ENVIRONMENTAL IMPACT MANAGEMENT SERVICES

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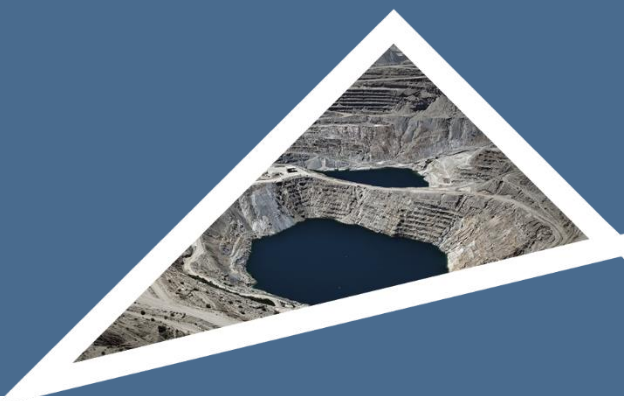
REHABILITATION STRATEGY AND IMPLEMENTATION PROGRAMME

KELVIN POWER STATION



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REVISION AND AMENDMENTS

REVISION DATE:	REV #	DESCRIPTION
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EXECUTIVE SUMMARY

Environmental Impact Management Services (Pty) Ltd, hereafter referred to as EIMS, was appointed as independent environmental consultants by Kelvin Power (Pty) Ltd, to update the Rehabilitation Strategy and Implementation Programme (RSIP). The 2025 RSIP update relates to Condition 10.2, Appendix II of the Water Use Licence (WUL) (Reference Number: 03/A21C/FGH/1110) issued on 24 June 2011 which states: "The IWWMP and RSIP shall thereafter be updated and submitted to the Regional Head for approval, annually". This 2025 RSIP is also submitted as part of the WUL renewal application.

This 2025 Annual RSIP update aims to address the WUL Condition 10.2 of Appendix II requirement as associated with the National Water Act, 1998 (Act No. 36 of 1998, as amended) (NWA), the NWA Water Use Licence Application (WULA) Regulations Regarding the Procedural Requirements for Water Use Licence Applications and Appeals, 24 March 2017, Government Notice (GN) R267.

The closure plan and RSIP are constantly under development. This plan is based on existing conditions and impacts, rather than actual measurements as closure approaches. Consequently, several assumptions have been made regarding the biophysical and socio-economic environment that will prevail at the end of the operational life. While these assumptions introduce some uncertainty, they also highlight potential risks and opportunities that cannot yet be fully defined. This RSIP and related closure documents represent an early-stage framework to support Kelvin Power through the operational phase. The goal is to minimise environmental impacts and ensure that final closure and rehabilitation are conducted appropriately. These documents will evolve over time but remain critical for guiding current operations.

Although data regarding pre-construction activities are limited, it is likely that prior to the initiation of Kelvin Power, the area was characterised by wilderness and a mix of grazing and cropping, likely subsistence-based, on lands with moderate to low arable potential. The closure vision states that amongst other requirements, Kelvin Power will optimise final post-closure land use so that there is a variation of land uses due to the Ash Dams remaining. In contaminated areas that are to be rehabilitated (such as the coal stockpiling areas), soil will be replaced to a minimum depth of 500 mm.

Given that there is insufficient baseline data pre-disturbance, achieving land capability that existed prior to disturbance will be difficult to demonstrate as it is uncertain what the land-use and land capability was. Thus, a mix of industrial and wilderness land will be required post closure, a deviation from restoring pre-activity land capability, to one where a mix of arable and grazing land is restored to optimise land uses that may be undertaken surrounding the processing activities. The main reasons being that a section of Station A will be used for gas production, the Ash Dams will remain, and the surrounding areas are either industrial or urban areas (with little wilderness areas remaining).

The following high-level recommendations are given that should be implemented by Kelvin Power within the following 12-months:

- Update 2017 closure and rehabilitation cost calculations;
- Continue with development of a closure and rehabilitation plan for the entire facility;
- Development of a Storm Water Management Plan (SWMP) for the power station and construction of stormwater management infrastructure around the coal stockpiling area.
- Continue with surface and groundwater monitoring and implement revised groundwater monitoring network and programme identified in the 2025 Gradient Consulting geohydrological report.

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Care and maintenance	This involves the maintaining and corrective action as requires as well as conducting the required inspection and monitoring to demonstrate achievement of success of the implemented measures.
CHPP	Coal handling and processing plant
Closure	This involves the application for closure certificate and initiation of transfer of on-going care and maintenance to third parties.
Contingencies	This allows for making reasonable allowance for possible oversights/omissions and possible work not foreseen at the time of compilation of the closure costs. Allowance of between 10 percent and 20 percent would usually be made based on the accuracy of the estimations. The South African Department of Mineral Resources Guideline (January 2005) requires an allowance of 10 percent.
Decommissioning	This relates to the situation after cessation of operations involving the deconstruction/removal and/or transfer of surface infrastructure and the initiation of general site rehabilitation.
EA	Environmental Authorisation
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
IWUL	Integrated Water Use Licence
LOM	Life of Mine- reflective of the current planned extent of the mining operations.
MWP	Mine works programme
NEMA	National Environmental Management Act (Act 107 of 1998)
Post-closure	The period of on-going care and maintenance, as per arrangement with third parties.
Rehabilitation:	The re-instatement of a disturbed area into a usable state (not necessarily its pre-mining state) as defined by broad land use and related performance objectives.
Remediation	To assist in the rehabilitation process by enhancing the quality of an area through specific actions to improve especially bio-physical site conditions.
Scheduled closure	Closure that happens at the planned date and/or time horizon.
Site relinquishment	Receipt of closure certificate and handover to third parties for on-going care and maintenance, if required.
Unscheduled closure	Immediate closure of a site, representing decommissioning and rehabilitation of the site in its present state.

1 INTRODUCTION

Environmental Impact Management Services (Pty) Ltd, hereafter referred to as EIMS, were appointed by Kelvin Power (Pty) Ltd, hereafter referred to as the Holder or Applicant, to apply for the renewal of their existing Water Use License (WUL), Reference Number: 03/A21C/FGH/1110) issued on 24 June 2011. Section 5: License and Review Period, 5.1 of the license, indicate that the license is valid for a period of 15 years from the date of issuance. Therefore, the Holder need to apply for a renewal of the license if they want to continue with the water uses after 24 June 2026, when the license will lapse.

Condition 10.2, Appendix II of the Water Use Licence (WUL) (Reference Number: 03/A21C/FGH/1110) issued on 24 June 2011 states: "*The IWWMP and RSIP shall thereafter be updated and submitted to the Regional Head for approval, annually*". This Rehabilitation and Implementation Programme (RSIP) is, therefore, also compiled to update the 2024 RSIP and is based on the 2024 RSIP annual update. **This 2025 RSIP is an update of the previous 2024 RSIP prepared by ENVIRONMENTAL ASSURANCE (PTY) LTD (Envass) – report number SPES-REP-RSIP-371-24_25.**

2 PROJECT CONTEXT

Kelvin Power Station is a coal-fired power station, located in the Gauteng province near OR Tambo International Airport in South Africa. Kelvin Power is one of only a few power stations in South Africa not owned by the national energy producer, Eskom. Kelvin Power supplies between 10% and 15% of the power needs of the City of Johannesburg. Kelvin comprises of two stations; Station A and Station B. Station A is under decommissioning and a service provider duly appointed to follow the applicable closure notifications as per WUL requirements as well as the National Environmental Management Act No. 107 of 1998 prescripts. Station B is currently in operation. The power station makes use of coal and water for the generation of electricity. Station A (shut down in 2012) has six 30MW generators and 11 chain grate boilers. The newer B station has seven 60MW generators and seven PF type boilers.

Coal is burnt inside the boiler to produce super-heated steam (SHS). The SHS is transported via pipes to the turbines. Here, the SHS drives the blades of the turbine, spinning the rotor at high speed (mechanical energy). The rotor then turns the generator, which generates electricity. The slurry (containing fine and coarse ash) from the burnt coal is hydraulically routed to Ash Dam A for deposition.

For steam production in the boilers, demineralised water is added as make-up water to recycled condensate. The steam is condensed by cooling it with water circulated through the hyperbolic cooling towers. Kelvin receives approximately 3 681 m^3/d of water from Rand Water and about 13 955 m^3/d of treated effluent.

Station A operations ceased, and this station is currently under extended care and maintenance. Station A has an installed capacity of 180 megawatts comprising six (6) turbo-alternators of 30 megawatts each and 11 boilers which consume approximately 85 tonnes of coal per hour. The furnaces at this station are chain grate types as opposed to the pulverised fuel type in Station B. The decommissioned Station A area will be utilized for the planned combined cycle gas turbine project.

Station A, which utilised a larger coal fraction for heat generation, produced coarse ash, most of which was previously discarded on an open dumping area to the west of the power station (Golder, 2021). The power station makes use of coal and water for the generation of electricity. Relatively small quantities of chemicals are also utilised for the treatment of water for the boilers in the demineralisation plant.

Kelvin consumes approximately 1.5 million tonnes of coal per annum, which is transported by road to Kelvin from various mines in the Mpumalanga Province. Station B uses 0.85 to 1.0 million tonnes per annum. These quantities will increase in proportion to production rate.

Kelvin receives water from the Rand Water Board (RWB) and treated effluent from the Northern Wastewater Treatment Works (NWTW) which is situated in Diepsloot. Roughly 15 000 m^3/d of water from NWTW is utilised at the Kelvin Power Station.

Station B has an installed capacity of 420 megawatts comprising seven (7) turbo-alternators of 60 megawatts each, and seven (7) boilers, which consume 250 tonnes of coal per hour. The steam is delivered at 62 bar and 482°C. The station turbo-alternators are not operated at full capacity to safeguard against failure (Golder, 2021).

The turbine shaft is coupled to the alternator rotor, rotating at 3 000 revolutions per minute. This large electro-magnet produces electricity by inducing voltage, which causes current to flow in the alternator stator. The electricity is transformed up to the grid voltage by the generator transformer and supplied to the grid via the switch yard.

For steam production in the boilers, demineralised water is added as make-up water to recycled condensate. The steam is condensed by cooling it with water circulated through the hyperbolic cooling towers (five towers for Station B) to the south of the power station buildings.

Station B uses a pulverised fine-coal fraction for heat generation, which results in a fine ash by-product. Previously, all the ash was pumped in slurry form to Ash Dam A. Presently, approximately 10% of the ash is being collected by a cement manufacturer as raw material, thereby facilitating waste minimisation (both in terms of ash and water use) at the power station. In addition, this practice is increasing the life of the Ash Dam's operational phase. The remainder of the ash is still slurried and disposed of on Ash Dam A.

The final waste product from Kelvin is in the form of a wastewater effluent, consisting of cooling tower blow-down, effluent from miscellaneous cooling water uses, ash-quenching effluent and washings. These effluents are discharged to the Modderfonteinspruit after de-siltation.

2.1 LOCATION

A locality map is presented in Figure 1.The properties in respect of the WUL (03/A21C/FGH/1110) activities are associated with the farm Zuurfontein 33 IR and indicated in Figure 2. Table 1 tabulates the facility, property descriptions, municipalities, and associated owner details as applicable to Section 21 water use activities in terms of the NWA.

Table 1: Property details.

Facility	Farm	Portion	Municipality	Owner
Kelvin Power Station	Zuurfontein 33 IR	87, 88, 89, 90 , 91, 97, 98, 99, 100, 425, 427, 429, RE96 and RE391.	Ekurhuleni Metropolitan Council	Kelvin Power (Pty) Ltd

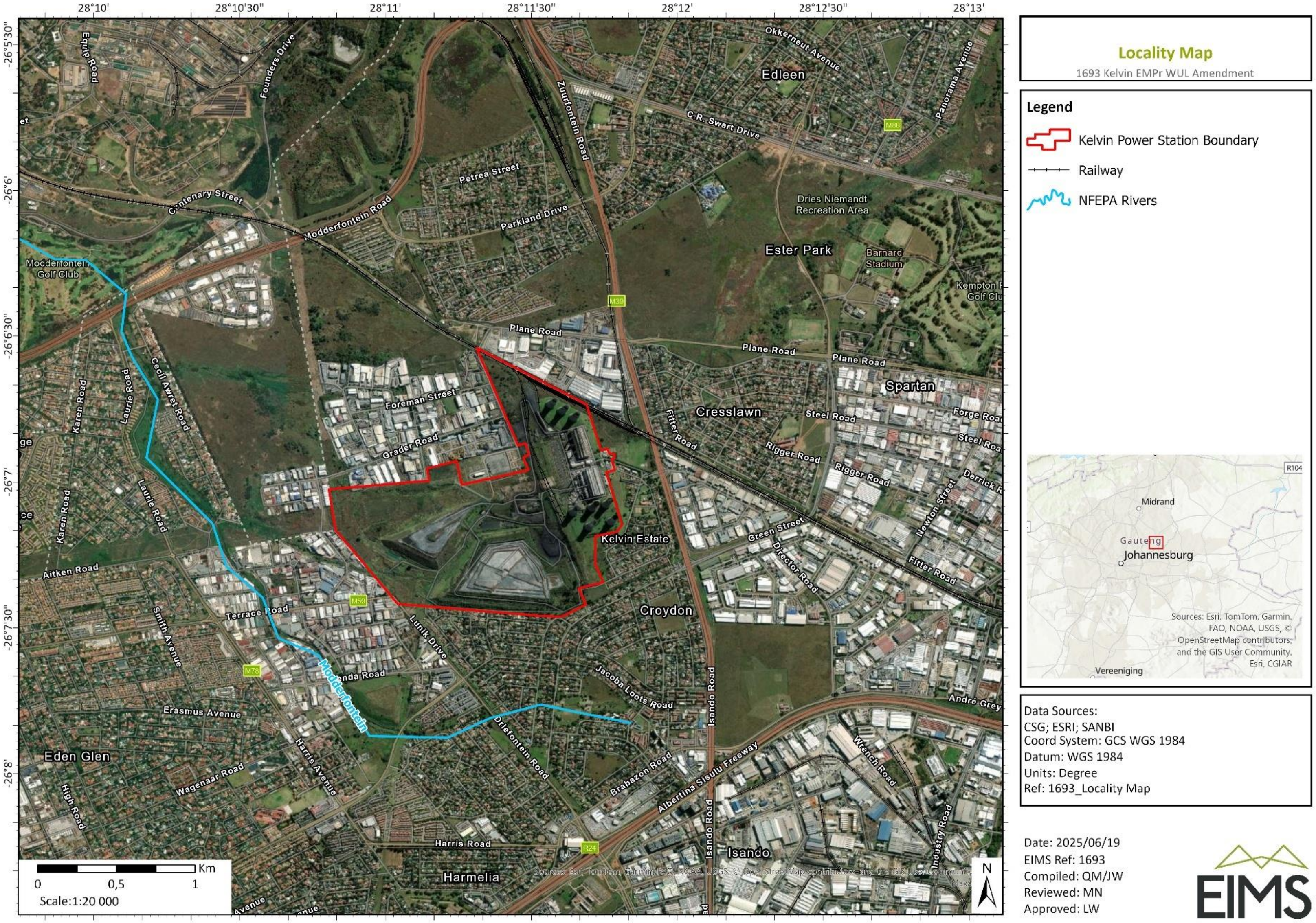

Figure 1: Aerial imagery locality map.

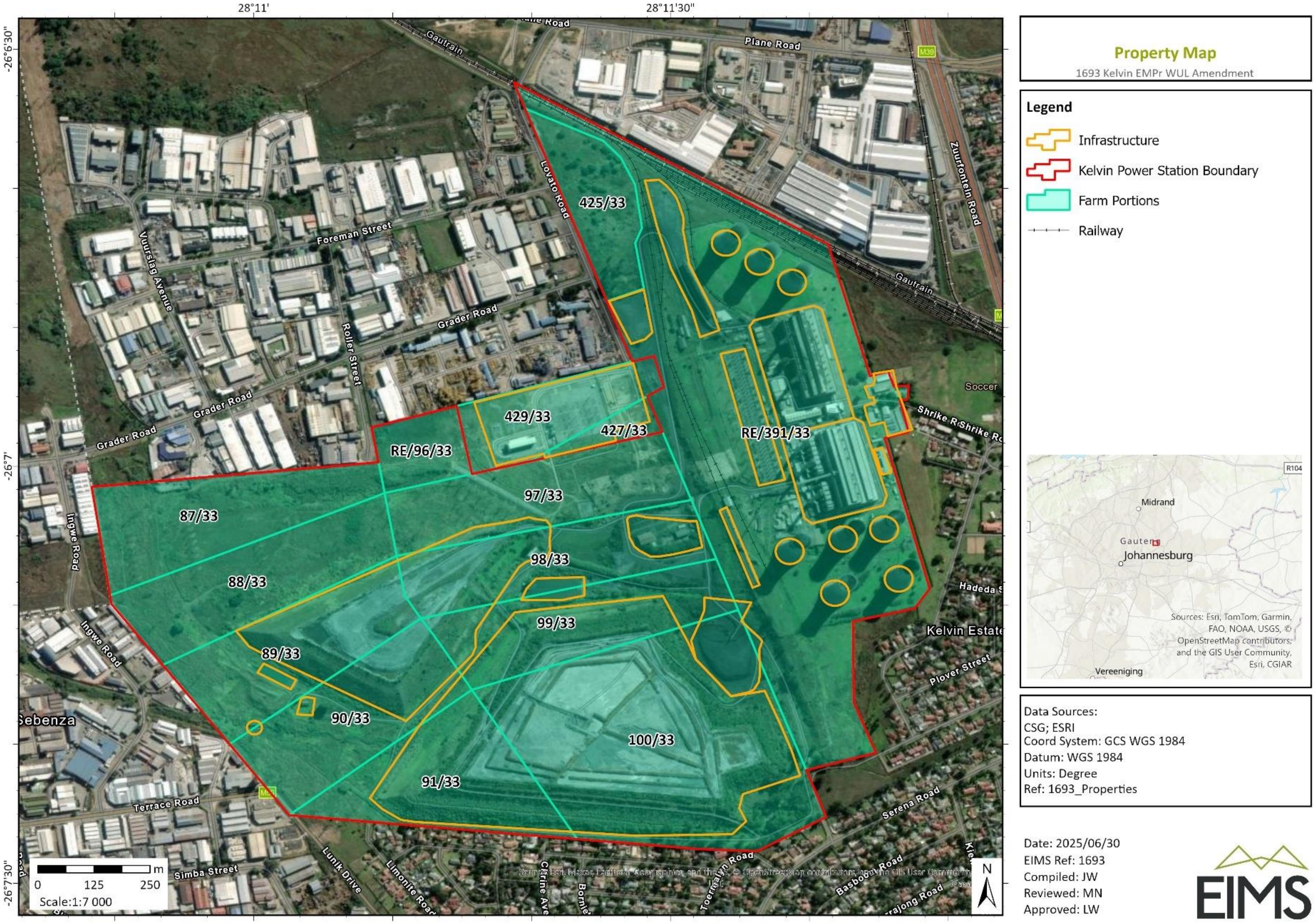

Figure 2: Properties Map with Kelvin Power Infrastructure

2.2 KELVIN POWER OPERATIONS GENERATION FACILITIES

Kelvin Power Station is a coal-fired power station, located in the Gauteng province near OR Tambo International Airport in South Africa. Kelvin Power is one of only a few power stations in South Africa not owned by the national energy producer, Eskom. Kelvin Power supplies between 10% and 15% of the power needs of the City of Johannesburg.

