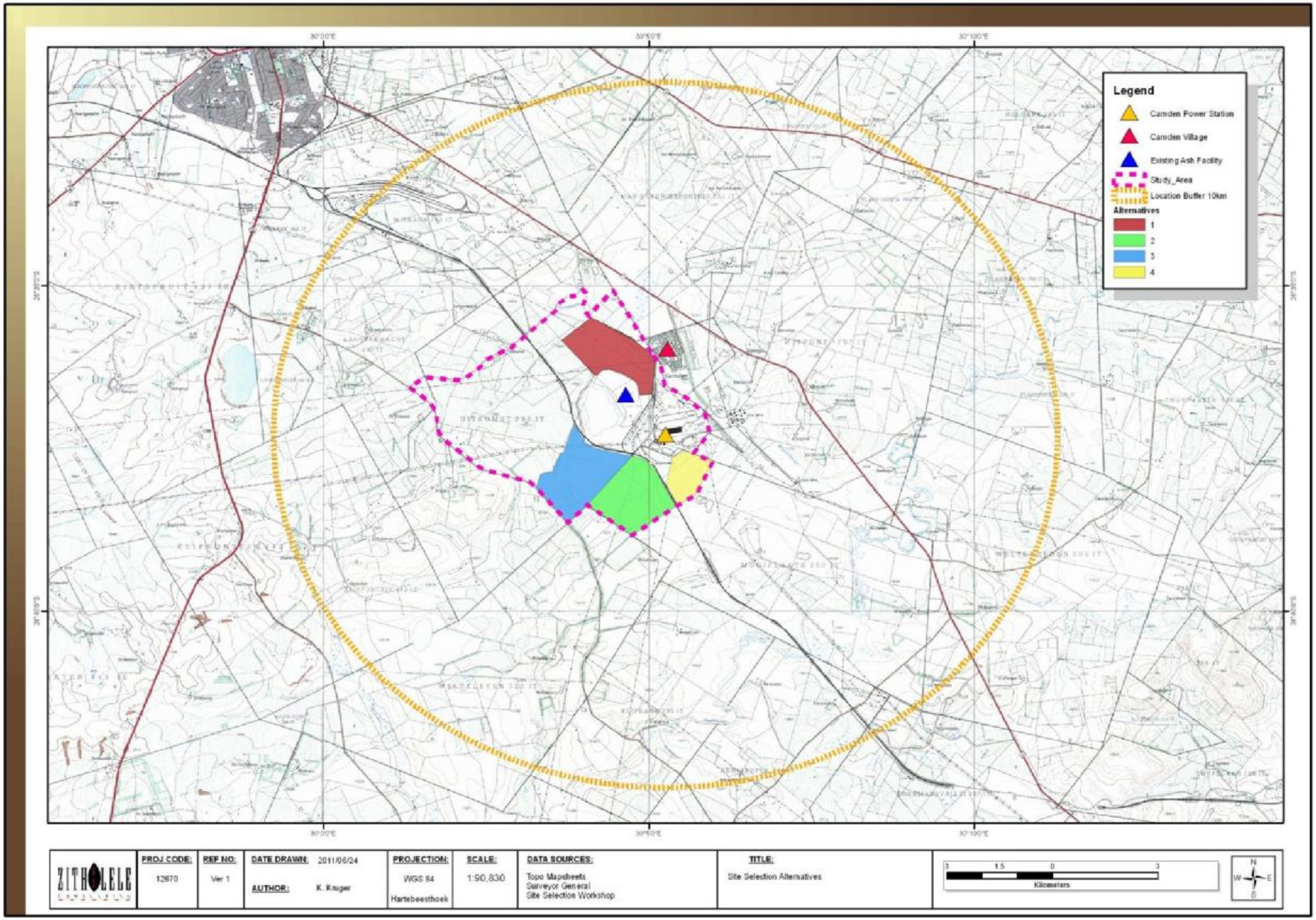

Figure 3-6: Locality of the ash disposal site alternatives.

Site Screening

Upon completion of the fatal flaw assessment screening of each of the sites was undertaken. Site screening involved the compilation of a site screening matrix, a one-day site investigation, and a workshop between the environmental team and key Camden Power Station personnel to rate each of the potential sites. A matrix was compiled to highlight the ranking of the sites and is shown in Table 3-3 below. A rating system of -3 (not suitable) to +3 (suitable) was used to score the sites as shown in the table below.

Economic Criteria

The economic criteria area focussed on the establishment and operating cost of each specific site. This includes the distance to the site from the waste sources, the accessibility of the site, the ease of operations, the available footprint, the cost to establish the site and security concerns. Under the economic criteria Alternatives 1 was the most suitable with Alternatives 3 second. This was expected as Alternative 1 is located very close to the existing site, which will allow very easy integration with current operations. Alternative 2 and 4 are both some distance from the existing services resulting in lower scores. It should be noted that a key finding from this analysis was that all the alternatives have existing transmission power lines running through the sites. The deviation of these transmission lines should be included in the EIA and the specialist studies that are to be undertaken.

Environmental Criteria

The environmental criteria that were identified as important ranking components include the distance to ground or surface water features, the depth of the soils on site and the sensitivity of the receiving environment where the site will be established. The scoring from the matrix indicated that Alternatives 1 - 3 were rated equal with no apparent distinction between the sites. This is due to the close proximity of the site to each other with only subtle differences in the receiving environment over such short distances. Alternative 4 on the other hand scored very poorly due to the existing stream and associated sensitive habitats in the centre of the site.

Public Criteria

The public criteria that were considered during the site selection was the possible displacements of local habitants, the visibility of the site, the sensitivity of the access road and the distance to the nearest residential area. According to the evaluation of the public criteria, Alternative 3 was the most suitable site, as this site will present the least visibility of the disposal facility from the main roads and settlements in the area. In addition the Camden township is close to Alternative 1. In recent years this township has been vacated by residents to a large degree, but a few residents remain. Alternative 4 scored reasonably in this section, largely due to the isolated location.

Overall Site Scoring

When all of the abovementioned scores are added a clearer picture of the suitability of the sites emerges. Alternative 1 comes out as the most preferred site, followed by Alternative 3. Alternative 1 is located in the proximity of the current site and therefore all the infrastructure and support services are in place including roads, security, monitoring boreholes and some fences. Alternative 4 has a no-go feature on site which eliminates it from further analysis.

It was therefore decided on the basis of the site selection exercise to investigate Alternative 1, 2 and 3 during the EIA phase of the project. This combined area will be assessed for sensitivities and the conceptual design of the facility will be fine-tuned accordingly. Alternative 2 was also included as there were a couple of unknown factors that when investigated, could improve the suitability of the site.

Route alternatives for associated infrastructure

At present the power station is serviced by pipelines that collect and transport the ash and brine and then deliver the ash to the existing site. Potential corridors for the alignment of the pipelines as well as the relocation of transmission lines will be considered in the EIA phase.

Table 3-3: Site Selection Matrix for the Suitable Alternatives

Ranking Component		Alt 1	Alt 2	Alt 3	Alt 4
Economic	The distance of the site from the ash/brine generation areas	3	1	1	1
	Access to the ash disposal site	3	1	1	1
	Size of available footprint	3	3	3	3
	Ease of operation	3	1	1	1
	Relocation of existing services to avoid facility	-1	-1	1	-1
	Cost to establish infrastructure	1	1	1	-1
	Land Owned Fully or Partially by Eskom	1	-1	-1	-1
	Security Concerns	1	0	0	0
Total Economic		14	5	7	3
Enviro	The distance to ground or surface water	1	1	1	-10
	The depth of soil on the site	1	1	1	1
	The sensitivity of the receiving environment e.g. vegetation, conservation areas or sensitive animals	1	1	1	-10
Total Environmental		3	3	3	-19
Public	The displacement of local inhabitants.	1	-1	1	1
	Exposed sites with high visibility	-1	1	1	1
	The sensitivity of the environment through which the access road(s) passes	1	1	1	-1
	The distance to the nearest residential area	-1	-1	1	1
Total Public		0	0	4	2
	Overall Site Scoring	**17**	**8**	**14**	**-14**

3	Very suitable
1	suitable
0	unknown
-1	unsuitable
-3	very unsuitable
-10	Fatal flaw

3.3.3 *Design Alternatives*

An iterative design approach will be utilised on this project. For each of the feasible sites identified in this report, the engineering team in consultation with the environmental team and proponent will generate conceptual layouts for of the proposed ash disposal facility (including the footprint of the site, associated infrastructure, relocation of infrastructure, and rehabilitation of existing infrastructure). Further evaluation will then be undertaken of each of the conceptual layouts by drilling down into detail the environmental, economic, engineering, and social characteristics of each alternative. Based on this analysis a preferred alternative will be selected, and a conceptual design will be drawn up.

3.3.4 *"No Go" Alternative*

The "No-Go" alternative will also be assessed further in the EIA process. This alternative presents that, in the case that the project does not take place, the power station will have to dispose of the ash generated illegally or stop operating all together.

Should the "No-Go" alternative be the preferred alternative, Eskom will have to close the Camden Power Station. The environmental and social impacts will be assessed and compared to the aforementioned alternatives

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4 RECEIVING ENVIRONMENT

The receiving environment section of this report was compiled by using the following methodology: Existing information/data was reviewed and a desktop study undertaken for each of the environmental elements. This was supplemented with observations made at a site visit on the 16th May 2011. The regional environment is described in the section below. For the context of this report the regional environment refers to the Msukaligwa Local Municipality.

4.1 Climate

4.1.1 *Data Collection*

Climate information was attained using the climate of South Africa database.

4.1.2 *Regional Description*

The climate of the study area is typical of the Highveld region of Mpumalanga, with warm, moist summers and cold, dry winters with frost in places. Average rainfall for the study area ranges from 650 mm to 900 mm per annum. Temperatures range from below zero during winter to above 30°C during summer, with mean daily temperatures of 12 to 25°C in summer and 0 to 20°C in winter. The first incidence of frost usually occurs during the first week of May, where frost can occur until the middle of September. Thunderstorms occur frequently during summer, between October and March, and are usually accompanied by lightning, heavy rain, strong winds and occasionally hail. Storms are mainly localised and rainfall can vary markedly over short distances. Snow falls are recorded most winters in the high-lying areas of the study area's south-eastern portion. Fog occurs on an average of 55 days per annum. Winds in the study area blow predominantly from the north, west and north-west, and may reach speeds of up to 60 km/h in summer. This regional information will be updated with the Ermelo weather station data in the EIA phase.

4.1.3 *Air quality*

The atmospheric conditions in the Highveld region of Mpumalanga results in high levels of pollution accumulating near ground level due to the creation of inversion layers that trap emissions. A high-pressure system prevails over the region and results in high atmospheric stability, clear skies and low wind speeds. Surface inversions occur often in winter and elevated inversions are common. Moist, unstable conditions and rainfall, which promote dispersion and deposition of pollutants, are confined almost exclusively to the summer period. The main sources of pollutants in the Mpumalanga Highveld region are from power stations, petrochemical plants, smaller industries, domestic combustion, motor vehicles, smouldering coal-discard dumps and veld burning. Pollutants emitted by these sources include particulates; sulphur dioxide, nitrogen oxides, carbon monoxide, hydrocarbons and carbon dioxides.

4.2 Geology

4.2.1 *Methodology and Data Sources*

This geological evaluation of the site is based on a literature search and an initial brief site visit. Appropriate information was obtained from the following sources:-

- The 1: 250 000 geological maps, No 2628 East Rand and No. 2630 Mbabane.
- The 1:50 000 topo-cadastral map 2630 CA Camden, published by The Department of Survey and Mapping, Mowbray 1985.
- Google Earth satellite imagery, obtainable from http/.earth.google.com.
- "The geology of South Africa." edited by Johnson, M.R., Anhaeusser, C.R., and Thomas, R.J. published by the Council for Geoscience and the Geological Society of South Africa. 2006.
- "Engineering Geology of Southern Africa" volume 3, by A.B.A. Brink (1979), published by Building Publications.
- "Minimum requirements for waste disposal by landfill." Third edition, published by the Department of Water Affairs and Forestry. 2005.

