Department of Water and Sanitation

NATIONAL WATER RESOURCE INFRASTRUCTURE (NWRI)

Resource Management Plan Review

BUFFELSPOORT DAM

REPORT – Volume 1 of 2

December 2016

WATER IS LIFE - SANITATION IS DIGNITY

water & sanitation

Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

2030 NDP

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Volume 1 of 2

ACKNOWLEDGEMENTS

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- Adjacent Land Owners;
- Buffelspoort boating club;
- Buffelspoort Valley Conservancy;
- Department of Environmental Affairs;
- Department of Public Works;
- Department of Rural Development and Land Reform;
- Department of Water and Sanitation;
- Environment and Conservation (Magaliesburg Protection Association);
- North West Department of Rural, Environment and Agricultural Developments;
- RGKB Rural Association;
- Rustenburg Local Municipality;
- South African Heritage Resource Agency;
- South African Police Service;
- The Buffelspoort Dam Committee; and
- The Community members of Ward 32.

Acknowledgement is also extended to all other Stakeholders who attended and participated in the Stakeholder engagements.

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Review:

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

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

AMENDMENTS PAGE

Revision No	Description	Date
1	Draft RMP Review for DWS Review	05/10/2015
2	Draft RMP Review for DWS Review	19/11/2015
3	Draft RMP Review for Public Review	17/12/2015
4	Final Draft RMP Review for DWS Review	11/04/2016
5	Final RMP Review for DWS Approval	16/08/2016
6	Final RMP Review for DWS Approval	30/11/2016
7	Final RMP for DWS Approval	14/12/2016

LIST OF ACRONYMS

AtoN	Aid(s) to Navigation
BDC	Buffelspoort Dam Committee
BDMC	Buffelspoort Dam Management Committee
BP	Business Plan
BPDM	Bojanala Platinum District Municipality
BVC	Buffelspoort Valley Conservancy
CATHSSETA	Culture, Arts, Tourism, Hospitality, Sport Sector, Education and Training Authority
CD: IO MANCO	Chief Director Infrastructure Operations Management Committee
CIWSP	Co-operative Inland Waterways Safety Programme
CMA	Catchment Management Area
CoGTA	Department of Corporative 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 Settlements
DoT	Department of Transport
DPW	Department of Public Works
DRDLR	Department of Rural Development and Land Reform
DSR	Department of Sports and Recreation
DWA	Department of Water Affairs
DWAF	Department of Water Affairs and Forestry
DWS	Department of Water and Sanitation
EMF	Environmental Management Framework
EMP	Environmental Management Plan
EMS	Environmental Management System
ECC	Effective Carrying Capacity
EPP	Emergency Preparedness Plan
FSL	Full Supply Level
GP	Guideline Program
GPS	Global Positioning System
GVD	Gross Value Added
GWWs	Government Waterworks
GIAMA	Government Immovable Asset Management Act
I&APs	Interested and Affected Parties
IALA	International Association of Marine Aids to Navigation and Lighthouse Authorities
IDP	Integrated Development Plan
IEE	Integrated Environmental Engineering
IRMP	Integrated Resource Management Plan
KPA	Key Performance Area
LAAP	Local Accountable AtoN Parties
LAAP	Local Accountable AtoN Parties
LED	Local Economic Development
MPA	Magaliesburg Protection Association
MPE	Magaliesberg Protected Environment
MPNE	Magaliesberg Protected Natural Environment

NDT	National Department of Tourism
NT	National Treasury
NEMA	National Environment Management Act
NEMBA	National Environment Management Biodiversity Act
NEPAA	National Environmental Protected Areas Act
NEPWP	North West Expanded Public Works Programme
NHRA	National Heritage Resource Agency
NPSC	National Project Steering Committee
NWA	National Water Act
NWRI	National Water Resource Strategy
NWRS	National Water Resource Strategy
OMC	Operational Management Committee
OP	Policy Program
PP	Public Participation process
PPP	Public Private Partnership
PSP	Professional Service Provider
QDS	Quarter Degree Square
RCC	Real Carrying Capacity
RLM	Rustenburg Local Municipality
RMP	Resource Management Plan
RWU	Recreational Water Use
SAHRA	South African Heritage Resource Act
SAMSA	South African Maritime Safety Authority
SAPS	South African Police Service
SASCOC	South African Sports Confederation and Olympic Committee
SDF	Spatial Development Framework
SEA	Strategic Environmental Assessment
SGWS	Sterkstroom Government Water Scheme
WfW	Working for Water
PCC	Physical Carrying Capacity

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 Buffelspoort 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 Buffelspoort Dam.

The existing RMP for Buffelspoort Dam was approved on **05 March 2008**. However, it was never implemented. On this note DWS has identified the need to review the RMP for Buffelspoort Dam.

Purpose of the RMP Review: The purpose of the RMP review is to ascertain its contribution to the attainment of the National Water Act, 1998 (Act No. 36 of 1998) objectives by ensuring effective engagement of communities affected and interested in the water resource and its utilisation, and also the engagement of industry key role players.

The RMP review also ensures that the plan is based not only on ecological principles but also on the needs and expectations of communities and the recreation industry.

According to DWAF (2006), RMP requires a five (5) year revision and an annual revision for the BP to ensure that management objectives remain relevant and management actions are continually improved.

Location of the dam: Buffelspoort Dam is an earth fill type of dam which impounds Sterkstroom River. It falls under Ward 32 within the jurisdiction of the Rustenburg Local Municipality (RLM) which forms part of the Bojanala Platinum District Municipality (BPDM) in the North West Province, South Africa. Its GPS coordinates are: **25°46'53.18"S 27°29'13.83"E.**

Purpose of the dam: The primary purpose of Buffelspoort Dam is to provide raw water for irrigation, and industrial use.

The dam also currently offers recreational activities such as boating, skiing, swimming, picnicking, hiking, organized events, etc.

Dam ownership and management: Buffelspoort Dam is owned and operated by the DWS. There are three (3) official access gates at the dam, where one (1) is located next to the dam wall, the second one is at the Boat Club and third one at the public area.

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 Buffelspoort 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 was conducted and literature reviewed in order to gather baseline information about the dam. A process was also established to get into contact with the I&APs and relevant authorities to ensure co-operative interests and support in the RMP project.

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

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

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

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

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

Outlined below is the list of objectives, amongst others, that were identified previously, during the development of the existing RMP:

- To manage the resource according to sound policies, effective monitoring techniques as well as clear communication strategies and information flow;
- To sustain water based recreational use whilst not retarding the primary function of Buffelspoort Dam;
- To maintain the water quality, sustain inflows and protect the aquatic resource for recreational use as well as to ensure a healthy environment;
- To have Buffelspoort Dam free of invasive alien vegetation;
- To identify, acknowledge and conserve resources of archaeological, cultural and religious significance within the dam basin;
- To promote, accommodate and manage a variety of activities and facilities at the dam in a manner that enhances the user experience and minimizes the impact on the resource;
- To enable broad public enjoyment of a variety of recreational uses at the dam supported by appropriate infrastructure;
- To unlock the potential of the dam for commercial opportunities;
- To provide exclusive and dedicated space for organized sporting events to take place in a manner that is safe and meets the participant's expectations;
- To promote sustainable fishing by local communities;
- To ensure safety regarding all aspects of utilisation as well as the resource and associated infrastructure;
- To uplift the local economy and increase benefit flows to the surrounding communities through employment opportunities, empowerment as well as social and education programs; and
- To meet the user needs and satisfy government requirements regarding the standard of activities and facilities, appropriateness of land use, compliance with applicable legislation and rights of use and access.

None of the aforementioned identified objectives were achieved, as such no new objectives were put forward by the stakeholders as the previously identified objectives are still relevant. However, the Strategic Plan have been updated by including other relevant programmes or actions that will assist in achieving the identified objectives.

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

"A commitment to manage, conserve, develop and utilise the resource in a sustainable, equitable and appropriate manner in order to maximise the recreational potential of the dam"

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 Buffelspoort Dam that could enhance tourist attraction:

- Establishment of a camping site.
- Provision of suitable recreational facilities such as braai areas and bank angling.
- Establishment of kiosk.

