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2022-03-30

MEMORANDUM ON SITE STATUS AND HERITAGE IMPACT OF THE PROPOSED EXPANSION OF THE GLENCORE THORNCLIFFE PLATINUM FLOTATION PLANT AND CHROME PLANT, GREATER FETAKGOMO TUBATSE LOCAL MUNICIPALITY, LIMPOPO PROVINCE

1. Background and Scope

1.1 Project Description

Ukwazi was appointed to facilitate the environmental authorisation process for the expansion of the platinum flotation plant and chrome plant at the Glencore Thorncliffe Mine. The project is located in the Greater Fetakgomo Tubatse Local Municipality of the Limpopo Province. The extension to the existing Platinum Flotation Plant (Thorncliffe Tailings Treatment Facility) will treat both current arising tails from the concentrators and material from the tailings dam as well as from external sources in order to recover Platinum Group Metals ("PGM") and produce a saleable PGM concentrate. This is similar to the existing PGM plant. The plant schematic diagram is detailed in Figure 1.

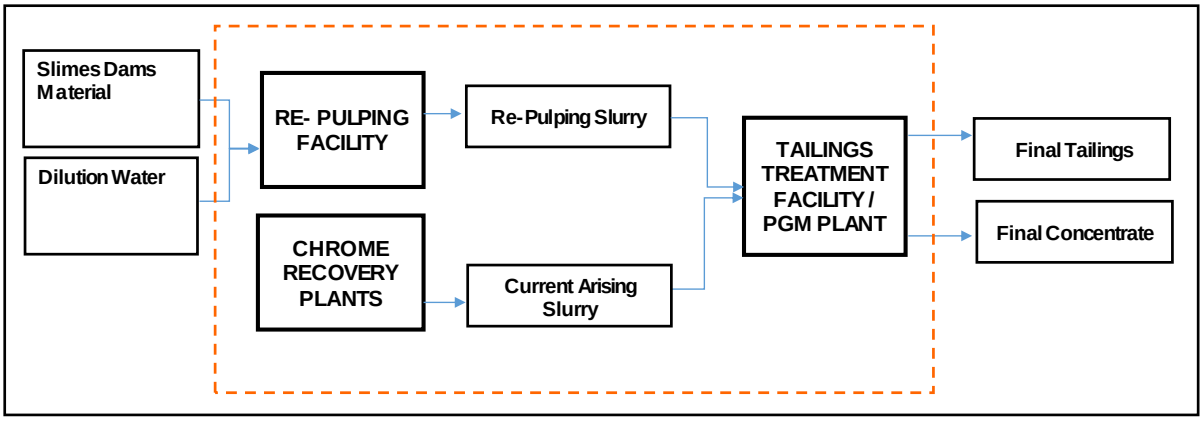

Figure 1 Plant Schematic Diagram

- **Feed Receiving and Preparation**

The Thorncliffe PGM Plant receives current arising tailings as feed from Thorncliffe, Helena and Magareng chrome concentrator plants, from external sources and from the Thorncliffe Tailings dump. All feed tailings material received as feed will be varied to suit the plant capacity. Ore will be received via pumping from Thorncliffe, Helena, and Magareng Chrome Plants current arising tailings and Thorncliffe re-mined tailings dumps. The re-mined tailings from Thorncliffe will be transferred from the re- mining site to a wash/stock pad area next to the plant where it is washed into the process feed surge tank using high pressure monitor guns. All incoming material will report to the surge tanks. Slurry from the surge tanks will be fed to a feed preparation circuit to render the feed properties suitable for milling.

- **Milling**

Mills or attritioners will be utilised to pre-treat the PGM plant feed. Due to the varying feed characteristics of the feed streams, two mills are utilised. The mill products will then be pumped to the flotation circuit.

- **Flotation**

The primary rougher flotation circuit will receive its feed from the SMD Mills. The primary rougher circuit concentrate will feed the cleaner flotation circuit for further upgrading. Primary rougher tails are discharged to the final tailings thickener. Cleaner concentrate will be pumped to the re-cleaner flotation circuit as well as final concentrate handling circuit. Cleaner tailings will then be recycled to the rougher feed tank. Feed to the re-cleaners comprises of concentrate generated from the cleaner floatation circuit. The concentrates are pumped to the concentrate thickener. The re-cleaner tailing will be recycled back to the cleaner feed.

- **Concentrate Handling**

Final concentrate will be pumped into a concentrate thickener. The settled thickener underflow will be pumped to a concentrate holding tank. The final concentrate has an option to be filtered or dispatched as slurry. Either in cake or slurry form, it will be loaded into concentrate trucks and then sampled and weighed on a weigh bridge prior to delivery to a smelter or other customers. The concentrate thickener overflow water is reused in the process.

- **Tailings Handling**

Final tailings are pumped to the Final Tailings Thickener. The thickener underflow is then transferred via pumping to the Thorncliffe Chrome Concentrator Final Tailings Filter Press. The PGM Plant can also transfer the final tails thickener underflow material to the nearby tailings disposal facility, which utilises cycloning deposition techniques to conserve water and permit an increased rate of rise.

- **Reagents Handling**

Five different reagents will be dosed in the plant, namely: Frother, Collector, Dispersant, Depressant and Flocculent. Dosing will take place at different points. Frother, Dispersant and Collector will be delivered in ISO Bulk Containers (IBCs) and distributed via chemical dosing pumps to various points of the flotation circuit. Depressant and flocculent will be delivered via road or rail and will be made through a mixing and hydration system. All dosing pumps are controlled through the process control system.

PROPOSED FINE CHROME RECOVERY PLANT

Feed will be re-mined and transported from the Helena and Thorncliffe mine old slime dams. The feed will first be subjected to a trash screen to remove debris. The debris from the trash screen overflow will be discarded on the waste stockpile. The trash screen undersize will be pumped to a desliming cyclone, cyclone overflow will report to a thickener and then to the flotation plant.

The Fine Chrome Recovery ("FCR") plant will be located on a disturbed footprint (0.17 ha) next to the existing chrome tailings retreatment plant. The cyclone underflow will be pumped to the belt magnets at the Fine Chrome Recovery ("FCR") plant for chrome extraction. The FCR tails, which are non-magnetics, will then be pumped back to a thickener and then to flotation plant. The belt magnet concentrate, which are magnetics, will be pumped to the already existing boom stacker cyclone as a final product.

