Appendix H.5

HYDROGEOLOGICAL ASSESSMENT

Eskom Komati Power Station PV ESIA and WULA

HYDROGEOLOGIAL INVESTIGATION

Solar PV & BESS Infrastructure

41103965-353050-4
MAY 2023

CONFIDENTIAL

Eskom Komati Power Station PV ESIA and WULA

HYDROGEOLOGIAL INVESTIGATION

Solar PV & BESS Infrastructure

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1 INTRODUCTION

Eskom Holdings SOC Limited (Eskom) appointed WSP (Pty) Ltd (WSP) to undertake the Environmental & Social Impact Assessment (ESIA), and Water Use Licence Application (WULA) processes for the Solar Photovoltaics (PV) and Battery Energy Storage System (BESS) Project at Komati Power Station (KPS) - Request for Quote (RFQ): Task Order: 00211.

This report provides the hydrogeological investigation and impact assessment of Eskom KPS as part of the Environmental & Social Impact Assessment (ESIA). It is understood that a Water Use License Application (WULA) authorization process will follow for potential (c) and (i) water uses.

1.1 BACKGROUND

The Eskom KPS is about 37 km from Middelburg, 43 km from Bethal and 40 km from Witbank via Vandyksdrift in the Steve Tshwete Municipality, Mpumalanga Province of South Africa. The regional setting is provided in Figure 1-1. The consolidated land belonging to Eskom covers approximately 686.95 ha (VPC, 2021), with KPS covering about 315 ha.

KPS is a coal power station initially commissioned in 1961 and operated until 1990. The power station was mothballed in 1990 but was returned to service in December 2005 (Eskom, 2021, Lidwala, 2015). KPS includes eight cooling towers, coal stock yard, distribution stations, contractors' yards and the Ashing Area which includes a series of ash dams and return water dams (RWD). The station has a total of nine units, five 100 MW units on the east (Units 1 to 5) and four 125 MW units on the west (Units 6 to 9), with a total installed capacity of 1000 MW but will reach its end-of-life expectancy in September 2022. Water is supplied via pipeline by the Komati Government Water Scheme which originates from the Nooitgedacht dam, (Lidwala, 2015).

The PV Sites A and B are separated by an Eskom servitude with Komati Town located between the KPS and PV Site B. Current and historical activities in and around the proposed development areas are discussed in Table 1-1 and included on the Layout plan in Figure 1-2.

Table 1-1 – Current and historical activities in and around the proposed development areas

Area	Size (ha)	Locality and Current Use
PV Site A	160.6	Much of the area was historically a farm, (maize/corn rotated with bean crops). The historical ash and rehabilitated domestic waste footprints1 are in the eastern portion of the area. Mining of the underlying No. 4 coal seam is understood to be planned in this area. This seam is indicated as being some 20 to 100 m below surface (Anglo American, 2015), Refer Figure 3.

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[1] The historical ash dump footprint is rehabilitated within PV Site A. A possible domestic waste site is noted as potentially having been located adjacent to the historical ash dump footprint but the extent and detail for this site is not known and it is not clear on the historical imagery. An asbestos disposal site (License #12/9/11/L73467/6) was utilised for the disposal of 4,050 kg of asbestos and asbestos containing waste in 2008 and was covered with two layers of ash and fenced. VPC, 2021 notes that Ergosaf Environmental and Occupational Health Services confirmed that there was no environmental risk of the disposed asbestos in 2013. All asbestos material has been removed off site.

Area	Size (ha)	Locality and Current Use
PV Site B	60.9	Vacant land but undermining and a historical coal discard dump[2] are noted to have been present in the northwest of this area. A landing strip / road crosses the area.
BESS A	2.6	Several buildings and contractor's yards are present within this area as well as offices, parking areas and a boiler
BESS B	3.2	The site is bounded by the Komati spruit (and wetland area) to the west and KPS (BESS A) to the northeast. Most of the area is not in use except for a church located within a bunker which was historically an old shooting range in the south-eastern corner.
BESS C	2	Site is bounded to the west by the KPS cooling towers and the drainage line of the Gelukspruit (and wetland) to the northeast. The Ashing Area is located to the south. Much of the area is currently not in use but there is a scrap yard in the southern portion. Eskom noted in discussion that an unknown fenced off area was leased to an unknown subcontractor.

1.2 PROPOSED ACTIVITY

Eskom is proposing the establishment of a solar electricity generating facility and associated infrastructure as part of its repurposing programme for KPS. The plan is to install 100 MW of Solar Photovoltaics (PV) and 150 MW of Battery Energy Storage System (BESS). The proposed development (refer Figure 1-2) is located within the property owned by Eskom.

The proposed development includes the following:

- PV Site A – located in the south-west corner of the Eskom property with the R542 to the south, Komati town to the north, agricultural land, and the Goedehoop Colliery (an underground coal mine) to the west and the Eskom Komati Ash dumps and dams (termed the Ashing area) to the east,
- PV Site B – located in the north-west corner of the Eskom property with Goedehoop Colliery to the west and north and Komati town to the east and
- The three areas for BESS storage located around the KPS plant and including:
    - BESS A: South-west of the KPS,
    - BESS B: Between Komati town and south-west of the KPS,
    - BESS C: East of KPS and down-gradient of the KPS ash dams.

The solar PV modules, which convert solar radiation directly into electricity, will occupy a space of up to approximately 177 ha over a footprint of around 210 ha. The modules will be elevated above the ground and will be mounted on either fixed tilt systems or tracking systems (comprised of galvanised steel and aluminium). The modules will be placed in rows in such a way that there is allowance for both perimeter and maintenance access roads.

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[2] A rehabilitated dump, subsequently identified by Eskom as a historical coal discard dump, is noted as being present in the north-west corner of PV Site B before 1990. This area is also noted by Bohlweki Environmental, 2005 to have been undermined with some subsidence noted as having occurred within this area

The main components of the BESS include the batteries, power conversion system and transformer which will all be stored in various rows of containers. The BESS components will arrive on site pre-assembled. The BESS footprints will range from roughly 2 ha up to 6 ha. Further information on the proposed infrastructure and specifications are provided in the ESIA report.

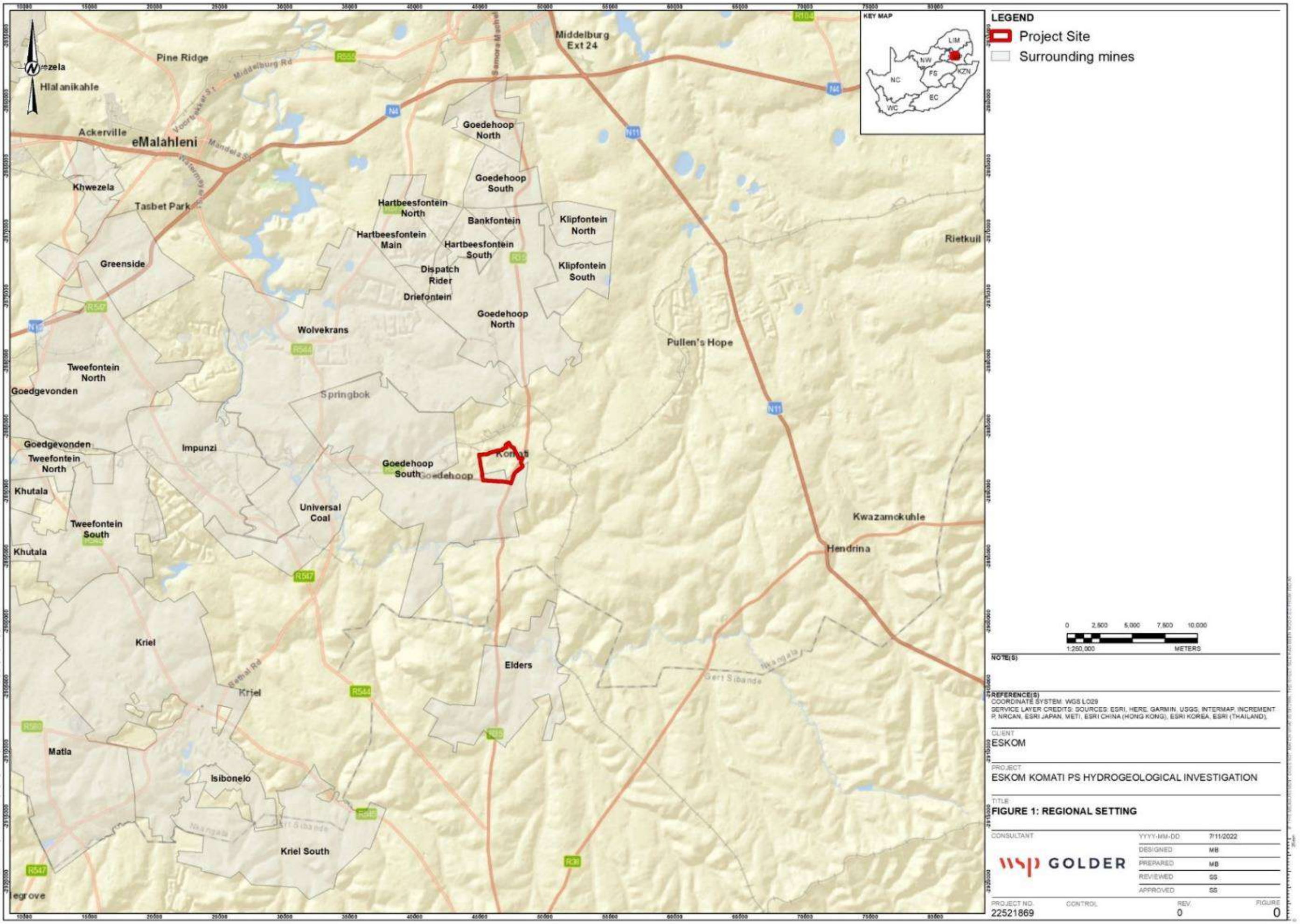

Figure 1-1 - Regional Setting

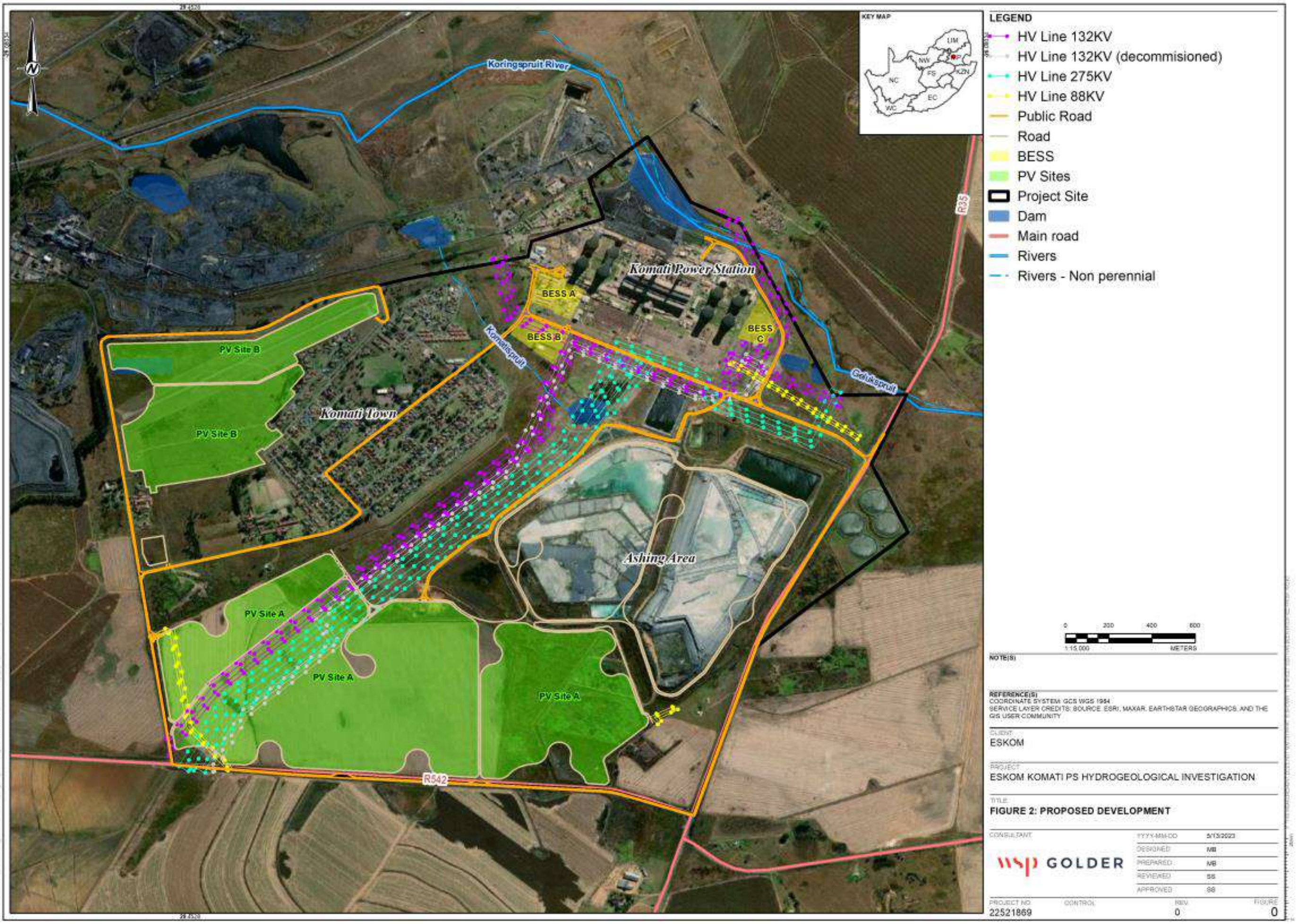

Figure 1-2 - Proposed Development

1.3 LEGISLATIVE CONTEXT

Eskom has two existing Water Use Licences (WUL) with amendments obtained in August 2017 and February 2021 as follows:

- WUL number 04/B11B/BCGI/1970 dated 2 February 2014 authorises the following water uses for the Eskom property located within the farm Komati Power Station No 56 IS:
  - Abstraction of water from the Komati Government Water Scheme (Section 21 b)
  - Diversion and impedances of the Koringspruit (Section 21 c and i)
  - Storage of water in the raw water dams (Section 21 b) and
  - Storage of waste and wastewater including the coal stockyard, ash dams and return water dam associated with the Ashing Area (Section 21 g)

  This WUL includes water quality limits for surface water (Appendix III, Table 3) and groundwater reserve (Appendix IV, Table 6). Table 3 was revised in the August 2017 amendment whilst the amendment of February 2021 includes changes to frequency of monitoring.
- WUL number 04/B11B/CI/2556 dated 11 January 2015 refers to construction of Komati storage facility within 500 m from a boundary of an unchanneled valley bottom wetland and seepage wetland which refers, based on the coordinates provided, to the Komati Spruit.

In addition to the above WUL, Eskom possesses the following two Waste Management Licences (WML):

- KPS Ash Disposal facility (License #: 12/9/11/L1010/6)
- Decommissioning of the asbestos disposal site within the Old Ash dam (License #12/9/11/L73467/6)

1.4 OBJECTIVES

The main objective of the hydrogeological investigation is to provide a report including:

- Detailed baseline description of groundwater conditions,
- Identification and high-level screening of impacts,
- Recommendations for potential mitigation measures.

1.5 SCOPE OF WORK

The scope of work includes the following:

- Review of available information,
- Compilation of a qualitative IA for the proposed new activities, and
- Reporting on the current site groundwater conditions, conceptual model understanding.

1.6 LIMITATIONS AND DATA GAPS

The following limitations were noted as part of the study:

- The study is based on available data and has not been verified.
- The available monitoring data is limited to the area surrounding the KPS. Groundwater monitoring data is therefore limited in the PV and BESS areas with no information for PV Site B, BESS A and BESS B. This was resolved following the completion of the study carried out as part

of the Contaminated Land Scope of work (WSP Report 41103965 dated 16 August 2022) which included the drilling of 10 shallow boreholes.

- Water level data for 2022 was not available and the borehole elevation has not been surveyed for the monitoring boreholes. The 2021 water level data was obtained from the monitoring reports, but it is noted that the latest data is handwritten, and the sample IDs are not verified. For example, there is no monitoring borehole AB08, it is assumed that this point is PB08. An update on water levels was provided from the boreholes drilled as part of the Contamination Land Scope of Work as discussed above.
- Borehole logs are limited to 9 of the 26 boreholes. There was no water strike nor yield information supplied at the time of drilling. Depth to weathering has therefore been assumed and confirmed by the study carried out during the Contaminated Land Study.

There is little distinction between a shallow perched aquifer and deeper fractured rock aquifer in the monitoring data.

2 GEOGRAPHICAL SETTING

2.1 TOPOGRAPHY AND DRAINAGE

Topography information was sourced from the 1:50 000 topographic map series, Eskom, 2021 and Eskom, 2019. The Eskom KPS Area is a generally undulating with PV Site A located in the higher lying areas and sloping towards the small drainage line of the Koringspruit River to the north (towards PV Site B) approximately 1585 mamsl in the floodplain. The highest points lie near the junction of R35 and R542 provincial roads at approximately 1655 mamsl in the southern portion of the site (PV Site A). The Ashing Area (east of PV Site A) is situated at 1650 to 1615 mamsl.

Eskom KPS is in the Olifants River quaternary sub-catchment B11B. The Koringspruit River flows past the northern boundary. The Koringspruit River also passes the Koornfontein and Goedehoop Coal mines and joins the Olifants River some 15 km downstream of the KPS.

The Komati spruit originates in the Ashing area (east of PV Site A) and drains the area west of the Ashing Area to the Koringspruit River. Several drains and dams have been constructed around the Ashing area.

The KPS is situated on a topographic flat ±1605 mamsl with a poor drainage pattern. The Gelukspruit flows in a north-westerly direction and drains to the Koringspruit River. According to Eskom, 2019, this stream was diverted to prevent ingress into the KPS activities. Dirty water from the Ashing Area, KPS and coal stockyard area drain to the Stoffel Dam, (VPS, 2021). Finn Dam is located downstream on the north-eastern corner of the KPS and receives water from the coal stockyard (Refer Figure 2-1).

Surface run-off from the KPS is in the order of 5% of the annual rainfall.

The local area around Eskom KPS is highly developed and water resources and dams have been altered by the mining and existing activities at the KPS. There are no wetland sites of national importance in the immediate area, but four wetlands were identified during the aquatic ecology study carried out by WSP in June 2022 (Refer Figure 2-1) for the ESIA. These include:

- A channel valley bottom associated with the Gelukspruit located to the east of the KPS.

- Seep 1 is located on the southern boundary. The small dam (termed the Clean Water Dam) is located downstream of the seep and impounds and pools the water in the wetland.
- Seep 2 is associated with the Komati spruit. It originates downstream of the Clean Water Dam and receives water from the Ashing Area. Seep 2 is bordered by the Komati village to the west.
- A shallow depression wetland is located within a crop field south and external to PV Site A. The wetland is approximately 3 ha in extent and is cut off from PV Site A by the tarred R542 road.

These wetlands were considered “Largely Modified” in terms of their Present Ecological State and are of low/marginal ecological importance. The channelled valley bottom wetland was however assessed as being moderate in terms of its Ecological Importance and Sensitivity as well as in terms of ecosystem services on account of biodiversity maintenance. No areas of potentially Critical Habitat, as defined by International Finance Corporation and World Bank standards, have been identified within the study area.

2.2 CLIMATE

The KPS experiences summer rainfall (Eastern Highveld) with cold dry and mild winters and warm, wet summers. Temperatures vary from maximum temperatures from 27 ^{0}C in January to 17 ^{0}C in July. Frost occurs frequently between May and September. The area also hosts to dust storms during prolonged dry periods.

Rainfall is seasonal with a Mean Annual Precipitation (MAP) of 687 mm and Mean Annual Evaporation (MAE) is 1550 mm per annum, (Eskom, 2021). A higher rainfall of approximately 735 mm was estimated by Kimopax, 2019.

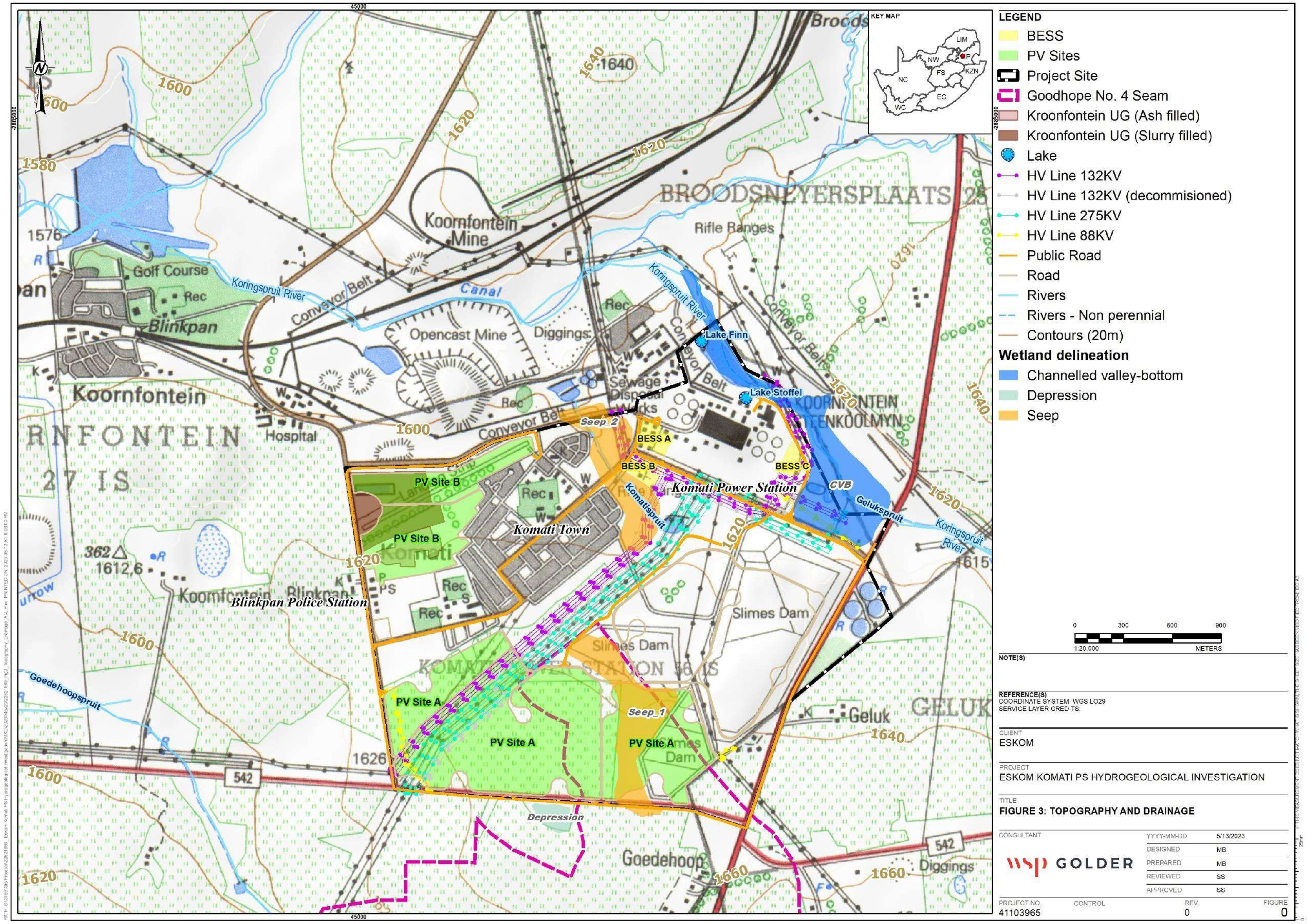

Figure 2-1 - Topography and drainage

3 METHODOLOGY

3.1 DESK STUDY

Previous groundwater studies focused on the KPS area. A summary of information provided by Eskom is presented in Table 3-1. Additional information was obtained from the specialist studies (contaminant land investigation and Wetland) completed during the Scoping Phase.