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CHAPTER 1: INTRODUCTION

1.1 BACKGROUND OF BUFFELSPOORT DAM

The Buffelspoort Dam is situated in North West Province within Ward 32 of Rustenburg Local Municipality (RLM) in Bojanala Platinum District Municipality (BPDM). The dam is located on the farm Buffelspoort 343 JQ, northern side of the Magaliesburg Mountain range and is on Global Positioning System (GPS) coordinates: **25°46'53.18"S; 27°29'13.83"E** (Refer to **Figure 1** for Locality Map)**.** The dam is owned by DWS and is part of the Sterkstroom Government Water Scheme (SGWS), a government controlled water scheme, which was built in 1935.

The study area for the RMP of the Buffelspoort Dam encompasses the State land as illustrated on the attached Buffelspoort Dam purchased boundary map in **Figure 2**.

The dam is often referred to as being the cleanest dam in the North West and its main purpose was for irrigation of approximately 1 900 hectares downstream of the dam. The current extraction is largely for downstream citrus farming and mining industry (Karee Mine and Tharisa Minerals). The area within and surrounding the dam is a significant tourism node which offers some water based recreational activities such as boating, skiing, swimming, picnicking, baptism practices at the Sterkstroom inlet, hiking, organised events, etc. the dam has also attracted a number of lodges and resorts such as Omaramba holiday resort.

The dam is relatively small to accommodate all user groups at the same time and this places certain challenges on the utilisation patterns and the quality of experience for the different users. It is therefore recognized that the roles and responsibilities of the users, their relationship towards each other and their interests regarding the water resource are of importance in the future operational success of the dam.

Although the resource has not been unlocked in a manner that the full potential is realized in terms of local community beneficiation, significant benefits such as job opportunities; regional tourism destination; consumptive utilization; education programmes and a community support programme have been created. The dam profile is summarised in **Table 1**.

Table 1: Buffelspoort Dam Profile

Buffelspoort Dam Profile	
Location	South Africa
Province	North West
District Municipality	Bojanala District Municipality
Local Municipality	Rustenburg Local Municipality
Nearest Town	Rustenburg
Completion Year	1937
Coordinates	25°46'53.18"S; 27°29'13.83"E
Purpose	Irrigation and Industrial Use
Owner	DWS
Water Management Area	Crocodile (West) and Marico Catchment Area
Quaternary Catchment	A21K
Catchment Area (km^2)	114

River	Sterkstroom River
Capacity (m^3)	10.330 000
Surface Area (ha)	135.7
Wall type	Arch
Wall Height (m)	34.7
Length (m)	166.56