This memorandum details the results of a desktop heritage screening and a brief site screening of the project area for the EMPr amendment application. An assessment is made of potential and probable impacts on heritage resources

emanating from the proposed development (if any) by investigating heritage signatures, site potential and the historical situation of heritage sites in the project area. Ultimately, the screening predicts and assesses the level of impact that the developments might have on the heritage landscape by means of a study of background information on the area's archaeology, a detailed aerial survey of the project footprint areas and further archive research. It should be noted that the conservation of heritage resources is provided for in the **National Environmental Management Act, (Act 107 of 1998)** and endorsed by section 38 of the **National Heritage Resources Act (NHRA - Act 25 of 1999)**. A copy of this memorandum will be lodged with the South African Heritage Resources Agency (SAHRA) and recommendations contained in this document will be reviewed.

1.2 Specialist Expertise

Exigo's expertise ensures that all projects be conducted to the highest international ethical and professional standards. As archaeological specialist for Exigo Sustainability, Mr Neels Kruger acted as field director for the project; responsible for the assimilation of all information, the compilation of the final consolidated AIA report and recommendations in terms of heritage resources on the demarcated project areas. Mr Kruger is an accredited archaeologist and Culture Resources Management (CRM) practitioner with the Association of South African Professional Archaeologists (ASAPA), a member of the Society for Africanist Archaeologists (SAFA) and the Pan African Archaeological Association (PAA). Please refer to **Addendum A for the Specialist CV**.

2. Site Description and Status

The Glencore Thorncliffe PGM and Chrome Plant Extension Project study area is located on portions of the farms Thorncliffe 374 KT and De Grooteboom 373 KT in the Greater Fetakgomo Tubatse Local Municipality. It is located approximately 30km south of Steelpoort and 110km south-east of Polokwane, east of the R555 regional road connecting Burgersfort and Stoffberg. The area falls under the Sekhukhune District Municipality in the Limpopo Province. The study areas appear on 1:50000 map sheet 2430CC (see Figure 2) and coordinates for the proposed project are **S24.962647° E30.127226°**. The regional topographical setting of the Steelpoort area can be largely classified as low mountainous terrain throughout most parts of the central, eastern and western sections of the study area often forming deep valleys and a gorge to the west where the Olifants River cuts through the mountainous area. This eastern area is dominated by rugged hills with well-defined ridges and joint pattern controlled valleys and troughs. The landscape straddles the westerly flowing Olifants River which appears to have exploited the natural joint pattern and created a deeply incised valley. Vegetation in the areas is generally classified as Bushveld and grassland cover.

The project is situated in a landscape that have been altered extensively as a result of mining, prospecting and the establishment of mine roads and other infrastructure. Original vegetation remains intact on high slopes of mountains in the area as well as along water courses and pioneer plant species are prevalent in transformed zones. A number of perennial and non-perennial streams and drainage lines originating in the surrounding hills, bisect the region. The project sites have been cleared of vegetation where a sludge catchment structure, temporary site offices and parking bays have been established. Little vegetation remains intact at the sites.

3. The Heritage Landscape

The history of the Steelpoort is reflected in a rich archaeological landscape, mostly dominated by Stone Age and Iron Age Farmer occurrences. Numerous sites, documenting Earlier, Middle and Later Stone Age habitation occur across the province, mostly in open air locales or in sediments alongside rivers or pans. In addition, a wealth of Iron Age sites is to be found in the larger landscape. These sites occur on hilltops, slopes, rock outcrops and occasionally in river beds. Moving into recent times, the archaeological record reflects the development of a rich colonial frontier, characterised by, amongst others, a complex industrial archaeological landscape such as mining developments, which herald the modern era in South African history.

- **Early History**

Human habitation of the Steelpoort area dates back as far as the earlier Stone Age. One of the more important sites, known as Bushman Rock Shelter, is located at Echo Caves north of Ohrigstad. Early humans lived here for thousands of

years from the Early Stone Age, through what is known as the Middle Stone Age and well into the Late Stone Age. The majority of Stone Age finds are classified as isolated surface occurrences, and mostly date to the Middle Stone Age. The location of Stone Age scatters in the area corresponds with a general Stone Age site distribution pattern where Stone Age archaeological sites in the landscape occur near water sources close to local sources of rare raw materials in lithic manufacture. From the deposition pattern and stratigraphy as observed in erosion gullies in this area, it is clear that the lithic scatters occur mainly as multiple horizons within a calcrete formation. In addition, an ephemeral surface overlay of Later Stone Age (LSA) artefacts produced on a variety of raw materials occurs in places. These materials are mostly of igneous origin, and predominantly fine-grained Cryptocrystalline Silicas (CCS) including quartzes, chalcedony, agates and mudstones, but also fine-grained dolerite and banded ironstone. Distinct production technologies were used to manufacture a range of specific tool types, resulting in characteristic features and attributes. Typical MSA tool types comprise blades, convergent flakes and backed formal tools. The latter tool types are mostly unifacial and bifacial points, knives, a variety of scrapers and also perforating tools (Thackeray 1992: Wadley 2005; Soriano et al 2007). The evidence for stages of lithic reduction, as observed in the dongas at Lesego points to some primary deposition and site integrity. However, only an in-depth technological study will identify a chain(s) of knapping operations, which can inform on such aspects, and also whether there are differences in knapping operations that may indicate chronological periods, e.g. early or final MSA depositions (Wadley 2001:216).

- **Later History: The Iron Age**

Iron Age people moved into southern Africa by c. AD 200, entering the area either by moving down the coastal plains, or by using a more central route. It seems more likely that the first option was what brought people into the Steelpoort area. From the coast they followed the various rivers inland. Being cultivators, they preferred rich alluvial soils. One of the earliest dated Iron Age sites is located near Tzaneen (Silver Leaves). Iron Age occupation of the larger Steelpoort area seems to have taken place on a significant scale and of note is the Doornkop phase of the Early Iron Age. A thousand years ago this large and sophisticated community existed for hundreds of years in the Steelpoort area. Known to archaeologists as the "Doornkop phase" (named after the type site) of the Earlier Iron Age, these people are well-known for the extraordinary clay masks they produced, some of which was found on a site near Lydenburg. These settlements seem to have been followed at a slightly later date by settlements linked to the "Eiland Phase" of the EIA (c. AD 1000) which lasted well into the second millennium AD. Early Iron Age sites are generally our only source of evidence for the occupation of the area by early farming communities. As such these sites are important and they are viewed to have medium to high significance. The last period of pre-colonial occupation consisted of Pedi-, Swazi- and Ndebele-speaking people that settled on terraced sites at the foot on the mountains. A single decorated potsherd from Site IA5 displays motives similar to that of the Maloko ceramic tradition, which can be broadly associated with some of these groups. The last 500 years in the area were characterised by population movements, conflict, contact and change which largely resulted in the current population and demographic distribution in the area today. The resonance of these sites in contemporary history generally deems them of medium significance.

