

ERF 11305 WALMER HOUSING DEVELOPMENT

AQUATIC ASSESSMENT

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SPECIALIST REPORT DETAILS

This report has been prepared as per the requirements of the Environmental Impact Assessment Regulations and the National Environmental Management Act (Act 107 of 1998), any subsequent amendments and any relevant National and / or Provincial Policies related to biodiversity assessments.

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I, **Dr. Brian Michael Colloty** declare that this report has been prepared independently of any influence or prejudice as may be specified by the National Department of Environmental Affairs.



Signed:..... Date:....15 October 2014.....

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ACRONYMS

CARA	Conservation of Agricultural Resources Act
CBA	Critical Biodiversity Area
CSIR	Council for Scientific and Industrial Research
DWS	Department of Water and Sanitation formerly the Department of Water Affairs
ECBCP	Eastern Cape Biodiversity Conservation Plan (Berliner & Desmet, 2007)
EIS	Ecological Importance and Sensitivity
GIS	Geographic Information System
NCAP	NMBM Bioregional Conservation Action Plan (SRK, 2011)
NFEPA	National Freshwater Ecosystem Priority Atlas (Nel, <i>et al.</i> 2011).
PES	Present Ecological State
SANBI	South African National Biodiversity Institute
WUL	Water Use License
WULA	Water Use License Application

1 INTRODUCTION

SRK Consulting appointed Scherman Colloty & Associates (SC&A) to assess the proposed study area for the potential occurrence of any natural waterbodies, including wetlands (Figure 1). The intent of this study is to assess the present ecological state of any natural water courses should they occur, and provide the client with an indication of any additional requirements needed by the Department of Water and Sanitation (DWS). This would include any potential Water Use Licenses under Section 21 c & i under the National Water Act, i.e. water course crossings or any construction within 500m of a wetland boundary.



Figure 1: Google Earth image of Erf 11305 near Walmer Heights

Several terms and definitions are used in this report and the reader is referred to the box below for additional detail.

Definition Box

Present Ecological State is a term for the current ecological condition of the resource. This is assessed relative to the deviation from the Reference State. Reference State/Condition is the natural or pre-impacted condition of the system. The reference state is not a static condition, but refers to the natural dynamics (range and rates of change or flux) prior to development. The PES is determined per component - for rivers and wetlands this would be for the drivers: flow, water quality and geomorphology; and the biotic response indicators: fish, macroinvertebrates, riparian vegetation and diatoms. PES categories for every component would be integrated into an overall PES for the river reach or wetland being investigated. This integrated PES is called the EcoStatus of the reach or wetland.

Ecological Importance and Sensitivity (EIS) are the terms used to describe the rating of the any given wetland or river reach that provides an indication of the ecological importance of the aquatic system using criteria such as conservation needy habitat or species, protected ecosystems or unique habitat observed. The sensitivity is then derived by assessing the resilience the habitat exhibits under stress as a result of changes in flow or water quality.

1.1 Relevant legislation and policy

Locally the South African Constitution, seven (7) Acts and one (1) international treaty allow for the protection of rivers and water courses. These systems are thus protected from destruction or pollution by the following:

- Section 24 of The Constitution of the Republic of South Africa;
- Agenda 21 – Action plan for sustainable development of the Department of Environmental Affairs and Tourism (DEAT) 1998;
- National Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998) inclusive of all amendments, as well as the NEM: Biodiversity Act, 2004 (Act 10 of 2004);
- National Water Act, 1998 (Act No. 36 of 1998);
- Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983);
- Minerals and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002);
- Nature and Environmental Conservation Ordinance (No. 19 of 1974);
- National Forest Act (No. 84 of 1998); and
- National Heritage Resources Act (No. 25 of 1999).

This report will be used as part of the relevant submissions to the Department of Water and Sanitation in terms of the registration / licensing (as required) for Section 21 c & i water uses should they be required.

Provincial legislation and policy

Various provincial guidelines on buffers have been issued within the province. These are stated below so that the engineers and contractors are aware of these buffers during the planning phase. Associated batch plants, stockpiles, lay down areas and construction camps should avoid these buffer areas. Until national guidelines for riverine and wetland buffers are established, the guidelines set out in the Eastern Cape Biodiversity Conservation Plan documentation should be applied (Berliner & Desmet, 2007). Table 1 provides recommended buffers for rivers.