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

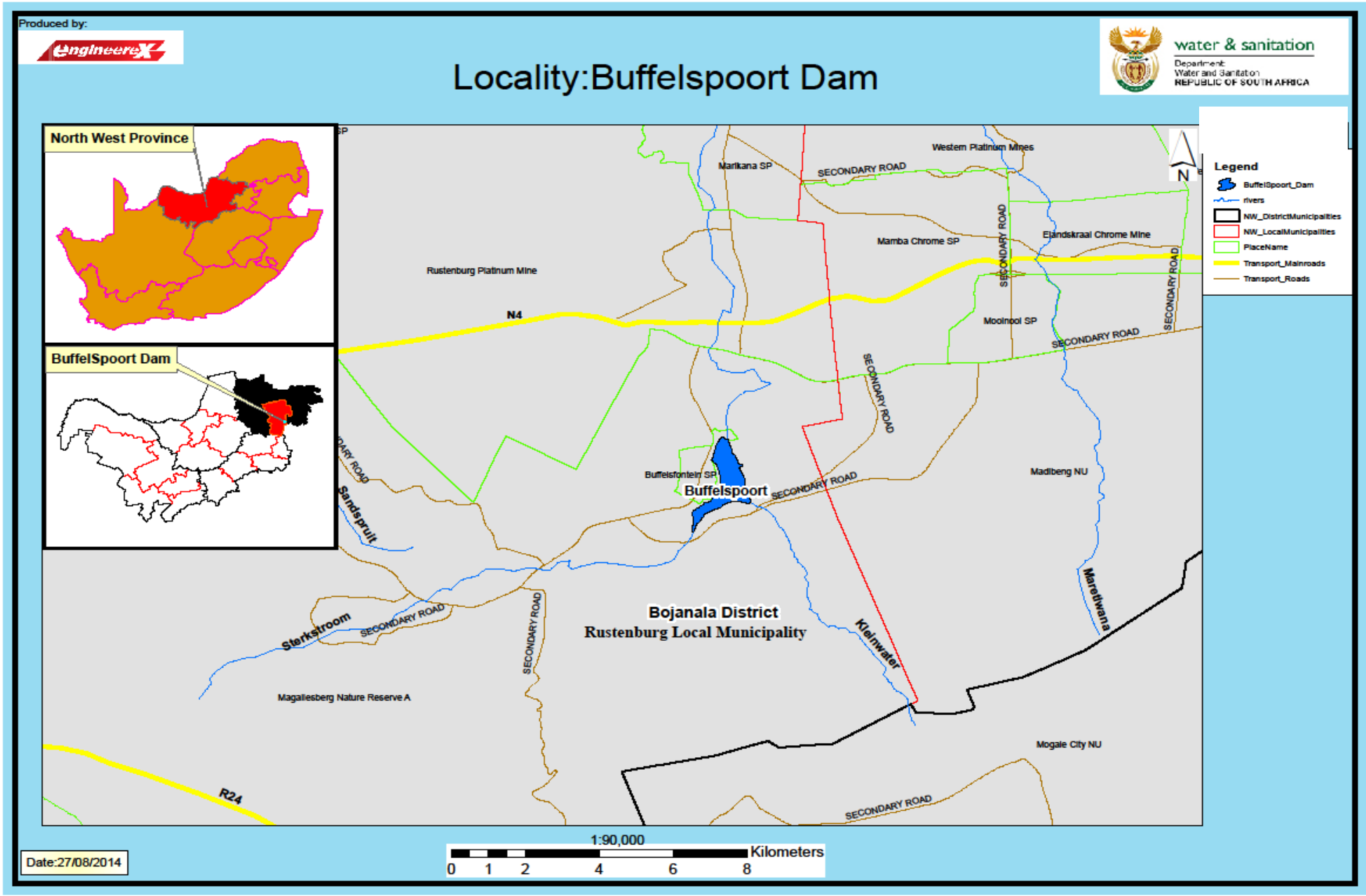

Figure 1: Locality Map for Buffelspoort Dam

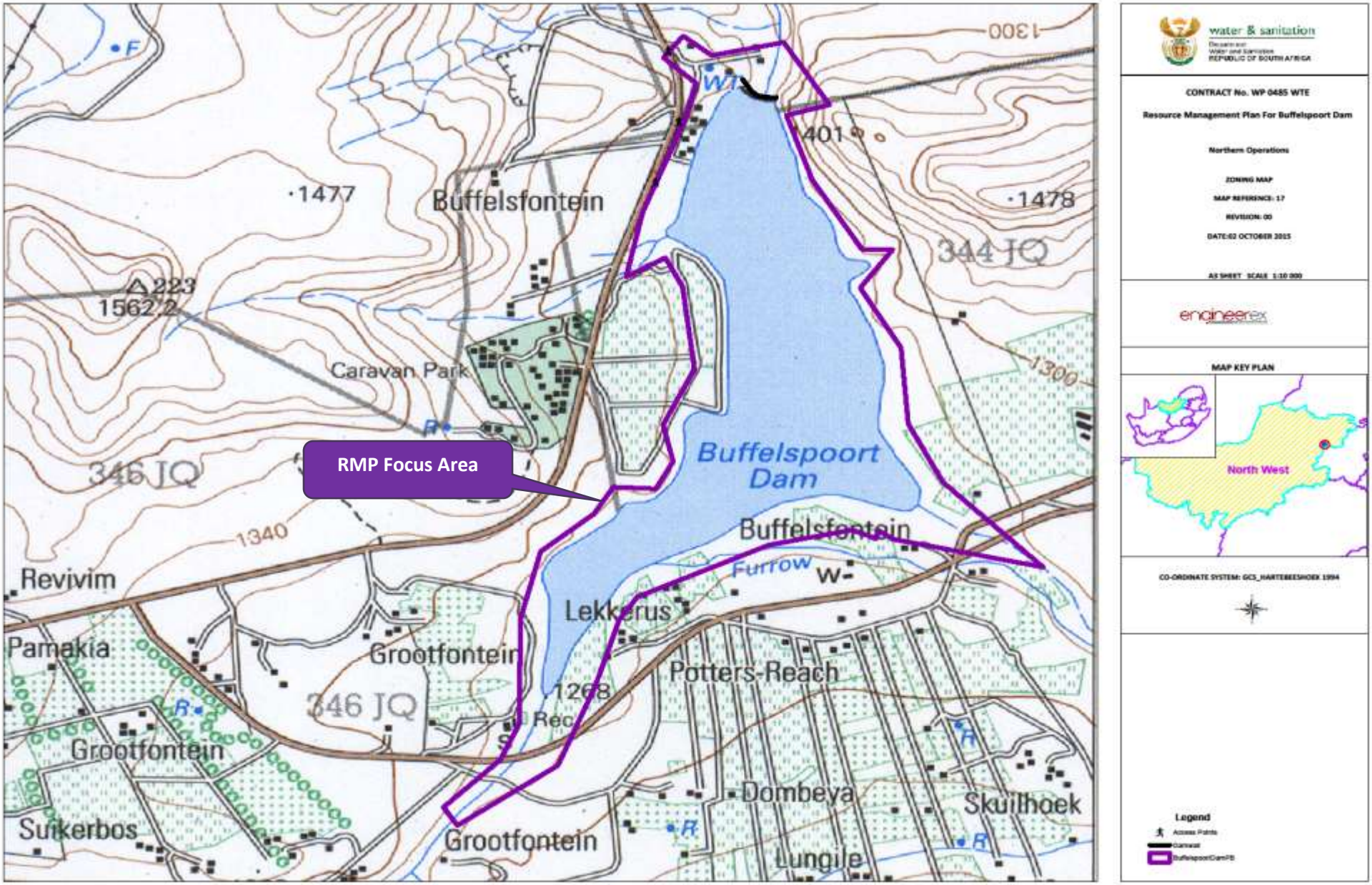

Figure 2: Purchased Boundary Map for Buffelspoort Dam

1.2 BIO-PHYSICAL ENVIRONMENT

1.2.1 Climate

According to Mucinah et al (2006), the dam is situated in dry winter rainfall region, with an annual precipitation level from about 50mm in the west to about 700mm in the east. In winter, frost is more frequent in the valleys on the southern side of the mountain, but almost never on the northern slopes. Mean monthly maximum and minimum temperatures range from 33.6°c to -3.1°c for January and June respectively.

1.2.2 Flora

The dam is located within the Moot Plains Bushveld Region which is characterised by thorny savanna, dominated by various Acacia Species. The herbaceous layer of the area is dominated by grasses.

1.2.2.1 **Terrestrial Alien Plants Species**

Alien species were either intentionally or unintentionally introduced to South Africa. 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*, blackwood (*Dalbergia melanoxylon)* and the silver wattle (*Acacia dealbata*).

The open landscape area of Buffelspoort Dam is invaded by Eucalyptus Grandis (Blue gums), which have the following impacts on the dam: reduces the water quantity, outcompete indigenous plant species and also cause soil erosion.

There are different control methods that can be applied to control the existing Terrestrial Alien Plant Species at the dam, however further studies need to be undertaken in order to determine the best control methods that will be feasible for Buffelspoort Dam.

1.2.2.2 **Aquatic Alien Plants Species**

Aquatic weeds have become an increasing concern in all water use types all over the world. According to Henderson (2001), there are ten (10) known invasive aquatic weed species in South Africa.

The water surface of the dam is infested by *Myriophyllum aquaticum* (Parrot Feathers) which has been spreading at a high rate (refer to **Figure 3** and **4**).

Figure 3: Blue-gums (Eucalyptus Grandis)

Figure 4: Parrot Feathers (*Myriophyllum aquaticum*)

Biological control method was applied in order to control the Parrot Feathers on the dam. However the method did not kill the weeds, rather ceased the spreading of the Parrot Feathers.

Further studies need to be undertaken in order to determine other control method that will be feasible for Buffelspoort Dam.

1.2.4 Fauna

Amphibians

According to the Avian Demography Unit (ADU), 2015 Frog map Atlas, Fourteen (14) protected species were found in the 2527CD Quarter Degree Square (QDS), however they are all classifies as least of concern. Refer to **Appendix A** for the identified frog list.

Reptiles

According to the (ADU, 2015), Eighteen (18) least of concern reptile species were found in the 2527CD Refer to **Appendix B** for the identified reptile list.

Fish Species

According to Buffelspoort Dam RMP (2008), the dam is regarded as a suitable spot for fishing and is commonly known as a great place to catch large carp using fishhooks.

Birds Species

The eastern side of the dam is home to a pair of African Fish Eagle (Buffelspoort Dam RMP, 2008).

Mammals

Fifty five (55) mammal species were recorded within 2527CD QDS (ADU, 2015) including Five (5) Near Threatened species (Serval, Brown Hyena, Honey Badger, Geoffroy's Horseshoe Bat and Schreibers's Longfingered) and One (1) Vulnerable (Niger). Refer to **Appendix C** for the identified Mammal list.

1.2.4 Geology and Soils

The area is characterized by red, yellow and greyish soils which is classified as freely drained and structure-less soils, which have restricted land use and soil depth due to its excessive drainage, high erodibility and low natural fertility (Mucina et al, 2006).

1.2.5 Historical, Archaeological and Cultural Environment

The dam is located within the Magaliesberg Mountains Region, which are rich in geological history and they are famous for their dramatic quartzite cliffs, abundance valleys, ravines, waterfalls, etc. Furthermore, local Christian churches practice baptism at the Sterkstroom inlet, this is due to its exceptionally clean water.

1.2.6 Hydrology

1.2.6.1 Water Surface

The dam is located within A21K quaternary catchment area which lies within the Upper Crocodile Sub-catchment area. The dam impound the Sterkstroom River and its dam wall has been raised twice (in the 50's and in the 60's) to increase its capacity to reach a volume of 10.330 million m^3. **Figure 5** illustrates the fluctuation of the water level over a year (DWA, Crocodile (west) and Marico WMA State of Dams).