- **European Occupation and Recent History of Nigel**

The Historical / Colonial Period in the Steelpoort area commenced roughly in the early 19th century with the arrival of the first white settlers. After negotiations between the Voortrekkers and the Pedi, the Steelpoort River was set as border between the groups. However, tension soon followed which rapidly resulted to armed conflict, notably the so-called Sekhukhune Wars (1876, 1879) if which remnants are still to be found in the larger geographical region. Later, during the so-called Mapoch Wars (1863, 1883) resulting land-ownership conflicts were contested. In later years, farms were proclaimed, most of which were used only for winter grazing. This was followed by a period when farmsteads and road infrastructure developed. In recent years, the substantial mineral wealth of the area was realised, primarily resulting from seminal work by geologist Hans Merensky. The farms Thorncliffe, De Grootboom and other farms in the area were proclaimed in 1890's.

4. Heritage Screening

4.1 Off-Site Desktop Findings

In terms of heritage resources, the general landscape around the project area is primarily well known for its Colonial / Historical Period archaeology primarily related to rural expansion and industrial and mining developments. A desktop study was prepared in order to contextualize the proposed project within a larger historical milieu. Here, archaeological and archival sources, aerial photographs, historical maps and local histories as well as past research projects pertaining to the project area elucidated the study. In particular, the study drew on Heritage Assessment reports to give a representation of known sites in the study area and the following HIA / AIA studies directly related to the project area bear reference (please refer to Figure 4):

- Kruger, N. 2014. Heritage Note: Additional site demarcations for the proposed Platinum Flotation Facility, Xtrata Thorncliffe platinum mine, Farm de Grooteboom 373 KT, Sekhukhune District, Limpopo Province. Ages Gauteng.
- Coetzee, F.P. 2008. Cultural Heritage Survey of the Proposed Platinum Flotation and Tailings Facility on the Farm De Grooteboom 373 KT, Sekhukhune District, Limpopo Province. University of South Africa.

In his HIA study, Coetzee (2008) indicated that no sensitive heritage receptors occur at sites then proposed for a flotation Plant and tailings facility which was planned in close proximity of the project area subject to this assessment. Kruger (2014) noted that no sensitive heritage receptors occur at a new site alternative for the flotation plant which was placed within the project area subject to this assessment.

A careful analysis of historical aerial imagery and archive maps reveals the following (see Figure 4 and Figure 5):

- Besides for an access road, no man-made features are indicated on historical topographic maps of the project area (1963, 1976) but mine heaps and mining infrastructure appear on later amps of the area (1997, 2002).
- Similarly, man-made structures are not visible on historical aerial images of the project area (1938, 1954) but it seems as though an agricultural field occurred in the project area in 1954.
- Contemporary maps and aerial images indicate that large portions of Thorncliffe and De Grootboom have been altered by recent and late historical mining. It might be assumed that the landscape, and the project areas in particular have been sterilized of precolonial and colonial heritage remains.

4.2 Site Scan

An brief site scan of the proposed project area was conducted in October 2021. Real time aerial orientation, by means of a mobile Google Earth application was also employed to investigate possible disturbed areas during the survey. As most archaeological material occur in single or multiple stratified layers beneath the soil surface, special attention was given to disturbances, both man-made such as roads and clearings, as well as those made by natural agents such as burrowing animals and erosion.

During the survey it was found the project areas have been transformed by past and ongoing mining activities and no sites of archaeological and historical value were documented within the proposed project footprints. It is also probable that no heritage resources were impacted upon during site clearing and initial construction, based on observations made on historic aerial images and maps.

4.3 Assumptions and Limitations

The site scan for the memo primarily focused around areas tentatively identified as sensitive and of high heritage probability (i.e. those noted during the mapping and aerial survey) as well as areas of potential human settlement catchment. In summary, the following constraints were encountered during the site survey:

- The surrounding vegetation in the project area mostly comprised out occasional trees and mixed grasses. Visibility proved to be a minor constraint in portions of the project area where vegetation remains intact.
- Dense vegetation restricted free movement in small portions of the project area.

Cognisant of the constraints noted above, it should be stated that a slight possibility exists that individual sites could be missed due to the localised nature of some heritage remains as well as the possible presence of sub-surface archaeology. Therefore, maintaining due cognisance of the integrity and accuracy of the archaeological survey, it should be stated that the heritage resources identified during the study do not necessarily represent all the heritage resources present in the project area. The subterranean nature of some archaeological sites, dense vegetation cover and visibility constraints sometimes distort heritage representations and any additional heritage resources located during consequent development phases must be reported to the Heritage Resources Authority or an archaeological specialist.

4. Heritage Impact Statement

Direct or primary effects on heritage resources occur at the same time and in the same space as the activity, e.g. loss of historical fabric through demolition work. **Indirect effects or secondary effects** on heritage resources occur later in time or at a different place from the causal activity, or as a result of a complex pathway, e.g. restriction of access to a heritage resource resulting in the gradual erosion of its significance, which is dependent on ritual patterns of access (refer to Section 10.3 in the Addendum for an outline of the relationship between the significance of a heritage context, the intensity of development and the significance of heritage impacts to be expected

It was established at desktop level that the project area subject to the Glencore Thorncliffe PGM and Chrome Plant Extension Project has been largely transformed and no heritage resources were identified in these areas in previous heritage studies pertaining to these areas (Coetzee 2008, Kruger 2014). Archive maps and aerial images infer a landscape vastly transformed by historical and recent mining and industrialization and the project area proposed for the platinum flotation plant and chrome plant expansions have been altered in totality over many years of human interference. Cognisant thereof, it is highly unlikely that sensitive heritage receptors or remnants remain at the site.

