Site Sensitivity Verification (SSV) Report

For the Proposed Casteel Dam Safety Rehabilitation Project, Farm Kasteel 231-JU, Bushbuckridge, Ehlanzeni District, Mpumalanga Province

DFFE Application Reference: Pending

Prepared for:

water & sanitation

Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

Department of Water and Sanitation
Infrastructure Management Branch
Directorate: Strategic Infrastructure Asset Management

Prepared by:

NEC NALEDZI ENVIRONMENTAL CONSULTANTS (Pty) Ltd

Naledzi Environmental Consultants (Pty) Ltd

Report date: 20 June 2023

Site Sensitivity Verification Report for the Proposed Casteel Dam Safety Rehabilitation Project, Farm Kasteel 231-JU, Bushbuckridge, Ehlanzeni District, Mpumalanga Province

Report prepared by:

This report has been prepared by Naledzi Environmental Consultants (Pty) Ltd.

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Naledzi is an independent environmental consultancy with no vested interest (either business, financial, personal or other) in the proposed activity proceeding other than remuneration for work performed in terms of the National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA).

Report prepared for:

This report has been prepared for the Department of Water and Sanitation, Sub-directorate: Dam Safety Surveillance.

water & sanitation
Department:
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1. INTRODUCTION

The DWS, Directorate: Strategic Infrastructure Asset Management through its Dam Safety Rehabilitation Programme proposes to conduct rehabilitation works at its Casteel Dam to address safety risks identified through a routine Dam Safety Evaluation. Casteel Dam is located within the jurisdiction of Bushbuckridge Local Municipality just south of Acornhoek along the Bushbuckridge-Acornhoek Road (R40) between Casteel and Arthur's Seat settlements within the Ehlanzeni District of Mpumalanga Province. The rehabilitation work is proposed on the Remainder of the farm Kasteel 231-JU accessed immediately off the R40 via an existing gravel road routing to the dam embankment. (Figure 1, 2 and 3 page 2 - 4).

The rehabilitation works will cover an area of 30 795m^2 and will be carried out within the same location as the original dam (i.e., spillway section, dam embankment). The existing access road will be upgraded as part of the rehabilitation works (i.e., less than 1km, 6m wide) and an additional short access road would need to be created to the spillway section on the right flank of the dam via Casteel settlement (less than 300m, no more than 4m wide). The construction team will also require a 0.9 ha site establishment area / laydown area north-east of the dam to accommodate site offices. DWS Chief Directorate: Construction management will execute the construction works and source all their material from a licensed commercial quarry. The construction period is estimated to be 24 months. Figure 4 illustrates the area of rehabilitation works superimposed on Satellite imagery.

The project will require the removal of indigenous vegetation (wetland and terrestrial) for the rehabilitation works and site establishment area below the dam wall and north east of the dam. The project therefore involves the undertaking of listed activity scheduled under GN R. 327 (activity 19 and 27) and GN R. 324 (activity 4, 12 and 14) published under the National Environmental Management Act, 1998 (Act 107 of 1998), Environmental Impact Assessment (EIA) Regulations of 2014 (GNR 326, 7 April 2017). An environmental authorisation is required subject to a Basic Assessment (BA) process and public participation in terms of Regulation 16, 19 and 39-44 of the EIA Regulations. The applicant is a state department consequently the application was submitted to the National Department of Forestry, Fisheries and Environment (DFFE) in Pretoria in June 2023.

Naledzi Environmental Consultants Pty Ltd is the appointed independent environmental assessment practitioner (EAP) undertaking the BA and public participation process (PPP) for the project.

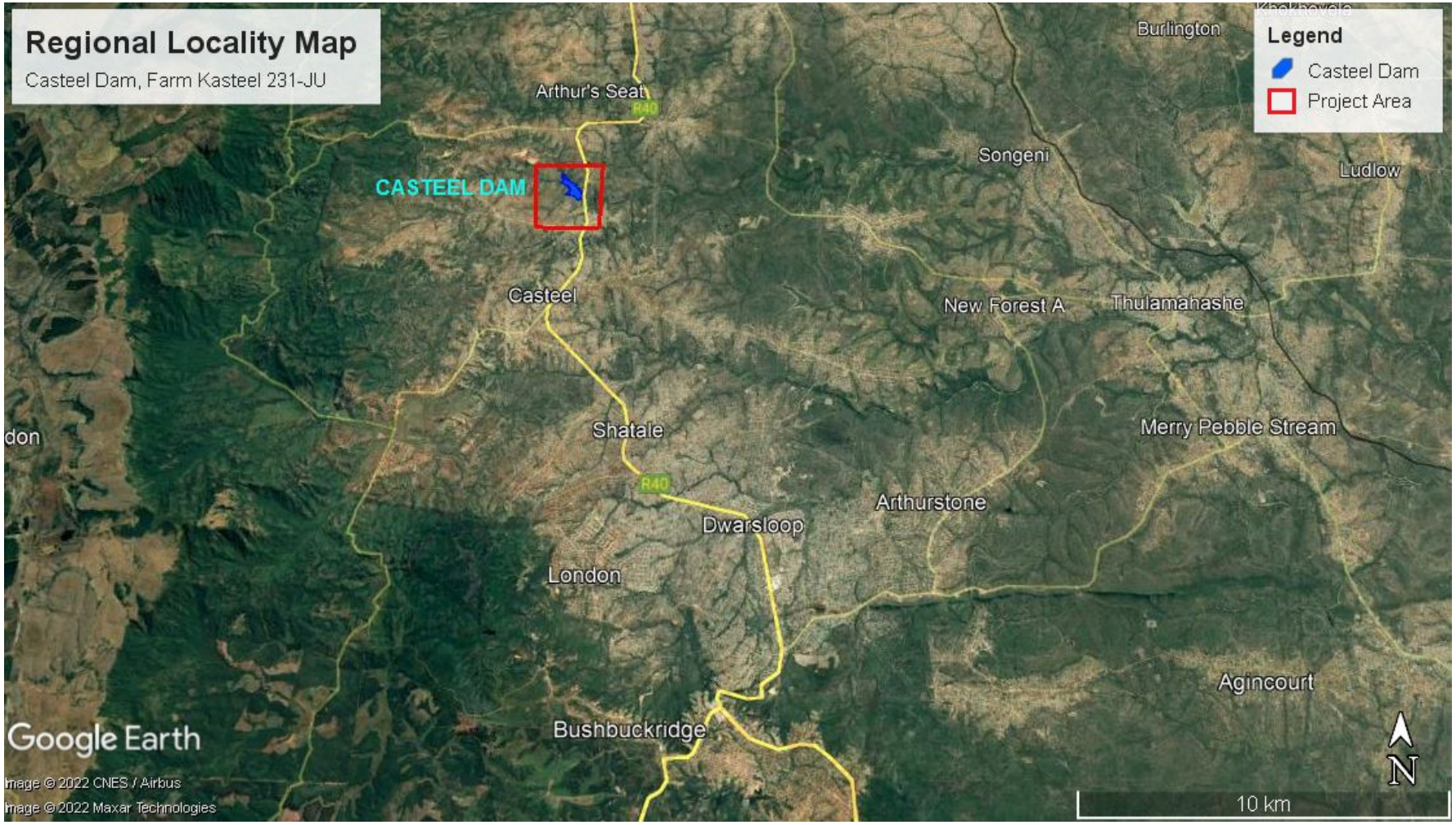

Figure 1 Google Earth Satellite Image showing the regional location of the Casteel Dam (red polygon) 15km North of Bushbuckridge Town along the R40 Bushbuckridge-Acornhoek Road.

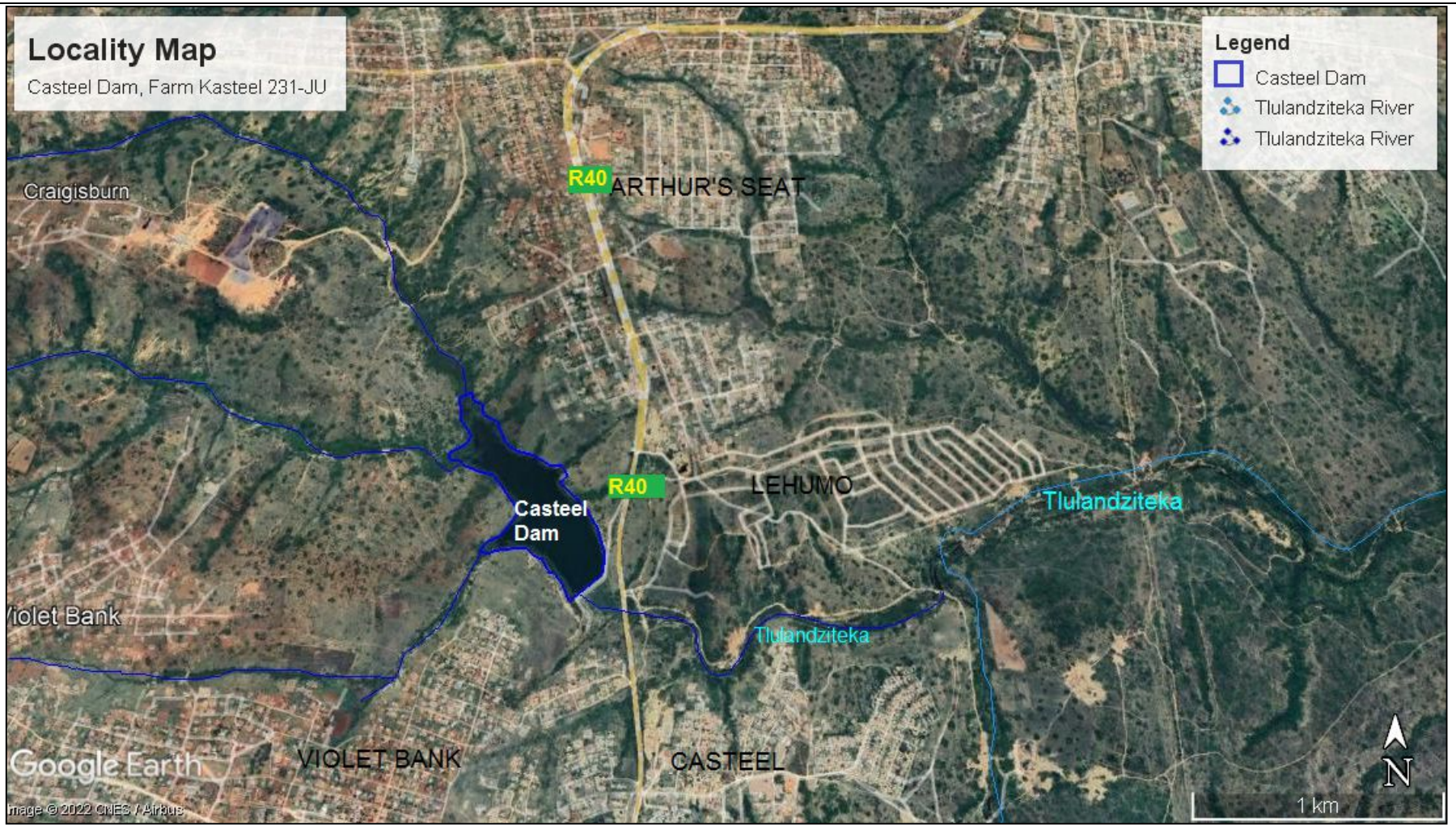

Figure 2 Google Earth Satellite image showing the location of Casteel Dam in the Tlulandziteka River along the R40 Road between Arthur's Seat and Casteel settlements.

