

EXECUTIVE SUMMARY: ENVIRONMENTAL IMPACT ASSESSMENT REPORT

ENVIRONMENTAL IMPACT ASSESSMENT OF THE USED FUEL TRANSIENT INTERIM STORAGE FACILITY AT KOEBERG NUCLEAR POWER STATION

DEA Reference Number: 14/12/16/3/3/2/947

1 INTRODUCTION

Eskom proposes to construct a Transient Interim Storage Facility (TISF) for the temporary storage of dry casks at Koeberg Nuclear Power Station (KNPS) (Figure 1). These casks will store used nuclear fuel from the reactors of the power station.

The TISF will comprise of concrete pad(s) within a site footprint of approximately 12 800 m² and will be designed to accommodate storage of not more than 160 casks, for used nuclear fuel generated at KNPS up to the end of operational life of plant.

SRK Consulting (South Africa) Pty Ltd (SRK) has been appointed by Eskom to undertake the Scoping and Environmental Impact Reporting (S&EIR, also referred to as Environmental Impact Assessment [EIA]) process required in terms of the National Environmental Management Act 107 of 1998, as amended (NEMA), and the EIA Regulations, 2014.

See page 8 for details on how you can participate in the process.

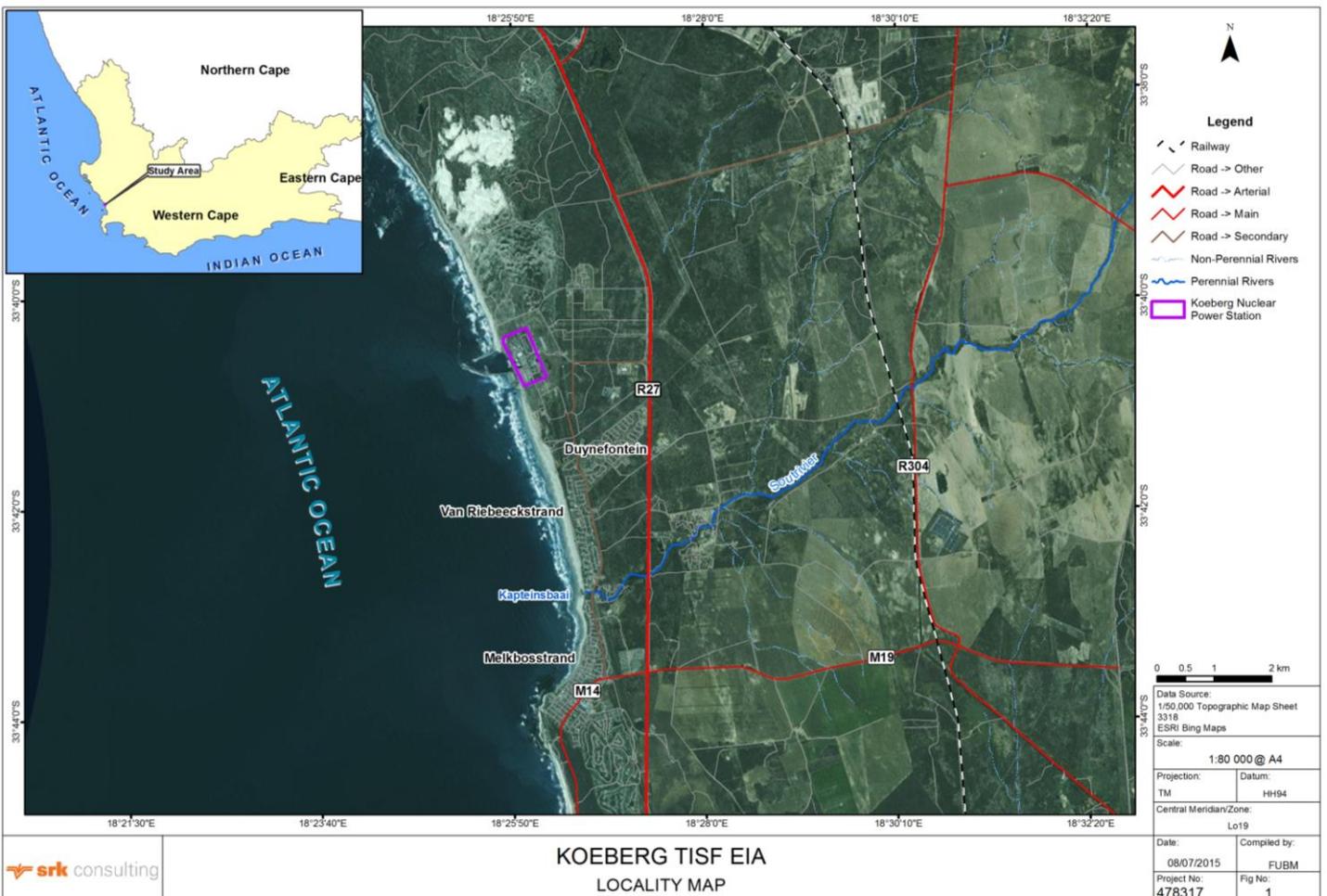


Figure 1: Locality Plan

2 GOVERNANCE FRAMEWORK

Sections 24 and 44 of NEMA make provision for the promulgation of regulations that identify activities which may not commence without an EA issued by the competent authority, in this case, the National Department of Environmental Affairs (DEA). The Environmental Impact Assessment (EIA) Regulations, 2014 (Government Notice (GN) R982, which came into effect on 8 December 2014), promulgated in terms of NEMA, govern the process, methodologies and requirements for the undertaking of EIAs in support of EA applications. The EIA Regulations are accompanied by Listing Notices (LN) 1-3 that list activities that require EA.

The EIA Regulations, 2014 lays out two alternative authorisation processes. Depending on the type of activity that is proposed, either a BA process or a Scoping and Environmental Impact Reporting (S&EIR) process is required to obtain EA. LN 1 lists activities that require a BA process, while LN 2 lists activities that require S&EIR. LN 3 lists activities in certain sensitive geographic areas that require a BA.