Currently there is no accepted priority ranking system for wetlands. Until such a system is developed, it is recommended that a **50m buffer be set for all wetlands** (Berliner & Desmet, 2007).

Other policies that are relevant include:

- Provincial Nature Conservation Ordinance (PNCO) – Protected Flora. Any plants found within the sites are described in the ecological assessment.
- Eastern Cape Biodiversity Conservation Plan (ECBCP), (Berliner & Desmet, 2007) – Aquatic Critical Biodiversity Areas (CBAs)
- Nelson Mandela Bay Metropolitan Bioregional Plan (SRK, 2011). Fine scale conservation plan with proposed CBA network also referred to NCAP or Nelson Mandela Bay Conservation Action Plan.
- National Freshwater Ecosystems Priority Areas – (Nel *et al.*, 2011). This mapping product highlights potential rivers and wetlands that should be earmarked for conservation on a national basis.

Table 1: Recommended buffers for rivers (the predominant buffer for the study region is highlighted in blue) (Berliner & Desmet, 2007)

River criterion used	Buffer width (m)	Rationale
Mountain streams and upper foothills of all 1:500 000 rivers	50	These longitudinal zones generally have more confined riparian zones than lower foothills and lowland rivers and are generally less threatened by agricultural practices.
Lower foothills and lowland rivers of all 1:500 000 rivers	100	These longitudinal zones generally have less confined riparian zones than mountain streams and upper foothills and are generally more threatened by development practices.
All remaining 1:50 000 streams	32	Generally smaller upland streams corresponding to mountain streams and upper foothills, smaller than those designated in the 1:500 000 rivers layer. They are assigned the riparian buffer required under South African legislation.

2 METHODS

2.1 Study terms of reference

SC&A based this study on the following scope of work:

- Identify and delineate any aquatic systems and associated biota that may be impacted upon by the proposed project based on the DWS wetland and riparian delineation methodology (DWAf, 2005);
- Identify and rate potential environmental impacts on these systems and associated biota;
- Provide a significance rating of surface water impacts which includes a rating of the ecological sensitivity of the site, and the effect of the development on the aquatic ecology of the site;
- Identify mitigation measures for negative and enhancement measures for positive impacts.

Based on our understanding of these requirements, SC&A would produce the following:

- Riparian and /or wetland area delineation supplied together with an analysis of the potential aquatic sensitivity (including any wetlands should they occur).
- Present Ecological State (PES) assessment of any watercourses after a short site visit has been conducted, in line with the Department of Water Affairs requirements should any Section 21 c & i water use licenses be required.
- Compile the required impact assessment and provide suitable recommendations.

2.2 Study methods

This assessment was initiated with a survey of the pertinent literature, including past reports that exist for the study region. Maps and Geographical Information Systems (GIS) were then employed to ascertain, which portions of the proposed development, could have the greatest impact on the water courses and associated habitats.

A site visit was then conducted to ground-truth the above findings, thus allowing critical comment of the possible impacts. Information was also collected to determine the PES and Ecological Importance and Sensitivity (EIS) should any natural systems be found. These analyses were based on the models developed by the Department of Water and Sanitation, with the results producing ratings (A – F), descriptions for which are summarised in Table 2.

Table 2: Description of A – F ecological categories based on Kleynhans *et al.*, (1999).

ECOLOGICAL CATEGORY	ECOLOGICAL DESCRIPTION	MANAGEMENT PERSPECTIVE
A	Unmodified, natural.	Protected systems; relatively untouched by human hands; no discharges or impoundments allowed
B	Largely natural with few modifications. A small change in natural habitats and biota may have taken place but the ecosystem functions are essentially unchanged.	Some human-related disturbance, but mostly of low impact potential
C	Moderately modified. Loss and change of natural habitat and biota have occurred, but the basic ecosystem functions are still predominantly unchanged.	Multiple disturbances associated with need for socio-economic development, e.g. impoundment, habitat modification and water quality degradation
D	Largely modified. A large loss of natural habitat, biota and basic ecosystem functions has occurred.	
E	Seriously modified. The loss of natural habitat, biota and basic ecosystem functions is extensive.	Often characterized by high human densities or extensive resource exploitation. Management intervention is needed to improve health, e.g. to restore flow patterns, river habitats or water quality
F	Critically / Extremely modified. Modifications have reached a critical level and the system has been modified completely with an almost complete loss of natural habitat and biota. In the worst instances the basic ecosystem functions have been destroyed and the changes are irreversible.	