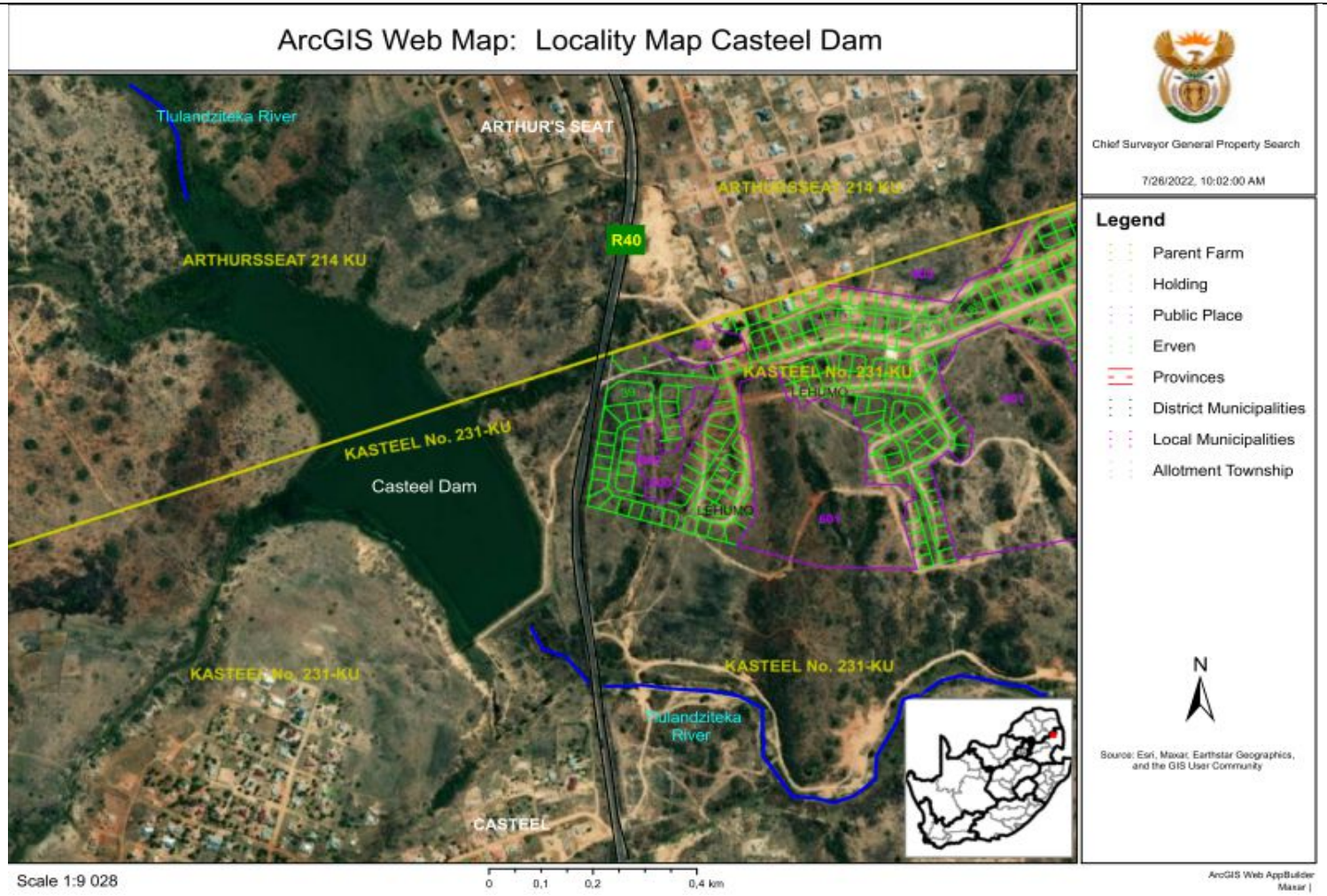

Figure 3: Chief Surveyor General Property Map showing the location of Casteel Dam on the parent farm Kasteel 231-JU.

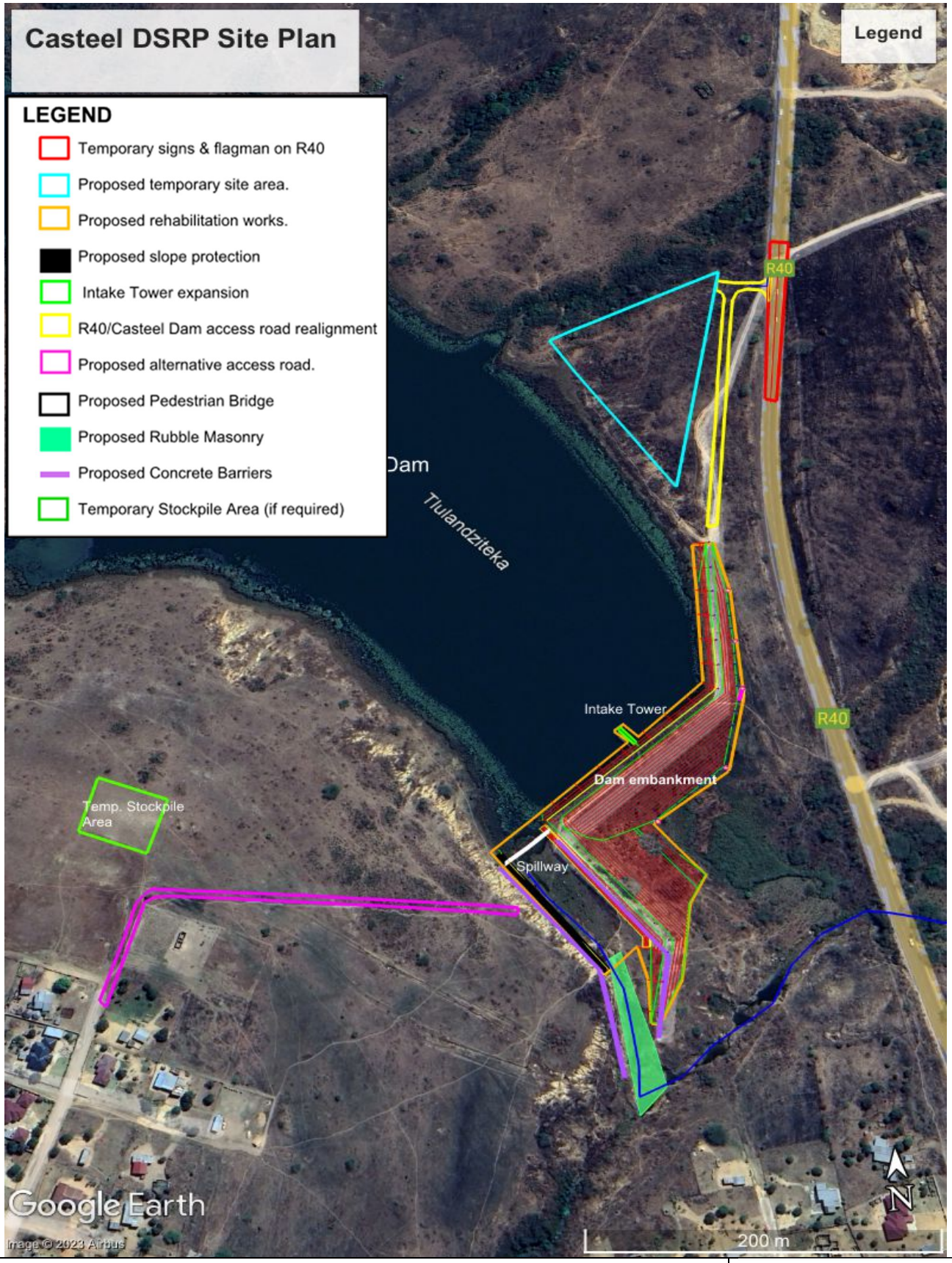

Figure 4: Google Earth Satellite image showing the location of the proposed rehabilitation works (red polygon) and site establishment area (green polygon) including the access roads to be used during the construction period.

2. PURPOSE OF THIS REPORT

Regulations 16 (1)(b)(v) of the EIA Regulations of 2014 requires the submission of a national web-based environmental screening tool report (STR) (GNR. 960 / 05 July 2019), when applying for an environmental authorisation. The STR is generated from the DFFE national online GIS-based 'National web-based Environmental Screening Tool' and provides detail on the environmental sensitivity, and specific requirements, including specialist studies that apply to a proposed development site, based on the national sector classification and the environmental sensitivity of the site.

Before commencing with the BA process, the EAP must undertake site sensitivity verification (SSV) in response to the sensitivity themes identified in the STR. The verification findings are recorded in a Site Sensitivity Verification (SSV) Report in line with the 'Protocols for Assessment and Minimum Report Content Requirements for Environmental Themes for Activities requiring Environmental Authorisation published in Government Notice Regulation 320 of 20 March 2020 under Section 24 (5)(a), (h) and 4 of the NEMA.

This is the SSV Report verifying the data in the National STR generated for the proposed Casteel Dam Safety Rehabilitation works. Herein the EAP confirms the site sensitivity themes and the required specialist assessments based on a desktop review of available geographic information and a site inspection.

3. APPLICANT DETAILS

Table 1: Applicant Details

Name:	Department of Water and Sanitation (DWS) Chief Directorate: Strategic Infrastructure Asset Management (SIAM) Sub-directorate: Dam Safety Surveillance
Contact Person:	Mr John Kgopiso (Director)
Address:	Sedibeng Building, 185 Francis Baard Street Pretoria, 0001
Contact details:	+2712-336-8726 KgopisoJ@dws.gov.za

The DWS, Directorate: SIAM is the custodian of all departmental dams and in charge of dam safety achieved through the Dam Safety Evaluation (DSE) and Dam Safety Rehabilitation Programme (DSRP).

The project site is registered to the National Government of the Republic of South Africa under Title Deed T9370/2012.

4. DETAILS OF ENVIRONMENTAL ASSESSMENT PRACTITIONER WHO PREPARED REPORT

Table 2: EAP Details

Environmental Assessment Practitioner Company:	Naledzi Environmental Consultants (Pty) Ltd
Contact Person:	Desmond Musetsho Marissa Botha
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Email :	dmusetsho@naledzi.co.za; botham@naledzi.co.za;
Qualifications and expertise of EAP:	Dr D Musetsho – More than 18 years of experience as an EAP (*PhD), Pr.Sci.Nat, M.Inst.D* M Botha - More than 18 years of experience as an Environmental Scientist and in Environmental Management. Registered Environmental Scientists *(Pr.Sci.Nat)*
Professional affiliation / registration:	**Dr Desmond Musetsho** SACNASP Registered EAP with EAPASA **Marissa Botha** SACNASP – Registered Environmental Scientist

See attached CVs of EAP and Environmental Scientist under Appendix B of Draft BAR.

5. SITE SENSITIVITY VERIFICATION

a. Requirements

The general requirements for site sensitivity verification for activities requiring environmental authorisation have been published in Government Notice Regulation 320 of 20 March 2020 under Section 24 (5)(a), (h) and 4 of the NEMA.

The protocols require that a Site Sensitivity Verification must be undertaken by an EAP or a specialist, prior to commencing with any specialist assessment for an EIA Study to verify the current land use and the environmental sensitivity of the site under consideration as identified by the national web based environmental screening tool (screening tool) and must include the following

a) Desktop analysis, using satellite imagery;
b) Site inspection
c) Any other relevant information which can inform the screening tool assigned sensitivity rating

The outcome of the site verification must be recorded in the form of a report that: -

a) Confirms or disputes the current use of land and the environmental sensitivity as identified by the screening tool, such as new developments or infrastructure, the change in vegetation cover or status etc.;
b) Contains a motivation and evidence (e.g. photographs) of either the verified or different use of the land and environmental sensitivity; and

c) Is submitted with the relevant assessment report in accordance with the requirements of the EIA Regulations.

b. Methodology

Naledzi has generated a National Screening Tool Report (STR) for the project site and verified the findings of the STR through a desktop spatial analysis, review of relevant environmental data for the project area and a site inspection conducted on 22 August 2022.

The Desktop Spatial Assessment was conducted to confirm the relevance of the environmental sensitivity themes and geographic areas identified in the STR using satellite imagery and various spatial datasets from various sources (i.e. provincial and national government, Ehlanzeni Bioregional Plan, Mpumalanga Biosector Plan, Mpumalanga Tourism and Park Agency, SAHRIS, Conservation Data, and SANBI BGIS).

The site inspection generated the required photographic proof required for the verified environmental sensitivities and confirmed land use for inclusion in the SSV Report.

6. SITE SENSITIVITY VERIFICATION RESULTS

7.1 National Screening Tool Report (STR) Findings

The STR has been generated for the project site provided in **Figure 5**. The STR was generated on in August 2022 and again in 26 April 2023 and is attached as **Appendix A**.