The following reports were sourced from public information on the adjacent Goedehoop Colliery.

- SRK Consulting, March 2021, Independent Competent Person's Report on Goedehoop Colliery, SRK Report reference 566657, (Authors Jeffrey, L and Wertz M).https://thungela.s3.eu-west-1.amazonaws.com/downloads/investors/Goedehoop-Colliery-CPR-dated-25-March-2021.pdf
- Anglo American, November 2015, Goedehoop Colliery, Hope No. 4 Seam Project Draft Environmental Impact Report (EIR) and Environmental Management Programme (EMPr), DMR Reference No.: MP 30/5/1/2/2/1 (122) EA, https://minedocs.com/21/GoedehoopColliery_EIR_EMP_Report_November2015.pdf

Table 3-1 - Summary of available information

Type of information	Report Reference
Baseline information and hydrocensus	GHT, July 2009, Komati Power Station Hydrological & geohydrological baseline study, GHT Consulting Scientists, RVN 537.5/909, Authors Van Niekerk, L.J. and Staats, S.
	Eskom, August 2019, Komati Hydrocensus Report - 2019, Applied chemistry and microbiology section: sustainability Division Eskom, RTD/ACM/19/240-149029270 (Authors Mathetsa, S & Swatz, N)
	VPC, October 2021, Draft Report for Komati Thermal Power Plant Technical Analyses on retiring and repurposing four coal plants, South Africa. Report for the World Bank, VPC GmbH. P-2021-00547
IWWMP	Lidwala, December 2015, Integrated water and waste management plan for Komati Power Station, Mpumalanga Province, Lidwala Consulting Engineers (SA) (PTY) Ltd, 16906 PRO_ENV, Authors Mochesane, M & Brummer, D
Numerical model	Kimopax, September 2019, Numerical modelling and geochemistry assessment, Eskom Komati Power Station, Gauteng, Kimopax (Pty) Ltd, KIM-WAT-2018-233 (Authors Halenyane, K)
Groundwater quality	Eskom, 2022. Komati WISH data – groundwater database supplied 15 June 2022.
Water level and quality monitoring Reports	Eskom, 2017, Komati Surface and Groundwater Monitoring Report, Phase 4, Eskom Sustainability Division, Research, Testing and Development Technical report, RTD/ACM/17/04, October 2017 (Authors Mathoho, G & Khuzwayo, L)
	Eskom, 2017, Komati Surface and Groundwater Monitoring Report, Phase 3, Eskom Sustainability Division, Research, Testing and Development Technical report. RTD/ACM/16/240-118739170, dated October 2017 (Authors Mathoho, G, Khuzwayo, L, and Samuels, V)
	Eskom, 2016, Komati Surface and Groundwater Monitoring Report, Phase 01, Eskom Sustainability Division, Research, Testing and Development Technical report. 240-112294332, April 2016, (Author Mathoho, G)
	Eskom, 2017, Komati Surface and Groundwater Monitoring Report, Phase 02, Eskom Sustainability Division, Research, Testing and Development Technical report. Rrtm/acm/16/240-118739170, (Author Mathoho, G), January 2017

Type of information	Report Reference
	Eskom, April 2018, Komati Surface and Groundwater Monitoring Report, Phase 5, Eskom Sustainability Division, Research, Testing and Development Technical report, RTD/ACM/17/05,
	Eskom, L, May 2018, Komati Surface and Groundwater Monitoring Report, Phase 6, Eskom Sustainability Division, Research, Testing and Development Technical report, RTD/ACM/17/06, (Authors Mathoho, G & Khuzwayo, L)
	Eskom, May 2018, Komati Surface and Groundwater Monitoring Report, Phase 7, Eskom Sustainability Division, Research, Testing and Development Technical report, RTD/ACM/18/240-140434399, (Authors Mathoho, G & Khuzwayo, L)
	Eskom, August 2018, Komati Surface and Groundwater Monitoring Report, Phase 8, Eskom Sustainability Division, Research, Testing and Development Technical report, RTD/ACM/18/240-140434709, (Authors Mathetsa, S & Swartz, N)
	Eskom, September 2019, Komati Surface and Groundwater Monitoring Report, July to September 2019, Eskom Sustainability Division, Research, Testing and Development Technical report, RTD/ACM/19/240-152749979,
	Eskom, September 2019, Komati Surface and Groundwater Monitoring Report, April to June 2019, Eskom Sustainability Division, Research, Testing and Development Technical report, RTD/ACM/19/240-150762666, (Authors Mathetsa, S & Swartz, N)
	Eskom, May 2020, Komati Surface and Groundwater Monitoring Annual Report, 2020/2021, Eskom Sustainability Division, Research, Testing and Development Technical report, RTD/ACM/20/240-163860231, (Authors Sinthumule, N & Mathetsa, S)
	Eskom, November 2020, Komati Surface, and Groundwater Monitoring - Quarter 2 of 2020/2021, Eskom Sustainability Division, Research, Testing and Development Technical report, RTD/ACM/20/240-160324741, (Author Mathetsa, S).
Latest Water quality reports by Eskom	Eskom, January 2021, Komati Surface, and Groundwater Monitoring - Quarter 3, Eskom Sustainability Division, Research, Testing and Development Technical report, RTD/ACM/21/240-1615539477, (Author Mathetsa, S)
Latest Water quality reports by Eskom	Eskom, March 2022, Komati Surface, and Groundwater Monitoring - Quarter 3, Eskom Sustainability Division, Research, Testing and Development Technical report, RTD/ACM/21/240-190000008 (Author Sinthumule, N)
Undermining areas	Bohlweki Environmental, September 2005, Single page (Figure 10) showing the undermining areas, subsidence and rehabilitation ash dump referenced to the Koornfontein Mines EMPR and originally titled Plan No. 4.5.

3.2 HYDROCENSUS

A hydrocensus was carried out in 2008 (GHT, 2009) with selected points (thirteen) resampled in 2019 (Eskom, 2019), Refer Figure 4. These covered an approximate 15 km radius around KPS. The locality of the census boreholes, boreholes utilised for site monitoring by Eskom and additional shallow boreholes (<10 mbgl) drilled by WSP in 2022 are presented in Figure 3-1.

The results of the hydrocensus (Refer Table 3-2) imply that the surrounding farms to the east, southeast and southwest of KPS obtain water from boreholes for domestic use and for irrigation of crops. The closest boreholes are located within 500 m of the Eskom boundary on the farms Goedehoop, Geluk and Broodsnyders (highlighted in bold text in Table 3-2).

Boreholes identified on the National Groundwater Archive (requested in late 2022) were confirmed to be beyond 1 km of the farm boundary.

Additional information obtained from the site monitoring and shallow boreholes drilled in 2022 is provided in Section 4-4. In summary:

- Water level information is limited as hydrocensus boreholes are generally installed with infrastructure which blocks access to water levels.
- Water quality data obtained for the hydrocensus boreholes are generally below the SANS 241:2015 limits for domestic use. This water is therefore suitable for drinking (based on the parameters analysed).
- Groundwater is utilized for domestic use with *ad hoc* use for irrigation.
- Groundwater is abstracted from the adjacent Goedehoop Colliery where groundwater is also utilized for supply, (SRK 566657, 2021).

3.3 GEOPHYSICAL SURVEY AND RESULTS

Geophysics was carried out for the 2008 baseline (GHT, 2009) and the geophysical survey focused on the boundaries of the ashing facility. The survey delineated potential drill sites for the ashing facilities for pollution remediation or management of pollution plumes from the facilities. The survey was conducted using the magnetic method to identify intrusive magmatic rocks, primarily dolerites sills or dykes, in the vicinity of the KPS.

3.4 DRILLING AND SITING OF BOREHOLES

3.4.1 EXISTING MONITORING PROGRAM

A monitoring program has been established for the KPS. While some information is available from (GHT, 2009), borehole logs were unavailable for all the points. Monitoring points located in or near the vicinity of the proposed activities are included in blue text in Table 3-3 below with additional information from the remaining monitoring points provided for reference. There are no monitoring boreholes located in or around PVSite B and BESS B and C.

Based on the data provided, it is inferred that shallow boreholes are drilled to depths of < 10 m below ground level (mbgl) whilst deeper boreholes are drilled to a depth of > 30 mbgl.

3.4.2 NEW BOREHOLES DRILLED IN 2022

At the request of Eskom ten permanent monitoring wells (BH01–BH10) were advanced by Soil and Groundwater Remediation Services (SGRS) under supervision of WSP at targeted safely-accessible locations to depths of up to 10m bgl. These were generally positioned in areas where coverage from the existing monitoring network was limited. The positions of the wells are presented in Figure 3-2.

Boreholes were initially manually advanced to depths of up to 2 mbgl prior to completion by percussive techniques. Seepage was encountered in the boreholes BH6, BH9, BH2 and BH1 with no water strikes observed in BH7 and BH8 (located in PV Site A). The remaining boreholes were moist with no discrete groundwater strikes observed during drilling. The borehole logs are provided for reference in Appendix A and summarised in Table 3-4.

Table 3-2 - Hydrocensus boreholes (2008) with 2019 update indicated in blue text

SiteID	Longitude (°E)	Latitude (°S)	Farm Name	Farmer/ Owner	Bore-hole Depth (m)	Casing Height (m)_2008	Equipment	Use	WL Below Collar (mbcl)	Condition
BB10	29.42091	-26.04868	Welverdiend23/2	Engelbreght	~	0.200	Submersible	Domestic Drink	~	Good
BB11	29.45898	-26.06239		G.F. Grobler	~	0.520	Hand pump	Domestic Drink	~	Good
BB12	29.46227	-26.06161		G.F. Grobler	~	0.300	Submersible	Domestic Drink	~	Broken
BB13	29.44845	-26.06403	Koornfontein 27/6	G.F. Grobler	27.2	0.280	Submersible	Domestic Drink	16.20	Blackish water
BB14	29.48485	-26.05469	Broodsnyers-plaas 25/10	Siyavuma Vervoer	~	0.000	Submersible	Domestic Drink	11.80	Good
BB15	29.49044	-26.05852	Broodsnyers-plaas 25/28	H De Beer	~	0.350	Submersible	Domestic Drink	~	Good
BB16	29.50683	-26.07076	Broodsnyers-plaas 25/1	P Storm	~	0.320	Hand pump	Domestic Drink	~	Good
BB17	29.49821	-26.07593	Broodsnyers-plaas 25/5	P Storm	66.0	0.000	Submersible	Domestic Drink	24.00	Good
BB18	29.49867	-26.07736		P Storm	85.0	0.000	None (2008), Pump (2019)	~	Dry	Dry hole (2008), in use in 2019
BB19	29.49741	-26.07693		P Storm	~	0.100	Hand pump	Domestic Drink	~	Good
BB20	29.48213	-26.08393	Broodsnyers-plaas 25/3	D Lee	26.1	0.100	Submersible	Domestic Drink	14.10	Good
BB21	29.47954	-26.10598	Geluk 26/7	MCL Dippenaar	26.8	0.200	None (2008), Windmill (2019)	~	2.20 (2008); 1.76 (2019)	Windmill (2019)
BB22	29.47907	-26.10586			~	0.000	Submersible	Domestic Drink	~	Good
BB23	29.47905	-26.10632			11.0	0.230	Submersible	Domestic Drink	4.50	Broken (2008) indicated to be in use 2019
BB24	29.47125	-26.11574	Goedehoop 46/3	F Schoeman	~	0.300	Submersible	Domestic Drink	15.00	Good
BB25	29.47127	-26.11574			26.5	0.300	Submersible	Domestic Drink, Livestock	20.50	Good
BB26	29.47783	-26.11699	Bultfontein 187/2	K Van Rensburg	6.1	0.100	None	~	Dry	Dry hole
BB27	29.47912	-26.11710			42.0	0.440	Submersible	Domestic Drink, Livestock	32.00	Good
BB28	29.50721	-26.11221	Bultfontein 187/11	Van Niekerk	~	0.680	Mono pump	Domestic Drink	~	Good
BB29	29.49529	-26.12859	Bultfontein 187/12	Von Wielligh	52.0	0.520	Submersible	Domestic Drink, Livestock	13.00	Good
BB30	29.50947	-26.13509	Bultfontein 187/6	E Erasmus	40.0	0.480	None	~	8.50	No Equipment
BB31	29.50961	-26.13511	Bultfontein 187/6	E Erasmus	~	0.120	Mono pump	Domestic Drink	~	Good
BB32	29.53378	-26.14317	Hartebeestkuil 185/2	D Van Woutenberg	~	0.370	None	~	5.00	No Equipment
BB33	29.53470	-26.14244			8.0	0.360	None	~	2.00	No Equipment
BB34	29.53840	-26.14023			~	0.100	Mono pump	Domestic Drink, Livestock	~	Good
BB35	29.49518	-26.15330	Wilmansrust 47/3	C.J. Van der Merwe	15.0	0.180	Submersible	Domestic Drink, Livestock	3.00	Works only in dry season
BB36	29.49503	-26.16079			32.0	0.170	Submersible	Domestic Drink, Livestock	18.00	Good
BB37	29.51189	-26.17976	Dunbar 189/2	Proefplaas	12.0	0.150	Submersible	Domestic Drink	3.50	Good

SiteID	Longitude (°E)	Latitude (°S)	Farm Name	Farmer/ Owner	Bore-hole Depth (m)	Casing Height (m)_2008	Equipment	Use	WL Below Collar (mbcl)	Condition
BB38	29.48366	-26.17902	Middelkraal 50/1	BJ Grobler	~	0.450	Windmill	~	~	2019: in use
BB39	29.48336	-26.17877		BJ Grobler	~	0.300	Mono pump	Livestock	~	Occasional use for domestic
BB40	29.48339	-26.17864		BJ Grobler	~	0.280	Submersible	Domestic Drink, Livestock	3.00 (2008), 2.72 (2019)	Not in use
BB41	29.47363	-26.16277	Leeufontein 48/3	BJ Grobler	~	0.450	Windmill	~	~	Not in use for a long time
BB42	29.47537	-26.16495	Leeufontein 48/16	BJ Grobler	~	0.000	Windmill	~	~	Not in use for a long time
BB43	29.42195	-26.12209	Goedehoop 46/7	J Harmse	15.0	0.300	Submersible	Domestic Drink	8.00	Good
BB44	29.42193	-26.12198		J Harmse	55.0	0.100	Submersible	Domestic Drink, Livestock	5.00	Good
BB45	29.41625	-26.11591		J Harmse	~	0.300	Windmill	~	~	Not in use for a long time
BB46	29.42719	-26.11853		J Harmse	~	0.600	Windmill	~	~	Not in use for a long time
KEY										
	Boreholes located within 500m of the Eskom KPS boundary are included in the shaded cells									

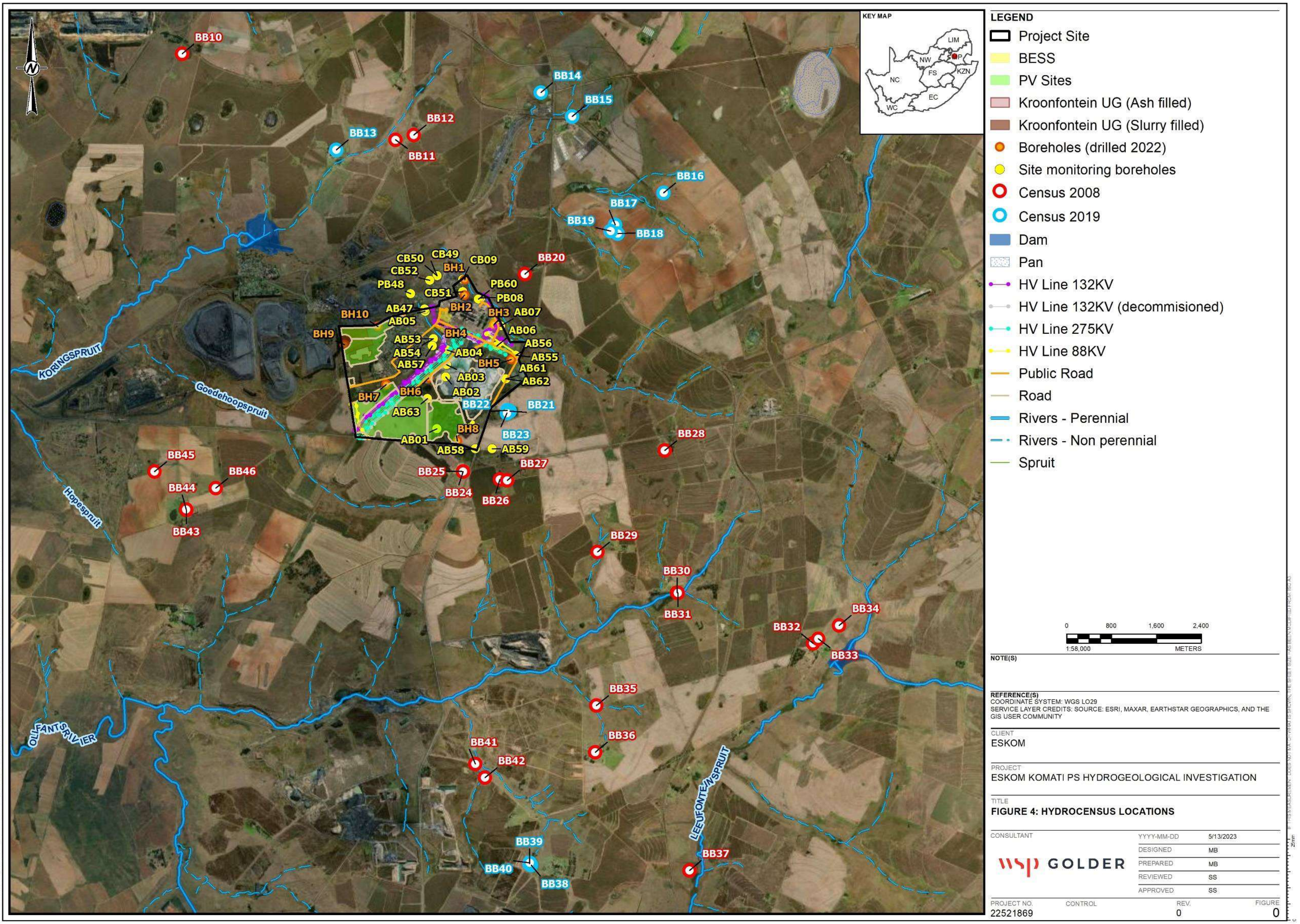

Figure 3-1 - Hydrocensus and Borehole localities

Table 3-3 - Data for Monitoring boreholes (boreholes located in or adjacent to the proposed activities are indicated in blue text)

Locality	Sample ID	Latitude (°S)	Longitude (°E)	Elevation [5]	Borehole depth	Sample depth (mbgl)(1)	Lithology
Ambient upstream (south) of Ashing area and PV Site A at T junction - Witbank Road.	AB58	-26,1121	29,473	1662	ND		
	AB59	-26,1121	29,476	1662	ND-shallow		
Inside PV Site A - Western boundary of Ashing Area and downstream of old rehabilitated domestic waste site.	AB01	-26.10885	29.4665	1652	35.5	15	Clay to 7,5m, weathered Sandstone to 17,5m, Siltstone and shale to 25m, coal to 26m, Siltstone and sandstone to 40m
	AB63	-26,1040	29,465	1643	ND		
Outside Eastern boundary PV Site A - West of Ashing Area north of small ash dam as well as west of large ash dams.	AB02	-26.10053	29.4681		32.5	20	Clay to 5m, weathered sandstone to 13m, shale and siltstone layers to 26m Dolerite at base.
Outside Eastern boundary PV Site A - West of Ashing Area. West of ash dam and in town area	AB53	-26,0944	29,466	1617	ND-deep		
Outside but adjacent to BESS C (east of KPS boundary) downstream of seepage recovery dam AP03.	AB07	-26.09225	29.47787	1612	37.0	15	Gravel to 1m, clay to 3m, weathered sandstone to 12m, Sandstone, siltstone and shale layers to 28m, coal to 29m, sandstone to 39m
North-eastern corner of KPS boundary & downstream of Coal Stockyard Area & dirty water dam	CB09	-26.08481	29.47110		36.5	31	Soil/Clay to 2m, shale to 12m, siltstone and sandstone to 17m, shale to 20, coal to 21, shale to 23m, sandstone and siltstone to 37m, shale and coal layers at base.
Outside BESS C on eastern boundary - downstream KPS Area	PB60	-26,0880	29,474	1608	ND		
Ashing Area- Monitoring borehole downstream and north of small ash dam as well as west of large ash dams.	AB03	-26.09855	29.46826		7.5 (collapsed)	-	Clay to 12m.
Ashing Area north-west of ash dams and south of dam AP02.	AB04	-26.09615	29.46831	1621	38.0	8.5	Clay to 8m, weathered sandstone to 11m, Shale and siltstone to 33m, dolerite at base

Locality	Sample ID	Latitude (°S)	Longitude (°E)	Elevation [5]	Borehole depth	Sample depth (mbgl)(1)	Lithology
Ashing Area next to Komati Spruit west of KPS.	AB05	-26.08999	29.46438		8.5 (collapsed)	-	Clay to 8m, weathered sandstone to 16m
Ashing Area north and downstream of ash dams.	AB06	-26.09551	29.47715	1620	37.0		
KPS & Sewage Plant Area	PB08	-26.08780	29.47429	1604	35.5	13	Clay to 5m, coal to 6m, siltstone and shale to 11m, sandstone to 15m, shale and coal to 18m, shale to 40m
Ashing Area close to Komati Spruit, west of KPS.	AB47	-26,8096	29.464304	1609	ND		
Ashing Area west of ash dam, next to AB53	AB54	-26,0944	29,466	1617	ND - Shallow		
Ashing Area North of ash dam. Next to tar road at Entrance Road to KPS	AB55	-26,0970	29,481	1621	ND - Deep		
Ashing Area- North of ash dam. Next to tar road at Entrance Road to KPS	AB56	-26,0970	29,481	1621	ND- shallow		
Ashing Area - West of ash dam	AB57	-26,0955	29,466	1621	ND		
Ashing Area - East of ash dam.	AB61	-26,1008	29,479	1634	ND- deep		
Ashing Area east of Ash Area – Shallow borehole and artesian	AB62	-26,1008	29,479	1634	ND- shallow		
KPS Area- north of sewage plant	PB48	-26,0871	29,462	1608	ND		

Notes: ND – no data

(1) – GHT, 2009

(1) – Eskom, 2018

(2) – Eskom, 2018

(3) - Eskom, 2019

(4) – Eskom, 2022. Note that water levels were interpolated from handwritten notes in appendix.