Kelvin comprises of two stations; Station A and Station B. Station A is under decommissioning and a service provider duly appointed to follow the applicable closure notifications as per WUL requirements as well as the National Environmental Management Act No. 107 of 1998 prescripts. Station B is currently in operation. The power station makes use of coal and water for the generation of electricity. Station A (shut down in 2012) has six 30MW generators and 11 chain grate boilers. The newer B station has seven 60MW generators and seven PF type boilers.

Coal is burnt inside the boiler to produce super-heated steam (SHS). The SHS is transported via pipes to the turbines. Here, the SHS drives the blades of the turbine, spinning the rotor at high speed (mechanical energy). The rotor then turns the generator, which generates electricity. The slurry (containing fine and coarse ash) from the burnt coal is hydraulically routed to Ash Dam A for deposition.

For steam production in the boilers, demineralised water is added as make-up water to recycled condensate. The steam is condensed by cooling it with water circulated through the hyperbolic cooling towers. Kelvin receives approximately 3 681 m^3/d of water from Rand Water and about 13 955 m^3/d of treated effluent.

Station A operations ceased, and this station is currently under extended care and maintenance. Station A has an installed capacity of 180 megawatts comprising six (6) turbo-alternators of 30 megawatts each and 11 boilers which consume approximately 85 tonnes of coal per hour. The furnaces at this station are chain grate types as opposed to the pulverised fuel type in Station B.

Station A, which utilised a larger coal fraction for heat generation, produced coarse ash, most of which was previously discarded on an open dumping area to the west of the power station (Golder, 2021). The power station makes use of coal and water for the generation of electricity. Relatively small quantities of chemicals are also utilised for the treatment of water for the boilers in the demineralisation plant.

Kelvin consumes approximately 1.5 million tonnes of coal per annum, which is transported by road to Kelvin from various mines in the Mpumalanga Province. Station B uses 0.85 to 1.0 million tonnes per annum. These quantities will increase in proportion to production rate.

Kelvin receives water from the Rand Water Board and treated effluent from the Northern Wastewater Treatment Works (NWTW) which is situated in Diepsloot. Roughly 15 000 m^3/d of water from NWTW is utilised at the Kelvin Power Station.

Station B has an installed capacity of 420 megawatts comprising seven (7) turbo-alternators of 60 megawatts each, and seven (7) boilers, which consume 250 tonnes of coal per hour. The steam is delivered at 62 bar and 482°C. The station turbo-alternators are not operated at full capacity to safeguard against failure (Golder, 2021).

The turbine shaft is coupled to the alternator rotor, rotating at 3 000 revolutions per minute. This large electro-magnet produces electricity by inducing voltage, which causes current to flow in the alternator stator. The electricity is transformed up to the grid voltage by the generator transformer and supplied to the grid via the switch yard.

For steam production in the boilers, demineralised water is added as make-up water to recycled condensate. The steam is condensed by cooling it with water circulated through the hyperbolic cooling towers (five towers for Station B) to the south of the power station buildings.

2.3 RETURN WATER DAM AND ASSOCIATED DIRTY WATER MANAGEMENT

Station B uses a pulverised fine-coal fraction for heat generation, which results in a fine ash by-product. Previously, all the ash was pumped in slurry form to Ash Dam A. Presently, approximately 10% of the ash is being collected by a cement manufacturer as raw material, thereby facilitating waste minimisation (both in terms of ash and water use) at the power station. In addition, this practice is increasing the life of the Ash Dam's operational phase. The remainder of the ash is still slurried and disposed of on Ash Dam A.

The final waste product from Kelvin is in the form of a wastewater effluent, consisting of cooling tower blow-down, effluent from miscellaneous cooling water uses, ash-quenching effluent and washings. These effluents are discharged to the Modderfonteinspruit after de-siltation. Figure 3 provides a simplified, visual schematic of the above-mentioned processes.

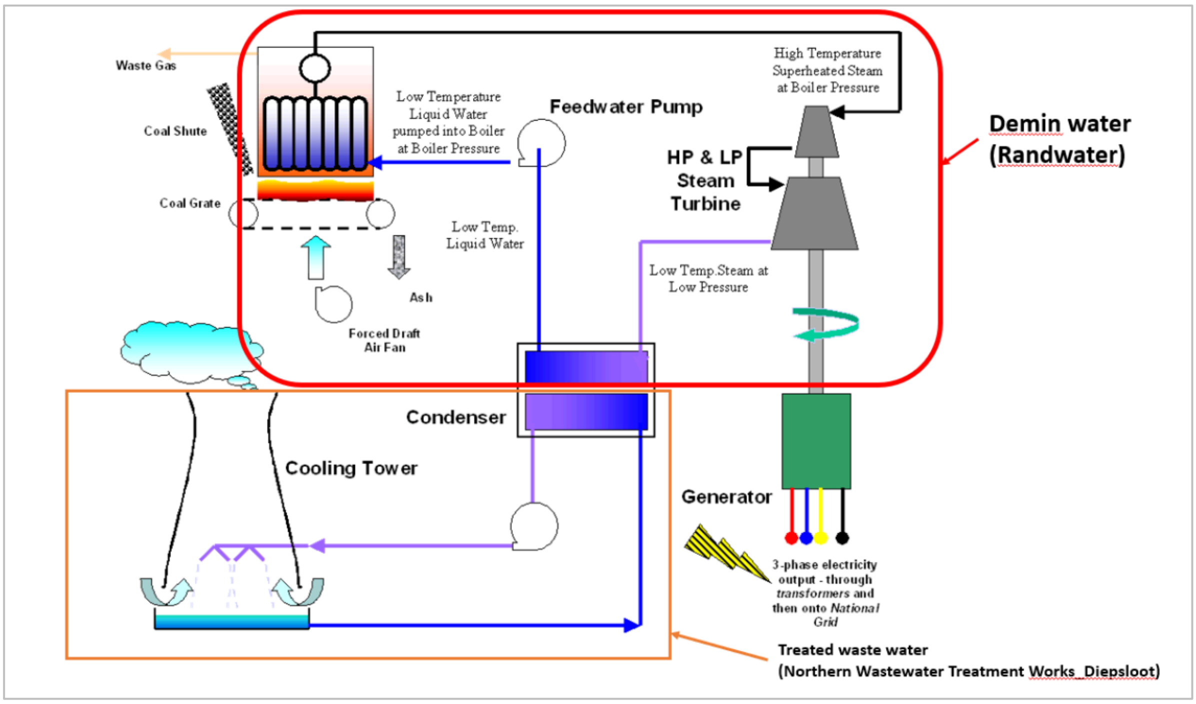

Figure 3: Simplified process schematic (Golder, 2021).

2.3.1 RELEVANT APPROVALS

This section details the various approvals and authorizations relevant to the RSIP

2.3.1.1 WATER USE ACTIVITIES

The following water uses have been authorised in the 2011 WUL (Table 2):

- Section 21(f): Discharging waste or waste water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit:
  - Discharging wastewater into the Modderfonteinspruit.
- Section 21(g): Disposing of waste or water containing waste in a manner which may detrimentally impact on a water resource:
  - Discharging water into Desilting Reservoirs 1 and 2;
  - Discharging water into the Return Water Dam (RTD); and
  - Discharging industrial wastewater into Ash Dam A and B.
- Section 21(h): Disposing in any manner of water which contain waste from, or which has been heated in any industrial or power generation process:
  - Discharging wastewater that has been heated in the power generation process.

2.3.1.2 DETAILS OF WUL NO. 03/A21C/FGH/1110 OF 24 JUNE 2011

WUL 03/A21C/FGH/1110, dated 24 June 2011, specifically authorises the following water uses under Appendix II and given in Table 2 below. **Additional identified water uses not included in the current license are also indicated. These water uses will be included in the ongoing WUL renewal application.** The locations of the water uses are provided in Figure 4.

2.3.1.3 WUL REQUIREMENTS INFORMING THE RSIP

The following conditions under Appendix II, Section 10 of the Kelvin Power WUL service a specific consideration toward establishing the RSIP:

- Section 10.1: The licensee must prepare an Integrated Water and Waste Management Plan (IWWMP) which must together with the Rehabilitation Strategy and Implementation Plan (RSIP) be submitted to the Regional Head for approval within 1 year from date of issuance of the license;
- Section 10.2: The IWWMP and RSIP shall thereafter be updated and submitted to the Regional Head for approval, annually; and
- Section 10.3: The licensee must at least 180 days prior to the intended closure of any facility, or any portion thereof, notify the Regional Head of such intention and submit any final amendments to the IWWMP and RSIP as well as final Closure Plan, for approval.

Table 2: Authorised and newly proposed water uses.

<table>
<tr><th>Section 21 Water Use</th><th>Description of Water Use</th><th>Volume (m³) per annum</th><th>Capacity (m³)</th><th>Coordinates</th><th>Included in Current License</th><th>Property</th></tr>
<tr><td>21 (f)</td><td>Discharge from Return Water Dam and secondary channel to the Modderfonteinspruit.</td><td>2 599 380 m^3/a</td><td>-</td><td>26° 07' 18.167" S
28° 10' 59.491" E</td><td>Yes</td><td>Portions 89 and 90 of the Farm Zuurfontein 33 IR</td></tr>
<tr><td rowspan="6">21 (g)</td><td>Desilting reservoirs 1 and 2.</td><td>4 891 000 m^3/a</td><td>12 794 m^3</td><td>26° 07' 08.724" S
28° 11' 21.708" E</td><td>Yes</td><td>Portions 98 and 99 of the Farm Zuurfontein 33 IR</td></tr>
<tr><td>Return water dam.</td><td>7 426 800 m^3/a</td><td>7 200 m^3</td><td>26° 07' 15.001" S
28° 11' 01.568" E</td><td>Yes</td><td>Portion 89 of the Farm Zuurfontein 33 IR</td></tr>
<tr><td>Ash Dam A.</td><td rowspan="2">207 377 m^3/a</td><td>207 377 m^3</td><td>26° 07' 19.119" S
28° 11' 25.084" E</td><td>Yes</td><td>Portions 97, 98, 99, 89 and 90 of the Farm Zuurfontein 33 IR</td></tr>
<tr><td>Ash Dam B.</td><td>9 800 m^3</td><td>26° 07' 10.886" S
28° 11' 10.653" E</td><td>Yes</td><td>Portions 90, 91, 99 and 100 of the Farm Zuurfontein 33 IR</td></tr>
<tr><td>Coal stockpile A (covered).</td><td>1 300 000 t/a</td><td>-</td><td>26° 07' 05.896" S
28° 11' 35.032" E</td><td>No</td><td>Remainder of Portion 391 of the Farm Zuurfontein 33 IR</td></tr>
<tr><td>Coal stockpile B (open).</td><td>2 100 000 t/a</td><td>-</td><td>26° 07' 12.997" S
28° 11' 34.222" E</td><td>No</td><td>Portions 99, 100 and the Remainder of Portion 391 of the Farm Zuurfontein 33 IR</td></tr>
<tr><td>21 (h)</td><td>Discharge to the Modderfonteinspruit.</td><td>2 599 380 m^3/a</td><td>-</td><td>26° 07' 18.167" S
28° 10' 59.491" E</td><td>Yes</td><td>Portions 89 and 90 of the Farm Zuurfontein 33 IR</td></tr>
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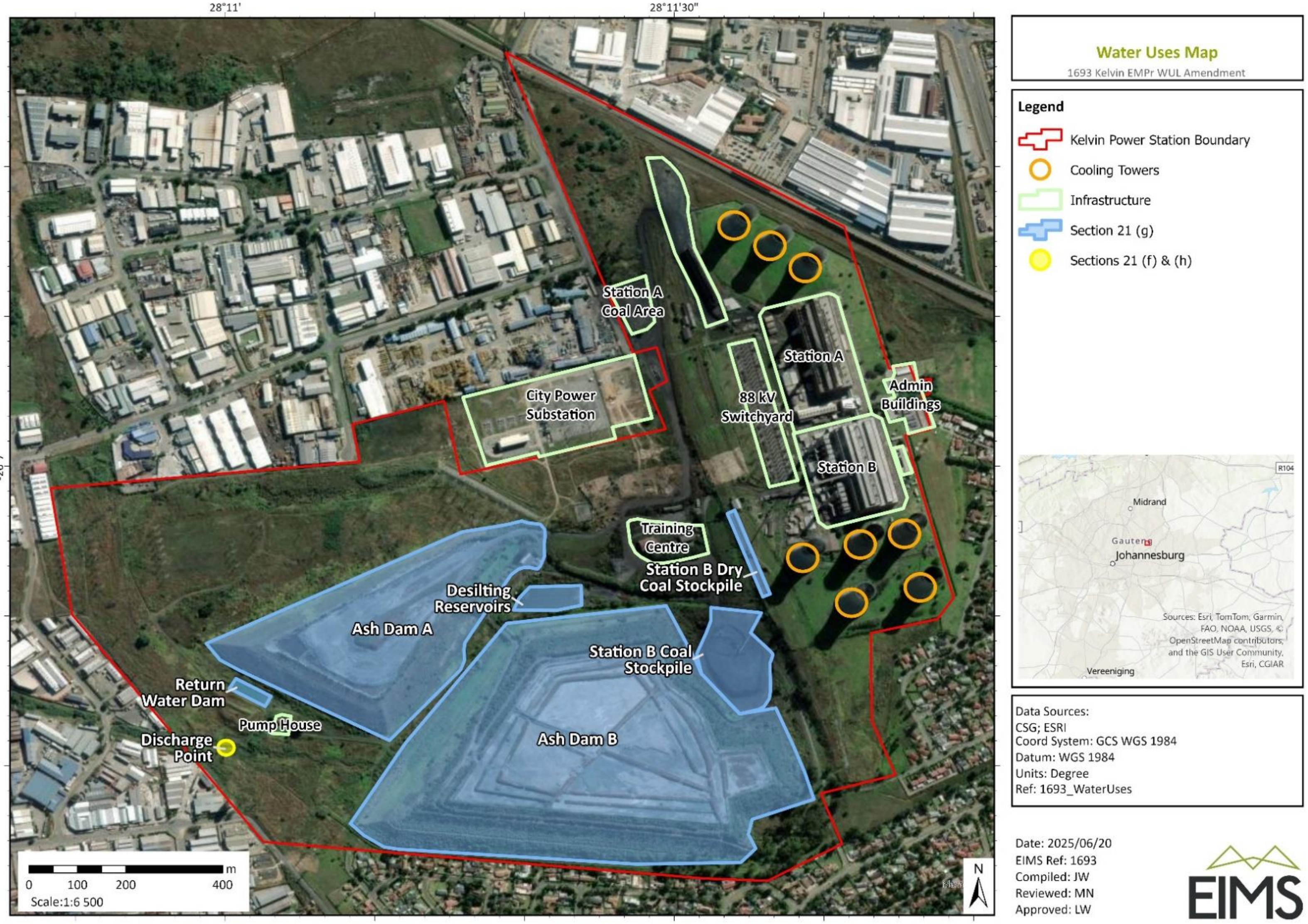

Figure 4: Kelvin Power authorised water uses map.

3 ENVIRONMENTAL CONTEXT

This section aims to provide context and focus attention on the receiving environment and to highlight sensitive environmental attributes which may require consideration in planning and implementing the closure strategy. The content of this section has been extracted from the IWWMP Report and where applicable summarised. Further details on the environmental context can be obtained from the IWWMP Report.