SRK has determined that the proposed project triggers activities listed in terms of LN 1, LN 2 and LN 3 of the EIA Regulations, 2014, requiring a S&EIR. The equivalent activities in terms of the EIA Regulations, 2014 are included in Table 1.

Table 1: Listed activities triggered by the project

No	Description
LN1 (requiring BA)	
27	The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation.
LN2 (requiring S&EIR)	
3	The development and related operation of facilities or infrastructure for nuclear reaction including energy generation, the production, enrichment, processing, reprocessing, storage or disposal of nuclear fuels, radioactive products, nuclear waste or radioactive waste.
LN3 (requiring BA in the sensitive areas)	
12	The clearance of an area of 300 square metres or more of indigenous vegetation. (a) In Western Cape: (i) Within any critically endangered or endangered ecosystem.

Consequently, the proponent is obliged to apply for EA for the project. Since activities listed under LN 2 apply to the project, a S&EIR process is required.

In addition to the EA, various other key authorisations, permits or licences may be required before the project may proceed (see Table 2).

Table 2: Key authorisations, permits and licences required for the project

Application	Authority	Status
Heritage Application	Heritage Western Cape (HWC)	HWC confirmed no further heritage studies required (Ref 16022313AS0224E, 16 March 2016)
Water Use Licence (WUL)	Department of Water and Sanitation (DWS)	DWS confirmed no WUL required for the project (Ref. 16/2/7G200/A/8, 10 May 2016)
NNR Licence Amendment	National Nuclear Regulator (NNR)	Planned to be submitted ~ September 2017

3 ENVIRONMENTAL PROCESS

The EIA Regulations, 2014 define the detailed approach to the S&EIR process, which consists of two phases: the Scoping Phase (completed in August 2016) and the Impact Assessment Phase (the current phase) (see Figure 2).

The Scoping Phase was completed in August 2016 and the Final Scoping Report was accepted by the DEA on 28 September 2016. The Impact Assessment Phase is being undertaken in accordance with the Plan of Study for EIA, included in the Scoping Report accepted by the DEA.