The following table summarizes potential impacts to the heritage landscape:

NATURE OF IMPACT: Impact could involve displacement or destruction of heritage material in the study area.		
	Without mitigation	**With mitigation**
EXTENT	Local	Local
DURATION	Permanent	Permanent
MAGINITUDE	Minor	Minor
PROBABILITY	Very improbable	Very improbable
SIGNIFICANCE	Low	Low
STATUS	Negative	Neutral
REVERSIBILITY	Non-reversible	Non-reversible
IRREPLACEABLE LOSS OF RESOURCES?	Yes	No
CAN IMPACTS BE MITIGATED?	Yes	
MITIGATION: Site monitoring.		
CUMULATIVE IMPACTS: Site monitoring by ECO.		
RESIDUAL IMPACTS: n/a		

Cognisant of known site distribution patterns in this section of the Steelpoort, and based on off-site and on-site observations and assessments, the author of this report is of the opinion that the proposed Glencore Thorncliffe PGM and Chrome Plant Extension Project and related construction activities will have no significant impact on heritage resources or the larger heritage landscape.

5. Recommendation and Conclusion

Following a detailed desktop assessment as well as on-site site scan of the prosed Glencore Thorncliffe PGM and Chrome Plant Extension Project footprint areas, the author of this document is of the opinion that the proposed project will not have an impact on heritage resources or the larger heritage landscape and it is recommended that the developer be exempted from further Phases of heritage and / or archaeological impact assessments for the environmental authorisation process, subject to final review and comment by the competent heritage authorities as well as provisions contained the **National Heritage Resources Act (NHRA - Act 25 of 1999**).

Considering the localised nature of heritage remains, the general monitoring of the development progress by an ECO or by the heritage specialist is recommended for all stages of the project. Should any subsurface palaeontological, archaeological or historical material, or burials be exposed during construction activities, all activities should be suspended and the archaeological specialist should be notified immediately.

6. Specialist Declaration of Independence

I, Nelius Le Roux Kruger, declare that –

- I act as the independent specialist;
- I am conducting any work and activity relating to the proposed project in an objective manner, even if this results in views and findings that are not favourable to the client;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have the required expertise in conducting the specialist report and I will comply with legislation, including the relevant Heritage Legislation (National Heritage Resources Act no. 25 of 1999, Human Tissue Act 65 of 1983 as amended, Removal of Graves and Dead Bodies Ordinance no. 7 of 1925, Excavations Ordinance no. 12 of 1980), the Minimum Standards: Archaeological and Palaeontological Components of Impact Assessment (SAHRA, AMAFA and the CRM section of ASAPA), regulations and any guidelines that have relevance to the proposed activity;
- I have not, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this declaration are true and correct.

Disclosure of Vested Interest

I do not have and will not have any vested interest (either business, financial, personal or other) in the proposed activity proceeding other than remuneration for work performed in terms of the Regulations.

Nelius Kruger

BA, BA Hons (Archaeology)

Heritage & Social Specialist, ASAPA Accredited Heritage Resources Practitioner

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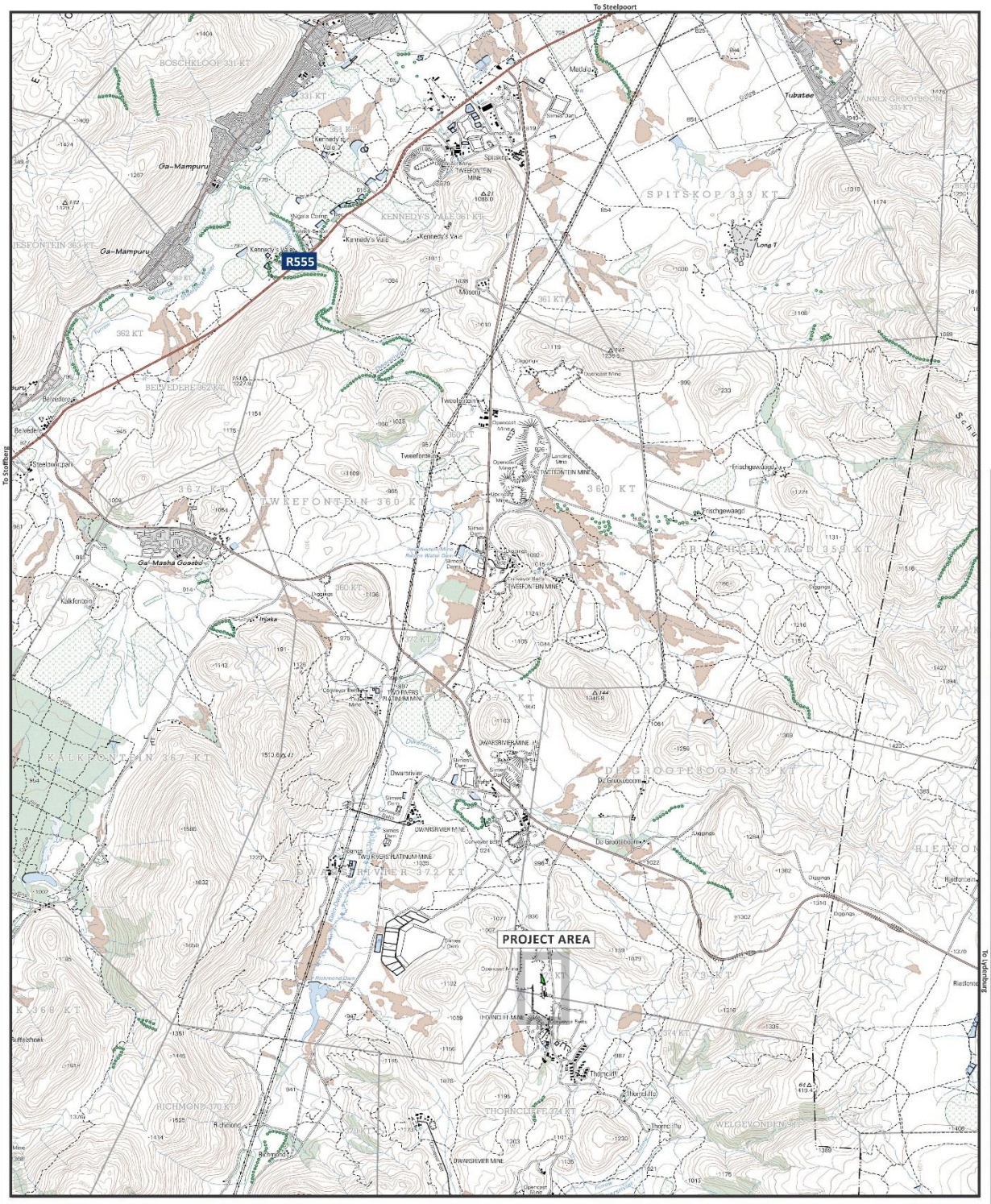


