Department of Water and Sanitation

NATIONAL WATER RESOURCE INFRASTRUCTURE (NWRI)

Resource Management Plan

MORGENSTOND 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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- Adjacent Land Owners;
- Department of Environmental Affairs (Working for Water);
- Department of Water and Sanitation;
- Gert Sibande District Municipality;
- Local Communities;
- Mkhondo Local Municipality;
- Mondi Group; and
- Recreational Club at the dam.

Acknowledgement is also extended to all other Stakeholders 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) Year 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	09/10/2015
2	Draft RMP for DWS Review	23/11/2015
3	Final Draft RMP for DWS Review	17/03/2016
4	Final Draft RMP for DWS Review	11/04/2016
5	Final RMP for DWS Approval	16/08/2016
6	Final RMP for DWS Approval	07/12/2016
7	Final RMP for DWS Approval	14/12/2016

LIST OF ACRONYMS

ADU	Animal Demography Unit
AtoN	Aid(s) to Navigation
BID	Background Information Document
BP	Business Plan
CATHSSETA	Culture, Arts, Tourism, Hospitality, Sports Sector, Education and Training Authority
CD: IO MANCO	Chief Director: Infrastructure Operations Management Committee
CIWSP	Cooperative Inland Waterways Safety Programme
COGTA	Department of Cooperative Governance and Traditional Affairs
CPSI	Centre for Public Service Innovation
DAFF	Department of Agriculture, Forestry and Fisheries
DEA	Department of Environmental Affairs
DHS	Department of Human Settlement
DMC	Dam Management Committee
DoT	Department of Transport
DPW	Department of Public Works
DRDLR	Department of Rural Development and Land Reform
DSR	Department of Sports and Recreation
DWAF	Department of Water Affairs and Forestry
DWS	Department of Water and Sanitation
ECC	Effective Carrying Capacity
EMF	Environmental Management Framework
FSL	Full Supply Level
GP	Guideline Programme
GWWs	Government Waterworks
IA	Implementing Agency
IALA	International Association of Marine Aids to Navigation and Lighthouse Authorities
I&APs	Interested and Affected Parties
IDP	Integrated Development Plan
IEE	Integrated Environmental Engineering
IRMP	Integrated Resource Management Plan
KPA	Key Performance Area
MLM	Mkhondo Local Municipality
MOA	Memorandum of Agreement
NDT	National Department of Tourism
NEMA	National Environmental Management Act
NEMPAA	National Environmental Management: Protected Areas Act
NPSC	National Project Steering Committee
NT	National Treasury
NWA	National Water Act
NWRI	National Water Resources Infrastructure
OMC	Operations Management Committee
PCC	Physical Carrying Capacity
PP	Public Participation
PPP	Public Private Partnership

PSP	Professional Service Provider
QDS	Quarter Degree Square
RCC	Real Carrying Capacity
RF	Rotation Factor
RMP	Resource Management Plan
SAMSA	South African Marine Safety Authority
SAPS	South African Police Service
SASCOC	South African Sports Confederation and Olympic Committee
SDF	Spatial Development Framework
SSA	Swimming South Africa
SWOT	Strengths, Weaknesses, Opportunities, Threats
TWQR	Target Water Quality Range
WfW	Working for Water
WMA	Water Management Area

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 Morgenstond 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 Morgenstond Dam.

Purpose of the RMP: The 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.

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: Morgenstond Dam is an earth-fill type of a dam which impounds Ngwempisi River. It falls under Wards 29 and 30 within the jurisdiction of Mkhondo Local Municipality (MLM) which forms part of Gert Sibande District Municipality (GSDM) in Mpumalanga Province, South Africa. Its GPS coordinates are: **$26^0$42'52.01"S $30^0$32'19.89"E.**

Purpose of the Dam: The primary purpose of Morgenstond Dam is for industrial and municipal use. The dam currently supplies bulk water to Jericho Dam.

The dam also currently offers recreational activities such as boating, canoeing, fishing and jet skiing. These activities are undertaken from Morgenstond Boat Club which is situated at the dam.

Dam ownership and management: Morgenstond Dam is owned and operated by DWS. There are two access areas at the dam, one of the access areas is the restricted area of the dam wall which is used for DWS's maintenance only. The other access point is at Morgenstond Boat club which is used for recreational purposes. The club has an agreement with DWS for the leased property at the boat club.

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 Morgenstond 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 thus recognized that different roles and responsibilities of the stakeholders [Authorities and Interested and Affected Parties (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 help in producing 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 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.

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, formulated by the stakeholders.

The identified key common objectives are:

- To secure the dam with a proper fence;
- To ensure frequent testing of water in order to maintain the water quality of the dam;
- To ensure proper sewage system at the area near the dam;
- To develop a small scale fishery for the benefit of the local communities;
- To provide swimming lessons for the local communities;
- To develop a skiing school for local communities;
- To exploit the potential of tourism at the dam;
- To host skiing competitions at the dam;
- To improve the livelihood of the local communities through employment opportunities; and
- To establish an appropriate institutional structure which will effectively manage the recreational use of the water resource and the surrounding environment.

A vision for the dam for a period of 20 years was formulated by stakeholders to be as follows:

"Morgenstond Dam is an undiscovered area which has the potential to change the lives of local residents through the tourism potential that makes the dam more adorable as well as its surrounding environment".

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 Morgenstond Dam that could enhance tourist attraction:

- Swimming opportunities.
- Introduction of small-scale fishery.

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CHAPTER 1: INTRODUCTION

1.1 BACKGROUND OF MORGENSTOND DAM

Morgenstond Dam is an earth-fill type of a dam located on the Ngwempisi River. The dam is located within Ward 29 and Ward 30 of Mkhondo Local Municipality (MLM) under Gert Sibande District Municipality (GSDM) in the Mpumalanga Province. The dam is found at the following Global Positioning System (GPS) coordinates: **26º 42' 52.01"S** and **30º 32' 19.89"E**. The dam was established in 1978 and was refurbished in 1991.

The dam was officially opened in 1978. The owner and operator of the dam is DWS. The dam was originally constructed for municipal and industrial use and it currently supplies bulk water to Jericho Dam which is located eight (8) kilometres away from Morgenstond Dam. The purpose of this supply is for Eskom Cooling towers which needs a lot of water from Jericho Dam (Refer to **Figure 1:** Locality Map).

In addition to the primary uses, the dam also accommodate recreational activities such as boating, fishing etc for secondary use. The dam profile is summarized in **Table 1.**

Table 1: Morgenstond Dam Profile

Morgenstond Dam Profile	
Location	South Africa
Province	Mpumalanga
District Municipality	Gert Sibande District Municipality
Local Municipality	Mkhondo Local Municipality
Nearest Town	Bonnie vale
Opening Date	1978
Co-Ordinates	$26^0$42'52.01"S; $30^0$32'19.89"E
Purpose	Municipal & Industrial use
Owner	DWS
WMA	Inkomati Usuthu
Quaternary Catchment	H50A
Catchment Area (km^2)	548
River	Ngwempisi River
Capacity (m^3)	100,773,000
Surface Area (ha)	977.2
Wall type	Earth-fill
Wall Height (m)	6845.3
Length (m)	929

Source: Department of water affairs (List of registered dams, 2013)

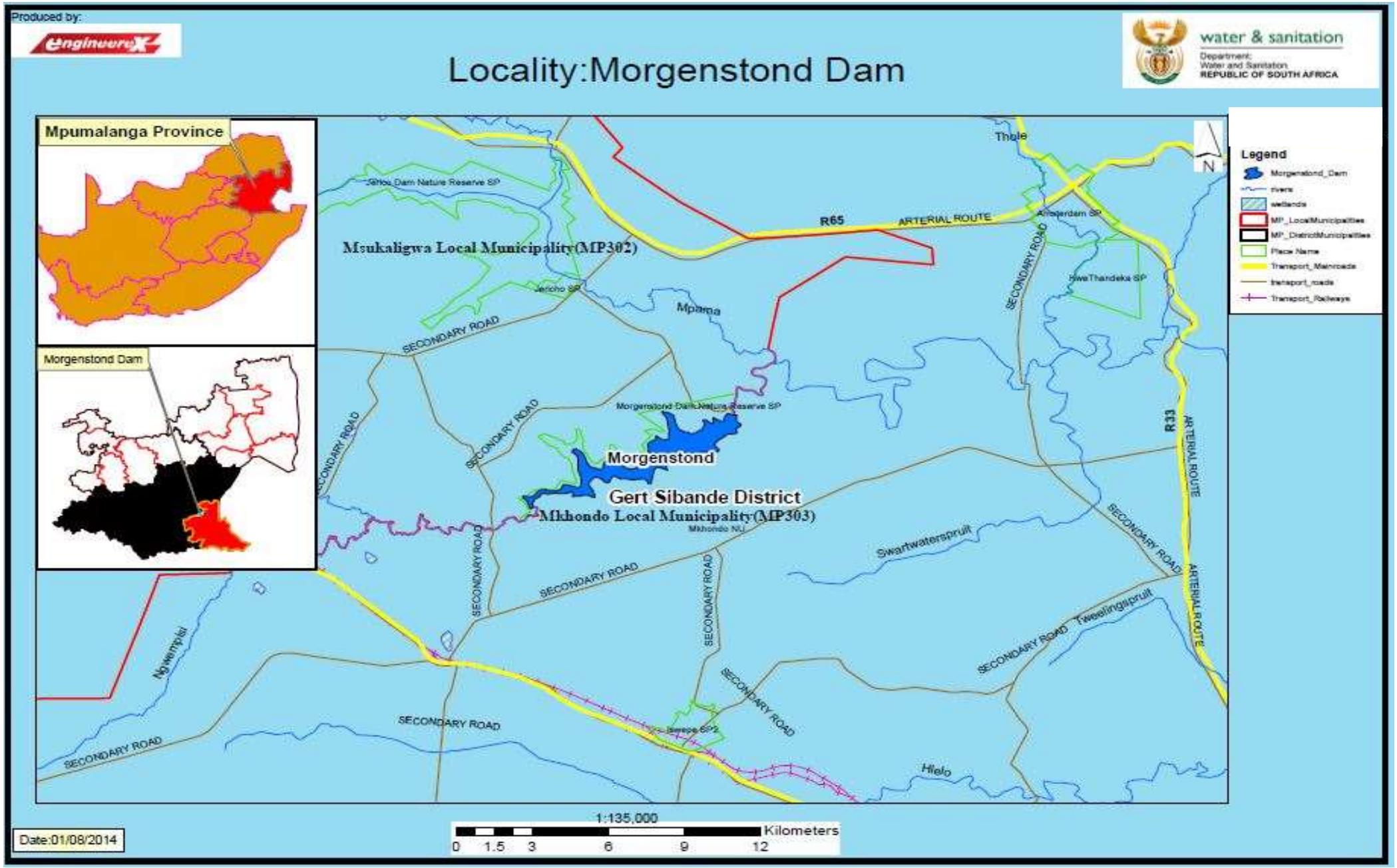

Figure 1: Locality Map for Morgenstond Dam

1.2. BIOPHYSICAL ENVIRONMENT

1.2.1. Climate

Morgenstond dam is characterized by warm temperate climate, with summer rainfall of about 900 mm. Temperatures reach close to 17 ^{0}C with fairly frequent frosts. The dam area is warmer during summer and cooler during winter[2] as illustrated on **Figure 2**.

