REPORT

Draft Environmental Management Programme for the Decommissioning and Demolition of the Kelvin A-Station Power Plant Infrastructure

Kelvin Power (Pty) Ltd

GDARD REFERENCE NUMBER: GAUT 002/22-23/E3386

Submitted to:

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Photo courtesy of A Pelser

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ABBREVIATIONS AND ACRONYMS

Abbreviation/ Acronym	Explanation
BA	Basic Assessment
BAR	Basic Assessment Report
BID	Background Information Letter
CRR	Comments and Responses Report
DEFF	Department of Environment, Forestry and Fisheries
DEA	Department of Environmental Affairs
dBAR	draft Basic Assessment Report
dEMP	Draft Environmental Management Programme
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
GDARD	Gauteng Department of Agriculture and Rural Development
GDP	Gross Domestic Product
GN	Government Notice
I&APs	Interested and affected parties
IWWMP	Integrated Water and Waste Management Plan
MAR	Mean Annual Runoff
NAAQS	National Ambient Air Quality Standards
NEMA	National Environmental Management Act 1998 (Act No. 107 of 1998), as amended
NWA	National Water Act 1998 (Act No. 36 of 1998), as amended
PPE	Personal protective equipment
SAHRA	South African Heritage Resources Agency
SAWQ	South African Water Quality
WML	Waste Management Licence
WUL	Water Use Licence

UNITS OF MEASUREMENT

Unit	Explanation
ºC	Degrees Celsius
cm	Centimetre
ha	Hectares
km	Kilometres
m	Metre
m/s	Metres per second
m3/d	Metres cubed per day
mamsl	Metres above mean sea level
mbgl	Meters below ground level
Mtpa	Million tons per annum
ML	Million litres
Mm	Million metres
mm	Millimetre

1.0 INTRODUCTION AND BACKGROUND

The Kelvin Power Station is a 13-unit coal-fired power plant with a total installed capacity of 600 MW, operated by Kelvin Power (Pty) Ltd (Kelvin Power) and is situated in the City of Ekurhuleni (CoE) in the Gauteng Province. The plant was completed between 1957 and 1969. It was developed and operated by the City of Johannesburg. Kelvin Power is one of only a few power stations in South Africa not owned by Eskom. Kelvin Power consists of two independent stations, A-Station and B-Station. The Kelvin Power A-Station was commissioned and started generating commercial power on 27 March 1957; it has six 30MW generators and 11 chain grate boilers. The newer Kelvin Power B-Station has seven 60MW generators and seven PF-type boilers.

The Kelvin Power Station is located west of the Zuurfontein Road and is approximately 5 km north-west of the O.R. Tambo International Airport (Figure 1). The total extent of the plant is 226.18 ha and is located on the farm Zuurfontein 33 IR, in a wider area classified as mixed industrial and residential.

The technology used in the A-Station has become very outdated and the last unit was placed on extended care and maintenance in November 2012. The newer B-Station is still operational. The associated infrastructure for each of the stations include a common High Voltage Yard (now replaced by the new Sebenza sub-station), a control room and workshop facilities.

A decision was made to decommission and demolish the A-Station infrastructure, making the site available for future development.

WSP Group Africa (Pty) Ltd (WSP), an independent environmental assessment practitioner, is appointed by Kelvin Power to conduct the required environmental authorisations for the proposed project.

In terms of the Environmental Impact Assessment (EIA) Regulations (2014, as amended) GN R.983 – GN R.985, Kelvin Power must submit an application for Environmental Authorisation (EA) to the Gauteng Department of Agriculture and Rural Development (GDARD), supported by a Basic Assessment process, which entails the compilation of a Basic Assessment Report (BAR) and an Environmental Management Programme (EMPr), which describes how the environmental impacts of the proposed decommissioning and demolition activities will be managed and mitigated.

This EMPr was drafted as part of the Basic Assessment process and must be read in conjunction with the draft BAR, including all specialist studies appended thereto, in support of the application for Environmental Authorisation.

1.1 Purpose of this EMPr

The purpose of the EMPr is to ensure that activities taking place at the Kelvin Power site during decommissioning, demolition and site clean-up are managed in a responsible and consistent manner.

The EMPr is viewed as a living document that will be amended from time to time as necessary in order to respond to a variety of factors that may include new information becoming available.

The overall objectives of the EMPr are to:

- Ensure that the proposed activities are undertaken in compliance with national, provincial and local environmental legislation.
- Determine environmental conditions and sensitivities of the site and areas outside that may be impacted by the activity.
- Detail mitigation measures, time-frames and criteria for assessing the success or failure of each measure.
- Provide detailed monitoring programmes to ensure compliance.

1.2 Responsibility of the Owner

It is the responsibility of Kelvin Power to:

- Implement the commitments and mitigations measures in this EMPr.
- Ensure that all contractors appointed to work on the site are made aware of the content of the EMPr and are provided with a copy of the document.
- Ensure that activities linked to the proposed decommissioning, demolition and site clean-up are conducted in a manner that is environmentally responsible and compliant with South African legislation.
- Update the EMPr as new information becomes available that highlights any deficiency in the current plan, or if the nature of the proposed decommissioning, demolition and site clean-up activities changes in a way, necessitating amendment of the proposed management measures.
- Audit the performance of all contractors working on site in terms of their environmental management and effectiveness of implementation of the requirements of the EMPr.

1.3 Responsibility of Contractors

The contractor shall identify likely aspects before commencing with any decommissioning, demolition and site clean-up activity. Examples of environmental aspects include, *inter alia*:

- Waste generation
- Storm water discharge
- Emission of pollutants into the atmosphere
- Chemical use operations
- Energy use operations
- Water use operations
- Use of natural resources
- Noise and dust generation

Thereafter the contractor shall programme his work in such a way that each cause and effect of an activity is also identified, and the activity planned so as to prevent any impact from happening. If prevention is not practicable, or in the event of mishap or misapplication, the contractor shall provide plans and measures for the Project Manager, Environmental Officer and Environmental Control Officer's approval, which will limit and contain the magnitude, duration and intensity of the impact. The contractor shall demonstrate that he/she is capable of carrying out any repair and reinstatement of the damaged environment.

Listed below are some environmental impacts that could adversely alter an aspect of the environment through decommissioning, demolition and site clean-up activities:

- Pollution of atmosphere, soil or water
- Destruction or removal of fauna and flora and effect on biological diversity
- Deformation of the landscape
- Soil erosion
- Effect on the built environment

General good demolition practice will play an important role in avoiding the occurrence of an impact.

1.4 Content of the Environmental Management Programme (EMPr)

The EMPr has been structured as follows to meet the requirements of Appendix 4 of the EIA Regulations, 2014, as amended:

Table 1: Content of the EMPr in accordance with Appendix 4 of GNR 982, 04 December 2014

Section	Requirements	Relevant Report Section
	Details of:	
	the EAP who compiled the EMPr; and	Section 2.2, **Table 3**
	the expertise of the EAP, including a Curriculum Vitae	Section 2.2, **Table 3**, APPENDIX A
(b)	Detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;	Section 3.0
(c)	A map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that any areas that should be avoided, including buffers;	Figure 7, Figure 4
(d)	A description of the impact management outcomes, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including-	
	Planning and design;	N/A
	Pre-construction activities;	N/A
	Construction activities	N/A
	Decommissioning and demolition activities	Table 8
	Rehabilitation of the environment after construction and where applicable post closure; and	Table 8
	Where relevant, operation activities.	N/A
(f)	A description of proposed impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (d) will be achieved, and must, where applicable, include actions to -	
	Avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;	Table 8
	Comply with any prescribed environmental management standards or practices;	Table 8
	comply with any applicable provisions of the Act regarding closure, where applicable; and	Table 8
(g)	The method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Table 9
(h)	The frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Table 9
(i)	An indication of the persons who will be responsible for the implementation of the impact management actions;	Table 8

Section	Requirements	Relevant Report Section
(j)	The time periods within which the impact management actions contemplated in paragraph (f) must be implemented;	Table 8
(k)	The mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	Table 9
(l)	A program for reporting on compliance, taking into account the requirements as prescribed by the Regulations	Table 9
(m)	An environmental awareness plan describing the manner in which-	
	The applicant intends to inform his or her employees of any environmental risk which may result from their work; and	Section 5.0
	Risks must be dealt with in order to avoid pollution or the degradation of the environment; and	Section 5.0
(n)	Any specific information that may be required by the competent authority	N/A

2.0 PROPONENT AND PRACTITIONER DETAILS

2.1 Details of the Proponent

For the purposes of the EMPr, the following person may be contacted at Kelvin Power regarding the proposed decommissioning and demolition project:

Table 2: Details of Kelvin Power

Project Applicant	**Kelvin Power (Pty) Ltd**
Responsible Position	General Manager
Contact Person	Oupa Seopa
Postal address	P.O. Box 311, Kempton Park, 1620
Telephone	+27 11 573 2578
Email	oupa.seopa@kelvinpower.com

2.2 Environmental Assessment Practitioner (EAP)

Kelvin Power has appointed WSP Group Africa (Pty) Ltd (WSP) as an independent Environmental Assessment Practitioner (EAP) to undertake the BA process that is required to support the application for environmental authorisation (EA) for the proposed decommissioning and demolition of the A-Station infrastructure.

WSP has no vested interest in the proposed project and hereby declares its independence as required by the EIA Regulations.

For purposes of this EIA, the following persons may be contacted at WSP:

Table 3: Details of WSP

Company Name:	**WSP Group Africa (Pty) Ltd**
Address:	Building 1, Magwa Crescent West, Maxwell Office Park, Waterfall City, Midrand P.O. Box 6001, Halfway House, 1685, South Africa Telephone: (011) 254 4800 Fax: (086) 582 1561
Environmental Assessment Practitioner (EAP):	**Marié Schlechter** (Senior Environmental Specialist) Ms Schlechter has worked in the mining industry and environmental consultancy for over twenty (20) years, gaining experience in the environmental management discipline. Marié has experience in conducting and managing environmental impact assessment projects, implementation, maintenance and internal auditing of environmental management systems as well as compliance audits. Marié is a Registered Environmental Assessment Practitioner (EAP No: 2020/1430). Email: marie.schlechter@wsp.com *Full CV is provided in APPENDIX A*

3.0 PROJECT INFORMATION AND DESCRIPTION

3.1 Location of the activity

The Kelvin Power Station is situated adjacent (west) of the Zuurfontein Road (M39) and is approximately 5 km north-west of the O.R. Tambo International Airport (Figure 1|). The total extent of the plant is 226.18 ha and is located on the farm Zuurfontein 33 IR, in an area classified as mixed industrial and residential.

The A-Station infrastructure is located in the northern section of the Kelvin Power site (Figure 2).

3.1.1 Magisterial District and relevant Local Authority

The Kelvin Power Station is located in the jurisdiction of the City of Ekurhuleni Metropolitan Municipality, in the Gauteng Province.

3.1.2 Description of the property

Table 4: Details of area applicable to the application for environmental authorisation

Farm names:	Farm Zuurfontein 33 IR, Remainder of Portion 391
Application area (Ha):	13.75 ha
Magisterial District:	City of Ekurhuleni Metropolitan Municipality
Distance and direction to nearest town	Located in the City of Ekurhuleni
SG Codes	T0IR00000000003300391

3.1.3 Surface Rights Owners and use of immediately adjacent land

The A-Station power plant is located on the Remainder Portion 391 of the farm Zuurfontein 33 IR, currently owned by Kelvin Power (Pty) Ltd (Figure 3).