(5) - Eskom, 2017

Table 3-4 - Groundwater Data for boreholes drilled in June 2022

Locality	Well	Latitude (°S)	Longitude (°E)	Elevation (mamsl)	Final depth (m)	Slotted section (m)	Water Strike	Lithology
Ashing Area (Up-gradient)	BH05	26°05'51.7"S	29°28'47.2"E	1618.65	10 but collapsed at 6m	1-6	Moisture at 4m	Ash to 0.5m, sandy gravel fill to 1.5, Vryheid formation.
PV Site A	BH07	26°06'06.4"S	29°27'26.9"E	1630.76	10	1.5-10	None	Ash to 0.5m. Vryheid formation
	BH08	26°06'38.9"S	29°28'12.8"E	1650.8	10	1.5-10	None	Vryheid formation
	BH06	26°06'02.6"S	29°27'54.2"E	1625.46	10	2.5-6.5	Seepage at 4	Ash to 0.5m. Vryheid formation
PV Site B	BH09	26°05'32.8"S	29°27'21.4"E	1618.65	10	1.5-10	Moisture 7	Fill – clayey shale to 0.5m. Vryheid formation
	BH10	26°05'43.4"S	29°27'00.2"E	1602.4	10	1.5-10	Seepage at 2m	Fill – clayey shale to 0.5m. Vryheid formation
	BH04	26°05'31.2"S	29°28'00.7"E	1611.04	6	1.5-6	Moisture 1.5	Vryheid formation
BESS C	BH03	26°05'31.5"S	29°28'35.9"E	1605.34	10	1.5-10	Moisture at 8m	Sandy fill to 0,5m. Vryheid formation
Coal stockyard area	BH02	26°05'14.4"S	29°28'16.9"E	1607.06	10	1.5-10	Seepage 8m	Fill to 1.5 m followed by weathered Vryheid formation
	BH01	26°05'05.4"S	29°28'17.2"E	1601.87	8	1.5-8	Seepage at 7m	Vryheid formation with Coal horizon from 1 – 7,

3.5 AQUIFER TESTING

The baseline report (GHT, 2009) reports on falling head tests on eight of the nine monitoring boreholes available at the time. Hydraulic conductivity was estimated as ranging from 0,007 m/d at AB07 to 2.4 m/d for AB04 with an average of 0,51 m/d. No further testing has been done.

3.6 SAMPLING AND CHEMICAL ANALYSIS

3.6.1 EXISTING MONITORING PROGRAM

Eskom has an extensive monitoring network covering an area of 10 km^2 (Eskom, 2021) and is focused on the KPS. According to Eskom's monitoring data, the monitoring boreholes include:

- Boreholes (AB58 and AB59) monitoring the ambient (upstream groundwater quality);
- Boreholes (AB61, AB62, AB01, CB51, and PB48) were delineated as source monitoring boreholes and
- Boreholes (AB02, AB03, AB63, AB55 and AB56) are used to track the groundwater plume.

Sampling is carried out by Eskom. Eskom reports that it follows a groundwater sampling guideline which includes bailing of water samples at a discrete interval from pre-determined sampling depths. This was provided for a few monitoring boreholes from the baseline report in 2008 but is not stated in subsequent monitoring reports. It is noted that some of the boreholes appear to have collapsed over the preferred sample depth.

Groundwater quality parameters that need to be analysed are specified in the WUL as pH, Electrical conductivity (EC), Total Dissolved Solids (TDS), Total Suspended Solids (SS), Total Alkalinity, chloride (as Cl), sodium (as Na), sulphate, nitrate, ammonia, orthophosphate, fluoride, potassium, manganese, copper, iron, zinc, arsenic and chromium.

As noted above, groundwater monitoring in the areas proposed for the BESS and PV are limited with monitoring boreholes located in PV Site A (area west of Ash dams) and in the north-eastern corner of the Power station near the coal stock yard.

3.6.2 NEW BOREHOLES

Water samples were obtained from the ten shallow boreholes drilled in May 2022 (Figure 3-2) following purging of the boreholes of a maximum of three well volumes (where possible) using dedicated single-use bailers. Samples were then collected in laboratory prepared containers which were stored in a temperature-controlled environment for delivery to an accredited laboratory for subsequent analysis.

Groundwater samples varied from brown to clear with no obvious visual or olfactory evidence of contamination. The water quality results for the ten boreholes obtained in 2022 are discussed in more detail in Section 4-4.

3.7 GROUNDWATER RECHARGE CALCULATIONS

The regional recharge distribution (37 – 50 mm/a), as provided by the hydrogeological map series information for South Africa, is presented in Figure 3-3. This is slightly higher than provided by the available reports which provide the following estimates:

- 3% of annual rainfall (20,6 mm/a based on 687 mm/a) in undisturbed areas Eskom, 2021.
- 36,5 mm/a estimated by Kimopax, 2019 based on the chloride method.

3.8 GROUNDWATER MODELLING

Groundwater modelling was not carried out for this investigation as no pollution dams, or 21 (g) water use are required for the PV and BESS plants. A comprehensive numerical groundwater model has been compiled for the KPS area as detailed by Kimopax, 2019.

The model considered the potential existing sources for KPS of the existing ash dams, coal stock yard, new ash return water dam and raw water dams.

Conclusions and recommendations from the model report are summarized as follows:

- The groundwater contaminant plume is expected to migrate post closure past the KPS boundary to the Koringspruit. It was recommended that the coal stockyard area be removed upon closure and disposed to an approved waste disposal facility pending confirmation of waste classification results (not provided).
- All water in contact with the ash dams should be contained and treated within the footprint area.
- The raw water and new ash return water dams need to be removed on closure, contaminated soil removed, and the footprints rehabilitated.
- Additional monitoring points were recommended, and it was noted that monitoring should continue for at least ten years following closure.

3.9 GROUNDWATER AVAILABILITY ASSESSMENT

Groundwater is utilized by the surrounding communities and the adjacent Goedehoop Colliery for water supply.

Groundwater availability is described as “d2” being primarily from an intergranular and fractured rock aquifer with an anticipated yield of between 0.1 and 0.5 l/s (Refer Figure 3-4).

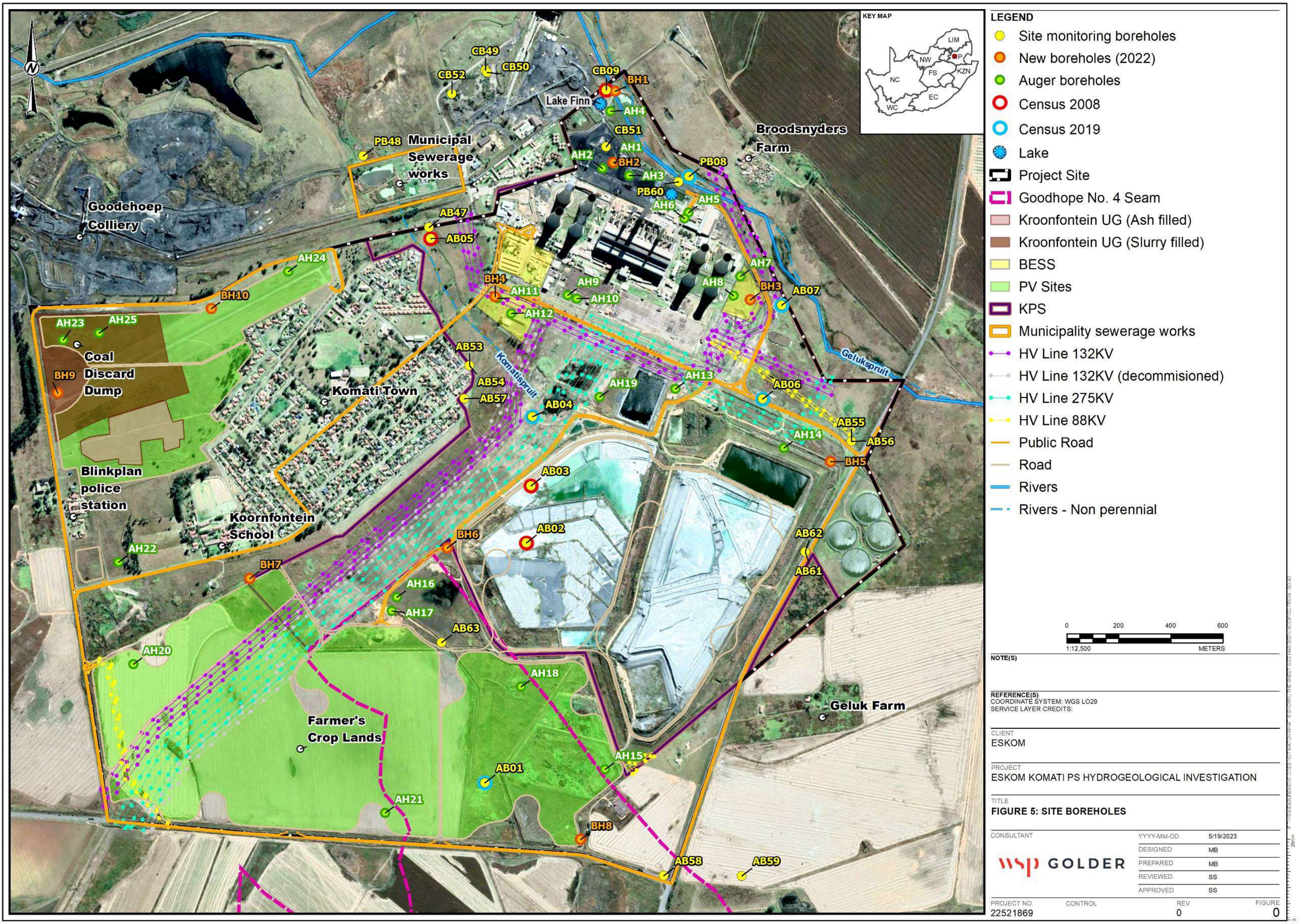

Figure 3-2 - Site boreholes

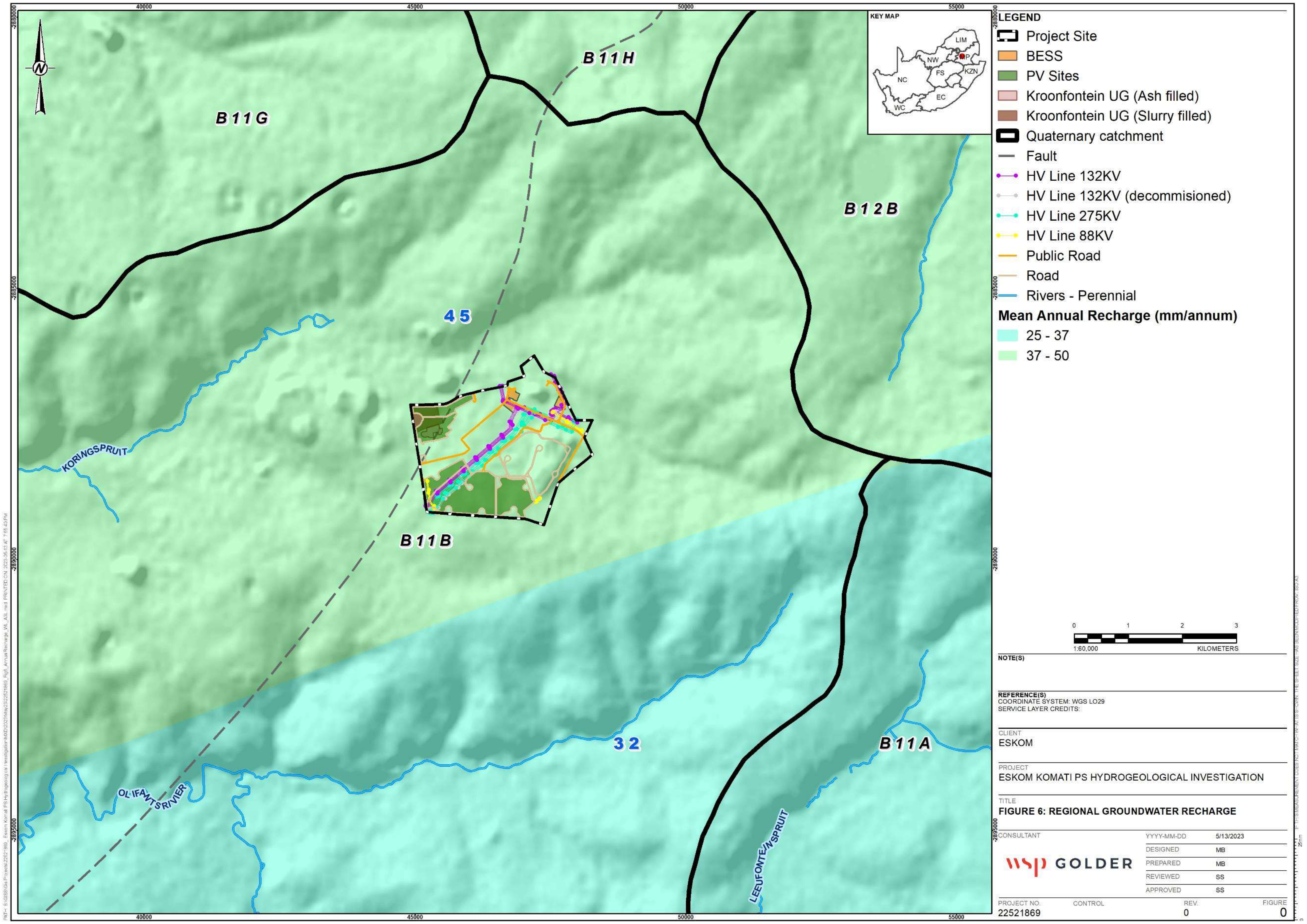

Figure 3-3 - Groundwater Recharge Distribution

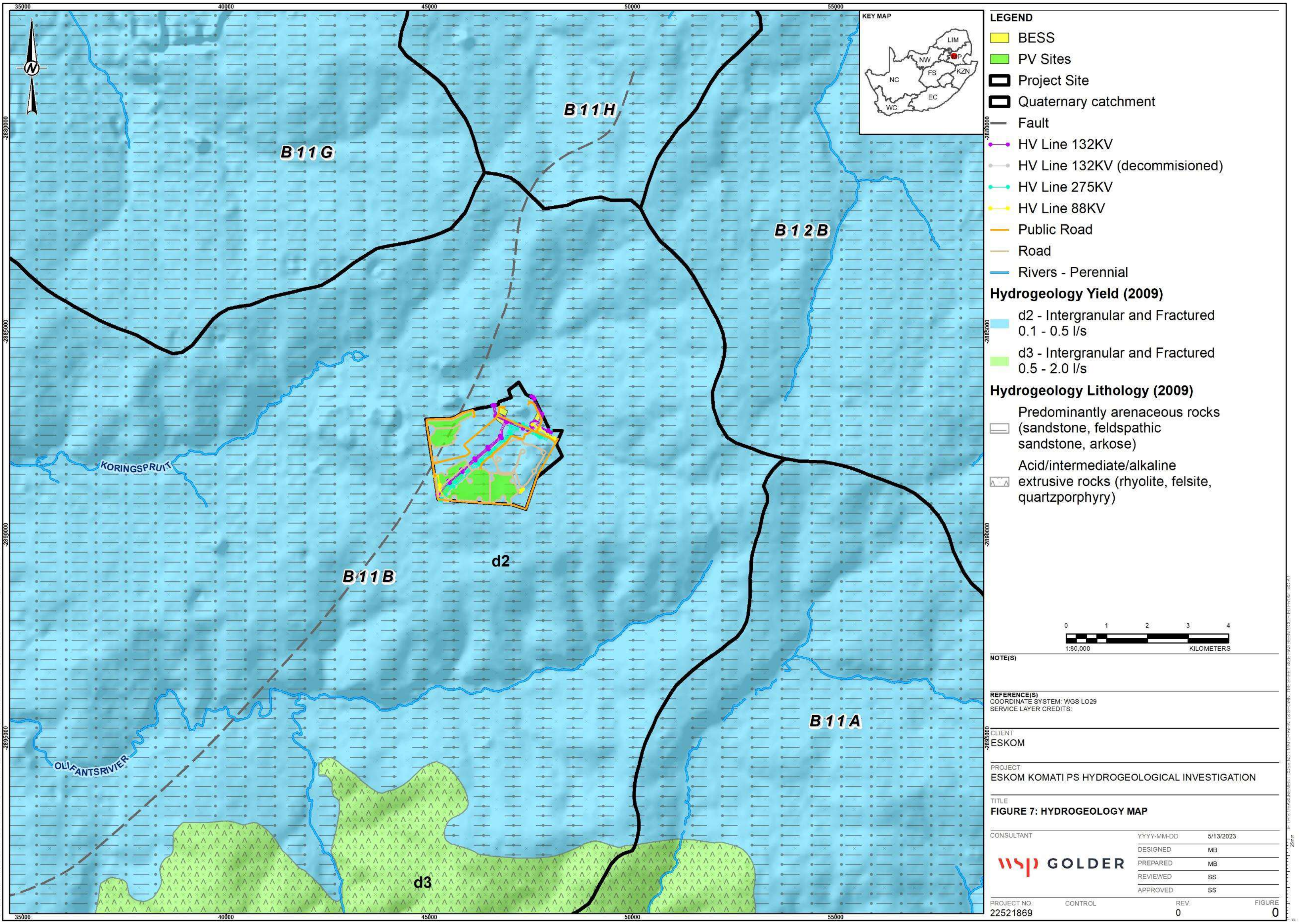

Figure 3-4 - Groundwater Availability

4 PREVAILING GROUNDWATER CONDITIONS

4.1 GEOLOGY

4.1.1 REGIONAL GEOLOGY

The KPS is located within the Highveld (Witbank) Coalfield. The regional geology is described (Eskom, 2021, Kimopax, 2019) as falling within the Carboniferous to early Jurassic aged Karoo Basin. The Karoo Supergroup comprises, from oldest to youngest, the Dwyka, Ecca and Beaufort Groups, with the coal seams generally hosted within the Vryheid Formation of the Middle Ecca Group. The Vryheid Formation includes interbedded sandstone, siltstone, shales and coal seams. Five coal seams are present within the Vryheid Formation and are numbered (from base up as the Number 1, 2, 3, 4 and 5 Seams. The zone of undermining (Bohlweki Environmental, 2005) indicated as underlying the PV Site B is noted to be associated with the No 4. and No. 2 coal seams. The No 2 Seam ranges in between 1.5 and 4.0 m in thickness where it is laterally continuous whilst the No 4 Seam averages 4.0 m, varying from 1 – 12 m in thickness at Goedehoop mine (SRK 566657, 2021). The depth below ground level should be confirmed but based on the general stratigraphy is likely to be > 50 m below surface (SRK 566657, 2021).

The Vryheid Formation overlies the Dwyka formation. A summary of the Lithostratigraphy is provided in Table 4-1. The regional geological map is presented in Figure 8.

Table 4-1 - Lithostratigraphy

Age	Supergroup	Subsuite	Lithology
Quaternary		Q	Surficial alluvial deposits to the north associated with the Koringspruit River
Jurassic		Jd	Fine-grained dolerite
Permian	Karoo	Pv (Vryheid)	Sandstone, shale and coal beds
Carboniferous		C-pd (Dwyka)	Diamictite and shale

4.1.2 LOCAL GEOLOGY

The local geology generally comprises weathering products of the sandstones, siltstones and mudstones of the Vryheid Formation, with isolated patches of dolerite. The top layer consists of reddish-brown sandy soil, with clayey-sandy subsoil comprising yellowish to brown clays residual of the underlying sandstone formations. Weathering is not, based on the available borehole logs, expected to extend deeper than approximately 10 m. Surficial ash and coal are likely present within PV Site A associated with the historical ash footprint and in the coal stockyard area.

A linear structure is indicated on the regional geological maps (Refer Figure 4-1) to be striking north-east to south-west through PV Site B.

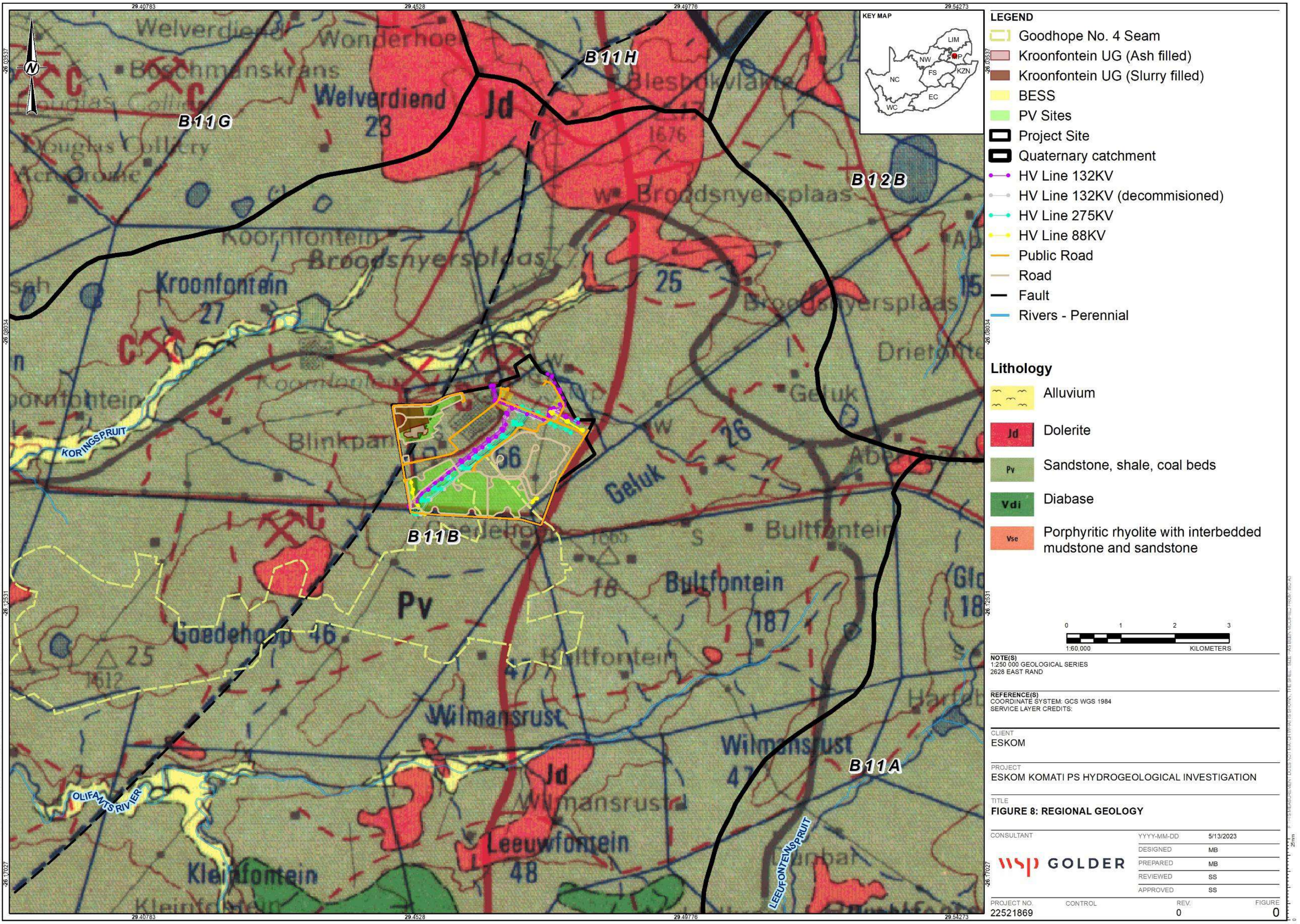

Figure 4-1 - Regional Geology

4.2 ACID GENERATION CAPACITY

Not applicable as there are no waste facilities associated with the PV and BESS plant.

4.3 HYDROGEOLOGY

4.3.1 UNSATURATED ZONE

Twenty-five auger holes (AH01–AH25) were manually advanced to depths ranging from 0.3–1.7 mbgl with geotechnical refusal was encountered in most of the holes in addition to the ten shallow boreholes. The deepest soil profile that could be achieved was at PV Site A within the area previously used for crops. The soil profile comprised darker brown clayey sand which become lighter brown with depth. No crops were evident at the time of the investigation.

The “natural” soil horizon (weathered bedrock) comprises a moist, orange, brown to red-brown sandy clay or clayey sand (residual Vryheid formation) with occasional mottled clayey sand with ferricrete nodules in most of the areas inferring a seasonally fluctuating water table.