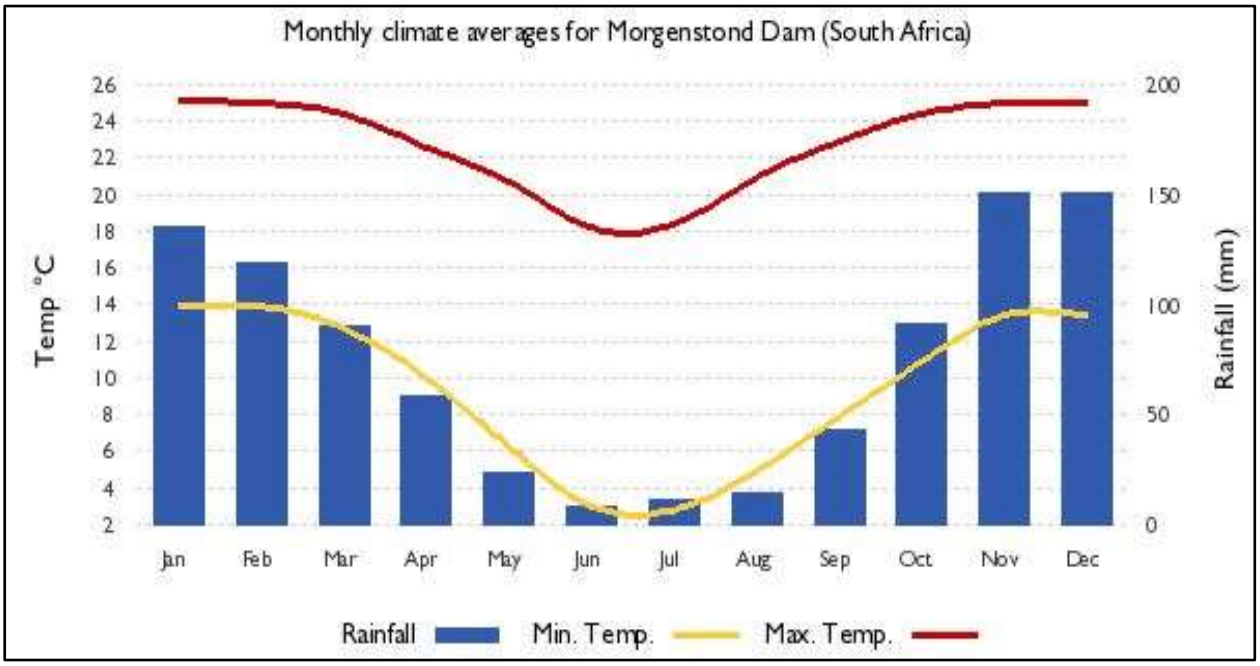

Figure 2: Variations in temperature

1.2.2. Flora

The landscape in the area is mainly undulating with moderately steep slopes, but valley basins are wide and flat. The mountainous areas occurs mostly along the northern and eastern boundary. Tall closed grassland rich in forbs and dominated by *Tristachy leucothrix, Themeda triandra* and *Hyparrhenia hirta.* Evergreen woody vegetation is characterised on rocky outcrops. (Mucina & Rutherford (2006)

1.2.2.1. Terrestrial Alien Species

Alien invasive plant species are non-indigenous plants introduced from other countries. Once they were introduced, they tend to spread beyond the area where they are desired. Alien plant species also outcompete the indigenous species wherever they germinate. Many of these species are prominent in riparian ecosystems. I.e. on the banks of water sources (streams, rivers, estuaries, dams and lakes).

Alien species were either intentionally or unintentionally introduced to South Africa. The intentional introduction was for aesthetic and/or economic gain. Some plants have been introduced with the intent of aesthetically improving public recreation areas or private properties, whilst others are introduced for ornamental or timber uses.

The most common Terrestrial Alien Plants in South Africa are the Black Wattle (Arcacia Mearnsii) , Mauritius Thorn (Caesalpinia Decapetala), Guava (Psidium Guajava), Castor Oil plant (Ricinas Communis), Blue Gum (Eucalyptus globulus), Pine Trees, Bug weed (Solanum Mauritinum), Port Jackson willow (Acacia Saligna), weeping willow (Salix Babylonica), Tickberry (Lantana camara,

[2] (African Protected Areas Report: http://bioval.jrc.ec.europa.eu/PA/pa/300456/frame_300456.html)

blackwood (Dalbergia melanoxylon) and the silver wattle (Acacia dealbata).

1.2.2.1.1 Impacts of Alien Plants on Natural Environment

- They are water guzzlers.
- They cause Eutrophication.
- They outcompete and displace the indigenous species.
- They cause soil erosion.

1.2.2.1.2 Control Methods

There are three methods to control or eradicate alien invasive species growing in the environment namely; **Physical control, Chemical and Biological control**.

Physical removal

Many invasive plants can be removed manually or with the help of simple tools. Shrubs can be removed by using a tree popper. The top growth of such plants can be cut, followed by the removal of the stem and roots from the ground. Larger trees can be dealt with using the ring-barking method. This involves peeling off the barks on the stem of the tree.

Chemical control

Herbicides can be sprayed on plants less than 2m in height for quick results. Spraying needs to be done when there is no wind in order to prevent spray drifting onto adjacent wanted plants. All plants that are subjected to the spray will be destroyed. Large tree can be cut down, leaving a stump as flat and as close to the ground as possible, and apply a recommended herbicide.

Biological control

Biological control consists of the use of natural enemies to reduce the vigour or reproductive potential of an invasive alien plant. Biocontrol can be achieved by the use of specially selected and carefully tested plant-feeding insects, mites, and pathogens.

The terrestrial alien species identified at Morgenstond Dam is Black Wattle.

1.2.2.2. **Aquatic Alien Species**

Aquatic weeds is defined as “unwanted and/or undesired plants which grow and reproduce in an aquatic environment ‘’.Whilst plants are important components of the aquatic environment, the excessive growth and spread of aquatic weeds can have a detrimental effect on water bodies and its inhabitants. Some of the problems caused by the growth and spread of aquatic weeds in water bodies are as follows:

- Interfere with or prohibit recreational activities such as swimming, fishing, and boating;
- Detract from the aesthetic appeal of a water body;
- Stunt or interfere with a balanced fish population;
- Produce quiet water areas that are ideal for mosquito breeding;
- Certain weeds can give water bad tastes and odours;
- Impede water flow in drainage ditches, irrigation canals, and culverts, causing water to back up; and
- Deposition of weeds, sediment, and debris, can hinder bodies of water to fill in.

There are ten known aquatic weeds in South Africa. The known weeds include, among others, the Water Hyacinth (Eichhornia crassipes), Red water fern (Azolla filiculoides), Parrots feather (Myriophyllum aquaticum), Water lettuce (Pistia Stratoites), etc.

1.2.2.2.1 Control Methods

Mechanical Control

Mechanical control usually refers to the mowing or mechanical cutting of an invasive plant infestation to limit seed production. With mowing, timing is essential. Invasive plants must be removed before the plants go to seed in order to be an effective method of control. Plants should be cut as close to the ground as possible and may have to be treated more than once in a growing season to achieve desired results.

Manual Control

Manual invasive plant control usually refers to hand-pulling or digging. Manual control works well for dealing with single plants or small infestations that can be eradicated with a small amount of labour. It is most effective if invasive

plants are shallow rooted and the soil is loose or moist. One should be aware this type of control may not be effective for invasive plants that also reproduce by roots and rhizomes. In these instances, limited hand-pulling or digging may actually increase the size of the infestation.

Biological control

Biological control often works best on large infestations, or infestations that are near the water. It is a long-term approach and often it takes many years for insects to establish and results to be seen. In some cases, a single biological control agent can adequately control an invasive plant species.

However, in most cases, a variety of agents are needed to achieve control of the weed species population levels. Biological control will not eradicate the infestation directly. Rather, the agents are used to decrease the vigor and seed production of the plants in order to decrease their competitive ability. Therefore, it is important to use other weed management strategies to ensure that the infestations are contained.

NB: Morgenstond Dam currently does not have aquatic alien invasive species.

1.2.3 Fauna

1.2.3.1 **Amphibians**

According to the Frog Map Atlas, eleven (11) species were found in the 2630DA Quarter Degree Square (QDS) (Animal Demography Unit (ADU) 2015). These frog species are not listed on the Red data species list. Therefore. They are not endangered species as shown in **Table 2**.

Table 2: List of Amphibians

Genus	Species	Common Name
Breviceps	*Mossambicus*	Mozambique Rain Frog
Amietophrynus	*Gutturalis*	Guttural Toad
Hyperolius	*Marmoratus*	Painted Reed Frog
Kassina	*Senegalensis*	Bubbling Kassina
Semnodactylus	*Wealii*	Rattling Frog
Phrynobatrachus	*Natalensis*	Snoring Puddle Frog
Xenopus	*Laevis*	Common Platanna
Amietia	*Quecketti*	Drakensberg River Frog
Cocosternum	*Boettgeri*	Common Caco
Stronglylopus	*Grayii*	Clicking Stream Frog
Tomoptema	*Natalensis*	Natal Sand Frog

1.2.3.2. **Reptiles**

Six (6) species of reptiles were found within the 2630DA QDS (ADU 2015). All these species are not found on the Red List Category. **Table 3** indicates these reptile species.

Table 3: List of Reptiles

Genus	Species	Common Name
Boaedon	*Capensis*	Brown House Snake
Lycophidion	*Capense*	Cape Wolf Snake
Scelotes	*Mirus*	Montane Dwarf Burrowing Skink
Trachylepis	*Margaritifer*	Rainbow Skink
Trachylepis	*Punctatissima*	Speckled Rock Skink
Trachylepis	*Varia*	Variable Skink

1.2.3.3. **Mammals**

Three (3) mammal species have been recorded for 2630DA QDS (ADU 2015). These species included the endangered Ourebi species as listed in **Table 4**.

Table 4: List of Mammals

Genus	Species	Common Name
Ourebia	*Ourebi*	Oribi
Gerbilliscus	*Brantsii*	Highveld Gerbil
Orycteropus	*Afer*	Aardvark

1.2.4 Geology and Soils

The area is underlain by Archaean granite, Gneiss and partly covered by Karoo Supergroup sediments and intruded by Karoo Dolerite, Suite Dykes and Sills.

The type of soil identified around the dam area is mostly loamy soil. Sandy soil also covers some parts of the area. During the rainy season the loamy soil becomes very muddy because it is closely packed in texture. Dominant soils on the sedimentary parent material are yellow apedal, well drained with a depth of greater than 800 mm and a clay content of greater than 35%, representing the soil series: Hutton, Clovelly and Griffin. Shortlands soils are dominant on Dolerite. The most dominant Rock structure at Morgenstond dam is Granite which can be predominantly white, pink, or gray in color, depending on their mineralogy. The North Eastern side of the dam wall is characterized by Gabbro rocks and Basalt Rocks. (Mucina & Rutherford (2006). (Refer to **Figure 3:** Geology Map)