Table 5: Landowner's details

Farm Zuurfontein 33 IR, Remainder of Portion 391	
Landowner:	Kelvin Power (Pty) Ltd
Contact person:	Oupa Seopa
Postal address:	P.O. Box 311, Kempton Park, 1620
Telephone:	+27 11 573 2578
E-mail:	oupa.seopa@kelvinpower.com

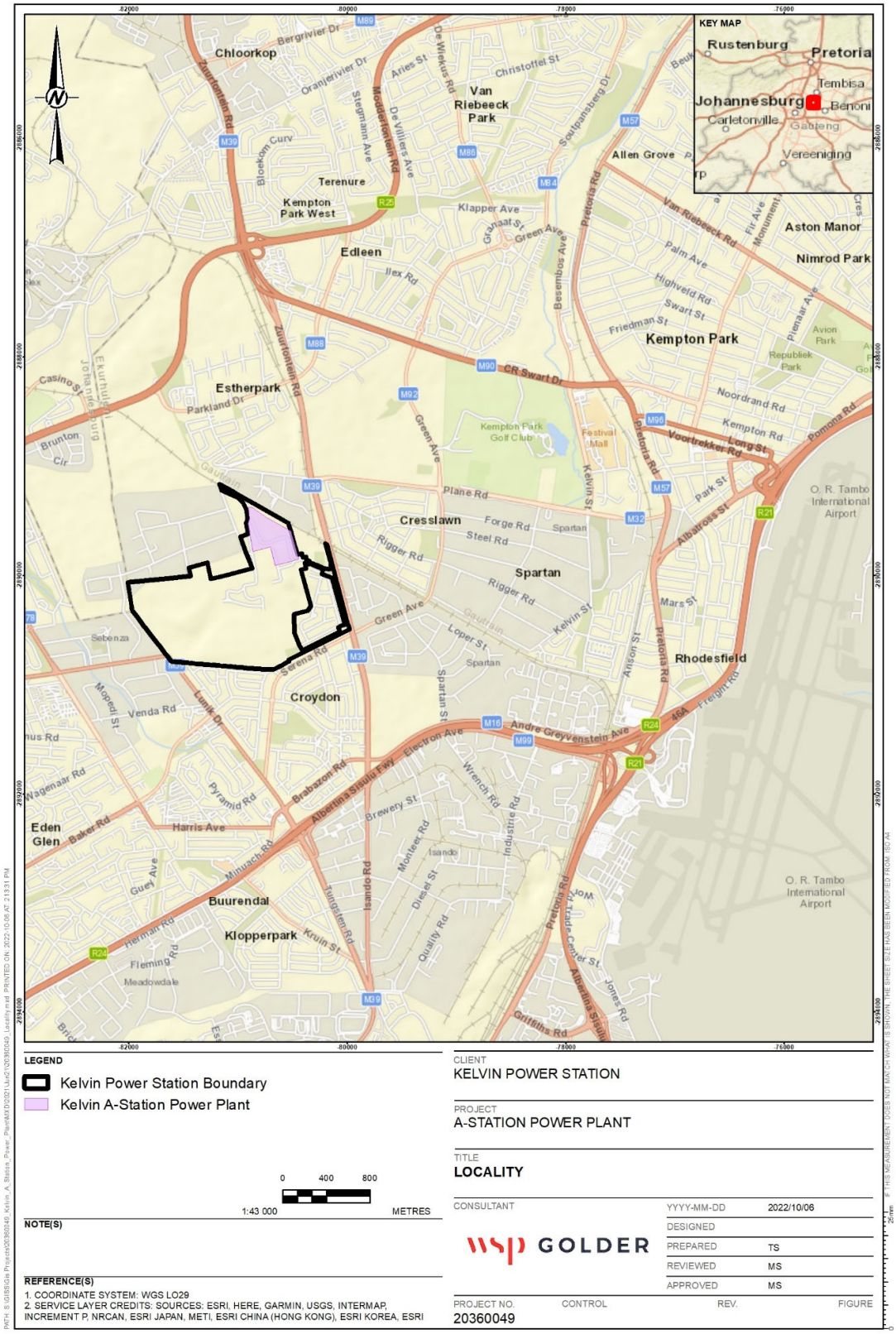


Figure 1: Regional locality of the Kelvin Power Station and A-Station project area.

Figure 2: Locality of the A-Station within the Kelvin Power site.

Figure 3: Farm portions affected by the A-Station infrastructure.

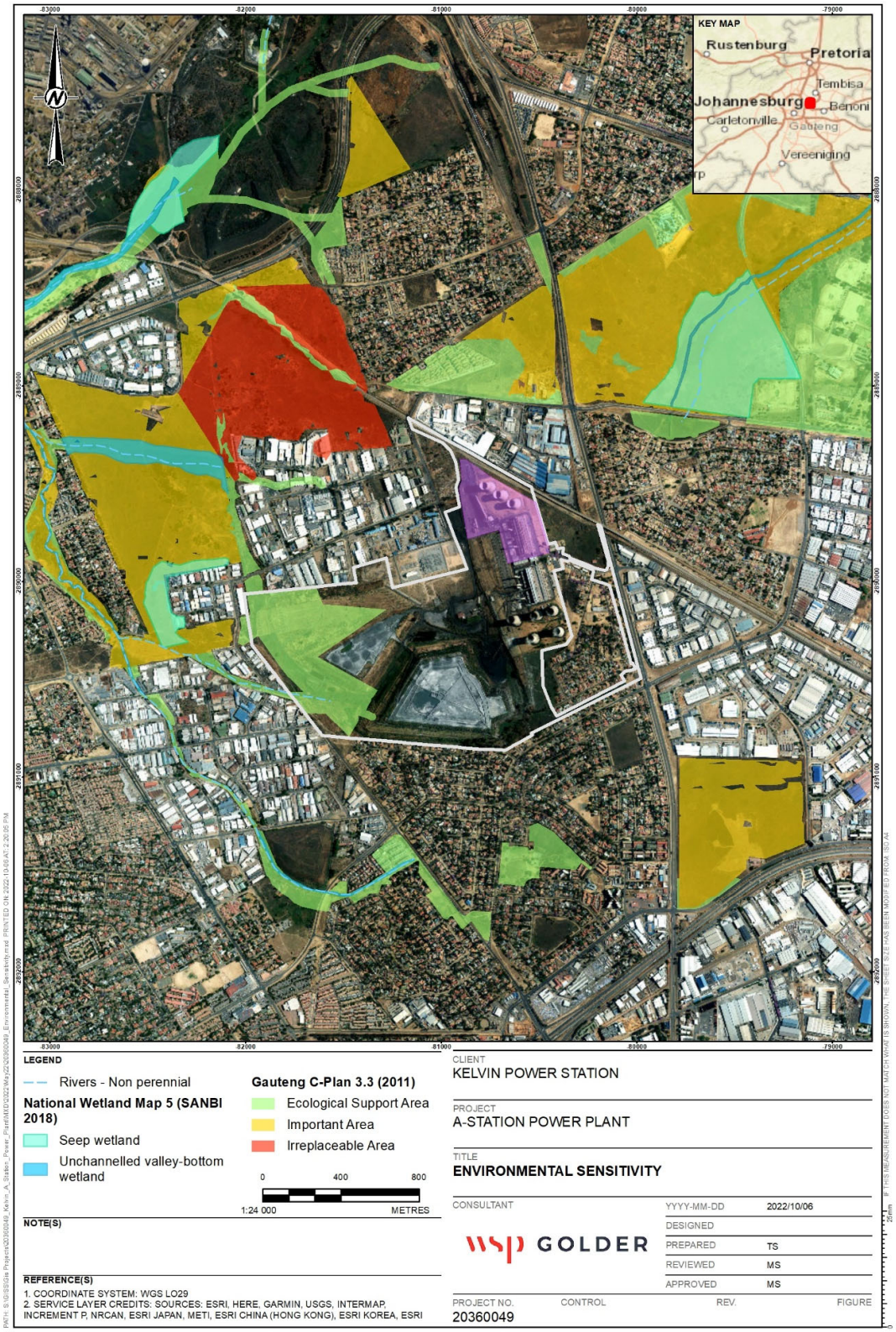


Figure 4: Environmental Sensitivities of the wider project area

3.1.4 Site Background Information

Kelvin Power has two separate power stations, namely the A-Station and the B-Station. The A-Station was commissioned first and stared generating commercial power on 27 March 1957. The technology used in the A-Station has become very outdated and the last unit was placed on extended care and maintenance in November 2021. The newer B-Station is still operational. The associated infrastructure for each of the stations include a common High Voltage Yard (now replaced by the new Sebenza sub-station), a control room and workshop facilities.

Kelvin Power provides approximately 10% of the electricity required by City Power. It is currently the only generator connected to the new[1] R1.2 billion[2] City Power Sebenza substation, which has been described as the biggest substation in South Africa constructed in the last 10 years[3].

3.1.5 Kelvin Power A-Station

3.1.5.1 Process Description

The A-Station has an installed capacity of 180 MW comprising of six 30 MW turbo-alternators and eleven 85 ton/hr Babcock and Wilcox boilers. The steam conditions at the turbine stop valve are 454 °C and 41.3 bar.

During its operational period, coal was transported to the site by rail. The coal was fed by conveyors either directly to the A-Station or tipped onto the coal storage areas. The coal that was elevated to the A-Station by the conveyors was discharged into the coalbunkers from where it was fed to the chain grate system of the A-Station boilers. Figure 5 provides an overview of the process flow for the A-Station while Figure 6 provides a schematic representation of the electricity production process.

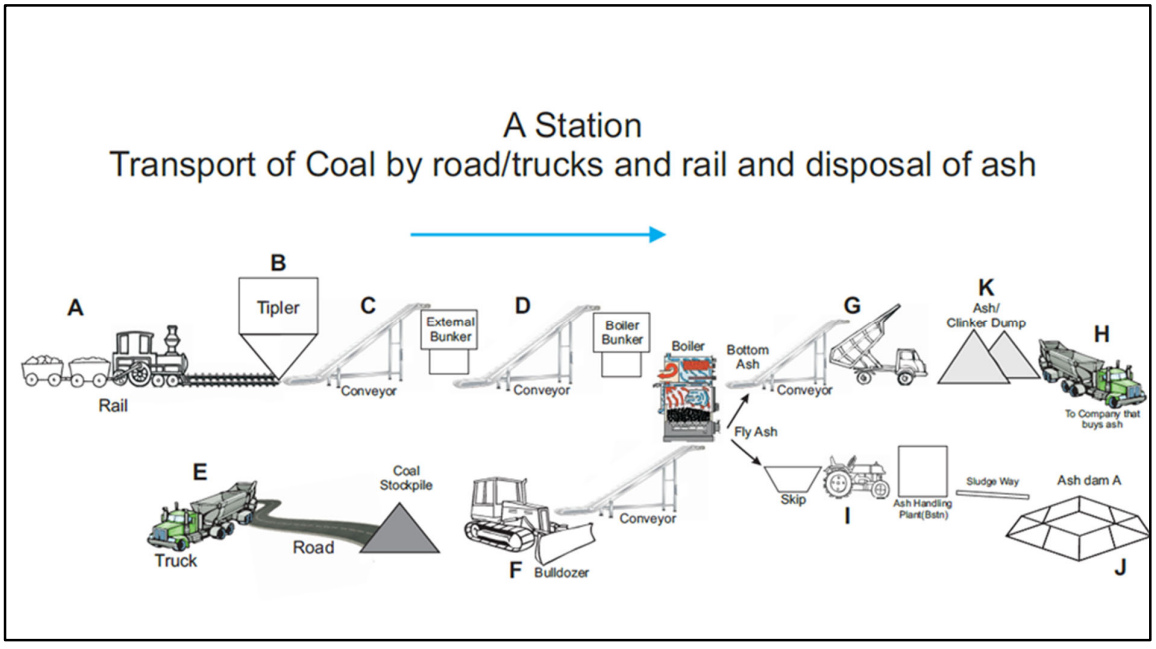


Figure 5: Process flow illustrating the inputs and outputs for the A-Station.