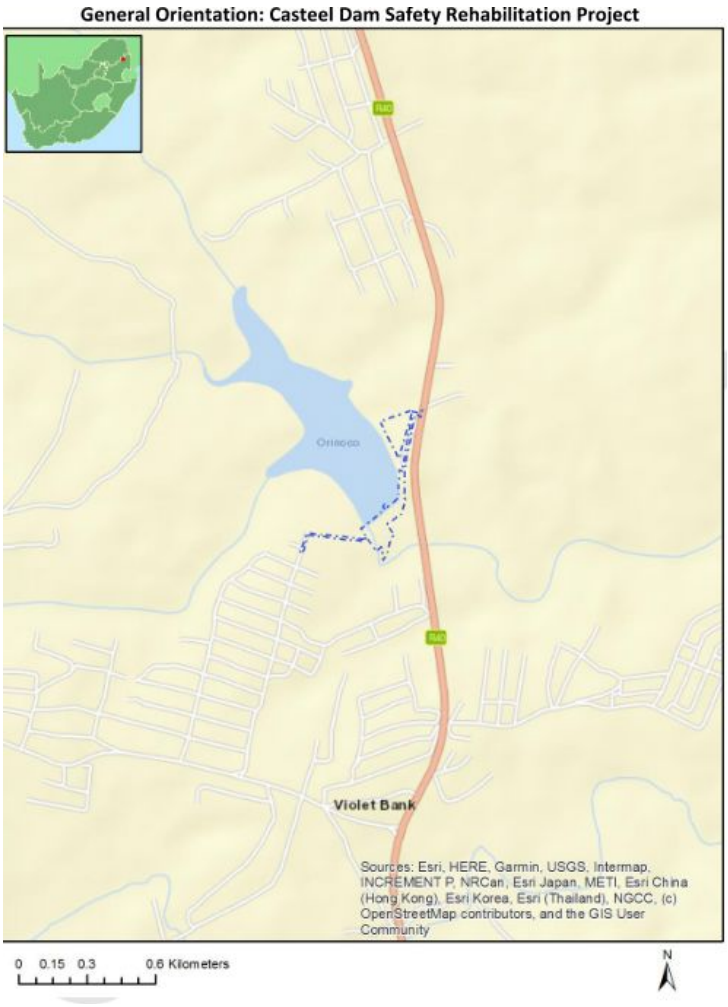

Figure 5: Map showing the application area for which the STR was generated

The STR notes the incentives, restrictions; exclusions or prohibitions that apply to the development site as well as environmental sensitivity themes on site associated with the application category '**Any activities within / close to a watercourse'.** The STR has a four tier environmental sensitivity rating which is associated with the level of assessment required to determine the possibility of impact management. The four tiers include Very High, High, Medium and Low Sensitivity in context of the project to the application site.

The STR for the application site generated from the National web based Environmental Screening Tool identified the following incentives, restrictions, exclusions or prohibitions:

- South African Conservation Areas

The STR also identified the following environmental themes sensitive for **activities located within or close to a watercourse:**

Very High Sensitivity
- Terrestrial Biodiversity
- Aquatic Biodiversity
- Very High Agriculture

High Sensitivity
- Civil Aviation

Medium Sensitivity
- Plant species
- Animal species
- Palaeontology

Low Sensitivity
- Archaeological and Cultural Heritage
- Defence

According to the National web Screening Tool, the site falls within the following geographic areas:

1. Protected Area Expansion Strategy
2. Terrestrial CBA
3. Aquatic CBA
4. Wetlands
5. Strategic Water Resource Area
6. FEPA Sub catchment
7. Freshwater Ecosystem Priority area – quaternary catchment

The STR identified the following specialist assessments for inclusion as part of the Basic Assessment Report for the project:
- Terrestrial Biodiversity Impact Assessment
- Aquatic Biodiversity Impact Assessment
- Visual Impact Assessment
- Archaeological Impact Assessment
- Palaeontological Impact Assessment
- Hydrology Assessment
- Socio Economic Impact Assessment

According to the STR it is the EAP's responsibility to confirm the list of specialist assessments and motivate the reason for not including any of the identified specialist studies including provision of photographic evidence of the site situation.

In cases where the EAP is of the opinion that a specialist study required according to the Screening Tool would be superfluous, motivation must be provided with the Basic Assessment Report. The SVR will cover this requirement.

7.2 Verification of STR findings

This section of the SVR serves to:

- Verify the land use and sensitivities identified in the STR; and
- Confirm/refute the sensitivity themes and need for various specialist inputs called for in terms of the STR ;
- Motivation and evidence of either the verified or different use of land and environmental sensitivity.

The verification findings are presented below and have been informed by:

- Desktop analysis of satellite imagery;
- Desktop Spatial Assessment (review of geographic information systems/data);
- Site Inspection undertaken on 22 August 2022;
- Specialist inputs (to be added end of September 2022, whereafter the SVR will be finalised).

7.2.1 Verified Land Use

The rehabilitation works area (Figure 7) has been transformed and comprises the existing Casteel Dam embankment, spillway channel and downstream slope. The upstream slope of the dam embankment, spillway and inner banks comprise hydrophytic vegetation (i.e., reeds). The main embankment and downstream slope comprise disturbed Granite Lowveld veld (i.e., re-established veld grass, low density Sicklebush) and a Channelled Valley Bottom Wetland below the dam embankment.

Indigenous trees are mainly present below the dam embankment i.e. Acacia tortillas / Umbrella thorn and numerous Sclerocarya birrea/Marula trees (national protected). Three protected plant species have been recorded onsite i.e., Marula (nationally protected), Barberton Aloe and Thick Leaved Gladiolus (provincially protected). The area west of the spillway channel is degraded through slope/embankment erosion. The dam wall is also infested with termites.

The site establishment area (Figure 6) is situated just west of the R40 Bushbuckridge/Acornhoek Road north east of the dam. The area is used for cattle grazing and several footpaths are evident throughout the site. The area is covered in disturbed Granite Lowveld bush with a moderate level of alien infestation. The vegetation mainly comprises veld grass, thick stand of Sicklebush (indicative of previously disturbed soils) and many small to medium sized Marula trees. This specific area has a higher population of Barberton Aloe.

The existing gravel road from the R40 is completely transformed. The area west of the spillway where the alternative access road is proposed (coming from Casteel settlement) are modified old lands previously used for subsistence crops but now lie fallow (Figure 8).

The photographic evidence is provided under **Appendix B**.

Figure 7: Rehabilitation works area superimposed on Google Earth Satellite imagery showing the site is covered in disturbed veld/open bushland, a CVB wetland and the Tlulandziteka River. The area has been disturbed in the past by the construction of the dam.

Figure 6: Site establishment area superimposed on Google Earth Satellite imagery showing the area is covered in veld/open bush land. Past disturbance is evident.

Figure 8 Proposed alternative access road required west of the dam to access the spillway channel on the right embankment.

7.2.2 Incentives, Restrictions, Exclusions or Prohibitations

According to the STR, the project site falls within a South African Conservation Area (**Figure 9).**

Based on desktop analysis of the South African Protected Areas Register the project site falls within the Kruger to Canyon Biosphere Reserve (**Figure 10**). It does however not fall within any proclaimed provincial nature reserves, national parks or any associated protected area buffer zones. According to the land-cover status quo map of the Biosphere Reserve (BR), the Casteel Dam falls within the Transitional Zone comprising woodland/open bush and wetland situated amid 'dense rural settlements.

The BR has undergone a drastic land cover change in the past few years wherein rural areas are becoming particularly denser along roadways (i.e. 39% increase since 2006) and human-impacted vegetation increased by 6.8%. Block losses of intact vegetation are a concern, by implication fragmentation with knock-on effects for ecosystem functioning within the BR. Currently agriculture, forestry and mining have significant repercussions for land-cover change in the BR[1].

The project does not involve changing the land use cover within the Biosphere Reserve Transitional Zone, it primarily includes rehabilitation works at the original dam and the site establishment area will only be temporary. The project will not impact the BR.

[1] Coetzer, Kaera & Erasmus, Barend & Witkowski, E. & Bachoo, Asheer. (2010). Land-cover change in the Kruger to Canyons Biosphere Reserve (1993– 2006): A first step towards creating a conservation plan for the subregion. South African Journal of Science - S AFR J SCI. 106. 10.4102/sajs.v106i7/8.221.

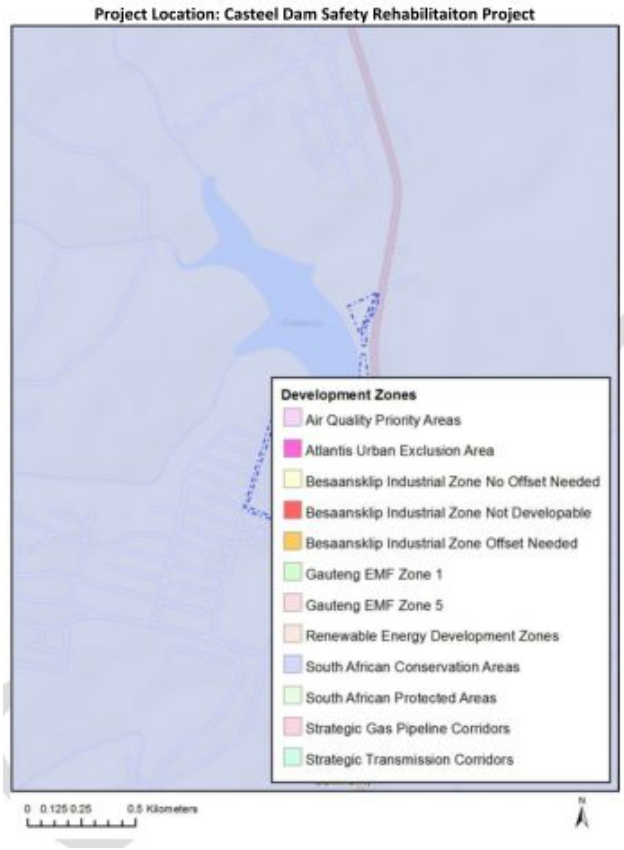

Figure 9 STR Restrictions, Exclusions Map

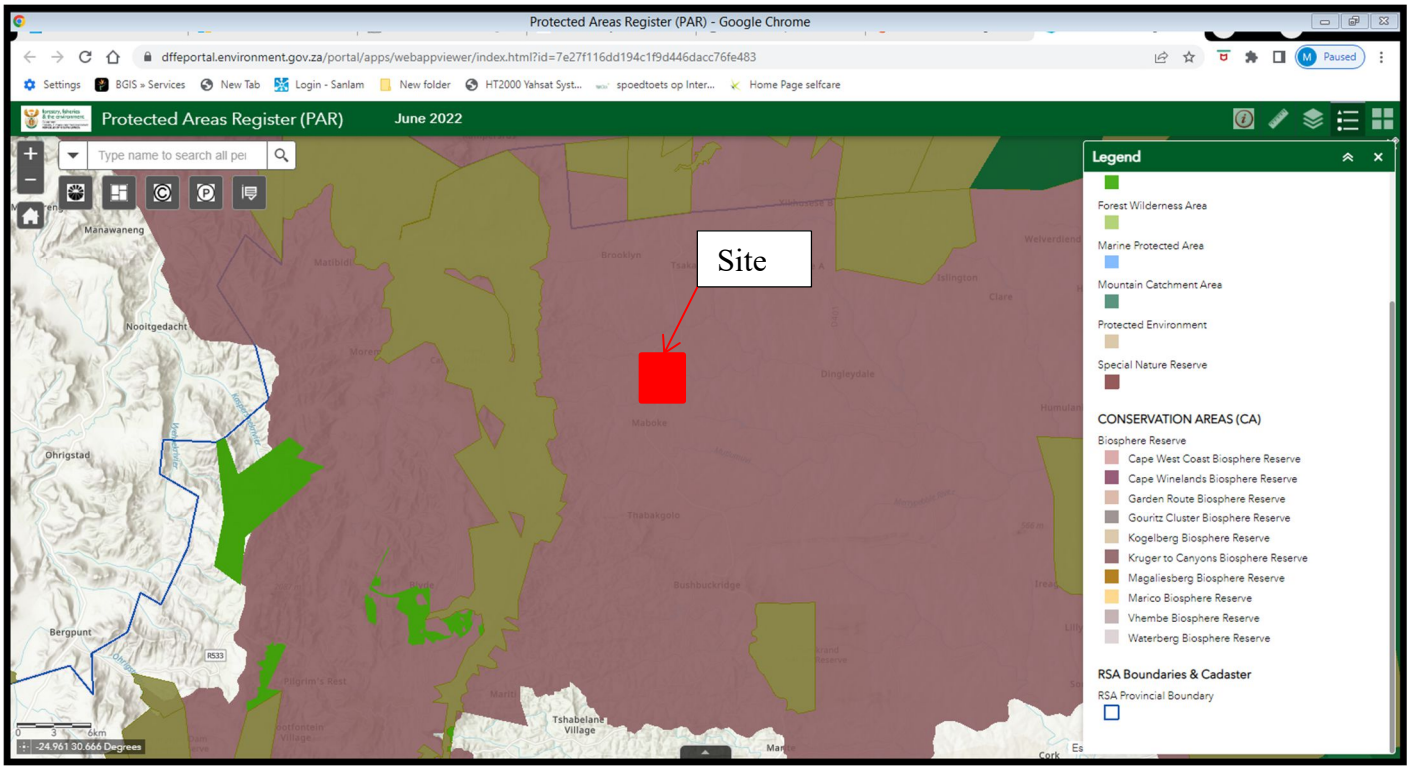

Figure 10: A screen shot from the DFFE South African Protected Areas Register portal showing the project site

Nature Reserve (Blyderiver Canyon) Kruger to Canyons Biosphere Reserve Forest Nature Reserve

7.2.3 Agricultural Sensitivity Themes

According to the STR map the project site is situated in an area of mostly high agricultural sensitivity due to the Moderate-High land capability (**Figure 11**). Based on a review of Google Earth satellite imagery the rehabilitation works area and site establishment area does not fall within any areas of agricultural production and is hemmed in by 'dense rural settlement'. Only the alternative access road proposed west of the spillway channel would pass through 'old modified fields' which have lied fallow for several years now. The project primarily involves rehabilitation works. No expansion is proposed which would decrease or impact agricultural potential land and the site establishment area would be temporary in nature.

