Department of Water and Sanitation

NATIONAL WATER RESOURCE INFRASTRUCTURE (NWRI)

Resource Management Plan

ALBASINI DAM

REPORT – Volume 4 of 5

December 2016

WATER IS LIFE - SANITATION IS DIGNITY

water & sanitation

Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

2030 NDP

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ACKNOWLEDGEMENTS

Engineerex (Pty) Ltd would like to express its gratitude to the following Stakeholders that immensely contributed to the development of this Resource Management Plan for Albasini Dam:

- Department of Environmental Affairs;
- Department of Rural Development and Land Reform;
- Department of Water and Sanitation;
- Limpopo Department of Agriculture;
- Limpopo Economic Development, Environment and Tourism;
- Local communities members of Mpheni;
- Makhado Local Municipality;
- South Africa Maritime Safety Authority; and
- Vhembe District Municipality.

Acknowledgement is also extended to other Stakeholders, not listed above, who attended and participated in the Stakeholder engagements.

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Review Period	Month	Year				
Annual Review of Business Plan	December	2018[1]	2019	2020	2021	2022
Five (5) Yearly Review of RMP	December	2022				

[1] The implementation of the RMP and BP requires a year budget planning prior to operationalisation.

AMENDMENTS PAGE

Revision No	Description	Date
1	Draft RMP for DWS Review	23/10/2015
2	Draft RMP for DWS Review	23/11/2015
3	Draft RMP for DWS Review	02/12/2015
4	Draft RMP for Public Review	15/12/2015
5	Draft RMP for DWS Review	04/08/2016
6	Final RMP for DWS Approval	30/11/2016
7	Final RMP for DWS Approval	14/12/2016

LIST OF ACRONYMS

AtoN	Aid(s) to Navigation
AWUA	Albasini Water User Association
BID	Background Information Document
BOD	Biochemical Oxygen Demand
BP	Business Plan
CATHSSETA	Culture, Arts, Tourism, Hospitality, Sports Sector Education and Training Authority
CD: IO MANCO	Chief Director: Infrastructure Operations Management Committee
CIWSP	Co-operative Inland Waterways Safety Programme
CMA	Catchment Management Area
COGTA	Department of Cooperative Governance and Traditional Affairs
CPSI	Centre for Public Service Innovation
DAC	Department of Arts and Culture
DAFF	Department of Agriculture, Forestry and Fisheries
DEA	Department of Environmental Affairs
DHS	Department of Human Settlement
DMC	Dam Management Committee
DO	Dissolved oxygen
DSR	Department of Sport and Recreation
DoT	Department of Transport
DPW	Department of Public Works
DWAF	Department of Water Affairs and Forestry
DRDLR	Department of Rural Development and Land Reform
DWS	Department of Water and Sanitation
EA	Environmental Authorization
ECC	Effective Carrying Capacity
EIA	Environmental Impact Assessment Regulations
EMF	Environmental Management Framework
FSL	Full Supply Level
GIAMA	Government Immovable Asset Management Act
GPS	Global Positioning System
GWWs	Government Waterworks
I&APs	Interested and Affected Parties
IALA	International Association of Marine Aids to Navigation and Lighthouse Authorities
IA	Implementing Agency
IDP	Integrated Development Plan
IEE	Integrated Environmental Engineering
IRMP	Integrated Resource Management Plan
KPA	Key Performance Areas
LDA	Limpopo Department of Agriculture
LED	Local Economic Development
LEDET	Limpopo Economic Development, Environment and Tourism
MFMA	Municipal Finance Management Act
MLM	Makhado Local Municipality

MOA	Memorandum of Agreement
MSA	Municipal Systems Act
NEMA	National Environmental Management Act
NEMPAA	National Environmental Management: Protected Areas Act
NPSC	National Project Steering Committee
NDT	National Department of Tourism
NT	National Treasury
NWA	National Water Act
NWRI	National Water Resource Infrastructure
OMC	Operations Management Committee
PCC	Physical Carrying Capacity
PFMA	Public Finance Management
PP	Public Participation Process
PPP	Public Private Partnerships
PSP	Professional Service Provider
RCC	Real Carrying Capacity
RHP	River Health Programme
RMP	Resource Management Plan
SAMSA	South African Maritime Safety Authority
SAPS	South African Police Services
SASCOC	South African Sports Confederation and Olympic Committee
SDF	Spatial Development Framework
SUP	Sustainable Utilisation Plan
SWOT	Strengths, Weaknesses, Threats, Opportunities
TSS	Total Suspended Solids
WfW	Working for Water
WMA	Water Management Area
WMS	Water Modelling System

EXECUTIVE SUMMARY

Mandate: The Department of Water and Sanitation (DWS), through the National Water Act, 1998 (Act No. 36 of 1998), is mandated to protect aquatic and associated ecosystems and their biological diversity. The Minister of Water and Sanitation, as the custodian of the nation's water resources must ensure that the Government Waterworks (GWWs), including Albasini Dam, are protected, used, developed, managed and controlled in a sustainable manner, for the benefit of all. To assist the Minister in attaining the mandate, and to ensure that access to, and use of, the dam is equitable, the DWS initiated and commissioned the development of the Resource Management Plan (RMP) for Albasini Dam.

Purpose of the RMP: A Resource Management Plan (RMP) is a plan which aims to regulate access and the recreational utilization of a water resource and the surrounding state land, in ways which promote community participation and beneficiation, environmental conservation and unlock socio-economic potential of the water resource.

According to DWAF (2006), the use and management of the GWWs for recreation purpose needs to be based on Integrated Resource Management Plan (IRMP) included within the RMP.

Location of the dam: The Albasini Dam is a gravity and arch type of a dam which impounds the Luvuvhu and Doringspruit Rivers. It falls under ward 15 within the jurisdiction of Makhado Local Municipality which forms part of Vhembe District Municipality in Limpopo Province. It is located 24km east of Makhado town. Its GPS coordinates are **23°6'12.82"S; 30°5'38.27"E**.

Purpose of the dam: The primary purpose of the dam is mainly for irrigation and domestic use. The dam provides water to rural communities in the vicinity of Makhado Town.

The dam also currently offers recreational activities such as angling, fishing and rowing. Other recreational activities which require full contact, such as swimming, are not allowed at the dam due to the presence of dangerous animals and/or reptiles such as hippopotamuses and crocodiles.

Dam ownership and management: Albasini Dam is owned and operated by the DWS. There is one public access point controlled by DWS.

There is currently no institutional structure to manage the recreational use of the dam. However, the structure has been proposed in the RMP. The recreational institutional structure is necessary for the effective governance of the Albasini Dam for recreational purposes.

Stakeholder engagement: The success of the development and implementation of the RMP depends on the role players and their level of participation. It is recognized that different roles and responsibilities of the stakeholders (Authorities and I&APs), their relationship towards each other and the steps in the planning procedure are imperative in the successful development of the RMP. As such, proper consultation with the public was done in order to produce a credible RMP.

DWAF's Guidelines for Public Participation (2001) outlines three (3) broad phases for public participation namely the **Planning, Participation** and **Exit phase**.

During the **Planning phase** a site inspection was conducted and literature reviewed in order to gather baseline information about the dam. A process was also established to get into contact with the I&APs and relevant authorities to

ensure co-operative interests and support in the RMP project.

The **Participation phase** entailed three (3) important aspects, namely:

- Informing stakeholders about the RMP project;
- Meeting the stakeholders to present the RMP process; and
- Giving Feedback in the form of meeting minutes, follow-up emails, telephonic and direct communication.

During the **Exit phase**, a draft RMP was presented to the stakeholders for comment and inputs. The Exit phase entailed two (2) important aspects, namely:

- Ensuring that all goals, challenges, concerns, objectives and the vision of the dam are identified and documented in the RMP; and
- Officially ending the public participation process.

Identified objectives and vision: During the Authority and Public Meetings issues of concerns were raised from which common objectives were identified and a vision for the dam, for a period of 20 years, were formulated by the stakeholders.

The identified key common objectives are:

- To construct tarred roads in order to improve accessibility to the dam;
- To monitor some farming methods used on the commercial farms next to the dam;
- To raise the dam wall in order to increase its volume;
- To maintain water levels at an appropriate level to support sustainable recreational use;
- To maintain the water quality on the dam by frequently monitoring and assessing the main pollution sources;
- To have the dam and surrounding areas free of alien vegetation species;
- To protect the faunal species at the Albasini Dam for tourism purpose;
- To avoid direct water contact activities due to the the presence of crocodiles and hippos;
- To protect the fish species in the dam by monitoring the fishing trends;
- To enable broad public enjoyment of the water resource and surrounding State land;
- To ensure that the Albasini Dam is incorporated into the municipal plans such as IDPs and SDF since it has a potential in tourism;
- To introduce small scale fishery at the dam**;**
- To introduce additional recreational activities such as skiing and facilities such as: boating clubs, golf courses and also cultural museum; and
- To ensure that a suitable institutional structure with the appropriate powers and delegations is in place to effectively manage the recreational use of the water resource in accordance with the RMP.

A vision for the dam for a period of 20 years was formulated from the key common objectives and stands as follows:

"To ensure that there is sustainable utilisation of the water resource and the surrounding environment, unlock the tourism potential for the dam, ensure safety, promote community beneficiation, integrated management and an effective institution to manage the water resource in order to reach the proposed objective of the RMP and NWA".

The aforementioned objectives and vision are aimed at supporting the attainment of DWS's vision, mission and objectives.

Tourism Potential: The following were identified as some of the potential recreational developments at the Albasini Dam that could enhance tourist attraction:

- Cultural museum and more recreational activities such as swimming.
- Small scale fishery and aquaculture.
- Bird watching.

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CHAPTER 1: INTRODUCTION

1.1 BACKGROUND OF ALBASINI DAM

The dam impounds Luvuvhu and Doringspruit Rivers. It was named after a man called Joao Albasini who died in 1888 and was buried near its entrance gate. The dam falls under ward 15 within the jurisdiction of the Makhado Local Municipality (MLM) which form part of the Vhembe District Municipality (VDM) in Limpopo Province. Its GPS co-ordinates are **23°6'12.82"S 30°5'38.27"E**.It is located 24km east of Makhado town. Presented in **Figure 1** is a locality map of the dam**.** It was built in 1952 and was raised by 3m by means of spill way gates in 1970/71.

The primary purpose of the dam is irrigation and domestic use. Albasini Dam falls under A91B Quaternary Catchment within Luvuvhu-Letaba Water Management Area (WMA) (refer to **Figure 2** for the Hydrology map).The dam provides water to rural communities in the vicinity of Makhado Town. However, the dam is unable to meet the demand of water at a satisfactory level because of its small volume. The water is conveyed through an extended canal system to the Levubu area where there is extensive cultivation of crops (DWS website)**.** Provided in **Table 1** illustrates the profile of Albasini Dam.

Table 1: Albasini Dam Profile

Albasini Dam Profile	
Location	South Africa
Province	Limpopo Province
District Municipality	Vhembe District Municipality
Local Municipality	Makhado local Municipality
Nearest Town	Makhado
Completion Year	1952
Coordinates	23°6’30”S; 30°7’48.2”E
Purpose	Domestic supply and irrigation
Owner	DWS
Water Management Area	Luvuvhu/Letaba Water Management Area
Quaternary Catchment	A91B
Catchment Area (km^2)	509
Rivers	Luvuvhu and Doringspruit Rivers
Capacity (m^3)	28 200
Surface Area (ha)	350
Wall type	Gravity and Arch
Wall Height (m)	34
Length (m)	622

Source: Department of Water Affairs (List of registered dams; March 2013)

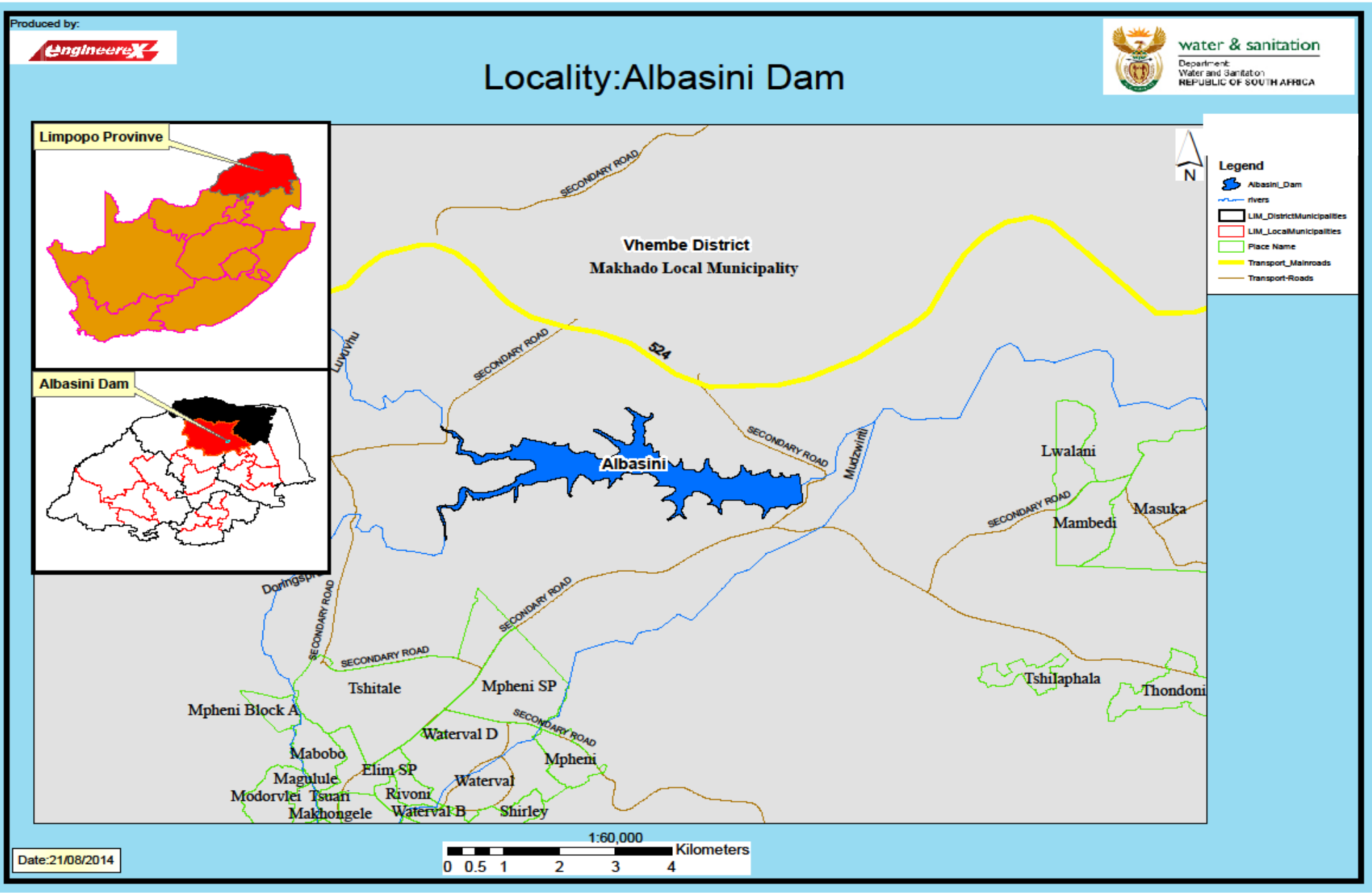

Figure 1: Locality Map for Albasini Dam

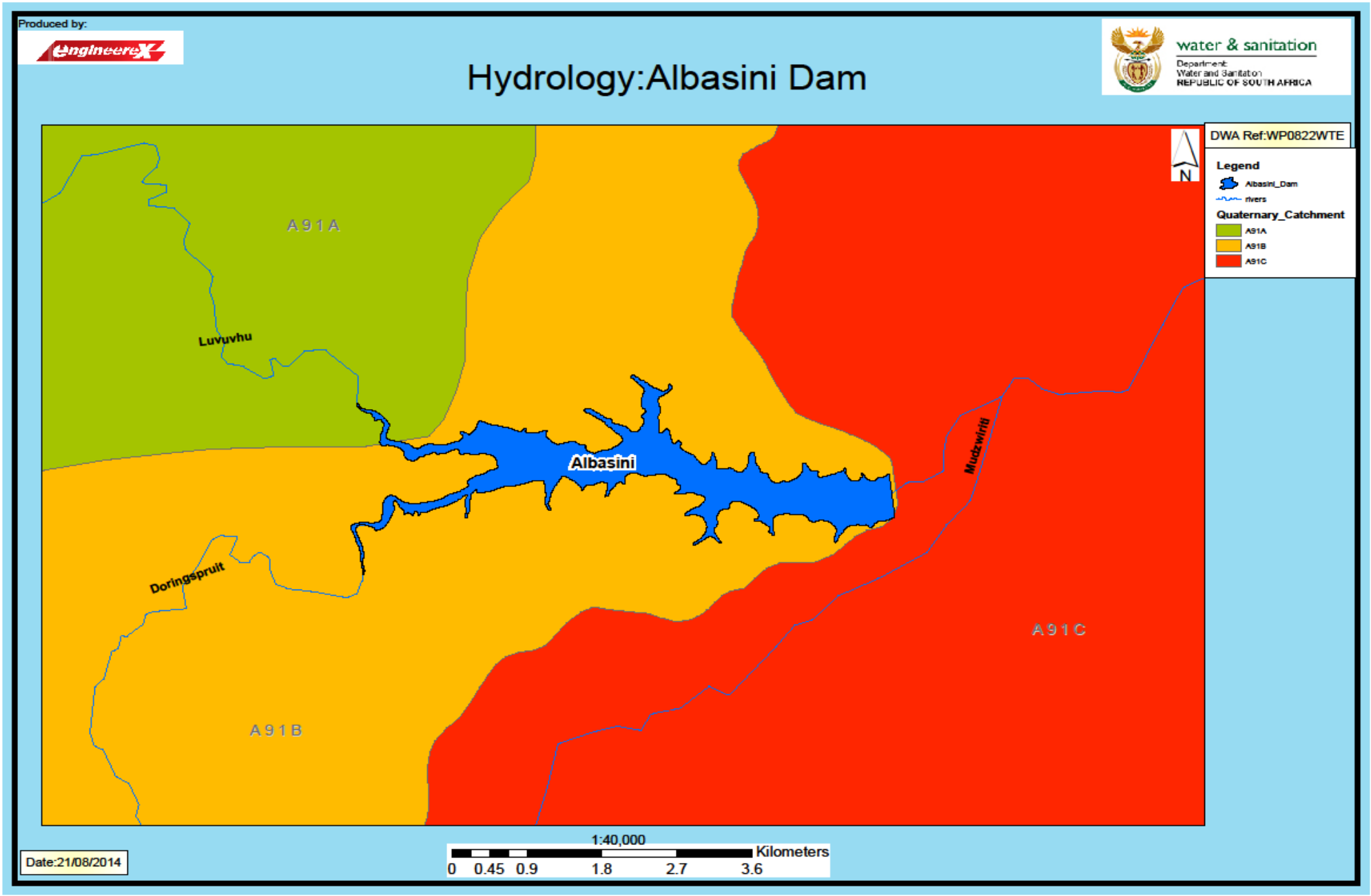

Figure 2: Hydrology Map for Albasini Dam

1.2 BIO-PHYSICAL ENVIRONMENT

1.2.1 Climate

The Albasini Dam is situated at the Soutpansberg mountain ranges which is characterized by climate which consists of two seasons, warm wet season from October to March with daily average temperature ranging between 16 and 40°C and a cool dry winters (April-September) with daily temperatures between 12-22°C (Kabanda, 2003). The area receives summer rainfall with high rain falling between November and February (Mucina and Rutherford, 2006). Ridges of the Soutpansberg receive orographic rainfall on the southern slope and shadow rain effects are apparent on the northern ridges.