Figure 2: : 1:50 00 Map representation of the location of the Glencore Thorncliffe PGM and Chrome Plant Extension Project (sheet 2430CC)

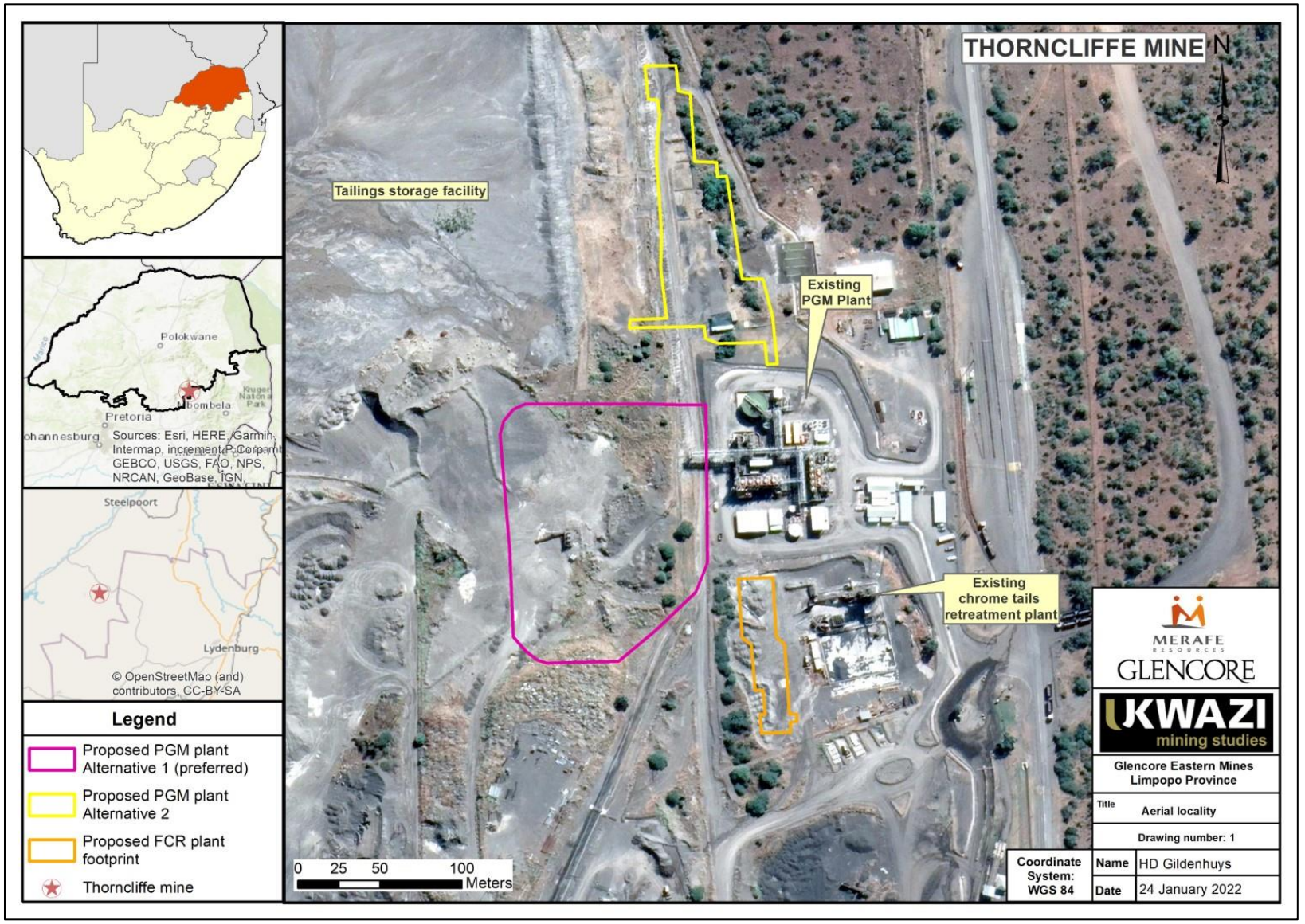


Figure 3: Aerial image indicating the project components subject to the Glencore Thorncliffe PGM and Chrome Plant Extension Project.