3.1 SOCIO-ECONOMIC CONTEXT

Kelvin Power is located within Kempton Park and in close proximity to O.R. Tambo International Airport. It thus falls under The City of Ekurhuleni Municipality. The City of Ekurhuleni is a Category A municipality which exercises legislative and executive authority within its jurisdiction, as determined by the Constitution of the Republic of South Africa. The City is one of three (3) metropolitan municipalities in the Gauteng Province, a province which has a total land mass 16 548 km². Ekurhuleni covers 1975 km² which represents 12% of the province's land mass; while housing 27% of Gauteng's population, representing 7% of South Africa's total population. The city is exceptionally densely populated with 1609.4 persons per km^2 as compared to Gauteng (675.12 persons per km^2) and the national population (42.8 persons per km^2). The highest population density of Ekurhuleni is in previously disadvantaged areas such as: Daveyton, Tsakane, KwaThema, Tokoza, Katlehong, Tembisa, Vosloorus and Duduza (City of Ekhurhuleni, 2024).

3.1.1 DEMOGRAPHIC INFORMATION

According to Statistics South Africa's recent census 2022, approximately 4 066 691 people reside in the City of Ekurhuleni with 1 421 003 households. The gender distribution of the population is 51% male and 49% female. Table 3 below shows the population by growth and gender over the last three (3) years. Refer to Figure 5 and Figure 6 visualise the gender and age distribution as well as the percentage male and female, respectively.

Table 3: Ekurhuleni population growth and gender (City of Ekurhuleni, 2024).

2021/ 2022			2022/ 2023			2023/ 2024		
Male	Female	Total	Male	Female	Total	Male	Female	Total
1971 815	1886 332	3858 147	2006 178	1920 499	3926 677	2040 990	1955 133	3996 123

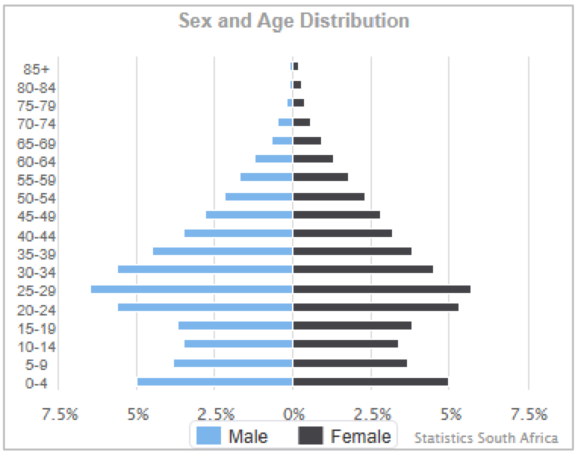

Figure 5: Ekurhuleni gender and age distribution (STATSSA, 2025).

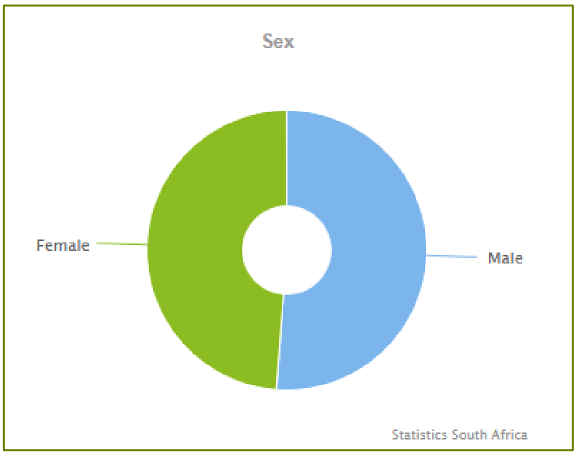

Figure 6: Percentage male and female in Ekurhuleni (STATSSA, 2025).

The average annual population growth rate within the metro currently stands at 2.47%. The population increased by 28% from 3.18 million in 2011 to 4.07 million in 2022. The increase in the population has adverse implications for the already ageing infrastructure and further heightens the demand for provision of basic services. Other implications of the population growth include growing service backlogs and a heightened demand for economic opportunities to address the poverty challenge. The population is divided into 78.7% Black Africans, 15.8% Whites, 2.7% Coloured, 2.1% Indian/ Asian and 0.6% other with the most prominent language being spoken is IsiZulu (28.6%) followed by English (11.9%) and Afrikaans (11.8%), see Figure 8**.**

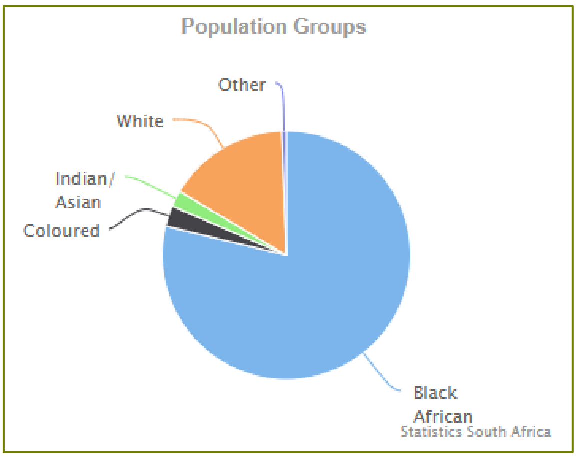

Figure 7: Population groups of Ekurhuleni (STATSSA, 2025).

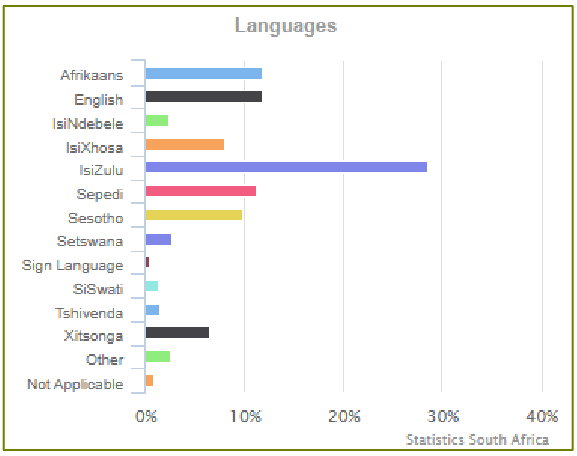

Figure 8: Language distribution in Ekurhuleni (STATSSA, 2025).

3.1.2 ECONOMIC INFORMATION

The socio-economic indicators for the city reveal a complex and evolving landscape. The housing backlog has been exacerbated by a growing population and increased demand for adequate housing, with a notable rise of 1.3% between 2021/ 22 and 2022/ 23, and a further 0.8% increase between 2022/ 23. The prevalence of HIV and AIDS has seen a slight increase from 15.7% to 16.1% over the past three years, highlighting ongoing challenges despite various mitigation programs.

The unemployment rate has been increasing since 2020, and this is due to the fact that a greater number of the economically active population have either given up on the search for employment or have become discouraged from doing so. The official unemployment rate in the City (36.4%) is higher than that of the Gauteng province (34%) and the national figure (32.7%). The unemployment rate has increased by 2.1% from 2020 to approximately 37.1% in 2022 whilst in the year 2023, the percentage decreased by 0.7% to 36.4%.

Germiston has recorded the lowest official youth unemployment rate of 60.9% from 2020 to date among all the towns in the city, while Nigel has the highest rate of 75.2%, which is higher than the city's average of 64.6%. The Coloured population in Nigel experienced the highest unemployment rate of 80% in 2023, while the City's coloured youth unemployment average was 39.5%. The Springs recorded the highest youth unemployment rates for the White population at 42.5%, which is greater than the city's white youth unemployment average of 33%. The black youth population recorded 77.8%, while the City's average was 69.5%. The Asian youth population experienced the greatest youth unemployment rate of 38.7%, which is twice the City's average of 19.7%.

In the City of Ekurhuleni, the number of people living below the poverty line decreased from 942 617 in 2020/ 21 to 925 856 in 2022/ 23. This number however rose to 1 077 140 in 2023/ 24, raising concerns about food security within the city. The figure below shows the trend in persons living below the food poverty line within the city over the last three years. The data indicates that there has been a 3% increase in 2023/ 24, from a percentage of 24% recorded for both 2021/ 22 and 2022/ 23. The majority of households found living below the poverty line are predominantly found in townships, informal settlements and peri-urban areas of the city. Figure 9 indicates the employment for those aged 15 – 64 years old whereas Figure 10 indicates the average household income for the City of Ekurhuleni.

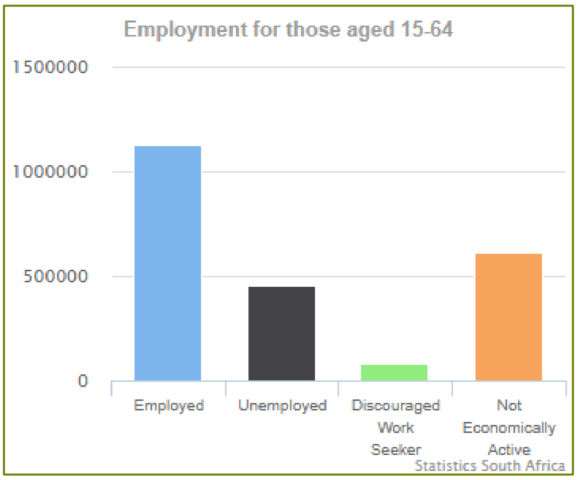

Figure 9: Employment for those aged 15 – 64 (STATSSA, 2025).

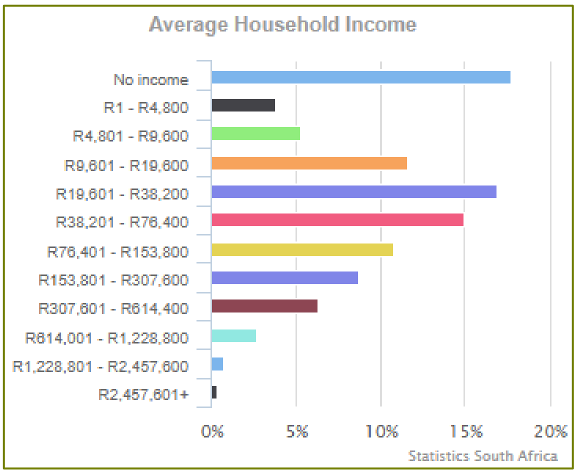

Figure 10: Average household income in Ekurhuleni (STATSSA, 2025).

3.1.3 STAKEHOLDER ENGAGEMENT

A public participation process as required by the NEMA EIA regulation (GNR 982) has not yet been conducted. In order to achieve a practical and appropriate closure strategy and rehabilitation plan, it is recommended that this RSIP be subject to public and key stakeholder review and comment. This RSIP will be appended to the 2025 IWWMP for the Power Station which will be subject to a 60-day review period as part of the current WUL renewal application. This section will be updated at the end of the review period with specific comments and issues raised during the public participation process for the IWWMP and RSIP.

3.2 BIO-PHYSICAL CONTEXT

3.2.1 HERITAGE AND PALEONTOLOGY

No baseline heritage or palaeontology study was conducted before the construction of Kelvin Power. There is no known significant heritage features existing on site. The only heritage aspects relate to the historic structures at the site, as many of the buildings are over 60 years of age.

3.2.2 CLIMATE

Kempton Park falls within the cold interior climatic zone of South Africa (SANS 204:2011) which consists of warm summers from December to February and cold, dry winters between June to August. The cold interior climate zone is known for moderately high summer and winter daytime temperatures which vary from about 14 ºC to 26 ºC during the summer and on average from 4 ºC to 22 ºC in winter. The area experiences summer rainfall, wintertime frost, fog, and varying wind speeds (Meteoblue, 2024). The region experiences unpredictable rainfall that ranges from 715 mm to 735 mm annually, as averaged at 620 mm. Winter months are typically dry, while precipitation is mainly associated with thunderstorms during the summer (October to March). Monthly evaporation data was available from the DWS station A2E009, located approximately 5km south-east of the project site (DWS, 2025). This station has an approximate Mean Annual Evaporation (MAE) of 2207.6 mm (S-Pan) over the period of available data (1957-1984). The highest evaporation occurs in the spring/ summer months of September to March.

3.2.2.1 **REGIONAL CLIMATE**

Kempton Park falls within the cold interior climatic zone of South Africa (SANS 204:2011) which consists of warm summers from December to February and cold, dry winters between June to August. The cold interior climate zone is known for moderately high summer and winter daytime temperatures which vary from about 14 ºC to 26 ºC during the summer and on average from 4 ºC to 22 ºC in winter. The area experiences summer rainfall, wintertime frost, fog, and varying wind speeds (Figure 11, Figure 12 and Figure 13).

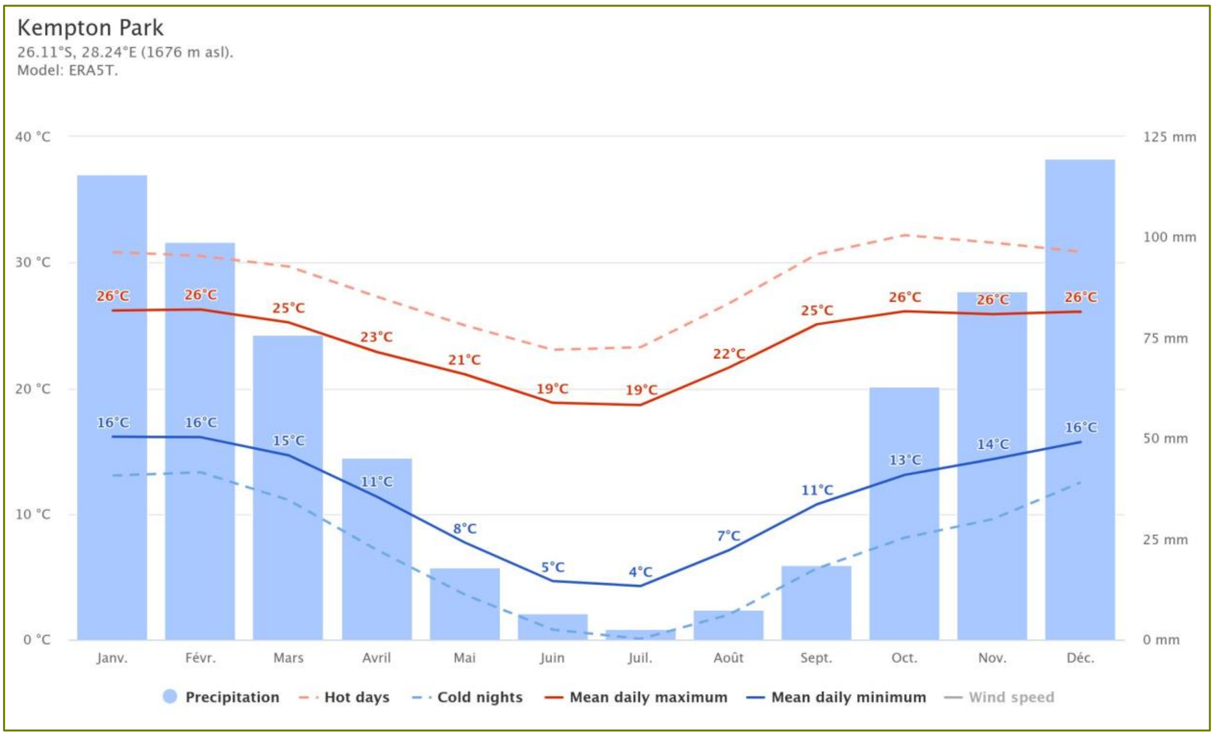

Figure 11: Average temperatures and precipitation of Kempton Park (Meteoblue, 2025).

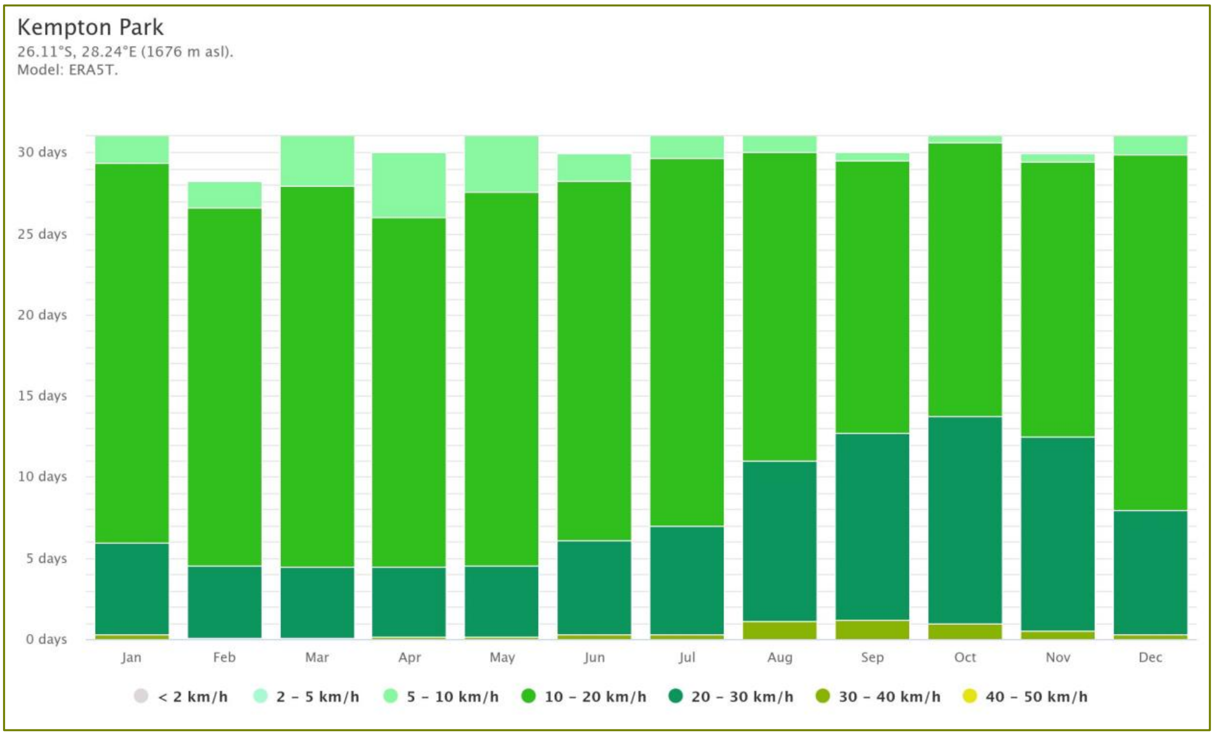

Figure 12: Average wind speed of Kempton Park (Meteoblue, 2025).