1.2.2 Flora

Levubu is a sub-tropical fruit farming area which has two major rivers, the Doringspruit and the Luvuvhu River. Both rivers are fringed by Lowveld Riverine Forest and Semi-deciduous mixed forest. Land-use activities include agriculture and forestry plantations which cover the upper reaches of the dam. The riparian zone of the dam has been infested by alien vegetation such as; *Eucalyptus, Psidium guajava*, *Lantana Camara*, *Populus* and *Morus, Caesalpinia-decapetala*.

Many invasive alien plant species out-compete and displace indigenous vegetation. They are often associated with disturbed areas caused by floodwaters and are the first to recolonize bare ground and in areas where they are prolific, river banks can become very unstable.These alien plants consume large quantity of water and causes plant encroachment compared to indigenous plants (See **Figure 3**). The indigenous plants include; *Salix Mucronata*, *Diospyros quiloensis, Broenadia salicina, Phragmites australis* and *Trichilia emetica*. The land cover map of the dam is illustrated in **Figure 4.**

Figure 3: Alien Invasive Plants *Psidium guajava* (Guava)

1.2.3 Fauna

1.2.3.1 Birds

Albasini Dam is located in the Vhembe Biosphere Reserve (VBR), it is the 10th largest body of water in the Limpopo area and it supports an extensive birdlife, with over 125 species recorded. Below is a list of some of the birds which were recorded by a Birding Specialist at the VBR in **Table 2** (http://www.birdingsoutpansberg-venda.co.za).

Table 2: Birds Species

Common Names	Scientific Names
Scaly Throated Honeyguide	*Indicator variegatus*
African Firefinch	*Logonosticta rubii*
Narina Trogon	*Apaloderma narina*
Purple Crested Turaco	*Musophaga porphyreolopa*
African Fish Eagle	*Haliaeetus vocifer*
African Goshawk	*Accipiter tacchiro*
Bat Hawk,	*Macheiramphus alcinus*
Grey Cuckooshrike	*Caracina caesia*
Jackal Buzzard	*Buteo augur*
Lizard Buzzard	*Kaupifalco monogrammicus*
African Finfoot	*Podica Senegapolensis*
Comb Duck	*Sarkidiornis melanotos*
Green Backed Heron	*Butorides striata*
African Jacana	*Actophilornis africanus*
Squacco Heron	*Ardeola ralloides*
White Backed Duck	*Thasalassornis*

Common Names	Scientific Names
	leuconotus
Golden Weaver	*Ploceus xanthops*

1.2.3.2 **Reptiles**

Albasini Dam falls under Locus 2330AA (http://www.bgis.sanbi.org.za) whereby 36 species were recorded. Some of the species are listed on the Red Data book under vulnerable and least concern List. Soutpansberg Worm Lizard was recorded as a vulnerable species hence there is need for such species to be conserved and protected to avoid extinction. Some of the reptiles at the dam include crocodiles were identified during site inspection. Most of the reptile species were recoded under least concern list, these include:

Red-lipped Snake, Rhombic Egg-eater Boomslang, South African Slug-eater, Cape Wolf Snake, East African Shovel-snout, Common Girdled Lizard, Common Flat Lizard etc.

1.2.3.3 **Mammals**

30 mammal species have been recorded in locus 2330AA (http://vmus.adu.org.za/vmprojects.php). Hippopotamuses were also identified during site inspection. The mammal species have been listed in different categories which include; Least Concern, Vulnerable, Data Deficient and are tabulated in **Table 3.**

Table 3: Mammal Species

Common name	Red List Category
Red Duiker	Least Concern
Sykes's Monkey	
Leopard	
Bushbuck	
Bush Duiker	
Dusky Pipistrelle	
Banana Pipistrelle	
Egyptian Slit-faced Bat	
Tete Veld Aethomys	
Southern African Spiny Mouse	
Natal Mastomys	
Spinny mice	Not Listed
Vervet Monkey	
Reddish-gray Musk Shrew	Data Deficient
Red Musk Shrew	
Least Dwarf Shrew	
Sundevall's Leaf-nosed Bat	
Dark-footed Mouse Shrew	
Hildebrandt's Horseshoe Bat	Near Threatened
Temminck's Myotis	
Rusty Pipistrelle	
Welwitsch's Myotis	
Blue Monkey	Vulnerable
Northern Giant Pouched Rat	
Dark-footed Mouse Shrew	
Botswana Long-eared Bat	

1.2.3.4 **Amphibians**

According to the Frog map Atlas, seventeen (17) species were found in locus 2330AA. Most of the frog species are under least concern in the Red Data Book, see **Table 4**.

Table 4: Amphibian Species

Common name	Red list category
Transvaal Rain Frog	Vulnerable
Mozambique Rain Frog	Least Concern
Guttural Toad	
Raucous Toad	Least Concern
Northern Pygmy Toad	
Red Toad	
Natal Ghost Frog	
Painted Reed Frog	
Bubbling Kassina	
Snoring Puddle Frog	

Common name	Red list category
Striped Grass Frog	Least Concern
Drakens Albasini Frog	
Bronze Caco	
Striped Stream Frog	
Clicking Stream Frog	
Tremelo Sand Frog	
Natal Sand Frog	

1.2.3.5 **Fish Species**

According to Loreta (2001), fish species have been categorised into two groups, which are indegineuos and exotic species (see **Table 5 and 6**), the alien fish species out compete and displace the indigenous species. The alien species are invasive and they possess survival mechanisms even in harsh conditions and that give them an advantage over indigenous species. The alien species also cause changes on the ecosystem i.e. food web and food chain).

Table 5: Indigenous Fish Species

Common Name	Scientific Name
Line-spotted barb	*Barbus lineomaculatus*
Lawfin rock catlet	*Chiloglanis paratus*
Common mountain catfish	*Amphilius uranoscopus*
Southern barred minnow	*Opsaridium peringueyi*
Tiger fish	*Hydrocynus vittatus*

Table 6: Alien Fish Species

Common Name	Scientific Name
black bass (large mouth)	*Micropterus salmoides*
common carp	*Cyprinus carpic*
Nile tilapia	*Oreochromis niloticus*
rainbow trout	*oncoryhynchus mykiss*
bluegill sunfish	*Lepomis macrochirus*

1.2.4 Topography

The dam is situated within an area which is characterized by moderately gentle to steeper slopes with surface stones (Mucina and Rutherford, 2006), it is illustrated on a map showing the slope at the dam in **Figure 5.** However, the dam consist of a gentle slope, hence it is suitable to erect some major recreational structures such as small sized chalets.

1.2.5 Geology and Soils

The geology of the dam area is characterized by gneiss which comprises reddish or brown, sandstone and quartzite, conglomerate, basalt, tuff, shale and siltstone of the Soutpansberg group. There are some red and yellow drained sandy soils and loamy soil within the area. The soil also has excessive drainage, highly erosive and low natural fertility. However, the soil has favorable physical properties. The area is also characterized by low to high mountains, highest in the west, splitting into increasing number of lower mountain ridges towards the east (Mucina and Rutherford, 2006). Refer to **Figure 6** for the map that illustrates the geology map of Albasini Dam.

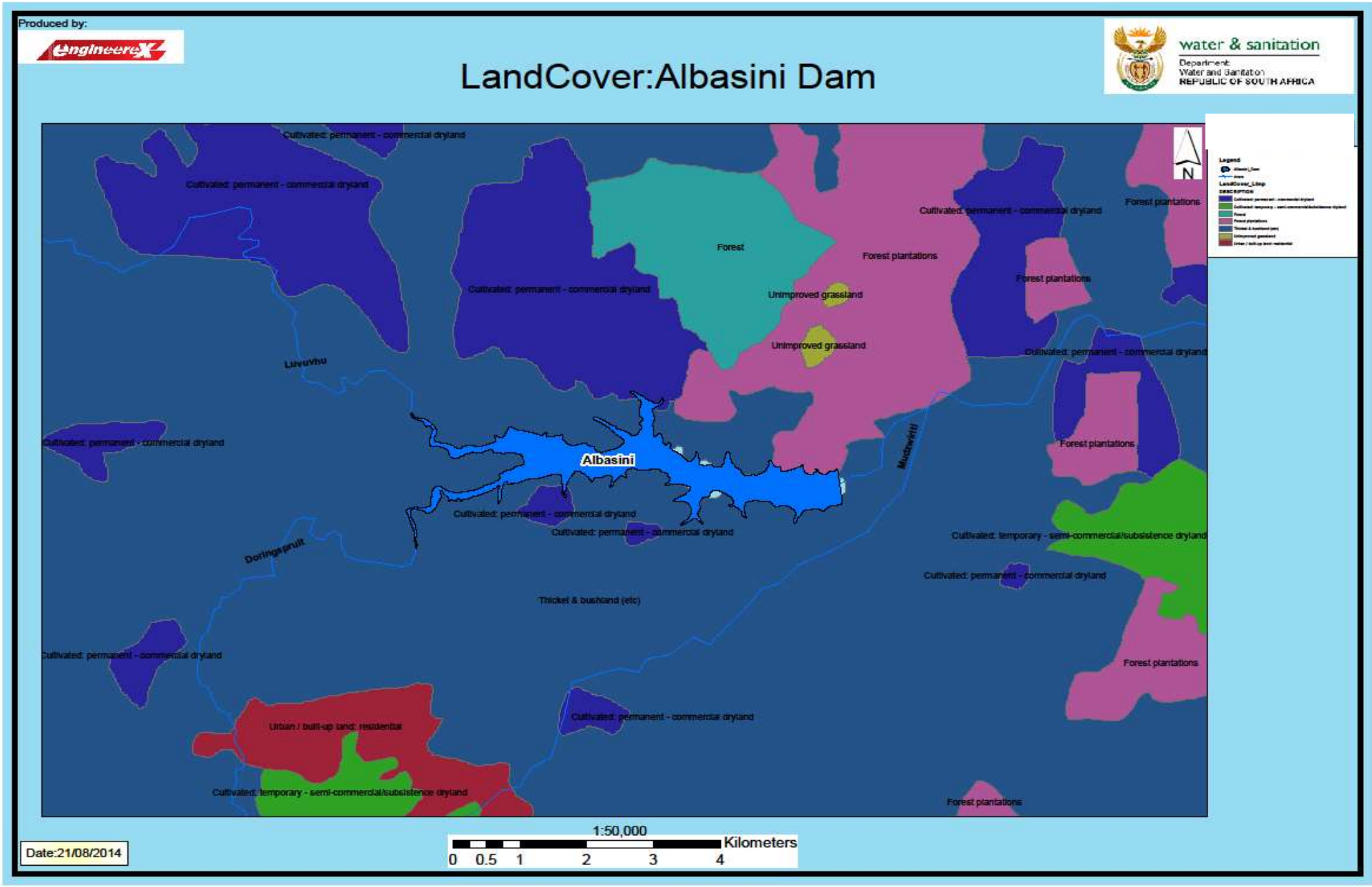

Figure 4: Land Cover Map for Albasini Dam

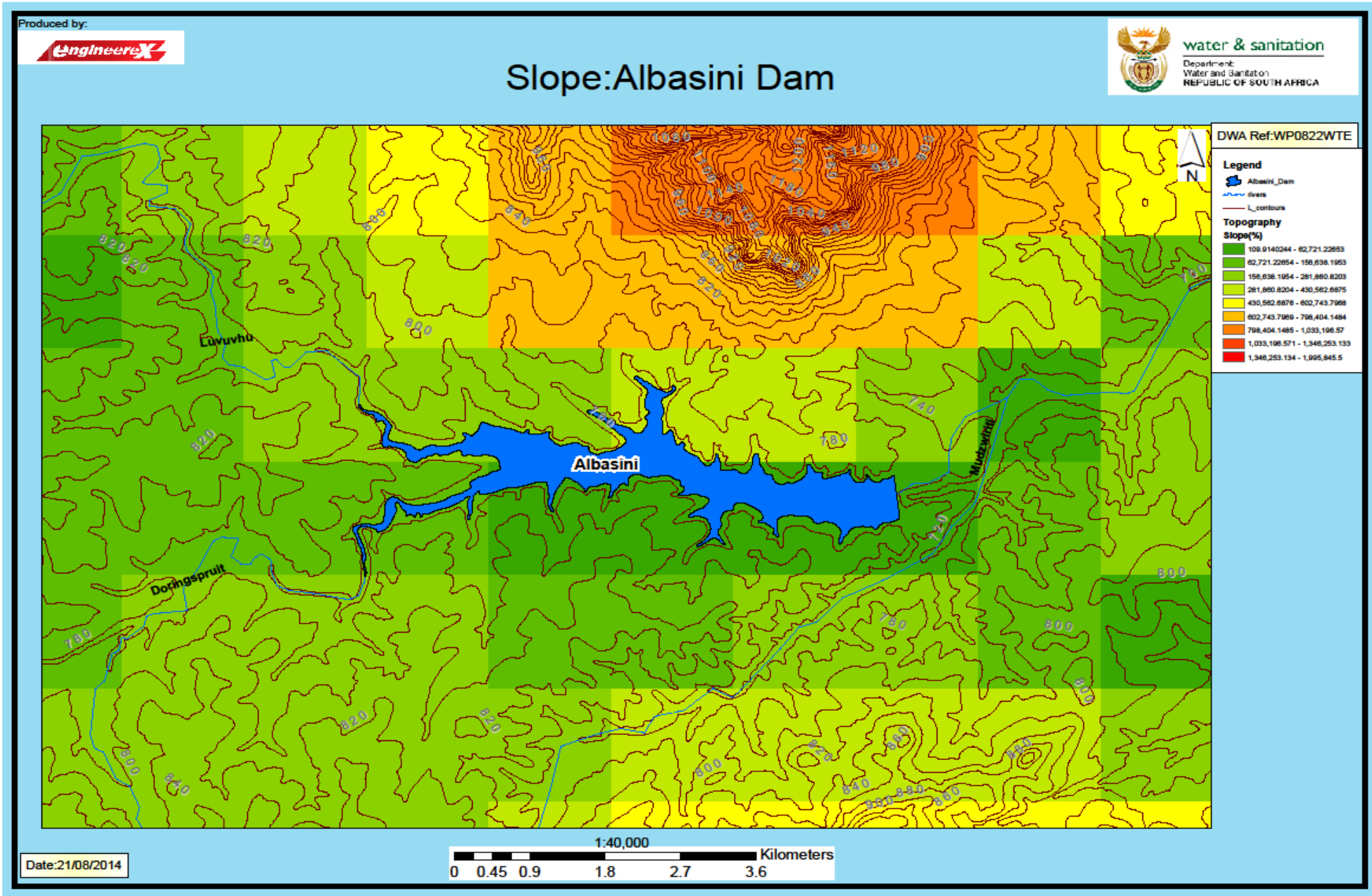

Figure 5*:* Slope Map for Albasini Dam

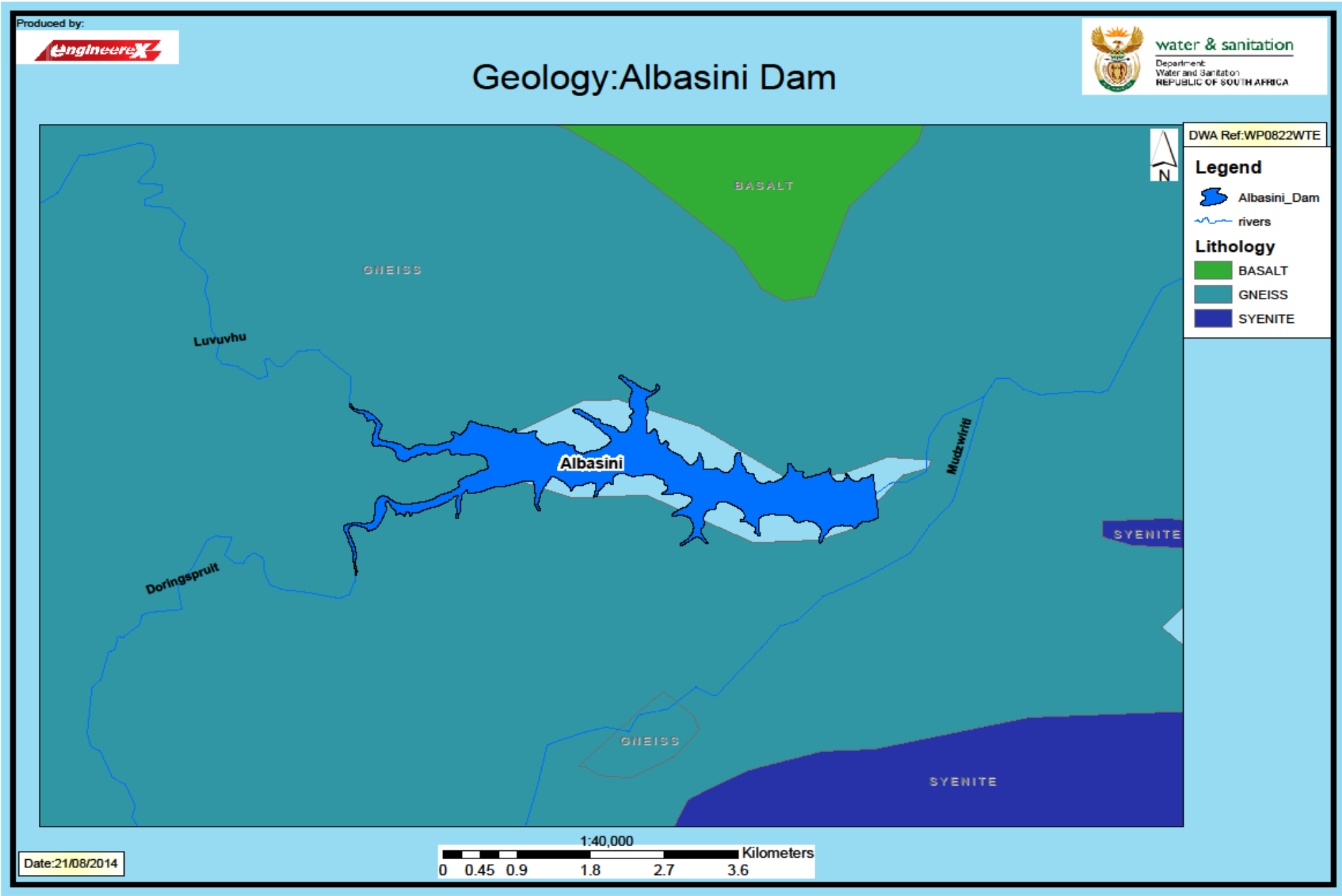

Figure 6: Geology Map for Albasini Dam

1.2.6 Hydrology

1.2.6.1 Surface Water

The dam lies within the Luvuvhu-Letaba WMA within Quaternary Drainage Area A91B It impounds the Luvuvhu and Doringspruit Rivers. According to DWS website (10/03/2015), **Figure 7** illustrates the fluctuation of the water level over a year. According to DWS website Surface Water Map, the Albasini Dam falls under Moderately High Storage in percentiles.