[1] https://www.engineeringnews.co.za/article/sebenza-substation-officially-opened-2019-02-07/rep_id:4136

[2] https://fourwaysreview.co.za/297038/city-launches-r1-2-billion-investment-sebenza-substation/

[3] https://www.concogrp.com/sebenza-biggest-substation-in-sa-in-10-years/

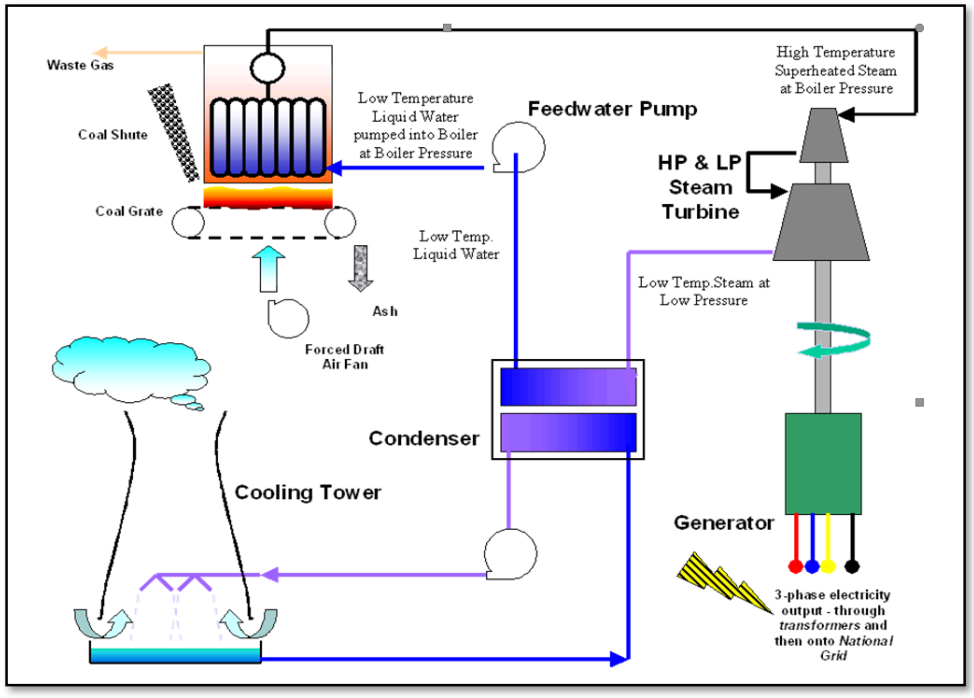


Figure 6: Schematic diagram of electricity production process

3.1.5.2 A-Station Infrastructure

The infrastructure associated with the A-Station occupies an area of approximately 13.75 ha and includes the following infrastructure as illustrated in Figure 7:

- A-Station building, including stacks.
- A-Station Cooling towers (3).
- Workshops.
- A-Station coal stockpile.
- A-Station Coal dry-store.
- A-Station Overland Ash Conveyor (removed).
- A-Station Wagon Tipplers.

3.1.5.3 Future of the A-Station

Since the A-Station infrastructure is very outdated a decision has been made to decommission and demolish the A-Station infrastructure, making the site available for future development.

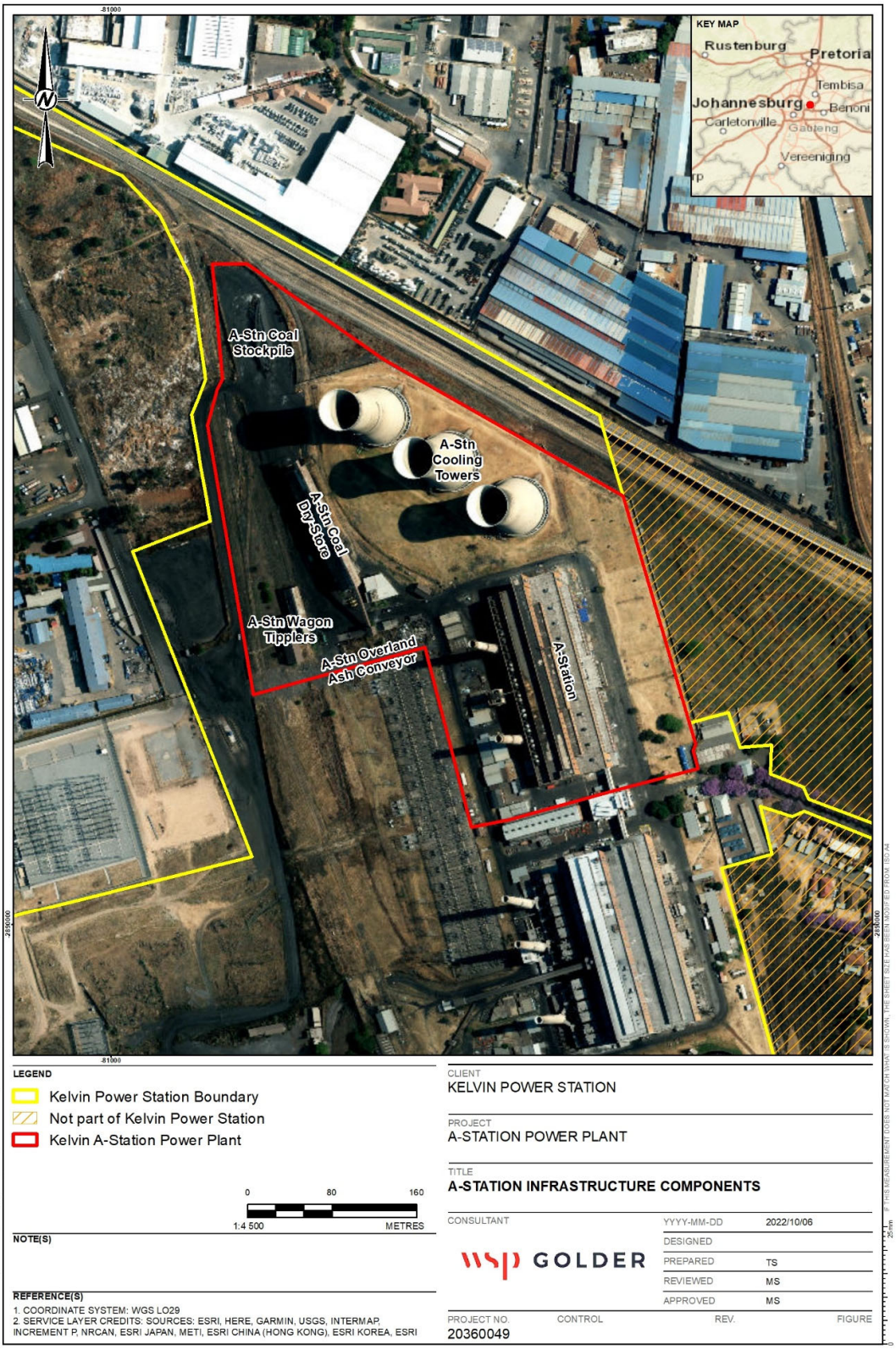


Figure 7: Kelvin Power A-Station Infrastructure

Table 6: A-Station Infrastructure

Infrastructure	Photo
A-Station building, including stack	
	
	

Infrastructure	Photo
A-Station cooling towers	
Workshops	
A-Station coal stockpile	

Infrastructure	Photo
A-Station Coal dry-store	
A-Station Wagon Tipplers	

3.1.5.4 Phases of the Project

Kelvin Power is proposing to appoint a demolition contractor to dismantle and demolish the redundant infrastructure associated with the A-Station Power Plant and leave behind land of undeveloped industrial quality on a stabilised and free draining site.

Kelvin Power intends on approaching the decommissioning and demolition of the A-Station infrastructure in three distinctive phases i.e., decommissioning, demolition and site clean-up.

During the decommissioning phase, usable assets such as machinery and equipment will be identified, dismantled and stored for either reuse at the B-Station or will be sold. It is anticipated that these items will be cleaned and decontaminated before removal from the A-Station site, as required.

Demolition will progress in a controlled manner, as determined by an appointed demolition contractor. Laydown areas, to be demarcated in consultation with the demolition contractor and Environmental Control Officer (ECO), will be utilised for the storage of waste skips, recyclables, inert concrete for crushing, offices and vehicle parking.

Waste, generated as part of the demolition process, will be separated, handled, recycled and disposed of in accordance with applicable waste management legislation, as detailed in the Waste Management Plan (Refer to Appendix G of the BAR) to various licenced waste management facilities in the vicinity of the site.

Hydrocarbon contamination and soil saturated by waste or waste which cannot be suitably cleaned by routine high-pressure cleaning will be identified visually and isolated for full removal and disposal. Site clean-up will be followed by confirmation through soil sampling and analysis.

It is anticipated that the demolition of the A-Station Power Plant will take approximately 12 months.

4.0 ENVIRONMENTAL IMPACT ASSESSMENT PROCESS AND METHODOLOGY

The significance of each identified impact was determined using the approach outlined below (terminology from the Department of Environmental Affairs and Tourism Guideline document on EIA Regulations, April 1998). This approach incorporates two aspects for assessing the potential significance of impacts, namely occurrence and severity, which are further sub-divided as follows:

Occurrence		Severity	
Probability of occurrence	Duration of occurrence	Scale/extent of impact	Magnitude (severity) of impact

To assess each of these factors for each impact, the following four ranking scales are used:

Probability	Duration
5 - Definite/don't know	5 - Permanent
4 - Highly probable	4 - Long-term
3 - Medium probability	3 - Medium-term (8 - 15 years)
2 - Low probability	2 - Short-term (0 - 7 years) (impact ceases after the operational life of the activity)
1 - Improbable	1 – Immediate
0 - None	
Scale	**Magnitude**
5 - International	10 - Very high/don't know
4 - National	8 - High
3 - Regional	6 - Moderate
2 - Local	4 - Low
1 - Site only	2 - Minor
0 - None	

Once these factors are ranked for each impact, the significance of the two aspects, occurrence and severity, is assessed using the following formula:

SP (significance points) = (magnitude + duration + scale) x probability

The maximum value is 100 significance points (SP). The impact significance will then be rated as follows:

SP >60	Indicates high environmental significance	An impact which could influence the decision about whether or not to proceed with the project regardless of any possible mitigation.
SP 30 – 60	Indicates moderate environmental significance	An impact or benefit which is sufficiently important to require management and which could have an influence on the decision unless it is mitigated.
SP <30	Indicates low environmental significance	Impacts with little real effect and which should not have an influence on or require modification of the project design.
+	Positive impact	An impact that constitutes an improvement over pre-project conditions

For the methodology outlined above, the following definitions were used:

- **Magnitude** is a measure of the degree of change in a measurement or analysis (e.g., the severity of an impact on human health, well-being, and the environment), and is classified as none/negligible, low, moderate, high, or very high/unknown.
- **Scale/Geographic** extent refers to the area that could be affected by the impact and is classified as site, local, regional, national, or international.
- **Duration** refers to the length of time over which an environmental impact may occur i.e. immediate/transient, short-term, medium term, long-term, or permanent.
- **Probability** of occurrence is a description of the probability of the impact occurring as improbable, low probability, medium probability, highly probable or definite.