4.2.2 *Regional Description*

From the available literature as well as the observations during the site investigation, it is apparent that all three sites are underlain by siltstone, mudstone and sandstone that belong to the Vryheid Formation of the Ecca Group, Karoo Supergroup.

Generally these rocks will decompose in-situ, forming residual soils that may be silty and clayey, with the possibility of expansive soil being present. These soils are often blanketed by a considerable thickness of transported soils of colluvial origin that consist of silty and clayey fine sands.

The presence of intruded dykes and sills in the Karoo sediments is well known and simple perusal of a 1: 250 000 scale geological maps of the area will confirm this. These features may vary in size from centimetres to tens of metres in width. Dykes and sills originate from deep seated magma chambers which force molten rock into cracks, and fissures as well as along bedding planes in the host formation. During the intrusion under the influence of extremely high pressure the host rock is further fractured in a process not to dissimilar to the proposed hydraulic fracturing. These are the reasons why water preferentially accumulates adjacent to the dykes and may provide hydraulic continuity with deeper aquifers.

4.2.3 *Site Description*

On the basis of the geological information available it is apparent that Alternative 2 straddles the contact between the host sedimentary formations and an intruded dolerite sill. No

intrusive features are indicated on the geological maps in the vicinity of Alternatives 1 and 3; however more detailed mapping will be required in order to establish the presence or absence of dykes and sills. Dykes or sill can form preferential groundwater drainage that can be a risk if the site has any spill or leakages. The geologies described above are illustrated in Figure 4-1 below.

4.2.4 *Sensitivities*

Due to the potential risk of surface subsidence due to the nearby location of areas with undermining these areas are considered sensitive, but will require further investigation during the EIA. The remaining area will be considered suitable for the ash disposal facility.

4.3 Topography

4.3.1 *Data Collection*

The topography data was obtained from the Surveyor General's 1:50 000 toposheet data for the region, namely 2630CA. Contours from the topographical mapsheets were used to form a contours layer as shown in Figure 4-2 below.

4.3.2 *Regional Description*

The Highveld plateau characteristically comprises a dissected plain formed by ancient planation. Ancient erosion of this plain has resulted in a gently undulating landscape in which outcrops are most characteristically found in the lower slope positions where the mantle of pre-weathered material has been stripped by erosion. The altitude ranges between 1 460 – 1 820 metres above mean sea level (mamsl).

4.3.3 *Site Description*

The overall site drains towards the southeast where the water is intercepted by the Vaal River. The topography at Alternative 1 is relatively flat and rolling, gently sloping to existing site in the south. Alternatives 2 and 3 are located south of the De Jagers Pan, which is a natural depression in the landscape. Both Alternatives 2 and 3 drain northwards to the depression as they are located on relatively steep slopes.

4.3.4 *Sensitivities*

Sensitivities associated with the topography are mainly in the form of ridges, which do not occur on any of the alternatives. Other associated impacts include the visibility and drainage of the sites, which will be assessed in more detail in the EIA phase.

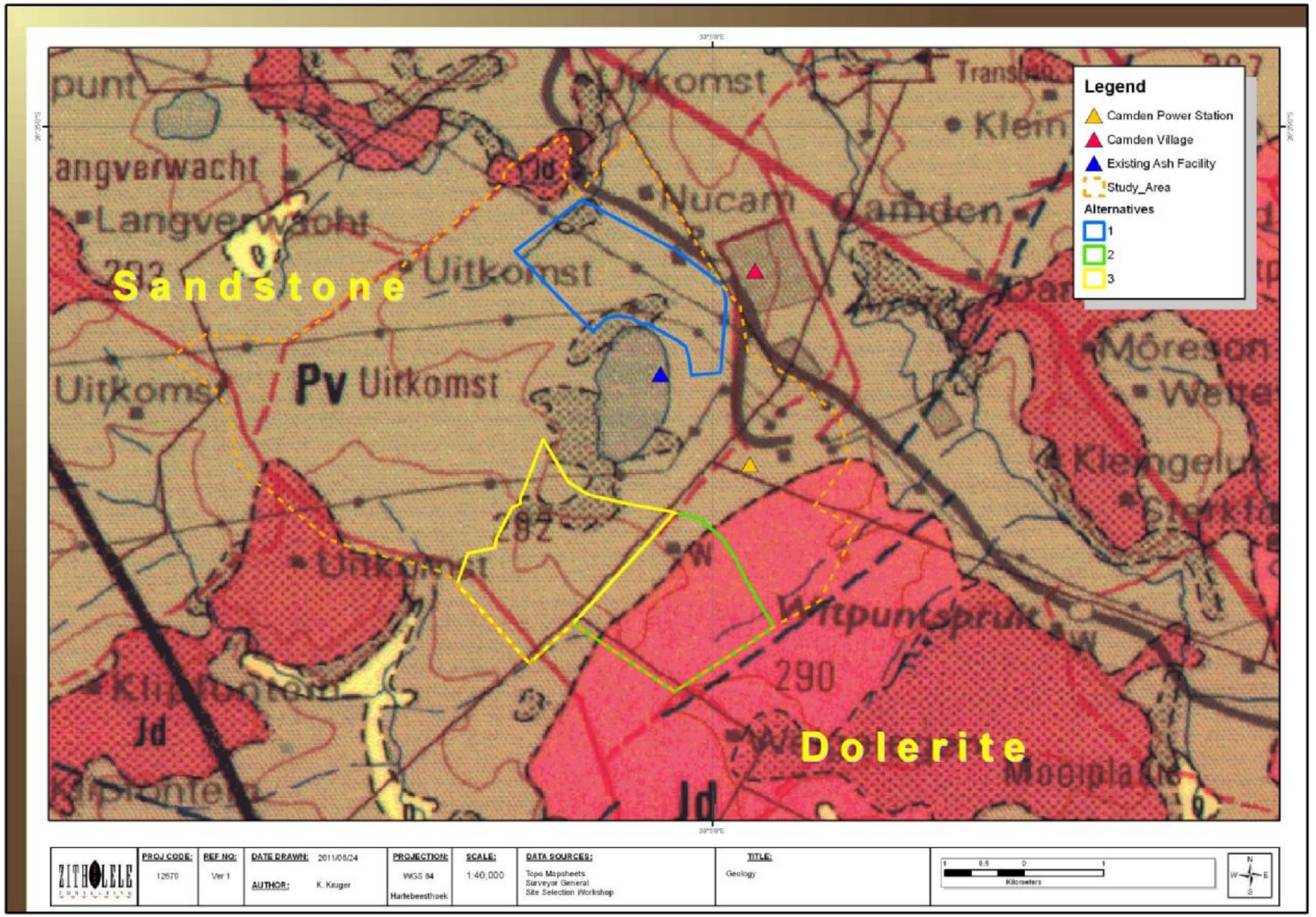

Figure 4-1: Regional Geology of the area

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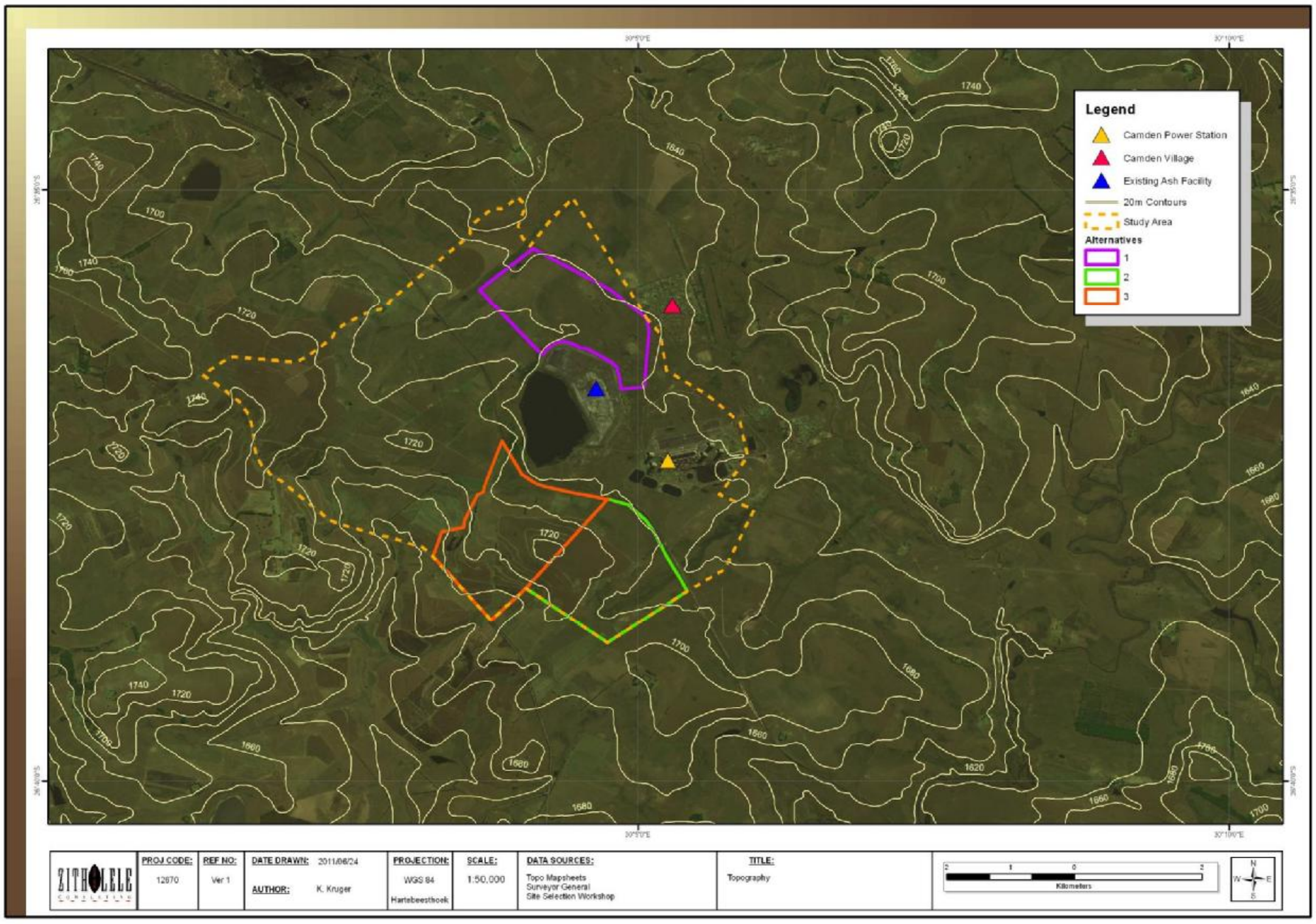

Figure 4-2: Topography of the area.

4.4 Surface Water

4.4.1 *Data Collection*

The surface water data was obtained from the Department of Water Affairs National database of Freshwater Ecosystem Priority Areas (FEPAs) for river ecosystems and wetlands. The data used included catchments, wetlands, water bodies, river alignments and ecological status of these sources.

4.4.2 *Regional Description*

The main drainage features of the area are the Witpuntspruit which drains southeastwards to the Vaal River, which is located some 6 km from Camden Power Station. Several unnamed tributaries are also found in the area. In addition to the streams, several wetlands and pans can also be found in the region as illustrated in Figure 4-3 below. The streams and their associated pans and wetlands support a number of faunal and floral species uniquely adapted to these aquatic ecosystems, and therefore all surface water bodies are earmarked as sensitive features and should be avoided as far as possible.

4.4.3 *Site Description*

From Figure 4-3 below, it is evident that there are water bodies or streams in close proximity to the study area. The De Jagers Pan is a natural depression/pan that is located adjacent to the existing ash disposal site. This pan is used as a return water dam as part of the approved water management system at the station. In addition to the pan there are small non-perennial drainage lines on all three alternative sites. In order to identify the exact location and status of these features a wetland and riparian delineation study will be undertaken as part of the EIA.