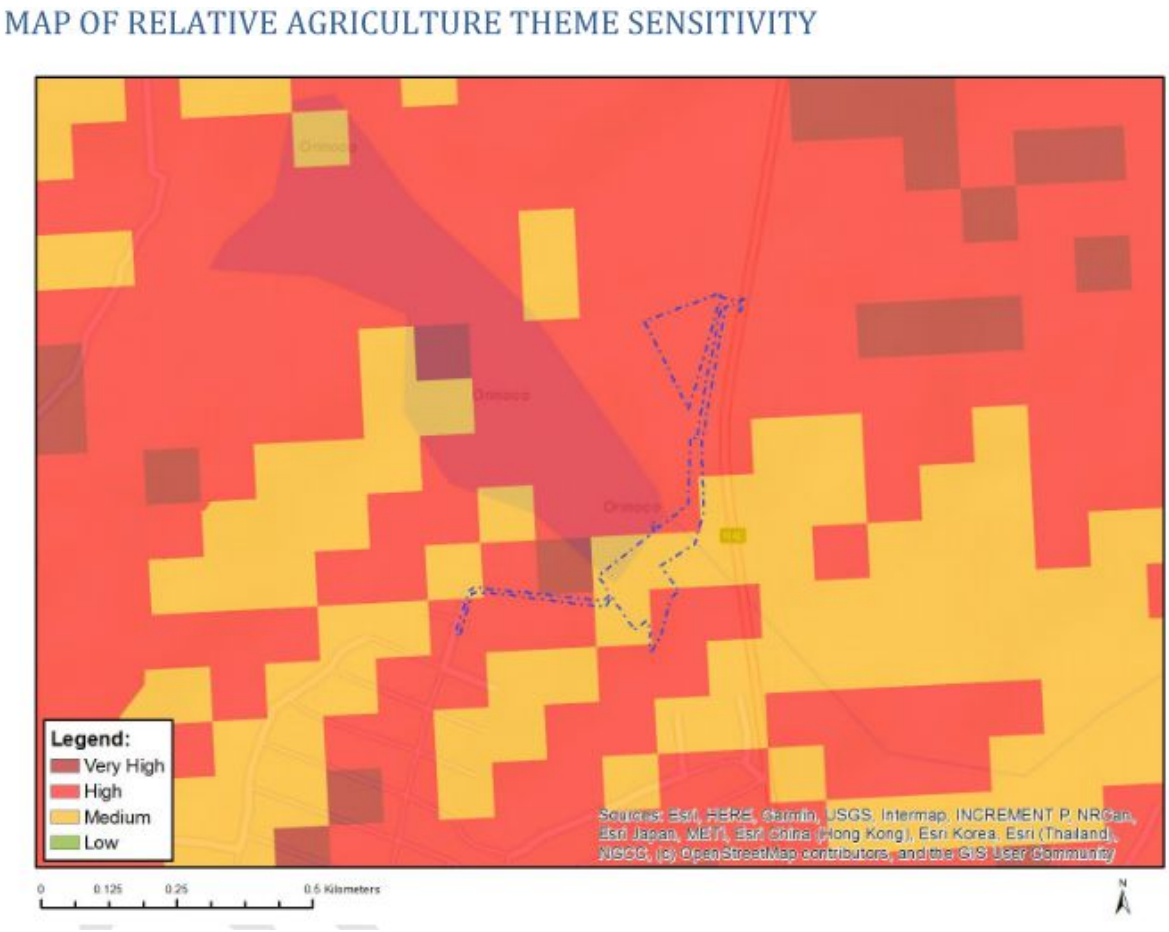

Figure 11 STR Agricultural Theme Map

The site verification undertaken on 22 August 2022 (late winter season) confirms the above and site photographs are provided under Appendix B. The project will not have any impact on agricultural activities or production. The old modified field west of the spillway traversed by the proposed alternative access road uncultivated and the road would be temporary. The EAP does not refute the agricultural sensitivity merely confirms it would not impact available agricultural land. The STR does not require an Agricultural Study to be included in the Basic Assessment Report.

7.2.4 Animal Species Theme

According to the STR the site has a moderate animal sensitivity theme (Figure 12) that requires an animal species assessment due to the possible presence of sensitive species i.e. Avifauna (Terathopius ecaudatus / Bateleur/Berghaan), Mammals (Acinonyx jubatus/ Cheetah; Crocidura maquassiensis/Makwassie Musk Shrew; Dasymys robertsii/ Robert's shaggy rat; Lycaon pictus/African Wild dog).

The above listed animal species can mostly be found in the nearby private nature reserves (Hoedspruit, Kamersrus and Kruger National Park). The site does not present suitable habitat for the above species due to the high disturbance levels and encroaching rural settlements, roads and therefore highly unlikely to occur.

The EAP disputes the sensitivity theme identified in the STR and should be recorded as low. A Terrestrial Biodiversity Impact Study inclusive of an animal species assessment was conducted for the project and included in the Basic Assessment Report.

Based on the Terrestrial Biodiversity site verification and field assessment conducted by Digital Earth represented by Duncan McKenzie (attached under Appendix E to the Draft BAR Report) the site is of 'Low' sensitivity. There is low likelihood of occurrence of the above listed species since these are not likely to venture this far from Kruger National Park and the high disturbance levels not optimal for species.

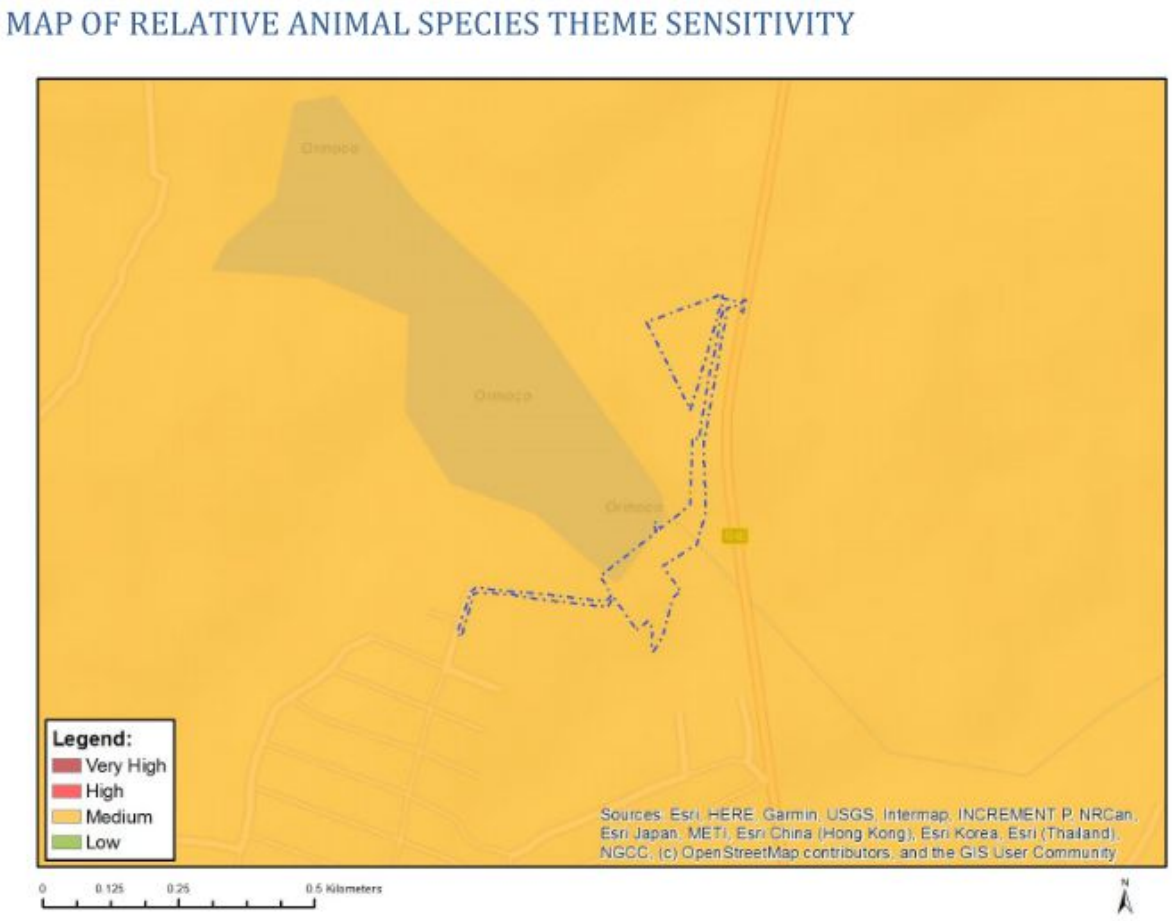

Figure 12 STR Animal Species Map

7.2.5 Aquatic Biodiversity Theme

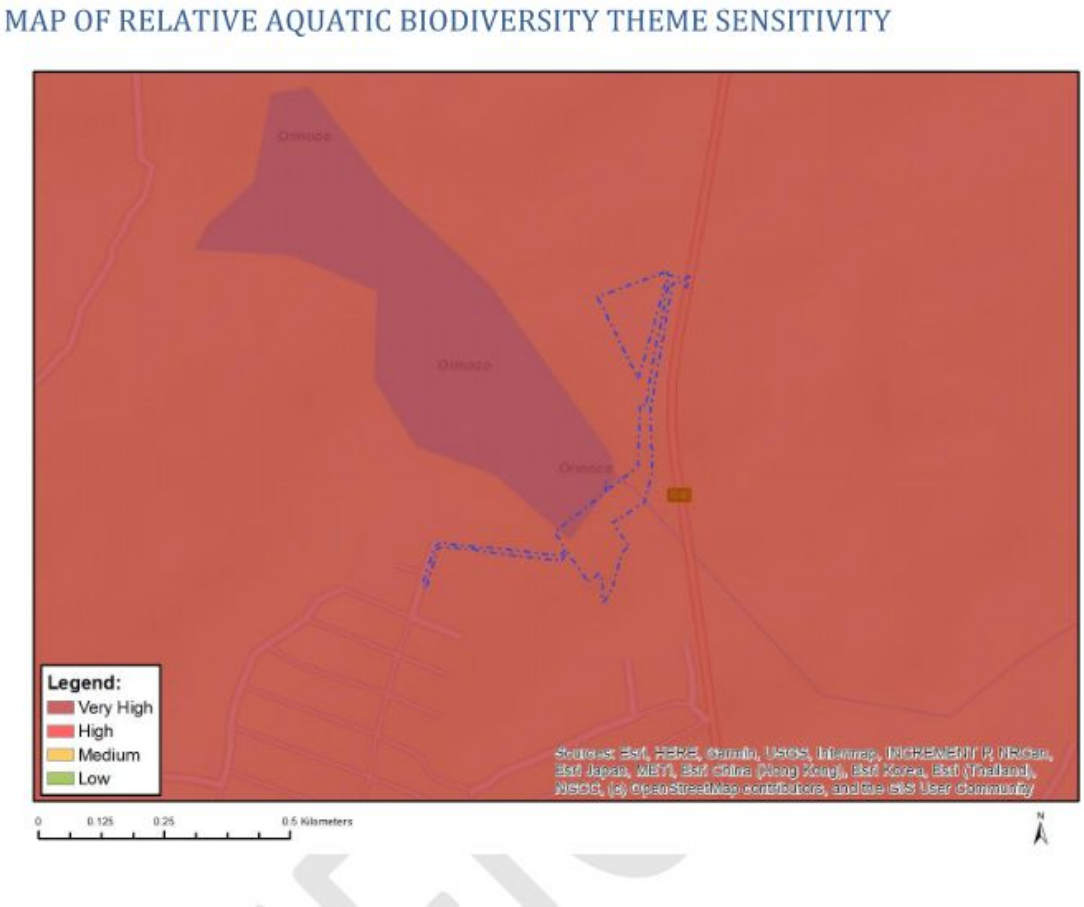

Figure 13: STR Aquatic Biodiversity theme map

According to the STR the site has a very high Aquatic Biodiversity sensitivity theme (**Figure 13**) and several aquatic features are present onsite for which an Aquatic Biodiversity Impact Assessment must be commissioned for inclusion in the Basic Assessment Report i.e.