3.2.2.2 **RAINFALL**

The region experiences unpredictable rainfall that ranges from 715 mm to 735 mm annually, as averaged at 620 mm. Winter months are typically dry, while precipitation is mainly associated with thunderstorms during the summer (October to March). Figure 13 illustrates the mean monthly rainfall values for the study area (Meteoblue, 2025).

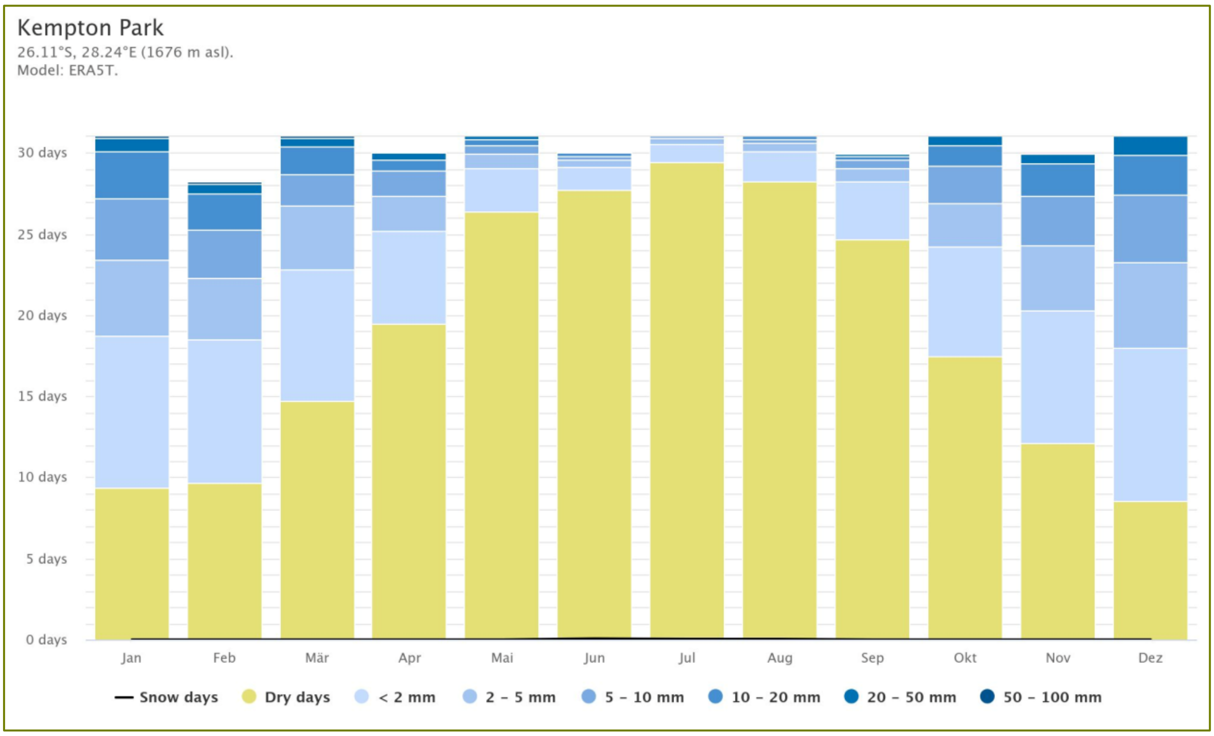

Figure 13: Average precipitation for Kempton Park (Meteoblue, 2025).

3.2.2.3 EVAPORATION

Monthly evaporation data was available from the DWS station A2E009, located approximately 5km south-east of the project site (DWS, 2025). This station has an approximate Mean Annual Evaporation (MAE) of 2207.6 mm (S-Pan) over the period of available data (1957-1984). The highest evaporation occurs in the spring/ summer months of September to March. The average monthly evaporation values are shown in Table 4**.**

Table 4: Average month evaporation values for station A2E009.

Month	Average Monthly Evaporation (mm)
October	249.3 mm
November	228.6 mm
December	235.4 mm
January	223.1 mm
February	182.9 mm
March	170.5 mm
April	134.9 mm
May	124.1 mm
June	111.2 mm
July	128.2 mm
August	177.3 mm
September	230.5 mm

Period and diurnal wind roses drawn from the South African Weather Service (SAWS) OR Tambo meteorological station data are shown in Figure 14. During the period January 2020 to December 2022, the dominant wind field was from the north-western sector. Calm conditions occurred 2% of the time. The predominant wind direction for day- and night-time conditions was from the northwest and north respectively.

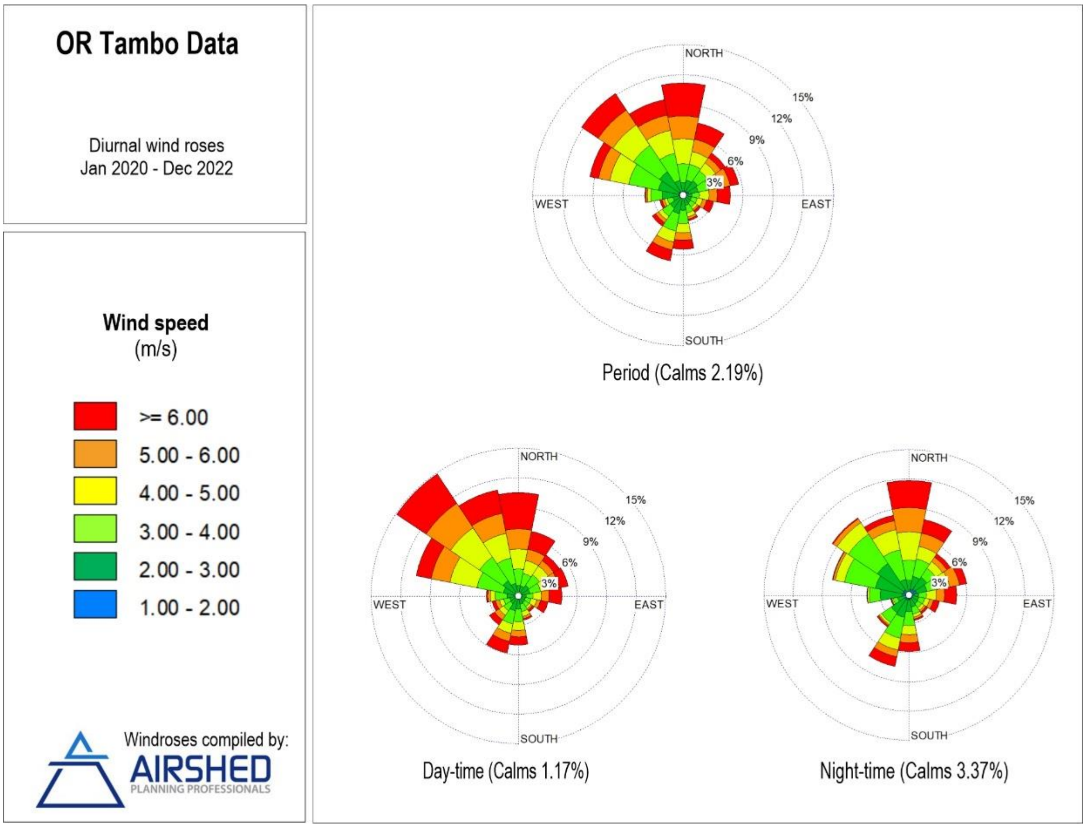

Figure 14: Period average, daytime and night-time wind roses (measured data; January 2020 to December 2022; SAWS OR Tambo meteorological station)

3.2.3 TOPOGRAPHY

The area surrounding Kelvin Power consists mainly of industrial and urban areas. Kelvin Power itself slopes downwards from east to west (1% to 4% gradient), with slopes draining primarily towards the authorised Modderfonteinspruit discharge point. This point is the lowest point of Kelvin Power and all surface water (whether channelled or surface runoff) flows to this point. Discharge and runoff enter a non-perennial stream which flows into the Modderfonteinspruit. The average elevation of the area falls between 1 668 and 1 619 metres above mean sea level (mamsl).

3.2.4 GEOLOGY AND SOILS

No soil study was undertaken before the construction of Kelvin Power and thus the pre-construction land-use and land capability is unknown. It is assumed that the area was used for grazing and agriculture while large sections remained wilderness areas. The current land use and land capability is for the generation of electricity. The surrounding areas are all used for either industrial or urban purposes. Even after closure and rehabilitation, the Ash Dams will remain and would prevent a large section of being rehabilitated. Kelvin Power is planning on demolishing Station A to make way for a gas production facility. The final land use and land capability will aim to reutilise the land for industrial purposes. Areas that cannot be used for industrial purposes will be returned to wilderness. Land use in the region includes heavy industry and residential purposes.

Soils in the study area were identified using GIS data obtained from WR2012 (WRC, 2016). The data indicates that soils toward the western zone of the study area is classified as Sandy-Loam to Sandy-Clay-Loam (SaLm-SaClLm) while the eastern segment is classified as Sandy-Clay-Loam (SaClLm).

According to the Council for Geoscience (CGS) 1:250 000 geological maps (Geological Map Sheet 2628 Johannesburg the surficial geology of the study area comprises of felsic, intermediate rocks of the Halfway House Dome situated on the central Kaapvaal Craton formed through a series of magmatic events during the mid-Archaean age.

The Ventersdorp Supergroup comprising of mafic and ultramafic volcanic rocks of the Klipriviersberg Group striking in a southwest northeast direction and dipping at approximately 50° in a southeastern orientation occurs just southwest of the project area. Following the Ventersdorp Group are siliciclastic rocks of the West Rand Group (Hospital Hill, Jeppestown as well as Government Subgroups) of the Witwatersrand Supergroup which also dips approximately 45° in a general south to southwestern orientation.

The Dwyka Group of the Karoo Supergroup flanks the West Rand Group towards the eastern perimeter of the greater study area while carbonate rocks of the Malmani Subgroup (Chuniespoort Group) occur towards the north and northeast.

3.2.5 BIODIVERSITY

No baseline biodiversity study was conducted before the construction of Kelvin Power. Kelvin Power does however conduct biomonitoring on a bi-annual basis on four (4) points in the Modderfonteinspruit, downstream of Kelvin Power.

3.2.6 WETLANDS

There are no known wetlands near or within Kelvin Power stations properties. The area is predominantly residential and industrial; however, no baseline studies have been conducted to verify that the site is not within the area of a delineated wetland to date (Divhani, 2024). The SANBI Map 5 wetlands data set indicates that no wetlands are present within the Kelvin Power boundary.

3.2.7 SURFACE WATER

The Kelvin site is situated on the boundary of two quaternary catchments, A21C and A21A, with 97% of the site in quaternary catchment A21C, the Jukskei River catchment. An unnamed tributary drains north-west for approximately 1.1km to confluence with the Modderfonteinspruit from the catchment of the ash dams where effluent is discharged. The Modderfonteinspruit confluences with the Jukskei River which drains in a north westerly direction and confluences with the Crocodile River approximately 35 km downstream. The station is situated within an industrial area, however it is also close to a number of residential areas. In addition, there are large areas of Alexandra, located downstream, where it is understood that informal use of water from the Jukskei River occurs. A-station, the area now proposed for the CCGT plant, is located in an area where there are no water resources that would be directly affected by runoff. Drainage from this section is currently via stormwater drains that drain directly to Main Channel which ultimately discharges to Modderfonteinspruit. Kelvin has implemented a surface water monitoring programme that includes daily monitoring of the effluent and weekly monitoring at the effluent discharge point into the unnamed tributary as well as at points up and downstream of this in the Modderfonteinspruit.

The station is situated within an industrial area, however it is also close to a number of residential areas. In addition, there are large areas of Alexandra, located downstream, where it is understood that informal use of water from the Jukskei River occurs. Catchment A21C is 75 961 ha and the part of the Kelvin site contributing to this catchment is 154.7 ha (or 0.2%) and Catchment A21A is 48 189 ha and the portion of the Kelvin site contributing to this catchment is 5.4 ha (or 0.01%). The site is at an elevation of between 1620 and 1680 mamsl with a gentle slope of approximately 0.03 (3% or 3 meters of elevation for every 100m).

The site falls within Integrated Unit of Analysis, IUA 1: Upper Crocodile/ Hennops/ Hartbeespoort, upstream of Hartbeespoort Dam and Resource Units 1.1 (Upper Hennops and Rietvlei Rivers to inflow of Rietvlei Dam, and dolomite aquifer systems) and 1.7 (Jukskei, Klein Jukskei and Modderfonteinspruit). This IUA has been classified as a Class III river. In respect of the classification of rivers, this means that it is a river that is highly used and configuration of ecological categories of that water resource are highly altered from the predevelopment condition

Natural and channelled runoff generated on the majority of the operation's property drains into the Modderfonteinspruit via a non-perennial stream situated downstream of the discharge point. No natural streams flow through the Kelvin Power site and runoff from the adjacent urban area (Spartan suburb) is collected in the secondary channel and channelled toward the Modderfonteinspruit discharge point. Figure 15 shows the location of the testing sites.

Figure 15: Map indicating position of toxicity testing sites as well as the flow of the Modderfonteinspruit (blue) and the effluent stream (red)

Table 5 indicates the latest in-situ monitoring results conducted by Clean Stream in January 2025. Monitoring point EFF indicates the water quality that is discharged into the Modderfonteinspruit.

Table 5: In-situ surface water quality (Clean Stream, January 2025).

Monitoring Locality	Results		
	pH @ 25°C	EC (mS/m) @ 25°C	Dissolved Oxygen (mg/l)
K1	8.1	42.9	8.5
K2	8.3	151.2	8.7
EFF	8.8	149.3	7.4
EFF-Plus	7.9	143.6	9.2
Ash Dam	9.9	204.2	7.3
Desilting Dam	9.1	139.7	7.0
RWD	10.1	176.7	7.5

The pH levels of the water samples ranged between 7.94 and 10.09 which are within (for samples K1, K2, EFF Plus and EFF) and above (for samples Ash Dam, Desilting Dam and RWD) the acceptable range (pH 6-9) in which pH can be excluded as a driving factor for toxicity (USEPA, 1996). The conductivities (ECs) of the water samples ranged between 42.9 mS/m and 204.2 mS/m. A dissolved oxygen (DO) concentration above 4 mg/L is required for aquatic organisms (USEPA, 1996) to survive. The DO levels for the 7 water samples ranged from 6.98 mg/L to 9.18 mg/L.

Sediment sample EFF Plus showed no lethal (mortalities) or sub-lethal (growth inhibition) environmental toxicity hazard (Class I). Sediment samples K1 and K2 were allocated a Hazard Class II (slight lethal environmental toxicity hazard) based on the 20% and 27% ostracod (H. *incongruens*) mortalities observed for these samples respectively following testing.

Water samples K2 and EFF-Plus showed no lethal or sub-lethal environmental toxicity hazard (Class I). Water samples K1, EFF, Ash Dam and Desilting Dam were classified as having a slight lethal or sub-lethal environmental toxicity hazard (Class II). For sample K1, the classification was based on the 33% vertebrate (P. reticulata) mortalities (lethal) observed following testing. Although no significant vertebrate (P. reticulata) mortalities (lethal) were observed on the 100% EFF and Ash Dam sample concentrations, such slight effects were observed on other dilutions of these samples – refer to Table 9 for detailed data trends. For sample Desilting Dam, the classification is based on the slight bacterial (A. fischeri) light emission inhibition effect (sub-lethal) observed on the 3.125%, 1.56% and 0.78% dilutions of this sample. Water sample RWD was allocated a Hazard Class III (sub-lethal environmental toxicity hazard) based on the 69% (TU=1.2) bacterial (A. fischeri) light emission inhibition effect observed following testing. Minimum acceptable effect levels (safe dilution factors) of 13%, 6% and 62% were calculated for samples EFF, Ash Dam and RWD respectively (e.g. 13 parts EFF water diluted with 87 parts 'clean' water should be sufficient to negate toxicity effects for these trophic levels should this water reach the natural environment. For sample Desilting Dam, no safe dilution factor could be established based on the slight bacterial (A. fischeri) light emission inhibition effects observed up to the 0.78% dilution of the sample.

3.2.8 GROUNDWATER

The groundwater in the area feeds into the Kelvin discharge channel and Modderfonteinspruit as baseflow. This is supported by the regional topographic slope, sustained flow within the Modderfonteinspruit during the dry season and the height of the groundwater in monitoring boreholes close to the river as well as other studies conducted by SRK in the regional area (Golder, 2021).

The measured groundwater levels in a number of boreholes in the vicinity and on the site were assessed in relation to the topography. The data indicated a very good correlation between topography and groundwater (R2 = 0.9915). The groundwater is therefore assumed to follow the topographic slope of the area, which is a gentle gradient on the site, tending in a west-southwest direction.

Groundwater monitoring is conducted on a quarterly basis by Groundwater Complete (2025) and the monitoring localities are given in Table 6 below.

Table 6: Groundwater monitoring points (Groundwater Complete, June, 2025).