4.4.4 *Sensitivities*

The design and final site layout will have to avoid all these features and also take them into consideration as part of the planning. All the water bodies are seen as sensitive and should be avoided by the ash disposal site, however detailed studies will be undertaken in the EIA phase to determine the buffer zones required around these sites. In addition to the buffer zones mentioned above, floodlines also need to be considered to ensure that the site is adequately located to avoid being impacted on in a flood event.

4.5 Land Use/Cover

4.5.1 *Data Collection*

The land cover data was obtained from the CSIR Land Cover database and supplemented with visual observations on site.

4.5.2 *Regional Description*

The land use in the region is dominated by cultivation, farming, mining and power generation. The Ermelo residential and commercial areas can be found the northwest of Camden Power Station.

4.5.3 *Site Description*

From the map below (Figure 4-4) it can be seen that the proposed alternatives are located in areas of cultivation / unimproved grassland and some water bodies. Alternative 1 is located on an area that is used for grazing with the immediate land uses adjacent to the site being the existing disposal site and the Camden village residential area. Alternative 2 and 3 are located down slope of existing cultivated lands (mostly maize). To the north Alternatives 2 and 3 are bordered by the Transnet railway line and the De Jagers Pan and the Camden Power Station.

4.5.4 *Sensitivities*

Sensitive land uses in this area include wetlands, waterbodies and mining, especially undermined areas. In addition the power station is also seen as infrastructure with national importance that should not be negatively impacted on by the proposed project.

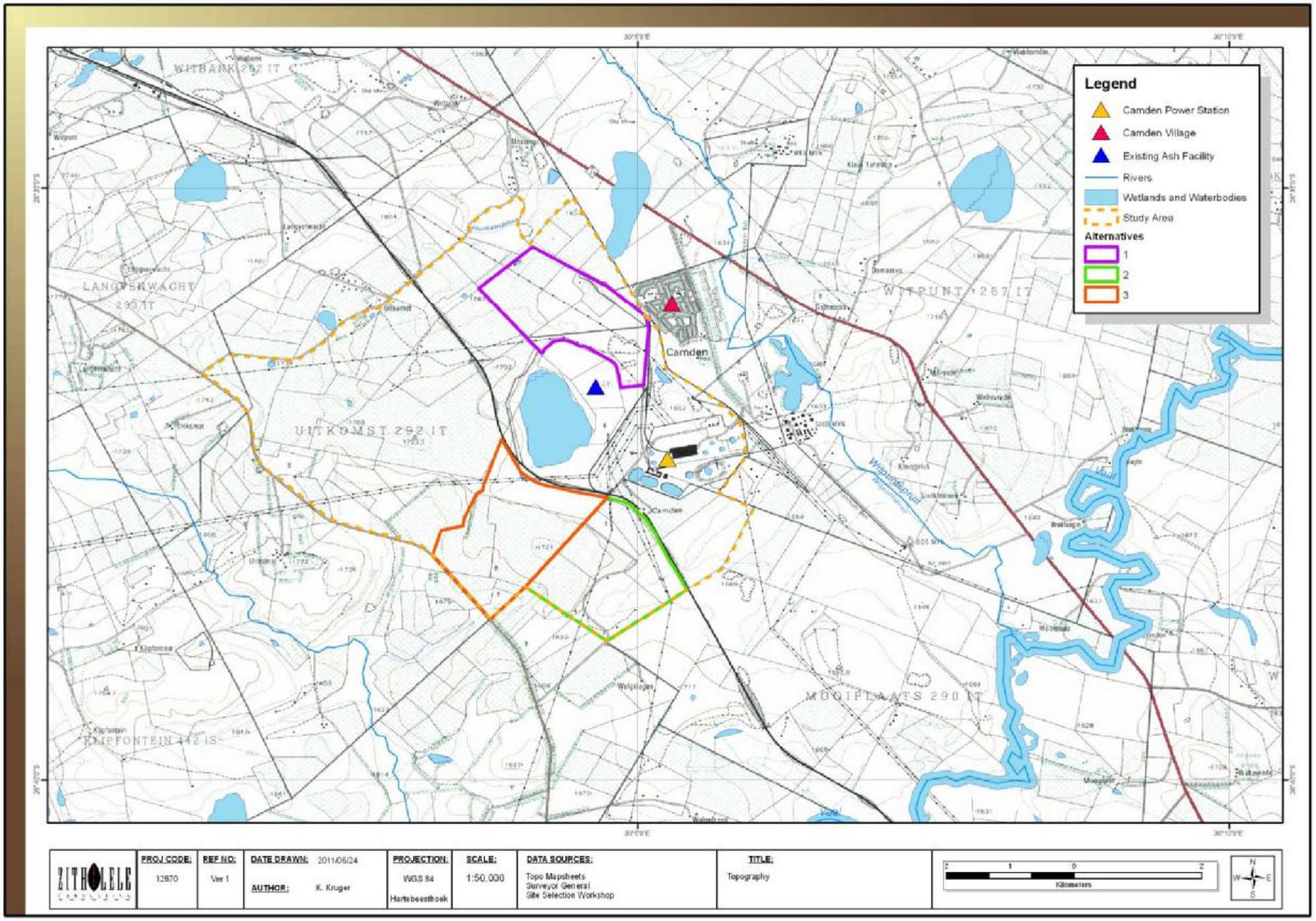

Figure 4-3: Surface water and drainage features of the area.

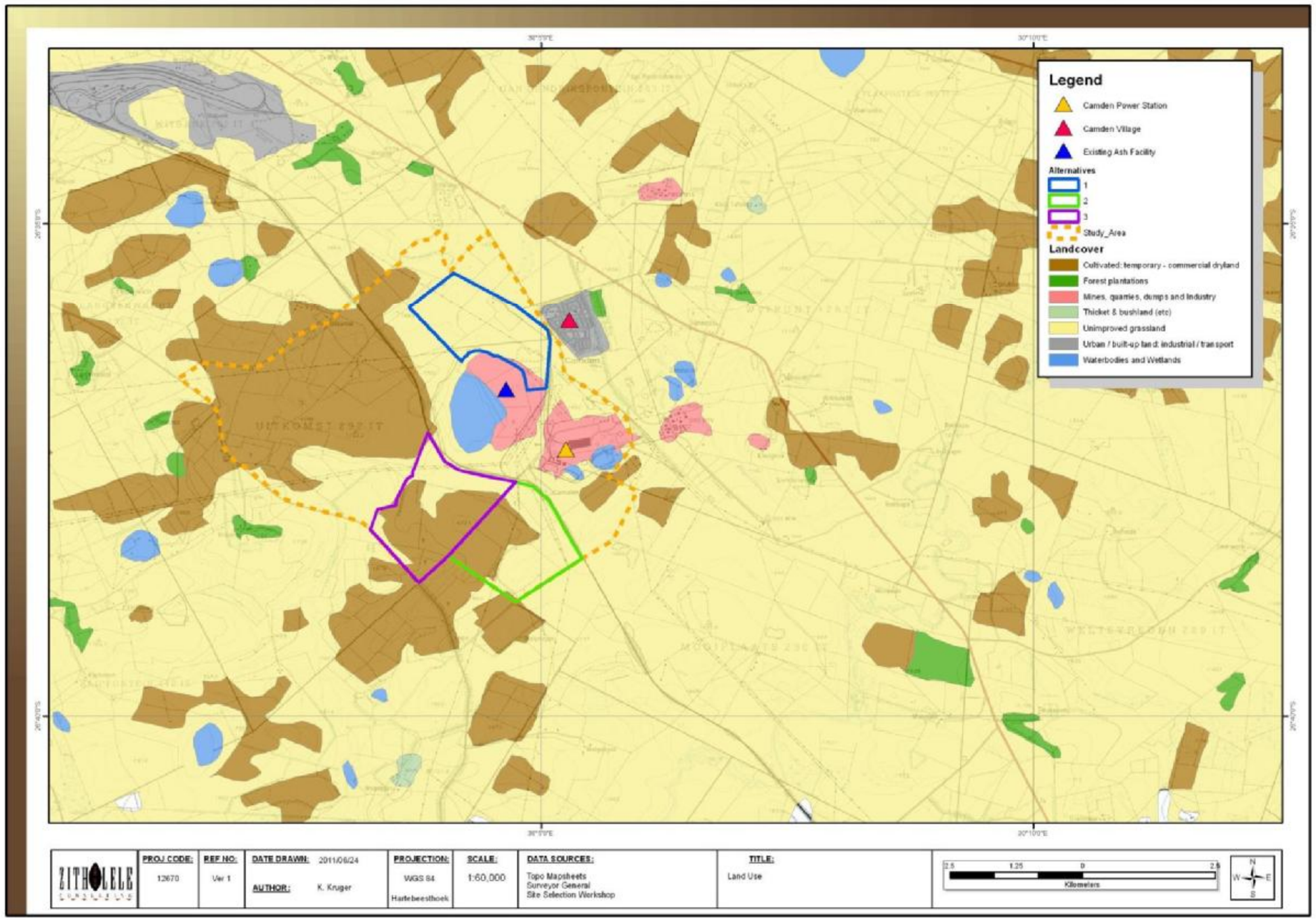

Figure 4-4: Land Use Map.

4.6 Faunal Biodiversity

4.6.1 *Data Collection*

A literature review of the faunal species that may occur in the area was conducted using the SANBI SIBIS database. C-Plan data (2007) provided by the Mpumalanga provincial department was used to conduct a desktop study of the area. This data consists of terrestrial components; ratings provide an indication as to the importance of the area with respect to biodiversity.

4.6.2 *Regional Description*

Fauna associated with the natural grasslands in the study area has been forced into decreasing areas of their original habitat due to the grasslands having been largely depleted by cultivation, grazing and some infrastructure development. Even so faunal records from the area (Precis database, June 2011) indicate that there are a potential 32 mammal, 37 amphibians, 540 birds, 116 fish, 96 reptile and 1104 invertebrate species that could occur in the area. The biodiversity rating is available for aquatic and terrestrial biodiversity as shown in Figure 4-6 and Figure 4-7.

4.6.3 *Site Description*

From the figures it can be seen that the aquatic biodiversity at sites 1 and 2 are not rated significant or sensitive. The catchment to the southwest of the watershed is rated as an irreplaceable site that should not be impacted on.

The terrestrial biodiversity information indicates that the areas around site 1, as well as portions of sites 2 and 3 are regarded as important ecological sites. This is due to the fragments of remaining grassland habitat in these areas. The areas at site 2 and 3 that are not rated important are already disturbed due to cultivation in these areas.

4.6.4 *Sensitivities*

From the databases there is no indication of known red data species that occur in the region. This will however be included in the ecological specialist assessment to ensure that no sensitive species are impacted on. The sensitive aquatic systems should also be avoided and a detailed specialist study will be undertaken to identify the potential impact to these habitats.

4.7 Floral Biodiversity

4.7.1 *Methodology and Data Sources*

The floral data below is taken from The Vegetation of South Africa, Lesotho and Swaziland (Mucina and Rutherford 2006)[1].

4.7.2 *Regional Description*

According to the South African National Biodiversity Institute (SANBI), the study area falls within the Grassland Biome, where most of the country's maize production occurs. The vegetation of the area is classified as the Mesic Highveld Grassland which includes in this region Amersfoort Highveld Clay Grassland and Eastern Highveld Grassland with pockets of Eastern Highveld Temperate Wetland and Wakkerstroom Montane Grassland as classified by Mucina and Rutherford[3].

Mesic Highveld Grassland is found mainly in the eastern, high rainfall regions of the Highveld, extending all the way to the northern escarpment. These are considered to be "sour" grasslands and are dominated by primarily *andropogonoid* grasses. The different grassland types are distinguished on the basis of geology, elevation, topography and rainfall. Shrublands are found on outcrops of rock within the bioregion, where the surface topography creates habitat in which woody vegetation is favoured above grasses. Refer to Figure 4-8 for an illustration of the vegetation types found on site.