3 STUDY AREA DESCRIPTION AND RESULTS

Although the study area is located within the Baakens River catchment, no connections via channels, streams, or rivers occur between the site and the Baakens River (Figure 2). Any potential connectivity has been further reduced by the roads (present and past).

This is further supported by the National Freshwater Ecosystems Priority Atlas (NFEPA - Nel *et al.*, 2011) (Figure 3) and Eastern Cape Biodiversity Conservation Plan (ECBCP) (Figure 4) spatial databases. The NFEPA project has captured and rated the importance of rivers and wetlands on a national basis and indicates that no such habitats (riverine or wetland) or priority areas are located within or adjacent to the site. This is a similar case for the ECBCP and NMBM Bioregional Plan (NCAP) data.

The study area is therefore characterised by the high degree of modification linked to the development of roads, housing (formal and informal) and alien tree invasion and high levels of illegal solid waste and building rubble disposal. The latter is particularly evident in areas around the former Arlington Race course (Plate 1).

Several areas were shown in the available aerial photographs as likely wetland areas (Plates 2 and 3), but after the site visit these were found to be either bare soils areas or dune hummocks (slack) with alien / secondary vegetation. Therefore no wetland areas were found within or adjacent to the study site.

Consequently no Present Ecological State (PES) and Ecological Importance and Sensitivity (EIS) of the areas was determined.



Plate 1: The large areas covered by building rubble adjacent the former Arlington Race track.



Plate 2: The dune hummock areas in the northern portion of the Erf 11305, that could typically be wetland areas, showed no evidence of such habitat, past or present.



Plate 3: A small area of bare soil, adjacent to the Airport reservoir, and was found to be an informal soccer field (soccer posts indicated by red arrow), with no evidence of wetland habitat (Erf 11305)