BH	Description	Coordinates *(WGS 84)* South	Coordinates *(WGS 84)* East	Sampled	Water level (mbs)	Comment
KPS-BH01	Western perimeter - toe of Ash Dam B	-26.1201	28.1828	Yes	3.1	Clear, no lid
KPS-BH02	Southern toe of Ash Dam B	-26.1218	28.1862	Yes	1.3	Clear
KPS-BH04	Western perimeter	-26.1224	28.1840	Yes	1.1	Clear
KPS-BH05	Southern perimeter - south of Ash Dam A	-26.1241	28.1910	Yes	2.9	Clear
KPS-BH07	South-western perimeter	-26.1228	28.1843	Yes	3.3	Clear
KPS-MON01	Northern perimeter next to Coal Stockpile	-26.1118	28.1927	Yes	8.9	Clear, no lid
KPS-MON02	Northern perimeter south of Coal Stockpile	-26.1130	28.1917	Yes	6.2	Clear
KPS-MON03	North of Ash Dump – north-western perimeter	-26.1157	28.1884	Yes	5.7	Clear
KPS-MON04	Western perimeter between the Ash Dump and Ash Dam B	-26.1185	28.1846	Yes	2.9	Slightly turbid
KPS-MON05	Southern perimeter on southern toe of Ash Dam A	-26.1234	28.1857	Yes	2.3	Slightly turbid
KPS-MON06	Between Ash Dam A and Southern Coal Stockpile	-26.1196	28.1918	Yes	2.1	Clear
KPS-MON07	South-east of Southern Coal Stockpile	-26.1216	28.1942	Yes	2.3	Turbid

BH	Description	Coordinates *(WGS 84)*		Sampled	Water level (mbs)	Comment
		South	East			
KPS-MON09	Background deep	-26.1173	28.1964	Yes	5.1	Clear
KPS-MON10	Background shallow	-26.1173	28.1963	Yes	4.6	Clear
KPS-MON11	Fuel storage	-26.1153	28.1942	Yes	4.8	Slightly turbid
KPS-MON12	HFO storage	-26.1173	28.1937	Yes	6.6	Clear
KPS-MON13	Brick Yard (Footprint)	-26.1182	28.1898	Yes	4.8	Clear
KPS-MON14	Switch Yard	-26.1147	28.1920	Yes	5.7	Clear
KPS-MON16	Clinker Dump (replace KPS-MON03)	-26.1174	28.1822	Yes	3.8	Clear
KPS-NBH01	Newly drilled borehole	-26.1217	28.1834	Yes	1.8	Slightly turbid
KPS-NBH02	Newly drilled borehole	-26.1194	28.1822	Yes	1.9	Slightly turbid
KPS-NBH03	Newly drilled borehole	-26.1242	28.1933	Yes	3.6	Slightly turbid

Groundwater TDS concentrations as measured in June 2025 were used to generate a thematic contour map of the groundwater quality impacts at Kelvin (Figure 16).

Currently the Ash Dams and Coal Stockpile Areas (the stockpile areas of Station A might not be in use, but coal is still present on the surface) is the biggest point source pollution contributors. None of these sites are lined and only the Coal Stockpile Area will be rehabilitated during the closure phase. Thus, seepage of polluted water onto the surface will cause significant pollution into the foreseeable future and negatively impact on the groundwater. Once contaminated, the groundwater in the newly polluted area will follow a pathway towards further downgradient pollution. High levels of biological contamination have been identified but the source has not yet been identified, it is important that Kelvin Power investigate to determine the source of the contamination. Sulphate (contributes to TDS) and various coliforms have been identified as the key water quality constituents contributing to the water quality risk.

The hydrochemical analysis results suggest the overall ambient groundwater quality is moderate good with the majority of macro and micro determinants of most samples below the SANS 241:2015 limits. Groundwater can be described as neutral to alkaline, saline to very saline and hard to very hard. The majority of samples analysed indicate enriched calcium and magnesium which can be attributed to the igneous formation host aquifer and are probably of geological origin. It should however be noted that, monitoring boreholes in close proximity to existing waste body footprints indicate an impacted groundwater environment with high salt load (TDS and conductivity) and sulphate being the main diver of the salt content. Neutral conditions as well as below limit metal concentrations suggest that Acid Rock Drainage (ARD) is currently not occurring.

The water quality of surface water localities analysed is poor and can be described as neutral, very saline and very hard. Nitrate concentration for both surface water samples analysed is highly elevated. It should be noted that only contact water samples were analysed and thus, the water quality discussed does not necessarily represent the ambient surface water quality.

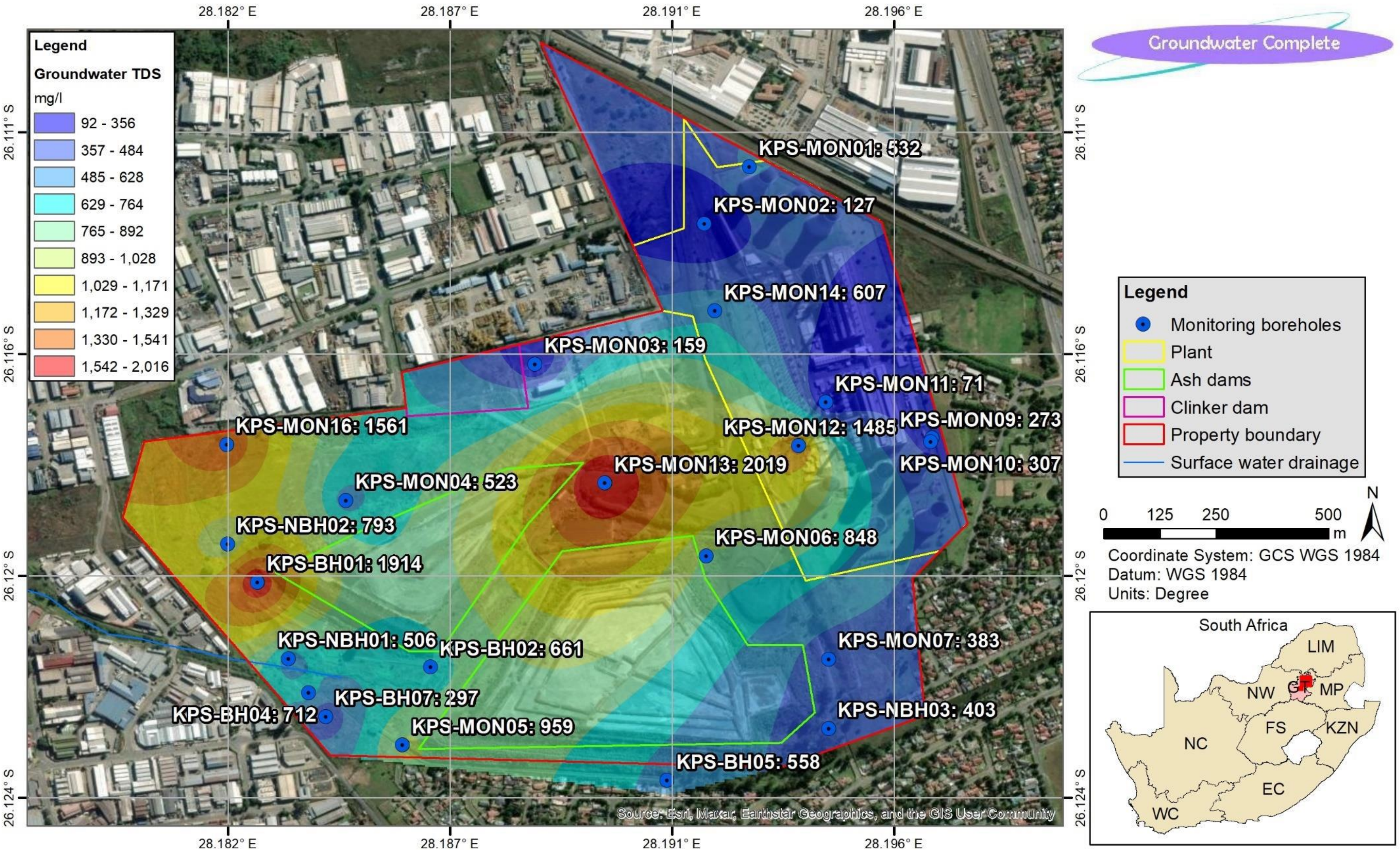

Figure 16: Contour map of the groundwater TDS concentrations for June 2025

3.2.8.1 RESULTS OF MONITOTING

The following conclusions and recommendations are derived from the evaluation of groundwater quality and water level information collected in June 2025.

Groundwater Levels:

- Groundwater level depths varied between 1.1 and 8.9 meters below surface (mbs), while the elevations were estimated to have varied between 1 619 and 1 666 meters above mean sea level (mamsl).
- The shallow water level depths measured directly downgradient from the two ash dams are most probably a result of artificial aquifer recharge in the form of seepage from the dams. The deepest water level was measured in KPS-MON01, which is situated north of the Plant.
- Significant water level variations are observed in some boreholes (e.g. KPS-MON01, KPS-MON02, KPS-MON03 and KPS-MON14) when considering the entire data record, which seem to be mostly seasonally driven. Water levels rise during the wet summer rainfall months and drop again during the dry winter months.
- Furthermore, boreholes KPS-MON01, KPS-MON02 and KPS-MON03 display long-term decreasing water level trends when considering the entire data record – the exact cause/s of which is unclear at this time.
- Groundwater flow from the ash dams is towards the west/south-west in the direction of a tributary of the Jukskei River. Flow from the plant area is predominantly towards the west, but may also occur towards the north-east as it is located on a local groundwater divide.

Groundwater Qualities:

- Groundwater qualities, in terms of the inorganic content, varied from mostly good to poor if compared with the South African National Standards for drinking water *(SANS 241:2015)*.
- Monitoring information shows signs of adverse groundwater quality impacts, especially downgradient from Ash Dam A and the coal stockpile (KPS-BH04, MON05 and MON06), Ash Dam B (KPS-BH01, BH02, NBH01, NBH02), the brick yard footprint (KPS-MON13) the Plant (KPS-MON01, MON12 and MON14) and clinker dump (KPS-MON04 and MON16).
- Sulphate, nitrate and sodium were identified as the dominant contaminants associated with the abovementioned source areas.
- Bacteriological contamination was encountered in five monitoring boreholes, which renders groundwater from these boreholes unsafe for human consumption. The source of this contamination is unknown and causes should be investigated.
- The bacteriological contamination varies significantly from quarter to quarter, this almost certainly indicates that contamination is of a sporadic nature.
- Groundwater is mainly dominated by magnesium cations. Sulphate is generally the dominant anion in the downgradient groundwater flow direction, which indicates adverse groundwater quality impacts. On the other hand, bicarbonate alkalinity dominates where the inorganic content of the groundwater is generally representative of ambient/unaffected conditions.
- The graph comparing the up- and downgradient groundwater qualities clearly shows the significance of the groundwater quality impacts. The average downgradient groundwater sulphate content was nearly ten times higher than the upgradient concentration. Furthermore, sodium was also markedly higher in the downgradient groundwater flow direction.
- Studies have shown ash dams to be potential sources of hexavalent chromium, which poses a major health threat to groundwater users as it is a confirmed carcinogen – if present at high enough concentrations. No traces thereof were found in the monitoring boreholes situated in the vicinity of the two ash dams.

- Groundwater samples were additionally analysed for a wide range of semi-volatile organic compounds (SVOCs) and polychlorinated biphenols (PCBs). None of the samples contained any discernible concentrations of PCBs, while the following SVOCs were found to be present in KPS-MON11: Phenanthrene, fluoranthene, pyrene, benzo(a)anthracene, chrysene, benzo(b+k)fluoranthene, benzo(a)pyrene, benzo(g,h,i)perylene, indeno(123-cd)pyrene.

Status quo of Recommendations made in the June 2025 monitoring report:

- Additional plume monitoring boreholes (i.e. KPS-NBH01 and NBH02) were drilled in March 2025, and the next step would now be to determine if any groundwater users are located downgradient from the power station that may potentially be affected (hydrocensus/user survey) – **The hydrocencus survey has been completed in 2025.**
- Numerical mass transport modelling is also recommended to predict/simulate plume migration in the years to come. **– Plume modelling has been completed in 2025.**
- Groundwater monitoring should continue on a quarterly basis, while the current range of physical and chemical analytes is considered to be sufficient – **Groundwater monitoring is ongoing on a quarterly basis.**

The results of the plume modelling and hydrocensus are included in the accompanying 2025 IWWMP update and are not reproduced in this RSIP. The following conclusions were derived from the outcomes of the 2025 geohydrology investigations:

- The study area is predominantly underlain by a Class d3 intergranular and fractured aquifer with host aquifers consisting of primarily intermediate or alkaline intrusive formations. The latter can be associated with relatively low hydraulic conductivity, hence, groundwater movement and migration of contaminants may be sluggish.
- According to the aquifer classification map of South Africa the project area is underlain by a "Minor aquifer.
- Under natural conditions there is pronounced interaction between surface water and groundwater. Regional drainages can be generally classified as influent or gaining stream systems with groundwater discharging as baseflow within these zones. Accordingly, potentially contaminated groundwater originating from the power generation development and infrastructure may negatively impact on the Modderfonteinspruit and associated drainage system.
- A hydrocensus user survey conducted did not identify any privately owned boreholes currently in use in the pollution plume migration pathway.
- The unsaturated zone within the study area has a mean thickness of approximately ~5.0m. Due to clay/silt lenses throughout the study area, the shallow vadose zone can also be indicative of perched aquifer conditions which may be associated with seepage zones throughout the study area. This implies that, due to the relatively thin unsaturated zone, host aquifers might be vulnerable to potential contamination.
- It can be noted that Coefficient of Variation (CV) calculated for the water level database is relatively low, indicating that the regional groundwater system is in quasi-steady state conditions.
- Analysed data indicate that the surveyed water levels correlate very well to the topographical elevation and even with dynamic water levels taken into consideration, the correlation is calculated at R2 >0.98. Accordingly, it can be assumed that, under natural conditions, the regional groundwater flow direction will be dictated by topography. The inferred regional groundwater flow direction of the shallow aquifer will thus be towards the lower laying drainage system and will flow in a general western to south-western direction.
- The hydrochemical analysis results suggest the overall ambient groundwater quality is moderate good with the majority of macro and micro determinants of most samples below the SANS 241:2015 limits.

It should however be noted that, monitoring boreholes in close proximity to existing waste body footprints indicate an impacted groundwater environment with high salt load (TDS and conductivity) and sulphate being the main diver of the salt content. Neutral conditions as well as below limit metal concentrations suggest that Acid Rock Drainage is currently not occurring.

- All site characterization information gathered along with time-series monitoring data were evaluated and incorporated into the formulation of a conceptual groundwater model. The conceptual model formed the basis of the numerical groundwater model development. The latter was calibrated to an acceptable error margin and applied as groundwater management tool for simulation of management scenarios.
- Two alternative management and mitigation scenarios which include active as well as passive water management strategies were simulated to evaluate the remedial options available. Based on the constraining effects of these mitigation scenarios on the pollution plume migration, both alternatives can be viewed as the remedial options for implementation. It can be noted that a collective approach can also be evaluated combining these alternatives for a cumulative impact.
- The model results were incorporated into a risk rating matrix to determine the significance of potential groundwater related impacts.
- During the operational phase the environmental significance rating of groundwater quantity impacts on down-gradient receptors are rated as insignificant as no groundwater will be removed from storage via dewatering or abstraction. Groundwater quality impacts from existing waste body footprints and associated infrastructure are rated as high negative without implementation of remedial measures and medium to low negative with implementation of mitigation measures.
- The main post-closure activities include rehabilitation and decommissioning of related infrastructure. During the post-closure phase, the environmental significance rating of groundwater quantity impacts on down-gradient receptors remains insignificant as not water will be removed from storage.

4 ENVIRONMENTAL RISK ASSESSMENT

An environmental risk assessment was undertaken for all areas of infrastructure at the Power Station and aspects for which the Power Station has a responsibility to mitigate an impact or risk at closure. The findings of this risk assessment aim to guide the appropriate closure strategies. This RSIP has been compiled to accompany the current application for the application for the renewal of the Water Use License and to include new water uses in the license, as well as to update the Annual RSIP. As such, the content of this section has been extracted from the associated IWWMP and adapted and supplemented where relevant. This risk assessment will, as per the WUL Conditions and NWA and Regulations, be revised and amended during the future annual review process to ensure that the ongoing risk and risk ratings are relevant to the station moving forward.

4.1.1 RISK ASSESSMENT METHODOLOGY

Environmental risks have been identified through review of the proposed and existing mining activities and the existing mine environment. The identification of risks was undertaken by a team of specialists including an Environmental Assessment Practitioner, wetland specialist, soils and land capability specialist, a hydrogeological specialist, and a team of environmental engineers. Further, if and where, risks or impacts are identified through the stakeholder engagement process these are included and assessed.

The impact significance, or risk rating methodology as presented herein is guided by the requirements of the NEMA EIA Regulations 2014 (as amended). The broad approach to the significance rating methodology is to determine the environmental risk (ER) by considering the consequence (C) of each impact (comprising Nature, Extent, Duration, Magnitude, and Reversibility) and relate this to the probability/ likelihood (P) of the impact occurring. The ER is determined for the pre- and post-mitigation scenario.

The significance (S) of an impact is determined by applying a prioritisation factor (PF) to the environmental risk (ER). The environmental risk is dependent on the consequence (C) of the particular impact and the probability (P) of the impact occurring. Consequence is determined through the consideration of the Nature (N), Extent (E), Duration (D), Magnitude (M), and Reversibility (R) applicable to the specific impact.