Localised Fill/made ground comprising coal was encountered in the coal stockyard, Ash observed downgrade of the Ashing Area in BH05 and BH06 and gravelly fill located in the historical Coal discard dump in the vicinity of PV Site B (BH9, BH10). A seepage zone was noted as perched on mottled sandy clay under this layer in the auger holes drilled in this vicinity.

4.3.2 SATURATED ZONE

A monitoring program has been established for the KPS with the available boreholes presented on Figure 5. The boreholes are distinguished as shallow or deep but there is limited lithological information provided. Groundwater monitoring in the areas proposed for the BESS and PV Sites are limited to around PV Site A.

Whilst borehole logs and depth are not provided for all the monitoring boreholes, the available information implies that there are two distinct aquifers present in the Komati area, namely:

- Seasonal shallow, discontinuous perched aquifer within the overlying weathered rock matrix. This zone is conceptualised (Kimopax, 2019) as an upper zone of completely weathered material to a depth of 8 to 10 m with a higher hydraulic conductivity (k of around 1 m/d). Monitoring boreholes which intercept this zone are typically less than 10 m deep. Boreholes drilled in May 2022 target this aquifer.
- Regional weathered and/or fractured rock aquifer within the Vryheid Formation. These aquifers are commonly confined along essentially horizontal bedding interfaces between different lithologies. This aquifer occurs below the unsaturated zone (> 10 mbgl) in slightly weathered or fractured bedrock with monitoring boreholes typically being > 30 m deep. GHT Consulting, 2009 indicate that the aquifer hydraulic conductivity for the regional aquifer ranges from 0.007 m/d at AB07 to 2.4 m/d for AB04 with an average of 0.51 m/d. This aquifer is likely to be highly heterogeneous.

4.3.3 HYDRAULIC CONDUCTIVITY

Hydraulic conductivity was estimated based on falling head tests (GHT, 2009) as ranging from 0,007 m/d at AB07 to 2.4 m/d for AB04 with an average of 0,51 m/d. Porosity was estimated as 0,3.

4.4 GROUNDWATER LEVELS

4.4.1 DEPTHS

Water levels (Refer Table 4-2) typically vary from around 1.4 to 12 mbgl with shallow groundwater at surface in AK62 between the Raw Water dams and Ashing Area. Eskom, 2021 indicates that the groundwater flow mimics the topography, and the direction of flow is towards the surface stream, particularly the Koringspruit. The water levels for the other monitoring boreholes located within the KPS area vary from 0 (AB62) to around 6 mbgl are provided for reference. Except for AB55 and AB58, water levels vary between 0,6 and 3.6 m over the period provided (2016 to 2021).

SRK 5666657 (2020) report that regional water levels have been lowered through dewatering of mine workings at Goedehoop Collieries. Water levels in the monitoring boreholes at KPS vary only slightly over time and do not appear to have been affected by dewatering at Goedehoop at the present time. Future undermining by Goodehoop Collieries to the south-east of the Ashing area may influence the local water levels.

A summary of the latest water level data around August for the past three years is provided for reference in Table 4-2. Ambient boreholes and boreholes in or near the PV and BESS areas are presented first.

As noted, above, there is limited information for PV Site B, BESS A, BESS B and BESS C, however additional information was obtained in June 2022 from the new boreholes. Measurements of static groundwater levels were carried out following stabilisation of the borehole after one week. The water level depths varied from 0.86 to 1.97 mbgl which is broadly consistent with the existing dataset (Komati WISH database, 2022). The data is summarised below in Table 4-3.

Table 4-2 - Water level data at KPS

Locality	Sample ID	Bore-hole depth	Sample depth (mbgl)[3]	19-Aug-2018[4]	30-Jul-19[5]	20-Aug-20[6]	26-Aug-2021[7]
Ambient upstream (south) of Ashing area and PV Site A T junction - Witbank Road.	AB58	ND		3,68	4.85	4,29	5,04
	AB59	ND (S[8])		7,62	8.3	7,58	8,54
Boreholes in or near the proposed PV and BESS plants							
Inside PV Site A - Western boundary of Ashing Area and downstream of old rehabilitated domestic waste site.	AB01	35.5	15	1,75	3.66		
	AB63	ND		1,72	0	2,34	3,63

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[3] GHT, 2009,

[4] Eskom, 2018

[5] Eskom, 2019

[6] Eskom, 2020

[7] Eskom, 2022 Note that water levels were interpolated from hand written notes in appendix

[8] (S) – Shallow, (c) – collapsed, (D) - Deep

Locality	**Sample ID**	**Bore-hole depth**	**Sample depth (mbgl)[(3)]**	**19-Aug-2018[(4)]**	**30-Jul-19[(5)]**	**20-Aug-20[(6)]**	**26-Aug-2021[(7)]**
Outside Eastern boundary PV Site A - West of Ashing Area north of small ash dam as well as west of large ash dams.	AB02	32.5	20		2.79		
Outside Eastern boundary PV Site A - West of Ashing Area. West of ash dam and in town area	AB53	ND (D)		11,29	11.91	11,27	11,46
Outside but adjacent to BESS C (east of KPS boundary) downstream of seepage recovery dam AP03.	AB07	37.0	15	2,62		2,17	4,01
Outside BESS C on north-eastern corner of boundary & downstream of Coal Stockyard Area & dirty water dam	CB09	36.5	31		4.59		
Outside BESS C on eastern boundary - downstream KPS Area	PB60	ND		2,23		2,54	2,33
Monitoring boreholes within the surrounding KPS area							
Ashing Area- Monitoring borehole downstream and north of small ash dam as well as west of large ash dams.	AB03	7.5 (c)	-				
Ashing Area north-west of ash dams and south of dam AP02.	AB04	38.0	8.5		1.46		2,16
Ashing Area next to Komati Spruit west of KPS.	AB05	8.5 (c)	-		4.3		
Ashing Area north and downstream of ash dams.	AB06	37.0		1,62		1,46	1,48
KPS & Sewage Plant Area	PB08	35.5	13	2,82			
Not indicated – probably incorrectly labelled	AB08					4,83	2,95
Ashing Area close to Komati Spruit, west of KPS.	AB47	ND					2,09
Ashing Area west of ash dam, next to AB53	AB54	ND (S)		1,47	2.33	1,59	1,98
Ashing Area North of ash dam. Next to tar road at Entrance Road to KPS	AB55	ND (D)		5,83	6.22	5,64	6,39
Ashing Area- North of ash dam. Next to tar road at Entrance Road to KPS	AB56	ND (S)		1,43	1.53	1,64	2,2
Ashing Area - West of ash dam	AB57	ND		2,64	4.86	3,13	3,45
Ashing Area - East of ash dam.	AB61	ND (D)				1,68	1,72
Ashing Area east of Ash Area – Shallow borehole and artesian	AB62	ND (S)			1.88	0	0
Coal Stockyard Area	CB49	ND (D)			2.89		
Coal Stockyard Area	CB50	ND (S)			2.8		
Coal Stockyard Area	CB52	ND		1,64		2,58	2,75
KPS Area- north of sewage plant	PB48	ND		1,06		1,6	1,36

Table 4-3 – Groundwater monitoring data – 06 June 2022

Locality	Well	Elevation (mamsl)	Water level (m bgl)	Water level (mamsl)	Observation
Ashing Area (Up-gradient)	BH05	1618.65	1.55	1,617.0	Light brown, no odour
PV Site A	BH07	1630.76	1.52	1,629.3	Light brown, no odour
	BH08	1650.8	1.25	1,649.6	Light brown, no odour
	BH06	1625.46	1.3	1,624.1	Clear transcluent, no odour
PV Site B	BH09	1618.65	0.86	1,601.5	Clear transcluent, no odour
	BH10	1602.4	0.95	1,610.0	Clear transcluent, no odour
	BH04	1611.04	0.88	1,604.4	Clear transcluent, no odour
BESS C	BH03	1605.34	1.52	1,605.6	Light brown, no odour
Coal stockyard area	BH02	1607.06	1.55	1,600.3	Brown, no odour
	BH01	1601.87	1.97	1,596.7	Light brown, no odour

4.4.2 FLOW DIRECTION AND HYDRAULIC GRADIENT

Eskom, 2021 indicates that the groundwater flow mimics the topography, and the direction of flow are towards the surface stream, particularly the Koringspruit River. There is little seasonal variation noted. The contoured groundwater level is provided after Kimopax, 2019 (Refer Figure 4-2). The piezometric contours were also plotted based on the water levels for the boreholes drilled in May 2022 (Figure 4-3).

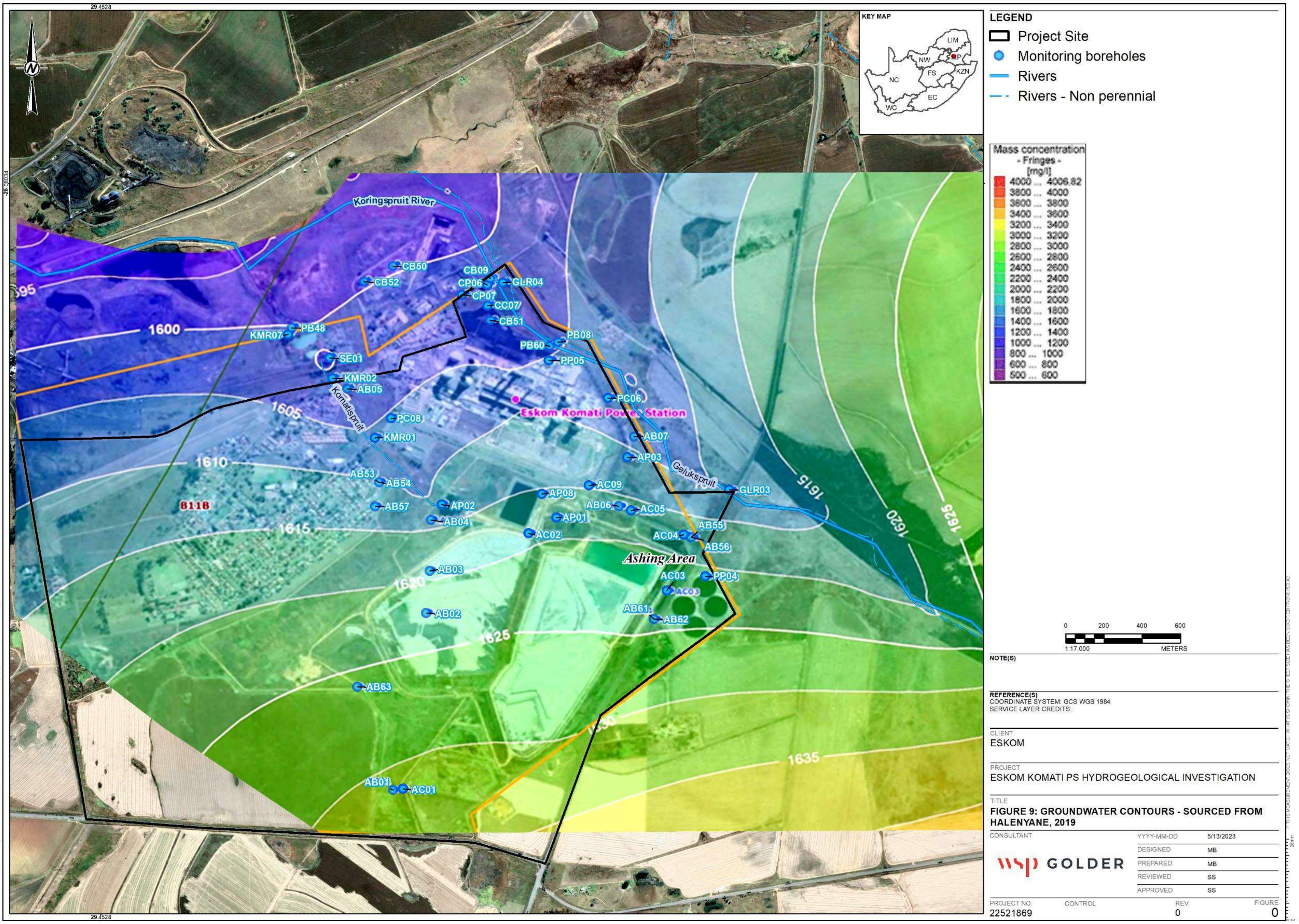

Figure 4-2 - Groundwater Contours – sourced from Kinomax, 2019

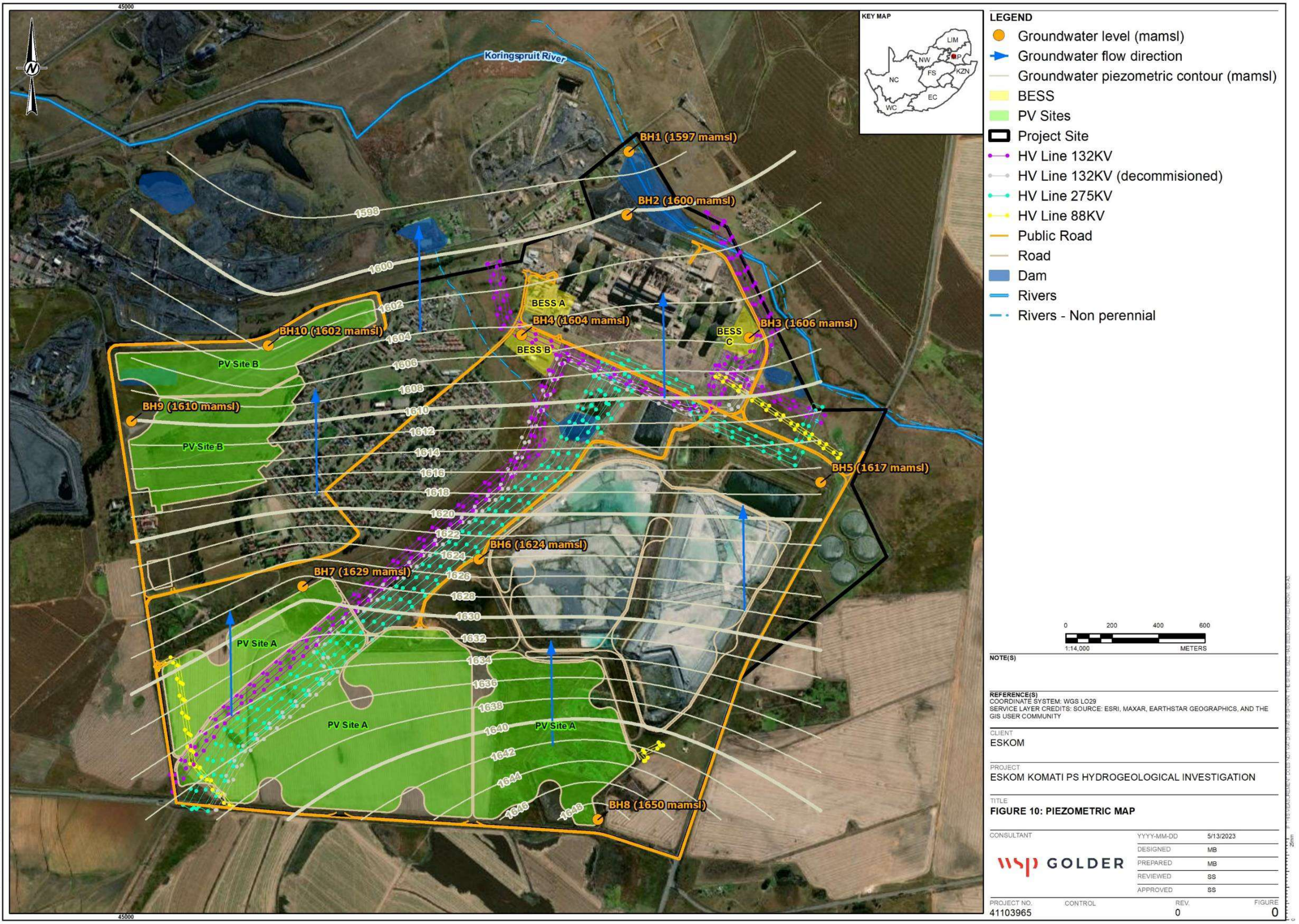

Figure 4-3 - Piezometric contours for boreholes drilled in 2022

Comparing topographic and groundwater elevations an R^2 value of 0.99 is calculable (Figure 4-4) resulting in a very strong correlation coefficient and consistent with previous works. Very broadly, an average hydraulic gradient is calculated with reference to groundwater elevations (Table 4.3) at BH08 in the south and BH01 in the north. This represents a difference of ~52.82 m over a lateral distance of approximately 2,866 m, equating to a hydraulic gradient of ~0.018. It should be stressed that hydrogeological conditions are unlikely to be homogenous especially recognising that the shallow aquifer is discontinuous and, therefore, local variability should be expected that may differ markedly from this calculated average.

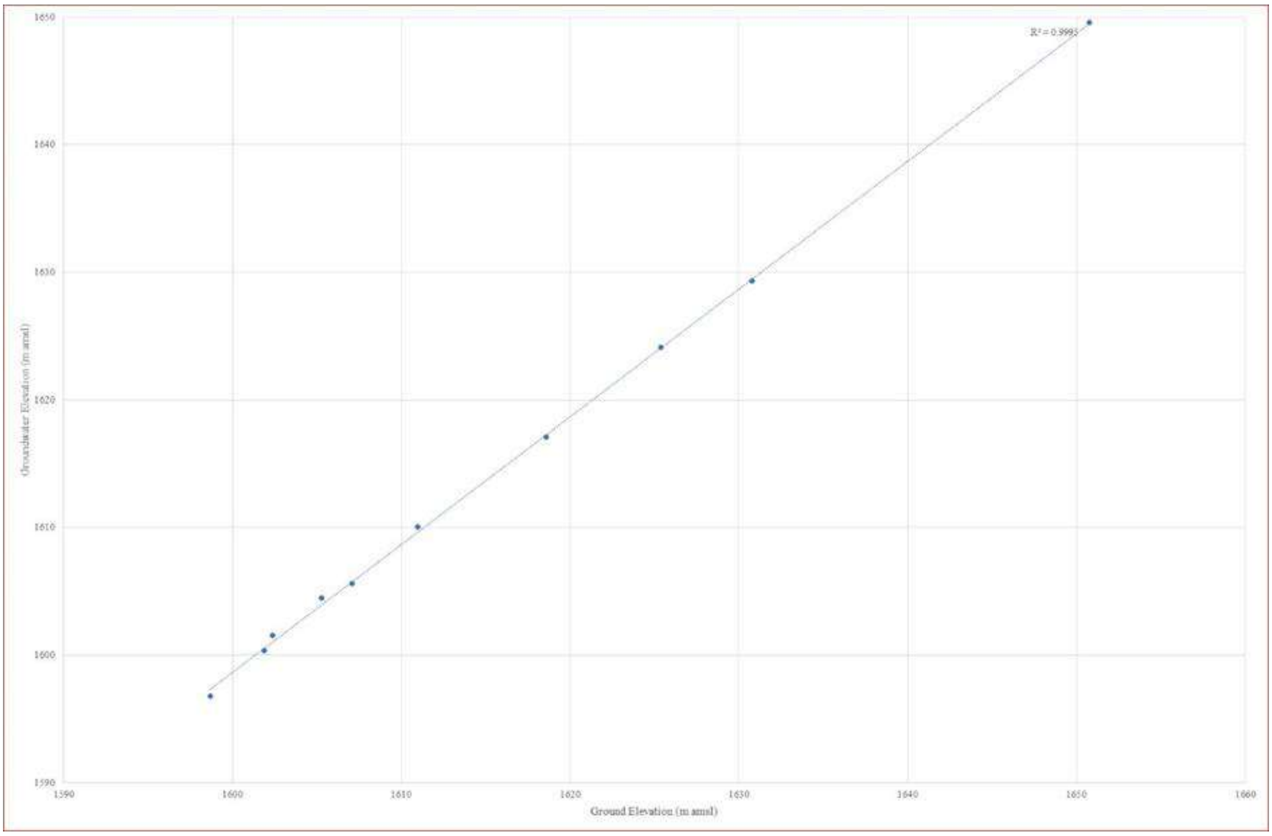

Figure 4-4 - Correlation: Topography versus groundwater elevation

4.5 GROUNDWATER POTENTIAL CONTAMINANTS

Residual contamination may be present in the PV and BESS areas due to historical activities generally related to the KPS. A contaminant land investigation was carried out to assess the potential for contamination to the groundwater. Of note is the residual ash footprint noted to the east of PV Site A and coal stock yard and coal stockyard pollution control dam as well as the settling ponds located on the boundary of KPS. Additional potential sources within the KPS area include a domestic waste dump, sewage plant and fuel depot.

4.6 GROUNDWATER QUALITY

Water quality data is captured in the WISH database for all parameters. Groundwater quality parameters that need to be analysed are specified in the WUL (Appendix IV Appendix B Clause 3.6) as pH, Electrical conductivity (EC), Total Dissolved Solids (TDS), Total Suspended Solids (SS), Total Alkalinity, chloride (as Cl), sodium (as Na), sulphate, nitrate, ammonia, orthophosphate, fluoride, potassium, manganese, copper, iron, zinc, arsenic and chromium. As noted above, the groundwater flow direction is from south to north. On this basis background groundwater quality is likely best represented by two boreholes located up-gradient of the KPS boundary (AB58 and AB59). The background water quality has been defined by the 95th percentile concentrations of determinants as sourced from the existing Komati Wish database supplied by Eskom with groundwater quality for selected boreholes presented for reference in Appendix B. The laboratory certificates for boreholes sampled in June 2022 are included in Appendix C.

Comparison to guidelines

The groundwater reserve is provided in the WUL (Appendix IV, Table 7, Clause 4.1) where it is noted that concentrations of 0 mg/l are presented for sodium and sulphate. It is expected that these will be naturally present in the regional aquifer as is evidenced for the ambient water quality at AB58 and AB59 where ranges of 17–22 mg/l and 8–21 mg/l are noted for sodium and sulphate, respectively. Although the reserve limits specified within the WUL have been adopted as the primary source of reference for those determinants included the zero values for sodium and sulphate are omitted from further consideration – Eskom should, however, liaise with the Department of Water and Sanitation (DWS) in this regard.

Water quality is in, addition compared to the SANS 241-2015 standard for drinking water and to ambient water quality as represented by two upgradient monitoring boreholes (AB58 and AB59). The average and 95th percentile results for the upgradient ambient water quality (AB58 and AB59) and boreholes located in and around the proposed areas (PV Site B) are provided for reference in the table below.

In recognition of groundwater use within 1 km together with the proximal freshwater aquatic surface water environs, analytical data has also been considered alongside the following:

- South African National Standard (SANS) for Drinking Water, SANS 241-1:2015 Edition 2, or Edition 1 (2011) for determinants omitted from the second version.
- South African Water Quality Guidelines (SAWQG) Volume 1, Domestic Use, Second Edition, 1996
- SAWQG Volume 7, Aquatic Ecosystems, Second Edition, 1996

Water quality discussion

The following is noted regarding the monitoring borehole data presented by Eskom:

- Ambient groundwater quality (as represented by AB58 and AB59) is generally alkaline with an average pH of 8.3. Electrical conductivity (EC) (average 17 and 32 mS/m for AB58 and AB59 respectively) is below the groundwater reserve of 112 mS/m.
- Water quality is affected by KPS activities particularly from the Ashing Area and coal stockyard. This is indicated by an increase in salinity associated with elevated chloride, sulphate, calcium, magnesium, sodium and fluoride in the coal stockyard area. Metal concentrations for iron and manganese are elevated compared to the ambient groundwater quality (<0.1 mg/l for iron and <0.5 mg/l for manganese) at AB07 (downgrade of the Ashing Area) and in CB09 (coal stockyard).
- Salinity is elevated exceeding ambient groundwater quality and the reserve for AB01, AB07, CB51, CB09, PB60. The localized increase in salinity is associated with elevated chloride, sulfate, calcium, magnesium, and sodium. Fluoride is near the groundwater reserve of 0,4 mg/l

in the ambient boreholes (95th percentile of 0,3 and 0,4 mg/l) and is locally elevated particularly in the coal stock yard area with the 95th percentile of 1.1 mg/l at CB09.
- Boreholes located on and near the northern boundary (CB52, AB47 and CB51) comprise sulphate, fluoride and manganese concentrations which are elevated compared to the ambient water quality and South African drinking water standards.