4.1 Activities and Mitigation Measures for Decommissioning and Demolition Activities

Kelvin Power intends on approaching the decommissioning and demolition of the A-Station infrastructure in three distinctive sub-phases i.e., decommissioning, demolition and site clean-up. Activities associated with each of the sub-phase are described below, whereas Table 8 summarises the potential impacts of the aspects associated with the proposed activities, together with the appropriate mitigation measures to manage the identified potential impacts. Responsibilities for implementing the mitigation measures are identified and the timeframes are provided.

4.1.1.1 Decommissioning Sub-Phase

During the decommissioning phase, usable assets such as machinery and equipment will be identified, dismantled and stored for either reuse at the B-Station or will be sold. It is anticipated that these items will be cleaned and decontaminated before removal from the A-Station site, if required.

The waste that arises from this phase will largely be as a result of the dismantling and removal of various items. If required, decontamination will be done at existing wash bay facilities and the wash water from hose down will be managed *via* the existing dirty water management facilities at the site.

Laydown areas will be utilised for packing salvageable equipment and steel into containers, located on existing concrete areas.

4.1.1.2 Demolition Sub-Phase

Surfaces, inside the A-Station building, which have been exposed to contaminants will be decontaminated prior to demolition. In most instances, structural material will be cleaned to a standard appropriate to consider the material ready for recycling and/or transport off site. Building surfaces requiring cleaning would typically include residues such as the following:

- Staining, oily accumulations, non-liquid / tacky build-up, grease, dirt, grime, adhesives, paint build-up and ash on floors and shallow trenches.
- Residue on walls, rafters, structural members, interior structures, platforms, equipment, and other horizontal and vertical surfaces.
- PCB impact electrical substation floors, if included in the A-Station area.

The contaminated water, generated during the washing of contaminated areas, will be collected in existing sumps, pumped into drums and treated at the existing wash bay facilities.

Following decontamination, demolition will progress in a controlled manner, as determined an appointed demolition contractor. Laydown areas, to be demarcated in consultation with the Environmental Control Officer (ECO) and the demolition contractor, will be utilised for the storage of waste skips, recyclables and inert concrete for crushing.

The demolition contractor will be required to utilise conventional building dismantling/demolition techniques. Demolition will be executed by work methods which will minimise creating excessive noise and dust. Dust will be controlled by spraying water on the demolition area while using mechanical equipment to shear, scabble or grind.

Waste known to be hazardous will be removed from the respective buildings / areas, prior to commencement of full-scale demolition. The contractor will appoint suitably qualified and licensed subcontractors to remove, handle and transport hazardous waste to a licensed landfill site. The subcontractor will supply the main contractor with waste disposal certificates in accordance with Regulation GN R. 634 of 23 August 2013 (as amended), thus recording the chain of custody for these wastes. These procedures are important to all stakeholders to manage short-, medium- and long-term risks associated with hazardous waste material management especially.

Transport must be by approved / licenced contractors relative to the properties of the materials being transported. The transporter will be required to use vehicles, on-loading and off-loading equipment, personal protective equipment (PPE) and methodologies appropriate to the material being transported and handled. The transporter will provide chain of custody documentation for all shipments including a mandatory sign-off from the receiver of all materials with effective reference made to specific material documentation as provided. The receiver of materials will be advised of handling and disposal requirements and shall acknowledge their understanding at time of delivery.

An asbestos survey has been conducted by Kelvin Power. Asbestos will be removed ahead of demolition by a registered asbestos contractor as per the Asbestos Register kept by the site. Any demolition will require approved asbestos contractors to handle the asbestos material and full compliance with the Asbestos

Regulations will be required for the handling, storage, transport and disposal of asbestos containing waste. Buildings slated for demolition and buildings within which some internal concrete removal will take place will need to be given special consideration for removal of asbestos ahead of demolition or removal of internal concrete. The removal of asbestos requires special procedures for all types of asbestos which need to be elaborated by the asbestos removal specialist to conform to International Standards. Kelvin Power will update and maintain its Asbestos Register to ensure that all identified asbestos-containing materials are recorded and disposal is tracked.

The asbestos waste will be stored in sealed and labelled containers to avoid human contact. Any exposed asbestos will be kept wet to avoid the dispersion of particles. It will then be disposed in the sealed containers in a properly licensed Class A landfill, such as Holfontein.

In order to prevent the propagation of alien invasive plants, Kelvin Power will ensure that the removed plant matter is contained or destroyed appropriately. The plant material may be dried and burned in a licenced furnace, or could be turned into mulch and composted at a registered composting facility. Kelvin Power will hire a well-established garden waste contractor to ensure the safe management of this waste.

In instances where demolition of super structures results in the uncovering of cavities, inert concrete waste will be crushed to a pre-determined size for infilling purposes. Only less than 25 000 tonnes of inert crushed concrete waste will be used on-site as fill material for land forming (to prevent exceeding trigger thresholds for waste licensing unless authorised by or under other legislation, as stipulated in GN R. 921 of 29 November 2019, as amended), followed by being dressed with a growth medium in order for the surface to be safe and free draining. The remainder of inert concrete will be disposed to a licensed waste facility for crushing and use as cover material.

The site will be lit at night and the perimeter as well. Documentation on the utilisation of personnel and resources on a daily basis will be retained to provide health and safety control and assurance for personnel employed at the site. Warehouses and storage areas will display danger signs to warn employees of potential hazardous substances.

All hazardous substance storage areas will be inspected weekly by a Supervisor to monitor leaks or spills, and the supervisor must sign the inspection register. A responsible person will also be assigned responsibility for the spill kit. This person must check on a regular basis that the kit is complete, as per the inventory form checklist inside the spill kit. Suspected leaks or spills must be reported immediately and contained or treated to prevent damage.

It must be ensured that storm water drains are clean and free of debris and link to the respective outlets as per the storm water management plan.

4.1.1.3 Site Clean-up Sub-Phase

A contaminated land assessment (CLA) (Golder , 2022) was conducted in support of the environmental authorisation process for the decommissioning and demolition of the A-Station Power Plant. The CLA is based on the results of a CLA assessment conducted in 2015/16 (Golder, 2016 as cited by (Golder , 2022)), the groundwater assessment report (Golder, 2021) and a visual assessment of the areas of potential concern (AOPC) to confirm the validity of the CLA conducted in 2015/16 for the exposed areas of the plant and identify additional AOPC. Thirty AOPC were identified and discussed separately (Refer to Appendix G of the BAR).

Practical measures to be included in the pre-demolition (site preparation) and demolition phase is recommended where sufficient information was available to do so.

Golder (2016) concluded that the main source of contamination relates to coal and ash prominent on the site. Large areas are covered with a veneer of varying thickness of coal and ash material, even in grassed areas

around the A-Station cooling towers where the entire sample profile (1100 mm) consisted of black fine and coarse ash. A major focus was therefore assessing whether or not this material needs to be removed based on the CLA (Golder, 2016 as cited by (Golder , 2022)) and the groundwater assessment (Golder, 2021 as cited by (Golder , 2022)). These studies show that the coal and ash veneer does not seem to have a significant impact on the groundwater. The removal of all this material, especially from grassed areas is therefore not recommended provided that the next land use remain industrial.

However, areas covered in thick layers of residual coal will require the removal of at least the top 300 to 500 mm of the coal/ash veneer. Due to the high volumes, landfill disposal is not recommended due to the consequential environmental impact (in terms of, transport, greenhouse gas emissions, landfill airspace required).

Once site clean-up is completed a contaminated land assessment and rehabilitation study needs to be conducted by a registered soil scientist or contaminated land specialist dependent on the future plan for the use of that parcel of land. The depth of the study will depend on the observations made during demolition. It is currently indicated that the future land use will remain industrial and therefore a high level assessment will be sufficient to confirm that the demolision and clean up was completed to an acceptable level. Similarly, a more in depth study and risk assessment will be required if the exposed footprint shows high levels of contamination.

There are several AOPC where there is insuficient information to pronounce on the impact. These areas will need to be further investigated. This report details the scope of work for the CLA required for areas that need to be assessed before demolition commences and once footprints become available after site clean-up.

4.2 IMPACT MANAGEMENT AND MONITORING ACTIONS

This section summarises the potential impacts of the proposed decommissioning and demolition project on various environmental aspects Table 7 together with the appropriate mitigation measures to manage the identified impacts (Table 8). Responsibilities for implementing the mitigation measures are identified and the frequencies with which the results of the various measures are to be monitored (Table 9) are stated. The responsibility for monitoring and reporting the results to the appropriate level of management rests with the Environmental Control Officer.

Table 7: Impact Summary

No.	Aspect and Associated Impact	Impact Rating before Mitigation	Impact Rating after Mitigation
Decommissioning			
Groundwater			
1.1	A change in the groundwater quality	**4**	**4**
1.2	A change in the volume or recharge of groundwater/change in water level	**4**	**4**
1.3	Changes in land use	**0**	**0**
1.4	Possible change in the groundwater flow regime	**3**	**3**
1.5	A change on the quality of the surface water (receptor).	**4**	**4**
Cultural Heritage			
1.6	Removal of machinery and equipment which forms part of the history, and the way electrical power was generated in the past.	**60**	**16**
Traffic			

No.	Aspect and Associated Impact	Impact Rating before Mitigation	Impact Rating after Mitigation
1.7	Additional traffic on the road network during the decommissioning activities.	5	5
Demolition			
Groundwater			
2.1	A change in the groundwater quality	30	6
2.2	A change in the volume or recharge of groundwater, previously covered areas will be exposed with associated change in water level	21	21
2.3	Changes in land use	16	16
2.4	Possible change in the groundwater flow regime (building excavation)	12	12
2.5	A change on the quality of the surface water (receptor).	24	4
2.6	Possible spills from construction vehicles	18	4
Surface Water			
2.7	Disturbance of soil during infrastructure removal may release chemicals leading to run-off (and erosion) from disturbed areas to the existing stormwater system containing increased concentrations of total dissolved solids and metals and additional sediment.	24	16
Cultural Heritage			
2.8	No impacts expected, but chance finds with potentially moderate impacts could occur	42	12
Palaeontology			
2.9	No impacts expected, but chance finds with potentially moderate impacts could occur.	42	12
Air Quality			
2.10	Demolition of infrastructure, creating dust emission that will impact on receptors 1, 6 and 8.	48	30
2.11	Demolition of infrastructure, creating dust emissions that could impact on all remaining receptors.	30	24
Noise			
2.12	Demolition of infrastructure, creating noise levels that will impact on receptors 1, 2, 4, 6, 7 and 8.	48	30
2.13	Demolition of infrastructure, creating noise levels that could impact on all remaining receptors.	24	12
Socio-economic			
2.14	Potential health, safety and security impacts as a result of external contractors arriving to work in the local area.	13	12