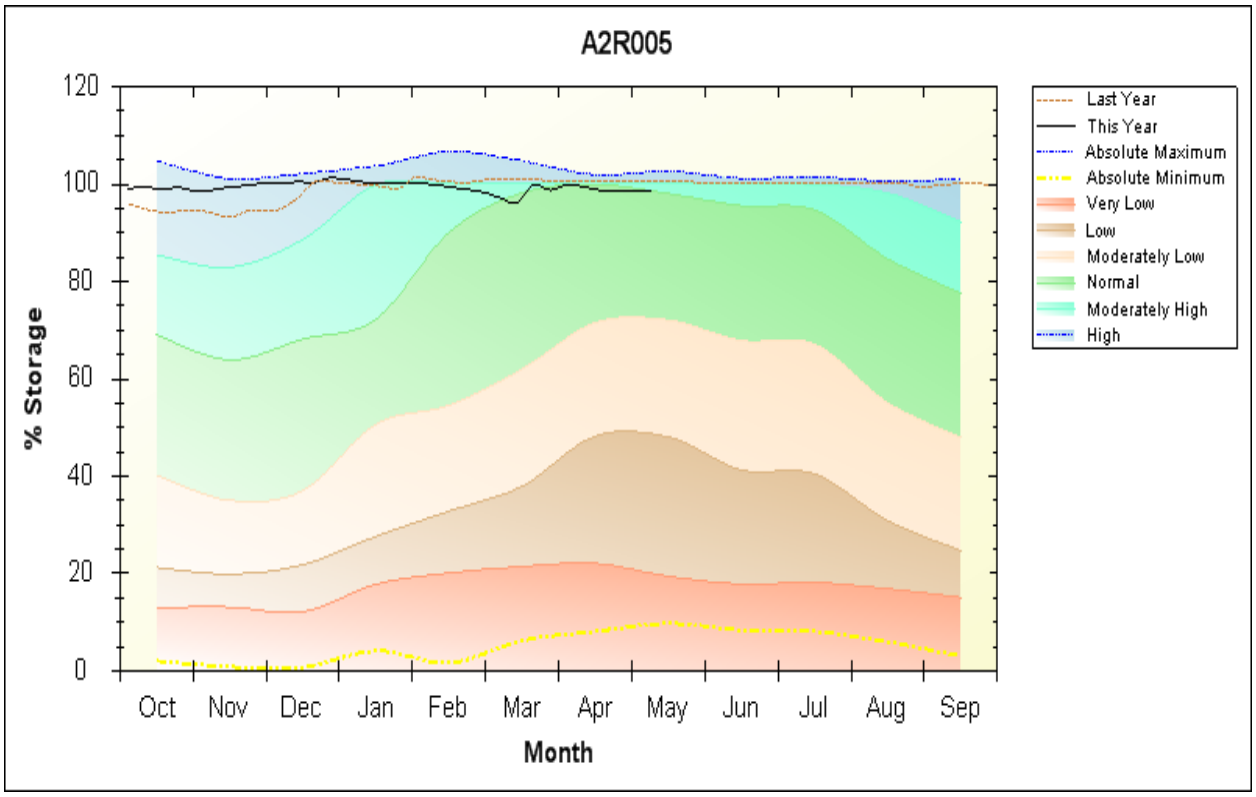

Figure 5: Fluctuation of the water level over the year (DWS, 2015)

1.2.6.2 **Water Quality**

The water quality data for the dam was obtained from DWS (Resource Quality Services) and was analysed on **14 January 2014**. The results concluded that the water quality of Buffelspoort Dam is generally good for recreational purposes as stipulated in **Table 2**.

Table 2: Raw Water Quality Data for Buffelspoort Dam (DWS: RQS, 2014)

Characteristics	Tests Results	Water Quality Target Range (Recreational Purposes)	Description
Clarity (Secchi disc, m)	2.1	3.0	The water is suitable for both full and intermediate contact recreation.
pH (pH units)	7.9	6.5 - 8.5	Minimal eye irritation occurs. 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 is absent.
Algae (Chlorophyll-a method, µg/chl-a)	3.8	0 - 15	No nuisance conditions may be encountered.
Ammonia (mg/L)	0.025	0 – 1.0	No health and or aesthetic effects can occur.
Magnesium (mg/L)	3.3	0 - 30	No health effects.
Potassium (mg/L)	1.7	0 - 50	No aesthetic or health effects.
Sulphate (mg/l)	3.7	0 - 200	No health or aesthetic effects are experienced.

Characteristics	Tests Results	Water Quality Target Range (Recreational Purposes)	Description
Electrical Conductivity (mS/m)	7.2	0 - 70	No health effects associated with electrical conductivity of water are expected < 45 mS/m

1.3 BUILT ENVIRONMENT

1.3.1 Infrastructure

The main infrastructures at the dam includes:

- Housing and Offices for DWS;
- Operators Offices;
- Boat Club;
- Ablution Facilities;
- Braai Stands; and
- Measuring Weir.

1.3.2 Transportation Network

The dam can be accessed by taking the N4 road towards Rustenburg from the N1, just after Buffelspoort Off-ramp. Refer to **Figure 6** for road network around the dam.

Figure 6: Road Networks around the dam

1.4 USES AND USERS OF THE DAM

1.4.1 Primary Function of the Dam

1.4.1.1 **Irrigation and Industrial Use**

The primary purpose of the dam was to irrigate approximately 1 900 hectares downstream of the dam. The current extraction is largely for downstream farming and mining industry (Karee Mine and Tharisa Minerals).

1.4.2 Secondary Use of the Dam

1.4.2.1 **Recreational Use**

The area within and surrounding the dam is a significant tourism node which offers different recreational activities such as:

- Boating;
- Skiing;
- Swimming;
- Picnicking; and
- Trail hiking, biking and running.

A number of organised events are held at the dam including cross triathlon competition, PUMA Trail Running and XTERRA events which involves swimming, trail running, mountain riding and biking. The dam has also attracted a number of lodges and resorts such as Omaramba holiday resort, Sparkling Waters, Bosveld Paradys, etc.

1.5 RECREATIONAL INSTITUTIONAL STRUCTURE

1.5.1 Current recreational structure

Buffelspoort Dam Committee is currently managing the dam for recreational use, however there is no lease agreement in place between DWS and BDC.

A recreational Institutional Structure will be established in accordance to the DWS Institutional Arrangements for Managing Use of Water for Recreational Purposes, in order to ensure that it is representative of all users.

1.5.2 Management of the Water Surface

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

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

1.5.3 Access

There is three (3) official access gates at the dam, where one (1) is located next to the dam wall, the second one is at the Boat Club and third one at the public area. However, there is illegal fishing by subsistence fishermen at no-go inlets areas as there is no access control.

1.5.4 Events Management

Permits are currently issued by BDC prior to any event undertaken at the dam.

1.6 SAFETY

1.6.1 Safety of Navigation

The existing fixed and floating Aids to Navigation[2] (AtoN) and Demarcation Markers is not standardised and harmonised.

1.6.2 Incident Management

There is incident management system in place, however a Unique Position Number (UPN) is also required to ensure that incidents are responded to in a co-ordinated manner.

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

1.7 SOCIO-ECONOMIC ENVIRONMENT

1.7.1 Social Audit

The main purpose of socio-economic analysis is to examine the general situation of the study area and to determine issues that need to be addressed when reviewing the RMP in order to overcome potential difficulties in an area. The study area falls entirely within Ward 32 of the RLM as illustrated in **Figure 7**. An understanding of socio-economic conditions of Ward 32 can be used at a later stage to determine the impact of a RMP in the area in terms of changed socio-economic conditions.

A social Audit which focused on the population composition of the ward, Education level, employment status and monthly income was undertaken and is presented in section 1.7.1.1 to 1.7.1.4, respectively.