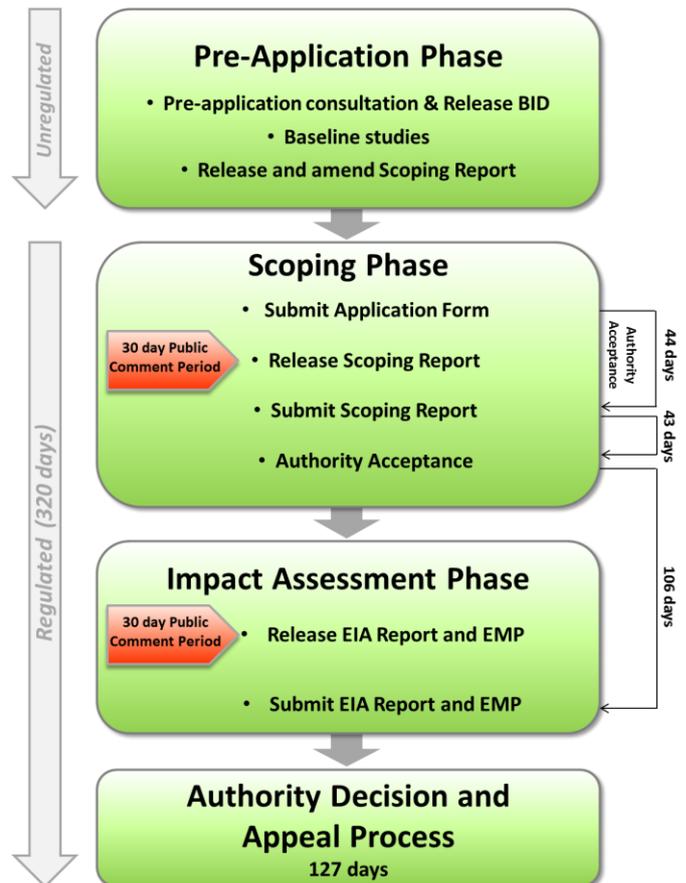


Figure 2: S&EIR Process

***Note:** EMP = Environmental Management Programme

The key objectives of the EIA are to:

- Inform Interested and Affected Parties (IAPs) about the proposed Project and the EIA process followed;
- Obtain comments from IAPs (including the relevant authorities and the public) and ensure that all issues, concerns and queries raised are fully documented and addressed in the EIA Report;
- Identify and assess potential significant impacts associated with the proposed development;
- Formulate mitigation measures to avoid and/or minimise impacts and enhance benefits of the Project; and
- Produce a Final EIA Report which will provide all the necessary information for the DEA to decide whether (and under what conditions) to authorise the proposed Project.

4 DESCRIPTION OF THE SITE AND ENVIRONMENT

KNPS is located on Cape Farm Duynefontyn No. 1552 along the sandy coastline of the West Coast, approximately 27 km north of the Cape Town Central Business District and 1.5 km north of the residential area of Duynefontein (Figure 1). Access to KNPS is via the R27 which runs along the property's eastern boundary or alternatively via Otto du Plessis Drive.

The topography of the area is relatively flat with an active dunefield extending north of KNPS. A stabilised primary dune inland of KNPS screens many of KNPS buildings although the two nuclear reactor units are prominent landmarks in the region (Figure 3).



Figure 3: KNPS as viewed from the Duynefontein residential area

The vegetation of the area consists of low coastal shrub (Cape Dune Strandveld and Atlantis Fynbos), typical of much of the West Coast region (Figure 3).

KNPS is located within the Koeberg Nature Reserve, a 3 000 ha reserve managed by the Koeberg Managing Authority. The Atlantic Ocean forms the western boundary of KNPS.

There are a variety of land uses immediately surrounding KNPS including the Duynefontein residential area to the south, the Koeberg Nature Reserve to the north, south and east.

KNPS is located within a predominantly natural environment, although there are existing built elements throughout the property including powerlines, office buildings, a visitors' centre, weather station, roads and parking areas.

The TISF will be located within the Security Protected Area (SPA) of KNPS, a flat area disturbed by previous construction activities and by current operations at KNPS.

5 PROJECT AND PROCESS DESCRIPTION

The TISF will be constructed on a portion of vacant land within the KNPS SPA. The TISF will comprise of concrete pad(s) within a site footprint of approximately 12 800 m².