For the purpose of this methodology the consequence of the impact is represented by:

$$\boldsymbol{C} = \frac{(\boldsymbol{E} + \boldsymbol{D} + \boldsymbol{M} + \boldsymbol{R}) * \boldsymbol{N}}{\boldsymbol{4}}$$

Each individual aspect in the determination of the consequence is represented by a rating scale as defined in Table 7 below.

Table 7: Criteria for Determining Impact Consequence

Aspect	Score	Definition
Nature	- 1	Likely to result in a negative/ detrimental impact
	+1	Likely to result in a positive/ beneficial impact
Extent	1	Activity (i.e. limited to the area applicable to the specific activity)
	2	Site (i.e. within the development property boundary)
	3	Local (i.e. the area within 5 km of the site)
	4	Regional (i.e. extends between 5 and 50 km from the site)
	5	Provincial / National (i.e. extends beyond 50 km from the site)
Duration	1	Immediate (<1 year)

Aspect	Score	Definition
	2	Short term (1-5 years)
	3	Medium term (6-15 years)
	4	Long term (15-65 years, the impact will cease after the operational life span of the project)
	5	Permanent (>65 years, no mitigation measure of natural process will reduce the impact after construction)
Magnitude/ Intensity	1	Minor (where the impact affects the environment in such a way that natural, cultural, and social functions and processes are not affected)
	2	Low (where the impact affects the environment in such a way that natural, cultural, and social functions and processes are slightly affected)
	3	Moderate (where the affected environment is altered but natural, cultural, and social functions and processes continue albeit in a modified way, moderate improvement for +ve impacts)
	4	High (where natural, cultural, or social functions or processes are altered to the extent that it will temporarily cease, high improvement for +ve impacts)
	5	Very high / don't know (where natural, cultural or social functions or processes are altered to the extent that it will permanently cease, substantial improvement for +ve impacts)
Reversibility	1	Impact is reversible without any time and cost.
	2	Impact is reversible without incurring significant time and cost.
	3	Impact is reversible only by incurring significant time and cost.
	4	Impact is reversible only by incurring prohibitively high time and cost.
	5	Irreversible Impact.

Once the C has been determined, the ER is determined in accordance with the standard risk assessment relationship by multiplying the C and the P. Probability is rated/ scored as per Table 8.

Table 8: Probability Scoring

Probability	1	Improbable (the possibility of the impact materialising is very low as a result of design, historic experience, or implementation of adequate corrective actions; <25%),
	2	Low probability (there is a possibility that the impact will occur; >25% and <50%),
	3	Medium probability (the impact may occur; >50% and <75%),
	4	High probability (it is most likely that the impact will occur- > 75% probability), or
	5	Definite (the impact will occur),

The result is a qualitative representation of relative ER associated with the impact. ER is therefore calculated as follows:

$$ER = C \; x \; P$$

Table 9: Determination of Environmental Risk

Consequence	5	5	10	15	20	25
	4	4	8	12	16	20
	3	3	6	9	12	15
	2	2	4	6	8	10
	1	1	2	3	4	5
		1	2	3	4	5
	Probability					

The outcome of the environmental risk assessment will result in a range of possible scores, ranging from 1 through to 25. These ER scores are then grouped into respective classes as described in Table 10.

Table 10: Environmental Risk Scores

ER Score	Description
<9	Low (i.e. where this impact is unlikely to be a significant environmental risk/ reward).
≥9 ≤17	Medium (i.e. where the impact could have a significant environmental risk/ reward),
>17	High (i.e. where the impact will have a significant environmental risk/ reward).

The impact ER will be determined for each impact without relevant management and mitigation measures (pre-mitigation), as well as post implementation of relevant management and mitigation measures (post-mitigation). This allows for a prediction in the degree to which the impact can be managed/mitigated.

4.1.2 IMPACT IDENTIFICATION

The identification of management and mitigation measures are guided by the hierarchy of mitigation. The ultimate aim being to avoid or mitigate detrimental impacts on the environment, and to optimise positive environmental impacts, and for matters pertaining thereto. Table 11 lists the environmental impacts and risks identified which relate to final rehabilitation, decommissioning, and closure. The relevant management and mitigation measures are listed. The applicable conceptual closure strategy to avoid, manage and mitigate the impacts and risks are also included in Table 11, together with the reassessment of the environmental risk after mitigation. The environmental

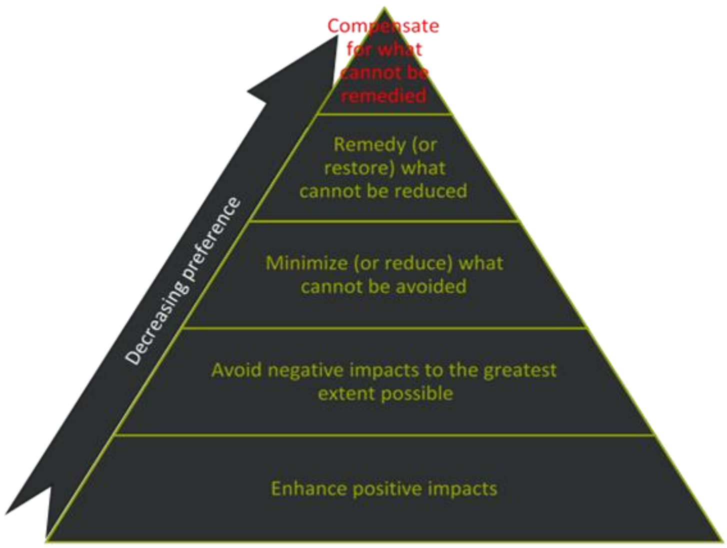

Figure 17: Hierarchy of mitigation and management.

risk assessment of the impacts associated with final rehabilitation, decommissioning and closure has informed the most appropriate closure strategy for the project. Impacts that are classified as high-risk post-mitigation are likely to represent either latent or residual environmental impacts and financial provision will be provided to remediate these specific impacts.

The significance scores are defined as Low (<9); Medium (≥9; ≤17); and High (> 17) and are colour-coded as follows: Low – Green, Medium – Orange, and High – Red. Positive impacts have not been colour-coded. It is important to note that the environmental risk assessment will be revised and updated on an annual basis to ensure that this RSIP remains applicable to the actual and predicted environmental impacts and risks.

For the purpose of report, the following broad phasing definitions apply:

- Planning/Pre-construction refers to the phase in which planning takes place, namely: exploration, environmental studies, finalising designs, etc.;
- Construction refers to the phase in which the site is prepared and infrastructure is established (e.g. vegetation clearance, access road preparation, construction camp establishment, infrastructure placement, etc.);
- Operation refers to the phase in which physical mining and production takes place – this phase will include mining and where relevant on-going progressive rehabilitation efforts;
- Decommissioning and rehabilitation refers to the inter-linked phases in which existing infrastructure is removed and final rehabilitation efforts are applied and their success monitored;
- The closure phase commences all operations have ceased, and final decommissioning and rehabilitation is being completed.
- Post-closure refers to the phase in which maintenance and rehabilitation monitoring are undertaken to ensure that the mines closure objectives are met. Post-closure typically commences once a closure certificate has been received. The duration of the post-closure phase is defined by the duration of the applicable residual and latent environmental impacts.

4.1.3 SPECIALIST STUDIES

4.1.3.1 UPDATED GROUNDWATER AND GEOCHEMICAL MODEL AND IMPACT ASSESSMENT

The updated groundwater and geochemical model has been completed in 2025 (Gradient Consulting, 2025). The results from the modelling are presented in the IWWMP (2025) for the power station and are not reproduced again in the RSIP. Refer to the accompanying 2025 IWWMP for further details.

Post-operational and decommissioning phase: Management and mitigation measures from the geohydrological report are provided below:

Mitigation and management measures associated with the post-operational and decommissioning phase activities include the following:

i. It is important to development and implement a post-closure groundwater monitoring program to assess the regional groundwater level rebound as well as pollution plume propagation to serve as early warning mechanism to implement mitigation measures. Should neighbouring boreholes remain affected, necessary actions such as provision of alternative water supply and/or compensation should be taken to ensure continual water supply. It should be noted that, currently no neighbouring boreholes were identified as being impacted on.

ii. Rehabilitation should be implemented in accordance with the rehabilitation model and limit areas and volumes of ponding water as far as possible.

iii. Down-gradient seepage capturing alternatives i.e., establishment of seepage capturing cut-off trenches or establishment of scavenger boreholes should be implemented as active waste-water management techniques in order to constrain the migration of pollution plumes emanating from pollution sources during the post-closure phase.

iv. Intercepted contact water should be treated to acceptable water quality standards and re-introduced to the catchment water balance.

v. It is expected that post-closure the generated pollution plume and local groundwater contamination footprint will decay and be diluted by rainfall recharge, however the lasting effect and subsequent impact on neighbouring borehole qualities should be monitored with alternative water supply sources or compensation measures available for nearby users if impacted on.

4.1.4 ENVIRONMENTAL RISK ASSESSMENT FOR REHABILIATION AND CLOSURE

This risk assessment identifies and assesses the environmental risks and potential impacts associated with the current operations. Where practical the mitigation hierarchy is applied to limit the post mitigation risk or impact significance. However certain impacts will perpetuate beyond the closure period and are identified described and assessed as residual and/or latent impacts in Section 6.

Table 16 provides a summary of the identified impacts, associated level of risk (or significance rating) both pre- and post- mitigation, the identified key management and mitigation actions, and finally the identified broad closure strategy.

Table 11: Impact Assessment for Rehabilitation, Decommissioning and Closure[1].

Aspect	Impact	Applicable phase	Pre-mitigation risk	Suggested Mitigation Measures	Post-mitigation risk (post-mitigation)	Closure Options/Actions
Surface Water	Surface water quality deterioration – Siltation of water resource from exposed soils during active rehabilitation and until suitable cover is provided. Siltation of watercourses impacts on the water quality and the health of the downstream benthic communities.	Decommissioning, rehabilitation, and closure phase.	-13 (Medium)	- No sediment laden water to be discharged directly to the stream or other clean water channels. - Ensure that the surface profile is rehabilitated to promote natural runoff drainage and avoid ponding of water within the rehabilitated area. - Surface inspection should be regularly undertaken to ensure that runoff is able to drain into the downstream drainage systems/rivers. - All rehabilitated terrestrial areas must be established with vegetation or alternative soil stabilisation mechanisms.	-9 (medium)	Free draining closure/ final landform. Closure phase monitoring and inspection- erosion and vegetation growth. Clearly defined post closure land-use plan
Surface Water	Surface water quality deterioration.	Decommissioning, rehabilitation, closure, and post closure phase.	-22.5 (high)	- Monitoring of surface water and groundwater in accordance with the proposed integrated monitoring network and protocol should be continued throughout the post operational phase.	-16 (medium)	Develop a post-closure SWMP.

[1]The significance scores are defined as Low (<9); Medium (≥9; <17); and High (≥ 17).

Aspect	Impact	Applicable phase	Pre-mitigation risk	Suggested Mitigation Measures	Post-mitigation risk (post-mitigation)	Closure Options/Actions
Surface Water	Surface water quality impacts due to removal of infrastructure.	Decommissioning, and rehabilitation phase.	-9.75 (medium)	- Ensure that hydrocarbon spills are minimised; - Implement spills prevention and response plan; - Existing roads should be used where possible; and - New disturbed areas should be minimised.	-6.00 (low)	Spills prevention and response plan. Limit new surface disturbance.
Surface Water	Alteration to surface runoff flow volumes.	Decommissioning, rehabilitation, closure and post-closure phase.	-12.75 (medium)	- Develop and implement SWMP. - Implement water quality monitoring; and - Rehabilitation of all infrastructure will be implemented and will include re-vegetating, capping (where applicable) and shaping.	-7.5 (low)	Develop a post-closure SWMP.
Groundwater	Surface and groundwater deterioration due Seepage from waste deposits.	Operation, decommissioning, rehabilitation, closure and post-closure phase.	-22.5 (high)	- It is important to development and implement a post-closure groundwater monitoring program to assess the regional groundwater level rebound as well as pollution plume propagation to serve as early warning mechanism to implement mitigation measures. Should neighbouring boreholes remain affected, necessary actions such as provision of alternative water	-12.75 (medium)	Free draining closure/ final landform. Management of contamination plume. Provision of adequate post closure monitoring and rehabilitation fund.
	Potential release of contamination from decommissioning of waste management facilities).	Decommissioning, and rehabilitation phase.	-21.25 (high)		-5.00 (low)	

Aspect	Impact	Applicable phase	Pre-mitigation risk	Suggested Mitigation Measures	Post-mitigation risk (post-mitigation)	Closure Options/Actions
				supply and/or compensation should be taken to ensure continual water supply. It should be noted that, currently no neighbouring boreholes were identified as being impacted on. - Rehabilitation should be implemented in accordance with the rehabilitation model and limit areas and volumes of ponding water as far as possible. - Down-gradient seepage capturing alternatives i.e., establishment of seepage capturing cut-off trenches or establishment of scavenger boreholes should be implemented as active waste-water management techniques in order to constrain the migration of pollution plumes emanating from pollution sources during the post-closure phase. - Intercepted contact water should be treated to acceptable water quality standards and re-introduced to the catchment water balance.		Develop and implement Post Closure Land Management and Monitoring Plan.

Aspect	Impact	Applicable phase	Pre-mitigation risk	Suggested Mitigation Measures	Post-mitigation risk (post-mitigation)	Closure Options/Actions
				- It is expected that post-closure the generated pollution plume and local groundwater contamination footprint will decay and be diluted by rainfall recharge, however the lasting effect and subsequent impact on neighbouring borehole qualities should be monitored with alternative water supply sources or compensation measures available for nearby users if impacted on		
Air Quality	Decline in air quality: dust from the vehicles and movement of material stockpiles.	Decommissioning, rehabilitation phase.	-6.75 (low)	- Implement effective dust control measures during rehabilitation activities. These can include limiting the speed of haul trucks; limit unnecessary travelling of vehicles on untreated roads; wetting of surfaces, application of chemical dust suppressants; or avoiding dust generating activities on windy days. - Demolition of infrastructure to have water sprays where vehicle activity is high or significant dust generated. - Rehabilitation and vegetation of mined area. - The access road to the Project also needs to be kept clean to minimise	-6.00 (low)	Implement effective dust control measures. Revegetation of disturbed areas.

Aspect	Impact	Applicable phase	Pre-mitigation risk	Suggested Mitigation Measures	Post-mitigation risk (post-mitigation)	Closure Options/Actions
				carry-through of mud on to public roads.		
Soil Resource	Erosion of topsoil's: Erosion has a direct and indirect impact on the area. The direct impact is the removal of usable soil and the indirect is the sedimentation of water resources downslope.	Decommissioning, rehabilitation, and closure phase.	-12 (medium)	- Vehicles will be driving around on the site and must stay within the designated routes. This will prevent compaction of soils outside of the project area. If areas have been compacted the soil must be ripped to remedy the effects of compaction. - Areas where erosion is identified must be rehabilitated by creating stormwater pathways or increasing the permeability at these concentrated flow paths. - If soil erosion is detected, the area must be stabilised using geo-textiles and facilitated re-vegetation.	-8.25 (low)	Re-instatement of vegetative cover as far as possible. Free draining closure/ final landform. Closure phase monitoring and inspection- erosion and vegetation growth.
Soils	Loss of land capability and agricultural land: The previously rehabilitated areas have been rehabilitated poorly and require supplementation.	Decommissioning, rehabilitation, and closure phase.	-16.25 (medium)	- Compacted areas are to be ripped to loosen the soil structure and vegetation cover re-instated; - If erosion occurs, corrective actions (erosion berms) must be taken to minimize any further erosion from taking place;	-8.25 (low)	Limit on site vehicle movements (during post operational phases) to defined routes and designated areas.

Aspect	Impact	Applicable phase	Pre-mitigation risk	Suggested Mitigation Measures	Post-mitigation risk (post-mitigation)	Closure Options/Actions
				- If erosion has occurred, topsoil should be sourced and replaced and shaped to reduce the recurrence of erosion; - Only the designated access routes are to be used to reduce any further unnecessary compaction; and - Storage of potential contaminants should be undertaken in bunded areas.		
Biodiversity	The natural vegetation associated with the power station areas has been destroyed	Decommissioning, rehabilitation, and closure phase.	-16 (medium)	- The areas to be rehabilitated must be accessed through the existing access routes or previously disturbed areas as far as practically possible to decrease the amount of vegetation disturbed. - The footprint area of the construction should be kept a minimum. The footprint area must be clearly demarcated to avoid unnecessary disturbances to adjacent areas.	-11.25 (medium)	Ensure protection of identified natural areas. Develop and implement and alien invasive control and eradication management plan.
Biodiversity	Further impacts due to the continued spread and/or establishment of alien and/or invasive species: Patches of alien invasive species were	Decommissioning, rehabilitation, and closure phase.	-15.00 (medium)	- Compilation and implementation of an alien vegetation management plan for the entire site, including the surrounding project area and especially the wetland areas.	-7.50 (low)	Implementation of alien invasive plant management plan. Limit on site vehicle movements to defined

Aspect	Impact	Applicable phase	Pre-mitigation risk	Suggested Mitigation Measures	Post-mitigation risk (post-mitigation)	Closure Options/Actions
	noted within the unrehabilitated and previously rehabilitated areas.					routes and designated areas.
Biodiversity	Displacement, direct mortalities, and disturbance of faunal community (including multiple threatened species) due to habitat loss and disturbances (such as dust and noise).	Decommissioning, rehabilitation, and closure phase.	-9.00 (medium)	- Faunal species should be given the chance to escape or move away from disturbances. If any faunal species do not move off naturally then a suitably qualified specialist should be consulted to identify the correct course of action; - Staff should be educated about the sensitivity of faunal species and measures should be put in place to deal with any species that are encountered during all the phases going forward. The intentional killing of any animals including snakes, lizards, birds, or other animals should be strictly prohibited; - Restrict vehicle access outside of demarcated work areas as much as possible and If vehicles are to be used, make use of existing roads; - Waste management must be a priority and all waste must be collected and stored adequately. It is recommended that all waste be	-5.00 (low)	Limit on site vehicle movements (during post operational phases) to defined routes and designated areas. Ensure free movement of small fauna into adjacent wetland/ riparian corridors.