No.	Aspect and Associated Impact	Impact Rating before Mitigation	Impact Rating after Mitigation
2.15	Formation of negative attitudes toward the proposed project.	**36**	**21**
2.16	Temporary job creation for qualifying companies during the decommissioning and demolition of the A-Station infrastructure.	**Positive**	**Positive**
Traffic			
2.17	Additional traffic on the road network during the demolition activities.	**5**	**5**
2.18	The unavailability of adequate public transport facilities and pedestrian sidewalks for contractors commuting to the project site.	**18**	**5**
Topography			
2.19	Impact on topography as a result of the decommissioning and demolition of the site.	**24**	**10**
Soils			
2.20	Impact on soils due to potential spillage of chemicals, incorrect waste handling and storage, storm water or decontamination water carrying colloidal contamination off site and windblown disturbance of stockpiled or bagged product / waste during the decommissioning phase.	**42**	**12**
2.21	Impact on soils due to the incorrect handling and storage of demolition material and waste during the demolition phase.	**33**	**12**
Terrestrial Biodiversity			
2.21	Impact on off-site flora as a result of the decommissioning and demolition activities.	**30**	**12**

Table 8: Mitigation Measures for the Decommissioning, Demolition and Site Clean-up Phases

No.	Aspect and Associated Impact	Management / Mitigation Measures	Mitigation Type	Time period for implementation	Standards to be achieved	Compliance with Standards	Responsible Person
4.2.1	**Groundwater**						
4.2.1.1	A change in the groundwater quality	No noticeable impact change expected during the decommissioning phase, no mitigation required during Decommissioning Phase. Groundwater monitoring (water levels and quality) should be used to confirm that the groundwater quality remains unchanged.	N/A	Duration of decommissioning phase	Groundwater quality limits in Kelvin Power WUL.	Implement the proposed mitigation measures to ensure compliance to the Kelvin Power WUL conditions.	Kelvin Power SHEQ Manager Demolition Contractor
4.2.1.2	A change in the volume or recharge of groundwater/change in water level						
4.2.1.3	Changes in land use						
4.2.1.4	Possible change in the groundwater flow regime						
4.2.1.5	A change on the quality of the surface water (receptor).						
4.2.1.6	A change in the groundwater quality	▪ Continue with existing groundwater monitoring programme (water levels and quality). ▪ Monitor for changes in water quality down gradient from Kelvin Power A-Station (KPS-MON03, KPS-BH-03, KPS-MON16 and KPS-MON04). ▪ All vehicles and machinery to be kept in good working order and inspected on a regular basis for possible leaks and shall be repaired as soon as possible if required. ▪ Vehicle repairs to be carried out in a dedicated repair area only, unless in-situ repairs are required. ▪ Drip trays shall always be placed under vehicles that require in-situ repairs. ▪ Drip trays to be emptied at designated containers and be disposed at licensed hazardous material disposal facility. ▪ Soil spills will be treated in-situ using sand, soil, or cold coal-ash as absorption medium. The contaminated material must be disposed of in accordance with the specifications prescribed by the Waste Management Plan.	Minimise and control through impact management and monitoring	Duration of demolition phase	Groundwater quality limits in Kelvin Power WUL.	Implement the proposed mitigation measures to ensure compliance to the Kelvin Power WUL conditions.	Kelvin Power SHEQ Manager Demolition Contractor
4.2.1.7	A change in the volume or recharge of groundwater, previously covered areas will be exposed with associated change in water level						
4.2.1.8	Changes in land use						
4.2.1.9	Possible change in the groundwater flow regime (building excavation)						
4.2.1.10	A change on the quality of the surface water (receptor).						
4.2.1.11	Possible spills from construction vehicles						
4.2.2	**Surface Water**						
4.2.2.1	Disturbance of soil during infrastructure removal may release chemicals leading to run-off (and erosion) from disturbed areas to the existing stormwater system containing increased concentrations of total dissolved solids and metals and additional sediment.	▪ Avoid clearing during heavy rainfall periods if possible (December, January, and February); try to do clearing during winter so that run-off will be limited. ▪ Only clear working areas and within the targeted footprint. ▪ Procedures on land clearance, soils handling and rehabilitation plan to be adhered to, including removal of contaminated material to a licenced waste disposal site. ▪ Maintain, and develop if needed, adequate berms and stormwater collection facilities to capture sediment before it enters the existing stormwater system and the Modderfonteinspruit.	Avoid, minimize, rehabilitate / repair.	Duration of demolition phase	Impact avoided	Implement the proposed mitigation measures to ensure compliance to the WUL conditions.	Kelvin Power SHEQ Manager Demolition Contractor

No.	Aspect and Associated Impact	Management / Mitigation Measures	Mitigation Type	Time period for implementation	Standards to be achieved	Compliance with Standards	Responsible Person
		■ Remove and dispose of soils within areas that have been subjected to high concentrations of contaminants over the years with as little exposure to rainfall as possible to limit contaminated run-off, after assessing level of contaminants and potential for reuse elsewhere. ■ Maintain Main Channel and clear any sediment should it be noted, ensuring that the sediment is removed and responsibly disposed to a licenced waste disposal site if it is found to be contaminated. ■ Ensure spill kits are on site with staff adequately trained to use them, if needed. ■ Drainage channels and sedimentation ponds (even temporary) must be maintained and developed if necessary. ■ Contaminated water, generated during the decommissioning and demolition activities, must be managed in accordance with the existing water management procedures and infrastructure at Kelvin Power to prevent any contaminated water from leaving the site. ■ Continue the surface water monitoring programme, however, undertake the following additional sampling: before decommissioning starts, and monthly during decommissioning, undertake a full spectrum of metals analyses and hydrocarbons at sampling points K1 and K2.					
4.2.2.2	Surface water drainage post demolition.	Shape the open areas to achieve free draining surfaces.	Minimise and control through impact management and monitoring.	Site clean-up post demolition	Impact avoided	N/A	Kelvin Power SHEQ Manager Demolition Contractor
4.2.3	**Cultural Heritage**						
4.2.3.1	Removal of machinery and equipment which forms part of the history, and the way electrical power was generated in the past.	■ A selection of the old machinery, equipment and tools associated with the A-Station to be preserved and displayed at the Kelvin Power Station as part of the preservation of its history. The selection will be determined in consultation with the heritage specialist and the Gauteng Provincial Heritage Resources Authority (Gauteng-PHRA). ■ The provision & use of the non-sensitive and non-confidential original drawings and plans of the A-Station as part of a display on the history of Kelvin Power Station at the site. ■ The erection of a display panel or panels describing the history of Kelvin Power Station and its function and role in the generation and supply of electricity to the greater Johannesburg region. ■ The application for and obtaining a Demolition Permit from the Gauteng Provincial Heritage Resources Authority (Gauteng-PHRA) for the demolition of the A-Station at Kelvin Power Station.	Minimise and control through impact management and monitoring	Duration of decommissioning phase	N/A	N/A	Kelvin Power SHEQ Manager Demolition Contractor

No.	Aspect and Associated Impact	Management / Mitigation Measures	Mitigation Type	Time period for implementation	Standards to be achieved	Compliance with Standards	Responsible Person
		▪ The selection of old machinery, equipment, tools, drawings and plans will be determined in consultation with the heritage specialist and the Gauteng Provincial Heritage Resources Authority (Gauteng-PHRA).					
4.2.3.2	No impacts expected, but chance finds with potentially moderate impacts could occur	▪ Chance find procedure to be implemented immediately should any heritage resources be unearthed: ▪ Cease all work in the immediate vicinity of the find. ▪ Demarcate the area with barrier tape or other highly visible means. ▪ Notify the South African Heritage Resources Agency (SAHRA) immediately. ▪ Commission an archaeologist accredited with the Association for Southern African Professional Archaeologists (ASAPA) to assess the find and determine appropriate mitigation measures. ▪ Prevent access to the find by unqualified persons until the assessment and mitigation process have been completed.	Minimise and control through impact management and monitoring.	Duration of demolition phase	Impact avoided	By monitoring demolition activities and implementing the chance find procedure, damage to heritage resources can be avoided.	Kelvin Power SHEQ Manager Demolition Contractor
4.2.4	**Palaeontology**						
4.2.4.1	No impacts expected, but chance finds with potentially moderate impacts could occur	▪ Chance find procedure to be implemented immediately should any heritage resources be unearthed: ▪ Cease all work in the immediate vicinity of the find. ▪ Demarcate the area with barrier tape or other highly visible means. ▪ Notify the South African Heritage Resources Agency (SAHRA) immediately. ▪ Commission an archaeologist accredited with the Association for Southern African Professional Archaeologists (ASAPA) to assess the find and determine appropriate mitigation measures. ▪ Prevent access to the find by unqualified persons until the assessment and mitigation process have been completed.	Minimise and control through impact management and monitoring.	Duration of demolition phase	Impact avoided	By monitoring demolition activities and implementing the chance find procedure, damage to palaeontological resources can be avoided.	Kelvin Power SHEQ Manager Demolition Contractor
4.2.5	**Soils**						
4.2.5.1	Impact on soils due to potential spillage of chemicals, incorrect waste handling and storage, storm water or decontamination water carrying colloidal contamination off site during the decommissioning phase.	▪ Ensure spills caused as a result of equipment dismantling is remediated *in situ* and/or removed in accordance with the project's spill response procedure. ▪ Ensure all general rubble, fugitive waste and hazardous waste is stored and removed in accordance with the Waste Management Plan. ▪ All hazardous substance storage areas must be inspected weekly by a Supervisor to monitor leaks or spills and an inspection register must be kept.	Minimise and control through impact management and monitoring.	Duration of demolition phase	Impact avoided	By regular inspection of the demolition areas	Kelvin Power SHEQ Manager Demolition Contractor

No.	Aspect and Associated Impact	Management / Mitigation Measures	Mitigation Type	Time period for implementation	Standards to be achieved	Compliance with Standards	Responsible Person
		▪ Ensure that spill kits are available at all hazardous waste storage areas and that clean up procedures are followed at all times.					