4.7.3 *Site Description*

All three site alternatives are located in the Eastern Highveld Grassland vegetation type. The Eastern Highveld Grassland occurs in the Mpumalanga and the Gauteng provinces on the plains between Belfast in the east and the eastern side of Johannesburg in the west extending southwards to Bethal, Ermelo and west of Piet Retief. The landscape is slightly to moderately undulating plains, including some low hills and pan depressions. The vegetation is short dense grassland dominated by the usual Highveld grass composition (*Aristida, Digitaria, Eragrostis, Themeda, Tristachya, etc*.) with small scattered rocky outcrops with wiry, sour grasses and some woody species (*Arcacia caffra, Celtis Africana, Diospyros luciodes subspecies lycioides, Parinari capensis, Protea caffra, P. Welwitschii and Rhus magalismontanum*).

Figure 4-5: Eastern Highveld Grassland found to the south of Camden Power Station.

[3] The Vegetation of South Africa, Lesotho and Swaziland, Mucina and Rutherford 2006.

In addition to the grassland vegetation type, the Eastern Freshwater Temperate Wetlands vegetation type is also found in several places near the site alternatives. This vegetation unit is found throughout the Northern Cape, Eastern Cape, Free State, North-West, Gauteng, Mpumalanga and KwaZulu-Natal Provinces as well as in neighbouring Lesotho and Swaziland. It is based around water bodies with stagnant water (lakes, pans, periodically flooded vleis, and edges of calmly flowing rivers) and embedded within the Grassland Biome. These water bodies support zoned systems of aquatic and hygrophillous vegetation of temporary flooded grasslands and ephemeral herblands.

Due to the recent efforts of organisations such as Ramsar, this vegetation unit is now 4.6 % conserved and rated as least threatened. The following alien species are encountered in this type of wetland: *Bidens bidentata, Cirsium vulgare, Conyza bonariensis, Oenothera rosea, Physalis viscosa, Plantago lanceolata, Rumex crispus, Sesbania punicea, Schkuhria pinnata, Stenotaphrum secundatum* (native on South African coast, alien on Highveld*), Trifolium pratense, Verbena bonariensis, V. brasiliensis, and Xanthium strumarium*.

Areas around drainage lines/seepage areas were also added to this unit because of the similar vegetation that may occur in these areas. Seepage areas are seasonally wet areas that occur in sandy areas where water seeps into lowlying drainage lines after rains. These areas are usually covered by hygrophytes such as sedges and reeds. The dominant sedge in the study area is *Juncus rigidus*. Sometimes bulrush (*Typha capensis*) and reeds (*Phragmites australis*) also occurs.

Wetlands are of a more permanent nature and occur in low-lying areas such as tributaries of streams and rivers. Here hydrophytes can be found. Typical plants are the Orange River Lily (*Crinum bulbispermum*), bulrush (*Typha capensis*) and reeds (*Phragmites australis*), sedges of the *Cyperus, Fuirena and Scirpus* genera also occur. The site had many drainage and seepage lines running into large streams and into dams. Many of the site drainage and seepage lines had associated wetland and riparian flora. This made these areas to have a high species diversity in terms of both plants and animals and makes them have a high conservation level.

4.7.4 *Sensitivities*

The Eastern Highveld Grassland is considered endangered with a conservation target of 24%. Only a very small fraction is conserved in statutory reserves (Nooitgedacht dam and Jericho dam Nature Reserves) and in private reserves (Holkranse, Kransbank, Morgenstond). Approximately 44% is transformed primarily by cultivation, plantations, mines, urbanisation and by the building of dams. Cultivation may have had a more extensive impact, indicated by land-cover data. No serious alien invasions are reported, but *Acacia mearnsii* can become dominant in disturbed areas.

In addition to the grassland the wetlands are also only 5% conserved with some 15% transformed through the same impacts mentioned above.

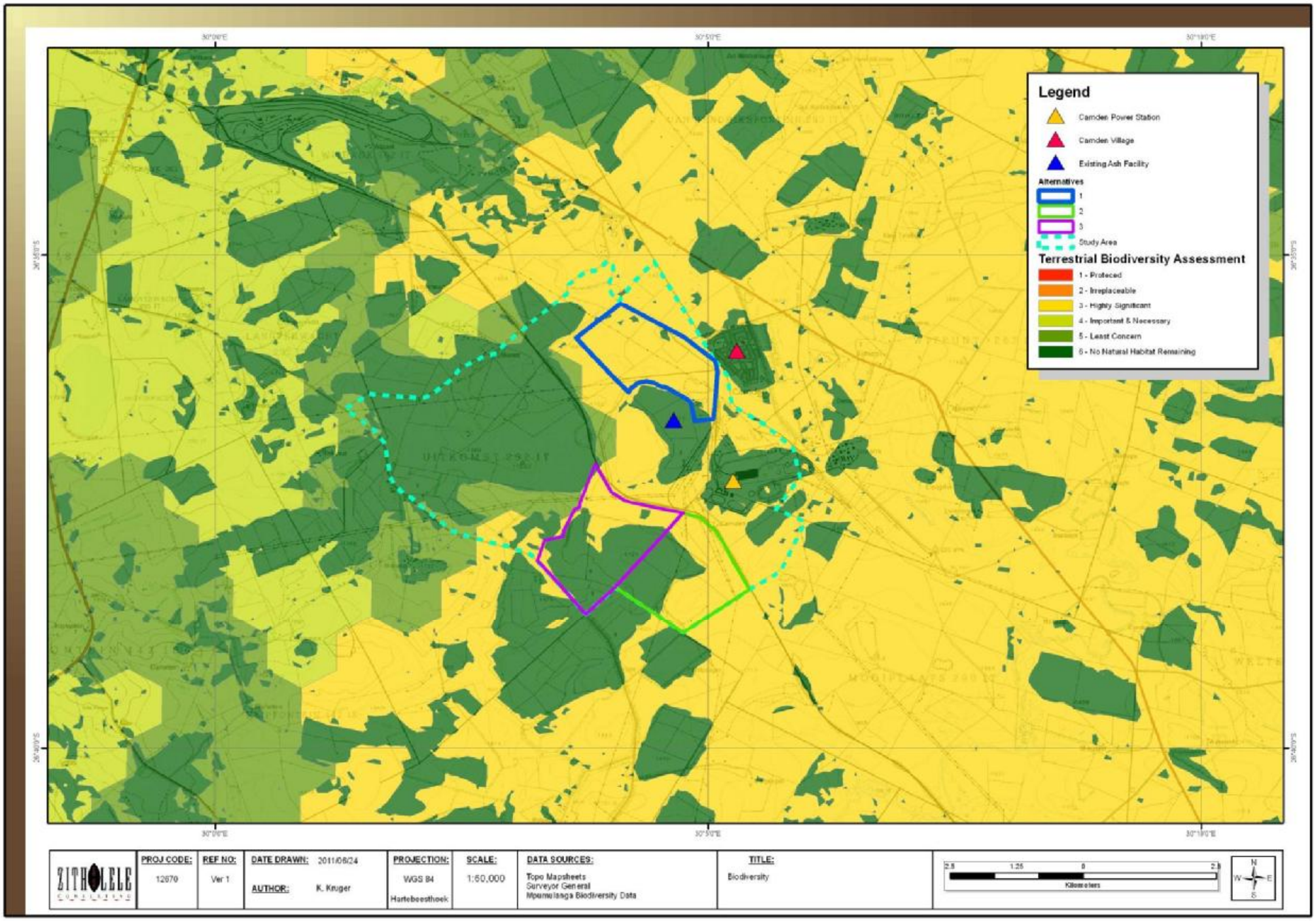

Figure 4-6: Terrestrial biodiversity of the area.

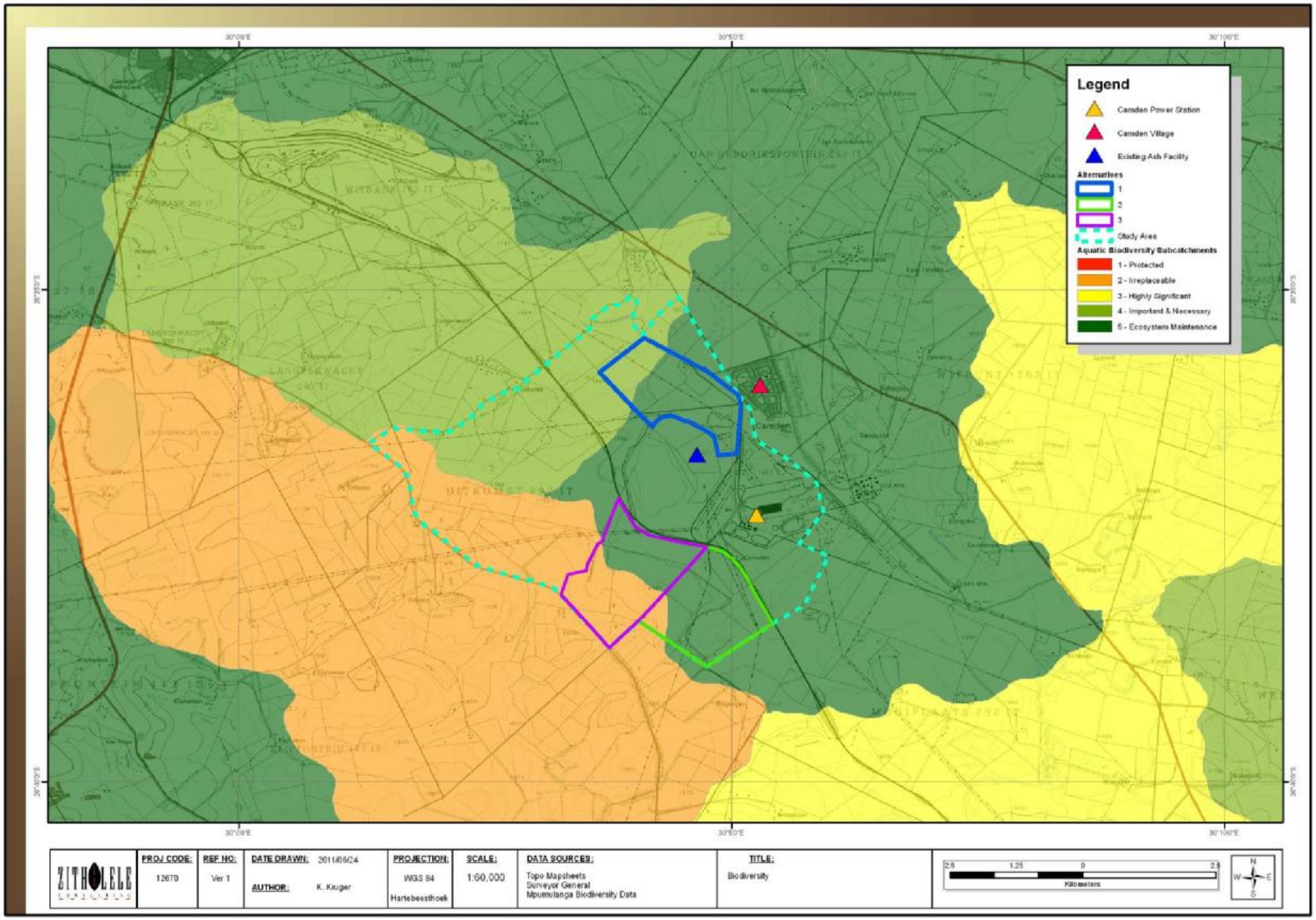

Figure 4-7: Aquatic biodiversity of the area.