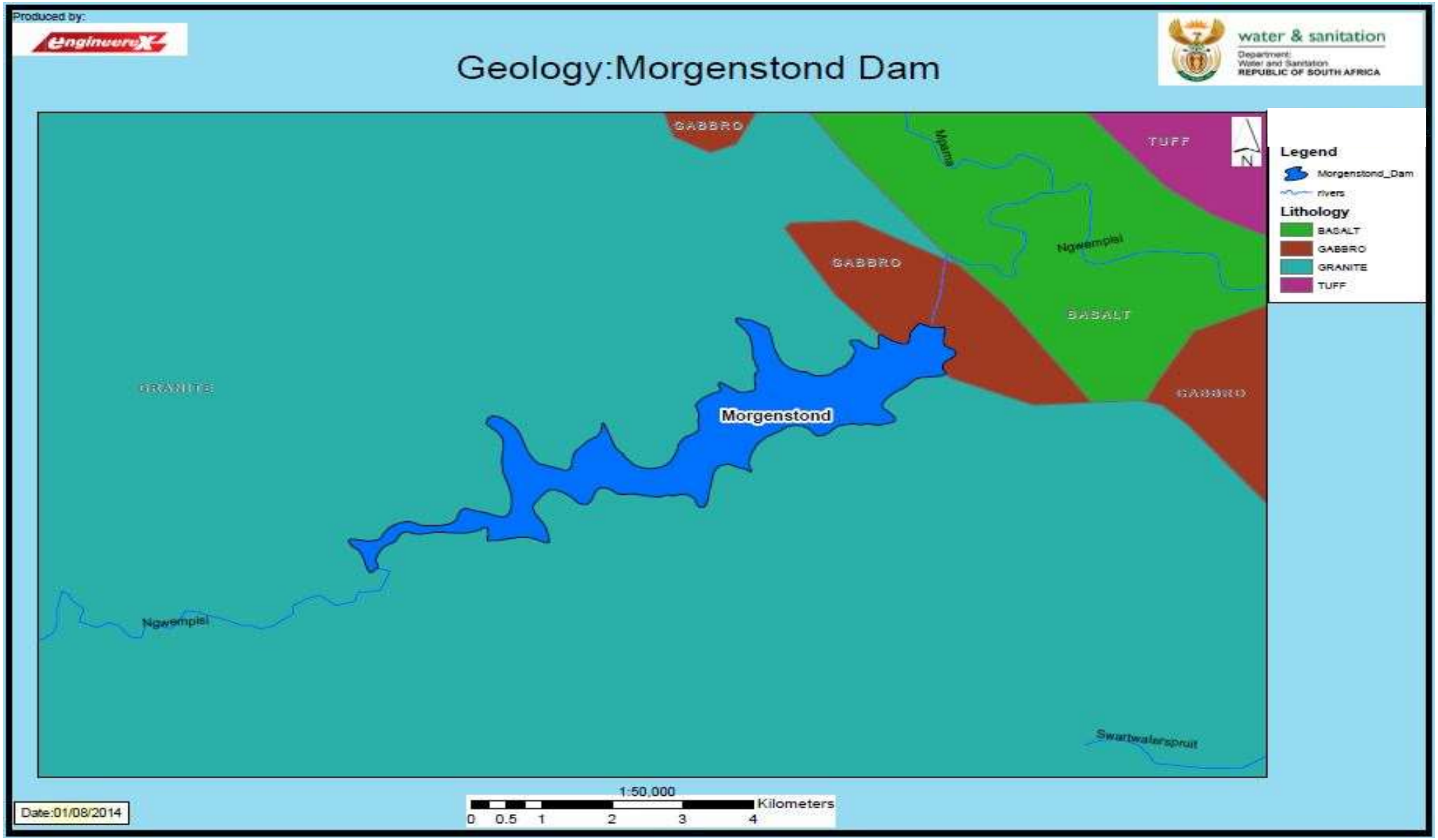

Figure 3: Geology Map for Morgenstond Dam

1.2.5 Hydrology

1.2.5.1. **Surface Water**

As of 2015 September, Morgenstond Dam is on the normal level as compared to the year 2014 where it has been on a moderately high level as well as reaching its highest level of 110%. (DWS website: www.dwa.gov.za). The variations in the water level have been clearly depicted on **Figure 4**.

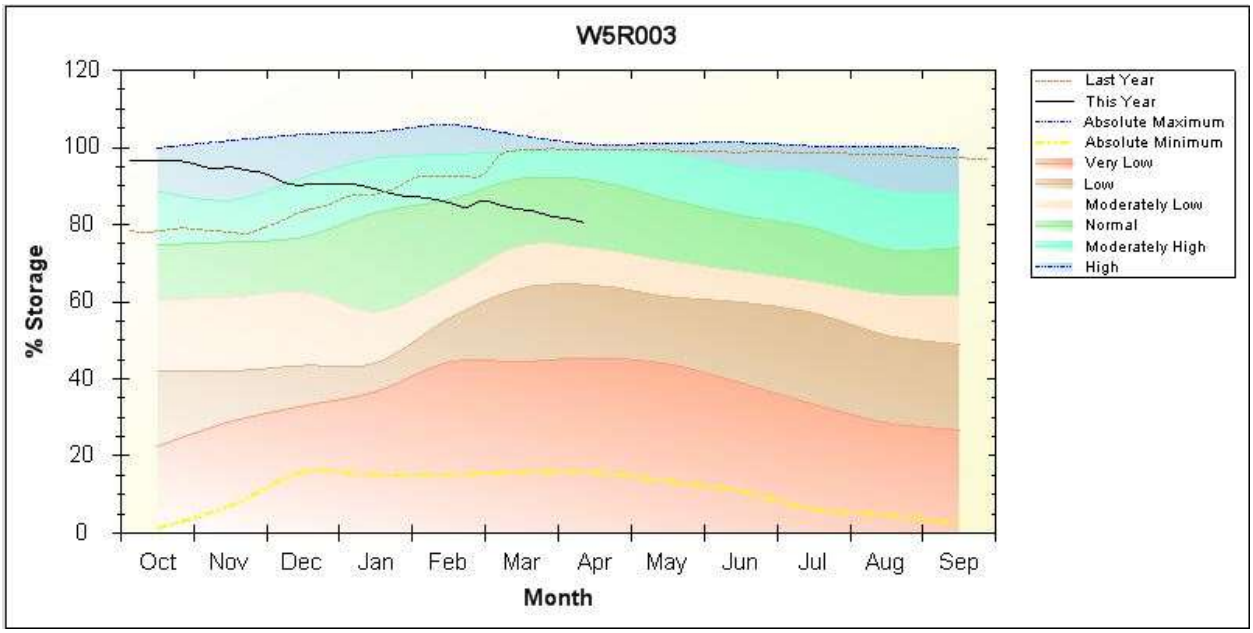

Figure 4: Full Supply Level (DWS, 2016)

1.2.5.2. **Water Quality**

Morgenstond dam has a record of good water quality. The water samples were tested by the Department of Water and Sanitation Hydrology section from 1978 to 2009. **Table 5** indicates the water quality data taken from 209 samples that were taken from 1978 to 2009. The results shown in **Table 5** have been calculated on average.

NB: These analytic results were the only ones available, and retrieved from DWS's Water Quality Management System for the study conducted.

Table 5: Morgenstond Dam Water Quality (DWS Water Quality Management System, 2014)

Characteristic	Tests Results	Water Quality Target Range (Recreational Purposes)	Description
Clarity (Secchi disc, m)	-	3.0	No information available.
pH (pH units)	7.4	6.5 - 8.5	The pH of water is well within Quality Range and the buffering capacity of the lachrymal fluid of the human eye. Skin, ear and mucous membrane irritation absent.
Algae (Chlorophyll-a method, µg/chl-a)	-	0 - 15	No nuisance conditions may be encountered.
Ammonia (mg/L)	0.003	0 – 1.0	No health and or Aesthetic effects can occur.
Magnesium (mg/L)	3.82	0 - 30	No health effects
Potassium (mg/L)	2.45	0 - 50	No aesthetic or health effects
Sulphate (mg/l)	10.135	0 - 200	No health or aesthetic effects are experienced

Characteristic	Tests Results	Water Quality Target Range (Recreational Purposes)	Description
Electrical Conductivity (mS/m)	10.923	0 - 70	No health effects associated with electrical conductivity of water are expected < 45 mS/m

Source: Water Quality Standards: Department of Water and Sanitation, Recreational Use: Volume 2, 1996

Algae: The concentration for algae measured as chlorophyll-A will not have any health impact for non-contact recreation. However contact sports such as swimming, will require further water quality tests before they can be attempted.

pH: The pH for the dam is within the TWQR for recreational use and also suitable for Aquatic ecosystem.

Turbidity: The turbidity is low but might be associated with a possibility of microbiological pollution associated with turbidity. Activities such as swimming, fishing and other contact activities will require further water quality tests before they can be attempted in order to avoid water-borne infections.

Phosphate: The phosphate concentration in the dam is low and this results to no nuisance growth of aquatic plants or blue-green algae in the dam. Based on the water quality results for the dam, the water will not cause effects on the current recreational activities and the dam's aesthetic quality. The most important water quality problem in surface water in South Africa is most likely to be faecal pollution together with the associated disease causing organisms.

1.3 USERS AND USES OF THE DAM

1.3.1 Primary Function

The primary purpose of the dam is for municipal and industrial use. The dam supplies raw water for Eskom cooling owners. Local communities use the dam for subsistence fishing.

1.3.2 Secondary Function

There is a recreational club at the dam which offer activities such as powerboating, jet skiing, canoeing and angling. There are twenty one houses within the premises.

1.4 RECREATIONAL INSTITUTIONAL STRUCTURE

1.4.1 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.

1.4.2 Access

There is one public access gate at the recreational facility. The other entrance is at the dam wall and it is only used by DWS for maintenance purposes.The most part of the dam is fenced including the dam wall.

1.5 AGREEMENTS

According to a Legal Report obtained from the Mpumalanga Deeds Office, there are three (3) lease agreements at the dam, these agreements are between DWS and Morgenstond Boat Club, Transvaalse Bass Master Club and Southern Bass Club. However, according to the DWS Land Matters there is only one (1) lease agreement between Morgenstond Boat Club and DWS.

1.5.1 Morgenstond Boat Club

The Morgenstond Boat Club has a lease agreement with the DWS. According to the agreement, Morgenstond Dam Boat Club leased two (2) hectares of land over the dam, which is owned by the state. Lease term was from 1st of March 1989 until 28th of February 1999 with an automatic renewal clause for the same period of 10 years under the same

conditions. The lease can be terminated six (6) months prior to the end of the lease period.

1.6 SOCIO ECONOMIC ENVIRONMENT

1.6.1 Social Audit

Through a socio-economic analysis of a given area, insight can be gained into specific needs in the area, socio-economic issues that need to be addressed for a development to overcome potential difficulties, skills and education levels which can aid or hinder a local development. Finally, an understanding of socio-economic conditions of a given area can be used at a later stage to determine the impact that a given development has had on a certain area in terms of changed socio-economic conditions.

1.6.1.1 Population Dynamics

Morgenstond Dam is located in MLM under Gert Sibande District Municipality. The MLM has a total population of about 171 982 (Census 2011). Of this population, 52.17% is female and 47.83% is male. **Table 6** and **Figure 5** shows the population percentage for the Local Municipality:

Table 6: Population Percentage (Census 2011)

Population Group	Number of People	Percentage (Census 2011)
Black African	162 832	94.68%
White	6 447	3.75%
Indian or Asian	1 417	0.82%
Colored	894	0.52%
Other	393	0.23%

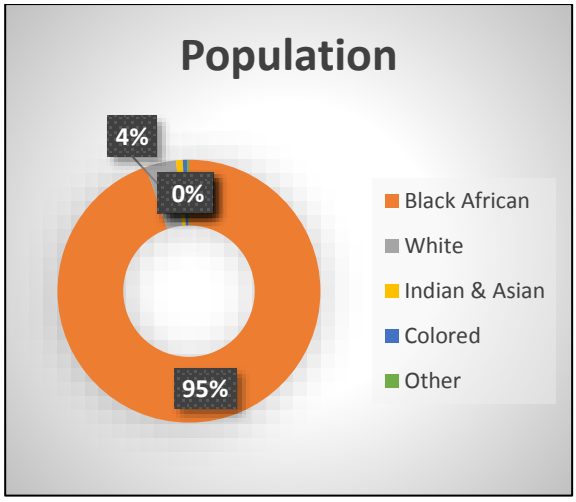

Figure 5: Population Percentage

1.6.1.2 Education Level

The higher percentage of the community has matric qualification. **Table 7** and **Figure 6** indicates the level of education at MLM for individuals above the age of 20 years.