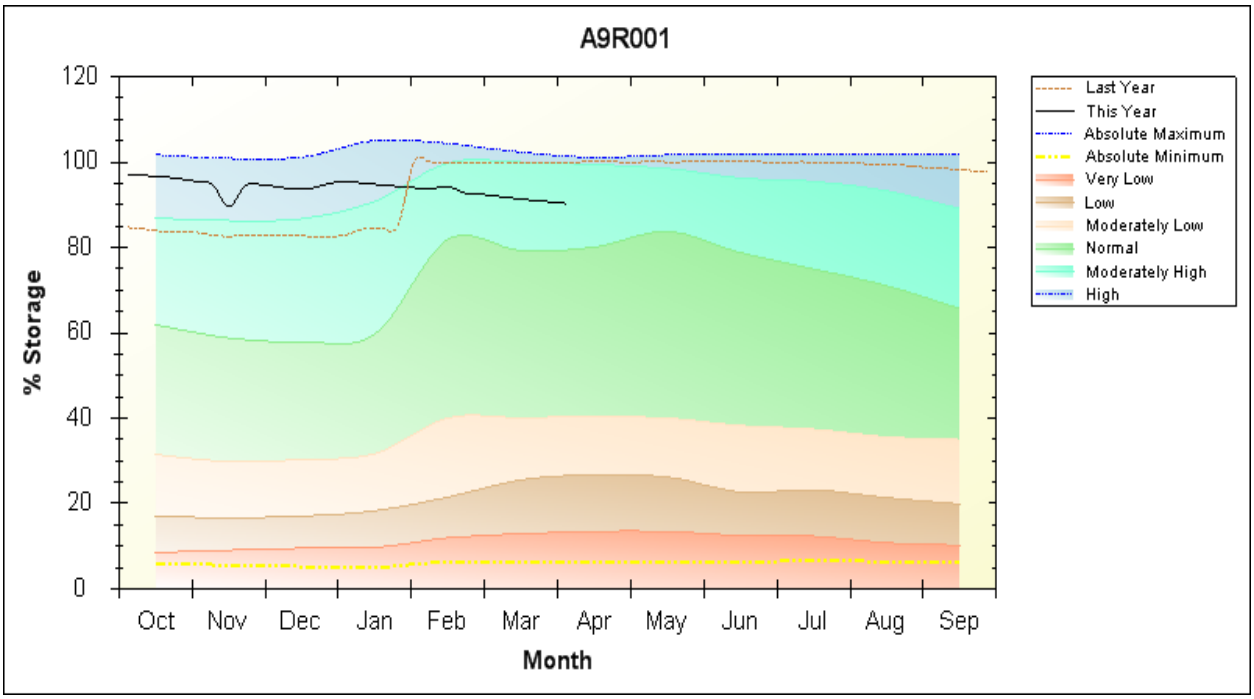

Figure 7: Full Storage Capacity (DWS, 2015)

1.2.6.2 Water Quality

The water quality at the dam has been poor in the past years due to high levels of nitrates and phosphates from the agricultural sites. Water quality parameters linked to eutrophication and agrochemicals were analyzed (Odiyo *et al* 2012). The study in which trophic status classification has been inferred from Total Suspended Solids (TSS), pH, nitrates, water transparency, Biochemical Oxygen Demand (BOD) and Dissolved Oxygen (DO) among other water quality parameters has inferred dominance of oligotrophic status for Albasini Dam(Odiyo *et al* 2012). However, Albasini dam SUP (2003) had indicated that the water quality of the dam is suitable for recreational activities, than what was recorded in the past. Current water data from the WMS indicates that the water quality is good. All water variables for Albasini Dam fall within the Ideal good classes, see below illustrates the analyzed variables by DWS (2014) to determine the fitness of water for recreational activities.

Table 7: Water Quality Variables for Albasini Dam (DWS Water Management Quality System, 2014).

Characteristics	Tests Results	Water Quality Target Range (Recreational Purposes)	Description
Clarity (Secchi disc, m)	1.9	3.0	The water is suitable for both full and intermediate contact recreation.
pH (pH units)	8.2	6.5 - 8.5	No health and or aesthetic effects can occur.
Chloride(mg/L))	15.3	0 - 100	No health and or aesthetic effects can occur.
Calcium(mg/L))	16.1	0 - 32	No health and or aesthetic effects can occur.
Magnesium (mg/L)	40.2	50- 70	No health effects.
Potassium (mg/L)	2.7	0 - 50	No aesthetic or health effects.
Sulphate (mg/l)	2.4	0 - 200	No health or aesthetic effects are experienced.

Source: Water Quality Standards (Department of Water Affairs, Water Quality Guideline for Recreational Water Use, 1996).

1.3 BUILT ENVIRONMENT

1.3.1 Transport Network

The dam can be accessed by taking the N1 road towards Polokwane from Pretoria. When one is about to reach Louis Trichardt, they can take the D10 road to Elim and proceed until they see Albasini Dam sign on the left side of the road. The dam can also be accessible by taking the R524 road going towards Thohoyandou.

1.4 USERS AND USE OF THE DAM

1.4.1 Primary Functions

1.4.1.1 Domestic Use

The Albasini Dam is fully allocated. It provides drinking water to other rural communities in the vicinity of Makhado Town. The dam is unable to meet demand at a satisfactory level of assurance (DWS website), to satisfy the growing demands for water because demand has outstripped water supply.

1.4.1.2 Irrigation Use

One of the initial functions of the dam was to provide water for irrigation. The irrigation schemes include forestry plantations, commercial farming which include macadamia nuts farms and subsistence farming.

1.4.1.3 Conservation Use

The dam has a good conservation value to the environment. It is a good hotspot for a variety of birds. It is rich in biodiversity for example impalas, monkeys, baboons. Students from the University of Venda also use the site as their study areas for their projects.

1.4.2 Secondary Functions

1.4.2.1 Recreational Use

There are many recreational activities that used to take place at the dam which have now stopped due to the closure of the access gate. These included:

- Angling;
- Boating;
- Fishing;
- Bird Watching;
- Rowing;
- Picnicking; and
- Camping.

1.5 RECREATIONAL INSTITUTIONAL STRUCTURE

According to the Albasini SUP there were two (2) proposed management structures to manage the dam. These are Albasini Water User Association and Management Institution. Only

the AWUA was established while the Management Institution was proposed and never established.

1.5.1 Management of Water Surface

The management of the surface water in terms of operation of the Dam is done by DWS.

In addition to the DWS, Local Accountable AtoN Parties (LAAP) and other Bodies providing access to Government waterways and watercourses have a responsibility to ensure that the required fixed and/or floating AtoN are provided after obtaining the necessary support from DWS and thereafter the permission by SAMSA.

1.5.2 Access

There is only one public access gate at the dam. The entrance gate has been closed since February 2014 up to date due to vandalism by the day visitors. No one has been given the responsibility of managing the access point of the dam, following the non-renewal of the services of the Security Company which had been rendering the services.Part of the dam is fenced, however most of the land surrounding the dam is privately owned and it is not fenced. Hence, despite the closure of the dam's entrance, people are still able to illegally access the dam, through these private properties which are surrounding the dam.

1.6 SAFETY

There are dangerous animals in the dam such as crocodiles and hippopotamus. Safety boards have been erected to create awareness of these animals around the dam (see **Figure 8**)

Figure 8: Safety Notice Board

1.6.1 Safety of Navigation

There is currently no adequate, standardised and harmonised fixed and floating Aids to Navigation[2] (AtoN) and Demarcation Markers in place.

1.6.2 Incident Management

There is no specific incident management system in place to ensure that incidents are responded to in a coordinated manner.

1.7 SOCIO-ECONOMIC ENVIRONMENT

1.7.1 Social Audit

The main purpose of a social audit is to examine the general status of the study area and to determine issues that need to be addressed when developing the RMP in order to overcome potential difficulties in an area.

The dam is situated in ward 15 in MLM (refer to **Figure 9)**. . A social Audit which focused on the population composition of the ward and employment status was undertaken and is presented is section 1.7.1.1 and 1.7.1.2, respectively.

[2]A marine Aid to Navigation (AtoN) is defined by the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) as "A device or system external to vessels that is designed and operated to enhance the safe and efficient navigation of vessels and/or vessel traffic".

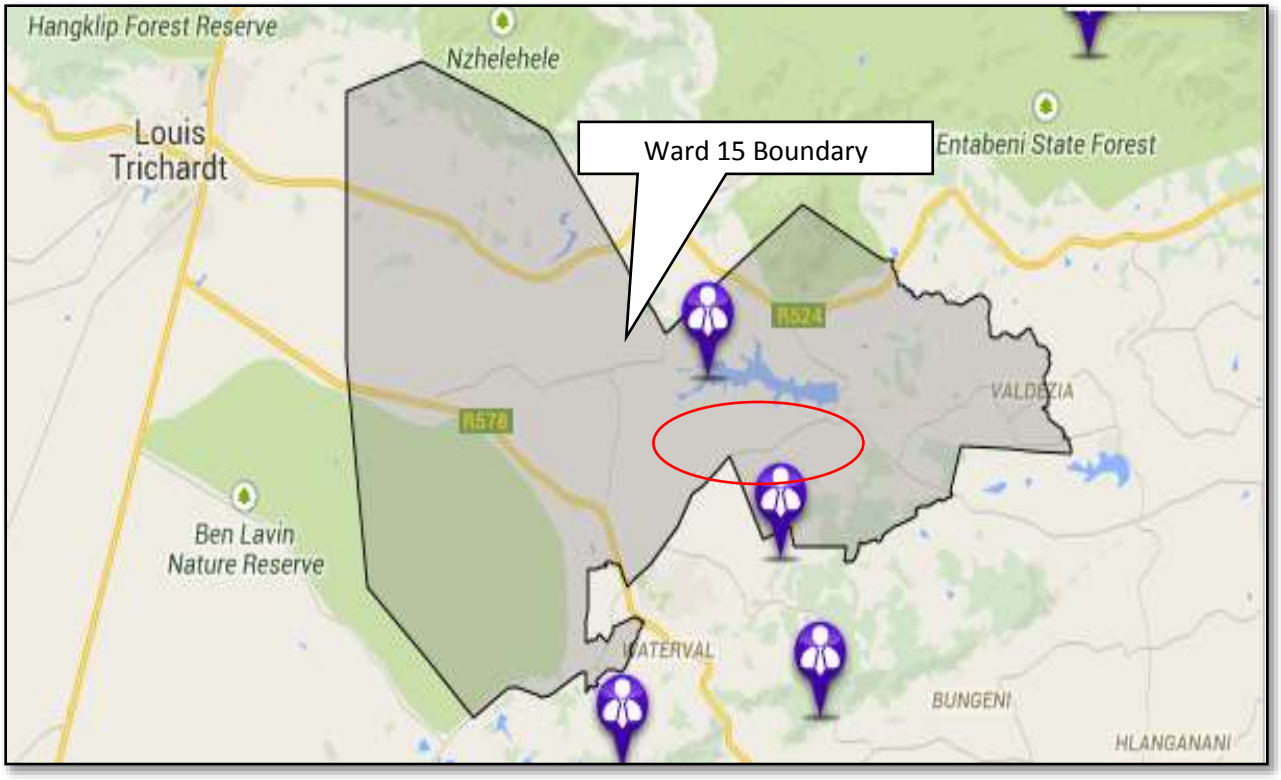

Figure 9: Makhado Municipality Ward 15 (Mobilitate, 2014)

1.7.1.1 **Population**

The purpose of a status quo analysis is to examine the general situation in the study area. The dam is situated in ward 15 in MLM. The population of MLM is 516 036 while ward 15 has a population of 17 665. **Figure 10** present the population dynamics of MLM.

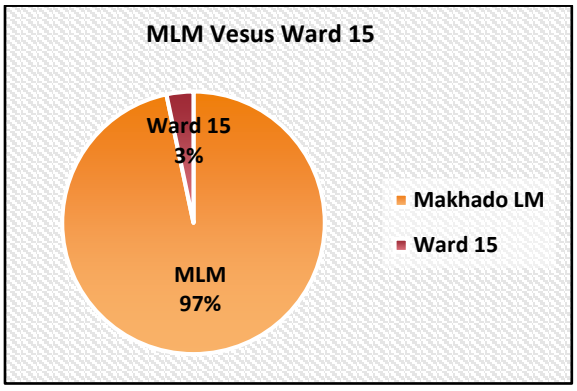

Figure 10: Population Dynamics in MLM and Ward 15

1.7.1.2 **Employment**

Community members around the dam are willing to participate in any recreational activities. However, some unemployed community members depend on fishing for their survival and this has resulted in illegal fishing (using nets) within the dam. Some community members also feel prohibited from accessing the dam, especially for fishing activities. In terms of employment status in ward 15 of Makhado Local Municipality 19% of the residents are employed, 6% are unemployed, 3% are discouraged, 32% are uneconomically active and 40% is not applicable. A major concern is that the percentages of people who are not earning is higher than the percentage of working people (see **Table 8** and **Figure 11**).

Table 8: Employment Status

Description	MLM Ward 15
Employed	3 288
Unemployed	1 132
Discouraged	526
Other uneconomically Active	5 710
Not applicable	7 009

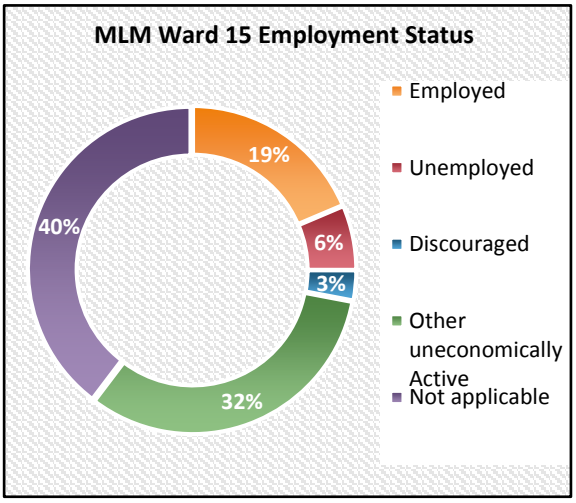

Figure 11: Employment Status

1.7.2 Community Beneficiation

It is DWS's belief that Local Communities should equally share the benefits emanating from the utilisation of the dam for recreational purposes, by ensuring that they have both physical access to the resource, as well as access to the water-based recreation economy.

According to DWAF (2006), by ensuring that the Local Communities move beyond merely being affected by or living close to a water resource, but rather undertaking the transition to become participants will ensure that water resources can and will be protected by the people closest to and most affected by the dam.

The community will benefit in amongst others the following ways:

- By having equitable access to the dam;
- By addressing the community needs in an appropriate and equitable manner;
- By being safe while accessing and using the dam;
- By being given first preference when there are employment opportunities and skills development;
- Through the PPP; and
- By participating in decision-making with respect to major developments planned or proposed for the dam (through the Dam Management Committee).

CHAPTER 2: LEGISLATIVE FRAMEWORK

This RMP forms the overarching framework for the management of Albasini Dam. It is informed by relevant policy, legislation and planning documents administered by other government departments. Similarly, these government departments are required to use the RMP to inform the development of future policy, legislation and planning documents.

I. **The Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996), Section 24:** Provides that, everyone has a right to an environment that is not harmful to their health or well-being.

II. **Conservation of Agricultural Resource Act, 1983 (Act No. 43 of 1983):** Provides for control over the utilization of the natural agricultural resources of the Republic in order to promote the conservation of the soil, the water sources and the vegetation and the combating of weeds and invader plants; and for matters connected therewith. Regulation 7 and 8 within the same Act deals with the protection of wetlands and water courses, while regulations 15 and 16 deals with Alien Invasive Plant Species and bush encroachment**.**

III. **Consideration on Institutional Arrangement for Managing Use of Water for Recreational Purposes (DWAF, 2003):** It outlines some of the institutional issues at a local level and makes recommendations about the conditions under which different Institution Management arrangements may be considered.

IV. **General Public Participation Guidelines (DWAF, 2001):** Public Participation refers to the ongoing interaction between Role Players and all stakeholders that is aimed at improving decision making during planning, design, implementation and evaluation of all projects within the state, this includes the proposed development of the RMP.

V. **Government Immovable Asset Management Act, 2007 (Act No. 19 of 2007):** To provide for a uniform framework for the management of an immovable asset that is held or used by a national or provincial department; to ensure the coordination of the use of an immovable asset with the service delivery objectives of a national or provincial department; to provide for issuing of guidelines and minimum standards in respect of immovable asset management by a national or provincial department; and to provide for matters incidental thereto.

VI. **Government Notice R654 dated 1 May 1964, in terms of the Water Act, 1956 (Act No. 54 of 1956):** Regulates access and use of government waterworks for recreational purposes.

VII. **Guidelines for Compilation of Resource Management Plans (DWAF, 2006):** Directs and guides the development of RMPs by providing insight into the purpose and objectives of these plans, the procedure for its compilation and structure of such documents.

VIII. **Merchant Shipping (National Small Vessel Safety) Regulations (2007):** These Regulations provide *inter alia* for:

- Requirements for vessel safety;
- Crewing requirements and responsibilities;
- Controlled events such as competitions and regattas; and
- Responsibilities of authorised agencies (governing boards/ clubs/

organisations and regulating authorities).

These Regulations apply to the Department of Water and Sanitation as they are applicable to all inland and sheltered waters and as the Department and its agencies are allowing access to government waterworks for recreational boating vessels.

IX. **Methodology for Carrying Capacity Assessment for the Use of Water for Recreational Purposes (DWAF, 2003):** The carrying capacity of a water resource represents the maximum level of visitor/recreational use and related infrastructure that the water resource and surrounding area can accommodate, without diminishing user satisfaction or adverse impacts upon the local or host community, the economy and culture of the area.

X. **National Environmental Management Act, 1998 (Act No. 107 of 1998):** NEMA serves as South Africa's Environmental Framework Legislation. It was designed to provide for co-operative and Integrated Environmental Governance by establishing a general framework for decision-making on matters affecting the environment.

XI. **National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) and Related Regulations:** This Act aims to provide the framework, norms and standards for the conservation, sustainable use and equitable benefit-sharing of South Africa's biological resources.

The Alien and Invasive Species Regulations for this Act came into effect 01 October 2014. NEMBA together with these Regulations aim to prevent the introduction and spread of alien and invasive species across South Africa.

XII. **National Environmental Management: Protected Area Act, 2003 (Act No. 57 of 2003):** The aim of this Act is to provide for the protection and conservation of ecologically viable areas, which are representative of South Africa's Biodiversity, as well as natural landscapes and seascapes.

XIII. **National Treasury Public Private Partnership (PPP) Toolkit for Tourism, 2005:** This toolkit assist the process of development of tourism-based businesses on State-owned Land. The Toolkit make it easier for Institutions and the Private Sector to enter into tourism related partnerships on State Property managed by National and Provincial Government Institutions.

XIV. **National Water Act, 1998 (Act No. 36 of 1998):** The purpose of the Act is to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in a sustainable and appropriate manner, for the benefit of all. Furthermore Section 113 of the Act states that the water of a government waterworks and surrounding state owned land may be made available for recreational purposes, subject to controls determined by the Minister and regulations made by the Minister.

Using water for recreational purposes is a water use under Section 21K and can be exercised as permissible use of water under Schedule 1 of the Act. However, this provision does not cater for commercial use hence the RMP should be implemented in line with General Strategic Plan for commercialisation of Tourism Public Private Partnerships at

Government Waterworks, 2009 and PFMA Treasury Regulation 16.

Once the RMP has been approved, the RMP will regulate access and use of the dam. It is important to note that users will need to comply with other relevant legislation.

XV. **Operational Policy: Using Water for Recreational Purposes (DWAF, 2004):** This policy is the main guideline in support of the RMP process with regards to the basic principles, policies, strategies and actions for regulating the use of water for recreational purposes.

XVI. **Public Finance Management Act (PFMA) (Act No. 29 of 1999**): Section 76 of the Act secures transparency, accountability and sound management of the revenue, expenditure, assets and liabilities of government departments. The Act promotes the objective of good financial management in order to maximize service delivery. The Act allows DWS to enter into PPP agreements with the private sector for the commercial use of state assets.

XVII. **Safety at Sport and Recreational Events Act, 2010 (Act No. 2 of 2010):** Events management is addressed by Safety at Sport and Recreational Events Act (Act No. 2 of 2010). This act deals with ensuring responsibility for safety and security at events. The act deals with among other things,

- Responsibility for safety and security at the events;
- Risk categorization of events; and
- Safety certificates.

XVIII. **South African Maritime Safety Authority Act, 1998 (Act No. 5 of 1998):** One of SAMSA's three legislative mandates is "to ensure safety of life and property at sea". The Act enables SAMSA to administer and execute the relevant maritime legislation.

XIX. **Water Services Act (Act No. 108 of 1997):** The Act outlines the roles and responsibilities for the supply of water and sanitation to citizens. It also recognises the rights of all humans to basic water supply and sanitation services.