Aspect	Impact	Applicable phase	Pre-mitigation risk	Suggested Mitigation Measures	Post-mitigation risk (post-mitigation)	Closure Options/Actions
				removed from the site on a weekly basis to prevent rodents and pests entering the site; - A pest control plan must be put in place and implemented.		
Biodiversity	Loss/ destruction of natural habitat.	Decommissioning, and rehabilitation phases.	-9.75 (medium)	- Where possible, existing access routes and walking paths must be made use of, and the development of new routes limited.	-5.50 (low)	Develop and implement adequate Stormwater Management (during decommissioning, rehabilitation and closure).
Socio-economic	Increase in noise levels at surrounding receptors: The re-introduction of mining vehicles and activities within the mine areas is likely to result in increased noise and other nuisance factors.	Decommissioning, and rehabilitation phases.	-10.50 (medium)	- All employees and contractors should receive induction that includes an environmental awareness component (noise). This is to allow employees and contractors to realize the potential noise risks that activities (especially night-time activities) pose to the surrounding environment. - Ensure a good working relationship between power station management and all potentially sensitive receptors (including landowners and surrounding landowners). Communication channels should be established to	-6.00 (low)	Continuation of mechanisms for communication and engagement with local farmers/ landowner/ occupiers.

Aspect	Impact	Applicable phase	Pre-mitigation risk	Suggested Mitigation Measures	Post-mitigation risk (post-mitigation)	Closure Options/Actions
				ensure prior notice to the sensitive receptor if noise intensive work is to take place close to them. - Ensure that equipment is well maintained and fitted with the correct and appropriate noise abatement measures. Engine bay covers over heavy equipment could be pre-fitted with sound absorbing material. Heavy equipment that fully encloses the engine bay should be considered, ensuring that the seam gap between the hood and vehicle body is minimised. - In the event of consistent complaints from receptors, noise level monitoring should be initiated, and where relevant additional management and mitigation applied.		
Socio-economic	Net employment impacts: the rehabilitation activities will result in additional employment opportunities. Rehabilitation contractors may have limited opportunity for local labour (skilled or unskilled) use.	Decommissioning, and rehabilitation.	+11.00 (medium positive)	- Where possible, the power station should source labour from the local and district areas.	+13.00 (medium positive)	Utilisation of local labour.

Aspect	Impact	Applicable phase	Pre-mitigation risk	Suggested Mitigation Measures	Post-mitigation risk (post-mitigation)	Closure Options/Actions
Social	Risk of vandalism	Decommissioning, rehabilitation, and closure phase.	-9.75 (medium)	- Ensure that suitable site access and security is continued to prevent unauthorised access. - Monitor the rehabilitated areas to ensure that illegal/ informal mining operations do not establish.	-4.5 (low)	Implement detailed landform design and plan. Access control.
Social	Safety and security (i.e. access to properties, theft, damage to private property, fire hazards, etc.).	Decommissioning, and rehabilitation phases.	-9.75 (medium)	- All contractors and employees should wear appropriate identification. - Vehicles should be clearly marked for ease of identification. - Entry and exit points to the power station should also be controlled. - Damage to public / private infrastructure and property must be repaired or compensated for.	-6.00 (low)	Site access control
Cultural and heritage	Disturbance/ destruction of historic buildings or sites; graves.	Decommissioning, and rehabilitation.	-5.50 (low)	- Maintenance of identification and demarcation of sites of heritage importance (historic buildings).	-2.00 (low)	Demarcation and monitoring of identified heritage sites.

5 DESIGN PRINCIPALS

The principles guiding the design or the rehabilitation, decommissioning and closure plan align with those defined in the Land Rehabilitation Guidelines for Surface Coal Mines (LaRSSA, 2019). These are presented in Table 10 below.

Table 12: Key principles for surface land rehabilitation.

Component	Rehabilitation principle
Regulatory compliance	• Achieving legal compliance is a minimum for appropriate rehabilitation planning. • Rehabilitation objectives and associated actions will not conflict with local legislation and will aim to complement and possibly go beyond legal compliance, where possible.
Concurrent implementation	• Concurrent, progressive rehabilitation will be undertaken throughout the operational stages of the project. • A risk-based approach will be applied to ensure concurrently implemented rehabilitation actions will achieve the desired post-operation landscape and land capability aligned with end land use targets.
Stakeholder engagement and custodianship	• Relevant mining-affected stakeholders will be identified and involved in rehabilitation planning throughout the power station lifecycle, as required. • Rehabilitation planning will leverage from local stakeholder views, experiences, cultures and/or customs, on possible uses and needs of the rehabilitated landscape, to foster a land stewardship culture from potential next land users.
Landform Management	• Rehabilitation will be undertaken and aligned to a site-specific surface landform design that will be compiled during the planning stage of an operation. • The site-specific landform design will incorporate the surface profiling needs of the target post-mining land capability and land use/s, to optimize material movement throughout the operational and decommissioning periods, and to ensure the long-term sustainability of the rehabilitated landscape. • A 'management-of-change review process' will be incorporated into the mine planning process, to ensure that changes to the mine plan do not compromise either the proposed final landform or its potential use
Land capability	• Post-mining land capability will, as far as is practically possible, be constructed to resemble the pre-mining land capability of the disturbed area. • Attention will be given to rehabilitating the site to specified land capabilities that can support a suite of mixed land uses. • Soil physical and chemical properties will be aligned to the productivity needs of the post-mining land use/s, and to support these in the long-term.
Land use	• Post-mining land use planning will consider the needs of changing regional development and planning, over time. • The site will be left in an environmentally physically safe, stable, and non-polluting condition for the defined post-mining land uses. • The defined post-mining land use/s will provide socio-economic value to next land users, as agreed with these land users (once exact post-mining land uses can be defined).
Climate uncertainty	• Predictive modelling will form the basis for longer-term environmental impact identification and risk management.
Monitoring	• Monitoring will be initiated as soon as the first ground has been moved (at construction).

Component	Rehabilitation principle
	• Monitoring will be continued progressively throughout the mining lifecycle, in parallel with concurrent rehabilitation activities. • Data obtained through ongoing monitoring will be frequently assessed for trends that could demonstrate rehabilitation success, and where corrective action may be required. • The monitoring process must be linked to a corrective action process.
Adaptive land management	• An adaptive land management approach will be adopted on-site, allowing for implementation of alternative and improved rehabilitation strategies and corrective action, where required.

5.1 LEGISLATIVE AND GOVERNANCE FRAMEWORK

The regulatory framework pertaining to the water use activities and waste management activities associated with Kelvin Power is described and discussed in the succeeding sections.

5.1.1 CONSTITUTION OF SOUTH AFRICA (CSA), 1996 (ACT NO. 108 OF 1996, AS AMENDED)

The legislative motivation for this project is underpinned by the Constitution of South Africa, 1996 (Act No. 108 of 1996, as amended) (CSA), which states that: The State must, in compliance with Section 7(2) of the Constitution, respect, protect, promote and fulfil the rights enshrined in the Bill of Rights, which is the cornerstone of democracy in South Africa. Section 24 of the Constitution:

24. Environment

-Everyone has the right-

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

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

i. prevent pollution and ecological degradation;

ii. promote conservation; and

iii. secure ecologically sustainable development and use of natural resources while promoting a justifiable economic and social development.

Section 24 of the CSA requires that all activities that may significantly affect the environment and require authorisation by law must be assessed prior to approval. In addition, it provides for the Minister of Environmental Affairs or the relevant provincial Ministers to identify:

- New activities that require approval;
- Areas within which activities require approval; and
- Existing activities that should be assessed and reported on.

Section 28(1) of the CSA states that: "*every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring*". If such pollution or degradation cannot be prevented, then appropriate measures must be taken to minimise or rectify such pollution or degradation. These measures may include:

- Assessing the impact on the environment;
- Informing and educating employees about the environmental risks of their work and ways of minimising these risks;
- Ceasing, modifying or controlling actions which cause pollution/ degradation;
- Containing pollutants or preventing movement of pollutants;

- Eliminating the source of pollution or degradation; and
- Remedying the effects of the pollution or degradation.

5.1.2 THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT (MPRDA), 2002 (ACT NO. 28 OF 2002, AS AMENDED)

Table 13 below indicates the sections of the MPRDA that are applicable to closure and will assist in informing this RSIP. Even though Kelvin Power is not a mining operation nor has any Mining Right (MR), Record of Decision (RoD) or Environmental Authorisation (EA) these Acts and Regulations will be used as a guideline.

Table 13: MPRDA applicable sections.

Area of Concern	Section	Legal Requirements
Environmental Management.	Section 37	*Requires that the principles set out in section 2 of NEMA must apply to all prospecting and mining operations, and that the generally accepted principles of sustainable development must be applied by integrating social, economic and environmental factors during the planning and implementation phases of mining projects.*
	Section 38	*Requires the applicant to manage all environmental impacts in accordance with his or her environmental management plan or the approved environmental management programme.*
	Section 39	*Deals with the requirements of an environmental management programme or plan, whichever is applicable.*
Closure Certificate.	Section 43	*Holder of a mining right is responsible for all environmental liabilities as may be identified in the EMP, application needs to be made to the regional manager for the closure certificate.*
Removal of Infrastructure.	Section 44	*When the mining operation comes to an end the mine may not remove buildings, structures or objects which may not be demolished or removed in terms of any other law.*
Remedial Measures.	Section 45	*The minister has the right to investigate, evaluate, asses and report on the impact of any pollution or ecological degradation and requires remedial measures.*

5.1.3 REGULATION 527 OF THE MPRDA

Government Notice No. R.527 (as published in the Government Gazette, 23 April 2004 (GG No. 26275, Volume 466), MPRDA: Regulations stipulate that the following closure objectives must form part of the EMPr:

- Identify the key objectives for closure of the operation to guide the project design;
- Development and management of environmental impacts;
- Provide future land use objectives for the site; and
- Provide proposed closure costs.

Table 14: Requirements of Government Notice 527.

Area of Concern	Regulation	Legal Requirements
Part III of R527 deals with environmental regulations for mineral development, petroleum exploration and production.	Regulation 56	*In accordance with applicable legislative requirements for mine closure, the holder of a prospecting right, mining right, retention permit or mining permit must ensure that –The land is rehabilitated, as far as is practicable, to its natural state, or to a predetermined and agreed standard or land use which conforms with the concepts of sustainable development.*
Closure objectives and contents of a closure plan.	Regulation 61	*Closure objectives form part of the environmental authorisation, as the case may be, and must-* *(a) identify the key objectives for mine closure to guide the project design, development and management of environmental impacts;* *(b) provide broad future land use objective(s) for the site; and* *(c) provide proposed closure costs.*
	Regulation 62	*A closure plan contemplated in Section 43(3)(d) of the Act, forms part of the environmental management programme or environmental management plan, as the case may be, and must include – a summary of the results of progressive rehabilitation undertaken.*

5.1.4 THE NATIONAL WATER ACT (NWA), 1998 (ACT NO. 36 OF 1998, AS AMENDED)

The National Water Act, 1998 (Act No. 36 of 1998) [as amended] (NWA) aims to provide management of the national water resources to achieve sustainable use of water for the benefit of all water users (Table 15). This requires that the quality of water resources be protected as well as integrated management of water resources with the delegation of powers to institutions at the regional or catchment level. The purpose of the NWA is to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in ways, which take into account:

- Meeting the basic human needs of present and future generations;
- Promoting equitable access to water;
- Redressing the results of past racial discrimination;
- Promoting the efficient, sustainable and beneficial use of water in the public interest;
- Facilitating social and economic development;
- Providing for growing demand for water use;
- Protecting aquatic and associated ecosystems and their biological diversity;
- Reducing and preventing pollution and degradation of water resources;
- Meeting international obligations; and
- Managing floods and droughts.

Table 15: NWA applicable sections.

Area of Concern	Section	Legal Requirements
Prevention and remedying effects of pollution.	Section 19	*Any situation exists or which may cause or is likely to cause pollution of a water resource, must take all reasonable measures to prevent any such pollution from occurring, continuing or recurring.*
Control of Emergency Incidents.	Section 20	*Incidences of pollution needs to be reported the Department and the relevant catchment agency.*

5.1.5 NATIONAL ENVIRONMENTAL MANAGEMENT ACT (NEMA), 1998 (ACT NO. 107 OF 1998, AS AMENDED)

NEMA strives to regulate national environmental management policy and is focussed primarily on co-operative governance, public participation and sustainable development. NEMA makes provisions for co-operative environmental governance by establishing principles for decision making on matters affecting the environment, institutions that will promote co-operative governance and procedures for co-ordinating environmental functions exercised by Organs of State and to provide for matters connected therewith. Even though Kelvin Power is not in possession of an Environmental Authorisation (EA) or a Record of Decision (RoD), the NEMA and its regulations will be used to develop this RSIP. Table 16 below indicates the relevant sections of NEMA that are applicable to this RSIP.

Table 16: NEMA applicable sections.

Area of Concern	Section	Legal Requirements
Principles that may significantly affect the environment.	Section 28	*General duty of care on every person who causes, has caused or may cause significant pollution or degradation of the environment to take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment.*
Control of emergency incidents.	Section 30	*Incidences of pollution needs to be reported the Department.*
EMPr.	Section 34	*A draft environmental management plan must include –* *information on any proposed management or mitigation measures that will be taken to address the environmental impacts that have been identified in a report contemplated by these Regulations, including environmental impacts or objectives in respect of –* *(iv) rehabilitation of the environment; as far as reasonably practicable, measures to rehabilitate the environment affected by the undertaking of any listed activity or specified activity to its natural or predetermined state or to a land use which conforms to the generally acceptable principle of sustainable*

Area of Concern	Section	Legal Requirements
		development, including where appropriate, concurrent or progressive rehabilitation measures.
Financial Provision.	Section 44 read with Sections 24, 24N, 24P and 24R.	*Regulations were made by the Minister of Environmental Affairs pertaining to Financial Provision in terms of these Sections of NEMA.*

5.1.6 REGULATION 1147 OF NEMA

Although the determination of closure costs for power stations is not required in terms of the Regulations Pertaining to the Financial Provision for Prospecting, Exploration, Mining or Production Operations (GN R.1147) (Table 17), this mining specific legislation provides a well-developed costing framework.

Table 17: Financial Provision Regulations applicable sections.

Area of Concern	Regulation	Legal Requirements
Minimum content of an Annual Rehabilitation Plan.	Regulation 11 (1)(a) Appendix 3 of the Regulations	*Review, assessment and adjustment of financial provision by the holder of a right of permit: The holder of a right must ensure that a review is undertaken of the requirements for annual rehabilitation as reflected in an annual rehabilitation plan. Annexure 3 contains the minimum content of an annual rehabilitation plan. This plan contains all the content as specified.*

5.1.7 NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE ACT (NEM:WA), 2008 (ACT NO. 59 OF 2008, AS AMENDED)

Waste is regulated under the National Environmental Management Waste Act, 2008 (Act No. 59 of 2008) [as amended] (NEM:WA). Any hazardous waste generated requires regulation under NEM:WA. This means any waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical, or toxicological characteristics of that waste have a detrimental impact on health and the environment. The NEM:WA follows the principle that waste generation be avoided, or if it cannot be avoided, that it is reduced, reused, recycled, or recovered, and as a last resort treated and/ or safely disposed of. NEM:WA previously excluded mine residues controlled under the MPRDA but the NEM:WA Amendment Act (NEM: WAA) came into effect on 2 June 2014 (Act No 26 of 2014, Government Gazette 37714) and makes provision for inclusion of mine residue deposits and stockpiles under Schedule 3 (defined wastes) of NEM:WA. Although the Minister of the DMR is the licensing authority for residue stockpiles and residue deposits, their management must be in accordance with the NEM:WA Regulations as prescribed by the Minister of the Department of Forestry, Fisheries and Environment (DFFE).

The rehabilitation measures must be aligned with the objections of the National Environmental Management: Waste Act, 2008 (Act 59 of 2008) (NEM:WA) [as amended] which includes:

a. to protect health, well-being and the environment by providing reasonable measures for—

i. minimising the consumption of natural resources;

ii. avoiding and minimising the generation of waste;

iii. reducing, re-using, recycling and recovering waste;

iv. treating and safely disposing of waste as a last resort;

v. preventing pollution and ecological degradation;

vi. securing ecologically sustainable development while promoting justifiable economic and social development;

vii. promoting and ensuring the effective delivery of waste services;

viii. remediating land where contamination presents, or may present, a significant risk of harm to health or the environment; and

ix. achieving integrated waste management reporting and planning;

b. to ensure that people are aware of the impact of waste on their health, well-being and the environment;

c. to provide for compliance with the measures; and

d. generally, to give effect to section 24 of the Constitution in order to secure an environment that is not harmful to health and well-being.

5.1.8 THE UNITED NATIONS SUSTAINABLE DEVELOPMENT GOALS

In 2015 all of the United Nations Member States adopted the 2030 Agenda for Sustainable Development. At the heart of this agenda are the 17 Sustainable Development Goals (SDGs) (Figure 18**)** that aim to end poverty, improve health and education while addressing environmental development and climate change. These SDGs are voluntary, but the principles are important in guiding industries towards a sustainable future.