4.2.5.2	Impact on soils due to incorrect handling and storage of demolition material and waste during the demolition phase.	▪ All readily identifiable waste streams to be classified and waste disposal requirements to be verified prior to disposal.
		▪ All assets that are removed and infrastructure that is dismantled must be stored in the respective lay-down areas in such a manner that it will not impact on the surrounding area.
		▪ Ensure that all demolished infrastructure and screened wastes are stored in the designated laydown areas.
		▪ Demolition, removal and handling of infrastructure and waste must be conducted as per the specifications prescribed by the Waste Management Plan and should include the following:
		  ▪ Compile a Safety Data Sheet (SDS) for each hazardous waste stream not already pre-classified in accordance with SANS 10234;
		  ▪ Classify and labelling waste in accordance with SANS 10234:2008 (Global Harmonised System); and
		  ▪ Adhere to Sections 16, 17, 18 and 38, 47 and 48 of the City of Ekurhuleni Metropolitan Municipality Integrated Waste Management By-laws, dated 25 March 2021.
		▪ Ensure buildings / infrastructure are demolished in a phased manner, whilst sorting and screening of wastes are done as close as possible to the footprint area of the building being demolished.
		▪ Ensure that all concrete, bricks and steel are decontaminated, where applicable.
		▪ Ensure that the transport and disposal of general and hazardous waste streams is undertaken as per the Waste Management Plan.
			Minimise and control through impact management and monitoring.	Duration of demolition phase	Impact avoided	By regular inspection of the demolition areas	Kelvin Power SHEQ Manager
							
							Demolition Contractor

4.2.6	**Air Quality**						
4.2.6.1	Demolition of infrastructure, creating dust emission that will impact on receptors 1, 6 and 8	**Truck loading and unloading activities:** ▪ Modify or cease loading activities during dry and windy conditions.	Minimise and control through impact	Duration of demolition phase	Complinace with NAAQS[4] at the site boundary.	By implementing dust control measures at	Kelvin Power SHEQ Manager

[4] National Ambient Air Quality Standards (GN R. 1210 of December 2009, as amended)

	Demolition of infrastructure, creating dust emissions that could impact on all remaining receptors	■ Avoid double handling of material where possible.
		■ Minimising the drop height of the material from truck loads/transfer points:
		  ▪ A drop height policy should be maintained on-site, and all equipment operators should be trained in the policy such that drop height reduction is implemented during materials handling activities.
		■ Using water carts with boom sprayers or wet suppression systems.
		Wind Erosion:
		■ Windbreaks in the form of shade cloth screens should be erected at exposed areas, and as such reduces the wind speed across the surface of the ground (higher wind speeds tend to scour the surface, leading to dust entrainment and subsequent transportation) and therefore reducing the impact of dust emissions on the surrounding environment.
		■ To decrease the erosion potential of stockpiles during the proposed decommissioning and demolition activities, the following mitigation techniques are recommended:
		  ▪ Water hose spray/ wet suppression system as required.
		  ▪ Temporary stockpiles be enclosed by porous walls.
		  ▪ Small, temporary stockpiles can be covered with a porous sheet (preferably hessian).
		  ▪ Maintaining the stockpile moisture level to avoid further entrainment of particles.
		Vehicle Entrainment on Roads and Exhaust Emissions:
		■ To adequately mitigate emissions of dust associated with vehicle entrainment and exhaust emissions, the following key recommendations are suggested:
		  ▪ The use of water as a dust suppressant on unpaved roads, which can reduce emissions by approximately 75%.
		  ▪ Paved areas within the decommissioning and demolition area must be washed down twice a week.
		  ▪ Implement vehicle speed and access restrictions within the site (approximately 10 – 20 km/h) and try to limit the amount of traffic using the roads.
		  ▪ Plan routes to be away from residents and other sensitive receptors.
		  ▪ Prioritising source reduction measures through the use of the most direct travel routes on site and using larger capacity trucks to minimise the amount of trips.
		  ▪ Vehicles carrying loose aggregate should be covered with tarpaulins or sheets at all times.
			management and monitoring.			significant emission sources, the cumulative ambient particulate load will be reduced.	Demolition Contractor

No.	Aspect and Associated Impact	Management / Mitigation Measures	Mitigation Type	Time period for implementation	Standards to be achieved	Compliance with Standards	Responsible Person
		▪ Prevention of material deposition onto haul roads by avoiding overloading of truck loads resulting in spillages on the roads and ensure adequate storm water drainage to prevent water erosion of the roads. ▪ Vehicles need to be clean. Washing facilities, such as hose-pipes and ample water supply should be provided at site exits, including mechanical wheel spinners where practicable. If necessary, all vehicles should be washed down before exiting the site. ▪ Vehicles and equipment should not emit black smoke from exhaust systems except during ignition at start-up. ▪ Engines and exhaust systems should be maintained so that exhaust emissions do not breach statutory emission limits set for the vehicle/equipment type and mode of operation. **Crushing and Screening:** ▪ To adequately mitigate emissions of dust associated with crushing and screening of material wet suppression systems should be utilised as required. **Complaints:** ▪ Dust related complaints should be directed to the site management and any actions arising from a complaint should be recorded in a complaint register to be maintained by the ECO.					
4.2.7	**Noise**						
4.2.7.1	Demolition of infrastructure, creating noise levels that will impact on receptors 1, 2, 4, 6, 7 and 8	▪ Planning decommissioning activities in consultation with local communities so that activities with the greatest potential to generate noise are planned during periods of the day that will result in least disturbance. Information	Minimise and control through impact	Duration of demolition phase	SANS 10103:2008[5]	By implementing noise control measures at	Kelvin Power SHEQ Manager

[5] SANS 10103:2008 – The measurement and rating of environmental noise with respect to annoyance and to speech communication.

No.	Aspect and Associated Impact	Management / Mitigation Measures	Mitigation Type	Time period for implementation	Standards to be achieved	Compliance with Standards	Responsible Person
	Demolition of infrastructure, creating noise levels that could impact on all remaining receptors	regarding construction activities should be provided to all local communities. Such information includes: ▪ Proposed working times. ▪ Anticipated duration of activities. ▪ Explanations on activities to take place and reasons for activities. ▪ Contact details of a responsible person on site should complaints arise. ▪ When working near (within 100 m) a potential sensitive receptor, limit the number of simultaneous activities to a minimum as far as possible. ▪ Avoiding or minimising project transportation through community areas. ▪ Using noise control devices, such as temporary noise barriers and deflectors for high impact activities. ▪ Strict enforcement of speed limits such as a limit of 20 km/hr, will aid in limiting any additional noise along internal roads. ▪ Selecting equipment with the lowest possible sound power levels. ▪ All equipment used on the site should be equipped with effective mufflers that are maintained in good condition. ▪ Direct principal noise sources (e.g. exhausts) away from noise-sensitive places as far as possible. ▪ Fitting of equipment with effective and properly maintained noise suppression equipment consistent with the requirements of the activity, where possible. ▪ Ensure equipment utilised is maintained and operated as per manufacturers' specifications. ▪ The noise level of audible warning devices should be kept to the minimum necessary for the health and safety of employees. ▪ Establishing noise deflection walls such as berms. ▪ Decommissioning, demolition and site clean-up activities will only take place between 07:00 and 17:00 on Mondays to Fridays, 07:00 to 13: 00 on Saturdays, excluding Sundays and Public Holidays. ▪ A notice will be placed in a conspicuous position, informing stakeholders of the agreed hours of work and prior to any activities taking place that could cause a disturbance or risk.	management and monitoring.			significant sources, the cumulative noise levels will be reduced.	Demolition Contractor

No.	Aspect and Associated Impact	Management / Mitigation Measures	Mitigation Type	Time period for implementation	Standards to be achieved	Compliance with Standards	Responsible Person
4.2.8	**Socio-economic**						
4.2.8.1	Potential health, safety and security impacts as a result of external contractors arriving to work in the local area.	▪ To prevent any potential impacts from this variable on proximate residential areas, construction workers should limit their movement to the work site. ▪ The movement of unknown individuals through projected sites should be avoided at all costs. ▪ Discuss safety and security issues and the construction schedule with the Ward Councilor, the local community policing forum, and the SAPS, where applicable. ▪ It is recommended that the demolition area be fenced. ▪ There should be control over access to the demolition area. ▪ The workers must possess identity cards and be distinguishable, for example, by wearing company apparel. ▪ Health, safety and security training must be provided to all project personnel and contractors.	Minimise and control through impact management and monitoring.	Duration of demolition phase	N/A	N/A	Kelvin Power SHEQ Manager Demolition Contractor
4.2.8.2	Formation of negative attitudes toward the proposed project.	▪ Establish a dedicated grievance and consultation procedure for the project. The appointment of a community liaison officer (CLO) is recommended. The CLO will interact with stakeholders, address grievances, provide information, and consult with them regularly. ▪ Engage with communities in a transparent manner using the grievance management and consultation procedure. ▪ Inform the recipient communities of project events, expected loud noises and so forth. The CLO can play a significant role in this process. ▪ Closely supervise the contractor workforce to prevent them from leaving the demolition site, minimise social interaction with the recipient communities, and avoid social ills such as drunkenness, substance abuse, or trade.	Minimise and control through impact management and monitoring.	Duration of demolition phase	N/A	N/A	Kelvin Power SHEQ Manager Demolition Contractor
4.2.9	**Resource Efficiency**						
4.2.9.1	Use of potable water during the demolition activities.	▪ Drive awareness on water conservation to ensure that all involved understand the importance of reducing the project's water footprint. This will be achieved through induction and toolbox talks to ensure that contractors are aware of their individual roles in attaining water efficiency. ▪ Use of water-efficient temporary sanitation facilities during demolition activities. ▪ Investigate the use of recycled grey water as an alternative source for daily onsite activities including dust suppression during the demolition activities. ▪ Consider implementation of water-wise dust suppression techniques such as misting or atomizing systems that use minimal water.	Minimise and control through impact management and monitoring.	Duration of demolition phase	N/A	N/A	Kelvin Power SHEQ Manager Demolition Contractor

No.	Aspect and Associated Impact	Management / Mitigation Measures	Mitigation Type	Time period for implementation	Standards to be achieved	Compliance with Standards	Responsible Person
4.2.9.2	Use of electricity during the demolition activities.	▪ Demolition activities should optimise daylight hours to reduce the need for lighting. ▪ Optimise the use of energy-efficient tools and equipment throughout the demolition activities. ▪ In the pursuit of promoting employment, labour intensive activities will be considered as preferred over mechanical demolition where practical and possible.	Minimise and control through impact management and monitoring.	Duration of demolition phase	N/A	N/A	Kelvin Power SHEQ Manager Demolition Contractor
4.2.10	**Traffic**						
4.2.10.1	Additional traffic on the road network during the demolition activities.	Additional expected traffic on the road network will have a negligible impact on the service levels in the study area. No mitigation of the road network, from a capacity point of view, is thus required to support the demolition and removal works.	N/A	Duration of demolition and decommissioning phases	N/A	N/A	N/A
4.2.10.2	The unavailability of adequate public transport facilities and pedestrian sidewalks for contractors commuting to the project site.	A minimum 2.0-meter-wide paved sidewalk is recommended on the northern side of Shrike Road between Zuurfontein Road and the Kelvin Power Station to segregate pedestrians and vehicles. This will not only benefit pedestrians during the project phase but also during the future operational phase of the Kelvin Power Station.	Minimise and control through impact management and monitoring.	Duration of demolition and decommissioning phases	N/A	N/A	Kelvin Power SHEQ Manager
4.2.11	**Topography**						
4.2.11.1	Impact on topography as a result of the decommissioning and demolition of the site.	▪ Backfill excavations with approved and decontaminated crushed concrete or graded and compacted fill material[6]. ▪ Cover backfilled area with 300mm clean soil sourced on site (if possible) or alternatively affected soils that have been treated to rectify the pH to above 5.5. ▪ Shape and profile the disturbed surface areas to match surrounding topography and to be free draining. ▪ Protect the exposed surface from erosion by placing a graded fill cover or cladding with ballast or gravel.	Minimise and control through impact management and monitoring.	Duration of demolition and decommissioning phases	N/A	N/A	Kelvin Power SHEQ Manager
4.2.12	**Terrestrial Biodiversity**						
4.2.12.1	Alien and invasive species control.	▪ Regularly inspect cleared areas for alien and invasive species. ▪ Implement eradication and control programmes as necessary.	Minimise and control through impact management and monitoring.	Site clean-up post demolition	Impact avoided	N/A	Kelvin Power SHEQ Manager Demolition Contractor

[6] Only less than 25 000 tonnes of inert crushed concrete waste will be used on-site as fill material for land forming (to prevent exceeding trigger thresholds for waste licensing), unless authorised by or under other legislation, as stipulated in GN R. 921 of 29 November 2019, as amended.