*The **Security Protected Area** is a restricted area surrounding the reactor units to which only authorised personnel have access. The SPA is distinct from the protected area status of Koeberg Nature Reserve.*

The TISF will be constructed to accommodate up to 160 dry storage casks, which will be placed on the pad(s) in a modular manner over time.

***Dry cask storage** is a method of storing used fuel that has already been cooled in the SFP. Casks are typically concrete or steel cylinders which are either welded or bolted closed to provide leak-tight containment of the used fuel. The used fuel assemblies within the casks are surrounded by inert gas and each cylinder is surrounded by additional steel, concrete, or other material to provide radiation shielding to workers and members of the public. Heat generated from used fuel radioactive decay will dissipate through the external surface of the dry casks.*

The dry storage casks will be either metal or concrete casks or concrete assemblies and will be approximately 6 m in height and 3 m in diameter. Each cask can hold up to 37 assemblies depending on the cask design. The dry storage casks are robust

and can withstand significant external impact forces such as an aircraft crash.

The design of the concrete pad(s) of the TISF lends itself to various types of dry storage casking systems. The TISF site will also include an auxiliary building to house ancillary equipment.

A secure perimeter fence will be erected around the TISF site with controlled access.

The TISF will meet the requirements of the NNR and will be built and managed in accordance with the International Atomic Energy Agency safety standards. Construction of the TISF will commence in 2018 and will take approximately 12 months to complete. The construction laydown area will be located within the proposed TISF site to reduce the disturbance footprint.

Temporary site offices and a parking area for construction vehicles and equipment will also be located in this area.

The dry storage casks will be transferred from the SFP to the TISF on the existing KNPS internal road network. The existing KNPS internal road network will be used to transfer casks from the SFP to the TISF. A portion of existing gravel road, approximately 20 m in length and approximately 6 m in width, will be resurfaced/tarred to connect the existing haul road at the entrance to Alternative 1.

The TISF will be decommissioned in accordance with the KNPS decommissioning plan.

6 ALTERNATIVES

Appendix 2 Section 2 (h)(i) of the EIA Regulations, 2014, requires that all S&EIR processes must identify and describe feasible and reasonable alternatives. Different types or categories of alternatives can be identified, e.g. location alternatives, type of activity, design or layout alternatives, technology alternatives and operational alternatives. Not all categories of alternatives are applicable to all projects.

Eskom identified six potential sites at KNPS for the location of the TISF, which were evaluated against various criteria. The site selection process identified two viable site locations for the TISF (refer to Figure 4) - the CSB site, the preferred alternative (Alternative 1), and the Ekhaya site (Alternative 2). Alternative 1 is located adjacent to the CSB on the northern boundary of KNPS and Alternative 2 is located along the southern boundary of KNPS next to the Ekhaya Building.

Alternative 1 is Eskom’s preferred alternative because:

- It is situated adjacent to an existing radiological zone (low level waste facility);
- It is located within a more ecologically disturbed area compared to Alternative 2; and
- Less extensive haul road upgrades will be required than for Alternative 2.



Figure 4: TISF Location alternatives

The No Go alternative was considered in the EIA in accordance with the requirements of the EIA Regulations, 2014. The No Go alternative entails no change to the status quo, in other words the proposed TISF will not be built.

7 STAKEHOLDER ENGAGEMENT

Stakeholder engagement is a key component of the S&EIR process and is being undertaken in accordance with Chapter 6 of the EIA Regulations, 2014. The key stakeholder engagement activities during the Impact Assessment Phase are summarised in Table 3 below.

Relevant local, provincial and national authorities, conservation bodies, local forums and surrounding landowners and occupants have been directly notified of the S&EIR process and the release of the EIA Report for comment.

Table 3: Stakeholder Engagement during Impact Assessment Phase.

Activity	Date
Release EIA Report to registered IAPs for comment	14 November 2016
Comment period	14 November – 14 December 2016
Finalise EIA Report, collate comments and submit Final EIA Report to DEA	February 2016

Key comments and concerns raised by stakeholders predominantly relate to:

- **Project Motivation:** Used nuclear fuel should be stored at a CISF and not at KNPS,
- **Project Description:** The length of time fuel will be stored on site;
- **Alternatives:** The possibility of reprocessing of used nuclear fuel instead of storage;
- **Health and safety risks:** The risk of KNPS being subject to terrorist attacks and the potential for casks to leak and cause radiation exposure;
- **Impacts of the TISF:** Potential negative impacts on coastal processes, sense of place, groundwater and terrestrial ecology;
- **Cumulative impacts:** Cumulative impacts of other proposed projects at KNPS, and cumulative exposure of radiation from the KNPS site;
- **EIA process:** The need for external peer review of in-house specialist studies; and
- **Regulatory requirements:** The TISF must meet the requirements of the NNR and the IAEA.