Table 7: Education Percentage (Census 2011)

Level of Education	Percentage (Census 2011)
No schooling	18.10%
Matric	25.50%
Higher education	5.40%

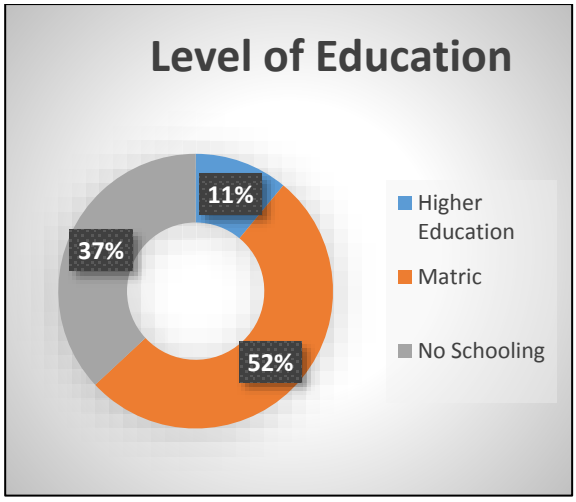

Figure 6: Level of Education

1.6.1.3 **Employment Status**

MLM has an unemployment percentage of 35.9%. The youth unemployment percentage is 44.60% (Census 2011) as illustrated in **Table 8**:

Table 8: Employment Percentage (Census 2011)

Labour Market	Percentage (Census 2011)
Unemployment Rate (official)	35.90%
Youth Unemployment Rate (official): age 15-34	44.60%

1.6.2 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;
- The community needs will be addressed 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 Dam Management Committee).

CHAPTER 2: LEGISLATIVE FRAMEWORK

RMP forms the overarching framework for the management of Morgenstond 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):** It 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 it is 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 maximise 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).
- Intergovernmental Relations Framework Act, 2005 (Act No.13 of 2005).
- Land Administration Act, 1995 (Act No. 2 of 1995).
- 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 water consumption, it is still a major water use and needs to be managed correctly to ensure increased community participation and beneficiation with minimal disturbances and environmental impacts.

3.2 PURPOSE OF THE RMP

The main aim of RMPs will be to attain the objectives underlying sustainability and to compile functional, workable sustainable access and utilisation 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, utilisation 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

Process 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 on **Table 9.**

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

Trigger Factors	Description
Resource Management	**Alien Species** • Black wattle is an Alien Invasive Plant species in the dam and if uncontrolled, it can present challenges to Native plant species. **Water Quality** • Water quality is not being assessed at the moment, this poses a threat to the dam users as they are not sure whether the water quality is suitable for recreational activities or not. **Secondary Activities** • The Local Municipality has identified this dam as a tourism node and has shown interest in managing the dam for recreational activities. Morgenstond Dam RMP will be vital for the management of these tourism activities. • Morgenstond Boat Club is the only boat club at the dam, with the following activities: Jet skiing,

Trigger Factors	Description
	canoeing and power boats. These activities require proper management.
Community Participation and Beneficiation	**<u>Community awareness</u>** • Local communities are not well informed about the recreational use of the dam and this can be addressed by the RMP. • The Local Municipality has a tourism business plan for this dam. The communities will have more involvement at the dam according to this plan.
Public Policy	**<u>Integration of Morgenstond Dam in Municipal Planning Initiatives</u>** • The Morgenstond Dam should also be integrated in other planning initiatives and decision support tools such as Mkhondo Local Municipality IDP, LED plans as well Gert Sibande District Municipality Environmental Management Framework (EMF).

3.4 RMP DEVELOPMENT PROCESS

The RMP is developed in accordance with the RMP guideline procedure (DWAF, 2006) as illustrated in **Figure 7.**

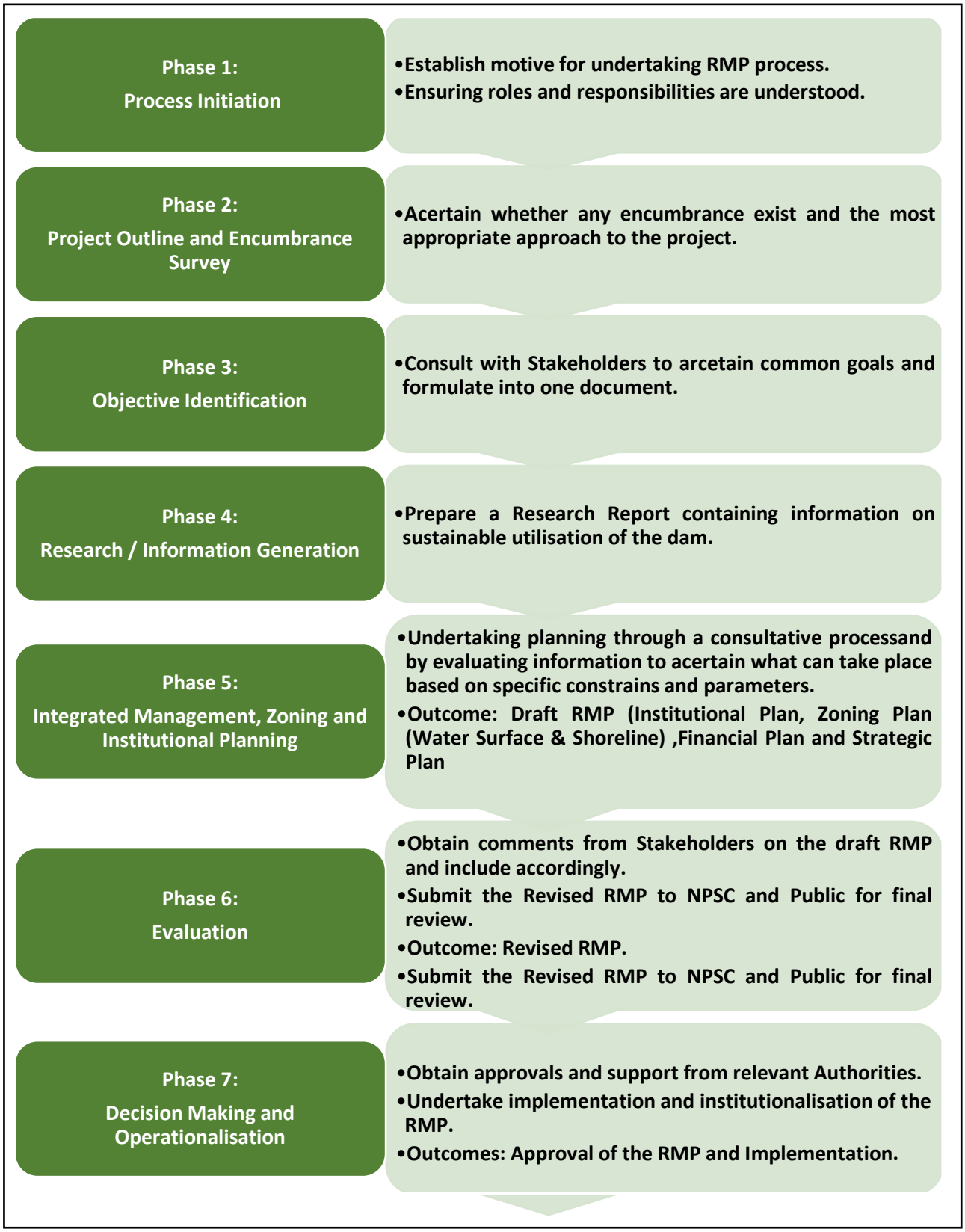

Figure 7: RMP Procedure

3.5 RMP PLANNING STAGES

3.5.1 Desktop Study

The desktop study was conducted in order to collect the baseline information about the dam as well as the surrounding environment. This study provided information such as the location of the dam, user groups, current activities and previous studies conducted for the dam.

3.5.2 Site Inspection

A site inspection was conducted at Morgenstond Dam on **19 May 2014** to gather baseline information using a checklist questionnaire. The site inspection was undertaken with the DWS delegates (DWS IEE, Central Operations Dam Operator and Southern Operations Champion). Photos of the study area were also taken during site inspection.

3.5.3 Public Participation

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).

Public Participation was conducted in order to acquire 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 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**

The **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. The success of the RMP is dependent on the level of involvement by the various stakeholders. Various stakeholders were identified and invited to participate in an open

and consultative process. (See attached **Appendix A)**. The stakeholder list is updated on a continual basis throughout the RMP process

3.5.3.2 **The Participation Phase**

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

- Informing and identifying 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.
- 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 can comment and give inputs.

3.5.3.4 **Advertising Process**

3.5.3.4.1 Compilation and Distribution of Background Information Document (BID)

The purpose of this document was to provide stakeholders with the background information about the proposed RMP project and to introduce the processes to be followed in developing the plan. It also aimed at informing stakeholders on how to fully participate in the process and encouraged active attendance to stakeholder's 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 **Khanyisa Newspaper**. The advert invited the public to attend the Public Participation Meeting. The advert was published in English on **04 July 2014**. Furthermore, an advert for the draft RMP was advertised on **22 January 2016**. (See attached **Appendix C**).

3.5.3.4.3 *Flyers 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.The flyers were compiled in English and were distributed on **01 July 2014.**

The flyers aimed at informing the communities about the meeting that was scheduled to take place on **08 July 2014** at **Jabulani Community Hall**. Moreover, the flyers for the draft RMP were distributed on **15 January 2016.** (See attached **Appendix D**).

3.5.3.5 **Direct Communication**

3.5.3.5.1 E-mails

Electronic 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 notifications were sent out on **30 June 2014** (See attached **Appendix E**). The second electronic invitations were sent out on **19 January 2016** and it included the draft RMP.

3.5.3.5.2 Authority Meeting

The Authorities Meeting was held on **08 July 2014** at the **Jabulani Village Community Hall**.

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.

The draft RMP was presented to the authorities on **02 February 2016.**

3.5.3.5.3 Public Meeting

The Initial public Meeting was held on **08 July 2014** at the **Jabulani Village Community Hall**. 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 Morgenstond Dam.

The draft RMP was presented to the public on **02 February 2016**.

3.5.3.5.4 Comments and Responses Register

A copy of the draft report was circulated on **02 February 2016** for commenting. The commenting period was to elapse on **30 May 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
Gert Sibande District municipality (GSDM) / Mkhondo Local Municipality (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 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 ANALYSIS

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

Item	Description
Geology and Soil	• The soil type is not too favorable during rainy season, this makes some areas around the dam to be inaccessible, therefore, access roads around the dam needs improvement.
Vegetation and Land Scape	• There is an invasive alien plant species called Black Wattle. It is considered a weed, and is seen as threatening native habitats by competing with indigenous vegetation, replacing grass communities, reducing native biodiversity and increasing water loss from riparian zones.
Climate	• This dam area is warmer during summer, therefore, the weather conditions are more favorable in summer. The winter months will be characterized by a lower number of tourism activities due to the cold weather.
Water Quality	• Water testing is currently not conducted. This lack of testing results in uncertainties on the water quality of the dam. The problem needs to be addressed because the water quality might be compromised.

Table 12: Summary of Legal Encumbrances

Item	Description
Lease Agreements	• The DWS Land Matters has a record of only one (1) Lease Agreement between DWS and Morgenstond Boat Club, however the Legal Report has a record of agreements between DWS and Southern Bass Club, Agreement between DWS and Transvaalse Bassmasterclub. • The access to the boat club is restricted to members only. The private use of recreational activities is caused by the joining fees as well as the limit in the number of members. General public is restricted from using this side of the dam as an access point.

Table 13: Summary of social Encumbrances

Item	Description
Educational Level	• The communities around Morgenstond dam have a low level of education.
Employment	• The dam is surrounded by poor communities, therefore, most of the secondary activities are too expensive for them to afford. These communities might end up not benefiting from the RMP. The level of employment is also low due to lack of resources. The residential areas are much isolated from each other and from the dam. This challenge is accelerated by lack of public transport at Jabulani Agri-Village.