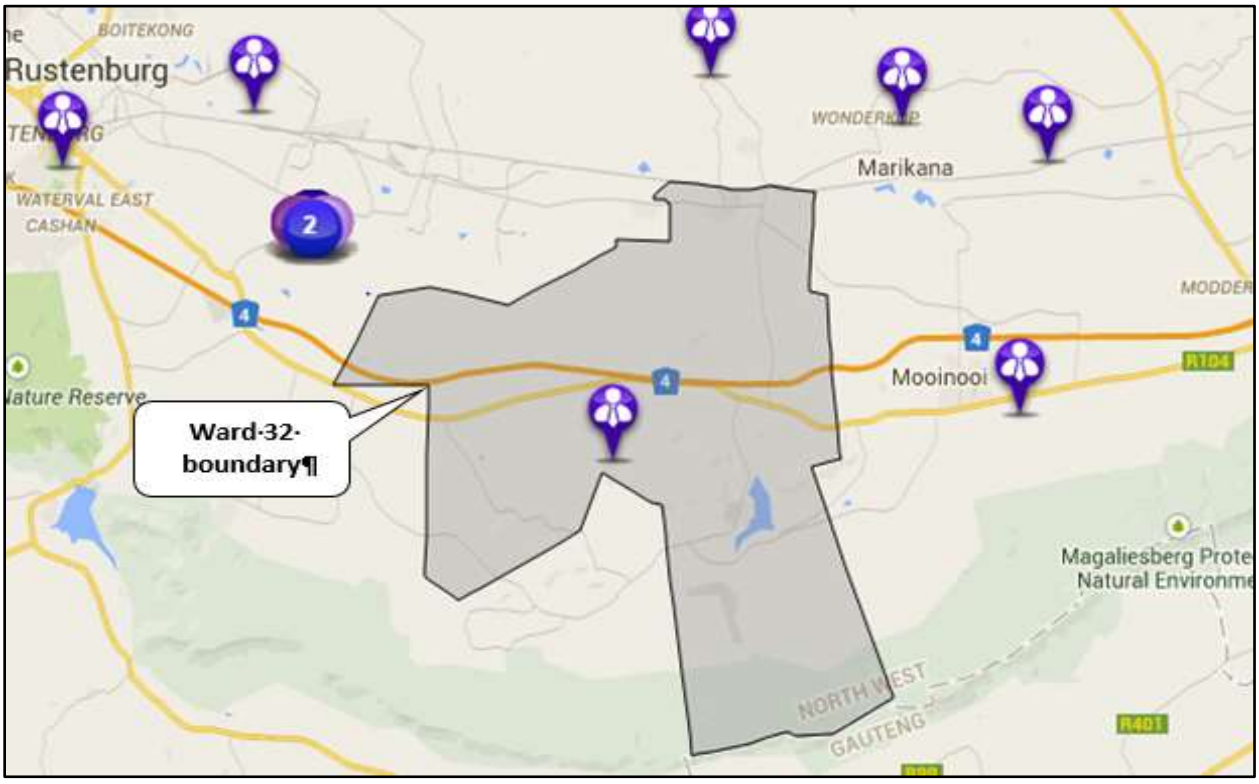

Figure 7: Rustenburg Local Municipality- Ward 32

1.7.1.1 Population Dynamics

According to Census (2011), RLM has total population size of 549 575, whereas a portion of Ward 32 have a total population size of 16 666. Recreational opportunities can be generated easily since Ward 32 of RLM only contains 3% of the population size as shown in **Figure 8**. The dam can also contribute to the growth of the Municipal socio-economic status.

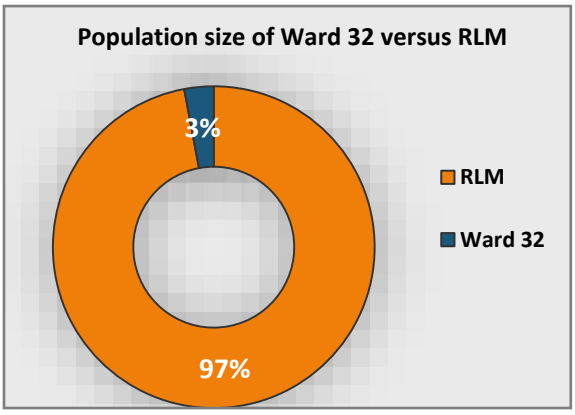

Figure 8: Population size of Ward 32 versus RLM

1.7.1.2 **Education Level**

The Census (2011) breaks down educational levels into each year of study. For the purpose of this report, the educational levels are grouped into key schooling, higher educational and no schooling categories. As illustrated by the table and graph below, 59% of residents in Ward 32 have some secondary education, however only 3% have a Grade 12 qualification and 1% of the population have moved beyond schooling to receive some kind of higher education.

Table 3: Education level of Ward 32 Versus RLM (2011)

Description	Ward 32 (2011)	RLM (2011)
Primary level	4, 449	65, 396
Secondary level	8, 792	133, 708
Certificate with grade 12	493	112, 423
Higher education level	209	30, 173
No schooling	838	20, 742

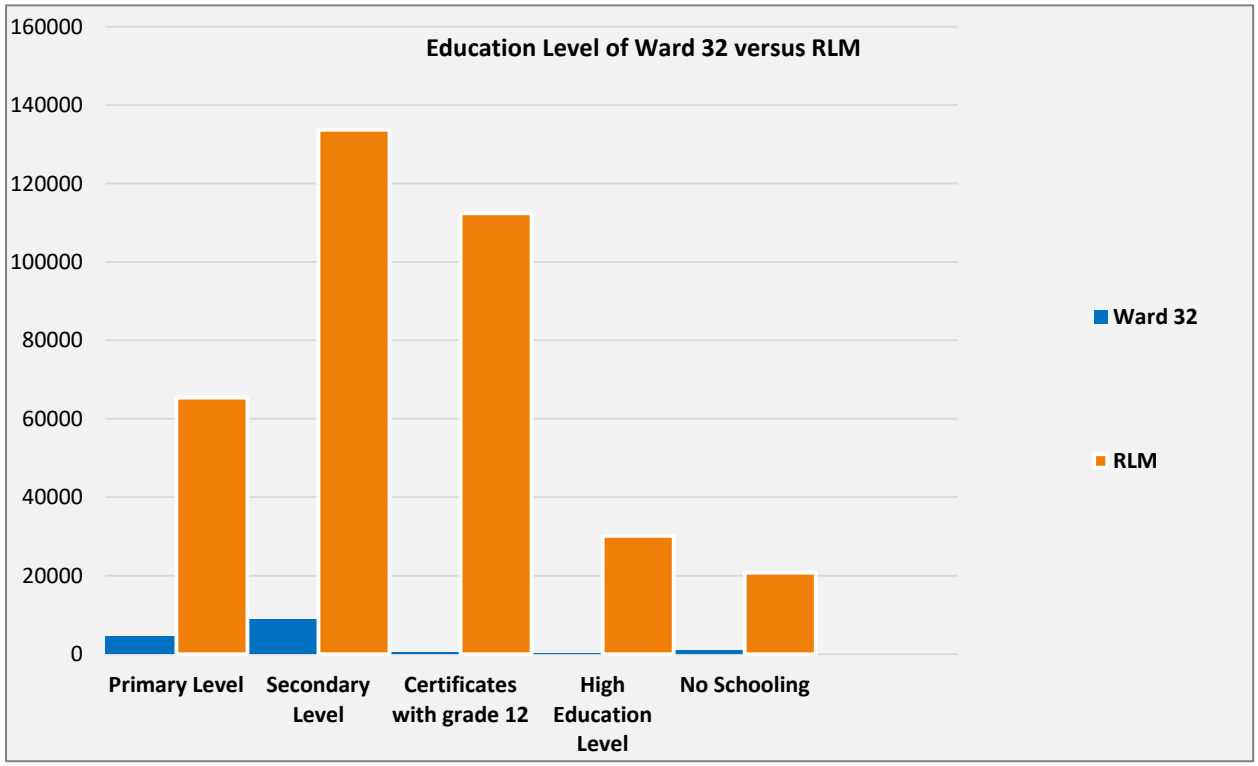

Figure 9: Educational Level of Ward 32 versus RLM

1.7.1.3 **Employment Status**

In terms of employment levels in Ward 32, majority of residents are employed and only 13% of residents are unemployed. However, only 16% of the residents are not economically active whereas 1% of them are discouraged work-seekers suggesting that they no longer seek to become employed (Census, 2011). Refer to **Table 4** and **Figure 10** for employment status of ward 32 versus RLM.