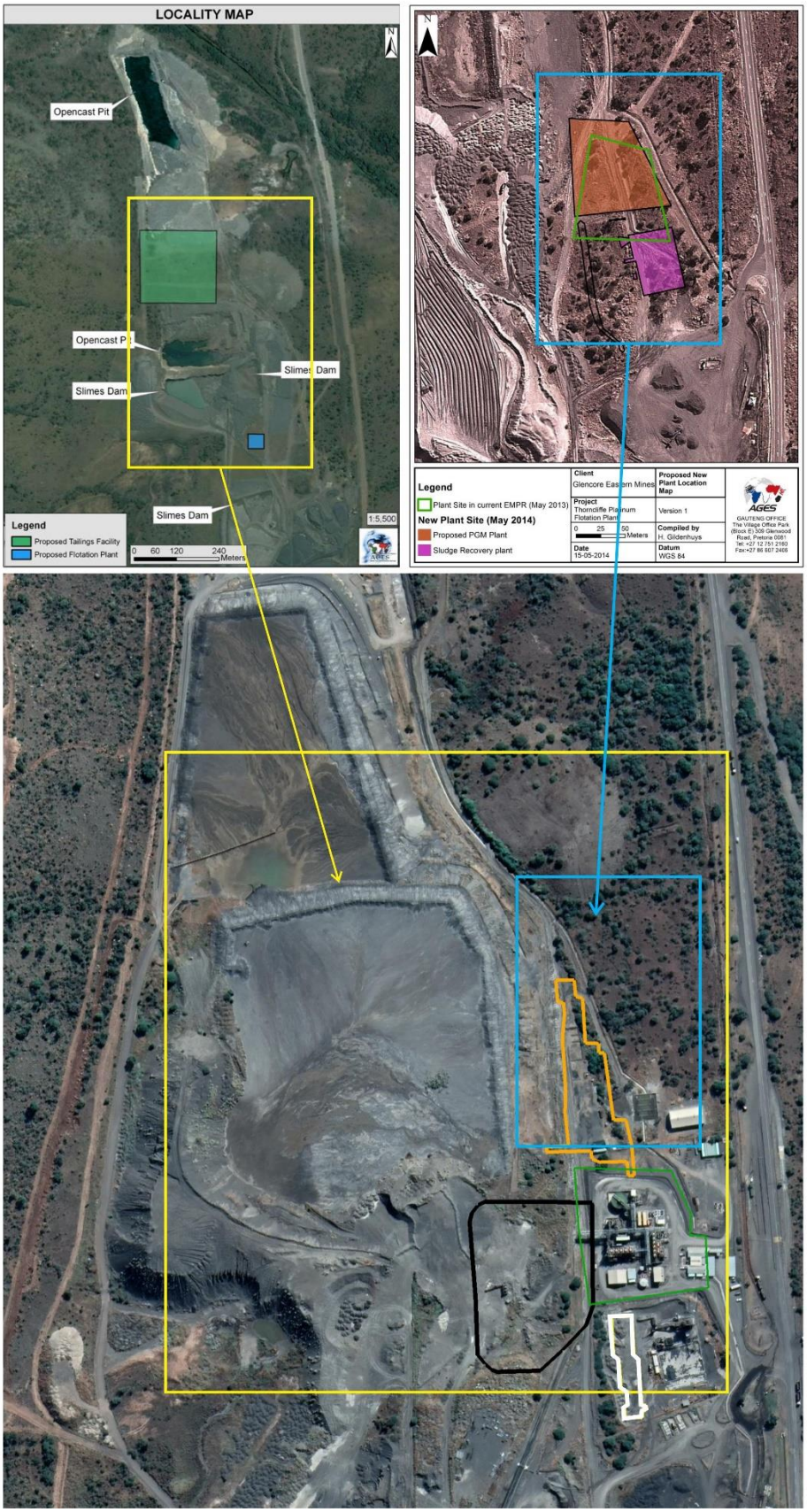
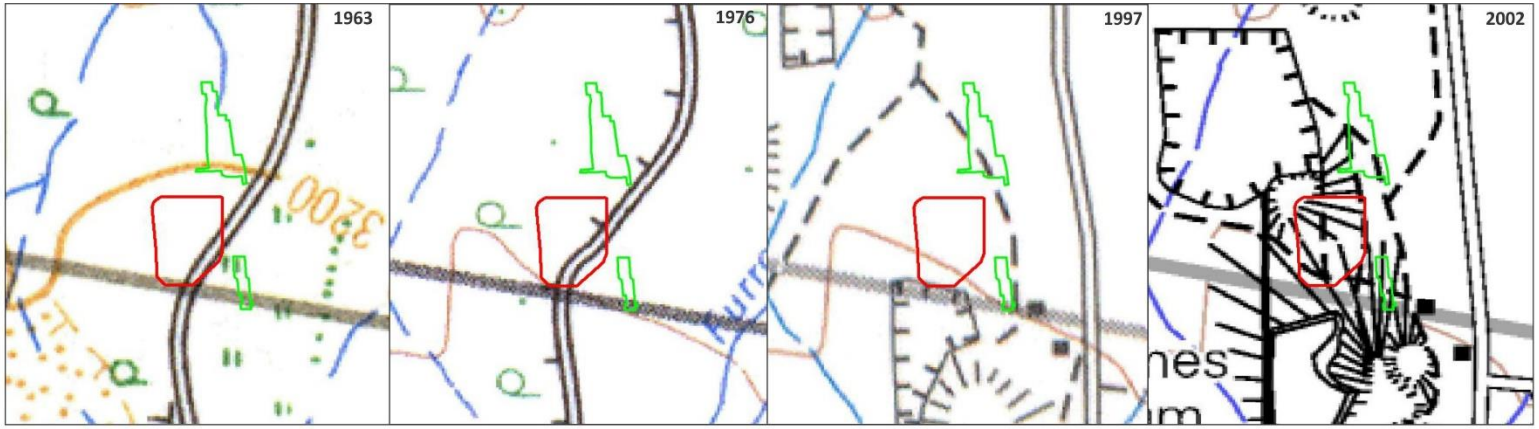


Figure 4: Aerial images indicating the scope of previous studies in the project area: Coetzee 2008 (survey area in yellow box) investigated the development of a proposed platinum flotation and tailings facility (top left) and Kruger 2014 (survey area blue box)) examined a new site for the proposed platinum flotation facility (top right). The project subject to this assessment is indicated on the bottom areal image.



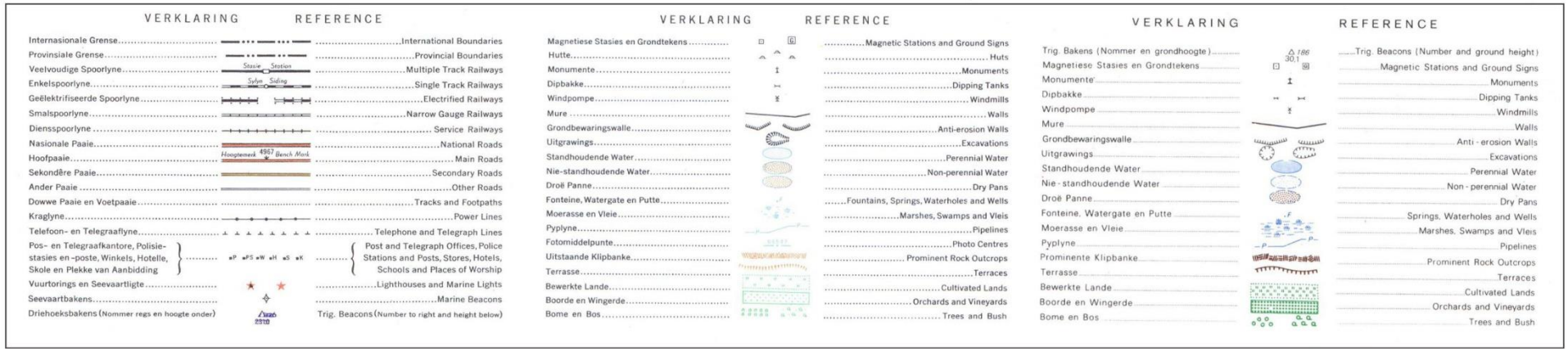


Figure 5: : A series of topographical maps indicating the project landscape as mapped in the past 60 years. Note the presence of mining infrastructure on later maps.