The RMP process also takes cognizance of the following Legislations, Policies, Programmes and Reports:

- Broad-based Black Economic Empowerment Act, 2003 (Act No. 53 of 2003).
- Communal Land Rights Act, 2004 (Act No.11 of 2004).
- Development Facilitation Act, 1995 (Act No. 67 of 1995).
- Disaster Management Act, 2002 (Act No. 57 of 2002).
- Environmental Conservation Act, 1989 (Act No, 73 of 1989).
- Intergovernmental Relations Framework Act, 2005 (Act No.13 of 2005).
- Land Administration Act, 1995 (Act No. 2 of 1995).
- Limpopo Conservation Plan v2 (2013).
- Limpopo Development Plan (2014)
- Limpopo Environmental Management Act, 2003 (Act No. 7 of 2003)
- Limpopo Growth and Development Strategy (2005)
- Limpopo Province: Provincial Land Use Legislature Reform (2011)
- Local Government: Municipal Systems Act, 2000 (Act No. 32 of 2000).
- National Heritage Resources Act, 1999 (No. 25 of 1999).
- Occupation Health and Safety Act, 1993 (Act No. 85 of 1993).
- Restitution of Land Rights Act, 1994 (Act No. 22 of 1994).

- State Land Disposal Act, 1961 (Act No. 48 of 1961).
- Sustainable Development Goals (2015)
- **Safety of Navigation:** In addition to its common-law responsibility, DWS is, in terms of the requirements described in the National Water Act, Act No 36 of 1998, amongst others, responsible for the safety of GWWs. DWS, its delegated public sector partner, or a delegated water management institution, has therefore the responsibility to provide the required fixed and/or floating AtoN for general navigation.

  In addition to the DWS, Local Accountable AtoN Parties (LAAP) and other Bodies providing access to Government waterways and watercourses have a responsibility to ensure that the required fixed and/or floating AtoN are provided after obtaining the necessary support from DWS and thereafter the permission by SAMSA. In order to demarcate specific zones/areas, standardised demarcation markers are to be used in conjunction with the relevant AtoN.
  - SAMSA Marine Notices and its Directive on the Standardisation of fixed and floating AtoN and Demarcation Markers on all navigable Inland Waterways in the Republic of South Africa.

The aim is to enhance the development of a best practice model to ensure a safe and structured inland maritime environment and culture, whilst protecting the country's precious water resources.Not only do these Acts, Regulations and Frameworks guide specific decisions and actions, they also provide the framework for monitoring performance and compliance, and provide guidelines regarding contravention, offences and penalties. This list is not extensive, other legislation could be applicable.

CHAPTER 3: WHAT IS A RESOURCE MANAGEMENT PLAN

3.1. DEFINITION OF RMP

A Resource Management Plan (RMP) is a plan which aims to regulate access and the recreational utilisation of a water resource and the surrounding state land, in ways which promote community participation and beneficiation, environmental conservation and unlock socio-economic potential of the water resource.

Recreational use includes activities ranging from leisure, sport to culture and religion. Although recreational use does not involve consumption of water, it is still a major water use and needs to be managed effectively with minimal environmental impacts and to ensure communities have access to water based economy.

3.2 PURPOSE OF THE RMP

The main aim of RMPs is to attain the objectives underlying sustainability and to compile functional, workable sustainable access and utilization plans for water resources.

Without approved management plans relating to water resources utilized for recreational purposes, it is difficult for informed decisions to be made, necessitating a precautionary approach to access, utilization and development proposals.

One of the components of the RMP process is to implement an Institutional Plan for effective management of GWWs. The focus on the Institutional Plan is accompanied by a Zoning Plan which is influenced by current and potential recreational uses. The RMP also outlines the Strategic Plan for all the identified objectives for the dam. In addition, a Financial Plan is incorporated into the Business Plan (BP) and provides guidance on funding requirements and funding options to implement the potential recreational activities at the dam.

3.3 PROCESS TRIGGERS

Triggers are factors that have encouraged DWS to initiate and commission the development of RMPs.

A number of generic factors have been identified by DWS for the development of RMPs, however, the Process Facilitator identified site specific trigger factors, as illustrated by **Table 9**

Table 9: Trigger Factors for the Development of Albasini Dam RMP

Trigger Factors	Description
Resource Management	**Water Quality** • According to Odiyo *et al.(*2012) the water quality of the dam was identified to be poor, however Resource Quality Information Services (DWS, 2014) indicated that the current status of water quality in the dam is suitable for recreational activities. There is a need to maintain the current water quality to avoid repitition of the previous situation. **Management Structure** • The picnic site at the dam is poorly managed, this is evident from the chalets that are worn out and vandalised gate. Hence there is a need to implement an efficient management structure. **Unauthorised Activities** • It is alleged that there is unauthorised abstraction of water directly from the dam, as well as unauthorised fishing (using gill nets) for commercial purposes. **Alien invasive species** • The environment around the dam is infested with alien vegetation such as *Lantana camara*, *Psidium guajava*, etc. These alien invasive plants have a detrimental effect on the water level because they consume lot of water as compared to indigenous vegitation.
Recreational Industry Involvement	**Access Control** • Most of the land around the dam is privately owned. This result in access control problems, given that the public is not permitted to access the dam through private properties. • The water surface is currently being utilised unlawfully for recreational purposes, for example; boating and canoeing which might lead to the spread of alien vegetation because there are no relevant facilities such as wash–bays within the dam to clean the vessels before they enter the water surface to get rid of alien plants which might have been carried from other dams. • Unlawful utilisation of the water resource is due to unmanaged recreational activities and unauthorised access points.
Community Participation and Beneficiation	**Community Beneficiation** • The communities are not utilising the dam and they do not directly benefit from the dam. However there is a need to ensure socio-economic development and encourage the local communities to participate and benefit from the opportunities emanating from the use and development of the dam.
Public Policy	**Local Planning Initiatives** • Albasini Dam should be integrated in the Local Municipal development plans and policies such as Makhado Local Municipality (MLM) Environmental Management Framework (EMF) and Spatial Development Framework (SDF).

3.4 RMP DEVELOPMENT PROCESS

The RMP is developed in accordance with the RMP Guideline procedure (DWAF, 2006) as illustrated in **Figure 12.**

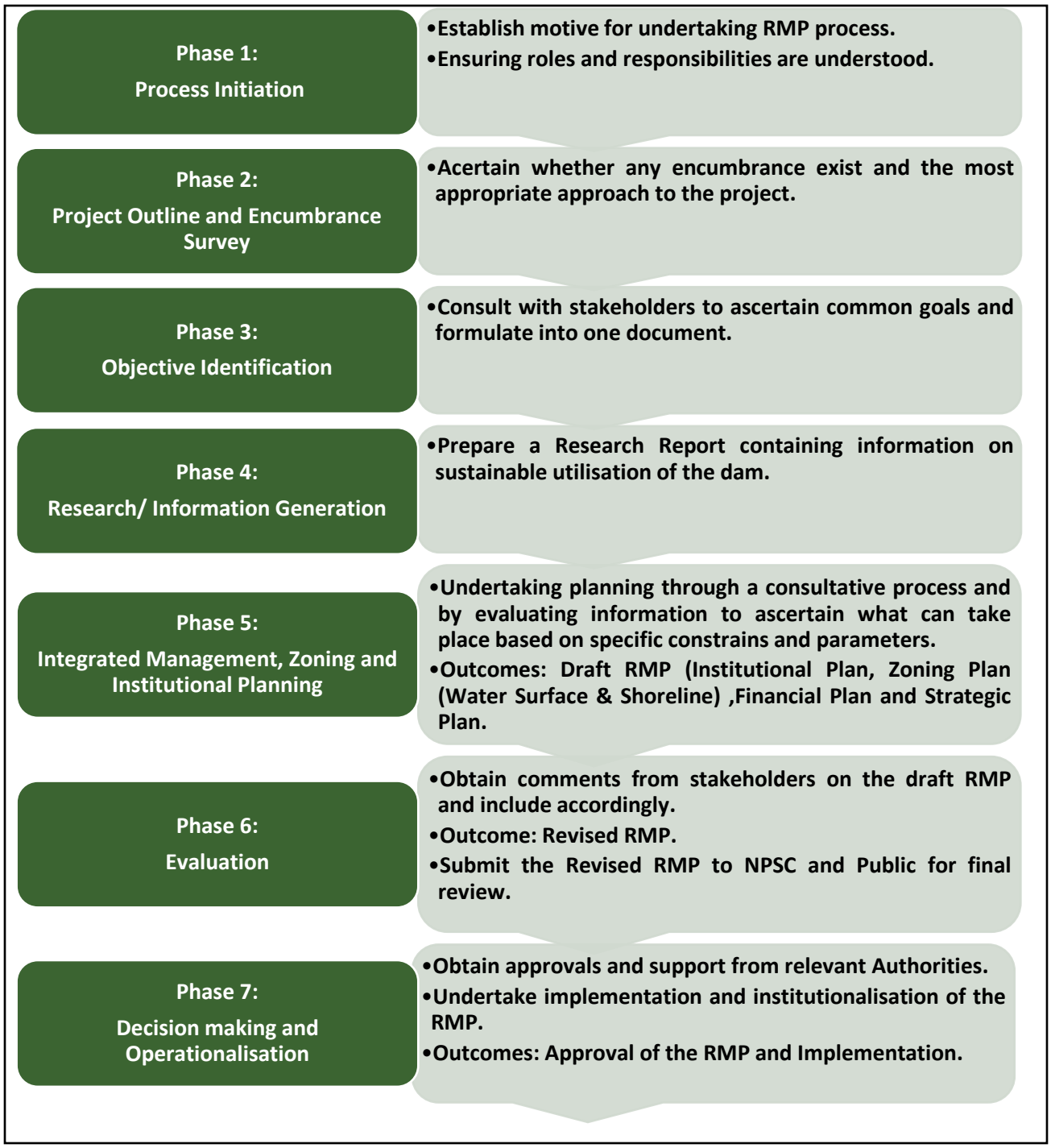

Figure 12: RMP Procedure

3.5 RMP PLANNING STAGES

3.5.1 Desktop Study

The desktop study was conducted with the aim of acquiring background information about the Albasini Dam. This was done through literature review. This study provided information such as the location of the dam, user groups, current activities, previous studies conducted for the dam.

3.5.2 Site Inspection

A site inspection was conducted at Albasini Dam on **05 & 06 June 2014** to gather baseline information using a checklist questionnaire. The site inspection was undertaken with the DWS delegates (DWS IEE, Northern Operations Manager, Dam Manager and Northern Operations Champion). Photos of the study area were also taken during site inspection as illustrated in **Figure 13.**

Figure 13: The picnic site at the dam

3.5.3 Public Participation Process (PP)

Public Participation process (PP) is a process in which potential Interested and Affected Parties (I&APs) are given an opportunity to comment on or raise issues relevant to specific matters. The three (3) fundamental and theoretical objectives of PP process as stipulated in the DWAF's Guideline for Public Participation (2001) are:

- To improve decision-making;
- To bring about sustainable development; and
- To normalise the attitudes of stakeholders (Authorities and I&APs).

A Public Participation was conducted in order to obtain information for **Phase 2 (Encumbrance Survey), Phase 3 (Objective Identification)** and **Phase 4 (Research/ Information Gathering)** from stakeholders, which was used to complete **Phase 5 (Integrated Management, Zoning and Institutional Planning)**. In order to successfully complete the RMP, it is essential that the information obtained in the previous phases is utilised as planning input.

The public participation process for this project was formulated to include the following objectives:

- The identification of role players;
- Introduce the RMP project to role players and inform them about their roles and responsibilities;
- To engage the Stakeholders (Authorities and I&APs) in the planning process;
- The answering of questions and noting of concerns;
- The identification of important issues, problems, conflicts and alternatives;
- Identification of the overall vision of the dam;
- The elimination of false expectations and preconceptions; and
- The creation of awareness amongst users.

DWAF's Guidelines for Public Participation (2001) outlines three (3) broad phases for public participation namely the **Planning, Participation** and **Exit phase**. Summarized below are the aspects of each phase and the approach for this project.

3.5.3.1 The Planning Phase

Planning phase entails three (3) important aspects namely:

- Decision analysis;
- Participation planning; and
- Implementation planning.

During the **Planning phase** a Site inspection and literature review was conducted to gather baseline information about the dam. A process was also established to get into contact with the I&APs and relevant Authorities to ensure co-operative interests and support in the RMP project.

3.5.3.1.1 The Role Players

It is recognized that different roles and responsibilities of the Stakeholders (Authorities and I&APs), and their relationship towards each other and the steps in the planning procedure are imperative in the successful development of the RMP. It is also important that proper consultation with the public is done in order to produce a credible RMP. As such the success of this RMP is dependent on the level of involvement of the various Stakeholders. Numerous Stakeholders were identified and invited to participate in an open and consultative process. (See attached registered stakeholder list in **Appendix A)**. The Stakeholder list is updated on a continuous basis throughout the RMP process.

3.5.3.2 Participation Phase

The **Participation Phase** entails three (3) important aspects:

- Informing stakeholders – explained briefly under **3.5.3.4 Advertising Process.**
- Meeting the stakeholders – explained briefly under **3.5.3.5 Direct Communication.**
- Feedback – it is of utmost importance that feedback is directed to and from stakeholders. In this project feedback thus far has been given in a form of minutes of the meetings and follow up e-mails.

3.5.3.3 **The Exit Phase**

The **Exit Phase** entails two (2) important aspects namely:

- Ensuring that all goals, challenges, concerns, objectives and the vision for the dam have been identified and documented in the RMP.
- Officially ending the public participation process for the RMP process.

During this Phase, a draft RMP will be presented to the Stakeholders so that they comment and give inputs.

3.5.3.4 **The Advertising Process**

3.5.3.4.1 Compilation and Distribution of the Background Information Document (BID)

The purpose of this document was to provide Stakeholders (Authorities and I&APs) with the background information about the proposed RMP project and to introduce the processes which will be followed in developing the plan. It also aimed to inform authorities and I&APs on how to fully participate in the process and to encourage active attendance in Stakeholder engagement meetings. The BID was compiled from the information collated through the desktop study and site inspection (See attached **Appendix B).**

3.5.3.4.2 Newspaper Advert

Newspaper advert regarding the RMP project was advertised on the **Mirror Newspaper**. The advert invited the public to attend the Public Participation Meeting. The advert was published in English on **18 July 2014**. Furthermore, an advert for the draft RMP was advertised on **18 December 2015**. (See attached **Appendix C**).

3.5.3.4.3 Flyer Compilation and Distribution

Flyers were also used as a form of notification, they aimed at informing the I&APs about the public consultative meetings. The flyer detailed a brief description of the RMP, meeting date, time, venue and relevant contact details.Flyers were compiled in English and distributed on **21 July 2014**

The flyers for the draft RMP were distributed on **15 December 2016**. (See attached **Appendix D**).

3.5.3.5 **Direct Communications**

3.5.3.5.1 E-mails

Meeting invitations were sent out to authorities and I&APs notifying them about the scheduled consultative meetings. The invitation entailed the BID, meeting venue and time. The email notification was sent out on **17 June 2014**. Moreover, the meeting invites for the draft RMP were sent out on **13 December 2015** (See attached **Appendix E**).

3.5.3.5.2 Authority Meeting

The initial authority meeting was held on **30 July 2014** at the **Mpheni Traditional Office.**

The purpose of the meeting was

- To present the RMP, its goal and objectives of the project to the authorities; and
- To allow the authorities an opportunity to participate in the project by sharing information on their respective mandates.

A follow up meeting was held on **31 October 2014** at **Nandoni DWS offices.**

The draft RMP was presented to the authorities on **09 March, 20 May and 23 May 2016.**

3.5.3.5.2 Public Meeting

The initial public meeting was held on **30 July 2014** at **Mpheni Traditional Office**. A platform was also given to I&APs to identify encumbrances/ challenges that might hinder the progress of the RMP as well as to identify objectives and vision for the Albasini Dam.

The draft RMP was presented to the public on **20 January 2016.**

3.5.3.5.3 Comments and Responses Register

A copy of the draft report was circulated on **15 December 2015** for commenting**.** The commenting period was to elapse on **20 January 2016.** (See attached **Appendix F**).

3.5.4 Planning Partners

RMPs are developed through a process of cooperative governance and Stakeholder participation. The distinctly different roles and responsibilities of the stakeholders, and their relationship towards each other and the steps in the planning procedure are imperative in the success compilation of the RMP.

The RMP provides for coordination between different governments and agencies to ensure that not only the objectives of DWS are attained, but also the objectives of other relevant Government Departments are attained. Such Departments includes among others as illustrated by **Table 10**.

Table 10: Planning Partners and their Respective Mandates

Department/ Agency	Mandate
Vhembe District Municipality/Makhado Local Municipality (EDM/MLM)	The dam is within the jurisdiction of the municipality and is mandated to provide bulk water services.
Department of Agriculture, Forestry and Fisheries (DAFF)	The purpose of DAFF includes sustainable development and management of resources to maximizing the economic potential of the fisheries sector while protecting the integrity and quality of the country's aquatic ecosystems. Operation Phakisa expansion to inland dams is one of DAFF initiative aimed at unlocking economic potential of fisheries sector within the inland water. The latter programme will be

Department/ Agency	Mandate
	used as benchmark for implementation of conservation policies while implementing job creation within fishery and fish processing market.
Department of Rural Development and Land Reform (DRDLR)	The department will assist in terms of Land Claims/Ownership issues.
Department of Environmental Affairs (DEA)	Responsible for Biodiversity Management within the dam including Invasive Alien Species.
Department of Public Works (DPW)	Has the power to regulate and control the use of state land outside the GWWs. In this regard, lease agreements or permits will be required from the department as some of the recreational activities will overlap into the state land.
Department of Transport (DoT)	Responsible for legislation, policy and regulations for all transportation in South Africa, including shipping and other transport by water or sea also inland waterways.
National Treasury (NT)	The use of State assets is governed by National Treasury Regulations, requiring DWS to plan concessions in compliance or association with National Treasury, guided by the Tourism Public Private Partnership (PPP) Toolkit of 2005.
South African Maritime Safety Authority (SAMSA)	One of SAMSA's three legislative mandates is "to ensure safety of life and property at sea". The Act enables SAMSA to administer and execute the relevant maritime legislation.

3.6 RMP DATA ANYLSIS

3.6.1 Encumbrance Survey (Phase 2)

The purpose of the Encumbrance Survey is to investigate/ ascertain whether any encumbrances exist around the dam and other factors that may influence the development and implementation of the RMP. The survey also identifies the information that is required for effective decision-making regarding the RMP (DWAF, 2006).

The identified encumbrances will assist DWS to identify hindrances and other factors that may influence the development and implementation of the RMP. The identified encumbrances are broken down into **Biophysical, Legal, Social and Existing Plans.**

Tables 11 - 14 outline the summary of limitations that might affect the development or implementation of the RMP for the dam.

Table 11: Summary of Biophysical Encumbrances

Items	Description
Geology and Soils	• The soil is so slippery, which is a factor that can eliminate some of the activities which can be established.
Biodiversity	• The area might experience loss of animal and plant species based on some of the recreational activities that might be undertaken in and around the dam. • Destruction of animal habitat. • Alien species are in competition with the native species, therefore the native species can be lost, and these native species have an aesthetic value to the tourists. • Prohibition of certain activities might occur because of crocodiles and hippos which can attack people.

Table 12: Summary of Legal Encumbrance

Item	Description
Land Ownership	• Access to certain parts of the dam is a challenge since most of the surrounding land is privately owned.

Table 13: Summary of Social Encumbrances

Item	Description
Social Audit	• The communities are much concerned about water provision and this can be a hindrance for the community to cooperate on the development of the RMP. • Community members feel prohibited from accessing the dam, especially for fishing activities. • The entrance gate at the DWS land has been closed since February 2014 till to date because it has been vandalised by the day visitors.
Employment	• Unemployed community members depend on fishing for their survival. However, they do illegal fishing using nets during the night which put their lives at risk since there are crocodiles and hippos in the dam. • There is high percentage of unemployed people.