Table 4: Employment status of Ward 32 Versus RLM (2011)

Description	Ward 32 (2011)	RLM (2011)
Employed	8, 227	189, 224
Unemployed	2, 103	62, 287
Discouraged work-seekers	141	10, 097
Not economically active	2, 628	86, 596
Not applicable	3, 567	21, 371

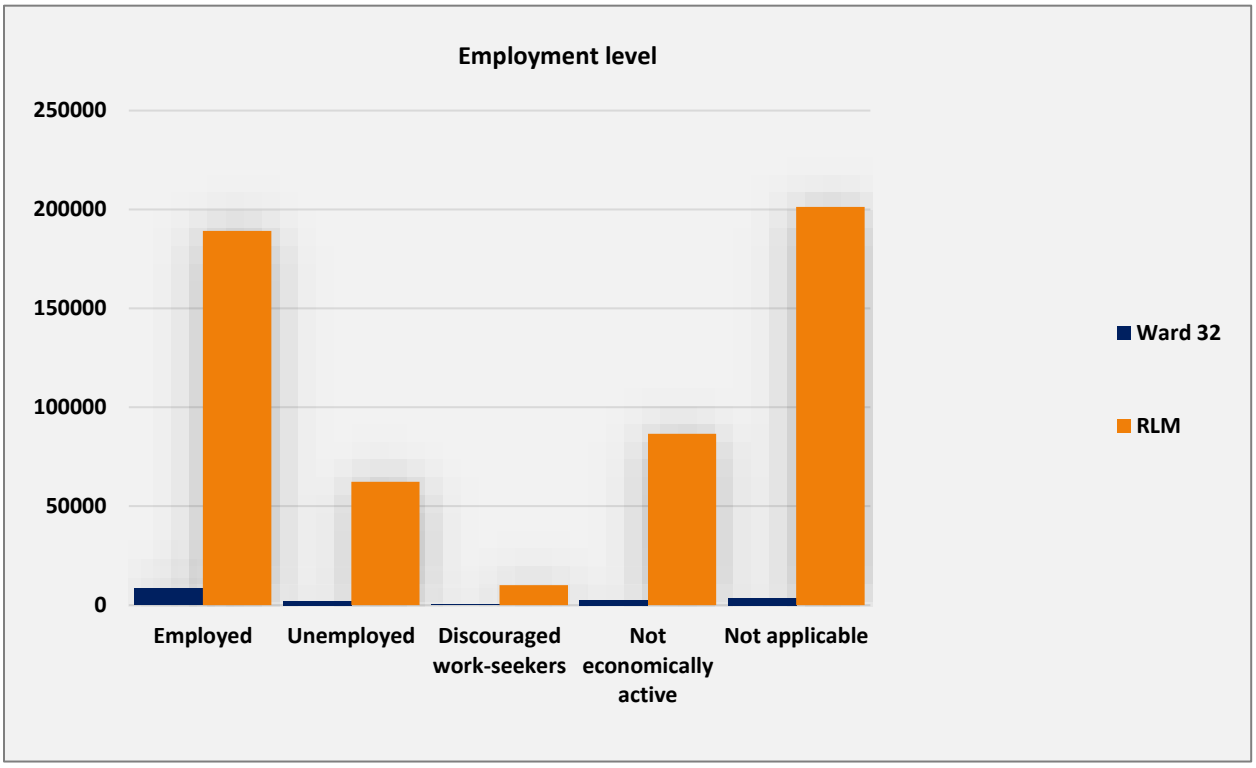

Figure 10: RLM Employment level

1.7.1.4 **Monthly Income**

Figure 11 shows that 51 364 individuals within Ward 32 do not have any source of income (Census, 2011). This then requires concerted and integrated efforts by the Municipality to create decent work and sustainable livelihoods for the people.

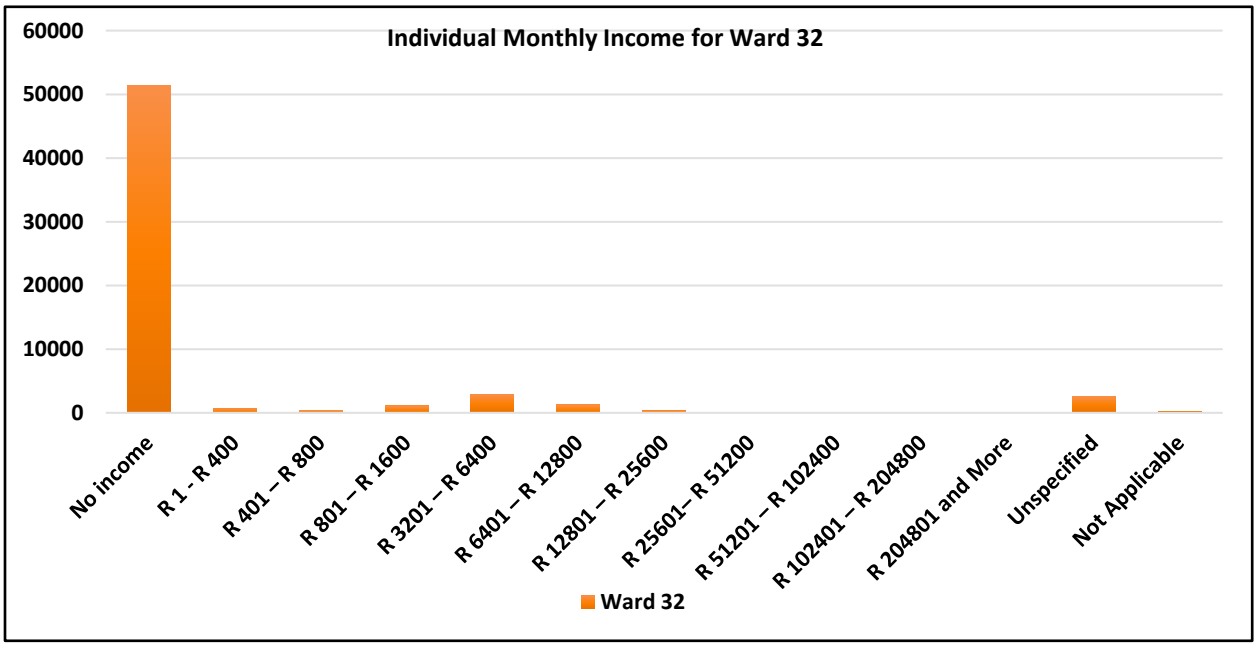

Figure 11: Individual Monthly Income within Ward 32

1.7.2 Gross Value Added

Gross Value Added (GVA) is defined as the total value of all the goods produced in a specified area during a specific period. Quantec Research classified the major sectors within the RLM into Primary sector which involves direct use of natural resources, Secondary sector involving manufacturing and Tertiary sectors, which comprises of services.

Figure 12 below illustrate the RLM GVA per sector for 2013 and it shows that the greatest contribution is from Primary sector (Mining and Quarrying). This data was taken from the RLM IDP (2013) and the variables are explained below:

Primary Sector:

- Agriculture, forestry and fishing; and
- Mining and Quarrying.

Secondary Sector:

- Manufacturing;
- Electricity; and
- Construction.

Tertiary Sector:

- Trade;
- Transport and Communication;
- Finance and Business Services; and
- Community, social and personal services.

The North West Province economy mainly receives its income from mining activities, which generate more than half of the province's gross domestic product and provides jobs for a quarter of its workforce.

The RMP for Buffelspoort Dam can contribute to the growth of the Municipal economic sectors, and this can be in the form of fishing, finance, business services, catering and accommodation, Transport, and communication