8 ASSESSMENT OF POTENTIAL IMPACTS

Specialist studies were undertaken to investigate key potential direct, indirect and cumulative impacts, as follows:

- Geohydrology Specialist Study;
- Terrestrial Ecology Specialist Study;
- Socio-economic Specialist Study;
- Review of Radiological Study;
- Human Health Specialist Study;
- Heritage Specialist Study; and
- Visual Specialist Study.

For all potentially significant impacts, the significance of the anticipated impact was rated without and with recommended mitigation measures. These impacts are presented in Table 4.

The significance of potential impacts of the proposed project was determined in order to assist decision-makers. Relevant observations with regard to the overall impact ratings, assuming mitigation measures are effectively implemented, are:

- The predicted *air quality* impacts, mainly associated with the creation of dust and exhaust emissions from vehicles and equipment, are rated as *insignificant* for both site alternatives largely due to limited emissions and the distance between the sites and the closest sensitive receptors.
- The predicted *noise* impacts mainly associated with the movement of vehicles and equipment are rated as *insignificant* for both site alternatives largely due to low levels of noise generated and the distance between the sites and the closest sensitive receptors.
- The predicted impacts on *surface water* resources, assuming stormwater is adequately managed, are rated as *insignificant* for both site alternatives since no surface water features occur on or in close proximity to either site.
- The predicted *traffic* impacts are rated as *insignificant* for both site alternatives given the modest existing traffic in the area.
- The predicted *geohydrology* impacts are rated as *insignificant* for either site alternative as the potential for groundwater contamination is extremely low.
- The predicted *terrestrial ecology* impacts are rated as *low* for both site alternatives during the construction phase, although the impact would be slightly higher for Alternative 2 which has a higher floral species diversity and is considered more sensitive. During operations, terrestrial ecology impacts will be *insignificant*.
- The predicted *socio-economic* benefits are rated as very low for both site alternatives. Adverse

socio-economic impacts also *very low* to *insignificant*.

- The predicted *health impacts* associated with radiation exposure during operations of the TISF are rated as *low* for both site alternatives.
- The predicted *heritage impacts* are rated as *very low* for both site alternatives due to the previous disturbance of both areas during the construction of KNPS making it extremely unlikely that any intact archaeological or palaeontological material would be encountered during construction.
- The predicted *visual impact* is rated as *insignificant* during construction and *low* during operations for both site alternatives.

Cumulative impacts in the region may derive from a number of developments currently proposed around (and largely related with) KNPS. Cumulative biophysical impacts are of relatively low significance apart from the cumulative loss of Endangered Cape Flats Dune Strandveld which is considered to be of medium significance.

Cumulative impacts on traffic and visual quality of the area are also considered to be of medium significance, with the proposed Nuclear 1 development to the north of KNPS (inside the Koeberg Nature Reserve) by far the greatest contributor to cumulative impacts.

Table 4 below summarises:

- The impacts assessed in the EIA;
- Their significance before and following the implementation of essential mitigation measures, on which the significance rating is based; and
- The key (non-standard essential) mitigation measures.

Impact Significance Ratings Legend:

Rating	+ve	-ve
Insignificant	I	I
Very Low	VL	VL
Low	L	L
Medium	M	M
High	H	H
Very High	VH	VH

Where applicable, the preferred alternative is indicated in bold text.