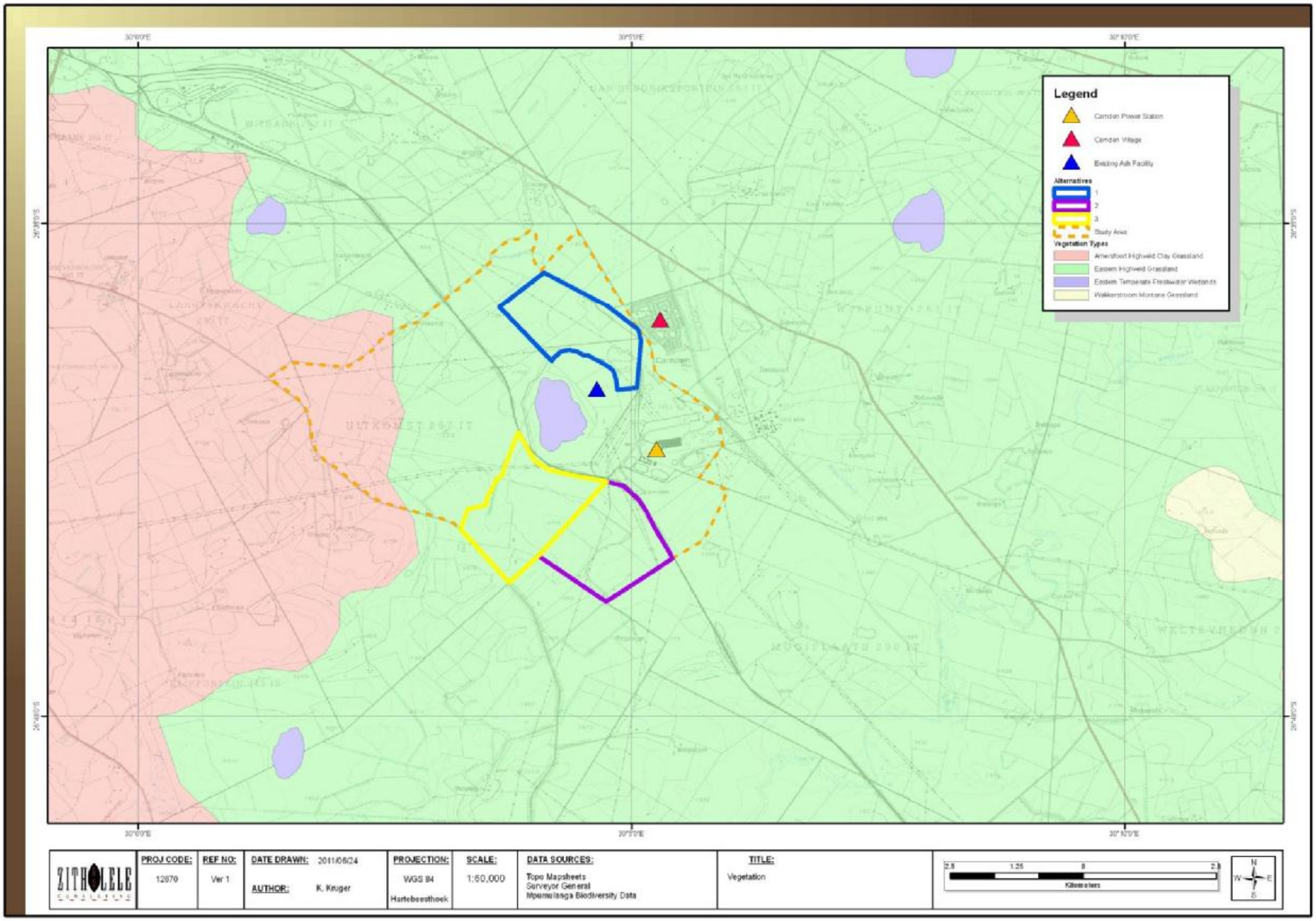

Figure 4-8: Vegetation of the area.

4.8 Infrastructure

4.8.1 *Methodology and Data Sources*

Infrastructure was identified using the 1:50 000 topocadastral maps of the area, and information provided by Eskom regarding existing services. A site visit to the area was undertaken to verify this information.

4.8.2 *Regional Description*

Access to the proposed project area is via the N2 National Highway to the north of the study site. The primary infrastructure within a radius of 20 km from the study area is:

- Camden Power Station;
- The N2 National highway between Ermelo and Piet Retief;
- The N11 National highway between Ermelo and Volksrust;
- The Camden tar road linking Camden with the N2;
- The national railway line to Richards Bay;
- The existing pipelines and conveyor belts between the Camden Power Station and the coal mines and between Camden Power Station and the Camden ash dams;
- Numerous 132 and 400 kV power lines traversing the area;
- Several dirt farm roads;
- Camden township; and
- The various coal mines.

4.8.3 *Sensitivities*

All the services linking the power station, the coal mines and the existing power grid are seen as sensitive features that should be avoided inter alia all conveyors, power lines, substations, roads and the railways. There is a potential that the location of the proposed ash disposal site could require the relocation of services such as powerlines. This will be assessed in more detail during the EIA phase and the relocation of such services will be included in the Environmental Impact Report (EIR).

4.9 Cultural, historical and paleontological resources

There is no information available on heritage or paleontological resources present within the proposed project area; however the occurrence of cultural and historical resources will be investigated during the EIA phase.

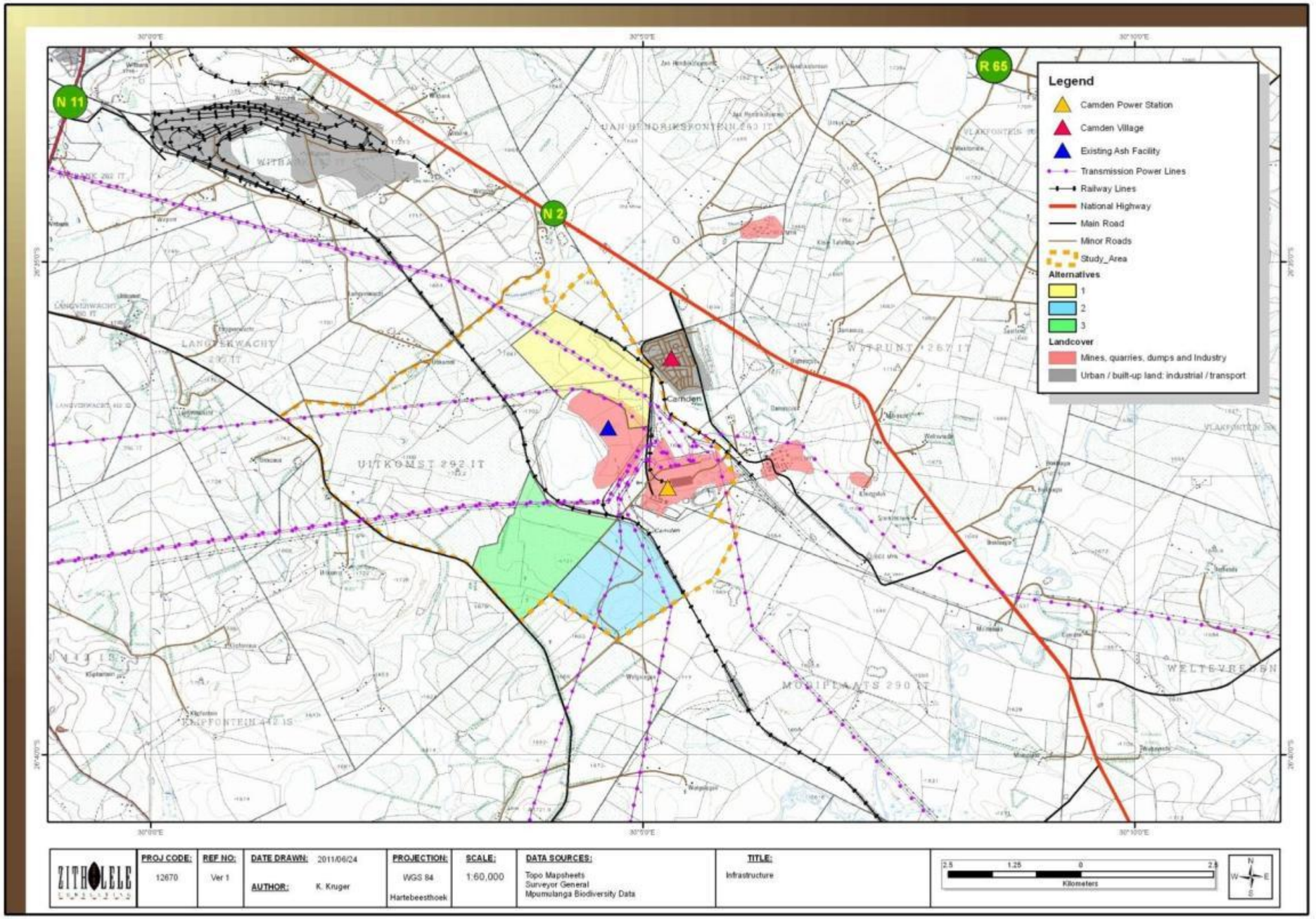

Figure 4-9: Infrastructure in the area

5 SCOPING PROCESS

5.1 Overall EIA Project Schedule

The primary milestones for the Camden Power Station ash disposal site EIA are described in Table 5-1 below.

Table 5-1: Primary EIA milestones of the Camden Ash Disposal Site.

MILESTONES	DATE
Final Scoping Report	September 2011
Undertake Specialist Studies	September - December 2011
Draft EIR and EMP	January - February 2012
Stakeholder Engagement on EIR / EMP	March - April 2012
Finalise EIR and EMP	April 2012
Submission to Relevant Authorities	June 2012
Environmental Authorisation	September / October 2012
Appeal Period	To be confirmed after the Environmental Authorisation
Construction (including EMP Auditing)	To be confirmed after the Environmental Authorisation

5.2 Technical (EIA) Process

For the Scoping Phase of this EIA, the following technical process is being followed:

5.2.1 *Consultation with client*

On notification and receipt of the appointment letter from Eskom, a project inception meeting was held on 13th April 2011 between Eskom and the Zitholele Consulting Project Team. During this project kick-off meeting the following was discussed:

- Project Scope and Requirements;
- Project Schedule;
- Identification of key stakeholders and role players; and
- Analysis of the preliminary ash disposal sites.

5.2.2 *Consultation with authorities, application forms and notification to landowners*

The DEA Integrated EIA and WML application form (**Appendix b**) for the proposed project was submitted to the DEA on 19th May 2011. Copies of the application form and notification of this application form were forwarded to the MDEDET as a commenting authority. As a point of departure, the I&AP database available from the Camden Power Station was used

for initial project notification and groundtruthed by the Zitholele team to identify additional I&APs on the 16th May 2011.

5.2.3 *Site Visit*

A site visit was conducted on the 16th of May 2011 with the objective of familiarising the project team with the area, undertaking the site selection and to distribute BID's to landowners.

5.2.4 *Draft Scoping Report and Plan of Study for EIA*

The Draft Scoping Report (SR) has been prepared with information and issues identified during the Scoping Phase activities. The Plan of Study (PoS) for EIA and the Terms of Reference (ToR) for the envisaged specialist studies are included in Chapter 8 of the report. The Draft SR and PoS for EIA will be updated based on comments from key commenting authorities, public review and comments obtained from I&APs. These issues will be captured in an Issues and Response Report (IRR).

5.2.5 *Final Scoping Report and PoS EIA*

The Draft Scoping Report (DSR) and PoS for EIA will be finalised (into a Final Scoping Report) once stakeholders were afforded an opportunity to comment on the Draft Scoping Report. These comments will be included into the Final Scoping Report (this report), the report will be finalised and submitted to the authorities for decision-making.

5.3 Public Participation Process (PPP)

Public participation is an essential and legislative requirement for environmental authorisation. The principles that demand communication with society at large are best embodied in the principles of the NEMA. In addition, Section 24 (5), Regulation 54-57 of GNR 543 under the NEMA, guides the public participation process that is required for an Environmental Impact Assessment (EIA) process.

The public participation process for the proposed Camden ash disposal facility has been designed to satisfy the requirements laid down in the above legislation and guidelines.