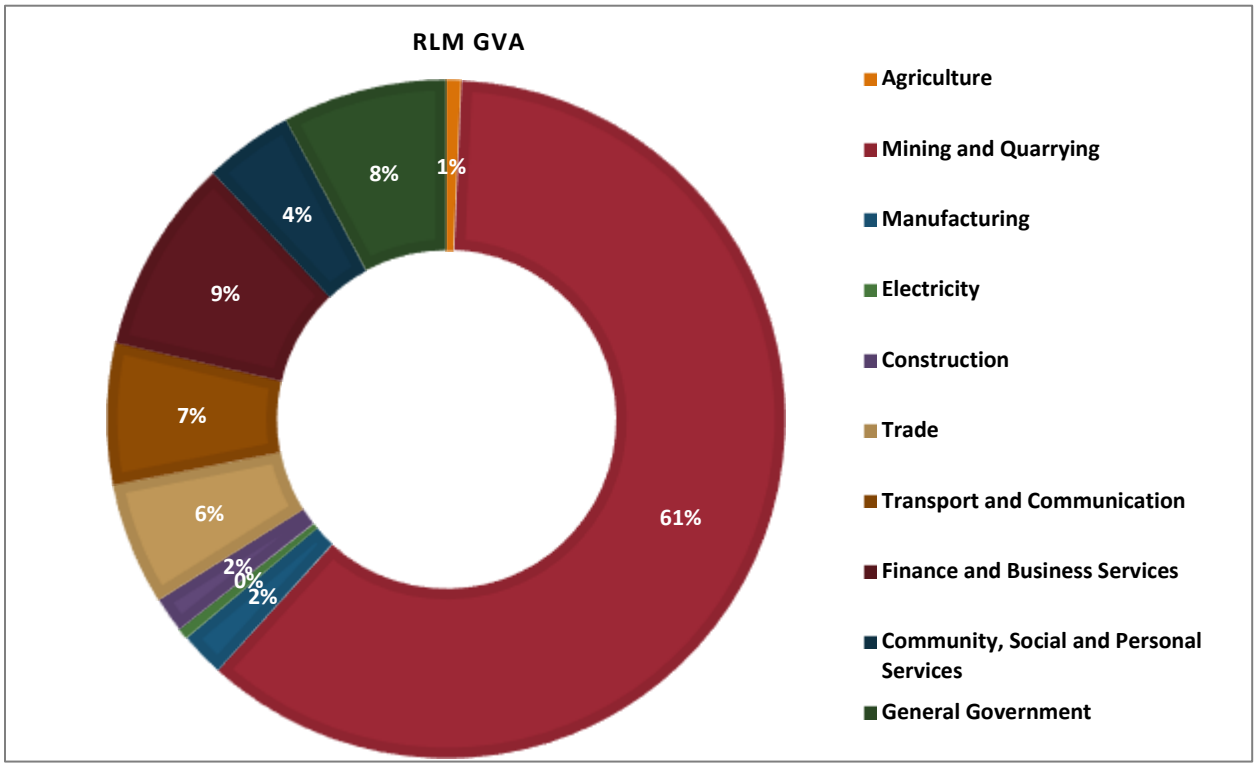

Figure 12: GVA for RLM in R million at 2013 constant prices

1.7.3 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 the Dam Management Committee).

CHAPTER 2: LEGISLATIVE FRAMEWORK

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

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

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

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

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

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

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

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

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

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

boards/clubs/organisations and regulating authorities).

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

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

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

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

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

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

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

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

Using water for recreational purposes is a water use under Section 21K and can be exercised as permissible use of water under Schedule 1 of the Act. However, this provision does not cater for commercial use hence the RMP should be implemented in line with General Strategic Plan for commercialisation of Tourism Public Private Partnerships at Government Waterworks, 2009 and PFMA Treasury Regulation 16.

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

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

XVI. **Public Finance Management Act (PFMA) (Act No. 29 of 1999**): Section 76 of the Act secures transparency, accountability and sound management of the revenue, expenditure, assets and liabilities of government departments. The Act promotes the objective of good financial management in order to 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).
- Disaster Management Act, 2002 (Act No. 57 of 2002).
- Integrated Development Plan of RLM (May 2011).
- Intergovernmental Relations Framework Act, 2005 (Act No.13 of 2005).
- Land Administration Act, 1995 (Act No. 2 of 1995).
- Local Economic Development Strategy of RLM (2012).
- Local Government: Municipal Systems Act, 2000 (Act No. 32 of 2000).
- National Heritage Resources Act, 1999 (No. 25 of 1999).
- North West Strategic Environmental Assessment (2004).
- Occupation Health and Safety Act, 1993 (Act No. 85 of 1993).
- Policy for the small scale fisheries sector in South Africa (Department of Agriculture, Forestry and Fisheries, 2012).
- Restitution of Land Rights Act, 1994 (Act No. 22 of 1994).
- RLM draft water service by-law (2013).
- RLM events coordination and management.
- Spatial Development Framework of RLM (2005).
- State Land Disposal Act, 1961 (Act No. 48 of 1961).

- Water supply and sanitation policy (DWAF, 1994).
- South African Water Quality Guidelines for Recreational Use (DWA, 1996).
- Soil Conservation Amendment Act, 1977 (Act No. 22 of 1977).
- The National Sport and Recreation Act, 1998 (Act No. 110 of 1998).
- **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 THE RMP

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

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

The RMP requires a five (5) year revision and an annual revision for the BP to ensure that management objectives remain relevant and management actions are continually improved.

3.2 PURPOSE OF THE RMP REVIEW

The purpose of the RMP review is to ascertain its contribution to the attainment of the National Water Act, 1998 (Act No. 36 of 1998) objectives by ensuring effective engagement of communities affected and interested in the water resource and its utilisation, and also the engagement of industry key role players.

The RMP review also ensures that the plan is based not only on ecological principles but also on the needs and expectations of communities and the recreation industry.

The existing RMP for Buffelspoort Dam was approved on **05 March 2008**. However, it was never implemented.

3.3 PROCESS TRIGGERS

Triggers Factors 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 for Buffelspoort Dam, as illustrated in **Table 5.**

Table 5: Relevant triggers for Buffelspoort Dam

Trigger Factors	Description
Resource Management	**Alien Invasive Plants species** • The dam is infested by invasive alien plants species (Parrot Feathers and Blue Gums). The parrot feathers can have detrimental impact on the water quality as well as interfere with other recreational activities such as boating. Whereas the Blue Gums can reduce the water level within the dam since they tend to consume lots of water. • Currently, there is no proper management of day visitor's boats to avoid the introduction of invasive alien plants species into the dam (e.g. establishment of wash bays). **Water Pollution** • There is a threat of water pollution which might occur as a result of the following:

Trigger Factors	Description
	○ Sewage discharge from adjacent and upstream developments; ○ Upstream agricultural Runoff; and ○ Underground fuel storage within the purchased land, etc. **Carrying Capacity** • The dam is too small to accommodate large number of recreational activities. It has been under severe pressure since 2008 due to an increase of visitors to the dam (i.e. there was a major increase of dam users since December 2008 and this resulted in inadequate facilities (ablution) which required lots of money for sewage removal).
Community Participation and Beneficiation	**Community participation and beneficiation** • The previously disadvantaged Local Communities is generally not aware of the recreational opportunities that the dam can to offer, and as such their interest and use is very low.
Public Policy	**Institutional Structure** • Currently the dam is managed by Buffelspoort Dam Management Committee (BDMC). However there is no support from the DWS with regard to the management of Buffelspoort Dam.

3.4 RMP REVIEW FRAMEWORK

According to DWAF (2006), the RMP requires 5-yearly revisions to ensure that management objectives remain relevant and management actions are continually improved, **Figure 13** illustrates a RMP and BP Review Framework.