Table 4: Summary of Impacts

Impact	Significance rating		Key mitigation/optimisation measures
	Without	With	
CONSTRUCTION PHASE IMPACTS			
Changes in Air Quality due to Project Related Emissions	I	I	<ul style="list-style-type: none"> • Avoid excavation and transport of dust generating materials during windy conditions. • Water exposed areas and roads and cover stockpiles during windy conditions.
Increased noise due to project activities	I	I	<ul style="list-style-type: none"> • Limit noisy construction activities to daylight hours from Monday to Saturday. • Comply with the applicable municipal and / or industry noise regulations. • Respond rapidly to complaints and take appropriate corrective action.
Contamination of surface water	I	I	<ul style="list-style-type: none"> • Refuel and service vehicles on an impermeable surface and use drip trays. • Immediately clean oil and fuel spills and dispose of contaminated material appropriately. • Compile and implement procedures for hazardous materials. • Implement the stormwater management.
Impacts of construction traffic	I	I	<ul style="list-style-type: none"> • Ensure that large construction vehicles are visible to other road users and pedestrians. • Investigate and respond to complaints about traffic. • Obtain the required abnormal load permits prior to the transport of casks to the site.
Groundwater contamination due to construction activities	VL	I	<ul style="list-style-type: none"> • Refuel and service vehicles on an impermeable surface and use drip trays during refuelling or under vehicles or equipment parked overnight or longer. • Immediately clean oil and fuel spills and dispose of contaminated material at licensed disposal sites. • Compile and implement a procedure for the storage, handling and transport of hazardous materials.
Loss of Vegetation, Floral Biodiversity and protected Species	M	L	<ul style="list-style-type: none"> • Demarcate construction site boundaries and treat all other areas as No Go areas. • Appoint suitably qualified individuals to locate SCC and (in consultation with the specialist and/or CapeNature) relocate protected species and SCC within construction boundaries prior to the commencement of construction. • Obtain a floral permit from CapeNature for removal of SCC and protected species if required. • Rehabilitate the development footprint with indigenous species during decommissioning.
Loss of faunal habitat, faunal biodiversity and protected species	M	VL	<ul style="list-style-type: none"> • Limit the footprint area of the construction activity to what is absolutely essential. • Confine construction vehicles to designated roadways and the construction footprint. • Flush any fauna within the construction footprint towards more suitable habitat the surrounding areas, if possible. Clear vegetation towards the security fence line, allowing natural faunal relocation. • Prohibit trapping harming or killing of animals.

Impact	Significance rating		Key mitigation/optimisation measures
	Without	With	
Decline in quality of life caused by construction activities	VL	I	<ul style="list-style-type: none"> Comply with mitigation measures intended to reduce noise, visual and traffic impacts.
Generation of employment, income and skills during construction	I	VL	<ul style="list-style-type: none"> Prioritise the employment of local people. Procure locally produced goods (plant and materials) and services, where possible. Promote on-the-job training wherever possible. Specify the above-mentioned optimisation measures in construction contract documents.
Increased revenue to government and economic investment during construction	I	I	<ul style="list-style-type: none"> No optimisation possible.
Decrease in resource value from a loss of floral habitat and species	VL	VL	<ul style="list-style-type: none"> No mitigation is required.
Loss or destruction of archaeological sites	VL	VL	<ul style="list-style-type: none"> Empower staff to stop works on discovery of archaeological or palaeontological artefacts. Report graves, human remains or historical artefacts to HWC or an archaeologist. Agree on suitable mitigation with HWC or the archaeologist. Obtain a permit for the removal of artefacts from the site if required.
Altered Sense of Place and Visual Intrusion by Construction Activities	VL	I	<ul style="list-style-type: none"> Avoid dust generating activities under windy conditions. Contain all activities, material and machinery within site boundaries Minimise the use of night-lighting.
OPERATIONS PHASE IMPACTS			
Changes in air quality due to project related emissions	I	I	<ul style="list-style-type: none"> Maintain all vehicles and equipment in good working order to minimise exhaust fumes.
Increased noise during operations	I	I	<ul style="list-style-type: none"> No mitigation required.
Impacts of Operational Traffic	I	I	<ul style="list-style-type: none"> No mitigation required.
Groundwater contamination due to project operations	VL	I	<ul style="list-style-type: none"> Implement a monitoring system to monitor for radioactive emissions. In the case of suspected emissions, return cask to fuel building for evaluation and repair and decontaminate cask storage pad. Ensure vehicles are in good working order and drivers are trained to deal with fuel spills.
Loss of faunal biodiversity and protected species	L	I	<ul style="list-style-type: none"> Continue alien vegetation control throughout the operational phase of the development. Restrict vehicles to designated roadways.
Decline in quality of life from altered sense of place and visual intrusion	I	I	<ul style="list-style-type: none"> No mitigation required.
Generation of employment, income and skills during operations	VL	VL	<ul style="list-style-type: none"> Favour local procurement.
Increased revenue to Government and economic investment during operations	VL	VL	<ul style="list-style-type: none"> No optimisation possible.
Increased health risk due to radiation exposure	L	L	<ul style="list-style-type: none"> No mitigation required/possible
Altered Sense of Place and Visual Intrusion caused by the TISF	L	VL	<ul style="list-style-type: none"> Reduce the footprint of the TISF and associated infrastructure to a workable minimum. Ensure infrastructure is well maintained and neat. Be sensitive to the use of materials with a high reflectivity. Limit lighting only to essential activities and facilities.