- Aquatic CBA's
- Wetlands
- Freshwater ecosystem priority area quaternary catchments

Based on a desktop spatial assessment of the 2019 Ehlanzeni Bioregional Plan the site overlaps freshwater features i.e. CBA (Tlulandziteka River), ESA (Channeled Valley Bottom Wetland below dam wall), Dam and Ecological Support Area – Important sub-catchment (Sand River sub-catchment) (**Figure 14**).

According to the South African Inventory of Inland Aquatic Ecosystems (SAIIAE) National Wetland Map 5 spatial dataset, there is a Channeled Valley Bottom (CVB) Wetland below the dam embankment associated with the Thlulandziteka River where the rehabilitation works are proposed. The rehabilitation works and site establishment area also fall within 500 meters of several other CVB wetlands. The CVB wetland below the dam embankment is in a D/E/F condition which a considered to be in a 'Largely Modified' Present Ecological State (PES). The CVB wetlands within 500 meters of the project site are in a similar condition (**Figure 15**).

The NFEPA database confirms that the site falls within the Sand River Catchment (FEPA) which forms part of the Sabie River Catchment within quaternary drainage region X32A (FEPA). There is a Channeled Valley Bottom (CVB) wetland at the rehabilitation works area and the FEPA river namely Tlulandziteka River, which is rated as Class B, a 'Largely Natural' state.

The NFEPA 2011, SAIIAE and EDM Bioregional Plan datasets therefore confirms the screening tool findings and presence of these aquatic features.

Based on the site verification undertaken on 22 August 2022 (during late winter season), the features are present. The sensitivity rating for these Aquatic features is confirmed to be very high. Photographic evidence is provided under Appendix B. An Aquatic Biodiversity Impact Study was conducted for the project and is included in the Basic Assessment Report under Appendix E.

The specialist delineated only one natural Channelled Valley Bottom (CVB) Wetland in the direct area of influence, the rest are artificial in nature and not sensitive. The wetland is in a 'C - moderately modified' present ecological state (PES) but has a 'High' functional importance and so too are the ecosystem services derived from it.

The wetlands' main function is flood attenuation, sediment trapping, nutrient and toxicant assimilation and important to control erosion and provides direct human benefit i.e., fishing and water supply. A buffer zone of at least 50 m from the edge of the wetland is recommended for all activities that are not needed within the wetland. By releasing the appropriate flow of water downstream during the construction period the direct negative impact on the Dingley Dale Irrigation Scheme and other downstream water users can be managed/avoided. The project will not impact negatively on ecosystem services.

Casteel Dam has already incurred direct impacts on the aquatic habitats therefore the rehabilitation works will not have a significant further impact. The ecological function of the wetland can easily be restored by rehabilitating the disturbed area and controlling the spread of alien invasive vegetation.
One species of threatened fish was confirmed in the study area i.e., Mozambique Tilapia/Kurper/Bream, and is unlikely to be negatively impacted by the rehabilitation works.

The project is not expected to alter the PES of the wetland.

The Tlulanditeka River is 1.8km downstream of Casteel Dam is the indirect area of influence and has a 'Very High' Ecological Importance and Sensitivity (EIS) and is in a 'C – moderately modified' present hydrological state. The works are likely to have a measurable indirect impact on the ecosystem. The gazetted Ecological Reserve for the Tlulandziteka (Sand) River at EWR S7 for a Category C ecological state is 32.67% of the MAR. The minimum flows to be released from the dam during normal/high rainfall and drought periods are 10-32 litres/second and 8-16 litres/second respectively.

The specialist recommends the proposed rehabilitation works to be authorised provided that all mitigation measures contained in this report are complied with.

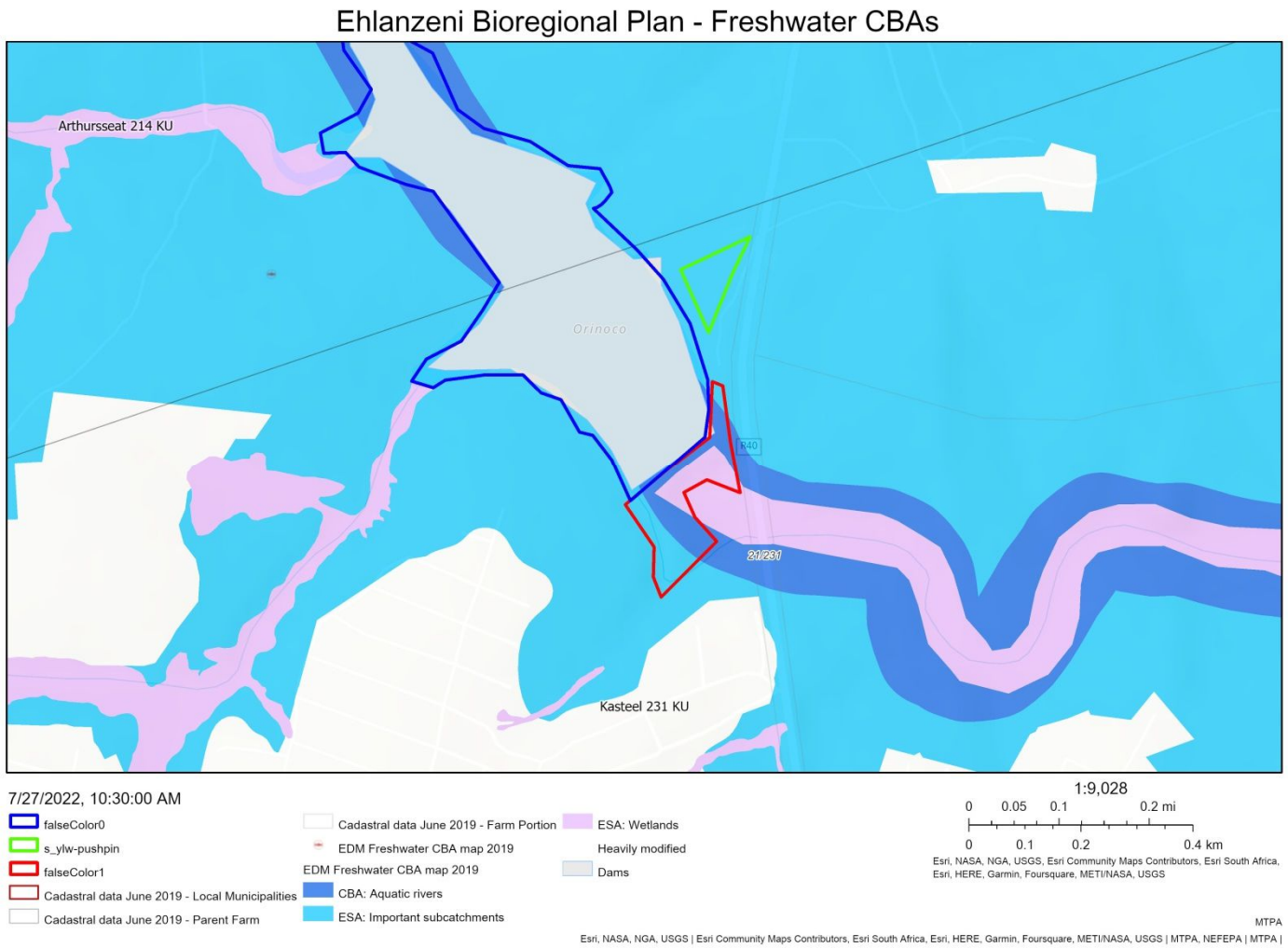

Figure 14: 2019 EDM Bioregional Plan Freshwater CBA Map Spatial Dataset superimposed on the project site. The site falls within a CBA Aquatic River, ESA (important sub catchment and wetland) and dam.

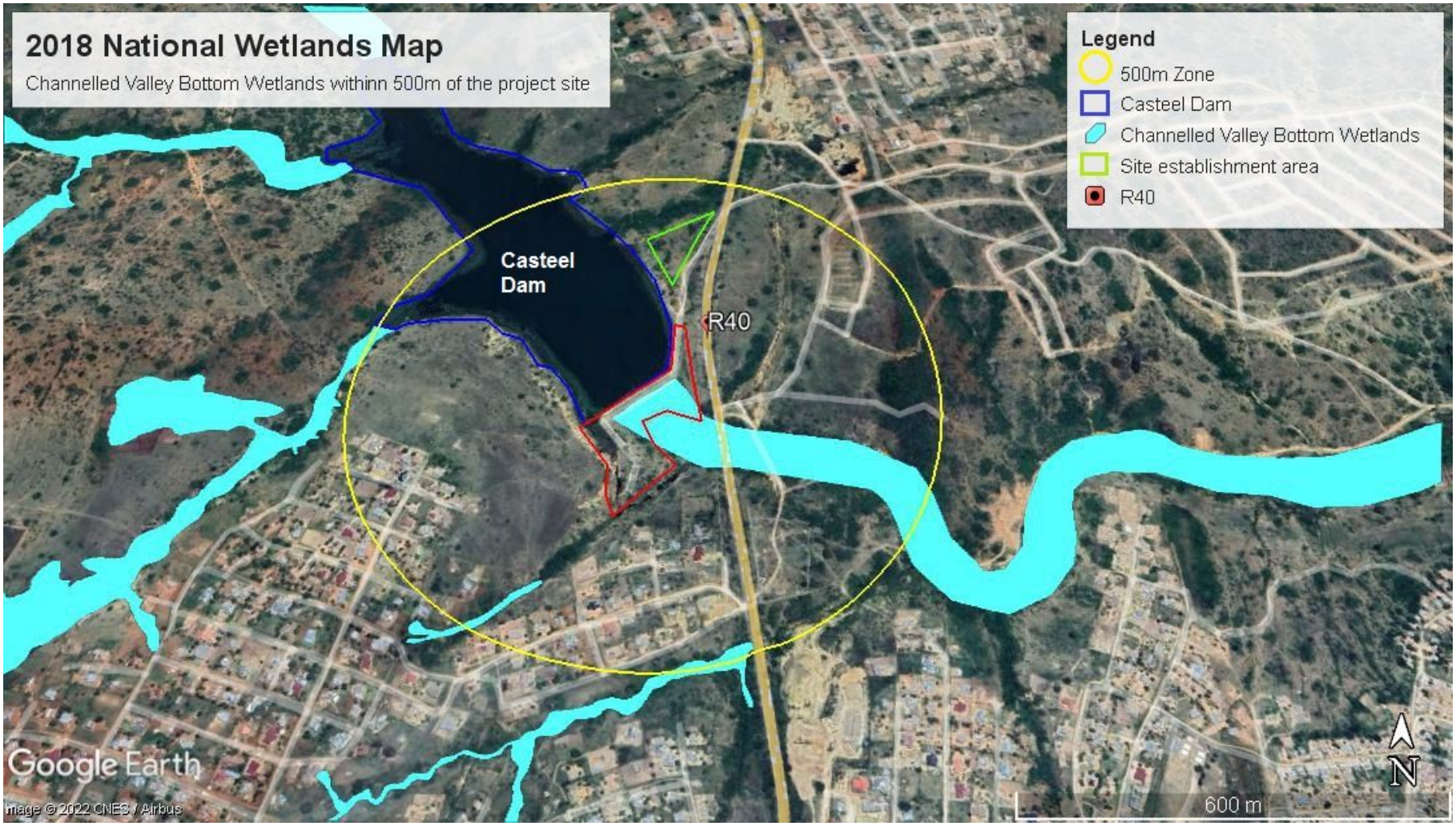

Figure 15: 2018 SAIIAE National Wetland Map 5 Spatial Dataset superimposed on the project site. There is a CVB wetland below the Casteel Dam embankment (area of works) and three other CVB wetlands within 500m of the project site.

7.2.6 Archaeological and Cultural Heritage Theme

According to the STR the site has a low 'Archaeological and Cultural Theme' (**Figure 16**) and requires a Heritage Impact Assessment Study for inclusion in the Basic Assessment Report.