Figure 5-1 provides an overview of the EIA technical and public participation processes, and shows how issues and concerns raised by the public are used to inform the technical investigations of the EIA at various milestones during the process. This section of the report highlights the key elements of the public participation process to date.

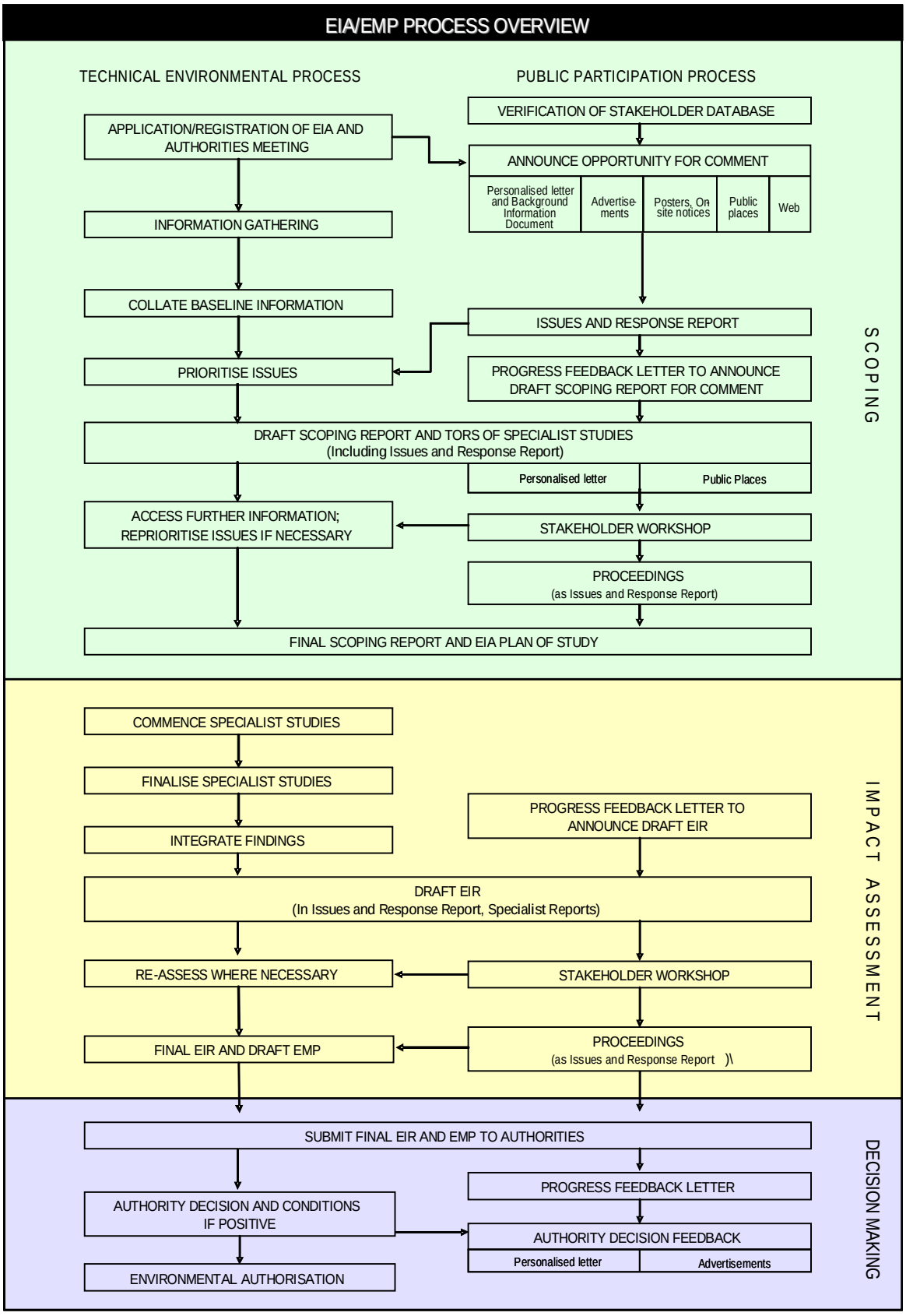

Figure 5-1: Technical and public participation process and activities for this project.

5.3.1 *Objectives of public participation in an EIA*

The objectives of public participation in an EIA are to provide access to sufficient information to I&APs in an objective manner so as to:

- During Scoping:
    - Assist I&APs to identify issues of concern, and providing suggestions for enhanced benefits and alternatives.
    - Contribute their local knowledge and experience.
    - Verify that their issues have been considered and to help define the scope of the technical studies to be undertaken during the Impact Assessment.
- During Impact Assessment:
    - Verify that their issues have been considered either by the EIA Specialist Studies, or elsewhere.
    - Comment on the findings of the EIA, including the measures that have been proposed to enhance positive impacts and reduce or avoid negative ones.

The key objective of public participation is to ensure transparency throughout the process and to promote informed decision making.

5.3.2 *Identification of Interested and Affected Parties (I&APs)*

The identification of stakeholders is on-going and is refined throughout the process. As the "on-the-ground" understanding of affected stakeholders improves through interaction with various stakeholders in the area the database is updated. The identification of key stakeholders and community representatives (land owners and occupiers) for this project is important as their contributions are valued. The identification of key stakeholders and was done in collaboration with Eskom (through the I&AP database for the EIAs in the area), the local municipalities and other organisations in the study area.

The stakeholders' details are captured in an electronic database management software programme that automatically categorises every mailing to stakeholders, thus providing an on-going record of communications - an important requirement by the authorities for public participation. In addition, comments and contributions received from stakeholders are recorded, linking each comment to the name of the person who made it.

According to the NEMA EIA Regulations, a register of I&APs (Regulation 55 of GNR 543) must be kept by the public participation practitioner. Such a register has been compiled and is being kept updated with the details of involved I&APs throughout the process (See Appendix D).

5.3.3 *Announcement of opportunity to become involved*

The opportunity to participate in the EIA was announced on the 16th May 2011 as follows:

- Distribution of a letter of notification to the neighbours of Camden Power Station, a letter of invitation to stakeholders to become involved was distributed, which was addressed to individuals and organisations, accompanied by a Background Information Document (BID) containing details of the proposed project, including a map of the project area, and a registration sheet (Appendix F and Figure 5-2).

Figure 5-2: BID documents placed on site

- Advertisements were placed in the following newspapers (Appendix C)

Table 5-2: Advertisements placed during the announcement phase

NEWSPAPER	DATE
Ekasi News	20 May 2011
Highvelder	19 May 2011
Highveld Tribune	24 May 2011
Beeld	23 May 2011
Citizen	20 May 2011

- Site notice boards were positioned at prominent localities during May 2011 on all roads around the Camden Power Station. These notice boards were placed at conspicuous places and at various public places (Figure 5-3).

Figure 5-3: Site notice boards were put up in the study area.

5.3.4 *Obtaining comment and contributions*

The following opportunities are available during the Scoping Phase for contribution from the I&APs:

- Completing and returning the registration/comment sheets on which space was provided for comment.
- Providing comments telephonically or by email to the public participation office.
- Attending stakeholder meetings that has been widely advertised (see table below) and raise comments there.

Issues relevant to the current project configuration have been considered and will be carried forward into the Impact Assessment phase.

Table 5-3: A Stakeholder meeting has been advertised and will be held as part of the public review period of the Draft Scoping Report

DATE	TIME	AREA	VENUE AND ADDRESS
27 July 2011	16:00	ERMELO	Indawo Lodge

The minutes of the public meeting will be attached to the Final Scoping Report in the form of an Issues and Responses Report.

5.3.5 *Issues and Response Report and acknowledgements*

The issues raised in the announcement phase of the project were captured in an Issues and Responses Report (IRR) Version 1 and appended to this DSR (Appendix E). The report will then be updated to include additional I&AP contributions that may be received as the Scoping Phase process proceeds, and as the findings of the EIA become available. The issues and comments raised during the public review period of the Draft Scoping Report will be added to the report as Version 2 of the IRR.

5.3.6 *Draft Scoping Report*

The purpose of the public participation process in the DSR is to enable I&APs to verify that their contributions have been captured, understood and correctly interpreted, and to raise further issues. At the end of the Scoping Phase, the issues identified by the I&APs and by the environmental technical specialists, will be used to define the Terms of Reference for the Specialist Studies that will be conducted during the Impact Assessment Phase of the EIA. A period of four weeks is available for public review of the DSR.

In addition to media advertisements and site notices that announced the opportunity to participate in the EIA, the opportunity for public review was announced as follows:

- In the Background Information Document (May 2011).

- In advertisements published (see Table 5-4 below and Appendix C) to announce the review of the Draft SR and inviting stakeholders to attend a stakeholder meeting.
- In a letter sent out in May 2011, and addressed personally to all individuals and organisations on the stakeholder database.

Table 5-4: A stakeholder meeting was advertised and was held as part of the public review period of the Draft Scoping Report

NEWSPAPER	DATE
Ekasi News	15 July 2011
Highvelder	21 July 2011
Highveld Tribune	19 July 2011
Beeld	14 July 2011
Citizen	14 July 2011

The Draft SR, including the Issues and Response Report Version 1, is being distributed for comment as follows:

- Left in public venues within the vicinity of the project area (these are listed in Table 5-5 below);
- Published on the Eskom and Zitholele websites;
- Mailed to stakeholders;
- Mailed to I&APs who requested the report; and
- Copies have been made available at the stakeholder meeting.

I&APs could comment on the report in various ways, such as completing the comment sheet accompanying the report, and submitting individual comments in writing or by email.

Table 5-5: List of public places where the Draft Scoping Report was available

PLACE	CONTACT PERSON	TELEPHONE	ADDRESS
Ermelo Public Library	Mr Stanley Dondolo	(017) 801-3621	Cnr Church and Taute Street, Civic Centre, ERMELO
Visitor Centre, Camden Power Station	Ms Thandiwe Mzoy	017 827 8000	Camden Power Station

5.3.7 *Final Scoping Report*

The Final Scoping Report was updated with additional issues raised by I&APs and may contain new information. The FSR will be distributed to the Authorities (DEA) and I&APs, and to those individuals who specifically request a copy. I&APs will be notified of the availability of the report for their review.

In the Impact Assessment Phase of the EIA, Specialist Studies will be conducted to assess the potential positive and negative impacts of the proposed project, and to recommend appropriate measures to enhance positive impacts and avoid or reduce negative ones. I&APs will be kept informed of progress with these studies.

5.3.8 *Public participation during the Impact Assessment*

Public participation during the Impact Assessment Phase of the EIA will mainly involve a review of the findings of the EIA, presented in a Draft Environmental Impact Report (EIR), the Draft Environmental Management Program (EMProg) and the volumes of Specialist Studies.

I&APs will be advised in good time of the availability of these reports, how to access them, and the dates and venues of public and other meetings where the contents of the reports will be presented for comment.

6 ISSUES IDENTIFIED FOR IMPACT ASSESSMENT

The proposed Camden ash disposal facility is anticipated to impact on a range of biophysical and socio-economic aspects of the environment. The main purpose of the EIA process is to evaluate the significance of these potential impacts and to determine how they can be minimized or mitigated.

It should be noted that a comprehensive Environmental Management Programme (EMP) will be developed and implemented to regulate and minimize the impacts during the construction and operational phases. Furthermore an Operational Management Plan/Manual (OMP) will be compiled to manage the operations of the ash disposal facility. The potential environmental impacts identified during the Scoping Phase, which will be investigated further in the EIA phase of the project are summarised in Table 6-1 below.

Table 6-1: Potential Environmental Impacts to be investigated in the EIA Phase.