Table 14: Summary of Existing Plans and their Encumbrances

Item	Description
Business Plan	• The proposed BP by Mkhondo Local Municipality and the Mondi Group to run the dam as a resort will require a portion of land which belongs to DWS, therefore a memorandum of agreement will need to be signed by DWS and MLM.
Zoning Plan	• Zoning plans are used as a vital tool for separating activities around the dam as well as for safety reasons. Without proper zoning plans it is difficult to control and manage activities in and around the dam.
Institutional Plan	• The lack of institutional structure will results in poor management of the dam and this needs to be addressed as part of the RMP process.

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 Morgenstond Dam

Strengths	Weaknesses
• The dam is big enough to accommodate different proposed activities. • The dam could be connected to the tourism node of Mkhondo Local Municipality. • The serenity and beauty of the dam and its surrounding area. • Local communities are willing to use the dam because they have an interest in preserving the dam and its surrounding.	• The dam is located far away from towns namely; Piet Retief and Ermelo. • Access to the dam is limited. • Poverty is still a challenge on surrounding communities. • The community is not well informed about the secondary use of the dam. • The access road are not in good condition. • It is alleged that there are graves under water.
Opportunities	**Threats**
• Tourism potential. • Job opportunities for the local communities. • The RMP could improve the socio-economic status of the people around the dam. • Swimming opportunities. • Fishing: possibility of small-scale fishery.	• There is a coal mine next to Heyshope dam and it is polluting the water flow. This might pose a threat to Morgenstond Dam. • The water depth needs to be assessed before any swimming can be undertaken. • The village sewage system should be correctly managed in order to avoid pollution to the dam.

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 Morgenstond Dam and have been categorized into three (3) Key Performance Areas (KPAs) as illustrated below:

KPA 1: Resource Management

- To fence off the perimeter of the dam;
- To preserve and maintain a good water quality standard for the dam and
- To control and manage the Jabulani Agri-village Sewage system near the dam.

KPA 2: Resource Utilisation

- To establish a small-scale fishery;
- To host and facilitate the provision of swimming lessons for local residents at the dam;
- To promote recreational activities at the dam as it has a high tourism potential and
- To effectively host skiing competitions at the dam.

KPA 3: Benefit Flow Management

- To promote job creation opportunities for local communities.

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:

"Morgenstond Dam is an undiscovered area which has the potential to change the lives of local residents through the tourism potential that makes the dam more attractive as well as its surrounding environment".

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 to serve as decision-making guideline tool. 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 8**.

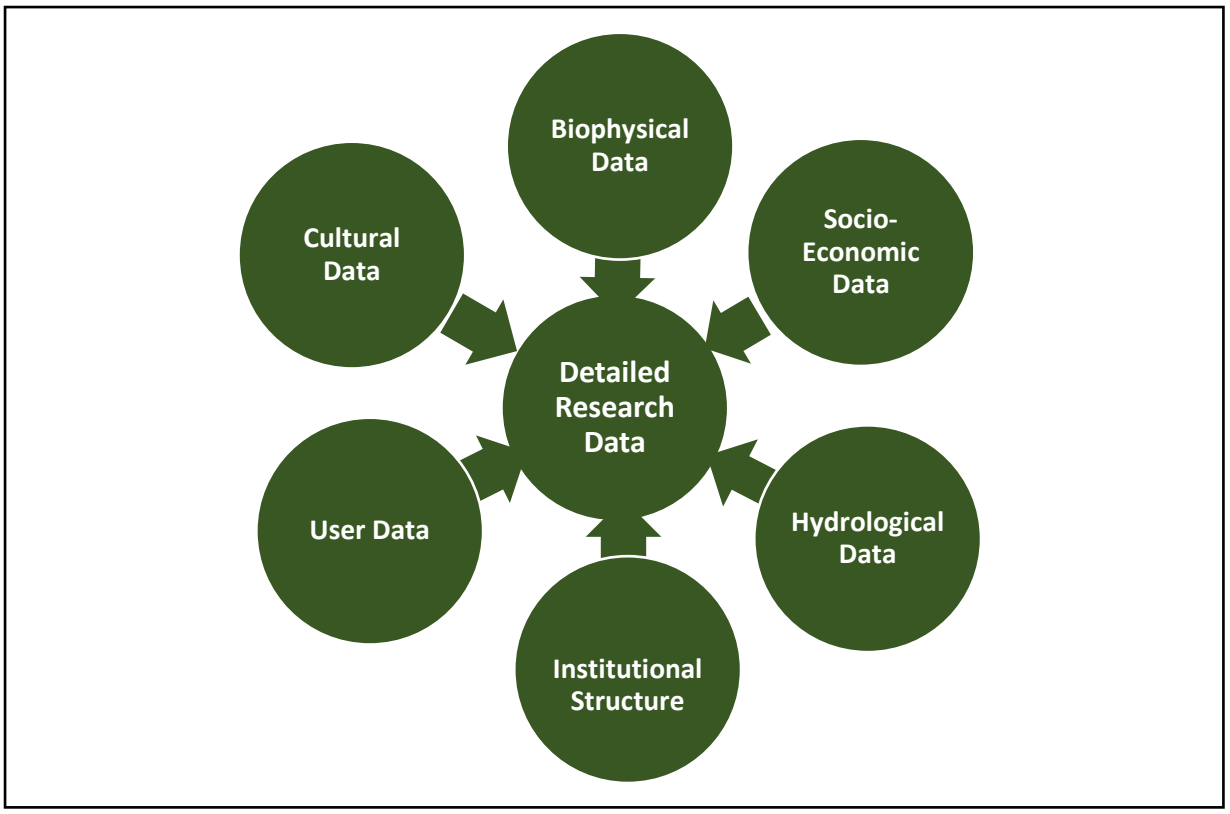

Figure 8: Research data

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**

Morgenstond dam has a potential to be connected to the tourism node of Mkhondo Local Municipality and Gert Sibande District Municipality. This will attract more tourists to visit the dam for recreational purposes.

The proposed development of a resort at the dam by the local municipality will make the dam more popular as well as increasing opportunities of job creation to the communities around the dam.

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 fence off the perimeter of the dam.	• Currently there is no fence surrounding the dam.	• The regional DWS should erect a security fence in order to promote dam safety as per section 2 of the National Water Act, 1998 (Act No. 36 of 1998). The practicality and feasibility will be considered in the business plan.
• To preserve and maintain a good water quality standard for the dam.	• The water quality at the dam is unknown as the water samples were tested by the Department of Water and Sanitation Hydrology section between 1978 and 2009. • No water quality monitoring is currently in place.	• The water quality monitoring should be reinstated as it was last conducted in 2009. • DWS Water Quality section should intervene as a matter of urgency in order to keep the water quality in a good state. • Enforcement of all relevant environmental legislations (NWA and NEMA) at the dam can always keep the dam's water quality in a good state.
• To control and manage the Jabulani Agri-village sewage system near the dam.	• The houses near the dam have pit latrines and with the expansion and development around the dam the sewage systems will be used which will be a threat to the water quality. • If the sewage pipelines are too close to the dam, possible sewage leakages might occur.	• Proper Geotechnical studies should be conducted prior to any developments near the dam. The study will determine the feasibility of sanitation infrastructures and the potential impacts on the water and aquatic ecosystems.
KPA 2: Resource Utilisation		
Objectives	**Status Quo**	**Practicability**
• To establish a small scale fishery at the dam.	• Currently there is no commercial fishing taking place at the dam.	• The Small Scale Fishery Policy (Marine Living Resources Act 1998, (Act No. 18 of 1998)) should be considered as it aims to provide rights to small scale fishing communities and to ensure that communities have equal access to water resources. • DAFF may assist in terms of issuing fishing licenses. • Corporative governance is essential to discover the dam's commercial access, use and development

		activities that will be able to benefit the communities. • The BP will assist in identifying the marketing strategies and funding mechanisms that can assist the local communities to invest in the recreational industry at the dam.
• To host and facilitate the provision of swimming lessons for local residents at the dam.	• Currently there are no swimming activities taking place at the dam due to unknown water quality.	• The water quality analysis should be conducted to determine if the water is fit for full contact activities such as swimming. • The purchased boundary is unknown and this might limit developments such as swimming pools within the purchased boundary.
• To promote recreational activities at the dam as it has high tourism potential.	• Currently boating is the only recreational activity taking place at the dam. • The dam has a potential to host more recreational activities.	• The implementation of RMP will guide the training of the locals to equip themselves and become active participants in the tourism sector as this will lead to community beneficiation. • Recreational transformation has a potential to change the livelihood of the community for the better and will improve the socio economic status of the local communities. • The BP will assist in identifying the marketing strategies and funding mechanisms that can successfully implement the recreational activities at the dam.
• To effectively host skiing competitions at the dam.	• No competitions are currently taking place at the dam. • The dam is not well known, therefore, the interest from the organizers of these competitions is limited.	• Morgenstond Dam is big enough to host skiing competitions, however, there has to be proper monitoring for skipper licenses, safety vests, boats and other safety measures for all the participants who participate in water sports. • The BP will assist in identifying marketing strategies for the tourism potential of the dam.

KPA 3: Benefit Flow Management		
Objectives	**Status Quo**	**Practicability**
• To promote job creation for community benefit flow.	• The employment percentage in the area is low, It is likely that population does not have the necessary skills to enter the tourism sector, based on the educational level audit.	• The implementation of RMP will guide recreational developments and the local communities will have the opportunities to equip themselves and become active participants in the tourism sector. • The BP will assist in identifying the marketing strategies and funding mechanisms that can successfully implement the recreational activities at the dam.

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 the needs of the dam users. The integrated resource 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 9**