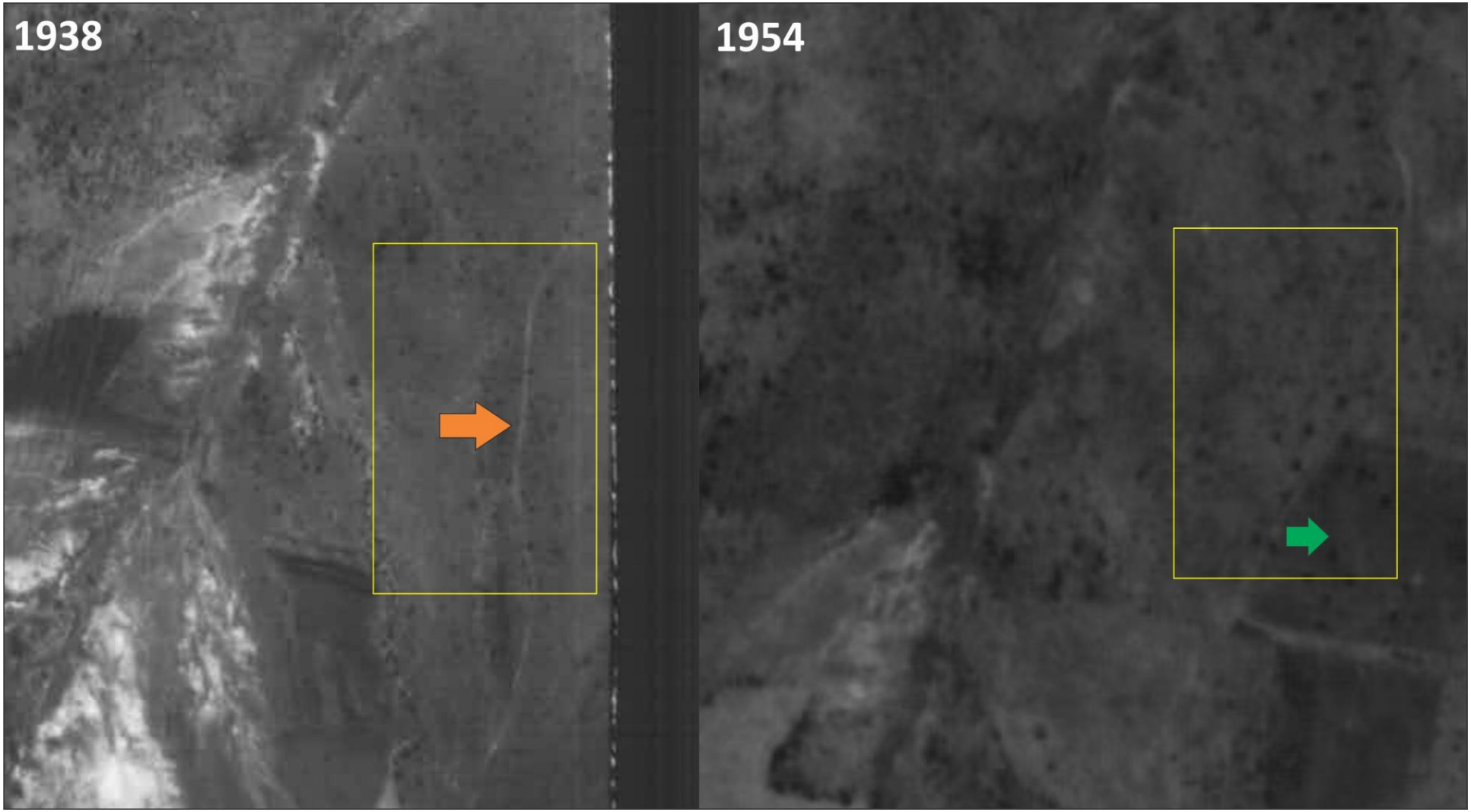


Figure 6: Historical aerial images of the project area (yellow outline), note the presence of an access road in 1938 and the existence of possible agricultural field sin 1954.

Figure 7: Views of the project area, note the presence of soil spill heaps.

Figure 8: Views of the project area, note the presence of a sludge catchment in the project area.

Figure 9: Views of the project area, note cleared surfaces and a temporary site office (right).

Figure 10: Views of the project area, at the PGM plant extension site Alternative 1 (Preferred).

Figure 11: : Views of the project area, at the PGM plant extension site Alternative 1 (Preferred).

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www.csg.dla.gov.za

accessed 2021-10-20

ADDENDUM A: SPECIALIST CV:

NELIUS LE ROUX KRUGER

BHCS Hons. (Archaeology)

PERSONAL DETAILS

Nationality:	South African
Date of Birth:	3 April 1979
Postal Address:	Postnet Suite 74, Private Bag x04, Menlo Park, 0102
Work Address:	70 Regency Dr, Route 21 Business Park, Centurion, 0178
Telephone numbers:	W: +27 12 751 2160 C: +27 82 967 2131
Identity number:	790403 5029 087
Languages:	English, Afrikaans, Sepedi (Basic)

HIGHER EDUCATION

University Attended:	University of the Pretoria
Degree Obtained:	BA Archaeology (Cum Laude) 2002
Major Subjects:	Anthropology, Archaeology, English, Afrikaans
University Attended:	University of the Pretoria
Degree Obtained:	BHCS Hons. Archaeology (Cum Laude) 2004

PROFESSIONAL AFFILIATIONS

Member of the Association for South African Professional Archaeologists (ASAPA).

Member of the Council of the Association for South African Professional Archaeologists (ASAPA): CRM Portfolio

Member of the CRM Section of the Association for South African Professional Archaeologists (ASAPA).

Member of the Society of Africanist Archaeologists (SAFA).

Member of the South African Museums Association (SAMA).

Accredited Professional Archaeologist & CRM Practitioner by the Association for South African Professional Archaeologists (ASAPA) & Heritage Natal (AMAFA).

HONOURS AND AWARDS

Aage V. Jensen Development Foundation (Denmark) grant for participation in the joint SAFA/PAA Congress, Dakar, Senegal (2010).

Five Hundred Years Initiative (NRF) Research Grant (2008 – 2009).

University of Pretoria post-graduate Merit Grant for MA studies in Archaeology (2004 – 2008).

University of Pretoria (CINDEK) bursary for post-graduate studies awarded by the Centre of Indigenous Knowledge (2003).

South African Archaeological Society's Hanisch Award for best graduate student in the Department of Anthropology and Archaeology at the University of Pretoria (2003).

University of Pretoria Academic Honorary Colours (2002).

University of Pretoria Graduate Merit Grant (2002).

University of Pretoria honorarium for archaeological collections management at the Department of Archaeology and

Anthropology (2001).