Environmental Element	Potential Impact
Climate and Air Quality	Mobilisation of dust from construction vehicles. Wind-blown ash dust to adjacent properties during operation.
Geology	Subsidence from weight of ash facility
Topography	Visual impact from visibility of the facility Change in topographic landscape
Surface and Ground Water	Altering of drainage patterns Potential pollution (hydrocarbons, dust, ash, leachate) of water resources from construction and operations Depending on the hazardous rating of the ash – pollutants could have a human/animal health impact if groundwater is contaminated The change to a proper designed facility can reduce the existing impact on water resources from the unlined existing site.
Land Use	The change in land use could negatively affect property value
Biodiversity (Terrestrial and Aquatic Fauna and Flora)	Loss of habitat / vegetative cover Displacement of species Propagation of alien invasive species Health implications due to pollution/ash deposition Impact on sensitive species/habitats
Soils and Land Capability	Compaction, pollution, erosion or sterilisation of soil resources Reduction in land capability
Heritage and Paleontological Resources	Destruction of sensitive features/fossils
Infrastructure and traffic	Relocation of existing services (e.g. powerlines) resulting in additional impacts to all the above mentioned environments Interruption of existing services / infrastructure The interruption of traffic flows
Social	Impacts to human health, jobs or perceptions Ensuring the ongoing operation of Camden Power Station prevents the loss of jobs
Economic	Ensuring continual power production from Camden Power Station minimising power cuts and economic losses

7 PLAN OF STUDY FOR EIA

7.1 Technical Process

7.1.1 *Specialist Studies*

Based on the baseline data, the issues raised by stakeholders and the sensitivities identified the following specialist studies will be conducted in the EIA phase:

- Ash Classification
- Ash Site Conceptual Design and compilation of an Operational Manual;
- Heritage and Paleontological Assessment;
- Soils and Land Capability Assessment;
- Surface and Groundwater Assessment;
- Wetland Delineation;
- Traffic Impact Opinion;
- Air Quality Assessment;
- Noise Impact Assessment;
- Geotechnical Investigations (Phase 1);
- Topographical Survey;
- Terrestrial Ecology (Fauna and Flora);
- GIS; and
- Visual Assessment.

The findings of these studies will be reflected in the EIA Report. The proposed Terms of Reference (ToR) for each of these specialist investigations is indicated below.

ToR: Ash Classification

The objectives of this study will be:

- Classify the site according to the Minimum Requirements 2nd Ed (DWAF) and the recent draft waste regulations from DEA;
- Determine if the ash from the site is classified as Hazardous or General Waste;

ToR: Ash Disposal Site Design and Operating Manual

A specialist disposal facilities design engineer has been appointed to complete the conceptual design of the ash disposal site, included in this scope is:

- Site visit of the project area;
- Oversee the Topographical Survey of the site;
- Generate conceptual layout alternative drawings for each of the 3 site alternatives;
- Compile design drawings for the preferred ash disposal alternative for the 20 year life of the site in line with the Minimum Requirements for Waste Disposal and to the requirements of the DWEA;
- Submit drawings to DEA and DWA for review and make any alternations required;
- Include any mitigation measures prescribed by specialist into the design for example storm water drainage; and
- Review and amend current site operating manual to be relevant for the new site.

ToR: Topographic Survey

A specialist surveyor will be required to undertake a topographic survey, included in this scope is:

- Survey of the site at 0.5m contours;
- Identify all features and structures on site; and
- Submit the information in an electronic CAD format.

ToR: Heritage and Archaeological

A Heritage Impact Assessment will be conducted to comply with Section 38 of the National heritage Resources Act (No 25 of 1999). Specific objectives of this study will be:

- Desktop study (consulting heritage data banks and appropriate literature);
- Site visit of the project area;
- Determine whether any of the types and ranges of heritage resources as outlined in Section 3 of the Act (No 25 of 1999) do occur in the project area;
- Determine what the nature, the extent and the significance of these remains are;
- Determine whether any heritage resources (including graves) will be affected by the development project;

- If any heritage resources are to be affected by the development project mitigation measures has to be undertaken and management proposals have to be set for heritage resources which may continue to exist unaffected in or near the project area.
- Compile a report which would:
    - Clearly identify possible archaeological, cultural and historical sites within the study area;
    - Identify the potential impacts of construction and operation of the proposed development on such resources, with and without mitigation;
    - Offer an opinion on a preferred site in terms of this specialist field;
    - Provide mitigation measures to ameliorate any negative impacts on areas of heritage significance; and
    - Include a map illustrating the salient aspects of the report

ToR: Soils and Land Capability/Agricultural Potential

The objectives of this study will be:

- Review existing information available from land type maps, previous reports and GIS information;
- An aerial photographic study to assess the accessibility, vegetation cover, drainage lines, slope aspects and percentage outcrop of each of the three sites;
- A field visit to verify the aerial photographic study observations. Additionally, during the visit, the depth and properties of regolith will be judged from natural exposure (dongas) and hand augering where applicable;
- A map will be compiled of each of the alternative sites, indicating the features observed;
- Assess the potential impacts and their significance on the agricultural potential of each alternative;
- Propose mitigation measures to reduce or mitigate potential impacts;
- Compile a report detailing the findings of the assessment; and
- Recommend a preferred site among the studied sites.

ToR: Wetland delineation

The objectives of this study will be:

- Review existing information available for the area;
- Delineate wetlands according to the practical field guide document from DWA, 2005;

- Assess the status of each of the wetlands identified and assess the potential impacts on the wetlands;
- Compilation of a wetland delineation report that is sufficient to address the requirements of a water and waste license applications, the EIR and management practices including mitigation measures; and
- Recommend preferred site among the studied sites;

ToR: Groundwater

The objectives of this study will be:

- Review of all existing groundwater information available from the power station and formulate a baseline status;
- Compilation of a groundwater impact report that is sufficient to address the requirements of a water and waste license application, the EIR and management practices including:
    - Groundwater flow regimes and the depth of the water table
    - Hydrocensus
    - Aquifer parameters, classification and vulnerability
    - Possible groundwater contamination or flooding
    - Risks of pollution
- Review current groundwater monitoring regime and make recommendations on any amendments required;
- Suggest mitigation measures to prevent any impacts to the groundwater;
- Highlight the current trends in the groundwater regime that could influence the design of the new ash disposal site; and
- Recommend the least sensitive site among the three.

ToR: Traffic Impact Opinion

An opinion will be obtained from a specialist with regards to the impact of the construction and operation of the site on the surrounding traffic movements including:

- Assess the baseline traffic condition prevailing on site;
- Assess the potential impact of the development on the surrounding traffic environment; and
- Compilation of a specialist report highlighting potential impacts, mitigation measures and the preferred alternative.

ToR: Air Quality Assessment

The objectives of this study will be:

- Description of the regional climate and site-specific atmospheric conditions impacting on the dispersion potential of the ash disposal site;
- Overview of the legislation and regulatory context as it pertains to the regulation of atmospheric emissions and air pollutant concentrations;
- Analysis of the baseline air quality, based on any available observational data which may be of relevance to the study site;
- Review types of emissions from ash disposal sites (construction and operational);
- Identification of potentially sensitive receptors in the vicinity of the proposed extension susceptible to air quality impacts (health and odour impacts);
- Provide mitigation measures to prevent and/or mitigate any environmental impacts that may occur due to the proposed project;
- Compile an air quality report in which alternatives are prioritised based on the findings of the study.

ToR: Noise Impact Assessment- Professional Opinion

The objectives of this study will be:

- To assess the impact of the construction and operation of a ash disposal site on the existing ambient noise climate of the area;
- Opinion on the expected response from the community and all other receptors (e.g. livestock) to the noise impact, i.e. the change in ambient noise of the area taking into account sociological factors as well as the noise climate based on the relevant SANS document.
- Measure / monitor the noise from existing operations;
- Provide mitigation measures to prevent and/or mitigate any environmental impacts that may occur due to the proposed project;
- A noise impact opinion report in which alternatives are prioritised based on the findings of the study
- Recommend preferred site among the three sites studied.

ToR: Geotechnical Investigations

The objectives of this study will be:

- Review of existing and available geological and geotechnical information;
- A site visit to verify available aerial photographs and to investigate the depth and properties of regolith by excavations and soil sampling;
- A map will be compiled indicating features observed;
- Identify and assess significance of potential geotechnical constraints to the proposed development;
- Propose mitigation measures that could reduce or eliminate the identified constraints; and
- A short report will be compiled based on the findings of the study.

ToR: Terrestrial Ecology

An ecological investigation will be conducted on the Camden ash disposal site. This will be split into terrestrial, aquatic and avifauna. The objectives of these studies will be:

- Review existing ecological information available;
- Conduct a site visit to determine the general ecological state of the proposed site, determine the occurrence of any red data and/or vulnerable species;
- Provide a ranking assessment of the suitability of the proposed sites;
- Provide mitigation measures to prevent and/or mitigate any environmental impacts that may occur due to the proposed project;
- Compile an ecological report, indicating findings, preferred site recommendations and maps indicating sensitive and/or no-go areas.

ToR: Visual Assessment

The objectives of this study will be:

- Desktop study (consulting existing and appropriate literature);
- Site visit of the project area if required;
- Assess the visual impact of the proposed development by evaluating the visibility from static and dynamic observers, the impacts on the sense of place and the viewshed of the proposed development;
- Provide a ranking assessment of the suitability of the proposed development; and

- Suggest any recommendation / mitigation measures that can be done to decrease the impacts of the proposed development;
- Compile a visual assessment report, indicating preferred site findings, fatal flaws, recommendations and maps indicating sensitive and/or no-go areas.

7.1.2 *Impact Assessment Methodology*

The impacts will be ranked according to the methodology described below. Where possible, mitigation measures will be provided to manage impacts. In order to ensure uniformity, a standard impact assessment methodology was utilised so that a wide range of impacts can be compared with each other. The impact assessment methodology makes provision for the assessment of impacts against the following criteria:

- Significance;
- Spatial scale;
- Temporal scale;
- Probability; and
- Degree of certainty.

A combined quantitative and qualitative methodology was used to describe impacts for each of the aforementioned assessment criteria. A summary of each of the qualitative descriptors along with the equivalent quantitative rating scale for each of the aforementioned criteria is given in Table 7-1.

Table 7-1: Quantitative rating and equivalent descriptors for the impact assessment criteria

Rating	Significance	Extent Scale	Temporal Scale
1	VERY LOW	*Isolated sites / proposed site*	Incidental
2	LOW	*Study area*	Short-term
3	MODERATE	*Local*	Medium-term
4	HIGH	*Regional / Provincial*	Long-term
5	VERY HIGH	*Global / National*	Permanent

A more detailed description of each of the assessment criteria is given in the following sections.

Significance Assessment

Significance rating (importance) of the associated impacts embraces the notion of extent and magnitude, but does not always clearly define these since their importance in the rating scale is very relative. For example, the magnitude (i.e. the size) of area affected by atmospheric pollution may be extremely large (1 000 km^2) but the significance of this effect

is dependent on the concentration or level of pollution. If the concentration is great, the significance of the impact would be HIGH or VERY HIGH, but if it is diluted it would be VERY LOW or LOW. Similarly, if 60 ha of a grassland type are destroyed the impact would be VERY HIGH if only 100 ha of that grassland type were known. The impact would be VERY LOW if the grassland type was common. A more detailed description of the impact significance rating scale is given in Table 7-2 below.

Table 7-2 : Description of the significance rating scale

Rating		Description
5	Very high	Of the highest order possible within the bounds of impacts which could occur. In the case of adverse impacts: there is no possible mitigation and/or remedial activity which could offset the impact. In the case of beneficial impacts, there is no real alternative to achieving this benefit.
4	High	Impact is of substantial order within the bounds of impacts, which could occur. In the case of adverse impacts: mitigation and/or remedial activity is feasible but difficult, expensive, time-consuming or some combination of these. In the case of beneficial impacts, other means of achieving this benefit are feasible but they are more difficult, expensive, time-consuming or some combination of these.
3	Moderate	Impact is real but not substantial in relation to other impacts, which might take effect within the bounds of those which could occur. In the case of adverse impacts: mitigation and/or remedial activity are both feasible and fairly easily possible. In the case of beneficial impacts: other means of achieving this benefit are about equal in time, cost, effort, etc.
2	Low	Impact is of a low order and therefore likely to have little real effect. In the case of adverse impacts: mitigation and/or remedial activity is either easily achieved or little will be required, or both. In the case of beneficial impacts, alternative means for achieving this benefit are likely to be easier, cheaper, more effective, less time consuming, or some combination of these.
1	Very low	Impact is negligible within the bounds of impacts which could occur. In the case of adverse impacts, almost no mitigation and/or remedial activity are needed, and any minor steps which might be needed are easy, cheap, and simple. In the case of beneficial impacts, alternative means are almost all likely to be better, in one or a number of ways, than this means of achieving the benefit. Three additional categories must also be used where relevant. They are in addition to the category represented on the scale, and if used, will replace the scale.
0	No impact	There is no impact at all - not even a very low impact on a party or system.