Table 14: Summary of Existing Plan Encumbrance

Item	Description
Institutional Plan	• The existing structure formed is not managing the dam as expected and the Management Institution was proposed in the SUP but never established hence there is poor management of the dam.

Upon identifying the encumbrances, objectives needed to be identified in order to facilitate a planning procedure aimed at the compilation of a RMP. It is essential to clarify objectives to be met by the planning procedure (DWAF, 2006).

3.6.2 SWOT Analysis and Objective Identification

The SWOT Analysis was conducted to gather **Strengths** and **Opportunities** that define the potential of the dam whereas the challenges regarding the dam where identified through **Weaknesses** and **Threats**. The common key objectives were formulated and identified from the **Strengths** and **Opportunities** of the dam. Moreover, the vision for the dam for a period of 20 years was formulated by stakeholders from the identified objectives.

3.6.2.1 SWOT Analysis Approach

There were issues of concerns that were raised in the stakeholder engagement meetings prior to conducting the SWOT Analysis. Other challenges or encumbrances that may hinder the progress of the dam's RMP process were identified by the stakeholders following the SWOT analysis approach as illustrated in **Table 15.**

Table 15: SWOT Analysis for Albasini Dam

Strengths	Weaknesses
• The dam has a potential in tourism for both local and national as it is rich in bird life. • The dam supply water to neighbouring communities in Makhado Town. • The dam has a good aesthetic value and it has good biodiversity including different bird species. • The dam is also near other tourist attraction centres such as Joao Albasini Grave and Luonde Mountains. • It is used for research projects by the University of Venda students. • It has been incorporated into the MLM IDP with regard to water supply to Makhado town.	• The entrance gate has been closed for a considerable time due to vandalism, since February 2014 till to date. • Access roads to the dam are in a poor condition and there is only one public access to the dam. • Local communities are not benefiting from the dam. • Poor management of the environment within DWS's purchased boundary. • The dam has a small carrying capacity which limit some of the recreational activities. • There is an established Institutional Management Structure, however, it is not managing the dam area efficiently. • The picnic site at the dam is poorly managed, this is evident from the chalets which are worn out and vandalised gate. • It is alleged that there is Illegal abstraction of water directly from the dam as well as illegal fishing (using gill nets) for commercial purposes. • Most of the land around the dam is privately owned. This result in access control problems, given that the public is not permitted to access the dam through private properties.
Opportunities	**Threats**
• Introduction of Cultural Museum and more recreational activities such as swimming, golf course, tennis court etc. • Introduction of small scale fishery and aquaculture. • The dam has a potential to offer youth training or an environmental centre. • The dam must supply water to the nearest communities such as Elim, Valdezia and Mpheni. • Job creation opportunities. • Introduction of Youth training or environmental centre. • The dam can serve as an economic hub for the local economic growth within the area.	• Crocodiles and hippos will hinder some recreational activities such as swimming as they may attack people during swimming activities. • During dry seasons the water level drops to lower levels. • Unauthorised fishing of people using nets. • Nutrients and fertilisers from farms can be washed into the dam during rain seasons causing water pollution in the dam. • There are some land claims which have been registered under Goedehoop 8LT and they are still under negotiation (Makhado Municipality IDP 2014/2015), this land fall under Davhana Royal Council. • There are no relevant facilities such as wash–bays within the dam to clean the boats before they enter the water surface.

3.6.2.2 **Objective Identification (Phase 3)**

Objectives were identified by all the stakeholders in order to ascertain common goals. These objectives address the following questions:

- What do we want?
- How are we going to achieve this?
- Who will be involved?
- By when would we like to achieve our goals?

- Why would we want to achieve our goals?

The set common key objectives were derived from the SWOT Analysis for the Albasini Dam and have been categorized into three (3) Key Performance Areas (KPAs) as illustrated below:

KPA 1: Resource Management

- To have roads tarred in order to improve accessibility to the dam;
- To monitor farming methods used on the commercial farms next to the dam;
- To have the dam wall raised in order to increase the dam capacity;
- To maintain water levels at an appropriate level to support sustainable recreational use;
- To maintain the water quality by frequently monitoring and assessing the main pollution sources;
- To have the area surrounding the dam free of alien vegetation;
- To protect the faunal species at the Albasini Dam for tourism purposes;
- To avoid direct water contact activities due to the presence of crocodiles and hippos in the dam; and
- To protect the fish by monitoring the fishing trends.

KPA 2: Resource Utilisation

- To enable broad public enjoyment of the water resource and surrounding state Land;
- To ensure that the dam is incorporated into the municipal plans such as IDPs and SDF since it has a potential in tourism; and
- To Introduce small scale fishery at the dam**.**

KPA 3: Benefit Flow Management

- To supply water to the local communities;
- To Introduce more recreational activities such as: skiing and recreational facilities such as: boating clubs, golf course and also cultural museum; and
- To ensure that a suitable institutional structure with the appropriate powers and delegations is in place to effectively manage the recreational use of the water resource in accordance with this RMP.

Action projects required to achieve these objectives are provided in detail in **Section 4.3** (**The Strategic Plan**).

A vision for the dam for a period of 20 years was formulated from the key common objectives identified by the stakeholders and stands as follows:

"To ensure that there is sustainable utilisation of the water resource and the surrounding environment, unlock the tourism potential for the dam, ensure safety, promote community beneficiation, integrated management and an effective institution to manage the water resource in order to reach the proposed objective of the RMP and NWA."

After setting both the dam's specific objectives, a research was conducted in order to provide relevant information to decision – makers regarding the sustainable utilisation of the water resource and where applicable the State Land

3.6.3 Research/ Information Generation (Phase 4)

The aim of undertaking the research process was to collect the relevant data about the dam so as to assist the decision makers regarding the sustainable utilization of the dam and the surrounding State Land where applicable. The report will serve as a decision-making guideline tool, guided by the objectives set for the dam and any limitations due to encumbrances. The

report documents the following data as illustrated in **Figure 14**.

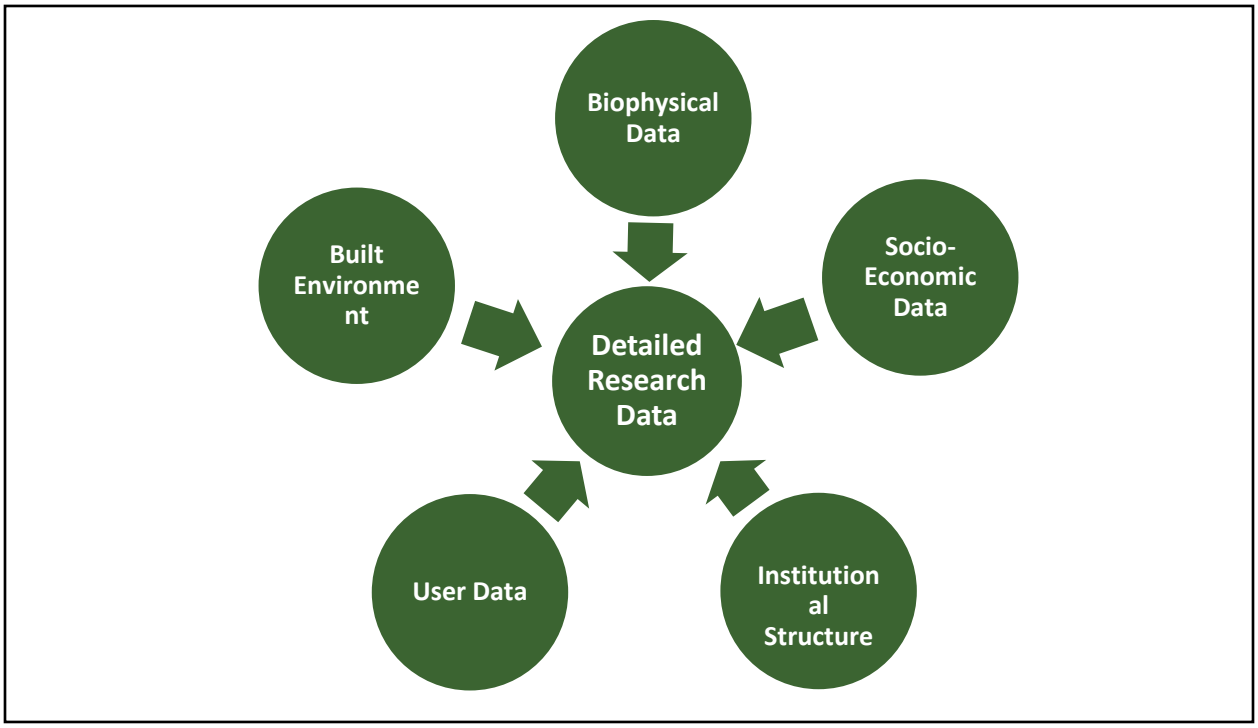

Figure 14: Research Data

The main aim of the research was to identify the dam tourism development potential and also to evaluate the practicability/feasibility of the potential objectives identified.

3.6.3.1**. Tourism Development Potential**

Albasini Dam is the 10th largest body of water in the Limpopo Province and it supports an extensive birdlife. Many people visit the dam because it is rich in biodiversity. There is an existing grave yard of Joao Albasini's family on the right hand side of the entrance gate which also attracts people to the area. At the entrance there is also a picnic site where people visit during festive seasons. There are also overnight accommodations near the dam for tourists, these include Shiluvari, Hayani, Beja and Texas.

The Tourism and Marketing Strategy has been developed in order to stimulate tourism growth in Makhado and also to develop opportunities and market the tourism icons and places of attractions that are found within Makhado Municipality. There is a need to stimulate community tourism structures and other stakeholders involved in tourism. There are four (4)community tourism associations (CTAs) in the area that are involved in tourism, namely, Soutpansberg Tourism Association, Ribolla Tourism Association, Tshakhuma Tourism Association and Nzhelele Tourism Association.

3.6.3.2 **Feasibility of Identified Potential Objectives**

According to DWAF (2006), the feasibility of the proposed objectives needs to be determined in light of the local environmental conditions.

Table 16 shows the practicability of all proposed recreational objectives.

Table 16: Feasibility of Potential Recreational Objectives

KPA 1: Resource Management		
Objectives	**Status Quo**	**Practicability**
• To have roads tarred in order to improve accessibility to the dam.	• The soil is highly erosive and slippery during rainy season, this affect access to the dam since the access gravel roads are rugged.	• Soil erosion can be mitigated through the Erosion Control Monitoring Programme and Implementation of Storm Water Reduction System to avoid excess soil erosion during heavy rains. • Access to the dam can be improved by upgrading the existing gravel roads into tarred roads.
• To monitor farming methods used on the commercial farms next to the dam	• Inorganic fertilisers such as phosphates and nitrates are used on the farms. Soils containing inorganic fertilisers from upstream farms are washed into the rivers through runoff, which end up deposited into the dam.	• Monitoring farming methods is therefore practically difficult as the source of pollution is from upstream farming activities. It is important to implement the use of organic fertilisers as this will reduce water pollution in the dam.
• To control alien vegetation on the areas surrounding the dam.	• The area is infested with alien invasive plant species such as Lantana Camara and Psidium Guajava. Such plants are a threat to the indigenous biodiversity and also consume large quantities of water.	• The DEA, Working for Water Programme, is responsible for the clearing of alien invasive plants. The programme is currently underway at the dam. • Wash bays can be constructed as a preventative method.
• To protect the faunal species at the dam for tourism.	• There is no institutional structure responsible for conservation of fauna around the dam.	• Establishment of functional institutional structure that will effectively manage the recreational utilisation of the dam and its associated State Land in accordance with the RMP. • All sensitive areas identified by the Ecological Study should be demarcated as conservation area. • The Institutional Structure should be representative of all relevant stakeholders.
• To protect the fish, by monitoring fishing methods and the fishing trends.	• No management structure is in place to monitor fish harvesting. • People are fishing using nets which can lead to depletion of fish species in the dam.	• The Institutional Structure must ensure sustainable harvesting of fish. • Public needs to be informed on procedures to follow to acquire a fishing license/permit.
KPA 2: Resource Utilisation		
Objectives	**Status Quo**	**Practicability**

• To introduce swimming as an activity at the dam.	• The dam consist of a gentle slope, hence it is suitable to erect some major recreational structures such as swimming pools. • The dam is a home to crocodiles and hippos which can pose danger to visitors accessing the dam for full contact water activities.	• Operational policy and procedures, dealing with problem animals should be developed and be in line with relevant Problem Animal Management Guidelines taking into consideration the national policy and strategy for Problem Animal Control in South Africa. • Swimming pools can be constructed on the terrestrial environment within the purchase line.
• To establish cultural museum.	• There are no cultural activities taking place at the dam. However, the dam consist of a gentle slope, hence it is suitable to erect cultural museum structure.	• Department of Arts and Culture (DAC) must take a leading role given the history of this dam and the heritage thereof.
• To introduce small-scale fishery.	• People do illegal fishing in the dam using gill nets which in turn put their lives in danger.	• One of the function of the proposed Institutional Structure should be to oversee the fishing practices at the dam. • Permit system should also be established in order to manage the fishing activity in the dam. • DAFF will be responsible for issuing of licenses/permits.
• To provide adequate public access for broader public use of the water resource through controlled authorized access and associated infrastructure development.	• The dam is a very popular destination within the basket of provincial leisure products. However, it has one public access and as such, the provision of public access is of outmost importance to the surrounding Local Communities. Currently the dam is mostly used by the adjacent land owners. This group access the dam via private entrances at their properties. • Access to the other parts of the dam might be difficult due to private ownerships surrounding the dam.	• The dam rules relating to the dam, use, fees payable for access, safety measures, speed limits and the time in which the dam will be open to the public should be determined. • The Business Plan will incorporate the objective and will include a cost structure that is market related and will be affordable to local visitors and tourism.
• To introduce more recreational activities such as skiing, and recreational facility such as boating clubs and also ensure that all recreational activities are permitted by the DWS and conducted in accordance with the relevant Legislation such as	• The access to the dam is currently limited to the private property. The public access has been closed since February 2014 till to date. • Currently, there are no safety or enforcement officers dedicated to the dam.	• As part of the RMP process, all the activities including boating should be compliant with SAMSA Regulation. SAMSA's mandate is to administer and execute maritime related legislation and regulations, including the National Small Vessel Safety Regulations and ensures standardisation, harmonisation and compliance of all marine AtoN in

NWA and NEMA Regulations.		South African waters. • With the development of the RMP and establishment of an effective institutional structure, public access to the dam can be properly managed. • The appointment of safety and enforcement personnel is imperative to ensure compliance of relevant legislations and rules of the dam. • Ensure that the local communities are getting benefits emanated from the dam use. • The BP will detail how the previously disadvantaged communities will economically benefit from the recreational opportunities.
KPA 3: Benefit Flow Management		
Objective	**Status Quo**	**Practicability**
• To ensure that a suitable Institutional Structure with the appropriate powers and delegations is in place to effectively manage the recreational use of the water resource in accordance with this RMP.	• There is an established Institutional Structure in place but it is not operational.	• The effective Institutional Structure should be updated and formalized as per RMP. This will effectively manage the recreational utilisation of the dam and its associated State Land.
• To ensure that local communities get water from the dam.	• There is no water supplied to the local communities near the dam.	• VDM to action this as mandated by the Water Services Act, 1997 (Act No. 108 of 1997).
• To ensure that the dam is incorporated into the municipal plans such as IDPs, since it has a high tourism potential.	• The dam is included in the IDP as a bulk water supply but it is not included as a tourism harbor.	• The implementation of the RMP will guide in the improvement tourism development for local communities. • The BP will assist in identifying the marketing strategies and funding mechanism that can assist in tourism development.

CHAPTER 4: INTEGRATED MANAGEMENT, ZONING AND INSTITUTIONAL PLANNING (PHASE 5)

The purpose of this phase is to evaluate the information obtained from previous stages to ascertain what could be achieved based on specific constraints and parameters of the various input factors such as biophysical, cultural and socio-economic, current institutional and needs of the dam users. The Integrated Resources Management Plan (IRMP) will take into account the following:

- Biophysical, Cultural and Socio-economic and User needs constraints;
- Development potential and requirements;
- Site planning and Zonation;
- Programmes and Plans that will unlock the potential of the water resource; and
- Institution options and legal aspects required to create these programmes and plans.

The IRMP is broken down into four (4) main plans namely the **Institutional Plan**, **Zoning Plan, Strategic Plan** and **Financial Plan** as illustrated in **Figure 15**.

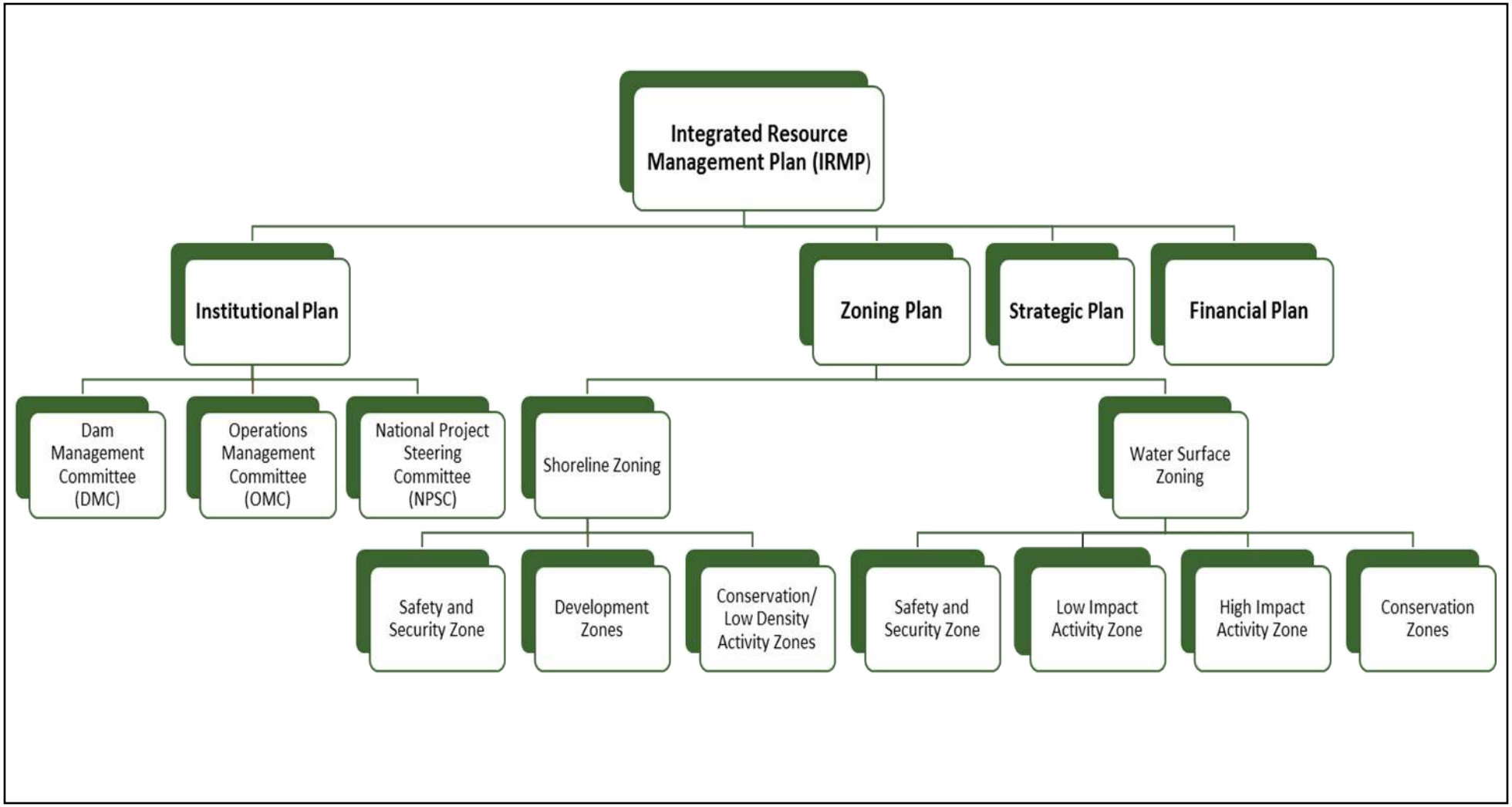

Figure 15: Integrated Resource Management Plan

4.1 INSTITUTIONAL PLAN

The Institutional Plan provides a framework for the institutional arrangements at the dam. The proposed management systems includes three (3) committees namely; The Dam Management Committee (DMC), Operations Management Committee (OMC) and National Project Steering Committee (NPSC). The appointed management authorities by DWS at the dams, also form part of the institutional structure.