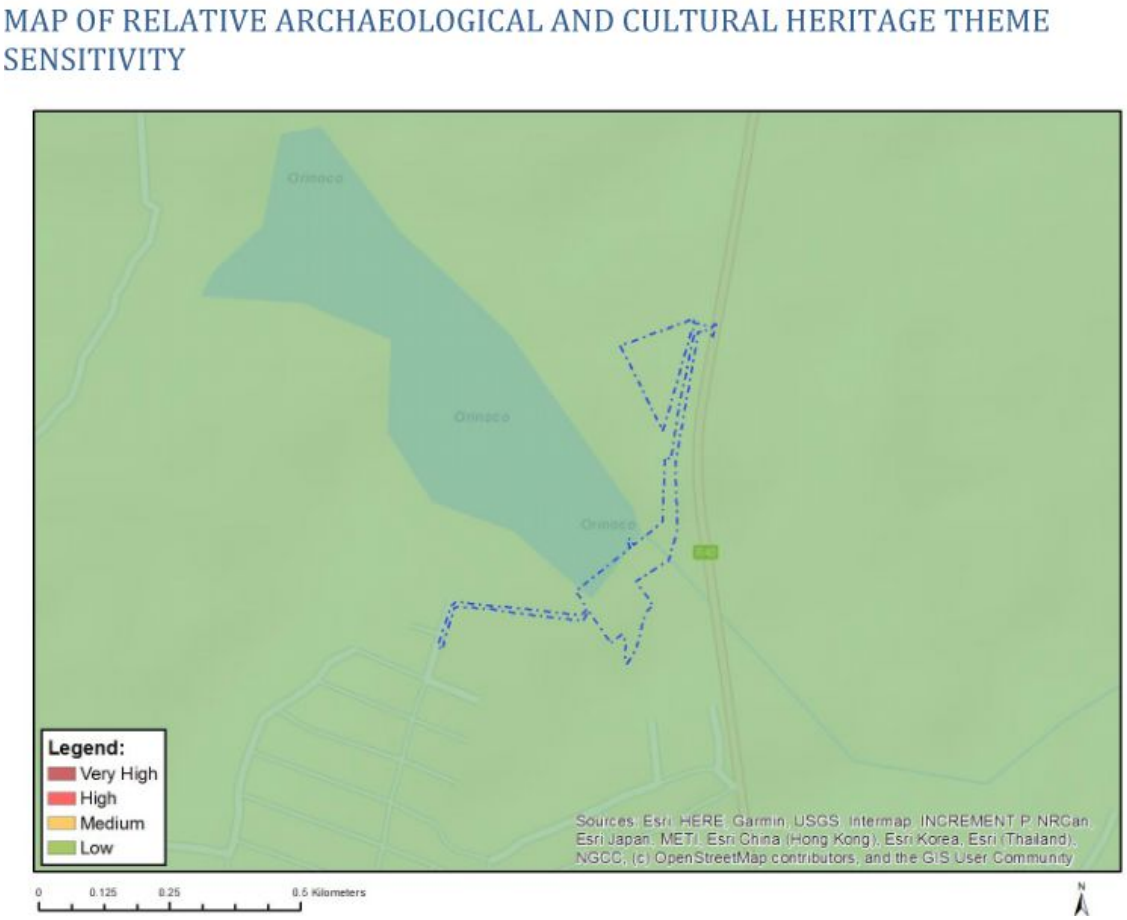

Figure 16: STR Archaeological and Heritage Theme map

Section 38 (1) of the National Heritage Resources Act of 1999 requires that a heritage impact assessment be undertaken for:

- Construction of a road, wall, power line, pipeline, canal or other similar forms of linear development of barrier exceeding 300m in length;
- Any development /activity that will change the character of a site (exceeding 5000m^2 in extent);
- Rezoning of a site exceeding 10 000m^2 in extent; or
- Any other development category provided for in regulations by SAHRA or a provincial heritage resources authority.

The dam was built in 1965 and the rehabilitation works will take place along the existing dam embankment where heritage resources are highly unlikely to occur due to past disturbance. The road upgrade will take place along an existing gravel road and the alternative access road west of the dam will pass through old modified lands. The site establishment area of 0.9 ha requires the removal of vegetation for temporary mobile site offices and a laydown area.

Naledzi conducted a two-hour site walkthrough on 22 August 2022 (winter season) and no cultural heritage resources were found. The 'low' archaeological and cultural heritage sensitivity, as stated in the STR, is therefore confirmed. An Archaeological Impact Assessment was conducted to confirm the finding and is included in the Basic Assessment Report under Appendix E.

7.2.7 Palaeontological Theme

According to the STR the site is of 'moderate' Palaeontological sensitivity due to the presence of medium sensitivity palaeontological features (**Figure 17**) and requires the inclusion of a Paleontological Study in the Basic Assessment Report.

However the STR was found to be incorrect since the SAHRIS Palaeontological (Fossil) Sensitivity Map shows that the site is of insignificant/zero 'Palaeontology Sensitivity' (**Figure 18**) based on the underlying sensitive geological formation as set out in the 1: 250 000 Geological Formation Maps as provided by the Council of Geoscience and requires no palaeontological studies.

According to the Geological Formation Map the site is underlain by Archaean Granite Gneiss Basement Formation (i.e. Cunning Moor Tonalite) which has no fossil heritage. The rock types and age of the Archaean Granite and Gneiss include intrusive granitoids, gneisses and mignatites. The Cunning Moor Tonalite lithology comprises grey, medium-grained equigranilar tonalite. The EAP therefore refutes the 'moderate' Palaeontology sensitivity theme and should be recorded as 'insignificant'. No Palaeontology Study is therefore required for the project.

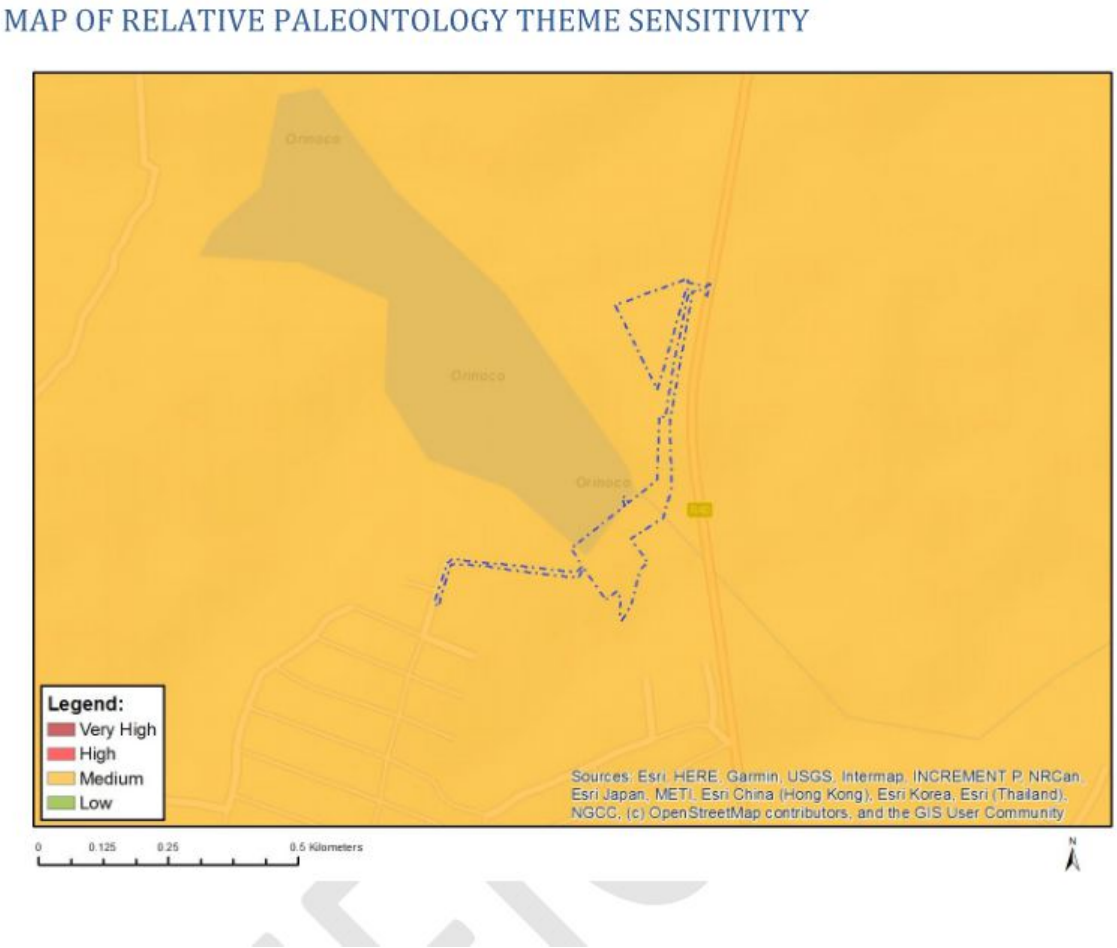

Figure 17: STR Palaeontological Theme map

Colour	Sensitivity	Required Action
RED	VERY HIGH	field assessment and protocol for finds is required
ORANGE/YELLOW	HIGH	desktop study is required and based on the outcome of the desktop study, a field assessment is likely
GREEN	MODERATE	desktop study is required
BLUE	LOW	no palaeontological studies are required however a protocol for finds is required
GREY	INSIGNIFICANT/ZERO	no palaeontological studies are required
WHITE/CLEAR	UNKNOWN	these areas will require a minimum of a desktop study. As more information comes to light, SAHRA will continue to populate the map.

Figure 18: Project site location superimposed on the SAHRIS Palaeontological Sensitivity Map illustrating that the site overlaps with a 'grey' area containing insignificant/zero fossil heritage.

7.2.8 Civil Aviation Theme

According to the STR the site has a high 'Civil Aviation Sensitivity Theme' because the site is located within a 'dangerous and restricted airspace as demarcated' and '8km to 15km of other civil aviation aerodrome' (**Figure 19**). The project site falls within the airspace of the Air Force Base Hoedspruit Aerodrome and in proximity to the Kruger National Park (NP10) according to the CAA NEMPAA National Parks and World Heritage Site Wall Chart which is considered a restricted airspace (**Figure 20**). Naledzi will solicit inputs from the Civil Aviation Authority during the Draft Basic Assessment Report public review period.

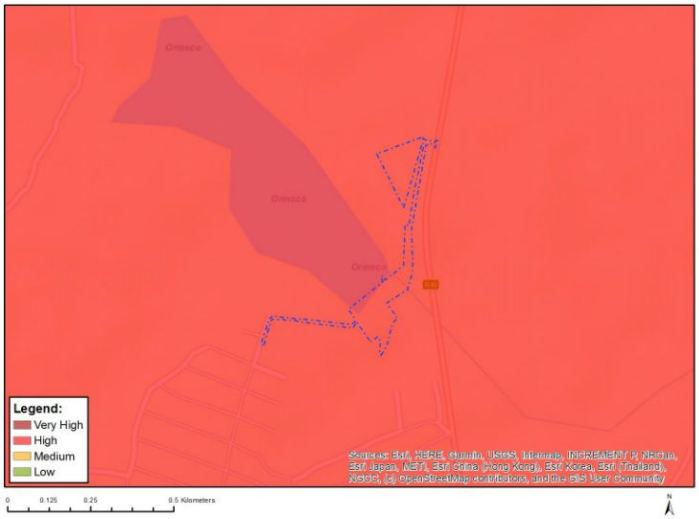

Figure 19: STR Civil Aviation Theme map

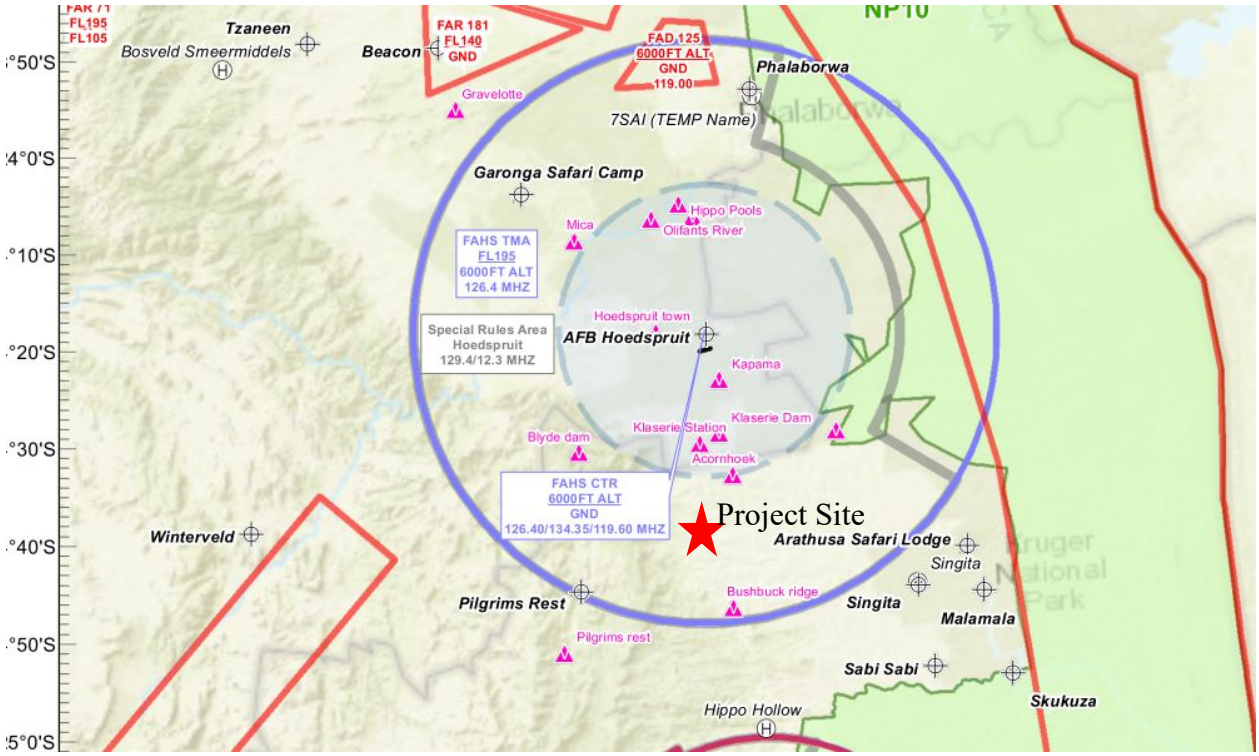

Figure 20: CAA NEMPAA NP and WHS Wall Chart showing restricted air spaces. The site is located in the AFB Hoedspruit restricted airspace