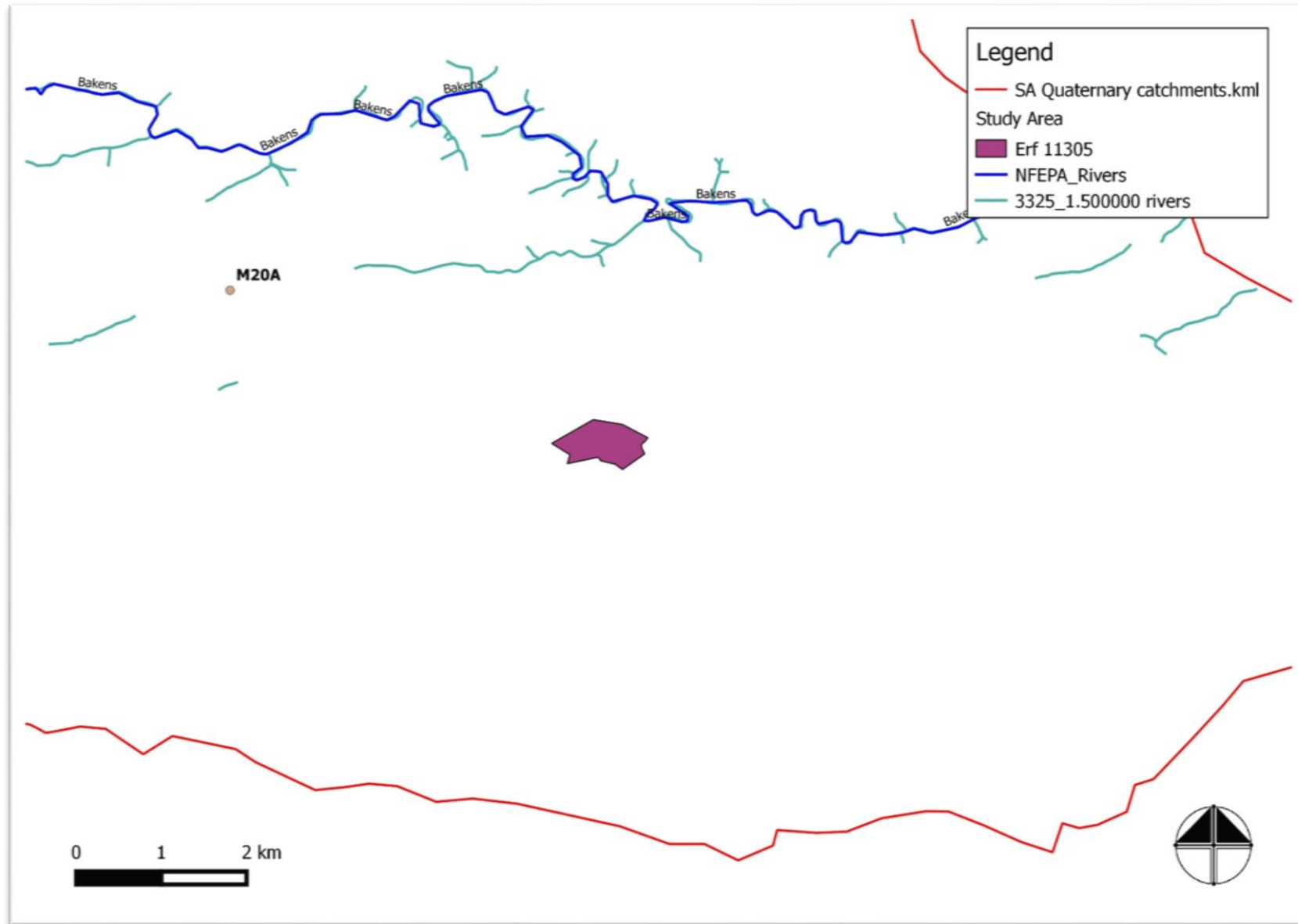


Figure 2: The project locality (light blue) in relation to the Baakens River (Quaternary Catchment M20A)