Figure 18: United Nations Sustainable Development Goals (UN, 2025).

5.2 CLOSURE VISION, OBJECTIVE AND RELINQUISHMENT CRITERIA

5.2.1 CLOSURE VISION

The closure vision for Kelvin Power is intended to inform the closure objectives for the site and states that:

"Kelvin Power will develop a sustainable post closure environment that is not harmful to the safety and health of surrounding communities, where prospects to utilise infrastructure after closure are maximised and where final post-closure land use is optimised."

5.2.2 CLOSURE OBJECTIVES

The closure objectives relevant to the Rehabilitation Strategy Implementation Plan (RSIP) include:

- Adhere to all statutory and other legal requirements;
- Ensure safety and health of all stakeholders during closure and post closure and that communities using the site after closure are not exposed to unacceptable risks;
- Ensure that closure supports productive uses considering pre-operating conditions and are in agreement with commitments to stakeholders;
- Physically and chemically stabilise remaining structures to minimise residual risks;
- Promote biodiversity and biological sustainability to the maximum extent practicable; and
- Utilise closure strategies that promote a self-sustaining condition with little or no need for on-going care and maintenance.

5.2.3 RELINQUISHMENT CRITERIA

To achieve the abovementioned objectives, generic closure requirements for Kelvin Power have been identified in the IWWMP. These requirements are reported to have formed the basis of the decommissioning and restoration costs, referred to in this iteration of the RSIP as relinquishment criteria:

- Make areas safe for both humans and animals, where practicable and possible;
- Make areas stable and sustainable where possible;
- Remove infrastructure other than Ash Dams where required;
- Remove and/ or bury excess rubble and waste (this does not include hazardous waste), where required;
- Rehabilitate disturbed land surfaces, return water dams, where required;
- Remove vehicles, plant and workshop equipment for salvage or resale, where no future use exists;
- Fixed assets that can be profitably removed will be removed for salvage or resale;
- Items that have no salvage value to the operation but could be of value to individuals will be treated as waste that could be made available for recycling/ reclamation;
- Structures will be demolished, terracing removed, and foundations demolished to 0.5 m below the original ground level where required;
- Excavations will be filled in with soil, of which the top 0.15 m will be topsoil, where required;
- Paved roads will be ripped up, the wearing coarse treated as waste while the sub-base will be ripped or ploughed and covered with 0.15 m topsoil where required;
- Inert ceramics such as bricks, concrete, gravel, etc. will be used as backfill or disposed of in a permitted general waste disposal site;
- Inert waste, which is more than 0.5 m underground, such as pipes, will be left in place;
- Inert ceramic and buried waste, with a salvage value, such as scrap metal, building materials, etc. will be removed, sold, or disposed of as required;
- Air and water quality will be monitored until they reach a steady state or for three years after closure;
- Redundant fencing will be dismantled and removed for salvage where practicable and possible;
- Concrete fence foundations will be demolished to a depth of 0.5 m below the original ground level where required the fence line will be covered with topsoil where required;

- The company contracted to supply fuel will be required to remove all fuel storage and reticulation facilities, and to address any soil and/ or groundwater contamination associated with the facility, as is typically written into a service level agreement;
- Contractor lay down areas will be demolished and rehabilitated where practicable and possible, and
- All services, for example the domestic water supply line and the power line will be demolished only for the section on the operations area, if required (approximately 1 km each).

5.3 ALTERNATIVE CLOSURE AND POST CLOSURE OPTIONS

5.3.1 BEST PRACTICE G5 – PROCESS OVERVIEW

During the decommissioning and closure phase, the mine will undertake the following closure related activities:

- Decommissioning & closure activities:
    - Obtain final approval for closure plan;
    - Implementation of closure plan;
    - Validate progress against closure objectives and targets;
    - Verification of latent/ residual impacts through monitoring systems and performance assessments; and
    - Get final agreement on closure from IAPs and obtain closure certificate from authorities.
- Post-closure activities:
    - Define post-closure monitoring and maintenance procedures;
    - Finalise financial arrangements for post-closure management and maintenance; and
    - Finalise contractual agreements with future landowners and/ or responsible parties.

5.4 FINAL POST CLOSURE LAND USE

Although pre-construction activities data is limited, it is assumed that prior to the initiation of Kelvin Power, the area was characterised by wilderness and a mix of grazing and cropping, likely subsistence-based, on lands with moderate to low arable potential. The closure vision states that amongst other requirements, Kelvin Power will optimise final post-closure land use so that there is a variation of land uses due to the Ash Dams remaining. In contaminated areas that are to be rehabilitated (such as the coal stockpiling areas), soil will be replaced to a minimum depth of 500 mm.

Given that there is insufficient baseline data pre-disturbance, achieving land capability that existed prior to disturbance will be difficult to demonstrate as it is uncertain what the land-use and land capability was. Thus, a mix of industrial and wilderness land will be required post closure, a deviation from restoring pre-activity land capability, to one where a mix of arable and grazing land is restored to optimise land uses that may be undertaken surrounding the processing activities. The main reasons being that a section of Station A will be used for gas production, the Ash Dams will remain behind, and the surrounding areas are either industrial or urban areas (with little wilderness areas remaining). Therefore, for purposes of this RSIP and until further engagement is undertaken with stakeholders and relevant authorities, the post closure land uses will aim to be industrial and wilderness areas.

6 CLOSURE ACTIONS

The following rehabilitation measures and actions (including monitoring requirements) are provided to guide Kelvin Power towards the final rehabilitation and closure phase. Concurrent rehabilitation actions are also provided that should be implemented during the operational phase which will in turn decrease the impact on the environment and assist with final rehabilitation and closure. This plan, actions and monitoring requirements are given in Table 18 below. It is important that the concurrent rehabilitation measures provided below be implemented as soon as possible and that proper planning (in terms of closure costs and a final closure and rehabilitation plan) should commence for final closure and rehabilitation.

Table 18: Rehabilitation measures and actions.

Aspect	Environmental Component	Concurrent Rehabilitation	Rehabilitation Action	Monitoring Requirement	Status
Station A plant area.	Soil Surface water Groundwater	• Prevent coal spillages from haul trucks onto clean areas (ensure tarpaulins are in place). • Clean any coal spillages as soon as possible. • Revegetate any bare areas. • Water management infrastructure to be maintained. • Remove contaminated soil as soon as possible.	• Remove all infrastructure that will not be reused for the new gas production facility. • Demolished infrastructure to be dumped at an approved waste management facility. • Remove old coal stockpiles and the soil located beneath to a depth of 500mm. • Remove all instances of contaminated soil. • Coal and contaminated soil to be placed on top of Ash Dam B. • Construct a berm to prevent contaminated water from the new gas production plant affecting the rehabilitated area. • Topsoil to be added where needed to a depth of 300mm. • Rip, slope and revegetate rehabilitated areas. Ensure that the surface profile is rehabilitated to promote natural runoff drainage and avoid ponding of water within the rehabilitated area. • Limit areas and volumes of ponding.	• Monthly site visits to ensure vegetation is stabilised. • Annual visit by terrestrial specialist. • Annual audits. • Monitoring of surface water and groundwater in accordance with the proposed integrated monitoring network and protocol should be continued throughout the post operational phase.	Not started: A-Station decommissioning has been completed however the area will be redeveloped and used for the newly proposed / planned gas turbine plant project.

Aspect	Environmental Component	Concurrent Rehabilitation	Rehabilitation Action	Monitoring Requirement	Status
Station B plant area and training facility.	Soil, land capability, and land use Ecology Surface water Groundwater Air quality	• Prevent coal spillages from haul trucks onto clean areas (ensure tarpaulins are in place). • Clean any coal spillages as soon as possible. • Revegetate any bare areas. • Water management infrastructure to be maintained. • Leaking pipes to be repaired as soon as possible. • Remove contaminated soil as soon as possible. • Remove general and hazardous waste on a regular basis, or as needed. • Clean sumps, oil collectors, hazardous spills, etc. regularly or as soon as spillage occurs. • Remove accumulated ash below conveyors, alongside ash slurry pipelines and roads. Dispose of onto Ash Dam B.	• All infrastructure and roads to be demolished and removed. This material must be taken to an approved waste management facility. • Contaminated soils (oil and hydrocarbons spillages) to be removed to a depth of 500mm and placed upon Ash Dam B. • Topsoil to be added where needed to a depth of 300mm. • Rip, slope and revegetate rehabilitated areas. Ensure that the surface profile is rehabilitated to promote natural runoff drainage and avoid ponding of water within the rehabilitated area • Ensure berms are in place to separate clean and dirty water. • Ensure fencing is in place to prevent unlawful access to the rehabilitated areas. • Limit areas and volumes of ponding	• Monthly site visits to ensure vegetation is stabilised. • Annual visit by terrestrial specialist. • Annual audits. • Monitoring of surface water and groundwater in accordance with the proposed integrated monitoring network and protocol should be continued throughout the post operational phase.	Not Started
Coal stockpiles and haul roads.	Soil, land capability, and land use Ecology	• Construct stormwater management infrastructure around the coal stockpile areas.	• All coal stockpiles and haul roads to be removed to a depth of 500mm. • Contaminated material and soil to be placed on Ash Dam B.	• Monthly site visits to ensure vegetation is stabilised. • Develop and implement an alien	Not Started

Aspect	Environmental Component	Concurrent Rehabilitation	Rehabilitation Action	Monitoring Requirement	Status
	Surface water Groundwater Air quality	• Do not increase the footprint of the coal stockpile areas. • Clean up any spillages outside of the footprint as soon as possible. • Prevent coal spillages from haul trucks onto clean areas (ensure tarpaulins are in place). • Clean spillages under conveyors and dispose of to Ash Dam B.	• Topsoil to be added where needed to a depth of 300mm. • Rip, slope and revegetate rehabilitated areas. • Remove invasive species as needed. • Ensure berms are in place to separate clean and dirty water.	and invasive species plan and pest control plan. • Annual visit by terrestrial specialist. • Annual audits. • Monitoring of surface water and groundwater in accordance with the proposed integrated monitoring network and protocol should be continued throughout the post operational phase.	
Ash Dam A and Ash Dam B.	Surface water Groundwater Air quality	• Revegetate walls as needed and conduct regular inspections to ensure stability of dam walls. • Continue with dust suppression activities. • Ensure that seepage channels are lined to prevent unnecessary seepage into the groundwater. • Ensure all stormwater management infrastructure is maintained.	• Ash Dams to remain in place. • Once all contaminated material has been dumped on Ash Dams, cap Ash Dams with at least 500mm of topsoil. • Hydroseed exposed areas. • Repair and/ or upgrade stormwater- and seepage management infrastructure. • Continue with dust suppression until vegetation has covered the exposed soils. • Drill additional boreholes to monitor groundwater pollution plume. Implement revised monitoring network and programme identified in the 2025	• Monthly site visits to ensure vegetation is stabilised. • Annual visit by terrestrial specialist. • Annual audits. • Monitoring of surface water and groundwater (including biomonitoring) in accordance with the proposed integrated monitoring network and protocol should be continued throughout	Not Started

Aspect	Environmental Component	Concurrent Rehabilitation	Rehabilitation Action	Monitoring Requirement	Status
			Gradient Consulting geohydrological report. • Drill interceptor boreholes and pump contaminated groundwater to RWD.	the post operational phase. • Annual inspections by an engineer to evaluate wall and cap stability.	
Desilting Dam, Return Water Dam and Discharge Point.	Surface water Groundwater	• Maintain/ upgrade the Desilting Dam, Return Water Dam, and Discharge Point. • Remove silted material on a regular basis and place upon Ash Dam B. • General housekeeping. • Continuously monitor flow in and out of these facilities.	• Desilting Dam and Return Water Dam to remain in place. • Desilting Dam can be used to collect contaminated groundwater from interceptor boreholes. • Regularly remove silt from dams and the discharge point. • Dams to be operated within the 0.8m freeboard limit. • Water within the Return Water Dam (depending on quality) can be used for irrigation and dust suppression. • Continuously monitor flow in and out of these facilities. • Down-gradient seepage capturing alternatives i.e., establishment of seepage capturing cut-off trenches or establishment of scavenger boreholes should be implemented as active waste-water management techniques in order to constrain the migration of pollution plumes emanating from pollution sources during the post-closure phase.	• Regular site visits to determine the need for silt removal and general housekeeping. • Annual audits. • Monthly surface water monitoring, quarterly groundwater monitoring and bi-annual biomonitoring. • Annual inspections by an engineer to evaluate dam wall and overall stability.	Not Started

Aspect	Environmental Component	Concurrent Rehabilitation	Rehabilitation Action	Monitoring Requirement	Status
Stormwater management infrastructure.	Surface water Groundwater	• Maintain, repair and upgrade stormwater management infrastructure. • Remove silt and other material on a regular basis. • General housekeeping.	• Stormwater management infrastructure to remain in place. • Maintain and repair stormwater management infrastructure. • Remove silt and other material on a regular basis. • General housekeeping. • Develop and implement post-closure SWMP.	• Regular site visits to determine the need for silt removal and general housekeeping. • Annual audits. • Monitoring of surface water and groundwater in accordance with the proposed integrated monitoring network and protocol should be continued throughout the post operational phase.	Not Started
General area and access roads.	Soil, land capability, and land use Ecology Surface water Groundwater Air quality	• Remove any spillages (oil, hydrocarbons, ash, etc.) as soon as they occur. • Remove invasive species on a continual basis. • Ensure property boundary is maintained and in working condition.	• All access roads to be removed to a depth of 500mm. • Infrastructure that will not be reused to be demolished and removed from site. • Contaminated material and soil to be placed on Ash Dam B. • Topsoil to be added where needed to a depth of 300mm. • Rip, slope and revegetate rehabilitated areas. • Remove invasive species as needed. • Ensure berms are in place to separate clean and dirty water. • Only vehicle tracks to remain.	• Monthly site visits to ensure vegetation is stabilised. • Annual visit by terrestrial specialist. • Annual audits. • Monitoring of surface water and groundwater in accordance with the proposed integrated monitoring network and protocol should be continued throughout the post operational phase.	Not Started

6.1 CLOSURE COSTS

The requirement to make financial provision for the rehabilitation or management of negative environmental impacts is regulated under NEMA. The Financial Provision Regulations (GNR1147) replaced Section 41 of the MPRDA, which was repealed in 2013. Regulations 53 and 54 of the MPRDA, which also cater for financial provisioning, have not been repealed, but are considered superseded by the new NEMA regulations.

Even though Kelvin Power is not in possession of an EA or RoD, closure and rehabilitation costs are calculated using GNR 1147. No closure and rehabilitation cost has been done as part of this RSIP, and it is recommended that Kelvin Power update their latest closure cost (please see Table 19 below for the closure cost calculated by Golder in 2017).

Table 19: Rehabilitation Costs (Golder, 2017).

	Rehabilitation Components	On-going Operational Control	Once-off Interventions to Protect the Water Resource
1.	Water and Waste Management Improvement Measures.	R 450 482,00	R8 244 482,00
2.	Monitoring, Maintenance and On-going Water Treatment.	R2 653 449,00	R56 410,00
3.	Additional Allowances.	-	-
3.1.	Preliminary and General.	R372 472,00	R996 107,00
3.2.	Contingencies.	R310 393,00	R830 089,00
3.3.	Additional Studies.	R2 790 920,00	R300 000,00
GRAND TOTAL		R6 577 715,00	R 10 427 089,00

7 CONCLUSION AND RECOMMENDATIONS

Water resource monitoring and management are integral to Kelvin Power's overall management program. Surface water quality is monitored monthly in streams associated with the facility, while groundwater monitoring assesses the impact of dewatering and seepage from the various activities on nearby aquifers on a quarterly basis. This involves measuring groundwater levels and sampling water quality in monitoring and boreholes to analyse trends. As the groundwater pollution plume is a serious concern it is imperative that investigations are conducted to accurately determine the size of this plume and develop remediation measures to either decrease or remove the contaminated groundwater. As the Ash Dams cannot be lined, the seepage into the groundwater must be managed effectively to prevent the plume from spreading further downstream. Clean and dirty water separation must be a priority to avoid contaminated runoff from entering surface- and groundwater sources.

The RSIP is updated annually to aid Kelvin Power in closure planning, aligning with the requirements outlined in the facility's WUL. As part of this process, an annual rehabilitation plan is compiled, forming a critical component of the water resource management plan and Integrated Water and Waste Management Plan (IWWMP), which is submitted to the Regional Head of DWS. The rehabilitation plan aims to review the progress of implemented remediation activities and set goals for the following financial year. These goals contribute to effective water resource use and the closure objectives should be used to develop Kelvin Power's final rehabilitation, decommissioning, and closure plan.

In compliance with the NWA and the WUL, Kelvin Power must ensure water resources are protected from further degradation. Water management infrastructure should be designed for long-term durability, including erosion protection and control, to support facility closure. Long-term water quality prediction, facilitated through water modelling, can help identify effective mitigation measures.

Annual updates to closure costs for water management must account for changes in infrastructure or operations. Facilities such as the Ash Dams, which continue to generate pollution post-closure, require long-term monitoring and interventions, with associated costs incorporated into the budget.

The following high-level recommendations are given that should be implemented by Kelvin Power within the following 12-months:

- Update 2017 closure and rehabilitation cost calculations;
- Continue with development of a closure and rehabilitation plan for the entire facility;
- Development of a SWMP for the power station and construction of stormwater management infrastructure around the coal stockpiling area.
- Continue with surface and groundwater monitoring and implement revised groundwater monitoring network and programme identified in the 2025 Gradient Consulting geohydrological report.

8 REFERENCES

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