7.2.9 Defence Theme

According to the STR the site has a low 'Defence Sensitivity Theme' (**Figure 21**). No Defence assessment is required due to the low sensitivity. GNR 320 assessment protocols for defence themes states if the sensitivity is low no further assessment is required.

MAP OF RELATIVE DEFENCE THEME SENSITIVITY

Figure 21 STR Defence Theme Map

7.2.10 Plant Species Theme

According to the STR the site overlaps a low- moderate plant species sensitivity theme (**Figure 22**). Several species are listed for the application area (i.e. species 1252, 575) and the STR requires a plant species assessment/statement.

According to the 2018 National Vegetation Map the project site covers one vegetation type as described by Mucina and Rutherford, 2006. i.e. Granite Lowveld vegetation. The vegetation type is described as tall shrubland with few trees to moderately dense low woodland with sandy uplands with Terminalia sericea (Silver Clusterleaf / Vaalboom), Combretum zeyheri (Large-Fruited Bushwillow/Raasblaar) and C.apiculum (Red Bush Willow / Rooibos). Dense thicket to open savannah in bottomlands with Acacia nigrescens (Knob-thorn / Knoppiesdoring), Dechrostachys cinerea (Sicklebush/Sekelbos) and Grewia bicolor (White raisin / Witrosyntjie). The vegetation type is vulnerable, with a 19% conservation target. Only 20% is statutorily conserved in the Kruger National Park.

A Terrestrial Biodiversity Assessment Study was conducted for the project and is included under Appendix E of the Basic Assessment Report.

According to the Ecologist the species are rare in Mpumalanga and only degraded habitats are present and none were located during fieldwork. The Ecologist found the project site to be of 'Low' sensitivity due to the lack of SCC and high disturbance levels.

Three protected plant species have been recorded onsite i.e., Marula (nationally protected), Barberton Aloe and Thick Leaved Gladiolus (provincially protected). Destruction permits from the DFFE Forestry Regulation will be obtained regarding the removal of tree *Sclerocarya birrea* (Marula) prior to construction works. All specimens of *Aloe barbertoniae* within the project footprint should be dug up with their roots intact and transplanted into either adjacent habitat or used in landscaping/re-vegetation around the construction site.

The specialist does not object to the project provided that the DWS complies with the recommended mitigation measures contained in this report.

MAP OF RELATIVE PLANT SPECIES THEME SENSITIVITY

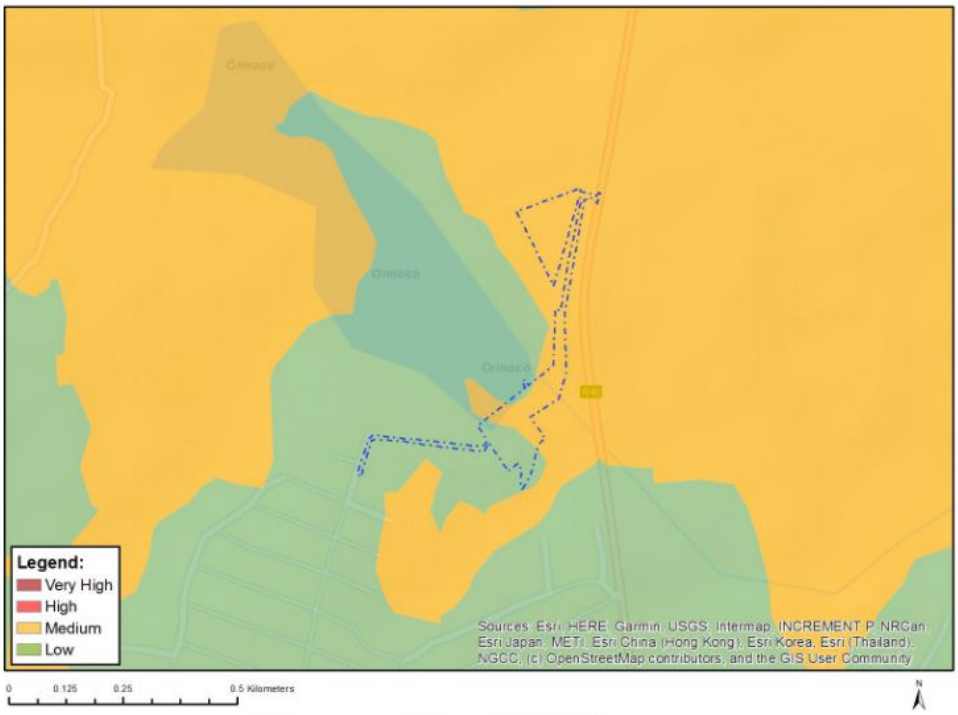

Figure 22: STR Plant Species Theme map

7.2.11 Terrestrial Biodiversity Theme

MAP OF RELATIVE TERRESTRIAL BIODIVERSITY THEME SENSITIVITY

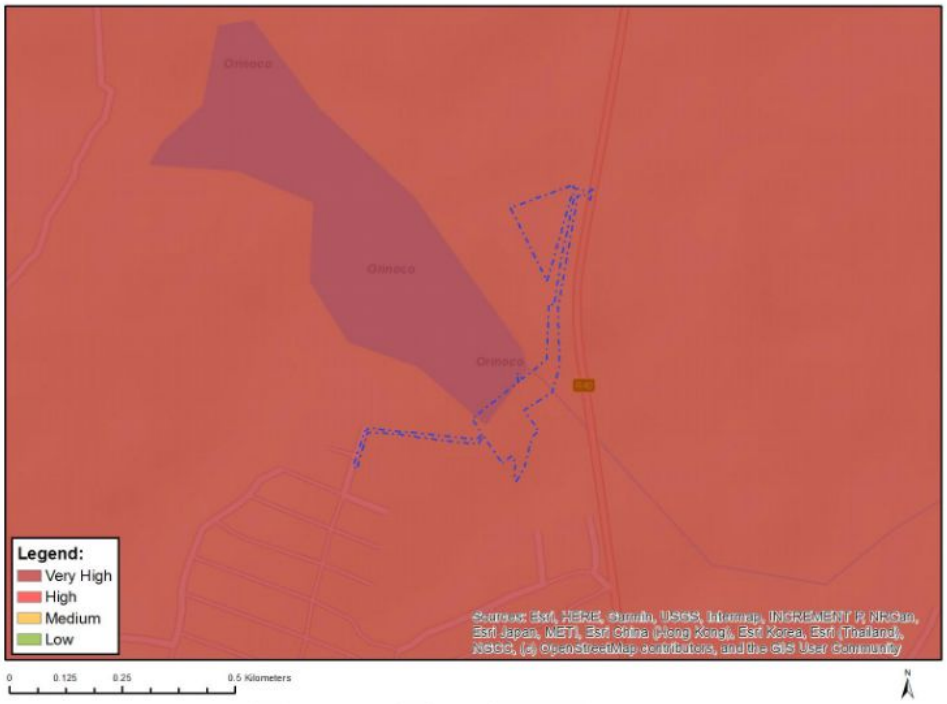

Figure 23: STR Terrestrial Biodiversity Theme Map

According to the STR the site has a 'very high' Terrestrial Biodiversity sensitivity theme (**Figure 23 above**) due to the site overlapping a Critical Biodiversity Area 2, FEPA Subcatchment, Protected Areas Expansion Strategy area including a Strategic Water Resource Area. Given the presence of these features the STR requires a Terrestrial Biodiversity Impact Assessment Study to be included in the Basic Assessment Report.

Based on the desktop spatial assessment, Ehlanzeni District has a Bioregional Plan (2019) in place and the site overlaps several terrestrial features (see **Figure 24** showing the project site superimposed on the Ehlanzeni Bioregional Plan Terrestrial CBA Map)

- Optimal CBA
- Moderately Modified Areas (old lands)
- ONA

According to the 2018 National Protected Areas Expansion Strategy 'Focus Areas' spatial dataset, the project site falls within a 'Priority Focus Area' and confirms the screening tool findings. **Figure 25** shows the project site superimposed on the 2018 NPAES spatial dataset. The focus areas are large, intact, unfragmented areas of high importance for land-based protected area expansion.

According to the 2017 Strategic Water Resource Area's (SWRA) spatial dataset, the project site does not fall within any SWRA. It is located outside of the Mpumalanga-Drakensberg SWRA. The screening tool finding is therefore incorrect with regards to the site being in a SWRA (see **Figure 26**). It is assumed that the screening tool may still refer to the 2014 Mpumalanga Biodiversity Sector Plan dataset (SANBI) which indicates that the site falls within SWRA's Top 50% of strategic water resource area'.

The project site is situated in the Sand River Catchment in quaternary catchment X32A. The catchment comprises nine (9) quaternary catchments of which X32A (wherein the project lies) and X32D together generate half of the runoff (Smits, 2004 Modeling Scenarios for Water Resource Management in the Sand River Catchment). The Top 50% of SWRA' therefore suggests that the quaternary catchment collects almost half of the runoff for the overall Sand River Catchment.

A Terrestrial Biodiversity Assessment was conducted for the project site and is included under Appendix E of the Basic Assessment Report.

The Ecologist finds the project is to be of 'Low' ecological sensitivity, lacking SCC and high disturbance levels are present therefore the 'Very High' sensitivity theme in the DFFE STR is not justified.

The site is in a degraded state due to impacts from overgrazing, firewood gathering, dumping, littering, soil erosion and modified habitat i.e., dam infrastructure and R40 Casteel Dam access road. The CBA 2 area associated with the site is degraded and should be excluded from the macro-scale assessment. The 'Protected Area Expansion Strategy Focus Area' overlapping the site was confirmed, however the closest protected area is 10km away, and the site surrounding area is densely populated therefore the categorisation nonsensical.