Spatial Scale

The spatial scale refers to the extent of the impact i.e. will the impact be felt at the local, regional, or global scale. The spatial assessment scale is described in more detail in Table 7-3.

Table 7-3 : Description of the significance rating scale

Rating		Description
5	Global/National	The maximum extent of any impact.
4	Regional/Provincial	The spatial scale is moderate within the bounds of impacts possible, and will be felt at a regional scale (District Municipality to Provincial Level).
3	Local	The impact will affect an area up to 10 km from the proposed site.
2	Study Area	The impact will affect an area not exceeding the Eskom property.
1	Isolated Sites / proposed site	The impact will affect an area no bigger than the ash disposal site.

Duration Scale

In order to accurately describe the impact it is necessary to understand the duration and persistence of an impact in the environment. The temporal scale is rated according to criteria set out in Table 7-4.

Table 7-4: Description of the temporal rating scale

Rating		Description
1	Incidental	The impact will be limited to isolated incidences that are expected to occur very sporadically.
2	Short-term	The environmental impact identified will operate for the duration of the construction phase or a period of less than 5 years, whichever is the greater.
3	Medium term	The environmental impact identified will operate for the duration of life of facility.
4	Long term	The environmental impact identified will operate beyond the life of operation.
5	Permanent	The environmental impact will be permanent.

Degree of Probability

Probability or likelihood of an impact occurring will be described as shown in Table 7-5 below.

Table 7-5 : Description of the degree of probability of an impact occurring

Rating	Description
1	Practically impossible
2	Unlikely
3	Could happen
4	Very Likely
5	It's going to happen / has occurred

Degree of Certainty

As with all studies it is not possible to be 100% certain of all facts, and for this reason a standard "degree of certainty" scale is used as discussed in Table 7-6. The level of detail for specialist studies is determined according to the degree of certainty required for decision-making. The impacts are discussed in terms of affected parties or environmental components.

Table 7-6 : Description of the degree of certainty rating scale

Rating	Description
Definite	More than 90% sure of a particular fact.
Probable	Between 70 and 90% sure of a particular fact, or of the likelihood of that impact occurring.
Possible	Between 40 and 70% sure of a particular fact or of the likelihood of an impact occurring.
Unsure	Less than 40% sure of a particular fact or the likelihood of an impact occurring.
Can't know	The consultant believes an assessment is not possible even with additional research.
Don't know	The consultant cannot, or is unwilling, to make an assessment given available information.

Quantitative Description of Impacts

To allow for impacts to be described in a quantitative manner in addition to the qualitative description given above, a rating scale of between 1 and 5 was used for each of the assessment criteria. Thus the total value of the impact is described as the function of significance, spatial and temporal scale as described below:

Impact Risk = (SIGNIFICANCE **+** *Spatial* **+** Temporal) X Probability

3 **5**

An example of how this rating scale is applied is shown below:

Table 7-7 : Example of Rating Scale

Impact	Significance	Spatial Scale	Temporal Scale	Probability	Rating
	LOW	*Local*	Medium-term	*Could Happen*	
Impact to air	**2**	***3***	**3**	**3**	**1.6**

Note: The significance, spatial and temporal scales are added to give a total of 8, that is divided by 3 to give a criteria rating of 2,67. The probability (3) is divided by 5 to give a probability rating of 0,6. The criteria rating of 2,67 is then multiplied by the probability rating (0,6) to give the final rating of 1,6.

The impact risk is classified according to five classes as described in the table below.

Table 7-8 : Impact Risk Classes

Rating	Impact Class	Description
0.1 – 1.0	**1**	**Very Low**
1.1 – 2.0	**2**	**Low**
2.1 – 3.0	**3**	**Moderate**
3.1 – 4.0	**4**	**High**
4.1 – 5.0	**5**	**Very High**

Therefore with reference to the example used for air quality above, an impact rating of 1.6 will fall in the Impact Class 2, which will be considered to be a low impact.

Cumulative Impacts

It is a requirement that the impact assessments take cognisance of cumulative impacts. In fulfilment of this requirement the impact assessment will take cognisance of any existing impact sustained by the operations, any mitigation measures already in place, any additional impact to environment through continued and proposed future activities, and the residual impact after mitigation measures.

It is important to note that cumulative impacts at the national or provincial level will not be considered in this assessment, as the total quantification of external companies on resources is not possible at the project level due to the lack of information and research documenting the effects of existing activities. Such cumulative impacts that may occur across industry boundaries can also only be effectively addressed at Provincial and National Government levels.

Using the criteria as described above an example of how the cumulative impact assessment will be done is shown below:

Impact	Significance	Spatial Scale	Temporal Scale	Probability	Rating
Initial / Existing Impact (I-IA)	**2**	**2**	**2**	*1*	0.4
Additional Impact (A-IA)	**1**	***2***	**1**	*1*	0.3
Cumulative Impact (C-IA)	**3**	***4***	**2**	*1*	0.6
Residual Impact after mitigation (R-IA)	**2**	***1***	**2**	*1*	0.3

As indicated in the example above the Additional Impact Assessment (A-IA) is the amount that the impact assessment for each criterion will increase. Thus if the initial impact will not increase, as shown for temporal scale in the example above the A-IA will be 0, however, where the impact will increase by two orders of magnitude from 2 to 4 as in the spatial scale the A-IA is 2. The Cumulative Impact Assessment (C-IA) is thus the sum of the Initial Impact Assessment (I-IA) and the A-IA for each of the assessment criteria.

In both cases the I-IA and A-IA are assessed without taking into account any form of mitigation measures. As such the C-IA is also a worst case scenario assessment where no mitigation measures have been implemented. Thus a Residual Impact Assessment (R-IA) is also made which takes into account the C-IA with mitigation measures. The latter is the most probable case scenario, and for the purpose of this report is considered to be the final state Impact Assessment.

Notation of Impacts

In order to make the report easier to read the following notation format is used to highlight the various components of the assessment:

- Significance or magnitude- IN CAPITALS
- Temporal Scale – in underline
- Probability – *in italics and underlined*.
- Degree of certainty - **in bold**
- Spatial Extent Scale – *in italics*

7.1.3 *Environmental Impact Report and Environmental Management Programme*

Findings and/or recommendations of the specialist studies will be integrated into the Draft Environmental Impact Report (EIR). The EIR and the IRR report will be updated as comments are received from I&APs. The Final Environmental Impact Report (EIR) together with a draft construction and operation Environmental Management Plan (EMProg) will be submitted to DEA for environmental authorisation.

7.2 Public Participation during the EIA phase

After the Scoping Phase, a detailed Impact Assessment will be carried out and the Draft EIR will be prepared. This report will contain descriptions of the study area to the process under consideration, an assessment of the environmental impacts of these alternatives, determination of the significance of the impacts, mitigation measures proposed to lessen the impacts. There will also be a section addressing the issues raised during scoping and a comparative assessment of the feasible alternatives.

The purpose of the public participation process during the Impact Assessment Phase is to present the findings of the EIA phase and to avail the Draft EIR to the public for comments. I&APs will be afforded an opportunity to verify that their issues have been considered either by the EIA specialist studies, or elsewhere. Also, I&APs will comment on the findings of the Draft EIR, including the measures that have been proposed to enhance positive impacts and reduce or avoid negative ones. Once the review is completed, the authority may decide to request additional information on matters that may not be clear from the report, authorise the

application with certain conditions to be complied with by the applicant or reject the application. An Environmental Authorisation reflecting the decision of the authority as well as any conditions that may apply will be issued to the applicant.

I&APs will be advised in good time of the availability of these reports, how to obtain them, and the dates and venues of public and other meetings where the contents of the reports will be presented for comment.

The public participation process for the EIAs will involve the following proposed steps:

- Announcement of the availability and public review of the Draft EIR;
- Host a public meeting for the stakeholders to review the DEIR;
- Announcement of the availability of the Final EIR;
- Notification of the authorities' decision with regard to Environmental Authorisations

Below information is provided about each step.

7.2.1 *Announcing the availability of the Draft EIR, its summary and the EMP*

A letter will be circulated to all I&APs, informing them in terms of progress made with the study and that the Draft EIR and EMP are available for comment. The report will be distributed to public places and also presented at a stakeholder meeting. Advertisements will be placed in the same newspapers used in the scoping phase to announce the public review period of the Draft EIR.

7.2.2 *Public review of Draft EIR and EMP*

The EIA Guidelines specify that stakeholders must have the opportunity to verify that their issues have been captured and assessed before the EIA Report will be approved. The findings of the specialist assessment will be integrated into the Draft EIR. The report will be written in a way accessible to stakeholders in terms of language level and general coherence. The Draft EIR will have a comprehensive project description, motivation and alternatives being considered and also the findings of the assessment and recommended mitigation measures. It will further include the Issues and Responses Report, which will list every issue raised with an indication of where the issue was dealt with in the EIR. The findings of the assessment and recommended mitigation measures will also be incorporated into the EIR.

As part of the process to review the Draft EIR and EMP, one stakeholder workshop with an open house component will be arranged to afford stakeholders the opportunity to obtain first-

hand information from the project team members and also to discuss their issues and concerns. Contributions at this meeting will be considered in the Final EIR.

7.2.3 *Announcing the availability of the Final EIR and EMP*

A letter will be circulated to all I&APs, informing them in terms of progress made with the study and that the Final EIR and EMP are available for comment. The reports will be distributed to the same public places (See section 6 with the venues) as the previous reports for I&APs to review.

7.2.4 *Progress feedback*

After comments from I&APs have been incorporated, all stakeholders on the database will receive a personalised letter to report on the status of the process, to thank those who commented to date and to inform them that the Final EIR and EMP have been submitted to the lead authority for consideration. They will be advised on the next steps in the process.

7.2.5 *Announce authorities' decision on Environmental Authorisation*

Registered I&APs will be notified by individual letters of the results from the authorities. Should it be a requirement from the authorities an advertisement will be placed in the same newspapers which were used during the scoping and impact assessment phases.

8 CONCLUSION AND WAY FORWARD

Eskom appointed Zitholele Consulting to undertake the EIA and waste licence application for the proposed Camden ash disposal facility and associated infrastructure. This Scoping study is being undertaken with the aim of identifying feasible sites; identifying potential aspects of concern (both positive and negative) on the biophysical environment and identifying issues, concerns and queries from I&APs. This Final Scoping report documents the process followed, the findings and recommendations of the Scoping study, and the proposed Plan of Study for the EIA Phase to follow.

The way forward recommended by this study is as follows:

- Upon approval of the Scoping Report all participating stakeholders are to be notified of the start of the EIA phase;
- Execute the Plan of Study for the EIA phase of the project, including amendment required by conditions recommended by the relevant authority; and
- Commence with engineering design and waste license report.

ZITHOLELE CONSULTING (PTY) LTD

Konrad Kruger Warren Kok

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Appendix a: EAP CV

Appendix b: Integrated EIA Application Form, EAP Declaration and DEA acceptance letter

Appendix c: Newspaper Advertisements and Site Notices

Appendix d: I&AP Database

Appendix e: Issues and Response Report

Appendix f: Background Information Document

Appendix g: Correspondence sent to stakeholders