4.1.1 Dam Management Committee (DMC)

DMC refers to any party that is interested or affected by the dam and will assist in raising and addressing issues relating to the dam.

One of the main functions of the DMC is to give support to Implementing Agency (IA) in the management of the dam for recreational purposes. Moreover, to assess commercial opportunities at the dam. As such, an agenda item related to the Strategic Plan for commercialization is required. In addition, changes in water quality, developments in the area, status of Aquatic Invasive Species and education and information programmes should be discussed. The DMC must meet quarterly.

The functions of the DMC include the following (amongst others):

- Seeking resolution for general management issues;
- Monitoring the practical implementation of the RMP and BP;
- Reviewing the feedback received from I&APs;
- Operational management of recreational activities such as ensuring the floating AtoN and demarcation markers are in place and setting times for use of the dam (no recreational activities can take place between sunset and sunrise);
- Conveying the Management Objectives and decisions pertaining to the dam to the relevant stakeholders; and
- Management of the incident management system and wash bays.

Figure 16 illustrates the proposed user groups that will form part of the DMC.

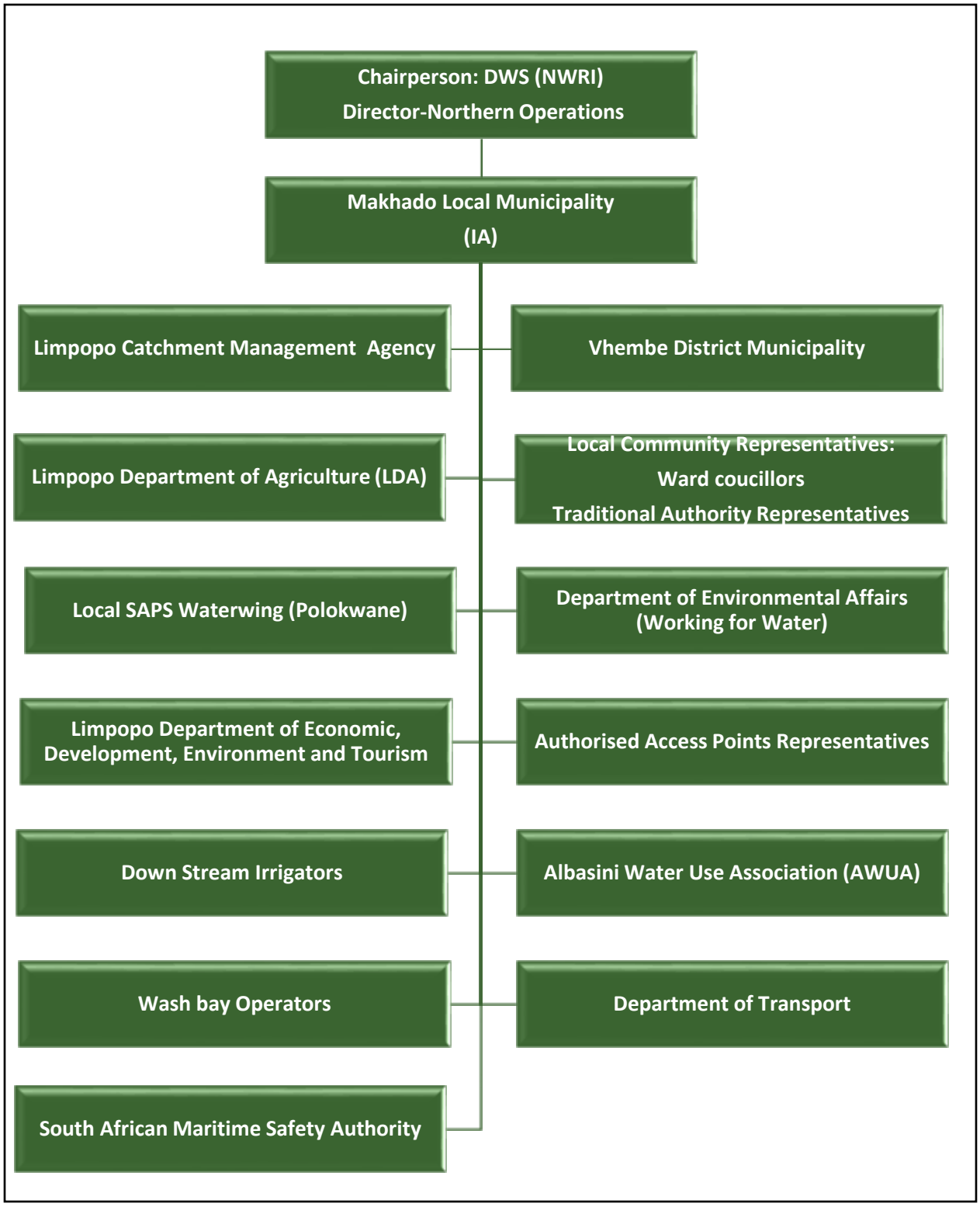

Figure 16: Proposed DMC

The DMC will have a number of management tools which will enable proper management of the dam in line with existing Legislations and Regulations requirements.

4.1.1.1 Management Tools

Terms of Reference

The DMC and NPSC will be guided by Terms of Reference (ToR) regarding roles and responsibilities. ToR are not required for **OMC**. The ToR provide guidance on the following management aspects:

- Roles and responsibility of chairperson;
- Roles and responsibility of IA;
- Roles and responsibilities of members;
- Minutes and attendance requirements;
- Reporting requirements;
- Management of agreements;
- Management of access objectives;
- Management of development targets;
- Management of water quality monitoring;
- Management of the control of aquatic invasive species;
- Management of development pressure;
- Management of incident management system and wash bays; and
- Management of AtoN and demarcation markers.

Agreements

One of the main management tool available is the use of agreements to ensure proper use of the dam in line with the RMP vision and objectives.

Agreements between DWS and Implementing Agency)

MLM will be appointed as an Implementing Agency (IA) for the RMP of Albasini Dam. MLM and DWS will sign a MOA, which is a legal binding document which outlines the roles and responsibilities and conditions to be followed by both parties in terms of managing the water resource for recreational use.

The minimum requirements of an IA includes the following:

- An IA can be a government entity or public-sector body identified by DWS;
- Must have the best interest of a water resource and the community at large; and
- Must be willing to work with DWS and other users of the water resource.

The IA is appointed to manage commercial and recreational use of the dam. This would include the following:

- Management of public access area;
- Management of incident management system;
- Management of community skills and training programmes;
- Management of commercial activities (in line with Treasury Requirements); and
- Management of AtoN and demarcation markers.

Regardless, all agreements should be in line with the RMP requirements and relevant Legislations and Regulations.

Recreational Use Agreements

Recreational clubs must enter into an agreement with the IA who will be responsible for the surface water and shoreline management of the dam. All recreational use at the dam must be through an appropriate Legal Framework. However, all agreements must be approved in writing by DWS and the IA. Recreational Use Agreements must be developed in line with the conditions stipulated in the agreement between DWS and the IA. All agreements must be finalised within twelve (12) months of the RMP being approved.

Safety of Navigation Agreements

In addition to its common-law responsibility, DWS is, in terms of the requirements described in the National Water Act, 1998 (Act No. 36 of 1998), amongst others, responsible for the safety of GWWs and watercourses, including its dams. DWS, its delegated public sector partner,

or a delegated water management institution, has therefore the responsibility to provide the required fixed and/ or floating AtoN[3] for general navigation.

Agreements between SAMSA and DWS, other relevant Parties or Bodies are to be concluded to allow them to:

- Exhibit the relevant AtoN; and
- Establish or deploy the relevant fixed and/or floating AtoN.

Access Agreements

All surface water and shoreline access must be formalised. The conditions for such access must be written into the agreement. All illegal practices must be addressed. Appropriate action must be taken to ensure that all parties comply with the requirements of the RMP.

All adjacent landowners and clubs must be made aware that access to the surface water as well as shoreline should only be through authorised access points. Accessing the surface water through unauthorised access points is an illegal activity unless they enter into a formal agreement with IA. Further, a formal agreement with IA will be required for all adjacent landowners and recreational clubs that have direct access to the water surface of the dam through constructed slipways, natural slipways or jetties for angling and/or launching of vessels.

The wash bay must be built on State Property as part of the CIWSP. A formal agreement is necessary between the IA and DEA on the management and maintenance of the facility.

Event Applications

The dam is used for a number of competitive angling events. All events must be managed through an event application process. The application should be submitted to the IA for approval and to DWS for commenting. These applications must follow a specific template and will include the following:

- Number of participants;
- Emergency Response Plan;
- Advertising and branding (will need to be in line with DWS communication requirements); and
- Access points and slipways to be used.

Furthermore, all Events must meet the requirements of the Safety at Sports and Recreation Act, 2010 (Act No. 2 of 2010).

National Affiliations

All recreational clubs should be affiliated to a SASCOC affiliated organisation. The development targets set by the National Organisations must be met.

4.1.2 Operations Management Committee (OMC)

There is an existing Chief Director: Infrastructure Operations Management Committee (CD: IO MANCO) within Infrastructure Operations which comprises of all directors of four (4) operations (Northern, Southern, Eastern and Central) and is chaired by the Chief Director: Infrastructure Operations within NWRI as illustrated in **Figure 17**.

The committee should meet quarterly to discuss matters relating to operations and maintenance of all GWWs. RMP must be a standard item on the agenda. Any matters relating to the RMP that are outside the scope of DWS will be escalated to the NPSC.

[3] AtoN refers to any sort of marker which aids the traveler in navigation; the term is most commonly used to refer to nautical or aviation travel, common types of such aids include lighthouses, buoys, fog signals and day beacons.

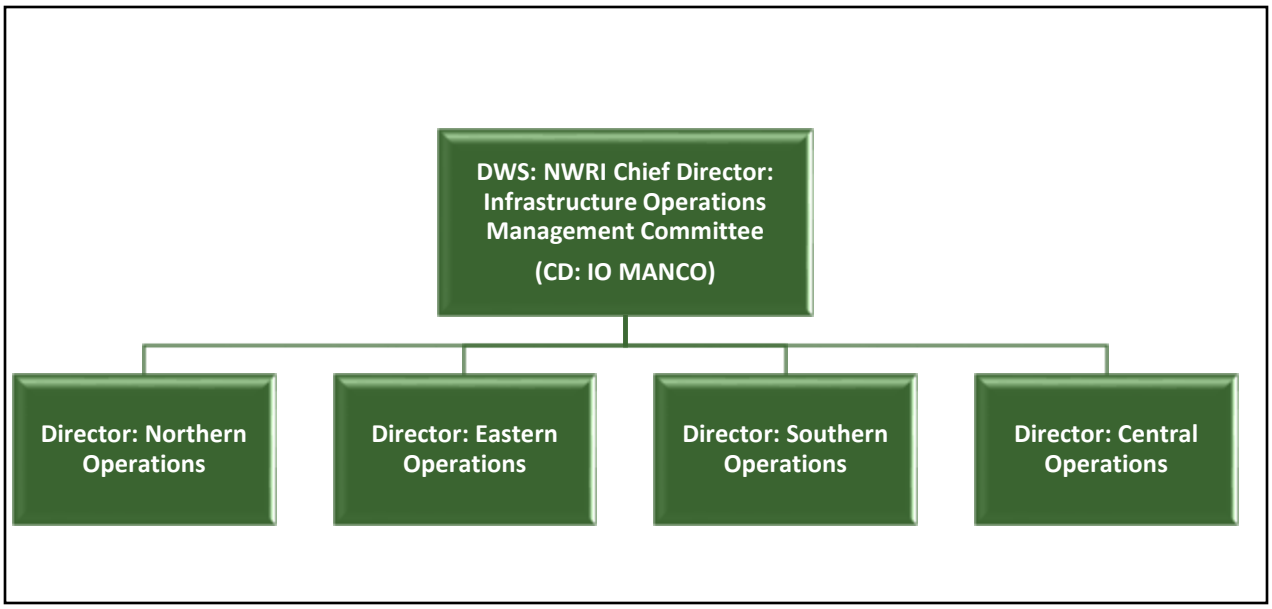

Figure 17: Existing CD: IO MANCO

4.1.3 National Project Steering Committee (NPSC)

NPSC is formed by DWS and is made up of representatives from National Government Departments and Implementing Agencies that are relevant in terms of managing the water resource.

The primary function of the NPSC is to provide guidance on recreational water use in terms of their respective mandates as well as to ensure that continuous support by different Government Sectors is provided to the dam with the aim of achieving sustainable utilisation of the dam for recreational purposes. The NPSC should meet twice a year. **Figure 18** illustrates a typical example of Governmental Departments that will form part of the NPSC:

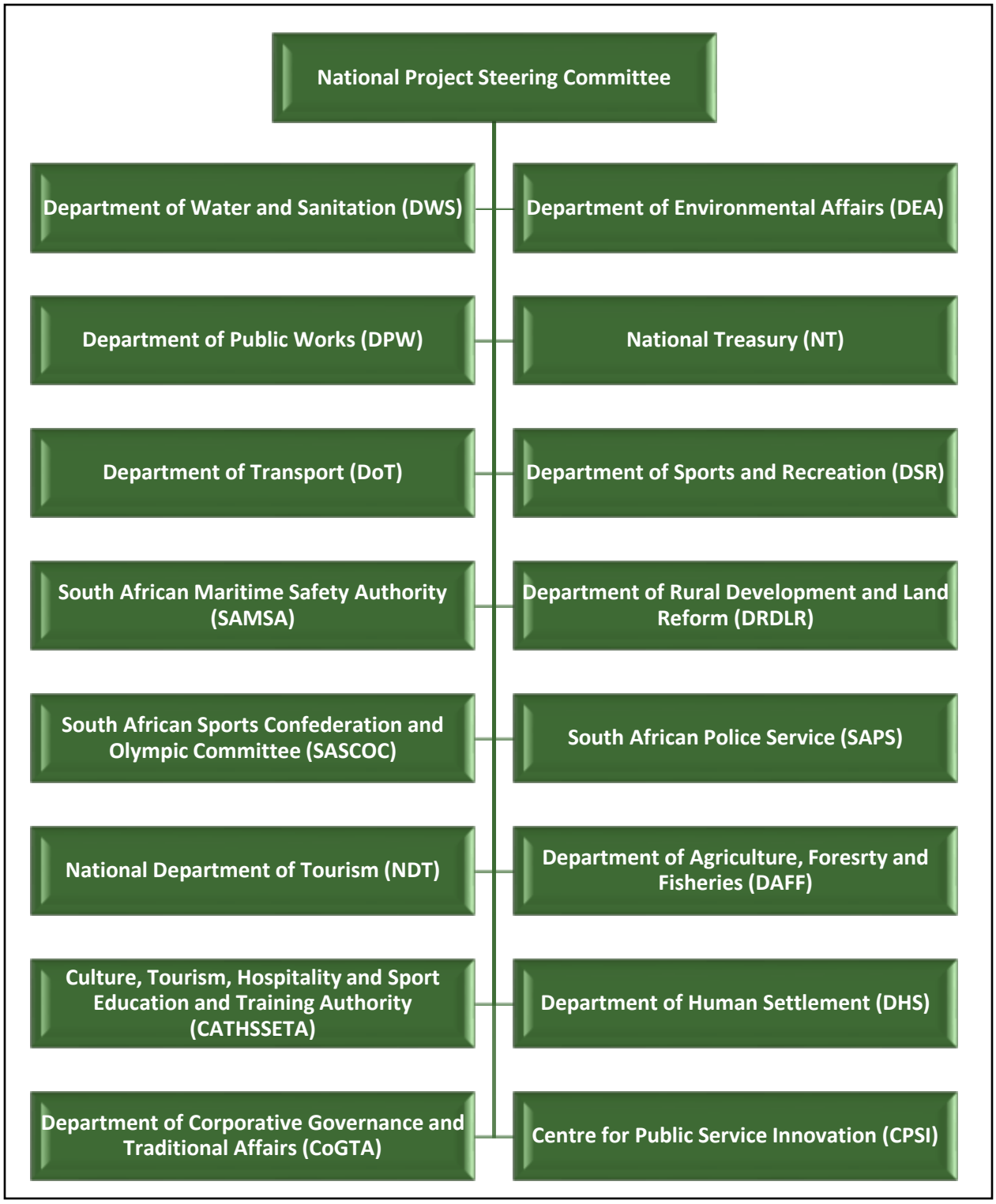

Figure 18: Proposed NPSC

The role of the relevant departments forming part of the NPSC is listed below:

Centre for Public Service Innovation (CPSI):
The CPSI is supporting a multi-departmental working group that is developing an innovative approach to inland water and safety integrity. The project, was initiated out of the need to find an innovative, practical and cost-effective way to implement SAMSA' vessel safety regulations on inland waterways and to implement responsible water use within the broader socio-economic context of the country.

The CIWSP is a project piloted by CPSI that is a partnership between multiple Government entities and between the Government and communities. The main aim of the project is to enhance the development of a best practice model to ensure safe and structured inland maritime environment and culture, whilst protecting the country's precious water resource.

Culture, Arts, Tourism, Hospitality, Sport Sector, Education and Training Authority (CATHSSETA):
CATHSSETA deals with the approval and financing of training relating to culture, hospitality, tourism and sport sectors.

Department of Agriculture, Forestry and Fisheries (DAFF):
The purpose of DAFF includes sustainable development and management of resources to maximizing the economic potential of the fisheries sector while protecting the integrity and quality of the country's aquatic ecosystems.

Operation Phakisa expansion to inland dams is one of DAFF initiative aimed at unlocking economic potential of fisheries sector within the inland water. The latter programme will be used as benchmark for implementation of conservation policies while implementing job creation within fishery and fish processing market.

Department of Corporative Governance and Traditional Affairs (CoGTA):
Its function is to develop national policies and legislation with regard to Provinces and Local government, and to monitor their implementation. Other function of the Department is to support Provinces and Local Government in fulfilling their constitutional and legal obligations.

Department of Environmental Affairs (DEA):
DEA is mandated to give effect to the right of citizens to an environment that is not harmful to their health or wellbeing, and to have the environment protected for the benefit of present and future generations. In relation to the RMP, the Department should ensure that Environmental Impact Assessments is undertaken for all activities that triggers EIA Regulations at the dam. Furthermore, DEA through WfW programme can assist to eradicate alien invasive plants species (Blue Gums and Parrot Furthers) and alien invasive fish species at the dam.

Department of Public Works (DPW):
DPW has the power to regulate and control the use of state land outside the GWWs. In this regard, lease agreements or permits will be required from the Department as some of the recreational activities will overlap into the State Land, e.g. trail running, biking and running.

Department of Rural Development and Land Reform (DRDLR):
The Department is tasked with the facilitation of land claims within the country. They are also involved in rural development by improving both economic infrastructure (such as roads, etc.) and social infrastructure (e.g. communal sanitation and non-farming activities).

Department of Sports and Recreation (DSR):
The Department is mandated to promote and develop sport and recreation activities and also in co-ordination of the relationships between the Sports Commission, national and recreation federations and other agencies.

Department of Tourism (NDT):
The Department is mandated to create conditions for the sustainable growth and development of tourism in South Africa. The Tourism Act makes provision for the promotion of tourism to and in the Republic and for regulation and rationalisation of the tourism sector, including measures aimed at the enhancement and maintenance of the standards of facilities and services utilised by tourists; and the co-ordination and rationalisation of the activities of those who are active in the tourism sector.