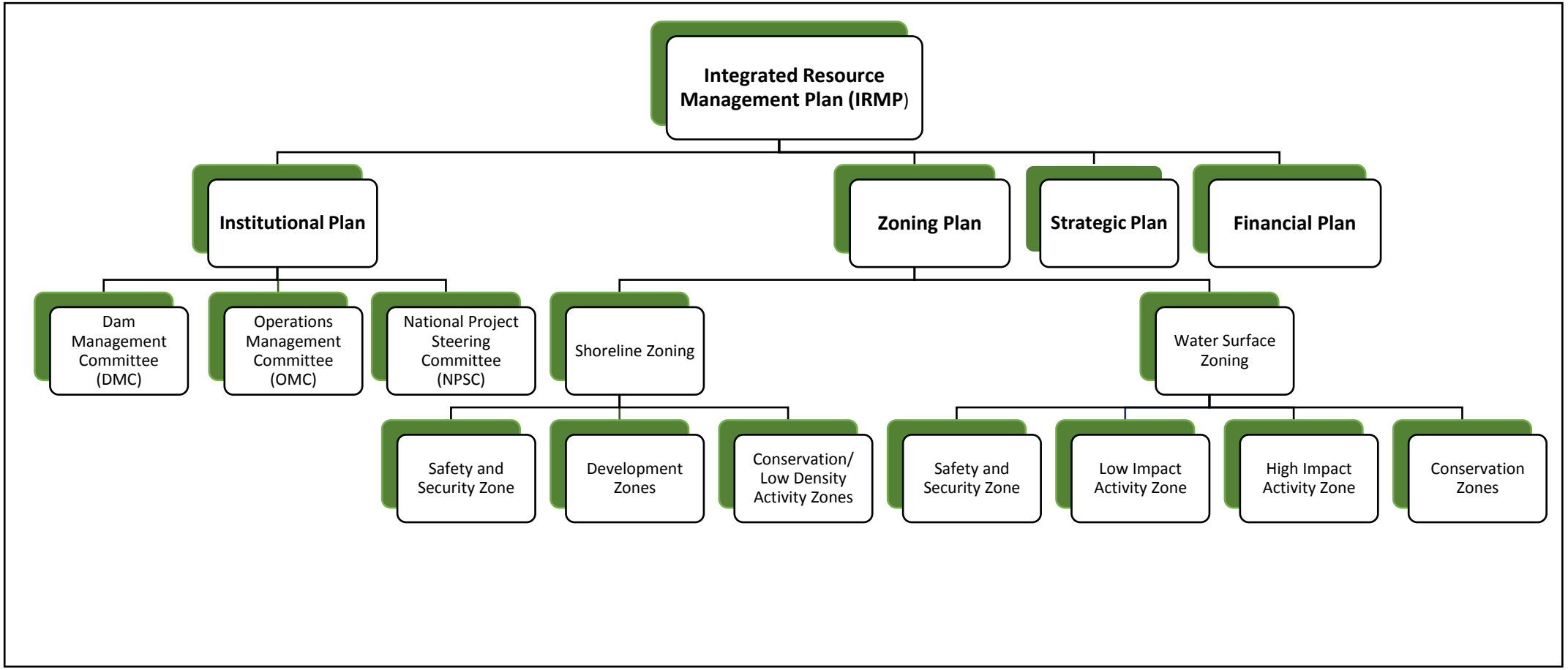

Figure 9: Integrated Resource Management Plan

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

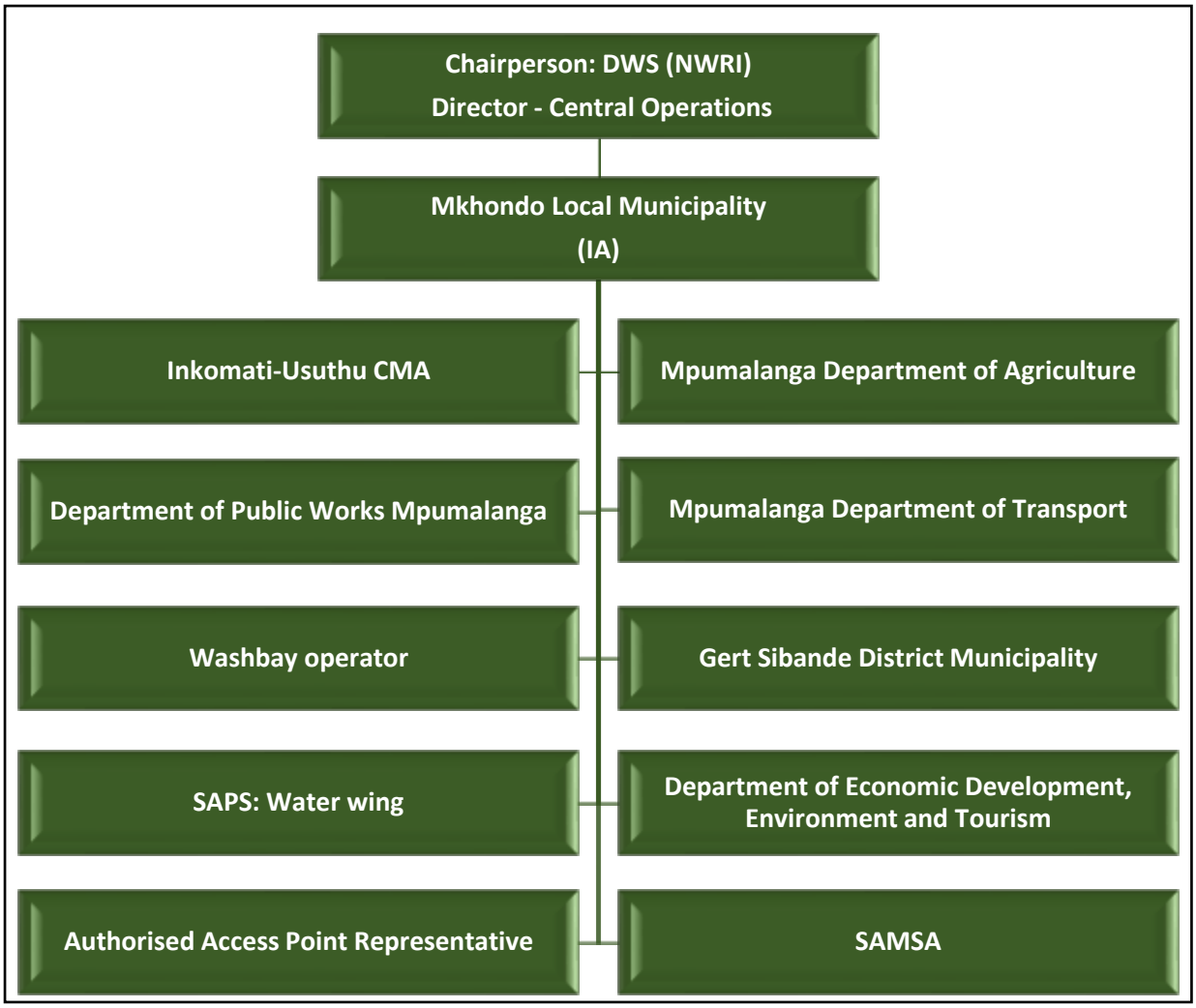

Figure 10: Proposed DMC

The DMC will have a number of management tools which will enable proper management of the dam in line with legislative 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 is not required for the OMC as this is an existing reporting structure. The ToR provide guidance on the following management aspects:

- Roles and responsibility of chairperson;
- Roles and responsibilities of an 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 the Implementing Agency (MLM)

MLM will be appointed as an Implementing Agency (IA) for the RMP of Morgenstond Dam. MLM and DWS will sign a MOA, which is a legal binding document which will outline 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 a 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.

A 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.

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. Furthermore, 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 boats.

[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.

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

All events must be managed through an event application process. The applications will 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 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 11**.

The committee should meet quarterly discussing matters relating to operations and maintenance of all GWWs. RMP will 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.

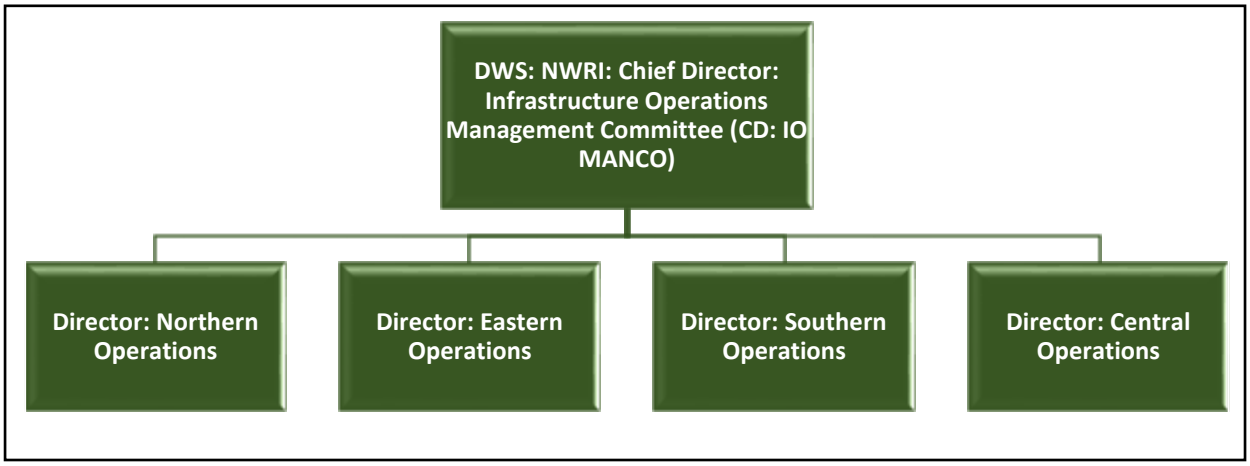

Figure 11: Existing CD: IO MANCO

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 12** illustrates a typical example of Governmental Departments that will form part of the NPSC.

Figure 12: 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 marine 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 authorised.

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 and fish 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 wind surfing, kayaking, swimming, rowing, sailing, paddle boating, float tubes, canoeing, angling, yachting, aquaculture and small scale fisheries.

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 boating, house boating, water skiing, and para-sailing.

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 dermacation 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: ○ Angling ○ Swimming ○ Canoeing ○ Rowing ○ Paddle boating ○ Kayaks ○ Float tubes ○ Rafting ○ Sailing	• High impact activities such as: ○ Motorised boating ○ Water Skiing ○ House boats ○ Para-sailing ○ Kite-surfing ○ Jet skiis • Swimming	• Area should be demarcated by demarcation makers and AtoN.
• High Impact Activity Zone.	• Motorised boating • Water Skiing • House boats • Para-sailing • Kite-surfing • Jet skiis	• Low impact activities such as: ○ Swimming ○ Boat angling ○ canoeing ○ 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.

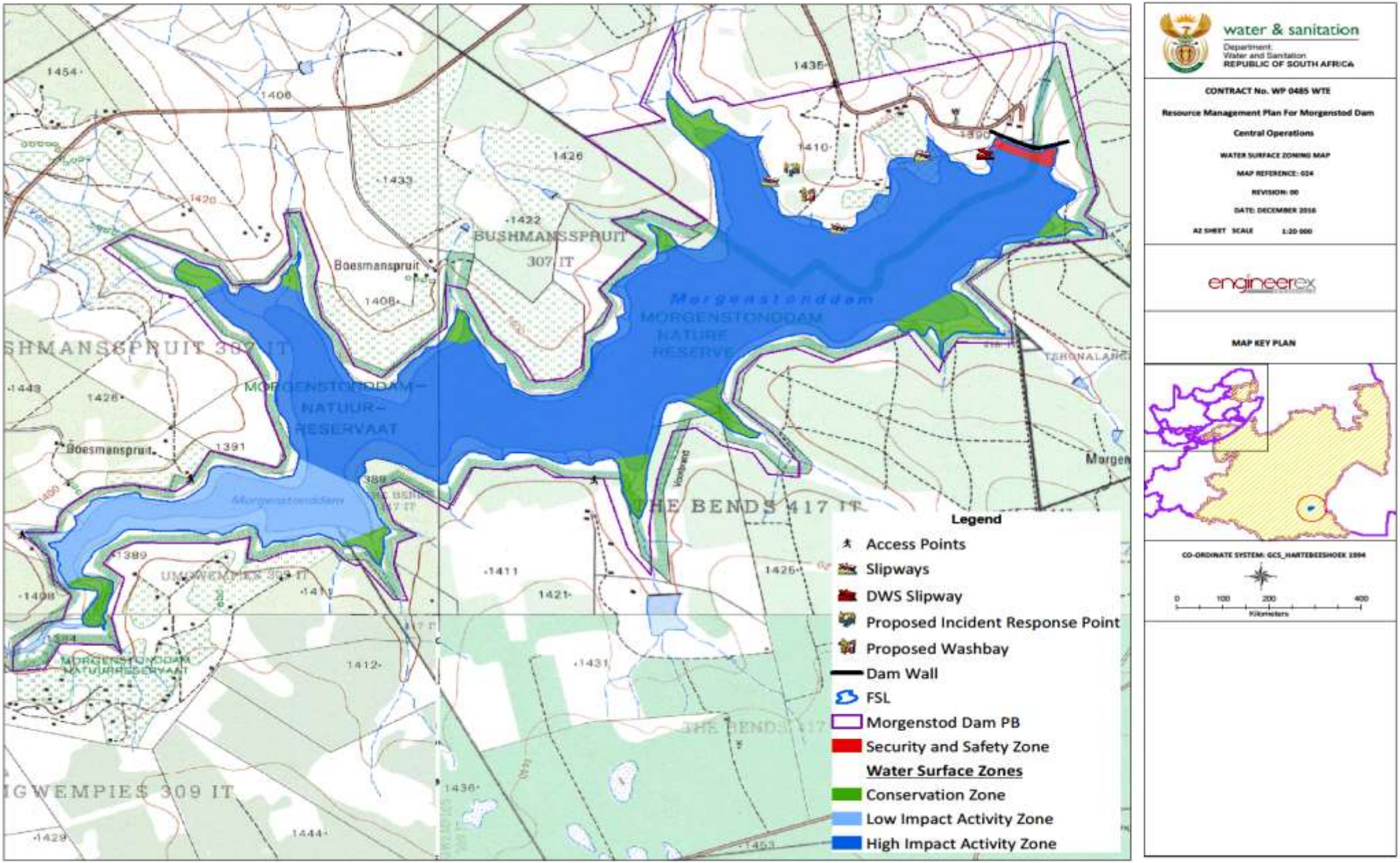

Figure 13: Proposed Water Surface Zoning

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, camping (tent and caravan), braai facilities, swimming pools, ablution facilities and infrastructure for services.