Table 9: Monitoring Plan

Aspect	Impact Requiring Monitoring Programmes	Functional Requirements for Monitoring	Monitoring Locations	Parameters	Roles and Responsibilities	Monitoring and Reporting Frequency and Time Period for Implementing Impact Management Actions.
Groundwater	To understand possible impacts on groundwater quality as a result of the decommissioning and demolition activities.	Groundwater monitoring of water levels and quality should continue as per WUL no. 03/A21C/FGH/1110 – 24/06/2011 on quarterly and annual frequency. Monitor for changes in water quality down gradient from Kelvin Power A-Station.	▪ KPS-MON03 ▪ KPS-BH-03 ▪ KPS-MON16 ▪ KPS-MON04	As stipulated in the Kelvin Power WUL	Kelvin Power SHEQ Manager	Quarterly and annually, as detailed in WUL no. 03/A21C/FGH/1110 – 24/06/2011.
Surface water	To understand possible impacts on surface water quality as a result of the decommissioning and demolition activities.	Surface water monitoring programme must be continued as per WUL no. 03/A21C/FGH/1110 – 24/06/2011	Surface water monitoring points as stipulated in the WUL.	As per WUL conditions.	Kelvin Power SHEQ Manager	As per WUL conditions.
Surface water	To understand possible impacts on surface water quality as a result of the decommissioning and demolition activities.	Before decommissioning starts, and monthly during decommissioning, undertake a full spectrum of metals analyses and hydrocarbons at sampling points K1 and K2 to assess the impacts from the decommissioning, and	▪ K1 (Modderfonteinspruit upstream of effluent discharge) ▪ K2 (Modderfonteinspruit downstream of effluent discharge,	Full spectrum	Kelvin Power SHEQ Manager	Monthly

Aspect	Impact Requiring Monitoring Programmes	Functional Requirements for Monitoring	Monitoring Locations	Parameters	Roles and Responsibilities	Monitoring and Reporting Frequency and Time Period for Implementing Impact Management Actions.
		inform additional mitigation that may need to be implemented to limit downstream impacts.	as well as a drainage line emanating from the industrial area north of Kelvin Power ash dams)			
Air Quality	Emissions concentrations causing exceedances of the NAAQS beyond the mine boundary.	Continued dust fallout monitoring using single direction dust buckets.	Continued dust fallout monitoring, as per current programme, using single direction dust buckets.	As per the National Dust Control Regulations.	Kelvin Power SHEQ Manager	Monthly
Noise	Noise levels that could cause disturbance at nearby sensitive receptors.	Period noise monitoring at neighbouring sensitive receptors such as 1, 2, 4, 6, 7 and 8[7].	At sensitive receptors such as 1, 2, 4, 6, 7 and 8.	As per SANS 10103:2008.	Kelvin Power SHEQ Manager	Quarterly during the demolition activities.

[7] Refer to Figure 4.

5.0 MANAGEMENT PROCEDURES AND ADMINISTRATIVE REQUIREMENTS

5.1 Organisational Structure and Responsibilities

Responsibilities, to ensure that key management measures / procedures are followed, for the Kelvin Power Project Manager, Demolition Contractor, Environmental Control Officers and sub-contractors are detailed in Table 10.

Table 10: Roles and Responsibilities

Responsible Person	Responsibilities
Kelvin Power Project Manager	■ Ensure that copies of the EA and EMPr are available onsite at all times for the duration of the project. ■ Be fully conversant with the content of the BAR, the conditions of the environmental authorisation (EA) and relevant licenses and the commitments in the EMPr. ■ Have overall responsibility for the implementation of the conditions of the EA and the EMPr. ■ Ensure that all conditions of the EA and EMPr are communicated to and adhered by the demolition contractor and its employees and sub-contractor(s). ■ Appoint an independent ECO before the commencement of the demolition activities to monitor and report on the level of compliance with the conditions of the EA as well as the implementation of the approved EMPr. ■ Ensure that internal audits are conducted to ensure/assess compliance with the conditions of the EA and the EMPr. ■ Update the EMP as new information becomes available that highlights any deficiency in the current plan, or if the nature of the proposed decommissioning, demolition and remediation activities changes in a way, necessitating amendment of the proposed management measures.
Demolition contractor, sub-contractors	■ Be fully conversant with the content of the BAR for the Proposed Project, the conditions of the environmental authorisation (EA) and relevant licenses and the commitments in the EMPr. ■ Be fully conversant with all relevant environmental legislation and Kelvin Power's environmental policies and procedures and ensure compliance thereto. ■ Appoint an Environmental Officer within the team to monitor the day-to-day activities and compliance to the requirements of the Environmental Authorisation and the EMPr.

Responsible Person	Responsibilities
	■ Develop method statements (refer to Section 0). ■ Liaise with the Project Manager or his delegate, the Environmental Officer, the ECO and others on matters concerning the environment. ■ Prevent actions that will harm or may cause harm to the environment and take steps to prevent pollution and unnecessary degradation onsite. ■ Confine project activities to demarcated areas. ■ Maintain the following: ▪ A site diary. ▪ An incident register. ▪ A complaints register; and ▪ A register of audits.
Environmental Control Officer	■ A suitably qualified ECO who will, on a two-weekly basis (or as necessary depending on the demolition activities), monitor and report monthly (or as per the frequency stipulated in the EA) on the project compliance with the conditions of the EA and the EMPr. ■ Be fully conversant with the content of the BAR for the Proposed Project, the conditions of the environmental authorisation (EA) and relevant licenses and the commitments in the EMPr. ■ Review and approve method statements. ■ Remain employed until the completion of the demolition and site clean-up activities. ■ Report all findings identified onsite to the Project Manager. Take appropriate action if the specifications contained in the EA and the EMPr are not followed ■ Convey the contents of the conditions of the EA and the EMPr to the relevant site staff and discuss the contents in detail with the Kelvin Power Project Manager and demolition contractor. ■ Provide any training to EPC staff on the approvals and EMPr, as required.

5.2 Environmental Method Statements

Method Statements are written submission by the contractor to the Kelvin Power Project Manager and the ECO in response to the requirements of this EMPr, or as requested by the ECO. The contractor shall be required to prepare Method Statements for several specific decommissioning and demolition activities and/or environmental management aspects. The Method Statement set out the plan, materials, labour and method that the contractor proposes to use to conduct a specific task or activity in order for the Kelvin Power Project Manager and the ECO to assess whether the contractor's proposed actions is in accordance with the requirements of this EMPr.

The contractor shall not commence the activity for which a Method Statement is required until the Kelvin Power Project Manager and the ECO have approved the relevant Method Statement. Method Statements must be submitted and accepted or rejected timeously. Failure to submit a Method Statement may result in suspension of the activity concerned until such time as a Method Statement have been submitted and approved.

Any changes to a method of work must be reflected by amendments to the original approved Method Statement and approved by the Kelvin Power Project Manager and the ECO.

The Method Statements shall cover relevant details with regard to:

- Proposed decommissioning and demolition activities.
- Delineation, establishment and management of demolition laydown areas including location and extent (this would be indicated on a site plan).
- Materials and equipment to be utilised.
- Procedures for transporting materials and equipment to/from site (entry/exit points and turning areas would be indicated on the site plan).
- Method and location for storage of waste, recyclables and concrete (this would be required to be indicated on a site plan).
- Procedures for containment of leaks/spills as well as associated Emergency Response.
- Management of stormwater.
- Dust and noise control.
- Fire prevention.
- Solid and liquid waste management.
- Erosion control.
- Equipment maintenance.
- Roles and responsibilities of the Contractor's key personnel concerning environmental management.

This Method Statement will be used in conjunction with the EMPr during project.

6.0 ENVIRONMENTAL AWARENESS PLAN

Conditions pertaining to environmental management will be included in all operational contracts, thereby making contractors aware of the potential environmental risks associated with the project and the necessity of implementing good environmental and housekeeping practices.

The following principles will apply to the Environmental Awareness Plan training:

- All personnel, including contactors will undergo general safety, health and environmental (SHE) induction and environmental management system (EMS) training.
- The Safety, Health, Environmental and Quality (SHEQ) Manager will identify the SHE training requirements for Kelvin Power's personnel and contractors. The training requirements will be recorded in a training needs matrix indicating particular training that must be undertaken by identified personnel and contractors. The training matrix will be administered by Kelvin Power's Human Resources (HR) Department; and
- Development of the Training Programme, which will include:
  - Job-specific training – training for personnel performing tasks which could cause potentially significant environmental impacts.
  - Assessment of extent to which personnel are equipped to manage environmental impacts.
  - Basic environmental training.
  - Training on emergency response, spill management, etc.
  - Training verification and record keeping.
  - Periodic re-assessment of training needs, with specific reference to new developments, newly identified issues and impacts and associated mitigation measures.

6.1 General Awareness Training

The HR Manager, together with the SHEQ Manager, will be responsible for the development of, or facilitating the development of, the required general SHE induction and awareness training. A general environmental awareness training module will be developed and integrated into the general induction programme. The general awareness training must include the Environmental Policy, a description of the environmental impacts and aspects and the importance of conformance to requirements, general responsibilities of Kelvin Power personnel and contractors with regard to the conditions of the EA and requirements of the EMPr and a review of the emergency procedures and corrective actions; and

A Training Practitioner or the ECO will conduct the general awareness training. The training presenter will keep a record of the details of all persons attending general awareness training. Such attendance registers shall indicate the names of attendants and their organisations, the date and the type of training received.

6.2 Specific Environmental Training

Specific environmental training will be in line with the requirements identified in the training matrix; and

Personnel whose work tasks can impact on the environment will be made aware of the requirements of appropriate procedures/work instructions. The SHEQ Manager will communicate training requirements to responsible supervisors to ensure that personnel and contractors are trained accordingly.

6.3 Training Evaluation and Re-training

The effectiveness of the environmental training will be reflected by the degree of conformance to EMPr requirements, the results of internal audits and the general environmental performance achieved at the mine.

Incidents and non-conformances will be assessed through an internal incident investigation and reporting system, to determine the root cause, including the possible lack of awareness/training.

Should it be evident that re-training is required, the SHEQ Manager will inform the Heads of Departments of the need and take the appropriate actions.

General awareness training of all personnel shall be repeated annually.

The re-induction shall take into consideration changes made in the EMPr, changes in legislation, the site's current levels of environmental performance and areas of improvement.

6.4 Emergency Procedures

The following emergency procedures are relevant to the project:

- The SHEQ Manager shall define emergency reporting procedures for the site.
- All personnel shall be made aware of emergency reporting procedures and their responsibilities.
- Any spills will be cleaned up immediately in accordance with relevant legislation.
- Telephone numbers of emergency services, including the local firefighting service, shall be conspicuously displayed.