Department of Transport (DoT):
Responsible for legislation, policy and regulations for all transportation in South Africa, including shipping and other transport by water or sea, including small vessels and inland waterways.

Department of Water and Sanitation (DWS):
DWS through the National Water Act, 1998 (Act No. 36 of 1998) is mandated to protect aquatic and associated ecosystems and their biological diversity as well as to reduce degradation of the water resources. As part of its mandate, DWS initiated the development of RMPs together with the supporting BPs with the aim of ensuring sustainable and equitable development, utilisation and management of GWWs.

National Treasury (NT):
The Department is mandated to support the optimal allocation and utilisation of financial resources in all spheres of government. As part of the RMP, The National Treasury Public Private Partnership (PPP) Toolkit for Tourism (2005), will assist the process of tourism-based businesses development on State-owned Land. The Toolkit make it easier for Institutions and the Private Sector to enter into tourism related partnerships on State Property managed by National, Provincial and Local Government Institutions.

South African Maritime Safety Authority (SAMSA):
Administers and executes maritime related legislation and regulations, including the National Small Vessel Safety Regulations and ensures standardisation, harmonisation and compliance of all AtoN in South African waters.

South African Police Service (SAPS):
The South African Police Service have been entrusted with the responsibility of creating a safe and secure environment for all people in South Africa as well as to prevent anything that may threaten the safety or security of any community.

South African Sports Confederation and Olympic Committee (SASCOC):
SASCOC is mandated to promote and develop high performance of sports as well as to act as a controlling body for sports in South Africa. It can also assist to coordinate organise events at the dam.

4.2 ZONING PLAN

According to DWAF (2006), a site-specific master planning and zoning which describes a framework for the allocation of zones needs to be undertaken based on the results of the Encumbrance Survey and basic Research regarding the Bio-physical, Social and Cultural environment as well as the objectives set by the Stakeholders (refer to section **3.6)**.

The proposed Zoning Plan will integrate conservation, recreation and development whilst not retarding the primary functions of the dam.

4.2.1 Water Surface Zoning

The water surface zoning provides guidance on permissible and non-permissible recreational activities on the water surface taking into account the biophysical factors of the dam. The Water Surface is zoned as follows:

Safety and Security Zone:

It covers a minimum of 100m area from the wall and outlet works indicated by demarcation markers and AtoN. This area is reserved for DWS management purposes.

Management of this zone is aimed at protecting the dam wall and outlet works, as well as to ensure the safety of the public. This is a no-go zone to the public unless authorized.

Conservation Zones:

The aim of this zone is to conserve and protect sensitive aquatic habitation at the inlet(s) of the dam. According to Section 12 and 26 of NWA, the existence of these zones is thus not negotiable as it is imperative to protect the water resource for the purposes relating to basic human needs, environmental sustainability and water quality requirements. Access to these areas is generally not allowed due to the following:

- The areas intercept sediments and nutrients/pollutants which pose safety risks to the public due to muddy clay, and
- They are used by aquatic birds, fish and crocodile species as habitat, refuge and breeding areas.

Low Impact Activity Zone:

This zone act as a buffer between High Impact Activity Zones and Conservation Zones. Low Impact Activity Zone allows for low intensity activities, i.e. activities associated with little or no wake such as fishing from boats and provision of drinking area for livestock.

High Impact Activity Zone:

This zone has the largest water surface area and is located where the reservoir is at its deepest. It caters for high impact activities associated with high speed, wake and noise activities such as motorised recreational boating, jet powered boats and house boating.

The water surface zoning colour coding means the following:

Colour	Zone Description
Red	Safety and Security Zone
Green	Conservation Zone
Sky Blue	Low Impact Activity Zone
Dark Blue	High Impact Activity Zone

Table 17: Proposed Water Surface Zoning Description

Zone Name	Permissible Activities	Non-permissible Activities	Recommendation
• Safety and Security Zone.	• Alien invasive species clearing • Management of dam infrastructure • Management and maintenance activities by DWS and authorised personnel	• Public access	• Area should be demarcated by demarcation makers and AtoN.
• Conservation Zone.	• None	• Public activities (in order prevent aquatic habitats disturbance)	• Area should be demarcated by demarcation makers and AtoN. • Strict management and control of these areas, especially with regards to illegal fishing and dumping.
• Low Impact Activity Zone.	• Activities associated with no or little wakes, such as: ○ Canoeing ○ Rowing ○ Boat angling ○ Small Scale fishery	• Speed boats • Skiing • Swimming • Interpretation Boats	• Area should be demarcated by demarcation makers and AtoN.
• High Impact Activity Zone.	• Interpretation Boats	• Canoeing • Rowing • Boat angling • Small Scale fishery • Houseboats • para-sailing	• Area should be demarcated by demarcation makers and AtoN. • All activities within the high impact zone shall take place beyond 70m from the shoreline. • Activities within this zone must be evaluated to determine their impact on the water resources and other dam users before they are allowed into the dam

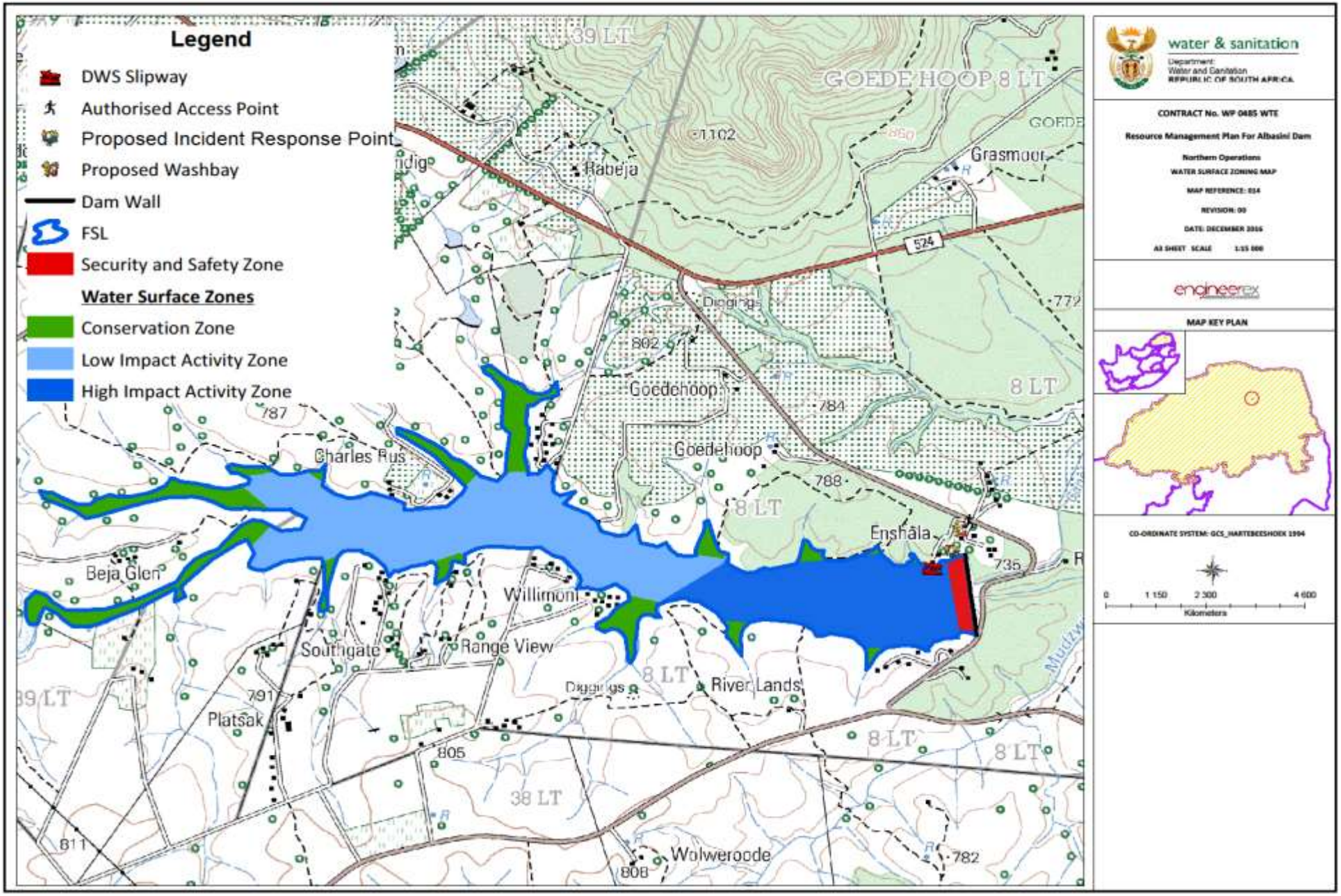

Figure 19: Proposed Water Surface Zoning Map

4.2.2 Shoreline Zoning[4]

In addition to the water surface zoning, an integral part of the RMP is also shoreline zoning, which provides guidance on what recreational activities (if any) are permissible and not permissible on the land adjacent to the dam (DWS purchased boundary). The management zones include:

Safety and Security Zone (dam wall and associated DWS infrastructure):

It is applicable to the area surrounding the dam wall and the outlet works. The extent of this zone is determined by DWS and shall not be less than 100m from the dam wall and downstream. This area is reserved for DWS management purposes.

Management of this zone is aimed at protecting the dam wall and outlet works, as well as to ensure the safety of the public and surrounding areas. This is a no-go zone to the public unless authorised.

Conservation / Low Density Activity Zone:

This zone consists of ecologically sensitive areas and areas with high biodiversity. It also includes the area around the inlets of the dam. Access to this area is limited to low impact activities such as hiking, bird watching, etc. This area is reserved to prevent ecological damage due to development activities hence high impact development not permitted.

Medium Density Activity Zone*:*

This area is reserved for small-scale activities such as day visitors, picnic areas, shoreline fishing, braai facilities, camping (tent and caravan), swimming pools, ablution facilities etc.

High Density Activity Zone:

This area is reserved for large scale activities including chalets, recreational club houses, infrastructure, etc.

Community Resource Zone:

This zone is for the sole beneficiation of the local communities in ensuring that their livelihood is maintained and improved. Activities include subsistence fishing, livestock watering points, small scale community gardens, etc.

The shoreline zoning colour coding means the following:

Colour	Zone Description
Red	Safety and Security Zone
Green	Conservation/Low Density Activity Zone
Yellow	Medium Density Activity Zone
Orange	High Density Activity Zone
Brown	Community Resource Zone

[4] Permanent structures within the purchase line are not allowed. All development should be outside 1:100 year floodline.

Table 18: Proposed Shoreline Zoning Description

Zone Name	Permissible Activities	Non-permissible Activities	Recommendation
• Safety and Security Zone.	• Fire management • Alien invasive species clearing • Management of dam infrastructure • Management and maintenance activities by DWS and authorised personnel	• Public access	• A minimum area of 100m wide downstream the dam wall should be demarcated preventing public access and use.
• Medium Density Activity Zone.	• Swimming pools • Ablution facilities • Shoreline fishing • Braai facilities • Picnic area • Lapas • Camping (tent and caravan) • Small sized resorts or chalets	• Permanent Structures	• The management of this area should follow the process of PPP in terms of National Treasury. • Requirements of NWA and NEMA must be taken into account in all developments. • All developments must be approved by IA and DWS.

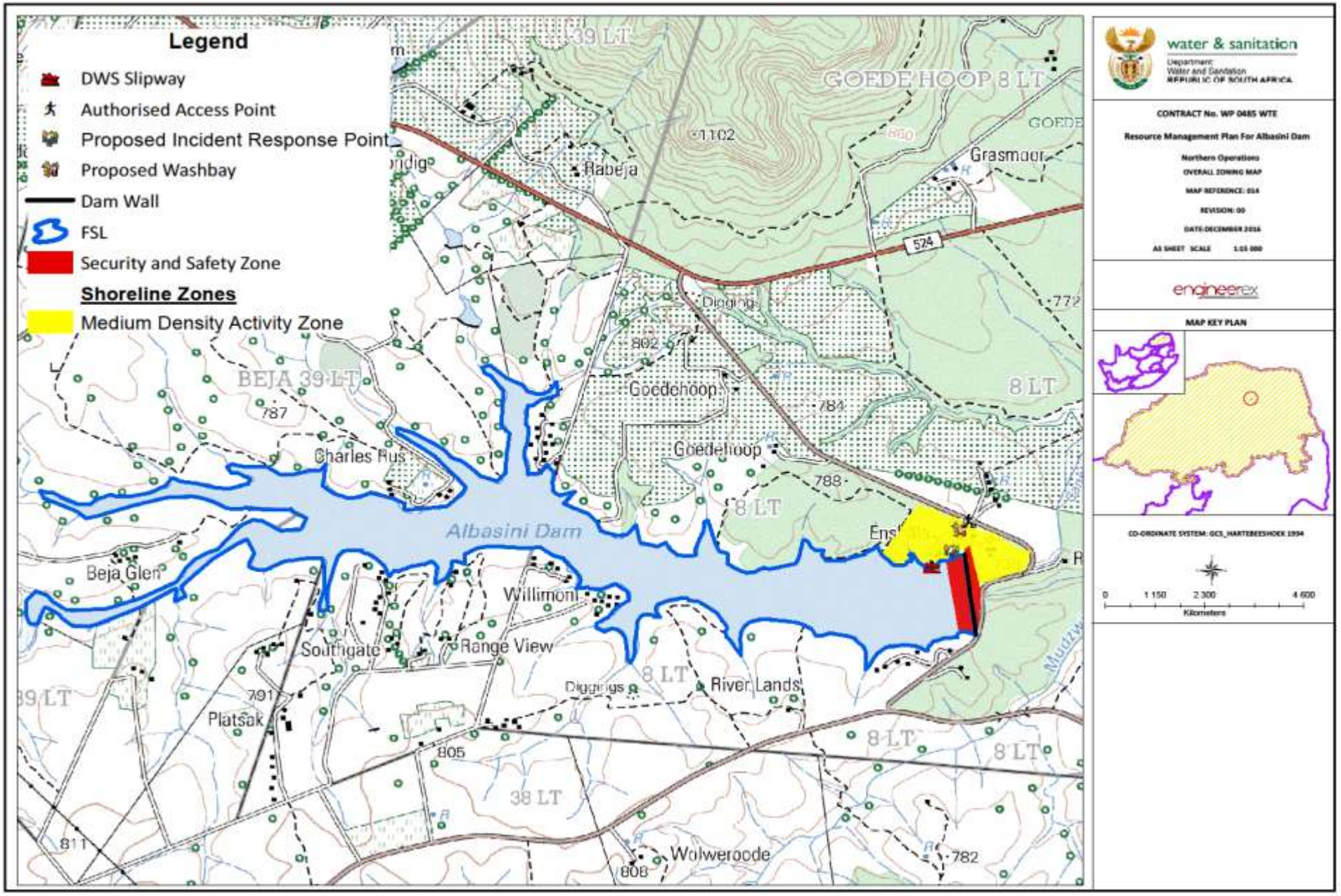

Figure 20: Proposed Shoreline Zoning Map

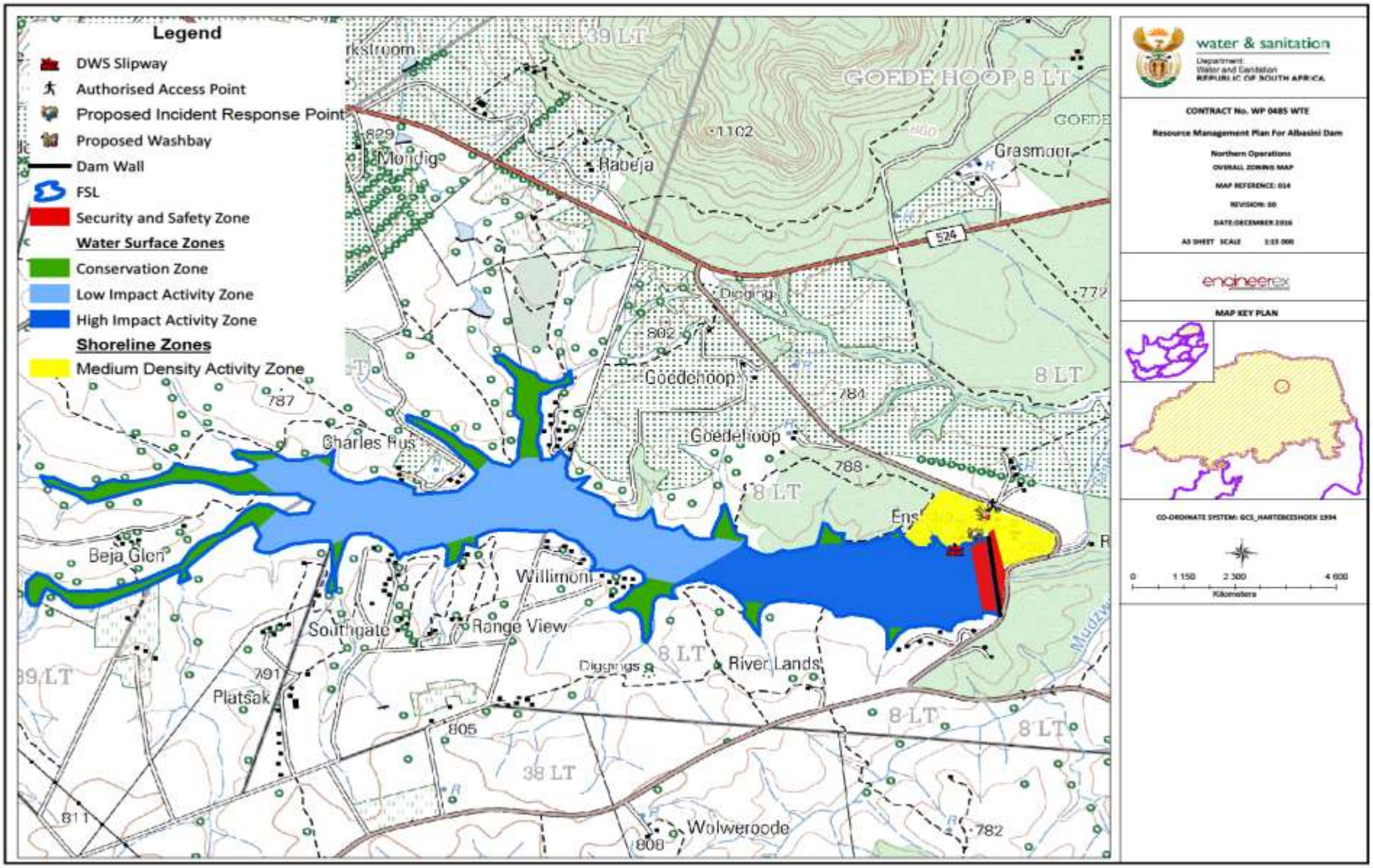

Figure 21: Proposed Overall Zoning Map

4.2.3 Carrying Capacity

The carrying capacity of a water resource represents the maximum level of users and related infrastructure that the water resource and surrounding area can accommodate, without diminishing user satisfaction, the economy and culture of the area.

In order to determine the degree or possible recreational use on the water surface, the Methodology for Carrying Capacity Assessment: Recreation Water Use (DWS 2003) was used as guideline to determine the level of activities that would be sustainable at Albasini Dam

Carrying capacity for recreation provides a guideline to ensure that recreation at the dam is safe, that users do not feel crowded and that they enjoy the use of the dam for leisure activities.

There are three kinds of carrying capacity:

- **Physical Carrying Capacity** (PCC) – this is the maximum number of users that can physically fit onto the water surface at any given time;
- **Real Carrying Capacity** (RCC) – this is the maximum number of users that can use the resource once corrective factors that are unique to the dam are taken into account; and
- **Effective** (or permissible) **Carrying Capacity** (ECC) – this is the number of visitors that can use the resource, given the management capacity.