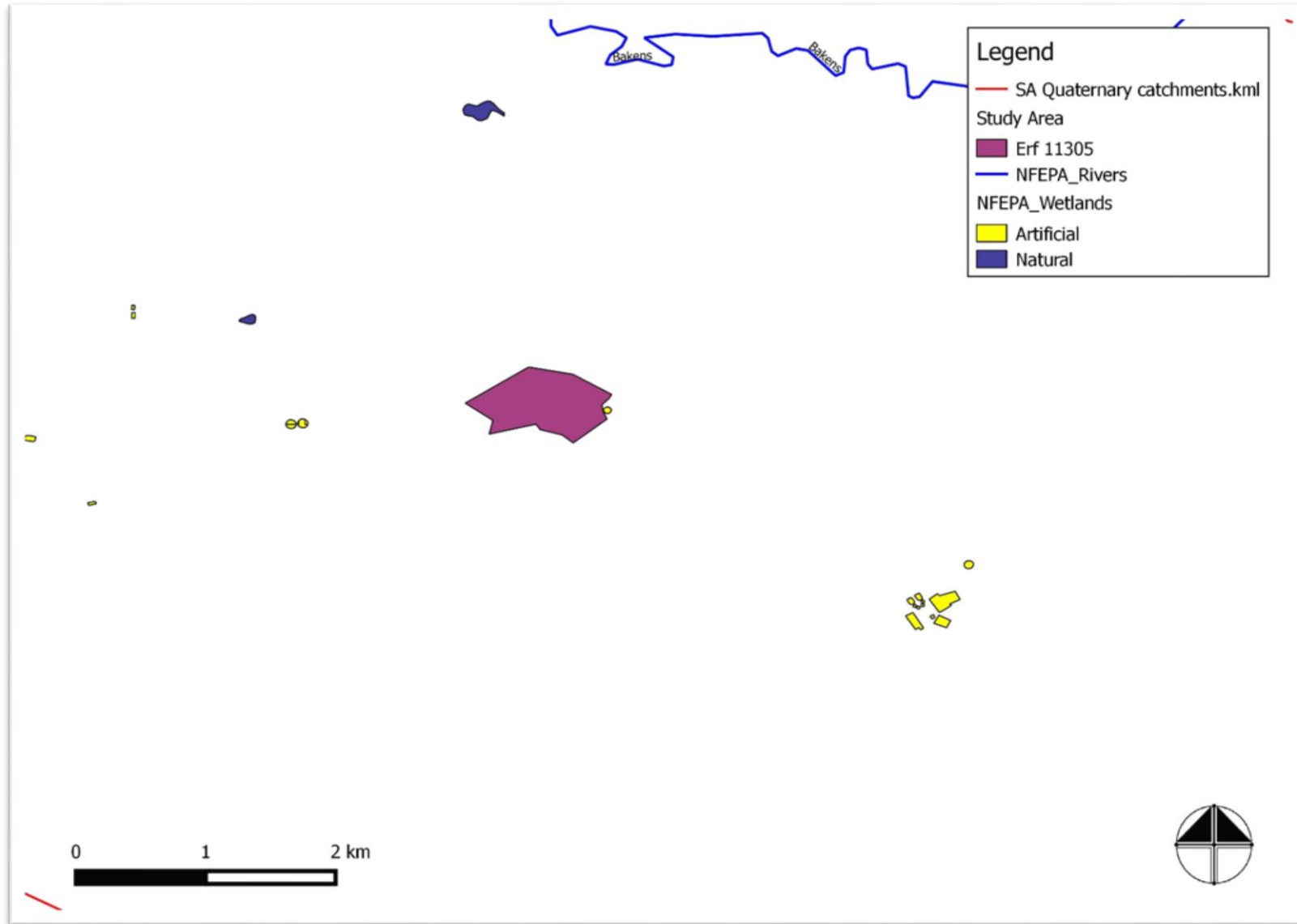


Figure 3: The project locality in relation the Freshwater Ecosystems Priority Areas (Nel et al., 2011).

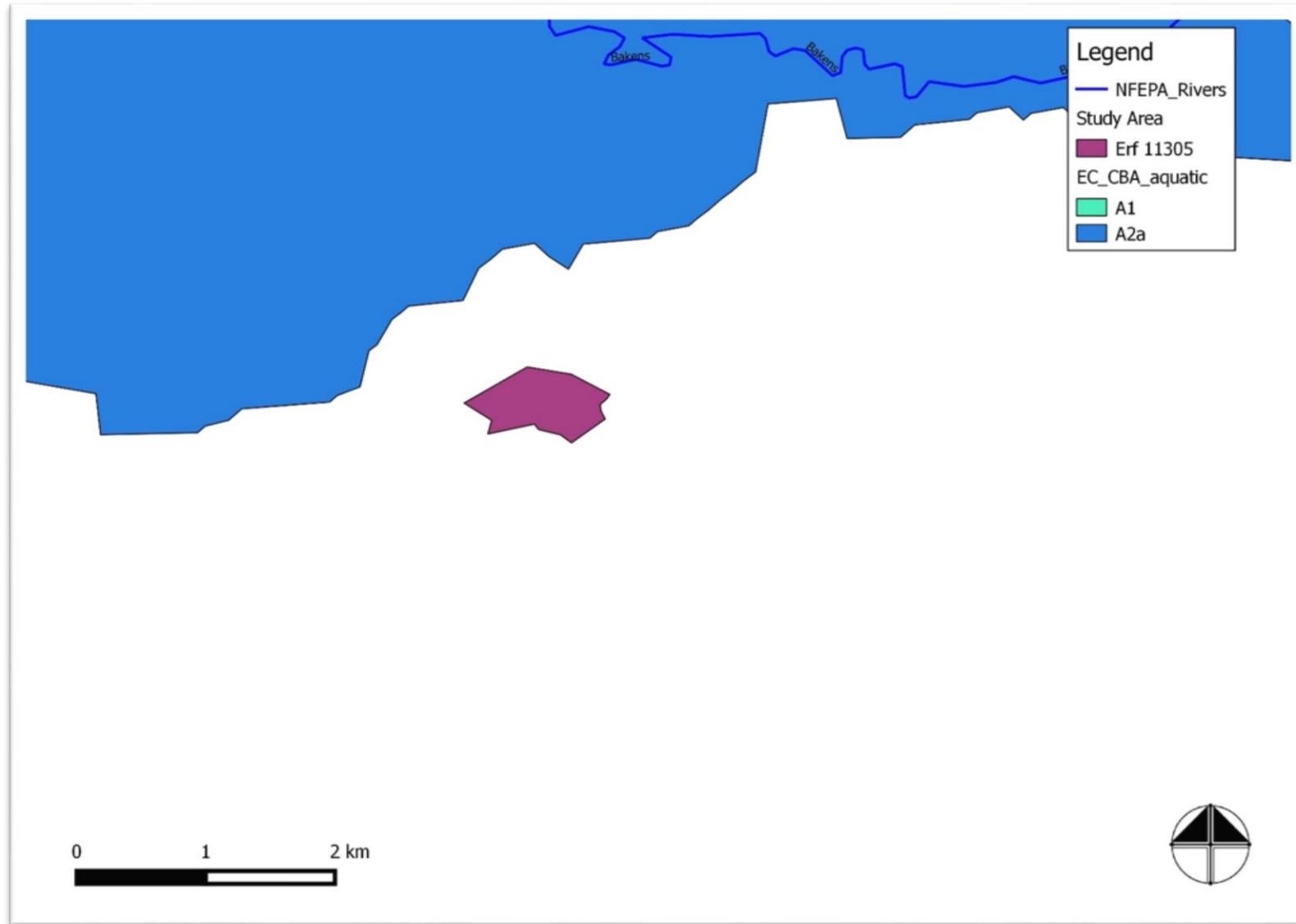


Figure 4: The project locality in relation the ECBCP Aquatic CBA spatial data.