The following is noted from the Contaminated Land report regarding the water quality for the boreholes drilled in 2022. In terms of pH and although lower than background (8.8–9.1) the shallow groundwater is generally near neutral (6.62–7.54) and satisfies the lower pH limit (6.6) specified within the WUL. The other determinants provided for within the WUL are also seen as being broadly compliant; however, exceptions are noted as follows:

- A high salt content is recorded at BH03 (BESS C) where, together with elevated concentrations of sodium and sulphate, electrical conductivity, calcium, magnesium and chloride were above their respective reserve limits. This is expected due to the known groundwater plume extending from the up-gradient Ashing Area and concentrations decrease further down-gradient of the KPS (BH02, BESS D) to below the reserve limits. However, increases in the concentrations of several determinants are noted at the further down-gradient position (BH01), with magnesium and chloride again above the reserve criteria, albeit at far lower concentrations than BH03.
- Electrical conductivity and magnesium are above their reserve limits at BH08. This is located up-gradient of KPS activities on the southern boundary of PV Site A but slightly down-gradient of the background borehole (AB58).
- Chloride was above its reserve limit at both BH05 (northeast of the Ashing Area and north of Raw Water Dams) and BH04 (BESS B).

The underlying shallow aquifer targeted as part of this investigation is considered a non-aquifer due to the low yield and discontinuous nature. Nonetheless, the possibility of vertical migration of contaminant impacts from this to the regional deeper weathered/fractured rock aquifer is recognised.

In recognition of groundwater use within 1 km together with the proximal freshwater aquatic surface water environs, the known plume associated with the Ashing Area expectedly dominates the signature of down-gradient groundwater quality with manganese at a concentration (1,718.3 µg/l) above both the drinking water chronic health standard (400 µg/l) and freshwater aquatic guideline (180 µg/l). While this plume has been shown to extend off-site to the north, seemingly additional contributions from the KPS and particularly the coal stockyard are also observed with a doubling in the concentration of manganese recorded at BH01 (3,269.5 µg/l). The likely lateral dispersivity of this plume is also apparent at BH05 to the northeast and BH06 to the west where manganese concentrations of 809.5 µg/l and 496.8 µg/l were respectively recorded. Manganese was not otherwise recorded above either its freshwater aquatic guideline or chronic health standard for drinking water, although was noted to be above its aesthetic drinking water standard at BH04 (BESS B).

Compared to the background range (6.2–10 µg/l) concentrations of zinc appear elevated within the shallow groundwater across the entire property (16.2–59 µg/l). While far below the drinking water standard of 2 000 µg/l, these are above both the Target Water Quality Range (TWQR) and Chronic Effect Value (CEV) of 2 µg/l and 3.6 µg/l, respectively for aquatic ecosystems, and also above the Acute Effect Value (AEV) of 36 µg/l in four of ten boreholes (40%) sampled under the current scope. This includes positions both up- and down-gradient and therefore the source of zinc remains uncertain.

While absent in the background, lead has been detected within all shallow groundwater samples obtained. Notably, however, this is an approximate order of magnitude greater, and above the drinking water standard, within the west of the property (BH06, BH07 and BH08 [PV Site A] and BH09 [PV Site B]). While the combustion of fossil fuels (i.e. coal) is a recognised source of environmental lead, the reason for the noted distribution is uncertain and therefore remains unconfirmed; however, appears to correlate with typically higher concentrations of lead in soils in the west of the premises (Section 6.2.2).

Exceedances of the adopted standards/guidelines does not necessarily confirm the presence of an unacceptable risk but provides a conservative indication of where the shallow groundwater may represent a source of impact for the identified receptors. It is understood (VPC, 2021) that rehabilitation and management is planned for the plume associated with the Ashing Area and, as such, long term improvements in the quality of shallow groundwater would be expected once this process is implemented. While the sources of lead and zinc cannot be categorically confirmed these are almost certainly related to the activities at both KPS and the neighbouring colliery, and more detailed assessment/s are recommended to ensure appropriate protection of any potential receptors. **Otherwise, the demonstrated impacts to shallow groundwater are not considered to represent substantial constraints to the proposed development specific to the two PV and BESS sites.**

5 AQUIFER CHARACTERIZATION

5.1 GROUNDWATER VULNERABILITY

The KPS is vulnerable to groundwater contamination due to the shallow water table. This is mitigated by the low k and low recharge. Due to the surrounding use of groundwater by communities, the aquifer is considered to have a high vulnerability to contamination as is indicated by the observed localised impact from existing sources.

5.2 AQUIFER CLASSIFICATION

The aquifer is classified as a Minor (Parsons[9], 1995; DWAF[10], 1998) or Poor (DEA[11], 2010) aquifer due to the low exploitation potential and low yields (0.1 and 0.5 l/s). It does, however, represent an important source of water for domestic supply to the local communities. The aquifer beneath the site (> 35m) is classified as Minor/Poor with the overlying shallow weathered zone (<10m) being perched and discontinuous.

The overlying shallow aquifer is not considered a viable groundwater resource but may contribute to seepage in the wetland areas as well as vertical migration into the regional deeper weathered/fractured rock aquifer. It is again noted that the underlying groundwater is known to have

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[9] Parsons, R, 1995, A South African Aquifer System Management Classification, WRC Report No. KV77/95.

[10] Department of Water Affairs and Forestry, Second Edition, 1998. Waste Management Series, Minimum Requirements for Water Monitoring as Waste Management Facilities.

[11] Department of Environmental Affairs, May 2010, Framework for the Management of Contaminated Land.

been impacted by mining and activities at KPS. Future mining of the No.4 coal seam underlying PV Site A is understood to be planned. The seam is located 20 to 100 m below ground surface (Anglo American, 2015).

5.3 AQUIFER PROTECTION CLASSIFICATION

A weighting and rating approach is then used to decide on the appropriate level of groundwater protection (Table 5-1). After rating the aquifer system management and the aquifer vulnerability, the points are multiplied to obtain a Groundwater Quality Management (GQM) index.

Table 5-1 - Ratings for the Aquifer Quality Management Classification System

Aquifer Classification		Vulnerability	
Class	Points	Class	Points
Sole Source Aquifer System	6	High	3
Major Aquifer System	4	Medium	2
Minor Aquifer System	2	Low	1
Non-Aquifer System	0		
Special Aquifer System	0 – 6		

Table 5-2 - Appropriate level of groundwater protection required

GQM Index	Level of Protection
<1	Limited Protection
1 – 3	Low Level Protection
4 – 6	Medium Level Protection
7 – 10	High Level Protection
>10	Strictly Non-degradation

Table 5-3 - Aquifer classification and vulnerability assessment

Description	Aquifer	Vulnerability	Rating	Protection
Regional Aquifer	Minor (2)	1-2	4	Medium

The above classification implies that the regional aquifer is less sensitive due to the low recharge and low k and hence a medium level of protection is required, (Parsons, 1995).

6 GROUNDWATER MODELLING

As stated in Section 4.5, a groundwater model is not required for this investigation as no pollution dams, or 21 (g) water use are required for the PV and BESS plants. A comprehensive numerical groundwater model has been compiled for the KPS area as detailed by Kimopax, 2019.

7 IMPACT ASSESSMENT

The impact assessment follows the methodology as described in the EISA where the solar PV plant has a minimum design life of 25 years.

The activity is described in the EISA as follows:

- During the life of the Solar PV facility, there will be normal maintenance of all electrical and mechanical components of the plant. In addition, there will be periodic cleaning and washing of the solar PV modules. This PV module cleaning will be performed when required, and it is estimated to occur 2-4 times a year. The water consumption during operation - estimated water required per year during operation is 10,000 kilolitres (total per year for design life of plant)".
- The site will have temporary laydown areas and offices for the construction contractors. Electrical supply could include use of generators and fuel storage (potentially diesel and oil), A concrete batching plant may be required.
- Construction could include excavation of trenches to allow for cabling and connections, foundations of the solar PV array and inverter stations.
- The findings from the contaminated land assessment indicate that there are local areas of fill and/or ash and localised areas where metals and salts (sulfate) could leach to groundwater. The findings from the contaminated land report are appended in Appendix D. Except for manganese AH20 (PV Site A), BH10 (PV Site B) and BH04 (BESS B) as well as vanadium at AH21 (PV Site A), metals were below their respective SSV2[12]s. While these localised anomalies are noted, overall average concentrations of both manganese (~754 mg/kg) and vanadium (~124 mg/kg) were below their SSV2s for a formal residential setting. Therefore, in the wider context these are considered unlikely to represent a significant source of risk with respect to human health, especially when recognising that all were below their SSV2s relevant for the commercial/industrial land-use of the proposed development areas. Soils are therefore largely not considered to represent a significant source of risk with respect to human health and/or aquatic systems when specifically considering the end-use of the areas of concern. Contaminated groundwater from the Ashing Area has been shown to extend to the north towards the Koringspruit with additional local impacts from the coal stockyard and surrounding areas.
- There is an existing groundwater plume from the adjacent Ashing area and seeps to the adjacent wetland are impacted by surface runoff from the Ash dams located near PC Site A. No 4-coal seam is anticipated to be mined some 20 – 100m below the surface. The risk to these workings from the existing plume is outside this scope of work.

The main impacts considered are in terms of groundwater quality and quantity.

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[12] SSV: Soil screening values where SSV1 (not land specific) represents the lowest value calculated for each parameter from both the human health and water resource protection pathways and SSV2 represents the land-use specific soil concentration and are appropriate for screening level site assessment in cases where protection of water resources is not an applicable pathway for consideration. SSV2s relevant for formal residential use were conservatively adopted to ascertain whether soil contamination may represent a potential health risk in recognition of the proximity to Komati town.

Quality impacts could result from:

- Hydrocarbons associated with heavy moving equipment during site preparation and construction.
- Site equipment including transformers, solar PV modules, inverters, excavators, graders, trucks, compacting equipment and construction material etc.
- Fuel storage areas (diesel and oil for example).
- Existing contaminated footprint where washing of the panels could result in an increased leaching of contamination to the groundwater.
- The following parameters were noted as needing to be considered for the new activity: arsenic, cadmium, chromium, iron, lead, mercury, nickel, selenium, manganese, and zinc from the ash and coal storage areas; polychlorinated biphenyls, polycyclic aromatic hydrocarbon, BTEX (benzene, toluene, ethyl benzene, xylene), and other petroleum hydrocarbons from oil storage and mechanical and electrical equipment; and copper, iron, nickel, chromium, and zinc from metal cleaning and cooling tower blowdown wastewaters

Quantity impacts could result from:

- Reduced recharge as solar panels and an increased compacted/hard standing footprint will reduce the extent that rainfall can infiltrate to ground and recharge the aquifer.
- Localised ad hoc artificial recharge from water used to wash the panels and/or footprint areas.

It is noted that there is no groundwater abstraction planned for this activity.

The main receptors are community boreholes located in the surrounding farms and rivers both in terms of the aquatic ecology and as potential pathway of contaminated water downstream.

8 GEOHYDROLOGICAL IMPACTS

The impact assessment follows the methodology provided for the Scope of Works and assesses the potential significance of the impact pre- and post-mitigation for the following:

- Magnitude (M)
- Extent (E)
- Reversibility (R)
- Probability (P) and
- Duration (D)

8.1 CONSTRUCTION PHASE

There are no groundwater quantity impacts identified during construction as water will not be obtained from the groundwater resource.

Quality impacts are assessed in the tabulated assessment below.

The following mitigation and management are recommended to manage the potential impacts:

- The aquifers within the proposed areas are limited and there are no groundwater users within the KPS boundary. A reduction in recharge will therefore have a limited impact on receptors in the area. However, groundwater is generally impacted (quality) by sources within the KPS, limiting the infiltration of rain through contaminated soils, particularly in the coal stock yard area which has been identified as a potential source, would reduce the leachate of contamination to the groundwater. This is therefore likely to result in a net positive benefit to the groundwater.

- The low k and low recharge will limit the migration of contamination to receptors.
- All equipment that has the potential to leach contamination to the environment should be stored on hard standing and in a bunded area (e.g., Fuel storage, soaps, greases, transformers etc.).
- Vehicles should be routinely inspected, and maintenance carried out to reduce likelihood of spillages.
- Transfer of fuels and parking of vehicles should be on hard standing.
- Spill kits should be used to clean up spills when they occur.
- Ensure appropriate management of excavations especially where these are required within areas proximal to residential dwellings of Komati.
- Spoil recovered from trenches in the areas where contamination has been identified should be assessed and the spoil disposed in an appropriate manner.

Impact number	Aspect	Description	Character	Ease of mitigation	Pre mitigation							Post Mitigation						
					M	E	R	D	P	S	Significance	M	E	R	D	P	S	Significance
1	Hydrocarbon spills from moving equipment	Decrease in groundwater quality	-ve	Moderate	2	1	3	2	3	24	N2 - Low	1	1	3	1	2	12	N1
2	Leachate/spills from fuel storage areas	Decrease in groundwater quality	-ve	Moderate	2	1	3	2	3	24	N2 - Low	1	1	3	1	2	12	N1
3	Spoil from excavated trenches may be contaminated and could leach to the groundwater.	Decrease in groundwater quality	-ve	Moderate	2	1	3	2	3	24	N2 - Low	1	1	3	1	2	12	N1

8.2 OPERATIONAL PHASE

There are no groundwater quantity impacts identified during operation as water will not be obtained from the groundwater resource.

The following mitigation and management are recommended to manage the potential impacts:

- The aquifers within the proposed areas are limited and there are no groundwater users within the KPS boundary. A reduction in recharge will therefore have a limited impact on receptors in the area. However, groundwater is generally impacted (quality) by sources within the KPS, limiting the infiltration of rain through contaminated soils, particularly in the coal stock yard area which has been identified as a potential source, would reduce the leachate of contamination to the groundwater. This is therefore likely to result in a net positive benefit to the groundwater.
- The low k and low recharge will limit the migration of contamination to receptors.
- All equipment that has the potential to leach contamination to the environment should be stored on hard standing and in a bunded area (e.g., Fuel storage, soaps, greases, transformers etc.).
- Surface water controls to capture and contain wash water for re-use/management will reduce the impact to groundwater.
- The potential for leachate from contaminated footprints where panels are washed is likely to be limited given the low k and low recharge. However, site monitoring to monitor existing plumes from historical operations should continue as required by the site WUL.

Quantity impacts are assessed as follows:

Impact number	Receptor	Description	Character	Ease of mitigation	Pre mitigation							Post Mitigation						
					M	E	R	D	P	S	Significance	M	E	R	D	P	S	Significance
1	Groundwater	Reduced recharge due to increase in hardstanding footprint	-ve	Moderate	3	1	3	4	3	33	N2 - Low	2	1	3	4	2	20	N2- low
2	Groundwater & Rivers	Localised artificial recharge due to washing of solar panels	-ve	Moderate	2	1	3	4	3	30	N2 - Low	1	1	3	1	2	12	N1 – very low

Quality impacts are assessed as follows:

Impact number	Receptor	Description	Character	Ease of mitigation	Pre mitigation							Post Mitigation						
					M	E	R	D	P	S	Significance	M	E	R	D	P	S	Significance
3	Groundwater	Reduced leachate from contaminated soils	+ve	Moderate	2	1	4	4	3	33	P3 - moderate	2	1	5	4	3	36	P3 - moderate
4	Groundwater & Rivers	Localised leachate from equipment	-ve	Moderate	3	1	5	4	3	39	N3 - Moderate	2	1	4	4	2	22	N2 - Low
5	Groundwater & Rivers	Localised increased leachate from contaminated soils due to following washing of solar panels	-ve	Moderate	3	1	5	4	3	39	N3 - Moderate	2	1	4	4	2	22	N2 - Low

8.3 DECOMMISSIONING PHASE

There are no quantity impacts identified during decommissioning. The quality impacts are anticipated to be similar to that envisaged during construction.

Impact number	Aspect	Description	Character	Ease of mitigation	Pre mitigation							Post Mitigation						
					M	E	R	D	P	S	Significance	M	E	R	D	P	S	Significance
1	Hydrocarbon spills from moving equipment	Decrease in groundwater quality	-ve	Moderate	2	1	3	2	3	24	N2 - Low	1	1	3	1	2	12	N1
2	Leachate from equipment no longer in use	Decrease in groundwater quality	-ve	Moderate	3	1	4	5	3	39	N2 - moderate	2	1	3	4	3	30	N2

The following mitigation and management are recommended to manage the potential impacts:

- The low k and low recharge will limit the migration of contamination to receptors.
- Vehicles should be routinely inspected, and maintenance carried out to reduce likelihood of spillages.
- Parking should be on hard standing.
- Spill kits should be used to clean up spills when they occur.
- Redundant equipment must be demolished and removed to an appropriate waste facility.
- Whilst footprint areas are considered contaminated in terms of Section 37(2) of the NEM: WA, it is WSP's considered opinion that that the demonstrated contamination specific to these areas "*does not present an immediate risk, but that measures are required to address the monitoring and management of that risk*". The areas in which concentrations were notably higher were however associated with the impacts from the Ashing area and around the coal stock yard where a remediation plan may be required. The PV and BESS areas are unlikely to require a specific remediation plan and monitoring, as is required by the existing WUL, should be sufficient. No further monitoring commitments are therefore recommended.

8.4 CUMULATIVE PHASE

Cumulative impacts are limited due to the low k and recharge. Monitoring and management as provided in the WUL should continue.

9 CONCLUSION AND RECOMMENDATIONS

The potential impacts from the PV and BESS activities are anticipated to be low to moderate and can be mitigated. A positive impact may be possible during operation where the activities could reduce the recharge through contaminated soils to groundwater.

Further monitoring requirements, other than the existing monitoring as provided by the WUL, has not been identified.

Appendix A

BOREHOLE LOGS

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BOREHOLE LOG

Hole No. **BH01**	Project: Komati Solar PV & BESS ESIA	Sheet: 1 of 1
Job No: 41103965	Client: Eskom Holdings SOC Limited	Date: 02-06-22

Contractor / Driller	Method/Plant Used	Logged By	Co-Ordinates (DEC)	Ground Level (m AOD)
Soil & Groundwater Remediation Services	Air Percussion	R. Netshirembe	E 29.471 N -26.085	1598.742

SAMPLES & TESTS

Depth	Type	Test Result	PID (ppmV)	HSV (kN/m2)	P.Pen (kN/m2)	Water
			<0.1 <0.1			
1.50	ES		<0.1			
			<0.1 <0.1 <0.1 <0.1 <0.1			
			<0.1			▼ 1 (7.00)
			<0.1			

STRATA

Elev. (mAOD)	Depth (Thick -ness)	Description	Legend	Geology	Install / Backfill Dia. 50 mm
1597.74	(1.00) 1.00	Moist orange-brown clayey SAND [Probable Weathered VRYHEID FORMATION].		VF	
1591.74	(6.00) 7.00	Wet black slightly gravelly clayey SAND. Gravel is subangular to subrounded fine to coarse coal [Probable Weathered VRYHEID FORMATION].		VF	
1588.74	(3.00) 10.00	Wet pale brown mottled black clayey SAND [Probable Weathered VRYHEID FORMATION].		VF	
		End of Exploratory Hole		END	

Boring Progress

Date	Time	Depth	Casing Dpt	Dia. (mm)	Water Dpt

Water Strikes

Date	Time	Strike	Minutes	Standing	Casing
		7.00			

Chiselling

From	To	Hours	Tool

Water Added

From	To

General Remarks
1. Seepage at 7m bgl.

Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and

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BOREHOLE LOG

Hole No.		BH02
Project	Komati Solar PV & BESS ESIA	
Sheet	1 of 1	
Job No	41103965	
Client	Eskom Holdings SOC Limited	
Date	02-06-22	

Contractor / Driller	Method/Plant Used	Logged By	Co-Ordinates (DEC)	Ground Level (m AOD)
Soil & Groundwater Remediation Services	Air Percussion	R. Netshirembe	E 29.471 N -26.087	1601.869

SAMPLES & TESTS

Depth	Type	Test Result	PID (ppmV)	HSV (kN/m2)	P.Pen (kN/m2)	Water
			<0.1			
1.00	ES		<0.1			
			<0.1			
			<0.1			
			<0.1			
			<0.1			
			<0.1			
			<0.1			
			<0.1			
			<0.1			1 ▼
			<0.1			
			<0.1			

STRATA

Elev. (mAOD)	Depth (Thick -ness)	Description	Legend	Geology	Install / Backfill Dia. 50 mm
1600.37	(1.50) 1.50	MADE GROUND: Moist black GRAVEL of subangular to subrounded fine to coarse coal.		MG	
1599.37	(1.00) 2.50	Moist orange-brown mottled black clayey SAND [Probable Weathered VRYHEID FORMATION].		VF	
1596.87	(2.50) 5.00	Moist orange-brown clayey SAND [Probable Weathered VRYHEID FORMATION].		VF	
1592.87	(4.00) 9.00	Moist pale brown silty SAND [Probable Weathered VRYHEID FORMATION].		VF	
1591.87	(1.00) 10.00	Moist grey to black silty SAND [Probable Weathered VRYHEID FORMATION].		VF	
		End of Exploratory Hole		END	

Boring Progress

Date	Time	Depth	Casing Dpt	Dia. (mm)	Water Dpt

Water Strikes

Date	Time	Strike	Minutes	Standing	Casing
		8.00			

Chiselling

From	To	Hours	Tool

Water Added

From	To

General Remarks
1. Seepage at 8m bgl.