Each level constitutes a corrected capacity level of the preceding level. The PCC is always greater than the RCC, and the RCC is greater than the ECC, thus: **PCC > RCC and RCC ≥ ECC.**

The process of establishing the carrying capacity is normally determined through the following tasks:

- Analysis of recreation and water resource management policies;
- Analysis of objectives of the water resource;
- Analysis of current recreational water use;
- Definition, strengthening or modification of policies regarding recreational water use management;
- Identification of factors influencing recreational water use; and
- Determination of the recreational water use carrying capacity.

Physical Carrying Capacity (PCC)

PCC is calculated as PCC = A × U/a × Rf

Where:

A = Area available for public use;
U/a = area required for each user; and
Rf = Rotation Factor (the number of visits per day)

A is calculated as the area of the water surface available for public use: 350 **ha**

U/A = There is a range of literature regarding the area required for different recreational users.

The **U/A** used for the assessment is as follows:

Craft	U/A (ha/craft)
Rowing	0.4
Canoeing	0.3
Fishing	3.0
Average	**1.2**

The PCC for Albasini Dam can further be calculated as:

PCC = A × U/a × Rf
=350×1/3× 1
=116 crafts

Real Carrying Capacity

Formula: RCC = PCC x (100 – Cf_1)% x (100 – Cf_2)% x … (100 – Cf_n)%

- Where: Cf = a corrective factor expressed as a percentage.

Real capacity is the PCC, taking into account factors that limit recreation. In this case limiting factors include:

- Biophysical, such as terrain and sensitive environments
- Safety No Go Zones
- One of the main limiting factors in regards to recreational use is the number of picnic spots. Currently there are no formalised picnic spots at the dam.

Calculating the area of the surface of the dam, adding a buffer-zone at the dam wall and the restricting factors outlined above

RCC for Albasini Dam is therefore:

RCC = PCC x (100 – Cf1)% x (100 – Cf2)% x (100 – Cfn)%

Where **Cf** = a corrective factor expressed as a percentage.

Effective Carrying Capacity

The maximum number of visitors that a site can sustain, given the management capacity (MC) available, however there is no management structure in place, as such MC =

ECC = [Infrastructure Capacity x Management Capacity] x 100/ RCC

MC will be finalised as part of the RMP, thus when the ECC will be calculated.

Determine Allocations

Once ECC has been confirmed, allocations for each zone can be refined. This will be done through an action project.

4.3 STRATEGIC PLAN

The Strategic Plan is informed by the objectives identified by stakeholders and through research on potential opportunities at the dam. The objectives are broken down into management fields which are listed below in a format offering ease of reference:

- Objective (What do we want?);
- Motivation (Why do we want to achieve this?);
- Action Projects (How do we achieve this?); and
- Management Support (Who will be involved?).

In **Tables 19– 21**, the Strategic Plan on how to achieve the identified objectives regarding the dam is outlined.

Table 19: Strategic Plan for KPA 1: Resource Management

KPA 1: Resource Management			
Objective (What do we want)	**Motivation (Why do we want to achieve this)**	**Action Projects (How do we achieve this)**	**Management Support (Who will be involved)**
Access Road: • To have roads tarred in order to improve accessibility to the dam.	• The soil at the Albasini Dam has excessive drainage and high erodibility since the access roads to the dam are gravel road and they are highly affected during rainy seasons.	• Soil erosion can be mitigated through the Erosion Control Monitoring Programme and Implementation of Storm Water Reduction System to avoid excess soil erosion during heavy rains. • Access to the dam can be improved by upgrading the existing gravel roads into tarred roads. • Avoid deforestation.	• The Department of Road and Transport must be involved to help in the upgrade and management of roads. • Department of Environmental Affairs (DEA) and EPWP must be involved to assist in the soil conservation strategies.
Farming Methods: • To monitor farming methods used on the commercial farms next to the dam	• Inorganic fertilisers such as phosphates and nitrates are used on the farms. Soils containing inorganic fertilisers from upstream farms are washed into the rivers through runoff, which end up deposited into the dam.	• It is important to implement the use of organic fertilisers as this will reduce pollution in the dam. • Implementation of monitoring of the usage of chemical fertilisers.	• LDA also need to be involved, in order to monitor the farming sites near the dam.
Water Quality: • To maintain water levels at an appropriate level to support sustainable recreational use	• Water quality in the area was a concern and it was recorded that the water was eutrophic in the past years. However, the current results indicated that the water quality is suitable for recreational activities.	• Pollution sources within the catchment should be identified and monitored. • The boats must be inspected before entering the water to get rid of pollution, for example oil spills etc. • Monitor and take samples on strategic to determine if agricultural farming is a pollution source. • Water quality monitoring to be	• Government Departments that concern themselves with water quality and environmental health need to be involved for example SAMSA, DWS and the Makhado Local Municipality. • The South African Water Quality Guidelines are used as a basis for developing materials to inform water users about the physical, chemical, biological and aesthetic properties of water.

KPA 1: Resource Management			
Objective (What do we want)	**Motivation (Why do we want to achieve this)**	**Action Projects (How do we achieve this)**	**Management Support (Who will be involved)**
		linked to the Incident Management System to allow quick response. • Management guideline for the surrounding development	
Alien Invasive Species: • To control alien vegetation on the area surrounding the dam.	• The area is infested with alien invasive plant species such as Lantana Camara and Psidium Guajava. Such plants are a threat to the indigenous biodiversity and also consume large quantities of water.	• DEA (Working for Water Programme) to assist in eradicating alien vegetation within the surrounding environment. • Monitor the inlets to get rid of the alien vegetation. • Rehabilitate the area infested by alien species by introducing indigenous plant species. • Survey of the dam to identify any Alien Invasive Species and develop a Species Management Plan to control and eradicate them. • Introduce environmental awareness education regarding the impacts of Alien Invasive Species on the land and water resource.	• Planning and performing eradication should be incorporation with Working for Water (WfW) within the Department of Environmental Affairs (DEA). Their involvement will assist in controlling and removing invasive species on the dam's surrounding.
Faunal Species: • To protect the faunal species at the Albasini Dam for tourism purposes Also to protect the fish, by monitoring the fishing methods.	• There is no institutional structure responsible for conservation of fauna around the dam. • No management structure in place to monitor fish harvesting. • All sensitive areas identified by the Ecological Study should be	• Ensure compliance with relevant legislations such as National Environmental Management: Protected Area Act, 2003 (Act 57 of 2003. • Monitor fishing and introduce fishing licenses to ensure good management.	• Devise a Programme to determine the status of rare, threatened and endangered animal species and adapt management interventions accordingly. • Undertake a biodiversity assessment and prepare a biodiversity management plan where Limpopo Department of Agriculture (LDA) and LEDET (Biodiversity and Wildlife Trade and Regulations Section) and DEA

KPA 1: Resource Management			
Objective (What do we want)	**Motivation (Why do we want to achieve this)**	**Action Projects (How do we achieve this)**	**Management Support (Who will be involved)**
	demarcated as conservation area. • People are fishing using nets which can lead to depletion of fish species in the dam.		(Local Government Support) must be involved.

Table 20: Strategic Plan for KPA 2: Resource Utilisation

KPA 2: Resource Utilization			
Objective (What do we want)	**Motivation (Why do we want to achieve this)**	**Action Projects (How do we achieve this)**	**Management Support (Who will be involved)**
Access and Municipal Plans: • To enable broad public enjoyment of the water resource and provide adequate public access for broader controlled authorized access and associated infrastructure since there is one access area for public. • To ensure that the dam is incorporated into the municipal plans such as IDPs and SDF since it has a potential in tourism	• Water quality results indicated that the water quality is suitable for recreational activities. • The dam is a very popular destination within the basket of provincial leisure products. However, it has one public access and as such, the provision of public access is of outmost importance to the surrounding Local Communities. Currently the dam is mostly used by the adjacent land owners. This group access the dam via private entrances at their properties. • Access to the other parts of the dam might be difficult due to private ownerships surrounding the dam.	• Protect the water resource and manage it sustainably. • Public access areas to be developed within the purchased boundary of the dam. • The entry fees need to be reasonable to ensure that the dam remains accessible and affordable to the local community. • The MLM has to incorporate the dam on its plans such as IDPs as a hosting water resource for recreational activities.	• The IA (MLM) must be involved to make sure that the dam is taken into account with regard to the recreational activities. The Department of Tourism must also be involved in order to ensure that tourism is well recognised. • DWS as the dam manager is required to approve any kind of public access, use and development within the dam basin.
Safety:	• The dam is a major attraction	• Implementation of Incident	• Relevant Government Departments such as

KPA 2: Resource Utilization			
Objective (What do we want)	**Motivation (Why do we want to achieve this)**	**Action Projects (How do we achieve this)**	**Management Support (Who will be involved)**
• To ensure safety regarding the utilization of the resource.	to various water based sports and outdoor enthusiasts within the Limpopo Province. Currently there is no overarching safety system at the dam and also there is no mechanism for reporting of environmental and recreational emergencies nor incidents.	Management System and extended to the local communities. • Standardized Aids to Navigation (AtoN) and demarcation markers to be implemented. • Appoint safety officers to ensure that the safety rules are adhered to at all times. • Implement all other aspects of the CIWSP best practice model. • DWS in conjunction with SAMSA and DEA (WFW) should provide a lifeguard skills and first aid trainings and educations to the locals and/ or the club members to ensure safe utilization of the dam. • Formal appointment of SAMSA Enforcement Officer at the dam. The officer will be able to utilise the Incident Management System to alert SAPS Water Wing of any illegal activity • Develop information material such as signage and pamphlets, to convey safety rules at the dam.	DEA (Working for Water), SAPS, DWS, LEDET (Wild Trade and Regulations) and SAMSA that are responsible for safety on the GWWs.
<u>Recreational Activities:</u> • To introduce swimming activity within the dam surrounding environment.	• The dam consist of a gentle slope, hence it is suitable to erect some major recreational structures such as swimming pools. • The dam is a home to	• Swimming pools can be constructed on the land within the purchase boundary. • Engagements with the Swimming SA to assist with training for lifeguards etc.	• Operational policy and procedures, dealing with problem animals need to be developed and be in line with relevant Problem Animal Management Guidelines taking into consideration the national policy and strategy for Problem Animal Control in

KPA 2: Resource Utilization			
Objective (What do we want)	**Motivation (Why do we want to achieve this)**	**Action Projects (How do we achieve this)**	**Management Support (Who will be involved)**
	crocodiles and hippos which can pose danger to visitors accessing the dam for full contact water activities.	• Appoint consultants to conduct a feasibility study and manage implementation. • Build and develop the infrastructure for swimming. • Train youth as life guards, sportsman, administrators and facility managers.	South Africa.

Table 21: Strategic Plan for KPA 3: Benefit Flow Management

KPA 3: Benefit Flow Management			
Objective (What do we want)	**Motivation (Why do we want to achieve this)**	**Action Projects (How do we achieve this)**	**Management Support (Who will be involved)**
<u>Community Beneficiation:</u> • Local communities must get water from the dam. • Ensure that the local Communities are getting benefits emanated from the dam use. This can be through development of eco-tourism, recreational opportunities as well as subsistence fishing.	• The neighbouring communities are concerned about the issue of not getting water from the existing dam, for them to participate effectively DWS need to supply water to them.	• Strengthen community participation and beneficiation by ensuring that the communities are involved in the planning of every projects relating to the dam. • Job opportunities arising should benefit all the nearby communities and should be allocated fairly. • Develop a strategy on capacity building and training programmes at the dam and implement accordingly. • Discussion between the local schools and universities regarding possible use of the dam for educational purposes. • Lifeguard skill training and first aid training to be provided to	• VDM to action this as mandated by the Water Services Act, 1997 (Act No. 108 of 1997). • All departments that are concerned with local economic development, the surrounding communities and natural resource management need to be involved, these include DWS, LEDET, LDA, municipalities etc.

KPA 3: Benefit Flow Management			
Objective (What do we want)	**Motivation (Why do we want to achieve this)**	**Action Projects (How do we achieve this)**	**Management Support (Who will be involved)**
		improve safety in regards to utilization of the dam.	
Recreational Facilities: • To develop, introduce and maintain the recreational facilities and current activities at the dam e.g, cultural museum, chalets.	• The introduction of recreational activities might create job opportunities to the local communities however the access to the dam is currently limited to the private property. The public access has been closed from February 2014 till to date.	• Repair the worn out chalets. • The IA will develop their Concept whereby they will do feasibility study and identify what activities are viable at the dam.	• DWS and LEDET must be responsible on how they can promote more recreational activities at the dam.
Institutional Arrangement: • To ensure that a suitable institutional structure with the appropriate powers and delegations is in place to effectively manage the recreational use of the water resource in accordance with this RMP.	• There is an established Institutional Structure in place but it is not operational.	• MLM to be appointed as an IA. • Ensure that roles and responsibilities of the role players are well defined and clarified.	• DWS
Small Scale Fishery: • To introduce small scale fishery and subsistence fishing at the dam.	• People living in the communities near Albasini Dam do unauthorised fishing in the dam using gill nets which in turn put their lives in danger because of dangerous animals. • Small scale fisheries will make an important contribution to nutrition, food security, sustainable livelihoods and poverty alleviation to the local community.	• Educate people on fishing methods that are sustainable, e.g. subsistence consumption, they can use fishing lines and for commercial purpose, they can introduce small scale fishery. • Conduct risk assessment and develop mitigating Strategy. • Conduct Screening and other legislative requirements in relation to small-scale fisheries and integrated fish farming in ponds.	• DAFF must be involved in introducing and issuing fishing licences/permits. For small scale fishery LDA will be responsible for issuing licences for subsistence fishing. • Different government departments such as DWS, LEDET and DAFF should work together into a management structure in order to assess the viability and possibility of introducing the small-scale fishery as proposed by the local community.

KPA 3: Benefit Flow Management			
Objective (What do we want)	**Motivation (Why do we want to achieve this)**	**Action Projects (How do we achieve this)**	**Management Support (Who will be involved)**
		• Appoint Safety Officer that will monitor compliance of the fishing rules.	

4.4 FINANCIAL PLAN

The RMP provides guidance on cost recovery mechanisms to ensure the sustained and improved management of the dam. There are opportunities for PPPs which could further unlock the economic potential of the dam. PPPs allows for DWS to make State Assets such as GWWs available to private parties who wish to engage in tourism related commercial operations (DWAF, 2009). PPPs should be established as per Regulation 16 of the National Treasury.

The dam is a state asset and as such all profits generated from the recreational use, should also be used to further develop the dam. People should not be denied access to the dam. All fees associated with the usage of the dam for recreation should take into account the socio-economic status of the users. The access fees should make a provision for equitable access.

The information acquired from the RMP will be used to produce the Business Plan based on the action projects for each objective as stipulated under the Strategic Plan. However, many of the identified objectives are not of commercial nature and as such these non-economic objectives will not feature in the BP.

The BP provides a good description of possible economic recreational activities and the methods that can be used or enhanced to achieve the ultimate vision and the key objectives of Albasini Dam RMP. It also describes the financial management and operational requirements to implement the Objectives of the RMP

The BP will include a Financial Plan (FP) which will facilitate the implementation of the RMP by providing implementation program cost estimate for all possible economic recreational activities.

WAY FORWARD

Once the RMP and its BP are approved by the Minister of Water and Sanitation, it will be published in the Government Gazette as a regulation in terms of Section 26 of the NWA.

Review of RMP

According to DWAF (2006), the RMP is reviewed and updated every five (5) years to ensure that the management objectives remains relevant and management actions are continually improved. The BP is updated annually. **Figure 22** illustrates the RMP & BP review framework.

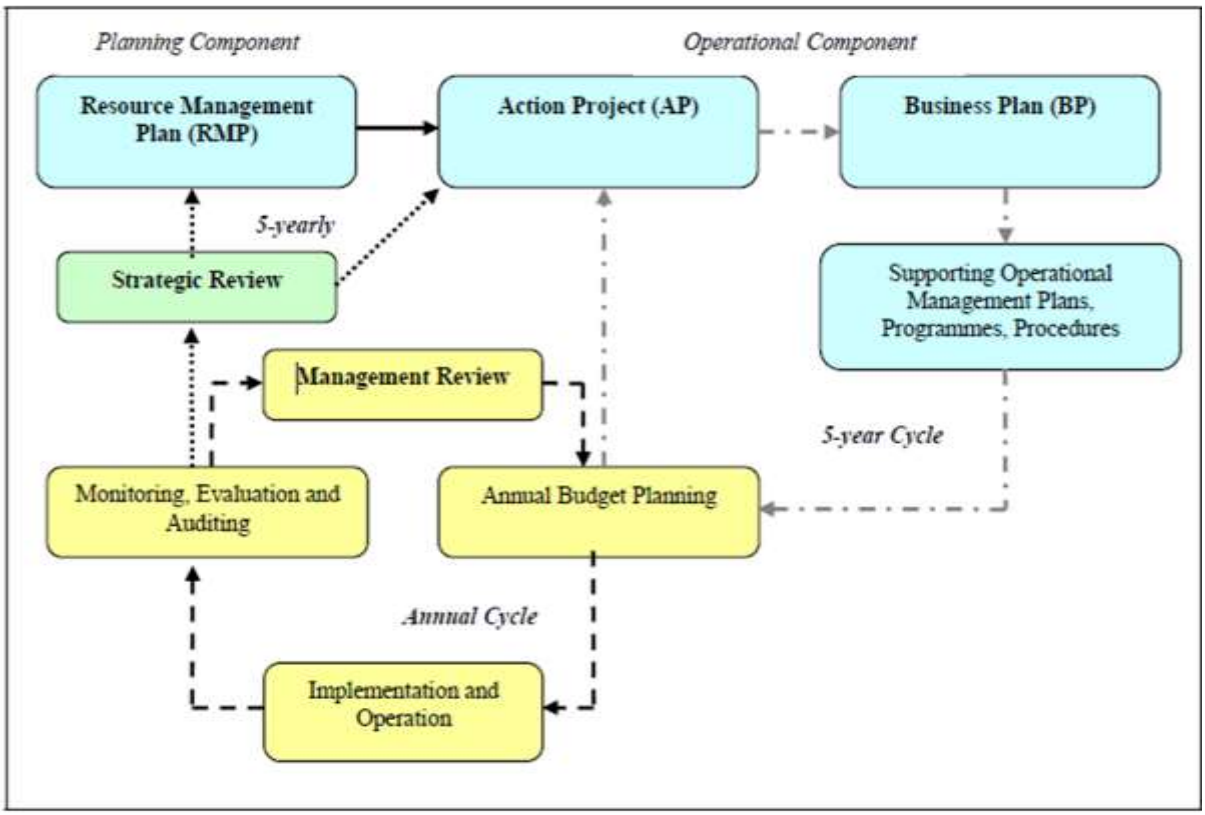

Figure 22: RMP and BP Review Framework

CONCLUSIONS

The RMP documents the challenges that exists within the Albasini Dam that can significantly impact on the utilisation and management of the dam and it's surrounding for recreational purposes. Such factors include legal, biophysical, socio-economic, hydrological as well as access to the resource. These factors will assist DWS with the most appropriate approach to ascertain that the issues are addressed before the implementation of the RMP.

The RMP will assist in effectively managing the dam and its surrounding environment. Furthermore its function is to implement an **Institutional Plan** for the effective management of dam. The focus on Institutional Plan is accompanied by a **Zonal Plan** which provides guidance on potential activities that are allowed on the dam, together with a **Strategic Plan**. In addition, a **Financial Plan** will provide guidance on funding requirements and funding options to implement the objectives of the RMP.

Furthermore the RMP promotes community participation and beneficiation, through Stakeholders engagement which were conducted to obtain common key objectives to be met by the RMP. The vision for the dam was formulated from the key common objectives identified by Stakeholders. Based on the strategic objectives identified for Albasini Dam, a BP has been developed to describe a manner in which the potential recreational activities are to be financially resourced. Furthermore, by including the RMP in the Local Initiatives such as IDPs, LED, etc, can ensure effective co-operative governance as well as to provide necessary support with regards to the use of the dam for recreational purposes. Undertaken in this manner, it is believed that the potential of the water resource can be optimally unlocked in a sustainable and equitable manner.

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APPENDICES