9 CONCLUSIONS AND WAY FORWARD

This Draft EIA Report has identified and assessed the potential biophysical and socio-economic impacts

associated with the proposed development of a TISF at KNPS in the Western Cape.

SRK believes that sufficient information is available for DEA to take a decision regarding authorisation of the development.

The TISF will result in unavoidable adverse environmental impacts, although these are of very limited extent, given the limited footprint of the project infrastructure and the disturbed nature of the site. Consequently, none of these adverse impacts are considered unacceptably significant and all can be managed to tolerable levels through the effective implementation of the recommended mitigation measures. In addition, the project will indirectly benefit the local and regional economy by facilitating ongoing power supply by KNPS.

Working on the assumption that Eskom is committed to ensuring that the TISF is operated and constructed to high standards, achieved through implementation of the recommended mitigation measures and ongoing monitoring of performance, SRK believes and the EIA Report demonstrates that through effective implementation of the stipulated mitigation measures, the adverse impacts can be reduced to levels compliant with national (and international) standards or guidelines.

The fundamental decision is whether to allow the development, which brings economic benefits and is generally consistent with development policies for the area, but which may have very limited biophysical and social impacts.

SRK believes that the specialist studies have shown that the development of the TISF is generally acceptable. The EIA has also assisted in the identification of essential mitigation measures that will mitigate the impacts associated with these components to within tolerable limits.

In conclusion SRK is of the opinion that on purely 'environmental' grounds (i.e. the project's potential socio-economic and biophysical implications) the application as it is currently articulated should be approved, provided the essential mitigation measures are implemented. Though site Alternative 1 is preferred, Alternative 2 could also be approved. Ultimately, however, the DEA will need to consider whether the project benefits outweigh the potential impacts.

HOW YOU CAN YOU PARTICIPATE IN THE EIA PROCESS

The Draft EIA Report is not a final report and can be amended based on comments received from stakeholders. Stakeholders' comments on the EIA Report will assist the DEA in making a decision regarding the application. The public is therefore urged to submit comment. Once stakeholders have commented on the information presented in the EIA Report, the Final EIA Report will be prepared and submitted to the DEA for approval. Once a decision is taken by authorities, this decision will be communicated to all registered IAPs.

REVIEW THE REPORT

Copies of the complete report are available for public review at the following:

- Koeberg Public Library, Duynefontein;
- Wesfleur Public Library, Atlantis;
- Cape Town Public Library;
- KNPS Visitors Centre;
- SRK's office in Rondebosch; and
- SRK's website: www.srk.co.za – click on the 'Library' and then 'Public Documents' links.

REGISTER OR PROVIDE YOUR OPINION

Register or send written comment to:

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IAPs are invited to comment, and/or to register on the project database. IAPs should refer to the DEA reference number, and must provide their comments together with their name, contact details (preferred method of notification, e.g. email), and an indication of any direct business, financial, personal or other interest which they have in the application, to the contact person below, by **14 December 2016**.

A Public Open Day will also be held to present and discuss the findings of the EIA with key stakeholders and members of the public. Since there will be no formal presentation, stakeholders can come at any time during the open day hours. Details are as follows:



Public Open Day:

Venue: KNPS Visitors Centre

Date: 30 November 2016

Time: 15h00 – 18h00

Please confirm your intention to attend.