4 IMPACT ASSESSMENT

The impact assessment rating methodology was provided by SRK Consulting. However no aquatic environments, natural or man-made were observed within both study areas. Thus the impact assessment was not required.

5 CONCLUSION AND RECOMMENDATIONS

Usually these types of reports also assess the impacts on instream biota, the removal of riparian vegetation and the impact on riparian systems, especially during the construction phase. However as none of these systems were evident, it was not necessary to assess these potential impacts.

As no waterbodies, natural or artificial were evident, no Water Use License Applications would be required, under the National Water Act (Act 36 of 1998).

However as the developments will create surface water run-off (hard surface areas) the following recommendations are provided:

- Stormwater from the final outlets should be managed using suitable structures such as swales, gabions and rock rip-wrap so that any run-off from sites is attenuated prior to discharge. Silt and sedimentation should be kept to a minimum, through the use of the above mentioned structures by also ensuring that all structures do not create any form of erosion.
- Vegetation clearing should occur in a phased manner in accordance with the construction programme to minimise erosion and/or run-off. Large tracts of bare soil will either cause dust pollution or quickly erode and then cause sedimentation in the lower portions of the catchment.
- Only indigenous plant species must be used in the re-vegetation process.
- All construction materials including fuels and oil should be stored in demarcated areas that are contained within berms / bunds to avoid spread of any contamination. Washing and cleaning of equipment should also be done in berms or bunds, in order to trap any cement and prevent excessive soil erosion. Mechanical plant and bowzers must not be refuelled or serviced within or directly adjacent to any channel. It is therefore suggested that all construction camps, lay down areas, batching plants or areas and any stores should be more than 50m from any demarcated water courses.
- All cleared areas must be re-vegetated after construction has been completed.
- It is also advised that an Environmental Control Officer, with a good understanding of the local flora be appointed during the construction phase. The ECO should be able to make clear recommendations with regards to the re-vegetation of the newly completed / disturbed areas, using selected species detailed in this report.
- All alien plant re-growth must be monitored and should it occur these plants should be eradicated. The scale of the operation does however not warrant the use of a Landscape Architect and / or Landscape Contractor.

6 REFERENCES

Berliner D. and Desmet P. 2007. Eastern Cape Biodiversity Conservation Plan: Technical Report. Department of Water Affairs and Forestry Project No 2005-012, Pretoria. 1 August 2007

Department of Water Affairs and Forestry - DWAF (2005). A practical field procedure for identification and delineation of wetland and riparian areas Edition 1. Department of Water Affairs and Forestry , Pretoria.

Kleynhans C.J., Thirion C. and Moolman J. (2005). A Level 1 Ecoregion Classification System for South Africa, Lesotho and Swaziland. Report No. N/0000/00/REQ0104. Resource Quality Services, Department of Water Affairs and Forestry, Pretoria.

Nel, J.L., Murray, K.M., Maherry, A.M., Petersen, C.P., Roux, D.J., Driver, A., Hill, L., Van Deventer, H., Funke, N., Swartz, E.R., Smith-Adao, L.B., Mbona, N., Downsborough, L. and Nienaber, S. (2011). Technical Report for the National Freshwater Ecosystem Priority Areas project. WRC Report No. K5/1801.

7 APPENDIX

7.1 Indigenous plant species List

List of recorded plant species found within the study area, with family name as per Germishuisen & Meyer (2003) using PRECIS.

Family	Scientific Name
ASTERACEAE	<i>Conyza obscura</i>
ASTERACEAE	<i>Felicia erigeroides</i>
POACEAE	<i>Cynodon dactylon</i>
POACEAE	<i>Eragrostis curvula</i>
POACEAE	<i>Eragrostis plana</i>
POACEAE	<i>Hyparrhenia hirta</i>