7.0 UNDERTAKING

The environmental assessment practitioner hereby confirms:

- The correctness, to the best of his knowledge, of the information provided in the specialist reports and of information provided by Kelvin Power. The information was accepted as being as reliable as information generated during an EIA and a feasibility study, and provided in good faith, can be.
- The inclusion of comments and inputs from stakeholders and I&APs.
- The inclusion of inputs and recommendations from the specialist reports where relevant.
- That the information provided to I&APs and the responses to comments and inputs made by the I&APs are correctly reflected herein

8.0 REFERENCES

Boyd, L., & Moodley, P. (2021). *Kelvin A-Station Power Plant Decommissioning and Demolition (Golder Report Number: 20360049-342046-2).* Johannesburg : Golder Associates Africa (Pty) Ltd.

Brink, D., & Van der Linde, G. (2021). *Groundwater Impact Assessment of Decommissioning and Demolition of Kelvin Power A-Station .* Johannesburg : Golder Associates Africa (Pty) Ltd.

Golder . (2022). *Contaminated Land Assessment for A-Station.* Midrand : Golder, Member of WSP.

Pelser, A. J. (2021). *Phase 1 HIA Report as Part of the Environmental Authorisation Application Process for the Decommissioning and Demolition of the Kelvin A-Station Power Plant, City of Ekurhuleni, Gauteng.* Lynnwood Ridge: APelser Archaeological Consulting.

Snyman, I., & Steyn, C. (2016). *Kelvin Power Station Contaminate Land Assessment (Golder Report Number: 1534189-298895-1).* Johannesburg: Golder Associates Africa (Pty) Ltd.

Signature Page

WSP Group Africa (Pty) Ltd

Marié Schlechter
Environmental Assessment Practitioner

Anri Scheepers
Principal Associate

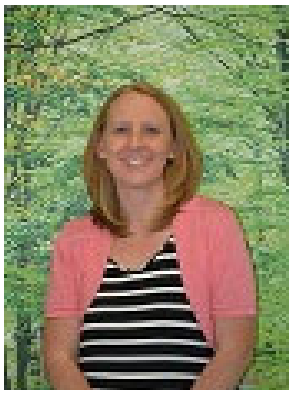
MS/ASc/ms

Reg. No. 2002/007104/07
Directors: RGM Heath, MQ Mokulubete, MC Mazibuko (Mondli Colbert), GYW Ngoma

https://golderassociates.sharepoint.com/sites/133264/project files/6 deliverables/draft/ba report/final for printing/20360049_rep_kelvinp_empr_draft_21nov2022_final for printing.docx

APPENDIX A

EAP Curriculum Vitae



Education

B.Sc. Earth Science, University of Johannesburg, Johannesburg, South Africa, 1998

B.Sc. (Hons) Geography and Environmental Management, University of Johannesburg, Johannesburg, South Africa, 1999

Certifications

Registered Environmental Assessment Practitioner, EAP Number 2020/1430

Lead Auditor and Technical Expert Auditor for Verification Audits of Gold and Silver Mines, International Cyanide Management Institute (ICMI)

Languages

English – Fluent

Afrikaans – Fluent

Golder Associates Africa (Pty.) Ltd. – Johannesburg

Senior Environmental Scientist

Marie Schlechter has worked in the mining industry and environmental consultancy for over twenty years, gaining experience in the implementation of environmental management systems and mitigation of environmental impacts from mining and industrial activities. Marié has experience in managing environmental impacts on mining and industrial sites as well as the implementation, maintenance and internal auditing of environmental management systems and compliance audits. Marié is also a pre-certified Lead Auditor and Mining Technical Specialist with the International Cyanide Management Institute (ICMI) as well as an Affiliate Member and Registered Environmental Auditor with the Institute of Environmental Management and Assessment (IEMA) and has conducted more than 33 gap, certification and recertification audits in South Africa, Mali, Guinea, Ghana, Tanzania and Finland. In addition, she has conducted and participated in various environmental compliance audits in South Africa, Ghana and Mozambique. Marié is registered as an Environmental Assessment Practitioner (EAPASA registration Number: 2020/1430).

Employment History

Golder Associates Africa – Johannesburg, South Africa
Senior Environmental Scientist (2011 to Present)

International Cyanide Management Code Auditing
Due Diligence Auditing
Compliance / Risk Auditing
Environmenta Management Programme Report Performance Assessments
Environmental Management Programme Report Consolidations and Amendments
Project and Finance Management
Integrated Environmental Authorisation Projects
Compliance Projects
Consultation with Interested and Affected Parties and Government Departments

AngloGold Ashanti – Orkney, South Africa
Senior Environmental Coordinator (2006 to 2011)

Implementation and maintenance of an Environmental Management System in accordance with ISO 14001:2004
Consultation with Interested and Affected Parties and Government Departments
Reporting on leading and lagging environmental indicators
Internal Auditing
Environmental Assistance to Metallurgical plants, Laboratories and Tailings departments
Project Management

Budget Management
Coordination and execution of monitoring of key environmental indicators

Oryx Environmental cc – Johannesburg, South Africa
Environmental Consultant (2002 to 2006)

ISO 14001 - Environmental Management System Implementation and Maintenance
Environmental Impact Assessments
Environmental Auditing
Report Writing
Project Management

Gold Fields Ltd - Driefontein Gold Mine – Carletonville, South Africa
Environmental Coordinator (2000 to 2002)

Implemented an Environmental Management System in accordance with the ISO 14001:1996 standard
Internal Auditing
General Environmental Management Duties

KEY PROJECT EXPERIENCE – ENVIRONMENTAL ASSESSMENT

Exxaro Grootegeluk Coal Mine Limpopo, South Africa	Environmental Authorisation Application for the proposed open cast mining pits at the Exxaro Grootegeluk Coal Mine near Lephalale, Limpopo Province.
Gamsberg Zinc Mine Northern Cape, South Africa	Environmental Authorisation Application for the construction of additional infrastructure at the existing opencast operations.
ACWA Power Bokoort II Solar Development Northern Cape, South Africa	Environmental Authorisation for a proposed Solar Development near Groblershoop, Northern Cape.
Palabora Copper Limpopo, South Africa	Environmental Authorisation for the proposed Magnetite Expansion and Additional Infrastructure Project.
Scaw South Africa (Pty) Ltd Gauteng, South Africa	Various projects to ensure environmental compliance at a number of Scaw South Africa sites.
Exxaro Resources - Grootegeluk Coal Mine Limpopo, South Africa	Compilation of a Consolidated Environmental Management Programme Report for Grootegeluk Coal Mine.
Exxaro Resources - Grootegeluk Coal Mine Limpopo, South Africa	Compilation of a Basic Assessment Report for the proposed New Gate at the Grootegeluk Mine.
Exxaro Resources Limpopo, South Africa	Compilation of an Environmental Management Plan (EMP) Addendum for the proposed New Gate and Cyclic Ponds at the Grootegeluk Mine.

Palabora Mining Company Limpopo, South Africa	Compilation of an Environmental Management Plan (EMP) Addendum for the proposed Iron Beneficiation Plant for Palabora Mining Company.
Palabora Mining Company Limpopo, South Africa	Compilation of an Environmental Management Programme Report Addendum for the South Paddock for Palabora Mining Company.
Palabora Mining Company Limpopo, South Africa	Compilation of a Consolidated Environmental Management Programme (EMP) for Palabora Mining Company.

KEY PROJECT EXPERIENCE – EHS AUDITING

GammaTec NDT Supplies (Proprietary) Limited Gauteng, South Africa	Various Phase I Environmental Site Assessments.
Karpower International DMCC (Karpowership) Nacala Bay, Mozambique	Private Environmental Compliance Audits of the Powership offshore in the Nacala Bay, Mozambique.
Oiltanking GmbH Kuriman, Indonesia	Evaluation of an Environmental and Social Action Plant to determine compliance to IFC Performance Standards and World Bank EHS Guidelines.
Nedbank Capital South Africa	Environmental Assessment in terms of Equator Principles and IFC Standards as part of a comprehensive technical due dilegence for the greenfields mining project in Mpumalanga.
Lonmin Marikana Operations North West, South Africa	Annual Performance Assessment of the Lonmin Marikana Operations' Environmental Management Programme Report.
Lonmin Marikana Concentrator North West, South Africa	Audit in terms of evaluation of compliance for the "Other Requirements" as identified in the Environmental Management System.
Anglo American Platinum South Africa	Independent group tailings environmental risk audit of the Anglo American Platinum Tailings Storage Facilities.
Anadarko Mozambique Area 1 Mozambique	Private Environmental Audit of AMA1's LNG Project.
Perseus Mining Ltd, Edikan Gold Mine Ghana	Environmental Compliance Audit

KEY PROJECT EXPERIENCE – INTERNATIONAL CYANIDE MANAGEMENT CODE AUDITING

AngloGold Ashanti South African Operations Gauteng, North West, Free State, South Africa	Gold Mining Technical Expert Auditor ICMI for re-certification audits for various operations.
Gold Fields South Deep Gold Plant Gauteng, South Africa	Gold Mining Technical Expert Auditor ICMI for re-certification audits for South Deep Gold Mine.
AngloGold Ashanti West Africa Operations Mali, Guinea	Gold Mining Technical Expert Auditor ICMI for re-certification audits for various operations.
Evander Gold Mine Mpumalanga, South Africa	Gold Mining Technical Expert Auditor ICMI for re-certification audit for Evander Gold Mine.
Harmony South African Operations Free State, Gauteng, South Africa	Gold Mining Technical Expert Auditor ICMI for re-certification audits for various operations.
Newmont, Ahafo and Akyem Gold Mines Ghana	Lead and Gold Mining Technical Expert Auditor ICMI for re-certification and gap audits for Ahafo and Akyem Gold Mines.
Gold Fields Tarkwa and Damang Gold Plants Ghana	Lead and Gold Mining Technical Expert Auditor ICMI for re-certification and gap audits for Tarkwa and Damang Gold Mines.
Barrick Buzwagi, Bulyanhulu, North Mara Gold Plants Tanzania	Gold Mining Technical Expert Auditor ICMI for re-certification audits for various operations.
Asanko Gold Mine Ghana	Gold Mining Technical Expert Auditor ICMI for gap and certification audits for Asanko Gold Mine.
Agnico Eagle Kittilä Gold Mine Lapland, Finland	Gold Mining Technical Expert Auditor ICMI for re-certification audit for Kitillä Gold Mine.
AngloGold Ashanti Geita Gold Mine Tanzania	Lead and Gold Mining Technical Expert Auditor ICMI for gap audit for Geita Gold Mine.

TRAINING

Environmental Management Systems Understanding the Transition to SANS 14001:2015
SABS Training Centre, 2017

ISO 14001:2015 Environmental Management Systems Auditing Based on ISO 19011 and ISO 17021 (SAATCA Approved)
SABS Training Centre, 2017

Project Management Fundamentals
Golder Associates (Internal Training), August 2012

Microsoft Project 2007 Essentials
Bytes Technology Group, 30 November 2011

IEMA Approved Foundation Course in Environmental Auditing (South Africa)
Aspects International, February 2012

Management Review
DQS SA (Pty) Ltd, 2009

Causal Analysis Technique
IRCA Global, 2009

Technical Report Writing
In-house Training for AngloGold Ashanti, 2007

Occupational Health and Safety Law for Managers
North West University, 2003

Project Management
University of Johannesburg, 2003

Internal Environmental Management Auditor Training Course
WSP Walmsley, 2001

Environmental Law
North West University, 2001

Environmental Management Systems (SABS/ISO 14001)
North West University, 2000

PROFESSIONAL AFFILIATIONS

Affiliate Member and Environmental Auditor - Institute of Environmental Management and Assessment (IEMA)

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