CURRENT STATUS

Heritage Resources Manager for Exigo Sustainability

Social impact Assessor and Research Associate for Exigo Sustainability

Associate and Unit Manager at Exigo Sustainability (formerly AGES Gauteng)

Part-time Lecturer (Archaeology) Department Anthropology and Archaeology (University of Pretoria)

SPECIALITY FIELDS

- Integrated Heritage and Archaeological Impact Assessment (Phase 1, 2 & 3), complying to SAHRA, PHRA and industry standards for heritage impact assessments.

- Industry standard Heritage Resources Management Plans, complying to SAHRA & PHRA standards for heritage impact assessments.

- Heritage destruction / alteration / excavation permitting facilitation and associated research.

- General facilitation in consultation and negotiation with heritage resources authorities (SAHRA, PHRA's).

- Heritage-related social consultation and focus group facilitation (for example, with Interested and Affected parties).

- Historical and anthropological studies.

- Heritage and Social Spatial Development Frameworks & Strategic Development Area Frameworks for municipalities.

- Industry standard and compliant Social Impact Assessments (SIA's).

- Mine Social and Labour Plans (SLP's)and social facilitation.

- Socio-cultural baseline studies and research.

- GIS and geo-spatial referencing and data analysis, heritage and social mapping.

PROFESSIONAL SKILLS & EXPERIENCE

Nelius Le Roux Kruger, an associate at Exigo Sustainability, is an accredited ASAPA (Association of Southern African Professional Archaeologists) archaeologist and Culture Resources Management (CRM) Practitioner with over 15 years' experience in the fields of heritage resources assessment, conservation management and social studies. In addition, he is involved in various aspects of social research and social impact assessment. He holds a BHCS (Hons) Archaeology degree from the University of Pretoria specializing in the Iron Age Farmer and Colonial Periods of South Africa. He has worked extensively on archaeological and heritage sites of the time periods and cultural contexts present in Southern Africa, both in the commercial and academics spheres and he holds vast experience in human remains relocation and related social consultation. Nelius has conducted social research projects across Southern Africa involving Social Impact Assessments as well as the compilation and monitoring of mining social and labor plans, public meeting facilitation and socio-cultural studies. His experience is not limited to South Africa and he has worked on archaeological and socio-cultural research projects across Africa and the Middle East. His publication record includes a number of academic publications in peer reviewed journals and books as well as a vast number of Heritage Management Reports. Nelius' expertise includes CRM assessment and management, applications in heritage legislation, Social Impact Assessment, social consulting as well as geospacing and Geographical Information Systems (GIS) applications in archaeology and CRM. Nelius is a conscientious and committed archaeologist and social scientist who is dedicated to the professionalism of the discipline of archaeology and social studies. He approaches all aspects of his specialst fields with enthusiasm, maintaining best practise at all times. When working with people, he strives to manage interpersonal communication and group dynamics with dedication, promoting positive group cohesion.

SELECTED PUBLICATIONS

Kruger, N. In Prep. Living the frontier: Ritual and Conflict in Ha-Tshirundu.

Kruger, N. 2016. Forthcoming. The Crocodile in his Pool: Notes on a significant find in the Ha-Tshirundu area, Limpopo Valley, South Africa. Nyame Akuma Bulletin of the Association of Africanist Archaeologists.

Antonites, A. & Kruger, N. et al. 2014. Report on excavations at Penge, a frst-millennium Doornkop settlement. Southern African Humanties 26:177-92

Antonites, A. & Kruger, N. 2012. A Preliminary Assessment of Animal Distribution on a 19th Century VhaVenda Settlement. Nyame Akuma Bulletin of the Association of Africanist Archaeologists. 2012:77

Kruger, N. In Prep. Living the frontier: Ritual and Conflict in Ha-Tshirundu.

Kruger, N. 2009. Forthcoming. The Crocodile in his Pool: Notes on a significant find in the Ha-Tshirundu area, Limpopo Valley, South Africa. Nyame Akuma Bulletin of the Association of Africanist Archaeologists.

Kruger, N. 2008. Ha Tshirundu: Landscape, Lived experience and Land Reform. Poster presented at the South African Association for Archaeologists Biannual Congress, Cape Town, March 2008.

Mathers, K. & Kruger, N. 2008. The Past is another Country: Archaeology in the Limpopo Province in Smith, A. & Gazin-Schwartz, A (Eds.). 2008. Landscapes of Clearance: Archaeological and Anthropological Perspectives. California: Left Coast Press

SELECTED PROJECTS

NATIONAL

- Phase 1 Heritage Impact Assessment (HIA) and further heritage management for the upgrading of the Warrenton Anglo Boer War blockhouse, Warrenton, Northern Cape Province

- Phase 1 Heritage Impact Assessment (HIA) and Phase 2 Site Investigation for the restoration of the old Johannesburg Fort, Constitution Hill, Johannesburg, Gauteng Province

- Phase 1 Heritage Impact Assessment (HIA) and further heritage management for the upgrading/refurbishment of the Burgershoop MPCC, Mogale City, Gauteng Province

- Phase 1 Heritage Impact Assessment (HIA) of historical period heritage sites on the farm Roodekrans, Dullstroom area, Mpumalanga Province

- Phase 1 Heritage Impact Assessment (HIA) of a historical bridge on the farm Pienaarspoort 339jr at Delfsand, Gauteng Province

- Phase 1 Heritage Impact Basements (HIAs) for 20 PV Solar Parks on location at Upington, Kimberley, Vryburg, Kuruman, Kathu, Hotazel, Douglas, Groblershoop and Prieska, Northern Cape Province, South Africa.

- Phase 1 Heritage Impact Assessments (HIAs) for 18 large scale water supply projects on location at East London, Mthatha, Ngcobo, Barley East, Elliot, Cathcart, King Williams Town and Mdantsane, Eastern Cape Province, South Africa.

- Phase 1 Heritage Impact Assessments (HIAs) for more than 40 residential infrastructure developments across South Africa.

INTERNATIONAL

- Heritage Impact Assessment for the Kitumba Copper-Gold Project (KCGP), Zambia

- Heritage Scoping Study for the BTR Kitumba Project, Mumbwa, Zambia

- Heritage Scoping Study for the Buckreef Gold Project, Geita, Tanzania

- Phase 2 mitigation and heritage assessment of the Koidu Monkey Hill Iron Age metallurgy site, Koidu Diamond Mine, Sierra Leone

- Phase 2 heritage site mitigation of the Sessenge archaeological site, Kibali Gold Mine,Democratic Republic of the Cong