Scale 1:68.75

Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and

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BOREHOLE LOG

Hole No.		**BH03**
Project	Komati Solar PV & BESS ESIA	
Sheet		1 of 1
Job No	41103965	
Client	Eskom Holdings SOC Limited	
Date		02-06-22

Contractor / Driller	Method/Plant Used	Logged By	Co-Ordinates (DEC)	Ground Level (m AOD)
Soil & Groundwater Remediation Services	Air Percussion	R. Netshirembe	E 29.477 N -26.092	1607.060

SAMPLES & TESTS

Depth	Type	Test Result	PID (ppmV)	HSV (kN/m2)	P.Pen (kN/m2)	Water
			<0.1			
			<0.1			
1.50	ES		<0.1			
			<0.1			
			<0.1			
			<0.1			
			<0.1			
			<0.1			
			<0.1			
			<0.1			▼1
			<0.1			
			<0.1			

STRATA

Elev. (mAOD)	Depth (Thick -ness)	Description	Legend	Geology	Install / Backfill Dia. 50 mm
1606.56	0.50	MADE GROUND: Moist brown SAND.		MG	
1605.06	(1.50) 2.00	Moist orange-brown clayey SAND [Probable Weathered VRYHEID FORMATION].		VF	
1602.06	(3.00) 5.00	Moist pale orange silty SAND [Probable Weathered VRYHEID FORMATION].		VF	
1597.06	(5.00) 10.00	Moist light brown silty SAND [Probable Weathered VRYHEID FORMATION].		VF	
		End of Exploratory Hole		END	

Boring Progress

Date	Time	Depth	Casing Dpt	Dia. (mm)	Water Dpt

Water Strikes

Date	Time	Strike	Minutes	Standing	Casing
		8.00			

Chiselling

From	To	Hours	Tool

Water Added

From	To

General Remarks

Scale 1:93.75

Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and

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BOREHOLE LOG

Hole No. **BH04**		
Project	Komati Solar PV & BESS ESIA	Sheet 1 of 1
Job No 41103965	Client Eskom Holdings SOC Limited	Date 01-06-22

Contractor / Driller	Method/Plant Used	Logged By	Co-Ordinates (DEC)	Ground Level (m AOD)
Soil & Groundwater Remediation Services	Air Percussion	R. Netshirembe	E 29.467 N -26.092	1605.338

SAMPLES & TESTS							STRATA					Install / Backfill
Depth	Type	Test Result	PID (ppmV)	HSV (kN/m2)	P.Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thick -ness)	Description	Legend	Geology	Dia. 50 mm
							1604.84	0.50	Moist (firm) red-brown sandy CLAY [Probable Weathered VRYHEID FORMATION].		VF	
			<0.1						Moist becoming wet red mottled brown clayey SAND [Probable Weathered VRYHEID FORMATION].			
1.00	ES		<0.1									
						▼ 1						
			<0.1									
			<0.1									
			<0.1					(5.50)			VF	
			<0.1									
			<0.1									
							1599.34	6.00				
			<0.1						End of Exploratory Hole		END	

Boring Progress					
Date	Time	Depth	Casing Dpt	Dia. (mm)	Water Dpt

Water Strikes					
Date	Time	Strike	Minutes	Standing	Casing
		1.50			

Chiselling				Water Added	
From	To	Hours	Tool	From	To

General Remarks

Scale 1:93.75

Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and

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BOREHOLE LOG

Hole No.	**BH05**
Project	Komati Solar PV & BESS ESIA
Sheet	1 of 1
Job No	41103965
Client	Eskom Holdings SOC Limited
Date	31-05-22

Contractor / Driller	Method/Plant Used	Logged By	Co-Ordinates (DEC)	Ground Level (m AOD)
Soil & Groundwater Remediation Services	Air Percussion	R. Netshirembe	E 29.480 N -26.098	1618.645

SAMPLES & TESTS

Depth	Type	Test Result	PID (ppmV)	HSV (kN/m2)	P.Pen (kN/m2)	Water
			<0.1			
			<0.1			
1.50	ES		<0.1			
			<0.1			
			<0.1			
			<0.1			1 ▼
			<0.1			
			<0.1			
			<0.1			
			<0.1			
			<0.1			
			<0.1			

STRATA

Elev. (mAOD)	Depth (Thick -ness)	Description	Legend	Geology	Install / Backfill Dia. 50 mm
1618.15	0.50	MADE GROUND: Moist grey ASH.		MG	
1617.15	(1.00) 1.50	MADE GROUND: Red brown and grey sandy GRAVEL of angular to subrounded fine to coarse brick and concrete.		MG	
1614.65	(2.50) 4.00	Moist red to brown clayey SAND with frequent weathered ferricrete nodules [Probable Weathered VRYHEID FORMATION].		VF	
1608.65	(6.00) 10.00	Wet brown clayey SAND [Probable Weathered VRYHEID FORMATION].		VF	
		End of Exploratory Hole		END	

Boring Progress

Date	Time	Depth	Casing Dpt	Dia. (mm)	Water Dpt

Water Strikes

Date	Time	Strike	Minutes	Standing	Casing
		4.00			

Chiselling

From	To	Hours	Tool

Water Added

From	To

General Remarks

1. Hole collapsed from 6 - 10 m bgl.

Scale 1:93.75

Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and

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	Project Komati Solar PV & BESS ESIA	Sheet 1 of 1
Job No 41103965	Client Eskom Holdings SOC Limited	Date 31-05-22

Contractor / Driller	Method/Plant Used	Logged By	Co-Ordinates (DEC)	Ground Level (m AOD)
Soil & Groundwater Remediation Services	Air Percussion	R. Netshirembe	E 29.465 N -26.101	1625.457

SAMPLES & TESTS							Water	STRATA					Install / Backfill
Depth	Type	Test Result	PID (ppmV)	HSV (kN/m2)	P.Pen (kN/m2)			Elev. (mAOD)	Depth (Thickness)	Description	Legend	Geology	Dia. 50 mm
								1624.96	0.50	MADE GROUND: Moist grey ASH.		MG	
			<0.1										
			<0.1						(1.50)	Moist (firm to stiff) orange-brown sandy CLAY [Probable Weathered VRYHEID FORMATION].		VF	
1.50	ES		<0.1										
			<0.1					1623.46	2.00				
			<0.1						(2.00)	Moist red-brown clayey SAND with occasional ferricrete nodules [Probable Weathered VRYHEID FORMATION].		VF	
			<0.1				1	1621.46	4.00				
			<0.1							Wet pale brown silty SAND [Probable Weathered VRYHEID FORMATION].			
			<0.1										
			<0.1						(6.00)			VF	
			<0.1										
			<0.1										
			<0.1					1615.46	10.00	End of Exploratory Hole		END	

Boring Progress						Water Strikes					
Date	Time	Depth	Casing Dpt	Dia. (mm)	Water Dpt	Date	Time	Strike	Minutes	Standing	Casing
								4.00			

Chiselling				Water Added	
From	To	Hours	Tool	From	To

General Remarks

1. Seepage at 4m bgl.

Scale 1:62.75

Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and

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	Project Komati Solar PV & BESS ESIA	Sheet 1 of 1
Job No 41103965	Client Eskom Holdings SOC Limited	Date 01-06-22

Contractor / Driller	Method/Plant Used	Logged By	Co-Ordinates (DEC)	Ground Level (m AOD)
Soil & Groundwater Remediation Services	Air Percussion	R. Netshirembe	E 29.457 N -26.102	1630.761

SAMPLES & TESTS						Water	STRATA					Install / Backfill
Depth	Type	Test Result	PID (ppmV)	HSV (kN/m2)	P.Pen (kN/m2)		Elev. (mAOD)	Depth (Thickness)	Description	Legend	Geology	Dia. 50 mm
			<0.1					(1.00)	Moist dark brown clayey SAND [Probable Weathered VRYHEID FORMATION].		VF	
			<0.1				1629.76	1.00				
			<0.1					(1.00)	Moist light brown clayey SAND [Probable Weathered VRYHEID FORMATION].		VF	
2.00	ES		<0.1				1628.76	2.00				
			<0.1						Moist light brown silty SAND [Probable Weathered VRYHEID FORMATION].			
			<0.1									
			<0.1									
			<0.1					(8.00)			VF	
			<0.1									
			<0.1									
			<0.1									
			<0.1				1620.76	10.00	End of Exploratory Hole		END	

Boring Progress					
Date	Time	Depth	Casing Dpt	Dia. (mm)	Water Dpt

Water Strikes					
Date	Time	Strike	Minutes	Standing	Casing

Chiselling				Water Added	
From	To	Hours	Tool	From	To

General Remarks

1. Groundwater not encountered.

Scale 1:93.75

Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and

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BOREHOLE LOG

Hole No. **BH08**	Project Komati Solar PV & BESS ESIA	Sheet 1 of 1
Job No 41103965	Client Eskom Holdings SOC Limited	Date 01-06-22

Contractor / Driller	Method/Plant Used	Logged By	Co-Ordinates (DEC)	Ground Level (m AOD)
Soil & Groundwater Remediation Services	Air Percussion	R. Netshirembe	E 29.470 N -26.111	1650.798

SAMPLES & TESTS

Depth	Type	Test Result	PID (ppmV)	HSV (kN/m2)	P.Pen (kN/m2)	Water
			<0.1			
1.00	ES		<0.1			
			<0.1			
			<0.1			
			<0.1			
			<0.1			
			<0.1			
			<0.1			
			<0.1			
			<0.1			
			<0.1			
			<0.1			

STRATA

Elev. (mAOD)	Depth (Thick -ness)	Description	Legend	Geology	Install / Backfill Dia. 50 mm
1649.80	(1.00) 1.00	Moist dark brown clayey SAND [Probable Weathered VRYHEID FORMATION].		VF	
1648.80	(1.00) 2.00	Moist light brown clayey SAND [Probable Weathered VRYHEID FORMATION].		VF	
1640.80	(8.00) 10.00	Moist light brown silty SAND [Probable Weathered VRYHEID FORMATION].		VF	
		End of Exploratory Hole		END	

Boring Progress

Date	Time	Depth	Casing Dpt	Dia. (mm)	Water Dpt

Water Strikes

Date	Time	Strike	Minutes	Standing	Casing

Chiselling

From	To	Hours	Tool

Water Added

From	To

General Remarks
1. Groundwater not encountered.

Scale 1:93.75

Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and

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BOREHOLE LOG

Hole No.		**BH09**
Project	Komati Solar PV & BESS ESIA	Sheet: 1 of 1
Job No: 41103965	Client: Eskom Holdings SOC Limited	Date: 31-05-22

Contractor / Driller	Method/Plant Used	Logged By	Co-Ordinates (DEC)	Ground Level (m AOD)
Soil & Groundwater Remediation Services	Air Percussion	R. Netshirembe	E 29.450 N -26.095	1611.041

SAMPLES & TESTS

Depth	Type	Test Result	PID (ppmV)	HSV (kN/m2)	P.Pen (kN/m2)	Water
			<0.1			
			<0.1			
1.50	ES		<0.1			
			<0.1			
			<0.1			
			<0.1			
			<0.1			
			<0.1			
			<0.1			1 ▼
			<0.1			
			<0.1			
			<0.1			

STRATA

Elev. (mAOD)	Depth (Thickness)	Description	Legend	Geology	Install / Backfill Dia. 50 mm
1610.54	0.50	MADE GROUND: Moist (firm) dark brown gravelly CLAY. Gravel is angular to subangular fine to coarse weathered shale [Suspected Reworked/Transported Natural Material].		MG	
1609.04	(1.50) 2.00	Moist (firm) light orange to brown sandy CLAY with occasional ferricrete nodules [Probable Weathered VRYHEID FORMATION].		VF	
1607.04	(2.00) 4.00	Moist (firm) light orange sandy CLAY [Probable Weathered VRYHEID FORMATION].		VF	
1601.04	(6.00) 10.00	Moist becoming wet light brown clayey SAND [Probable Weathered VRYHEID FORMATION].		VF	
		End of Exploratory Hole		END	

Boring Progress

Date	Time	Depth	Casing Dpt	Dia. (mm)	Water Dpt

Water Strikes

Date	Time	Strike	Minutes	Standing	Casing
		7.00			

Chiselling

From	To	Hours	Tool

Water Added

From	To

General Remarks

Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and

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BOREHOLE LOG

Hole No.	**BH10**
Project	Komati Solar PV & BESS ESIA
Sheet	1 of 1
Job No	41103965
Client	Eskom Holdings SOC Limited
Date	30-05-22

Contractor / Driller	Method/Plant Used	Logged By	Co-Ordinates (DEC)	Ground Level (m AOD)
Soil & Groundwater Remediation Services	Air Percussion	R. Netshirembe	E 29.456 N -26.092	1602.403

SAMPLES & TESTS

Depth	Type	Test Result	PID (ppmV)	HSV (kN/m2)	P.Pen (kN/m2)	Water
			<0.1			
			<0.1			
1.50	ES		<0.1			
			<0.1			1
			<0.1			
			<0.1			
			<0.1			
			<0.1			
			<0.1			
			<0.1			
			<0.1			
			<0.1			

STRATA

Elev. (mAOD)	Depth (Thickness)	Description	Legend	Geology	Install / Backfill Dia. 50 mm
1601.90	0.50	MADE GROUND: Moist (firm) dark brown gravelly CLAY. Gravel is angular to subangular fine to coarse weathered shale [Suspected Reworked/Transported Natural Material].		MG	
1600.40	(1.50) 2.00	Moist (firm) light orange to brown sandy CLAY with occasional ferricrete nodules [Probable Weathered VRYHEID FORMATION].		VF	
1598.40	(2.00) 4.00	Moist (firm) light orange sandy CLAY [Probable Weathered VRYHEID FORMATION].		VF	
1592.40	(6.00) 10.00	Moist light brown clayey SAND [Probable Weathered VRYHEID FORMATION].		VF	
		End of Exploratory Hole		END	

Boring Progress

Date	Time	Depth	Casing Dpt	Dia. (mm)	Water Dpt

Water Strikes

Date	Time	Strike	Minutes	Standing	Casing
		2.00			

Chiselling

From	To	Hours	Tool

Water Added

From	To

General Remarks
1. Seepage at 2m bgl.

Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and

Appendix B

WATER QUALITY DATA (ESKOM DATABASE)

Statistical Water Quality obtained from Eskom database.

Site Name	Unit	WUL	SANS 241-2015	Ambient Water Quality				PV Site A												Coal Stockyard			BESS C	
				AB58		AB59		AB01		AB63		AC02		AB53		AB07		CB51		CB09	PB60	
				Ave	95th	Ave	95th	Ave	95th	Ave	95th	Ave	95th	Ave	95th	Ave	95th	Ave	95th		Ave	95th
Analyses				Oct-11 to Jan-22		Oct-11 to Jan-22		Aug-11 to May-21		Oct-11 to Jan-22		Jan -11 to Sep-18		Oct-11 to Jan-22		Oct-11 to Jan-22		Oct-11 to May-20		Jan-11	Oct-11 to Jan-14	
pH	pH units	6.6	5.5-9.7	8,3	9,1	8,3	8,8	7,7	8,5	7,8	8,9	7,7	8,4	8,0	8,5	7,2	8,3	8,0	8,7	7,0	7,8	8,6
EC	mS/m	112	≤170 ^{AS}	32	44	17	29	214	275	102	223	112	140	38	45	192	248	89	143	43	107	169
TDS	mg/l	NLG	≤1 200 ^{AS}	214	290	107	189	1680	2055	706	1597	491	606	242	302	1570	2204	715	1124		819	1167
Turbidity	NTU			67	254	3	5	128	249	93	338	2	2	78	125	79	254	176	700		348	492
Ca	mg/l	96	NLG	16	25	7	12	154	225	75	222	107	125	32	39	175	286	50	150	51	52	71
Mg	mg/l	38	NLG	23	41	6	14	126	180	49	137	7	14	16	19	115	140	59	113	16	37	52
Na	mg/l	0	≤200AS	17	22	15	17	214	266	89	198	117	135	18	21	146	163	66	88	19	150	245
K	mg/l	NLG	NLG	12	15	8	11	28	37	10	33	35	43	8	9	10	12	2	3	4	5	7
TAlk as $CaCO_3$	mg/l	NLG	NLG	165	253	75	126	480	823	197	484	100	136	112	141	169	210	197	383	156	315	484
F	mg/l	0.4	≤1.5 ^{CH}	0,3	0,4	0,1	0,3	3,1	0,6	1,5	1,0	0,3	0,4	0,9	0,5	2,5	0,6	0,3	0,7	0,7	0,1	0,5
Cl	mg/l	31	≤300 ^{AS}	7	11	7	10	106	189	58	137	60	79	55	80	69	83	45	82	22	50	79
SO4	mg/l	0	≤500 $^{A.}$ ≤250^{A}	8	21	2	8	669	999	293	940	403	497	5	15	852	1252	231	464	39	227	495
NO3-N	mgN/l	10.9	≤11^{A}	0,4	1,1	0,4	1,4	0,2	0,8	0,6	1,9	0,3	0,8	0,1	0,5	0,2	0,5	0,2	0,6	0,1	0,2	0,5
NH4-N	mgN/l	NLG	≤1.5 ^{AS}	0,4	1,9	0,9	1,1	0,1	0,2	0,2	0,9	<0,003	0,1	0,2	0,2	0,1	0,3	0,3	0,7		0,2	0,3
PO4	mgP/l	NLG	NLG	<0,01	0,03	<0,01	0,02	<0,01	0,02	0,46	0,10	0,003	0,10	<0,01	0,03	0,03	0,04	<0,01	0,03	0,10	<0,02	0,01
COD				16,5	51,7	16,9	55,4	23,7	70,2	26,9	79,7	31,0	59,7	12,4	31,3	28,8	69,6	34,0	71,8		29,5	52,1
Suspended Solids			<25	18,5	65,7	14,5	140,6	59,4	129,2	51,7	145,2	16,2	43,7	20,8	43,0	37,5	93,6	68,5	256,2		121,6	311,1

Site Name	**Unit**	**WUL**	**SANS 241-2015**	**Ambient Water Quality**				**PV Site A**										**Coal Stockyard**			**BESS C**	
				AB58		**AB59**		**AB01**		**AB63**		**AC02**		**AB53**		**AB07**		**CB51**		**CB09**	**PB60**	
				Ave	**95th**	**Ave**	**95th**	**Ave**	**95th**	**Ave**	**95th**	**Ave**	**95th**	**Ave**	**95th**	**Ave**	**95th**	**Ave**	**95th**		**Ave**	**95th**
Analyses				**Oct-11 to Jan-22**		**Oct-11 to Jan-22**		**Aug-11 to May-21**		**Oct-11 to Jan-22**		**Jan -11 to Sep-18**		**Oct-11 to Jan-22**		**Oct-11 to Jan-22**		**Oct-11 to May-20**		**Jan-11**	**Oct-11 to Jan-14**	
As	mg/l	NLG	≤0,01 ^{CH}	<0,03	<0,01	<0,03	<0,01	<0,04	<0,01	0,06	<0,01	1,60	3,04	<0,03	<0,01	<0,03	<0,01	<0,05	<0,01		<0,06	<0,01
Cr	mg/l	NLG	≤0,05 ^{CH}	<0,018	0,004	<0,018	0,004	<0,020	0,002	<0,003	0,010	0,109	0,588	<0,019	0,004	<0,015	0,006	<0,024	0,002	0,006	<0,020	0,005
Cr6+	mg/l	NLG		<0,198	<0,002	0,331	<0,002	3,331	14,999	3,616	0,031	<0,002	<0,002	1,903	<0,002	2,208	4,198	<0,002	<0,002		<0,002	<0,002
Cu	mg/l	NLG	≤2 ^{CH}	<0,01	0,01	<0,02	0,00	<0,02	0,03	<0,01	0,02	<0,11	0,01	<0,02	0,01	<0,01	0,03	<0,03	0,02	0,01	<0,03	0,01
Fe	mg/l	NLG	≤ 2 $^{CH.}$ 0,3^{AS}	0,16	0,01	0,01	0,12	0,35	0,01	0,51	2,07	<0,03	0,17	0,02	0,07	0,98	5,28	0,16	0,01	0,1	0,0	0,0
Al	mg/l	NLG	300 (o)	0,52	0,88	0,01	0,16	0,98	0,06	0,42	0,29	1,08	5,50	0,08	0,12	1,45	0,30	<0,04	0,003	0,020	<0,037	0,003
Pb	mg/l	NLG	≤0,01^{CH}	<0,004	<0,004	<0,004	<0,004	<0,004	<0,004	0,243	<0,004			<0,004	<0,004	<0,004	<0,004	<0,004	<0,004		<0,004	<0,004
Mn	mg/l	NLG	≤0,4^{CH} and ≤0,1^{AS}	0,1	0,5	9,2	0,1	21,3	0,6	2,4	4,2	0,1	0,7	2,4	0,2	5,3	6,7	13,8	3,2	0,1	6,901	0,832
Hg	mg/l	NLG	≤0,006^{CH}	<0,004	<0,004	<0,004	<0,004	<0,004	<0,004	<0,004	<0,004			<0,004	<0,004	<0,004	<0,004	<0,004	<0,004			
Zn	mg/l	NLG	≤5 ^{AS}	<0,027	0,012	<0,029	0,006	0,4	2,0	0,1	0,02	<0,3	<0,03	<0,03	<0,0002	0,7	1,8	<0,1	<0,002		<0,052	0,009
Si	mg/l	NLG	NLG	5,0	10,6	0,1	0,3	7,7	11,3	5,6	20,7	2,6	2,6	1,7	2,3	17,7	23,1	1,5	4,7		4,8	6,9

NLG: no guideline

H: Health

CH: Chronic health

A: Aesthetic

O= Operational

Appendix C

LABORTORY CERTIFICATES, BOREHOLES SAMPLED IN 2022

Element Materials Technology
Unit D2 & D5
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South Africa
W: www.element.com

WSP Group Africa
Building C, Knightsbridge
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Bryanston
Johannesburg
Gauteng
South Africa
2191

Testing Laboratory
T0729

Attention :	Sarah Skinner
Date :	29th June, 2022
Your reference :	41103965
Our reference :	Test Report 22/556 Batch 1
Location :	Eskom Komati Power Station (ESIA and WULA
Date samples received :	10th June, 2022
Status :	Final report
Issue :	1

Eleven samples were received for analysis on 10th June, 2022 of which eleven were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Analysis was undertaken at either Element Materials Technology UK, which is ISO 17025 accredited under UKAS (4225) or Element Materials Technology (SA) which is ISO 17025 accredited under SANAS (T0729) or a subcontract laboratory where specified.

NOTE: Under International Laboratory Accreditation Cooperation (ILAC), ISO 17025 (UKAS) accreditation is recognised as equivalent to SANAS (South Africa) accreditation.