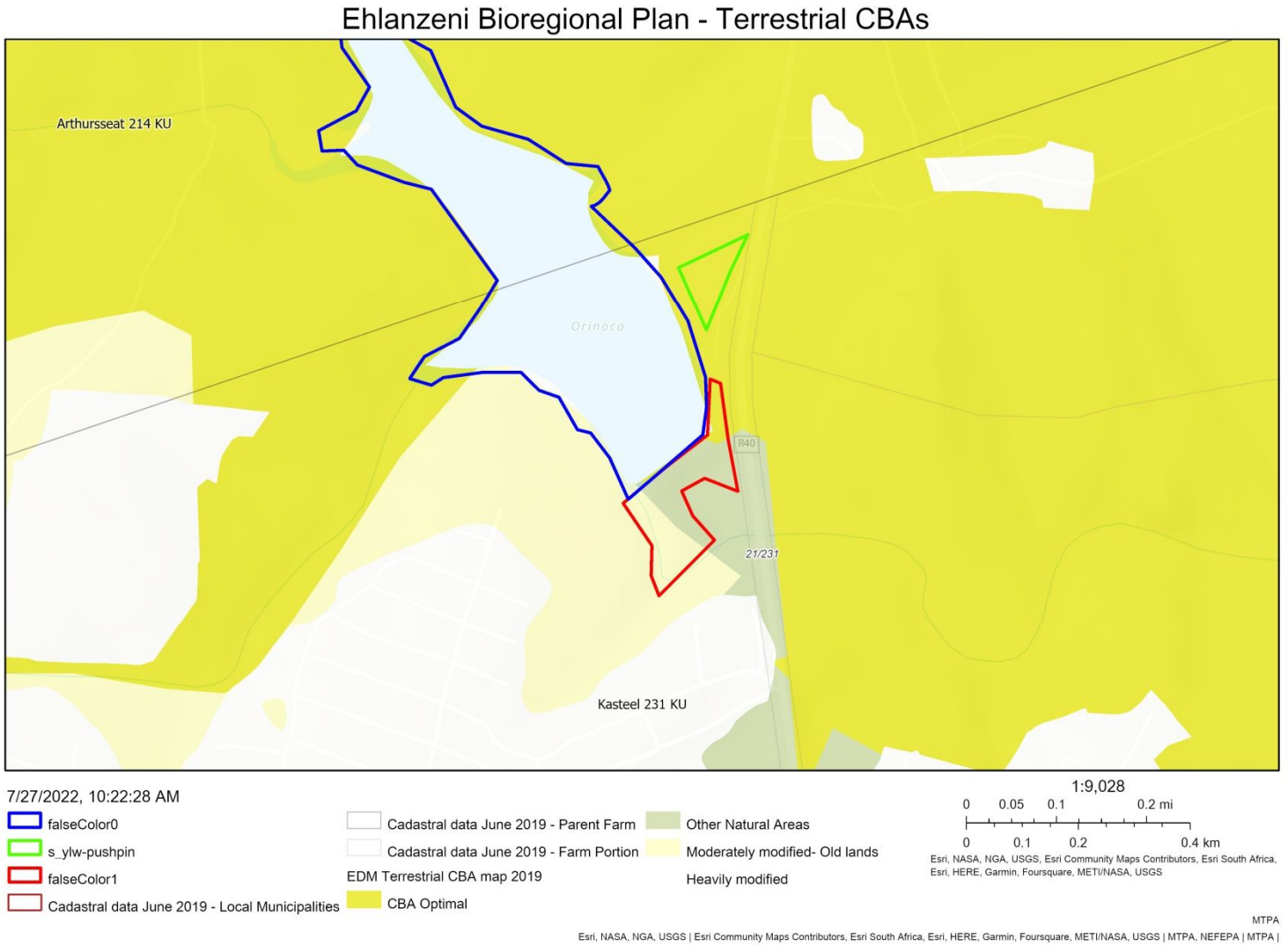

Figure 24: 2019 EDM Bioregional Plan Terrestrial CBA Map Spatial Dataset superimposed on the project site. The site falls within an Optimal CBA, ONA, Moderately Modified old lands, Heavily Modified (dam).

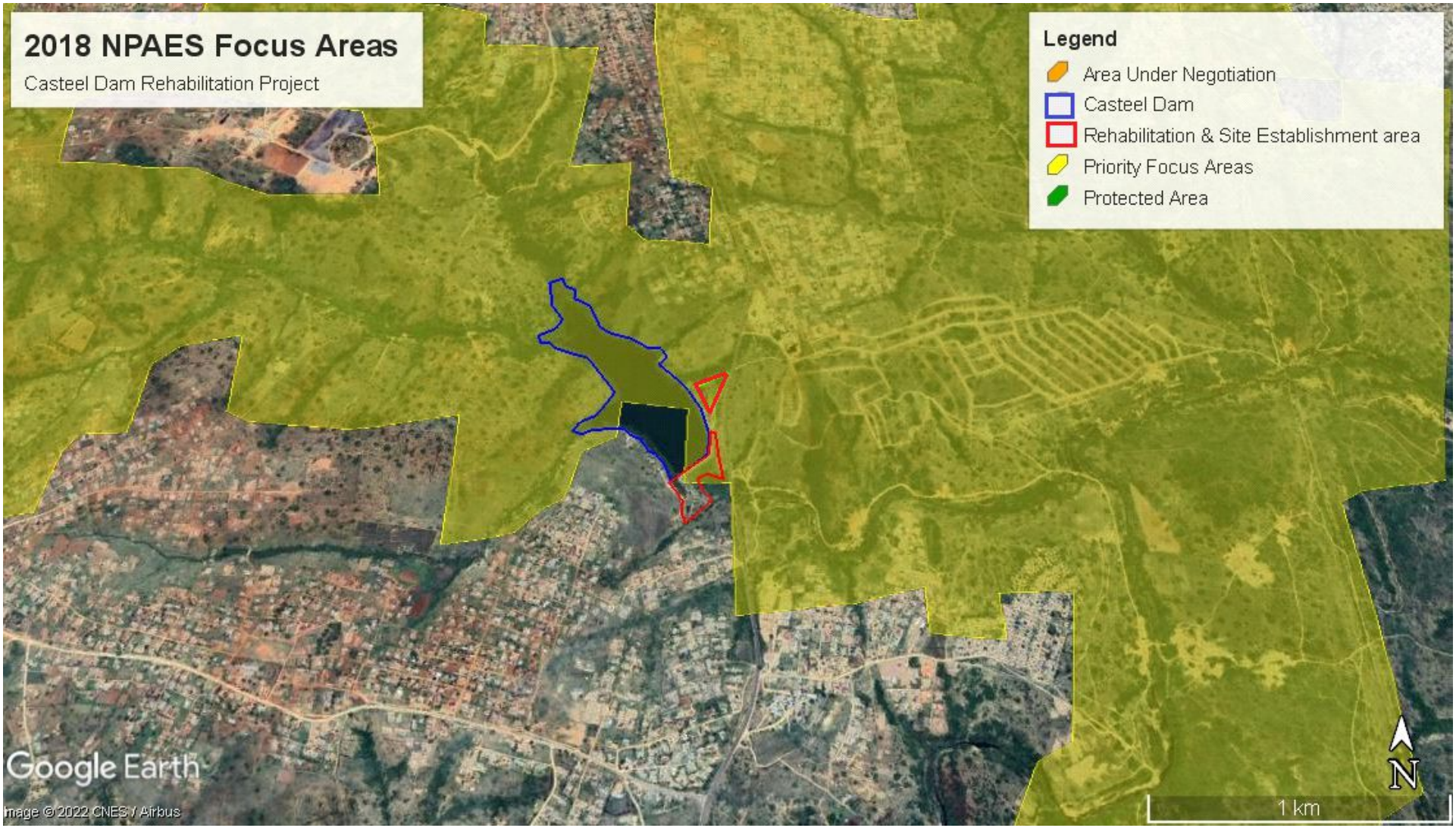

Figure 25: 2018 National Protected Areas Expansion Strategy Focus Areas Spatial Dataset superimposed on the project site (red polygon). The site falls within a 'Protected Area Priority Focus Area' (yellow shaded polygon).

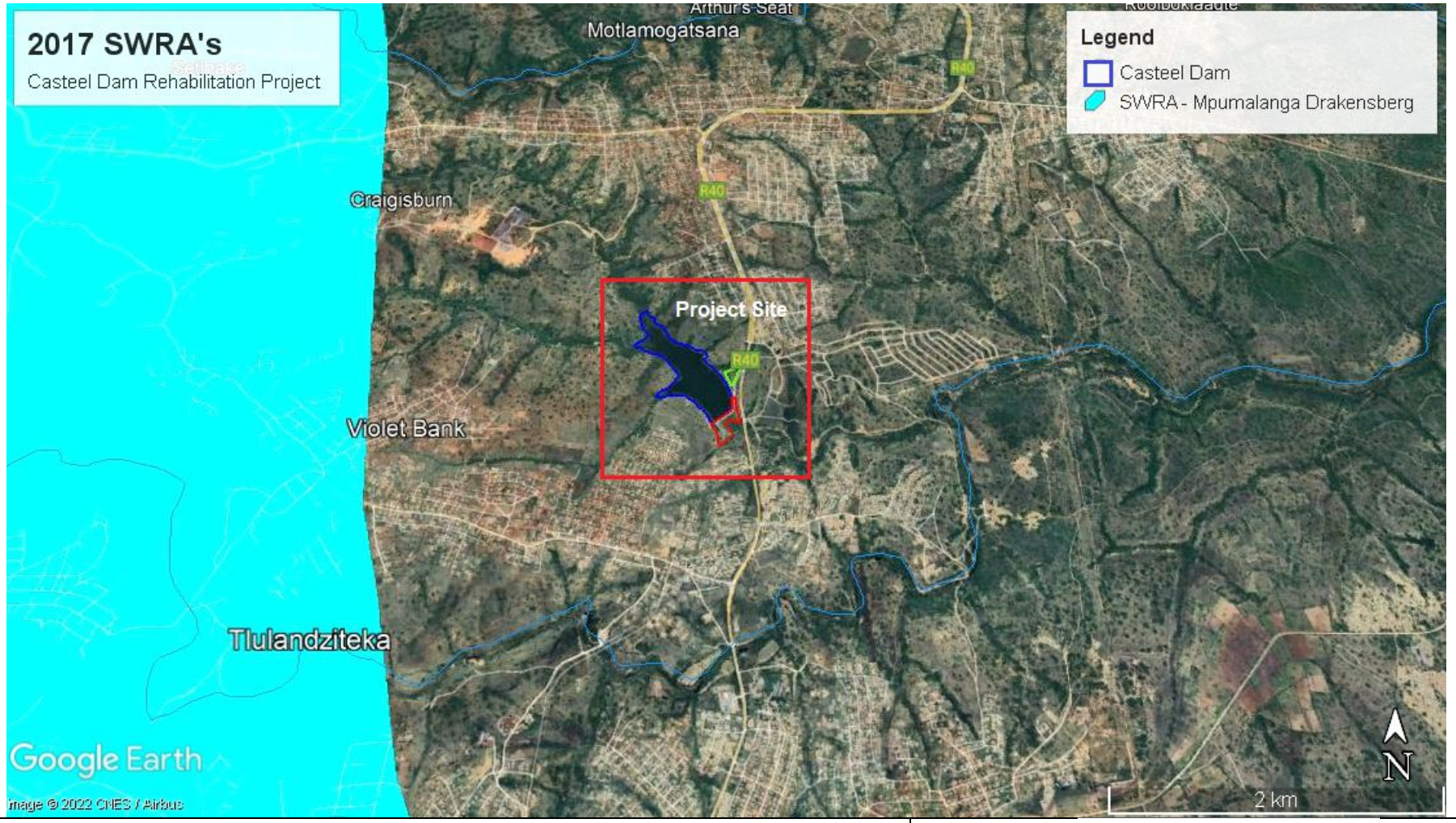

Figure 26: 2017 Strategic Water Resource Area Dataset superimposed on the project site. According to the dataset the site does not fall within any SWRA, but east outside the Mpumalanga Drakensberg SWRA (light blue shaded polygon).

7. CONFIRMED SPECIALIST STUDIES TO BE COMMISSIONED

Based on the above site sensitivity verification results and site observations the following specialist studies are included in the Basic Assessment Report:

- Terrestrial Biodiversity Assessment
- Aquatic Biodiversity Assessment (Wetland Delineation)
- Phase 1 Archaeological Impact Assessment
- Traffic Impact Statement / Full Assessment

The DWS already commissioned a Hydrological Analysis as part of the design report for the project and the other STR required specialist studies are considered superfluous i.e.

- Visual Impact Assessment
- Socio Economic Impact Assessment
- Palaeontological Impact Assessment

The project does not include a new facility or expansion of a facility but rehabilitation works therefore the visual impact is anticipated to be moderate-low. The surrounding area is characterised by dense rural settlements. The project will also have a positive social and economic impact by addressing the safety risk of the dam and will provide unskilled labour job opportunities during the construction phases. The negative social impacts are considered to be very low.

8. ANY FATAL FLAWS

There are no fatal flaws associated with the project or application site at the current stage of the environmental screening.

9. CONCLUSION

This Site Sensitivity Verification Report has been prepared by Naledzi Environmental Consultants Pty Ltd.

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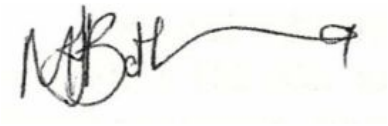

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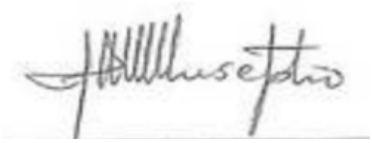
Marissa Botha, *Pr.Sci.Nat*

Reviewed by:
Prof. Desmond Musetsho
Managing Director and Project EAP
SACNASP and EAPASA Registered



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