High Density Activity Zone:

This area is reserved for large scale activities including chalets, recreational club houses, infrastructure for services, and Land Based Aquaculture.

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 developments should be outside 1:100 year floodline.

Table 18: Proposed Shoreline Zoning Description

Zone Name	Permissible Activities	Non-permissible Activities	Recommendations
• Safety and Security Zone.	• Fire management; • Alien invasive species clearing; • Management of dam infrastructure; and • 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.
• Conservation/ Low Density Activity Zone.	• Conservation management activities: ○ Bird watching ○ Hiking	• Development	• These zones should control access to ecological sensitive areas.
• Medium Density Activity Zone.	• Camping (tent and/or caravan) • Day visitors • Picnic • Shoreline fishing • Braai facilities • Swimming pools • Ablution facilities • Infrastructure for services	• Accommodation facilities such as: ○ Chalets and ○ Recreational club Houses	• The management of this area should follow the PPP in terms of National Treasury. • All developments must be approved by IA. • Requirements of NWA and NEMA must be taken into account in all developments. • All developments should have an approved Environmental Management Plan (EMP) to ensure construction does not impact on dam and must blend in with the natural environment. • Camping, birding, hiking, picnicking, bank angling and access to the water must be done in accordance to access agreements. • Camping and picnicking is allowed only in designated areas. • Noise levels to be kept at a minimum. • No littering at Camping and Picnic spots.
• High Density Activity Zone.	• Accommodation facilities: ○ Chalets ○ Resorts • Recreational club houses • Infrastructure for services	• Day visitors • Picnic • Hiking • Permanent structures	• The management of this area should follow the PPP in terms of National Treasury. • All developments must be approved by IA. • Requirements of NWA and NEMA must be taken into account in all developments. • All developments should have an approved EMP to ensure construction does not impact

Zone Name	Permissible Activities	Non-permissible Activities	Recommendations
			on dam and must blend in with the natural environment. • Noise levels should be kept at a minimum. • No private slipways should be built without approval from DWS. • All developments should be subject to Environmental Impact Assessment (EIA) process and water use licence (WUL) (Section 21 of NWA).
• Community Resource Zone.	• Subsistence fishing • Livestock watering points • Small scale community gardens	• Chalets • Recreational club houses • Hiking • Braai facilities • Camping	• Demarcation of the area by fence and provision of an access control. • The Community Resource Zone at Jabulani Agri-village is for livestock watering and fishing.

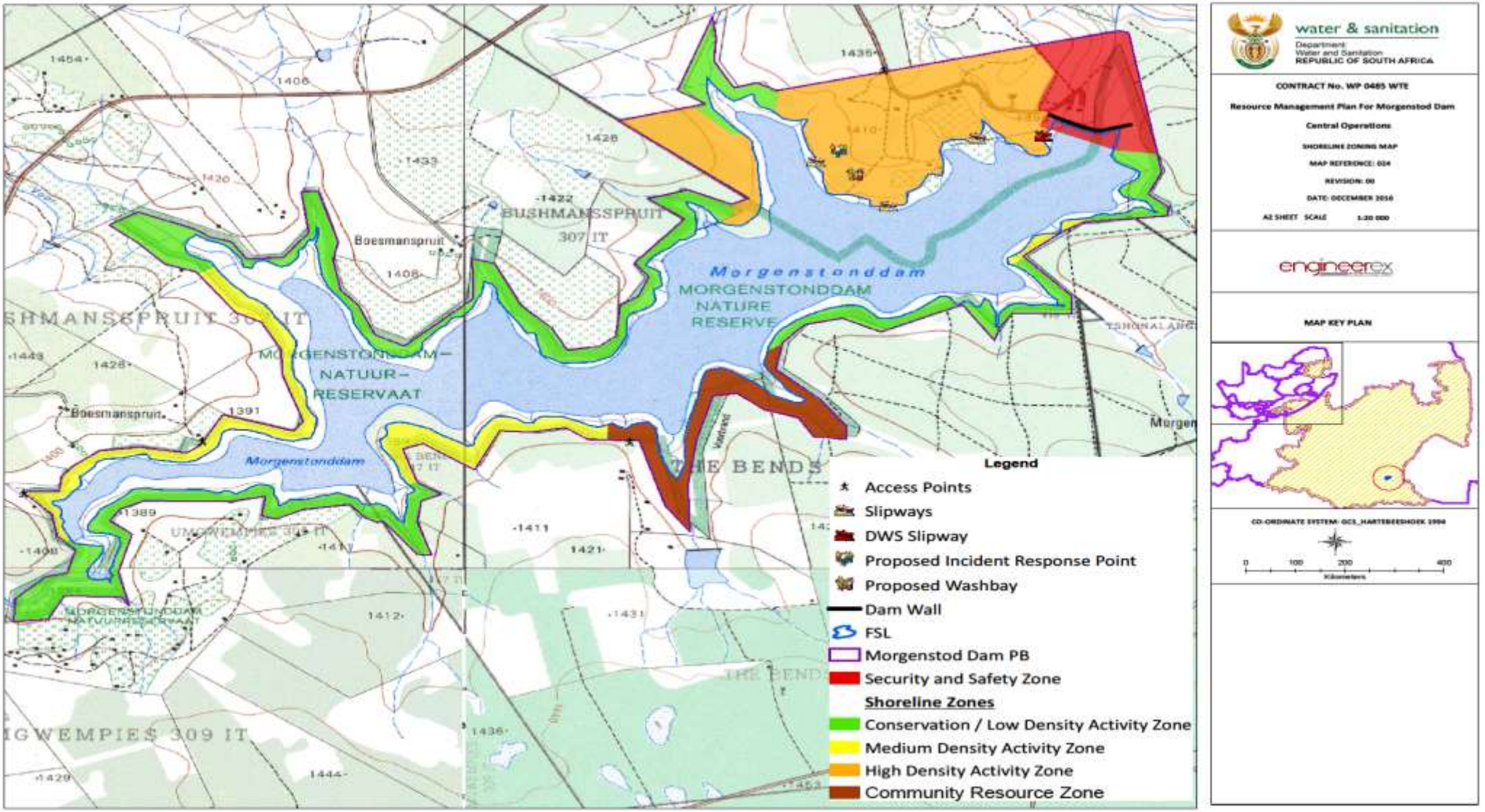

Figure 14: Proposed Shoreline Zoning Map

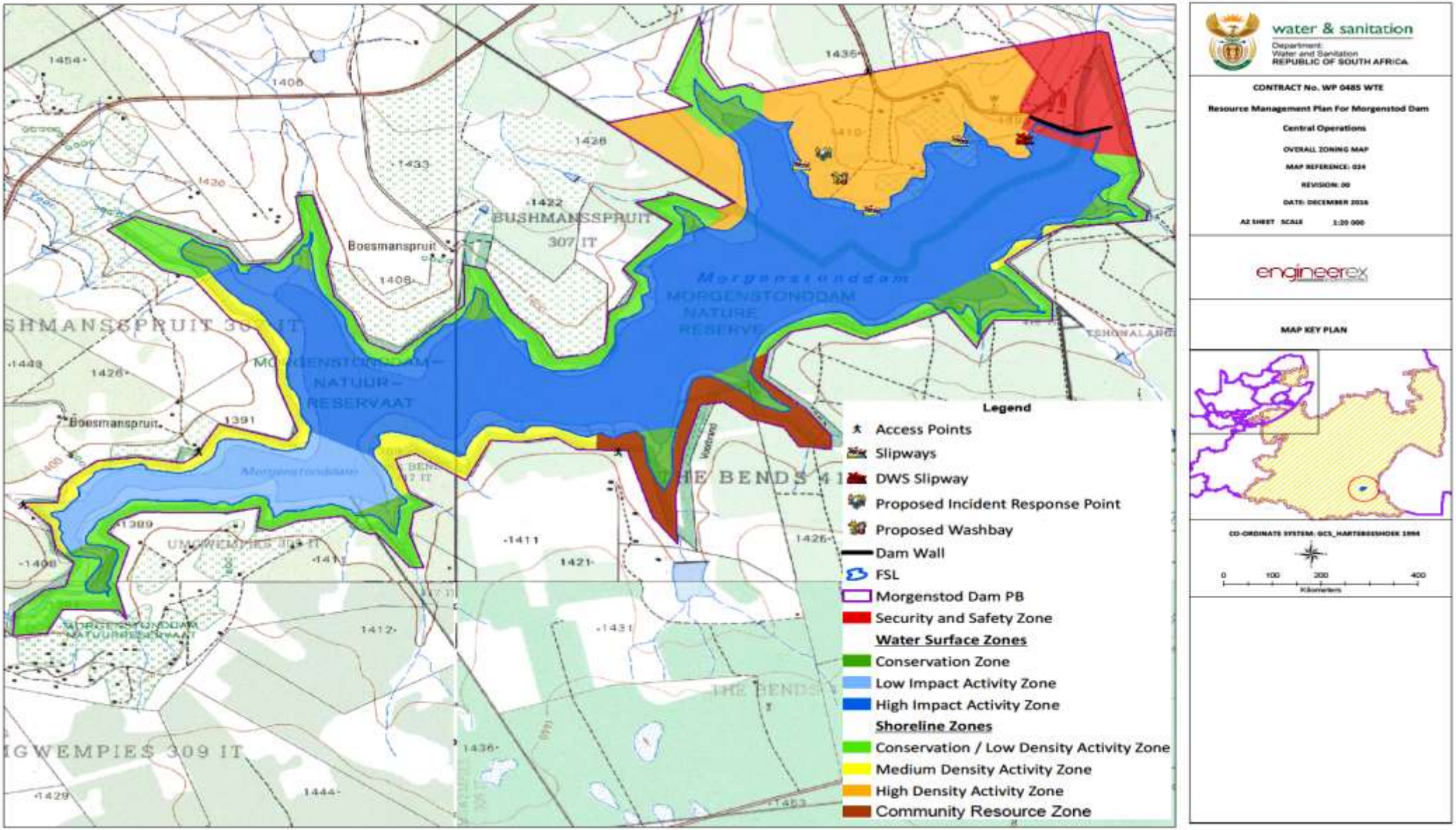

Figure 15: Proposed Overall Zoning Map

4.2.3 Carrying Capacity

In order to determine the degree of recreational use possible on the water surface, the Methodology for Carrying Capacity Assessment: Recreational Water Use (DWAF) was used as a guideline to determine the level of activity that would be sustainable at Morgenstond Dam.

Determining the carrying capacity ensures that recreational use of the dam is safe and that users do not feel crowded and enjoy their use of the dam. There are three kinds of carrying capacity, namely:

- **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 refers to the maximum number of users that can physically fit into or onto a defined water resource, over a particular time.

Formula: PCC = A x U/a x Rf

Where:

- **A** = Available Surface area for public use
- **U/a** = Area required per user
- **Rf** =Rotation factor (number of visits/day)

A is calculated as the area of the water surface available for public use: **977.2 ha**

The **U/a** is assumed to be the average which was calculated as 1 craft/3 ha. And again the rotation factor (Rf) is assumed as 1 visit per day.