Authorised By:	**Organics Laboratory:**	**Inorganics Laboratory:**
Debbie van Wyk	**Greg Ondrejkovic** **Technical Supervisor**	**Greg Ondrejkovic** **Technical Supervisor**

Client Name: WSP Group Africa
Reference: 41103965
Location: Eskom Komati Power Station (ESIA and WULA project)
Contact: Sarah Skinner
EMT Job No: 22/556

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
H=H_2SO_4, Z=ZnAc, N=NaOH, HN=$HN0_3$

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	1-9	10-14	15-21	22-28	29-35	36-42	43-49	50-56	57-63	64-70			
Sample ID	BH 1	BH 2	BH 3	BH 4	BH 5	BH 6	BH 7	BH 8	BH 9	BH 10			
Depth													
COC No / misc													
Containers	V HN P G	V P G	V HN P G	V HN P G	V HN P G	V HN P G	V HN P G	V HN P G	V HN P G	V HN P G			
Sample Date	07/06/2022	07/06/2022	07/06/2022	07/06/2022	07/06/2022	07/06/2022	07/06/2022	07/06/2022	07/06/2022	07/06/2022			
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water			
Batch Number	1	1	1	1	1	1	1	1	1	1	LOD/LOR	Units	Method No.
Date of Receipt	10/06/2022	10/06/2022	10/06/2022	10/06/2022	10/06/2022	10/06/2022	10/06/2022	10/06/2022	10/06/2022	10/06/2022			
Dissolved Antimony*	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	UK_TM170/UK_PM14
Dissolved Arsenic*	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	ug/l	UK_TM170/UK_PM14
Dissolved Cadmium*	<0.03	<0.03	<0.03	<0.03	0.04	0.03	<0.03	0.04	<0.03	<0.03	<0.03	ug/l	UK_TM170/UK_PM14
Total Dissolved Chromium*	<0.2	4.3	<0.2	1.4	0.4	<0.2	<0.2	0.2	0.3	<0.2	<0.2	ug/l	UK_TM170/UK_PM14
Dissolved Cobalt*	12.2	25.6	11.1	4.6	4.6	6.6	0.2	0.5	0.7	<0.1	<0.1	ug/l	UK_TM170/UK_PM14
Dissolved Copper*	<1	2	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	UK_TM170/UK_PM14
Total Dissolved Iron*	292.0	1692.1$_{AB}$	164.4	492.9	12.6	25.6	11.2	7.9	43.9	9.9	<4.7	ug/l	UK_TM170/UK_PM14
Dissolved Lead*	1.5	2.1	4.6	1.6	7.8	12.8	38.1	33.0	28.3	2.7	<0.4	ug/l	UK_TM170/UK_PM14
Dissolved Manganese*	3269.5$_{AB}$	1241.8$_{AB}$	1718.3$_{AB}$	114.8	809.5	496.8	15.7	68.8	18.3	6.8	<1.5	ug/l	UK_TM170/UK_PM14
Dissolved Mercury*	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	UK_TM170/UK_PM14
Dissolved Nickel*	4.7	8.2	12.8	6.3	5.5	7.0	4.5	23.6	1.7	3.2	<0.2	ug/l	UK_TM170/UK_PM14
Dissolved Selenium*	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	ug/l	UK_TM170/UK_PM14
Dissolved Vanadium*	<0.6	4.8	1.0	1.5	1.1	<0.6	<0.6	<0.6	2.2	1.5	<0.6	ug/l	UK_TM170/UK_PM14
Dissolved Zinc*	16.2	30.7	37.9	29.4	37.8	46.4	34.5	59.0	32.4	24.5	<1.5	ug/l	UK_TM170/UK_PM14
Dissolved Calcium ^{SA}	73.1	27.7	141.0	11.0	46.3	42.4	13.6	83.0	17.0	8.0	<0.3	mg/l	SA_TM27/SA_PM0
Dissolved Magnesium ^{SA}	50.0	22.5	125.4$_{AB}$	11.2	26.4	34.6	9.1	74.3	11.2	5.0	<0.2	mg/l	SA_TM27/SA_PM0
Dissolved Potassium ^{SA}	4.2	7.0	6.2	3.6	11.2	6.9	7.9	18.5	3.2	2.3	<0.1	mg/l	SA_TM27/SA_PM0
Dissolved Sodium ^{SA}	71.6	85.8	136.4	15.2	82.6	44.2	26.3	48.4	46.5	25.6	<0.1	mg/l	SA_TM27/SA_PM0
Dissolved Silicon*	21309$_{AB}$	28801$_{AB}$	19617$_{AB}$	10607$_{AB}$	8902	9616	6005	9986	23415$_{AB}$	9350	<100	ug/l	UK_TM30/UK_PM14

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Client Name: WSP Group Africa
Reference: 41103965
Location: Eskom Komati Power Station (ESIA and WULA project)
Contact: Sarah Skinner
EMT Job No: 22/556

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
H=H_2SO_4, Z=ZnAc, N=NaOH, HN=$HN0_3$

Please see attached notes for all abbreviations and acronyms

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Sample ID	BH 1	BH 2	BH 3	BH 4	BH 5	BH 6	BH 7	BH 8	BH 9	BH 10			
Depth													
COC No / misc													
Containers	V HN P G	V P G	V HN P G	V HN P G	V HN P G	V HN P G	V HN P G	V HN P G	V HN P G	V HN P G			
Sample Date	07/06/2022	07/06/2022	07/06/2022	07/06/2022	07/06/2022	07/06/2022	07/06/2022	07/06/2022	07/06/2022	07/06/2022			
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water			
Batch Number	1	1	1	1	1	1	1	1	1	1	LOD/LOR	Units	Method No.
Date of Receipt	10/06/2022	10/06/2022	10/06/2022	10/06/2022	10/06/2022	10/06/2022	10/06/2022	10/06/2022	10/06/2022	10/06/2022			
VOC MS													
Dichlorodifluoromethane	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	SA_TM15/SA_PM10
Methyl Tertiary Butyl Ether	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	ug/l	SA_TM15/SA_PM10
Chloromethane ^{SA}	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	SA_TM15/SA_PM10
Vinyl Chloride	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	ug/l	SA_TM15/SA_PM10
Bromomethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	SA_TM15/SA_PM10
Chloroethane ^{SA}	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	SA_TM15/SA_PM10
Trichlorofluoromethane ^{SA}	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	SA_TM15/SA_PM10
1,1-Dichloroethene (1,1 DCE) ^{SA}	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	SA_TM15/SA_PM10
Dichloromethane (DCM) ^{SA}	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/l	SA_TM15/SA_PM10
trans-1-2-Dichloroethene ^{SA}	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	SA_TM15/SA_PM10
1,1-Dichloroethane ^{SA}	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	SA_TM15/SA_PM10
cis-1-2-Dichloroethene ^{SA}	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	SA_TM15/SA_PM10
2,2-Dichloropropane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	SA_TM15/SA_PM10
Bromochloromethane ^{SA}	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	SA_TM15/SA_PM10
Chloroform ^{SA}	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	SA_TM15/SA_PM10
1,1,1-Trichloroethane ^{SA}	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	SA_TM15/SA_PM10
1,1-Dichloropropene ^{SA}	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	SA_TM15/SA_PM10
Carbon tetrachloride ^{SA}	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	SA_TM15/SA_PM10
1,2-Dichloroethane ^{SA}	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	SA_TM15/SA_PM10
Benzene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	SA_TM15/SA_PM10
Trichloroethene (TCE) ^{SA}	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	SA_TM15/SA_PM10
1,2-Dichloropropane ^{SA}	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	SA_TM15/SA_PM10
Dibromomethane ^{SA}	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	SA_TM15/SA_PM10
Bromodichloromethane ^{SA}	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	SA_TM15/SA_PM10
cis-1-3-Dichloropropene	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	SA_TM15/SA_PM10
Toluene ^{SA}	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/l	SA_TM15/SA_PM10
trans-1-3-Dichloropropene	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	SA_TM15/SA_PM10
1,1,2-Trichloroethane ^{SA}	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	SA_TM15/SA_PM10
Tetrachloroethene (PCE) ^{SA}	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	SA_TM15/SA_PM10
1,3-Dichloropropane ^{SA}	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	SA_TM15/SA_PM10
Dibromochloromethane ^{SA}	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	SA_TM15/SA_PM10
1,2-Dibromoethane ^{SA}	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	SA_TM15/SA_PM10
Chlorobenzene ^{SA}	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	SA_TM15/SA_PM10
1,1,1,2-Tetrachloroethane ^{SA}	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	SA_TM15/SA_PM10
Ethylbenzene ^{SA}	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	SA_TM15/SA_PM10
p/m-Xylene ^{SA}	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	SA_TM15/SA_PM10
o-Xylene ^{SA}	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	SA_TM15/SA_PM10
Styrene	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	SA_TM15/SA_PM10
Bromoform ^{SA}	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	SA_TM15/SA_PM10
Isopropylbenzene ^{SA}	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	SA_TM15/SA_PM10
1,1,2,2-Tetrachloroethane	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/l	SA_TM15/SA_PM10
Bromobenzene ^{SA}	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	SA_TM15/SA_PM10
1,2,3-Trichloropropane ^{SA}	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	SA_TM15/SA_PM10

Client Name: WSP Group Africa
Reference: 41103965
Location: Eskom Komati Power Station (ESIA and WULA project)
Contact: Sarah Skinner
EMT Job No: 22/556

Report : **Liquid**

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
H=H_2SO_4, Z=ZnAc, N=NaOH, HN=$HN0_3$

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	1-9	10-14	15-21	22-28	29-35	36-42	43-49	50-56	57-63	64-70			
Sample ID	BH 1	BH 2	BH 3	BH 4	BH 5	BH 6	BH 7	BH 8	BH 9	BH 10			
Depth													
COC No / misc													
Containers	V HN P G	V P G	V HN P G	V HN P G	V HN P G	V HN P G	V HN P G	V HN P G	V HN P G	V HN P G			
Sample Date	07/06/2022	07/06/2022	07/06/2022	07/06/2022	07/06/2022	07/06/2022	07/06/2022	07/06/2022	07/06/2022	07/06/2022			
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water			
Batch Number	1	1	1	1	1	1	1	1	1	1	LOD/LOR	Units	Method No.
Date of Receipt	10/06/2022	10/06/2022	10/06/2022	10/06/2022	10/06/2022	10/06/2022	10/06/2022	10/06/2022	10/06/2022	10/06/2022			
VOC MS Continued													
Propylbenzene ^{SA}	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	SA_TM15/SA_PM10
2-Chlorotoluene ^{SA}	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	SA_TM15/SA_PM10
1,3,5-Trimethylbenzene ^{SA}	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	SA_TM15/SA_PM10
4-Chlorotoluene ^{SA}	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	SA_TM15/SA_PM10
tert-Butylbenzene ^{SA}	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	SA_TM15/SA_PM10
1,2,4-Trimethylbenzene ^{SA}	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	SA_TM15/SA_PM10
sec-Butylbenzene ^{SA}	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	SA_TM15/SA_PM10
4-Isopropyltoluene ^{SA}	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	SA_TM15/SA_PM10
1,3-Dichlorobenzene ^{SA}	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	SA_TM15/SA_PM10
1,4-Dichlorobenzene ^{SA}	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	SA_TM15/SA_PM10
n-Butylbenzene ^{SA}	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	SA_TM15/SA_PM10
1,2-Dichlorobenzene ^{SA}	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	SA_TM15/SA_PM10
1,2-Dibromo-3-chloropropane	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	SA_TM15/SA_PM10
1,2,4-Trichlorobenzene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	SA_TM15/SA_PM10
Hexachlorobutadiene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	SA_TM15/SA_PM10
Naphthalene	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	SA_TM15/SA_PM10
1,2,3-Trichlorobenzene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	SA_TM15/SA_PM10
VOC TICs	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		None	SA_TM15/SA_PM10
SVOC MS													
Phenols													
2-Chlorophenol	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	SA_TM16/SA_PM30
2-Methylphenol	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	SA_TM16/SA_PM30
2-Nitrophenol	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	SA_TM16/SA_PM30
2,4-Dichlorophenol	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	SA_TM16/SA_PM30
2,4-Dimethylphenol	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	SA_TM16/SA_PM30
2,4,5-Trichlorophenol	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	SA_TM16/SA_PM30
2,4,6-Trichlorophenol	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	SA_TM16/SA_PM30
4-Chloro-3-methylphenol	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	SA_TM16/SA_PM30
4-Methylphenol	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	SA_TM16/SA_PM30
4-Nitrophenol	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	SA_TM16/SA_PM30
Pentachlorophenol	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	SA_TM16/SA_PM30
Phenol	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	SA_TM16/SA_PM30

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Client Name: WSP Group Africa
Reference: 41103965
Location: Eskom Komati Power Station (ESIA and WULA project)
Contact: Sarah Skinner
EMT Job No: 22/556

Report : **Liquid**

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
$H=H_2SO_4$, Z=ZnAc, N=NaOH, $HN=HN0_3$

EMT Sample No.	1-9	10-14	15-21	22-28	29-35	36-42	43-49	50-56	57-63	64-70			
Sample ID	BH 1	BH 2	BH 3	BH 4	BH 5	BH 6	BH 7	BH 8	BH 9	BH 10			
Depth													
COC No / misc													
Containers	V HN P G	V P G	V HN P G	V HN P G	V HN P G	V HN P G	V HN P G	V HN P G	V HN P G	V HN P G			
Sample Date	07/06/2022	07/06/2022	07/06/2022	07/06/2022	07/06/2022	07/06/2022	07/06/2022	07/06/2022	07/06/2022	07/06/2022			
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water			
Batch Number	1	1	1	1	1	1	1	1	1	1	LOD/LOR	Units	Method No.
Date of Receipt	10/06/2022	10/06/2022	10/06/2022	10/06/2022	10/06/2022	10/06/2022	10/06/2022	10/06/2022	10/06/2022	10/06/2022			
SVOC MS													
PAHs													
2-Chloronaphthalene ^{SA}	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	SA_TM16/SA_PM30
2-Methylnaphthalene ^{SA}	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	SA_TM16/SA_PM30
Naphthalene ^{SA}	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	SA_TM16/SA_PM30
Acenaphthylene ^{SA}	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	SA_TM16/SA_PM30
Acenaphthene ^{SA}	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	SA_TM16/SA_PM30
Fluorene ^{SA}	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	SA_TM16/SA_PM30
Phenanthrene ^{SA}	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	SA_TM16/SA_PM30
Anthracene ^{SA}	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	SA_TM16/SA_PM30
Fluoranthene ^{SA}	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	SA_TM16/SA_PM30
Pyrene ^{SA}	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	SA_TM16/SA_PM30
Benzo(a)anthracene ^{SA}	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	SA_TM16/SA_PM30
Chrysene ^{SA}	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	SA_TM16/SA_PM30
Benzo(b)fluoranthene ^{SA}	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	SA_TM16/SA_PM30
Benzo(k)fluoranthene ^{SA}	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	SA_TM16/SA_PM30
Benzo(a)pyrene ^{SA}	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	SA_TM16/SA_PM30
Indeno(123cd)pyrene ^{SA}	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	SA_TM16/SA_PM30
Dibenzo(ah)anthracene ^{SA}	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	SA_TM16/SA_PM30
Benzo(ghi)perylene ^{SA}	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	SA_TM16/SA_PM30
Phthalates													
Bis(2-ethylhexyl) phthalate ^{SA}	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/l	SA_TM16/SA_PM30
Butylbenzyl phthalate	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	SA_TM16/SA_PM30
Di-n-butyl phthalate ^{SA}	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	ug/l	SA_TM16/SA_PM30
Di-n-Octyl phthalate	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	SA_TM16/SA_PM30
Diethyl phthalate ^{SA}	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	SA_TM16/SA_PM30
Dimethyl phthalate ^{SA}	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	SA_TM16/SA_PM30

Please see attached notes for all abbreviations and acronyms

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: WSP Group Africa
Reference: 41103965
Location: Eskom Komati Power Station (ESIA and WULA project)
Contact: Sarah Skinner
EMT Job No: 22/556

Report : **Liquid**

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
H=H_2SO_4, Z=ZnAc, N=NaOH, HN=$HN0_3$

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	1-9	10-14	15-21	22-28	29-35	36-42	43-49	50-56	57-63	64-70	LOD/LOR	Units	Method No.
Sample ID	BH 1	BH 2	BH 3	BH 4	BH 5	BH 6	BH 7	BH 8	BH 9	BH 10			
Depth													
COC No / misc													
Containers	V HN P G	V P G	V HN P G	V HN P G	V HN P G	V HN P G	V HN P G	V HN P G	V HN P G	V HN P G			
Sample Date	07/06/2022	07/06/2022	07/06/2022	07/06/2022	07/06/2022	07/06/2022	07/06/2022	07/06/2022	07/06/2022	07/06/2022			
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	10/06/2022	10/06/2022	10/06/2022	10/06/2022	10/06/2022	10/06/2022	10/06/2022	10/06/2022	10/06/2022	10/06/2022			
SVOC MS													
Other SVOCs													
1,2-Dichlorobenzene ^{SA}	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	SA_TM16/SA_PM30
1,2,4-Trichlorobenzene ^{SA}	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	SA_TM16/SA_PM30
1,3-Dichlorobenzene ^{SA}	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	SA_TM16/SA_PM30
1,4-Dichlorobenzene ^{SA}	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	SA_TM16/SA_PM30
2-Nitroaniline	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	SA_TM16/SA_PM30
2,4-Dinitrotoluene ^{SA}	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	SA_TM16/SA_PM30
2,6-Dinitrotoluene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	SA_TM16/SA_PM30
3-Nitroaniline	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	SA_TM16/SA_PM30
4-Bromophenylphenylether ^{SA}	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	SA_TM16/SA_PM30
4-Chloroaniline	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	SA_TM16/SA_PM30
4-Chlorophenylphenylether ^{SA}	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	SA_TM16/SA_PM30
4-Nitroaniline	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	SA_TM16/SA_PM30
Azobenzene ^{SA}	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	SA_TM16/SA_PM30
Bis(2-chloroethoxy)methane ^{SA}	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	SA_TM16/SA_PM30
Bis(2-chloroethyl)ether ^{SA}	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	SA_TM16/SA_PM30
Carbazole ^{SA}	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	SA_TM16/SA_PM30
Dibenzofuran ^{SA}	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	SA_TM16/SA_PM30
Hexachlorobenzene ^{SA}	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	SA_TM16/SA_PM30
Hexachlorobutadiene ^{SA}	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	SA_TM16/SA_PM30
Hexachlorocyclopentadiene ^{SA}	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	SA_TM16/SA_PM30
Hexachloroethane ^{SA}	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	SA_TM16/SA_PM30
Isophorone ^{SA}	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	SA_TM16/SA_PM30
N-nitrosodi-n-propylamine ^{SA}	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	SA_TM16/SA_PM30
Nitrobenzene ^{SA}	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	SA_TM16/SA_PM30
SVOC TICs	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		None	SA_TM16/SA_PM30
TPH CWG													
Aliphatics													
C7-C9	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	SA_TM36/SA_PM12
C10-C14	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	SA_TM5/SA_PM16/PM30
C15-C36	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	SA_TM5/SA_PM16/PM30
Total aliphatics C7-C36	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	SA_TM5/TM36/SA_PM12/PM16/PM30
PCBs (Total vs Aroclor 1254)	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	ug/l	SA_TM17/SA_PM30
Fluoride ^{SA}	0.4	<0.3	0.3	<0.3	<0.3	<0.3	<0.3	<0.3	0.3	<0.3	<0.3	mg/l	SA_TM27/SA_PM0
Chloride ^{SA}	32.1	22.1	73.9	53.0	67.6	19.0	29.7	25.6	3.4	11.7	<0.3	mg/l	SA_TM27/SA_PM0
Sulphate ^{SA}	133.1	183.6$_{AA}$	983.1$_{AB}$	5.4	213.0$_{AA}$	234.8$_{AA}$	67.3	446.0$_{AB}$	51.1	55.4	<0.5	mg/l	SA_TM27/SA_PM0
Nitrate as N ^{SA}	<0.05	<0.05	<0.05	<0.05	<0.05	0.11	0.36	<0.05	1.27	<0.05	<0.05	mg/l	SA_TM27/SA_PM0

Client Name: WSP Group Africa
Reference: 41103965
Location: Eskom Komati Power Station (ESIA and WULA project)
Contact: Sarah Skinner
EMT Job No: 22/556

Report : **Liquid**

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
$H=H_2SO_4$, Z=ZnAc, N=NaOH, $HN=HN0_3$

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	1-9	10-14	15-21	22-28	29-35	36-42	43-49	50-56	57-63	64-70			
Sample ID	BH 1	BH 2	BH 3	BH 4	BH 5	BH 6	BH 7	BH 8	BH 9	BH 10			
Depth													
COC No / misc													
Containers	V HN P G	V P G	V HN P G	V HN P G	V HN P G	V HN P G	V HN P G	V HN P G	V HN P G	V HN P G			
Sample Date	07/06/2022	07/06/2022	07/06/2022	07/06/2022	07/06/2022	07/06/2022	07/06/2022	07/06/2022	07/06/2022	07/06/2022			
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water			
Batch Number	1	1	1	1	1	1	1	1	1	1	LOD/LOR	Units	Method No.
Date of Receipt	10/06/2022	10/06/2022	10/06/2022	10/06/2022	10/06/2022	10/06/2022	10/06/2022	10/06/2022	10/06/2022	10/06/2022			
Ortho Phosphate as P	0.046	0.039	0.055	0.033	0.029	0.023	0.036	0.046	0.039	0.026	<0.015	mg/l	SA_TM191/SA_PM31
Ammoniacal Nitrogen as N ^{SA}	2.60	0.47	0.75	<0.03	0.47	0.19	<0.03	0.05	<0.03	<0.03	<0.03	mg/l	SA_TM27/SA_PM0
Hexavalent Chromium*	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	mg/l	UK_TM38/UK_PM0
Total Alkalinity as CaCO3 ^{SA}	396	132	260	18	92	64	23	116	124	20	<3	mg/l	SA_TM32/SA_PM0
Electrical Conductivity @25C ^{SA}	981	684	1849	248	835	679	304	1133	370	125	<2	uS/cm	SA_TM28/SA_PM0
pH ^{SA}	7.44	7.44	7.25	7.10	7.54	6.67	7.00	7.42	7.54	6.62	<2.00	pH units	SA_TM19/SA_PM0
Total Dissolved Solids ^{SA}	616	541	1537	205	563	486	187	894	250	136	<35	mg/l	SA_TM20/SA_PM31
Total Organic Carbon*	<2	<2	<2	<2	<2	<2	<2	2	<2	<2	<2	mg/l	UK_TM60/UK_PM0

Client Name: WSP Group Africa
Reference: 41103965
Location: Eskom Komati Power Station (ESIA and WULA project)
Contact: Sarah Skinner
EMT Job No: 22/556

Report : **Liquid**

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
$H=H_2SO_4$, Z=ZnAc, N=NaOH, $HN=HN0_3$

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	71-77												
Sample ID	BH 10-01												
Depth													
COC No / misc													
Containers	V HN P G												
Sample Date	07/06/2022												
Sample Type	Ground Water												
Batch Number	1												
Date of Receipt	10/06/2022										LOD/LOR	Units	Method No.
Dissolved Antimony*	<2										<2	ug/l	UK_TM170/UK_PM14
Dissolved Arsenic*	<0.9										<0.9	ug/l	UK_TM170/UK_PM14
Dissolved Cadmium*	<0.03										<0.03	ug/l	UK_TM170/UK_PM14
Total Dissolved Chromium*	<0.2										<0.2	ug/l	UK_TM170/UK_PM14
Dissolved Cobalt*	11.0										<0.1	ug/l	UK_TM170/UK_PM14
Dissolved Copper*	<1										<1	ug/l	UK_TM170/UK_PM14
Total Dissolved Iron*	163.7										<4.7	ug/l	UK_TM170/UK_PM14
Dissolved Lead*	4.6										<0.4	ug/l	UK_TM170/UK_PM14
Dissolved Manganese*	1639.4$_{AB}$										<1.5	ug/l	UK_TM170/UK_PM14
Dissolved Mercury*	<0.5										<0.5	ug/l	UK_TM170/UK_PM14
Dissolved Nickel*	12.6										<0.2	ug/l	UK_TM170/UK_PM14
Dissolved Selenium*	<1.2										<1.2	ug/l	UK_TM170/UK_PM14
Dissolved Vanadium*	1.0										<0.6	ug/l	UK_TM170/UK_PM14
Dissolved Zinc*	37.0										<1.5	ug/l	UK_TM170/UK_PM14
Dissolved Calcium ^{SA}	141.5										<0.3	mg/l	SA_TM27/SA_PM0
Dissolved Magnesium ^{SA}	116.5$_{AB}$										<0.2	mg/l	SA_TM27/SA_PM0
Dissolved Potassium ^{SA}	6.0										<0.1	mg/l	SA_TM27/SA_PM0
Dissolved Sodium ^{SA}	137.1										<0.1	mg/l	SA_TM27/SA_PM0
Dissolved Silicon*	20135$_{AB}$										<100	ug/l	UK_TM30/UK_PM14