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

Craft	U/A (ha/craft)
Power boats	5.0
Angling	1.0
Canoe	0.3
Average	**2.1**

Based on the table above, the average hectare per user is 2.1 ha (21000 m^2), the value of 3 ha (30 000 M^2) can be acceptable area per user. This has been chosen in order to ensure that the dam is not overcrowded, as such impacting on the sense of the area.

Therefore: **PCC** = A x U/a x Rf
= 977 ha x (1 craft/3 ha) x 1
= 326 crafts

Real Carrying Capacity (RCC)

It refers to the maximum permissible number of users to the water resource, once the corrective factors (Cf) derived from the particular characteristics of the site have been applied to the PCC. The limiting factors include:

- Safety Areas/ No go Zones (**7.2 ha**) and
- Conservation Area (**63.14 ha**).

RCC for Morgenstond Dam: **RCC** = **PCC** x (100 – Cf1) % x (100 – Cf2) % x (100 – Cfn) %

Where:

Cf = a corrective factor expressed as a percentage.

The RCC takes into account factors that limit recreation use (craft based) of the dam. For Morgenstond Dam these factors includes sensitive areas, such as conservation areas (**63.14 ha**) as well as aspects regarding the safe operation and management of the dam (**7.2 ha**).
These factors accounts for 70.34 ha, which is 8%.
RCC = PCC x (100 – Cf1) % x (100 – Cf2) % x … (100 – Cfn) %
= 326 x (100 –8) %/100
= 299 Crafts

Effective Carrying Capacity (ECC)
The maximum number of visitors that a site can sustain, given the management capacity (MC) available.
ECC = [Infrastructure Capacity x Management Capacity] x 100/ RCC

Infrastructure Capacity
It takes approximately 20 minutes to launch or retrieve a boat during the day. There is currently 1 slipway at the dam; within the Boat Club [12 hours available per day/20 min] x 1 slipway for public use, therefore:

[720/20] x 1 = 36

As 20 minutes would apply either to launching or retrieving of vessel from the water, 36 would need to be divided: 36 / 2 = 18. This is the maximum amount of boats that can be launched on a given day.

Management Capacity
The current management capacity consist of (two) 2 people at the Boat Club: consisting of Gate Attendant and Boat Club Caretaker.

The required/proposed management capacity for the safe functioning of the dam would include 1 Area Manager, 2 Safety Officers for boats on the water surface and 3 Enforcement Officers present along the shoreline, this makes a total of six (6) people.

Management Capacity:
= Current capacity/required capacity x 100
= 2/6 x 100
= 33.3
Therefore:

ECC **=** (18 x 0.333) x 100/**RCC**
= (18 x 0.333) x 100/299
= 2.0

Given that there are less facilities e.g. slipways at Morgenstond Dam, the infrastructure capacity is estimated to be approximately 0.1. The management capacity is also estimated to be low as there is only one formalised recreational management structure in place and thus the ECC is currently 0. Once a proposed Institutional Structure and infrastructure capacity is in place, the ECC can be recalculated to verify if the RCC can be possible.

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 identified regarding the dam is outlined.

Table 19: Strategic Plan for KPA 1: Resource Management

KPA 1: Resource Management			
Objectives (What do we want)	**Motivation (Why do we want to achieve this)**	**Action Projects (How do we achieve this)**	**Management and Support (Who should be involved)**
Fence off the Perimeter: • To fence off the perimeter of the dam.	• A proper fencing should be made to surround the dam for the safety of the community and to avoid illegal access into the dam.	• Secure the dam with a suitable fence. • Fencing options should take current activities into consideration. This includes subsistence fishing and domestic animals drinking spots.	• DWS should ensure that a proper fencing is set up around the dam especially on the purchase area. This will prevent unauthorised entry into the dam and thereby reducing the number of possible fatalities in the dam.
Water Quality: • To preserve and maintain a good water quality standard for the dam.	• The water samples have not been taken for testing since 2009. This results in uncertainties on the water quality at the dam.	• The components of CIWSP should be implemented at the dam to achieve this objective. • DWS should step in and assist the municipality upon evidence of their failure to abide by the minimum standards or requirements that have been defined by the green drop certification programme for Wastewater Treatment Quality Management Regulations. • All recreational activities must be monitored and evaluated to ascertain if there is any pollution threat to the dam. • Frequent monitoring of water quality.	• DWS and DEA have a mandate to monitor the quality of water in the dams. Therefore these departments should work together and ensure that the water samples are tested. This will provide assurance in the state of the water quality.
Management of sewage system: • To control and manage the Jabulani Agri-village sewage system near the dam.	• The village sewage system should be correctly managed in order to prevent any spillage of sewage into the dam.	• Programmes such as EPWP may be used to construct sanitation facilities for local communities	• DWS, DEA, DAFF, MLM, DPW, GSDM and the Mondi group should ensure that a proper sanitation system is provided for the local communities

KPA 1: Resource Management			
Objectives (What do we want)	**Motivation (Why do we want to achieve this)**	**Action Projects (How do we achieve this)**	**Management and Support (Who should be involved)**
	• Spillage of raw sewage into the water may cause pollution to the dam.		especially those located within close proximity with the dam.

Table 20: Strategic Plan for KPA 2: Resource Utilisation

KPA 2: Resource Utilisation			
Objective (What do we want)	**Motivation (Why do we want this)**	**Action Projects (How do we achieve this)**	**Management And Support (Who should be involved)**
<u>Small scale Fishery:</u> • To establish a small scale fishery at the dam.	• Small scale fishery means that sector of fishers who employ traditional and/or passive fishing gear and engage in a range of Labour intensive harvesting, processing and distribution technologies to harvest marine living resources on a full-time or part-time basis in order to ensure food security. This sector of fishers also engage in ancillary activities such as their own net-making, boat-building, which provide additional fishery-related employment and income opportunities to their communities. • Subsistence fishing is one of the prevalent activities at the dam. This activity can be commercialised into a small-scale fishery to benefit the community.	• Local communities needs to be equipped with proper skills in order to undertake these activities properly. • Fishing licenses will also need to be provided in order to control the extraction of the fish from the dam.	• DWS, DT, DEA, DAFF and other governmental departments should initiate and manage the small scale fishery. This development will benefit local communities in skills transfer and job opportunities.

Swimming: • To host and facilitate the provision of swimming lessons for local residents at the dam.	• Swimming lessons reduce the risk of drowning. • Swimming builds whole body strength, it can also be used as an alternative to running exercises. • It is a great individual and team sport. • Swimming is suitable for almost all ages.	• Construction of a swimming pool can be beneficial to the local communities. • Swimming lessons are vital in the communities around the Morgenstond Dam. People of different age groups needs to engage in these lessons. This will reduce the possible dangers of drowning in the dam.	• MLM, DWS, GSDM, DEA and other governmental departments should initiate this project as part of community development. A funding structure will also need to be established so that this project is properly financed.
Recreational Activities: • To promote recreational activities at the dam as it has high tourism potential.	• Morgenstond Dam has a potential of becoming one of the biggest tourism destinations in the MLM. The proposed developments should be in line with the recreational norms and standard. • The dam can also be connected to the tourism Node of Mkhondo Local Municipality. This will increase the tourism opportunities and therefore improving the Socio-economic status of the local communities.	• The new RMP for Morgenstond Dam will enhance the state of recreational activities in the dam. • Tourism activities generates a better revenue for the GSDM, MLM and the provincial government of Mpumalanga.	• MLM, GSDM and DWS need to work together to improve the economy in the area using the Morgenstond Dam. National and provincial government departments should also take part in this development.
Skiing Competition: • To effectively host skiing competitions at the dam.	• The dam is big enough to host skiing competitions. • These competitions will also make the dam popular to tourists who are not familiar with the area. • They can also be used as a means of generating revenue.	• A relevant management structure which involves different government departments and an Organising committee needs to be in place in order to ensure successful and safe competitions.	• SAMSA should be involved to ensure safety of the people in the water. • SAPS ensures safety around the tourism areas. • DWS ensures the proper management of the water bodies. • Other governmental departments are also involved in ensuring the smooth running of the skiing activities.

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 this)**	**Action Projects (How do we achieve this)**	**Management And Support (Who should be involved)**
<u>Job opportunities:</u> • To promote job creation for communities.	• The communities around Morgenstond Dam are still living in poverty. This has been identified as a challenge that needs to be addressed, therefore the proposed developments should provide local communities with employment opportunities.	• Development around the dam should facilitate skills transfer into local communities. • The RMP implementation should focus on local community development.	• DWS, DEA, DT, DAFF, GSDM, and MLM should work together in empowering the local communities around Morgenstond dam.

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 Morgenstond 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 16** shows the RMP & BP review framework.

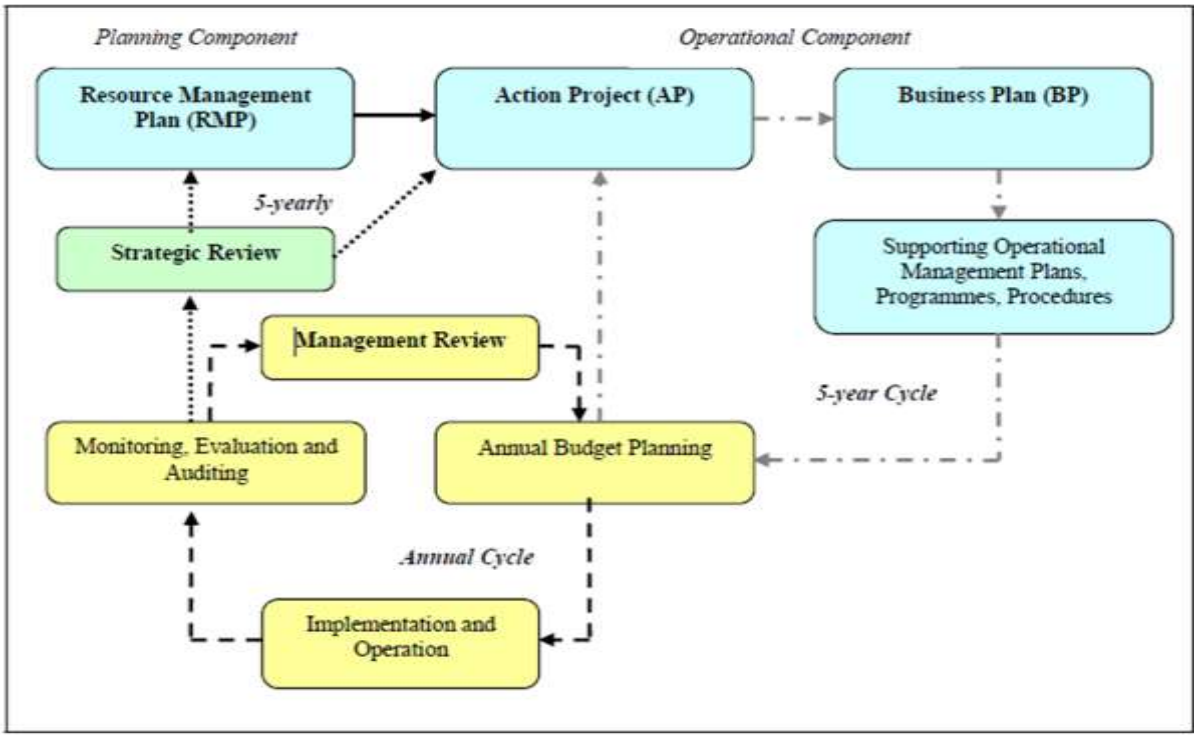

Figure 16: RMP and BP Review Framework

CONCLUSIONS

The RMP documents the challenges that exists within the 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 and 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**.

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 of the dam was formulated from the key common objectives identified by Stakeholders. Based on the strategic objectives identified for Morgenstond 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 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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