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EMT Sample No.	71-77												
Sample ID	BH 10-01												
Depth													
COC No / misc													
Containers	V HN P G												
Sample Date	07/06/2022												
Sample Type	Ground Water												
Batch Number	1										LOD/LOR	Units	Method No.
Date of Receipt	10/06/2022												
VOC MS													
Dichlorodifluoromethane	<2										<2	ug/l	SA_TM15/SA_PM10
Methyl Tertiary Butyl Ether	<0.1										<0.1	ug/l	SA_TM15/SA_PM10
Chloromethane ^{SA}	<3										<3	ug/l	SA_TM15/SA_PM10
Vinyl Chloride	<0.1										<0.1	ug/l	SA_TM15/SA_PM10
Bromomethane	<1										<1	ug/l	SA_TM15/SA_PM10
Chloroethane ^{SA}	<3										<3	ug/l	SA_TM15/SA_PM10
Trichlorofluoromethane ^{SA}	<3										<3	ug/l	SA_TM15/SA_PM10
1,1-Dichloroethene (1,1 DCE) ^{SA}	<3										<3	ug/l	SA_TM15/SA_PM10
Dichloromethane (DCM) ^{SA}	<5										<5	ug/l	SA_TM15/SA_PM10
trans-1-2-Dichloroethene ^{SA}	<3										<3	ug/l	SA_TM15/SA_PM10
1,1-Dichloroethane ^{SA}	<3										<3	ug/l	SA_TM15/SA_PM10
cis-1-2-Dichloroethene ^{SA}	<3										<3	ug/l	SA_TM15/SA_PM10
2,2-Dichloropropane	<1										<1	ug/l	SA_TM15/SA_PM10
Bromochloromethane ^{SA}	<2										<2	ug/l	SA_TM15/SA_PM10
Chloroform ^{SA}	<2										<2	ug/l	SA_TM15/SA_PM10
1,1,1-Trichloroethane ^{SA}	<2										<2	ug/l	SA_TM15/SA_PM10
1,1-Dichloropropene ^{SA}	<3										<3	ug/l	SA_TM15/SA_PM10
Carbon tetrachloride ^{SA}	<2										<2	ug/l	SA_TM15/SA_PM10
1,2-Dichloroethane ^{SA}	<2										<2	ug/l	SA_TM15/SA_PM10
Benzene	<0.5										<0.5	ug/l	SA_TM15/SA_PM10
Trichloroethene (TCE) ^{SA}	<3										<3	ug/l	SA_TM15/SA_PM10
1,2-Dichloropropane ^{SA}	<2										<2	ug/l	SA_TM15/SA_PM10
Dibromomethane ^{SA}	<3										<3	ug/l	SA_TM15/SA_PM10
Bromodichloromethane ^{SA}	<2										<2	ug/l	SA_TM15/SA_PM10
cis-1-3-Dichloropropene	<2										<2	ug/l	SA_TM15/SA_PM10
Toluene ^{SA}	<5										<5	ug/l	SA_TM15/SA_PM10
trans-1-3-Dichloropropene	<2										<2	ug/l	SA_TM15/SA_PM10
1,1,2-Trichloroethane ^{SA}	<2										<2	ug/l	SA_TM15/SA_PM10
Tetrachloroethene (PCE) ^{SA}	<3										<3	ug/l	SA_TM15/SA_PM10
1,3-Dichloropropane ^{SA}	<2										<2	ug/l	SA_TM15/SA_PM10
Dibromochloromethane ^{SA}	<2										<2	ug/l	SA_TM15/SA_PM10
1,2-Dibromoethane ^{SA}	<2										<2	ug/l	SA_TM15/SA_PM10
Chlorobenzene ^{SA}	<2										<2	ug/l	SA_TM15/SA_PM10
1,1,1,2-Tetrachloroethane ^{SA}	<2										<2	ug/l	SA_TM15/SA_PM10
Ethylbenzene ^{SA}	<1										<1	ug/l	SA_TM15/SA_PM10
p/m-Xylene ^{SA}	<2										<2	ug/l	SA_TM15/SA_PM10
o-Xylene ^{SA}	<1										<1	ug/l	SA_TM15/SA_PM10
Styrene	<2										<2	ug/l	SA_TM15/SA_PM10
Bromoform ^{SA}	<2										<2	ug/l	SA_TM15/SA_PM10
Isopropylbenzene ^{SA}	<3										<3	ug/l	SA_TM15/SA_PM10
1,1,2,2-Tetrachloroethane	<4										<4	ug/l	SA_TM15/SA_PM10
Bromobenzene ^{SA}	<2										<2	ug/l	SA_TM15/SA_PM10
1,2,3-Trichloropropane ^{SA}	<3										<3	ug/l	SA_TM15/SA_PM10

Client Name: WSP Group Africa
Reference: 41103965
Location: Eskom Komati Power Station (ESIA and WULA project)
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Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
$H=H_2SO_4$, Z=ZnAc, N=NaOH, $HN=HN0_3$

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	71-77										LOD/LOR	Units	Method No.
Sample ID	BH 10-01												
Depth													
COC No / misc													
Containers	V HN P G												
Sample Date	07/06/2022												
Sample Type	Ground Water												
Batch Number	1												
Date of Receipt	10/06/2022												
VOC MS Continued													
Propylbenzene ^{SA}	<3										<3	ug/l	SA_TM15/SA_PM10
2-Chlorotoluene ^{SA}	<3										<3	ug/l	SA_TM15/SA_PM10
1,3,5-Trimethylbenzene ^{SA}	<3										<3	ug/l	SA_TM15/SA_PM10
4-Chlorotoluene ^{SA}	<3										<3	ug/l	SA_TM15/SA_PM10
tert-Butylbenzene ^{SA}	<3										<3	ug/l	SA_TM15/SA_PM10
1,2,4-Trimethylbenzene ^{SA}	<3										<3	ug/l	SA_TM15/SA_PM10
sec-Butylbenzene ^{SA}	<3										<3	ug/l	SA_TM15/SA_PM10
4-Isopropyltoluene ^{SA}	<3										<3	ug/l	SA_TM15/SA_PM10
1,3-Dichlorobenzene ^{SA}	<3										<3	ug/l	SA_TM15/SA_PM10
1,4-Dichlorobenzene ^{SA}	<3										<3	ug/l	SA_TM15/SA_PM10
n-Butylbenzene ^{SA}	<3										<3	ug/l	SA_TM15/SA_PM10
1,2-Dichlorobenzene ^{SA}	<3										<3	ug/l	SA_TM15/SA_PM10
1,2-Dibromo-3-chloropropane	<2										<2	ug/l	SA_TM15/SA_PM10
1,2,4-Trichlorobenzene	<3										<3	ug/l	SA_TM15/SA_PM10
Hexachlorobutadiene	<3										<3	ug/l	SA_TM15/SA_PM10
Naphthalene	<2										<2	ug/l	SA_TM15/SA_PM10
1,2,3-Trichlorobenzene	<3										<3	ug/l	SA_TM15/SA_PM10
VOC TICs	ND											None	SA_TM15/SA_PM10
SVOC MS													
Phenols													
2-Chlorophenol	<1										<1	ug/l	SA_TM16/SA_PM30
2-Methylphenol	<0.5										<0.5	ug/l	SA_TM16/SA_PM30
2-Nitrophenol	<0.5										<0.5	ug/l	SA_TM16/SA_PM30
2,4-Dichlorophenol	<0.5										<0.5	ug/l	SA_TM16/SA_PM30
2,4-Dimethylphenol	<1										<1	ug/l	SA_TM16/SA_PM30
2,4,5-Trichlorophenol	<0.5										<0.5	ug/l	SA_TM16/SA_PM30
2,4,6-Trichlorophenol	<1										<1	ug/l	SA_TM16/SA_PM30
4-Chloro-3-methylphenol	<0.5										<0.5	ug/l	SA_TM16/SA_PM30
4-Methylphenol	<1										<1	ug/l	SA_TM16/SA_PM30
4-Nitrophenol	<10										<10	ug/l	SA_TM16/SA_PM30
Pentachlorophenol	<1										<1	ug/l	SA_TM16/SA_PM30
Phenol	<1										<1	ug/l	SA_TM16/SA_PM30

Client Name:	WSP Group Africa	**Report :**	**Liquid**
Reference:	41103965		
Location:	Eskom Komati Power Station (ESIA and WULA project)		
Contact:	Sarah Skinner	**Liquids/products:**	V=40ml vial, G=glass bottle, P=plastic bottle
EMT Job No:	22/556		$H=H_2SO_4$, Z=ZnAc, N=NaOH, $HN=HN0_3$

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	71-77												
Sample ID	BH 10-01												
Depth													
COC No / misc													
Containers	V HN P G												
Sample Date	07/06/2022												
Sample Type	Ground Water												
Batch Number	1											LOD/LOR	Units	Method No.
Date of Receipt	10/06/2022													
SVOC MS													
PAHs													
2-Chloronaphthalene ^{SA}	<1										<1	ug/l	SA_TM16/SA_PM30
2-Methylnaphthalene ^{SA}	<1										<1	ug/l	SA_TM16/SA_PM30
Naphthalene ^{SA}	<1										<1	ug/l	SA_TM16/SA_PM30
Acenaphthylene ^{SA}	<0.5										<0.5	ug/l	SA_TM16/SA_PM30
Acenaphthene ^{SA}	<1										<1	ug/l	SA_TM16/SA_PM30
Fluorene ^{SA}	<0.5										<0.5	ug/l	SA_TM16/SA_PM30
Phenanthrene ^{SA}	<0.5										<0.5	ug/l	SA_TM16/SA_PM30
Anthracene ^{SA}	<0.5										<0.5	ug/l	SA_TM16/SA_PM30
Fluoranthene ^{SA}	<0.5										<0.5	ug/l	SA_TM16/SA_PM30
Pyrene ^{SA}	<0.5										<0.5	ug/l	SA_TM16/SA_PM30
Benzo(a)anthracene ^{SA}	<0.5										<0.5	ug/l	SA_TM16/SA_PM30
Chrysene ^{SA}	<0.5										<0.5	ug/l	SA_TM16/SA_PM30
Benzo(b)fluoranthene ^{SA}	<1										<1	ug/l	SA_TM16/SA_PM30
Benzo(k)fluoranthene ^{SA}	<1										<1	ug/l	SA_TM16/SA_PM30
Benzo(a)pyrene ^{SA}	<1										<1	ug/l	SA_TM16/SA_PM30
Indeno(123cd)pyrene ^{SA}	<1										<1	ug/l	SA_TM16/SA_PM30
Dibenzo(ah)anthracene ^{SA}	<0.5										<0.5	ug/l	SA_TM16/SA_PM30
Benzo(ghi)perylene ^{SA}	<0.5										<0.5	ug/l	SA_TM16/SA_PM30
Phthalates													
Bis(2-ethylhexyl) phthalate ^{SA}	<5										<5	ug/l	SA_TM16/SA_PM30
Butylbenzyl phthalate	<1										<1	ug/l	SA_TM16/SA_PM30
Di-n-butyl phthalate ^{SA}	<1.5										<1.5	ug/l	SA_TM16/SA_PM30
Di-n-Octyl phthalate	<1										<1	ug/l	SA_TM16/SA_PM30
Diethyl phthalate ^{SA}	<1										<1	ug/l	SA_TM16/SA_PM30
Dimethyl phthalate ^{SA}	<1										<1	ug/l	SA_TM16/SA_PM30

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: WSP Group Africa
Reference: 41103965
Location: Eskom Komati Power Station (ESIA and WULA project)
Contact: Sarah Skinner
EMT Job No: 22/556

Report : **Liquid**

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
H=H_2SO_4, Z=ZnAc, N=NaOH, HN=$HN0_3$

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	71-77												
Sample ID	BH 10-01												
Depth													
COC No / misc													
Containers	V HN P G												
Sample Date	07/06/2022												
Sample Type	Ground Water												
Batch Number	1										LOD/LOR	Units	Method No.
Date of Receipt	10/06/2022												
SVOC MS													
Other SVOCs													
1,2-Dichlorobenzene ^{SA}	<1										<1	ug/l	SA_TM16/SA_PM30
1,2,4-Trichlorobenzene ^{SA}	<1										<1	ug/l	SA_TM16/SA_PM30
1,3-Dichlorobenzene ^{SA}	<1										<1	ug/l	SA_TM16/SA_PM30
1,4-Dichlorobenzene ^{SA}	<1										<1	ug/l	SA_TM16/SA_PM30
2-Nitroaniline	<1										<1	ug/l	SA_TM16/SA_PM30
2,4-Dinitrotoluene ^{SA}	<0.5										<0.5	ug/l	SA_TM16/SA_PM30
2,6-Dinitrotoluene	<1										<1	ug/l	SA_TM16/SA_PM30
3-Nitroaniline	<1										<1	ug/l	SA_TM16/SA_PM30
4-Bromophenylphenylether ^{SA}	<1										<1	ug/l	SA_TM16/SA_PM30
4-Chloroaniline	<1										<1	ug/l	SA_TM16/SA_PM30
4-Chlorophenylphenylether ^{SA}	<1										<1	ug/l	SA_TM16/SA_PM30
4-Nitroaniline	<0.5										<0.5	ug/l	SA_TM16/SA_PM30
Azobenzene ^{SA}	<0.5										<0.5	ug/l	SA_TM16/SA_PM30
Bis(2-chloroethoxy)methane ^{SA}	<0.5										<0.5	ug/l	SA_TM16/SA_PM30
Bis(2-chloroethyl)ether ^{SA}	<1										<1	ug/l	SA_TM16/SA_PM30
Carbazole ^{SA}	<0.5										<0.5	ug/l	SA_TM16/SA_PM30
Dibenzofuran ^{SA}	<0.5										<0.5	ug/l	SA_TM16/SA_PM30
Hexachlorobenzene ^{SA}	<1										<1	ug/l	SA_TM16/SA_PM30
Hexachlorobutadiene ^{SA}	<1										<1	ug/l	SA_TM16/SA_PM30
Hexachlorocyclopentadiene ^{SA}	<1										<1	ug/l	SA_TM16/SA_PM30
Hexachloroethane ^{SA}	<1										<1	ug/l	SA_TM16/SA_PM30
Isophorone ^{SA}	<0.5										<0.5	ug/l	SA_TM16/SA_PM30
N-nitrosodi-n-propylamine ^{SA}	<0.5										<0.5	ug/l	SA_TM16/SA_PM30
Nitrobenzene ^{SA}	<1										<1	ug/l	SA_TM16/SA_PM30
SVOC TICs	ND											None	SA_TM16/SA_PM30
TPH CWG													
Aliphatics													
C7-C9	<10										<10	ug/l	SA_TM36/SA_PM12
C10-C14	<10										<10	ug/l	SA_TM5/SA_PM16/PM30
C15-C36	<10										<10	ug/l	SA_TM5/SA_PM16/PM30
Total aliphatics C7-C36	<10										<10	ug/l	SA_TM5/TM36/SA_PM12/PM16/PM30
PCBs (Total vs Aroclor 1254)	<0.2										<0.2	ug/l	SA_TM17/SA_PM30
Fluoride ^{SA}	0.4										<0.3	mg/l	SA_TM27/SA_PM0
Chloride ^{SA}	69.9										<0.3	mg/l	SA_TM27/SA_PM0
Sulphate ^{SA}	837.9$_{AB}$										<0.5	mg/l	SA_TM27/SA_PM0
Nitrate as N ^{SA}	<0.05										<0.05	mg/l	SA_TM27/SA_PM0

Client Name: WSP Group Africa
Reference: 41103965
Location: Eskom Komati Power Station (ESIA and WULA project)
Contact: Sarah Skinner
EMT Job No: 22/556

Report : **Liquid**

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
H=H_2SO_4, Z=ZnAc, N=NaOH, HN=$HN0_3$

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	71-77										LOD/LOR	Units	Method No.
Sample ID	BH 10-01												
Depth													
COC No / misc													
Containers	V HN P G												
Sample Date	07/06/2022												
Sample Type	Ground Water												
Batch Number	1												
Date of Receipt	10/06/2022												
Ortho Phosphate as P	0.042										<0.015	mg/l	SA_TM191/SA_PM31
Ammoniacal Nitrogen as N ^{SA}	0.36										<0.03	mg/l	SA_TM27/SA_PM0
Hexavalent Chromium*	<0.006										<0.006	mg/l	UK_TM38/UK_PM0
Total Alkalinity as CaCO3 ^{SA}	256										<3	mg/l	SA_TM32/SA_PM0
Electrical Conductivity @25C ^{SA}	1850										<2	uS/cm	SA_TM28/SA_PM0
pH ^{SA}	6.62										<2.00	pH units	SA_TM19/SA_PM0
Total Dissolved Solids ^{SA}	1533										<35	mg/l	SA_TM20/SA_PM31
Total Organic Carbon*	<2										<2	mg/l	UK_TM60/UK_PM0

Notification of Deviating Samples

Client Name: WSP Group Africa
Reference: 41103965
Location: Eskom Komati Power Station (ESIA and WULA project)
Contact: Sarah Skinner

Matrix : Liquid

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
22/556	1	BH 1		1-9	SVOC	Sample holding time exceeded
22/556	1	BH 2		10-14	SVOC	Sample holding time exceeded
22/556	1	BH 3		15-21	SVOC	Sample holding time exceeded
22/556	1	BH 4		22-28	SVOC	Sample holding time exceeded
22/556	1	BH 5		29-35	SVOC	Sample holding time exceeded
22/556	1	BH 6		36-42	SVOC	Sample holding time exceeded
22/556	1	BH 7		43-49	SVOC	Sample holding time exceeded
22/556	1	BH 8		50-56	SVOC	Sample holding time exceeded
22/556	1	BH 9		57-63	SVOC	Sample holding time exceeded
22/556	1	BH 10		64-70	SVOC	Sample holding time exceeded
22/556	1	BH 10-01		71-77	SVOC	Sample holding time exceeded

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.
Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 22/556

SOILS and ASH

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 37°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.
Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

Customer Provided Information

Sample ID and depth is information provided by the customer.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher, this result is not accredited.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range
AA	x2 Dilution
AB	x5 Dilution

EMT Job No: 22/556

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
SA_TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds by Headspace GC-MS.	SA_PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.				
SA_TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds by Headspace GC-MS.	SA_PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
SA_TM16	Modified USEPA 8270. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	SA_PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
SA_TM16	Modified USEPA 8270. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	SA_PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
SA_TM17	Modified US EPA method 8270. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	SA_PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
SA_TM19	Determination of pH by bench pH meter	SA_PM0	No preparation is required.	Yes			
SA_TM191	Orthophosphate as PO4 by Colorimetric Measurement v1	SA_PM31	Sample is filtered				
SA_TM20	Modified BS 1377-3: 1990 Gravimetric determination of Total Dissolved Solids	SA_PM31	Sample is filtered	Yes			
SA_TM27	Major ions by Ion Chromatography	SA_PM0	No preparation is required.	Yes			
SA_TM28	Determination of Electrical Conductivity with hand held manual conductivity probe.	SA_PM0	No preparation is required.	Yes			

EMT Job No: 22/556

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
SA_TM32	Determination of Alkalinity by titration of the sample with a standard solution of acid by visual detection of end points.	SA_PM0	No preparation is required.	Yes			
SA_TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12, MTBE and BTEX by headspace GC-FID.	SA_PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.				
SA_TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	SA_PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
SA_TM5/TM36	TM005: Modified USEPA 8015B. Determination of solvent Extractable Petroleum Hydrocarbons (EPH) including column fractionation in the carbon range of C10-35 into aliphatic and aromatic fractions by GC-FID. TM036: Modified USEPA 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C5-10 by headspace GC-FID. Including determination of BTEX and calculation of Aliphatic fractions	SA_PM12/PM16/PM30	please refer to SA_PM16/PM30 and SA_PM12 for method details				
UK_TM170	Determination of Trace Metal elements by ICP-MS (Inductively Coupled Plasma - Mass Spectrometry) modified USEPA 200.8/6020A and BS EN ISO 17294-2 2016	UK_PM14	Analysis of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for dissolved metals and acidified if required.				
UK_TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	UK_PM14	Analysis of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for dissolved metals and acidified if required.				
UK_TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	UK_PM0	No preparation is required.				
UK_TM60	Modified USEPA 9060. Determination of TOC by calculation from Total Carbon and Inorganic Carbon using a TOC analyser, the carbon in the sample is converted to CO2 and then passed through a non-dispersive infrared gas analyser (NDIR).	UK_PM0	No preparation is required.				

Appendix D

SUMMARY OF FINDINGS FROM CONTAMINATED LAND REPORT, 2022

Summary of findings in soil and groundwater for each area

Area of investigation	Summary of concentrations exceeding screening values	Risk Summary
PV Site A	Soil: Cu (in almost all samples) and As, Pb, Mn, and V were locally elevated above the SSV1 in some samples but less than SSV2 screening levels. Sulphate was elevated above SSV in AH15. Groundwater: Pb (all), Mn (BH6 only), SO4 (BH8 and BH6) elevated above SANS 241:2015. Pb (all), Mn (BH6 only), Zn (all), ammoniacal N (all) elevated above SAWQG for aquatic species (SAWQG).	Potential sources: Area was historically used for crops with historical footprints in the eastern portion. Receptors to which an exposure pathway are complete include site workers (human health) and the environment. Soils are largely not considered to represent a significant source of risk with respect to human health and/or aquatic systems when specifically considering the end-use of the areas of concern. There is an existing groundwater plume from the adjacent Ashing area and seeps to the adjacent wetland are impacted by surface runoff from this area. No 4-coal seam is anticipated to be mined some 20 – 100m below the surface. The risk to these workings from the existing plume is outside this scope of work.
PV Site B	Soil: Cu (in all samples) and As, Pb, Mn, and V were locally elevated above the SSV1 in some samples but less than SSV2 screening levels. Groundwater: Pb (BH9 only), Mn (BH6 only), SO4 (BH8 and BH6) elevated above SANS 241:2015 and SAWQG. Zn (both) > SAWQG	Potential sources: A coal discard dump footprint is located to the north-west. Backfilled mine workings have been noted to occur at a depth greater than the 10m assessed by this study. Receptors to which an exposure pathway may be complete include site workers (human health), residents of Komati town, and the environment. Soils are largely not considered to represent a significant source of risk with respect to human health and/or aquatic systems when specifically considering the end-use of the areas of concern but there will, be a requirement to ensure appropriate management of excavations, and especially where these are required within areas proximal to residential dwellings of Komati.
BESS A	Soil: Cu in AH9 elevated above the SSV1 but less than SSV2 screening levels. Concentrations were all below SSV1 in the second sample AH10. Groundwater: No samples	Area is currently in use with several buildings and contractor's yards. Samples were therefore obtained from the adjacent area. Receptors to which an exposure pathway may be complete include site workers (human health) and the environment. Soils are largely not considered to represent a significant source of risk with respect to human health and/or aquatic systems when specifically considering the end-use of the areas of concern. The risk from soils is as indicated above for the general site but visual inspection of this area may be necessary following demolition/ decommissioning to ensure there is no local areas of concern.
BESS B	Soil: Cu (in all samples), Pb and Mn locally in BH4 elevated above the SSV1 in some samples but less than SSV2 screening levels Groundwater: Fe, Mn > SANS 241-2015 aesthetic Mn, Zn > SAWQG	Potential sources: Most of the area is not in use except for a church located in the south-eastern corner. There is no evidence of a graveyard, but this should be confirmed with Eskom. The church is located within a bunker which was historically an old shooting range and there could be spent bullets within the bunker. Receptors to which an exposure pathway may be complete include site workers (human health). Komati town and the environment, specifically the aquatic environment of the Komati stream. Soils are largely not considered to represent a significant source of risk with respect to human health and/or aquatic systems when specifically considering the end-use of the areas of concern. The risk to the water resources (aquatic and groundwater) are influenced by the surface runoff and groundwater migration from the Ashing Area.
BESS C	Soil: Cu (in all samples), As, Pb, Mn and V locally elevated above the SSV1 in some samples but less than SSV2 screening levels. Groundwater: EC, Mn, SO4 > SANS241-2015. PO4, Ammoniacal N, Mn, Zn, Pb > SAWQG	Potential sources: KPS, Ashing Area (upgradient), scrap yard and a possible temporary hazardous waste facility. Receptors to which an exposure pathway may be complete include site workers (human health) and the environment, specifically the aquatic environment of the Gelukspruit (and wetland). Soils are largely not considered to represent a significant source of risk with respect to human health and/or aquatic systems when specifically considering the end-use of the areas of concern. Ground water quality is affected by contamination migrating from the Ashing Area.

Appendix E

DOCUMENT LIMITATIONS

DOCUMENT LIMITATIONS

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