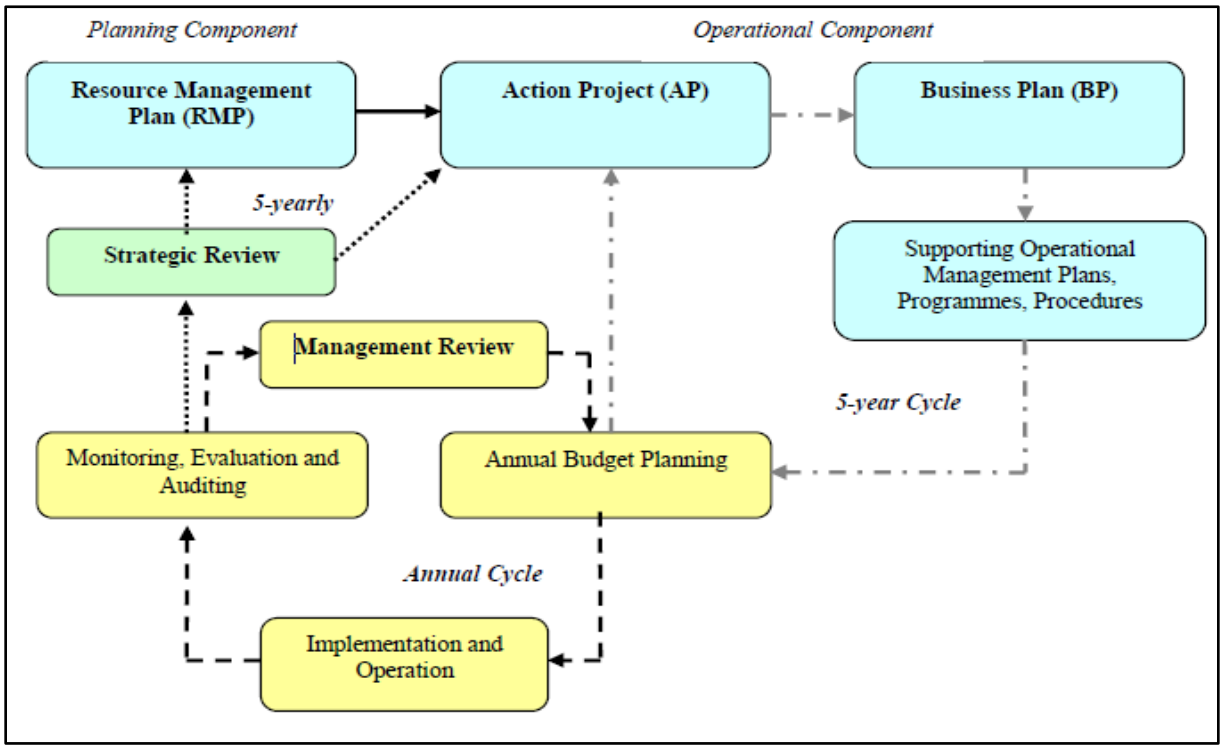

Figure 13: RMP Review Framework

3.5 RMP PLANNING STAGES

3.5.1 Desktop Study

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

3.5.2 Site Inspection

A site inspection was conducted at Buffelspoort Dam on **27 June 2014** to gather baseline information using a checklist questionnaire. The site inspection was undertaken with the DWS delegates (DWS IEE and the Dam Manager 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).

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

- To engage the Stakeholders (Authorities and IAPs) in the review process;
- To present opportunity to other Stakeholders who were not part of the RMP development process;
- The answering of questions and noting of concerns;
- The identification of new important issues or challenges as well as other objectives that were not incorporated in the existing RMP; and
- To verify if the previously identified objectives and vision for the dam is still relevant.

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

3.5.3.1 **The Planning Phase**

Planning phase entails three (3) important aspects namely:

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

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

3.5.3.1.1 The Role Players

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

3.5.3.2 **Participation Phase**

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

- Informing stakeholders – explained briefly under **3.5.3.4 Advertising Process.**

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

3.5.3.3 **Exit Phase**

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

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

During this phase, a draft RMP will be presented to the stakeholders so that they can comment and give inputs.

3.5.3.4 **The Advertising Process**

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

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

3.5.3.2.2 Newspaper Advert

A Newspaper advert regarding the RMP project was placed in the **Rustenburg Herald Newspaper**. The advert invited the public to attend the Public Participation Meeting. The advert was published in English on **08 August 2014**. Furthermore, an advert for the draft RMP was advertised on **Eikestadnuus Newspaper** on **20 December 2015**. (See attached **Appendix F**).

3.5.3.2.3 Flyer Compilation and Distribution

Flyers were also used as a form of notification, they aimed at informing the I&APs about the public consultative meetings. The flyer detailed a brief description of the RMP, meeting date, time, venue and relevant contact details. The flyers were compiled in English and were distributed on **08 August 2014**

The flyers for the draft RMP were distributed on **20 December 2015** (See attached **Appendix G**).

3.5.3.5 **Direct Communications**

3.5.3.3.1 E-mails

Meeting invitations were sent out to Authorities and I&APs notifying them about the scheduled consultative meetings, the invitation entailed the BID, meeting venue and time. The email notification was sent out on **08 August 2014**.

Moreover, the meeting invites for the draft RMP were sent out on **15 December 2015 (**See attached **Appendix H**).

3.5.3.3.2 Authority Meeting

The initial authority meeting was held on **19 August 2014** at **Bosveld Paradys.**

The purpose of the meeting was:

- To present the RMP Review, its goal and the 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 **21 January 2016**.

3.5.3.3.3 Public Meeting

The initial public meeting was held on **19 August 2014** at **Bosveld Paradys**. A platform was also given to I&APs to identify other challenges and objectives that were not incorporated in the existing RMP.

The draft RMP was presented to the Public on **21 January 2016**.

3.5.3.6 **Comments and Responses Register**

At the initial Stakeholder (Authorities and I&APs) meeting, it was agreed that a copy of the existing RMP will be circulated to all Stakeholders so that they can add their current issues and objectives that will be incorporated in the updated RMP.

A copy was circulated on **03 September 2014** given a period of 3 weeks to respond. Furthermore, a reminder was sent on **09 February 2015** given an extension of 1 week to respond.

A copy of the reviewed draft RMP was circulated on **17 December 2015** given a period of approximately one (1) month to respond. Refer to **Appendix I** for the comments and response register.

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 outlined in **Table 6**.

Table 6: Planning Partners and their Respective Mandates

Department/ Agency	Mandate
Rustenburg Local Municipality (RLM)	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/ Agency	Mandate
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 existing RMP has highlighted and unpacked various issues at the dam. However, most of the issues are still not addressed as the existing RMP was not implemented.

Provided below are the previous and current encumbrances:

Previous Encumbrances:

The previous encumbrances are broken down into **Biophysical, Legal and Social.** Refer to **Table 7 – 9.**

Table 7: Summary of Biophysical Encumbrances

Item	Description
Climate	• The dam is surrounded by woody savanna vegetation which is prone to wild fire. However, there is no firefighting equipment in place to prevent fire breaks at the dam which pose danger to the dam as well as users.
Vegetation	• The dam is infested by invasive alien plants species (Parrot Feathers and Blue Gums). The parrot feathers can have detrimental impact on the water quality as well as interfere with other recreational activities such as boating. Whereas the Blue Gums can affect the water level within the dam since they tend to consume lots of water. • Destruction of sensitive dam bank vegetation by illegal mooring of boats.
Geology	• The soil within the area is classified as freely drained and structure less soils which can hamper the development as it consist of high erodibility and low base structure. This means that only minimal development can occur within the purchased land e.g. chalets.
Fauna	• Waves caused by motorboats can cause inundation of nests and general disturbance to bird breeding and foraging habitat.

Item	Description
	• Three types of exotic fish species have been introduced into the dam as angling species. This might lead in having impact on the indigenous fish within the dam as they can outcompete indigenous fish species.
Water quality	• There is a threat of water pollution which can occur as a result of the following: o Sewage discharge from adjacent and upstream residential developments; o Upstream agricultural Runoff; and o Underground fuel storage within the purchased land.
Carrying capacity	• The dam is too small to accommodate large number of recreational activities. However, it has been under severe pressure since 2008 due to an increase of visitors to the dam (i.e. there was a major increase of dam users since December 2008 and this resulted in inadequate facilities (ablution) which required lots of money for sewage removal).

Table 8: Summary of Legal Encumbrances

Item	Description
Activities on State land	• There are unauthorised slipways which are visible along the dam shoreline. • There is illegal fishing by subsistence fishermen at inlets areas.

Table 9: Summary of Social Encumbrances

Item	Description
Aesthetic Environment	• Presence of alien invasive plant species (Parrot feathers) especially on the western inlet lowers the general aesthetic quality of the water within the dam. • Noise pollution by powerboats and water-ski training, especially during early mornings and evenings affects nearby residence.
Tourism	• The dam is small in size and it is well known by power boaters and water skiers, however, in recent years it has attracted more user groups resulting in overcrowding at the dam.
Community Participation and Beneficiation	• The previously disadvantaged Local Community is generally not aware of the recreational opportunities that the dam can offer. And as such their interest and use is very low.

Current Identified Issues:

During the initial Stakeholder engagement meetings for the RMP review, it was highlighted that there are other issues that were not incorporated into the existing RMP and were identified as follows:

- There is an illegal abstraction of water from the dam and clarity must be given by DWS as to who has the water rights at the dam;
- The dam is infested by invasive alien plants species (Parrot Feathers and Blue gums). The parrot feathers can have detrimental impact on the water quality as well as interfere with other recreational activities such as boating. Whereas the Blue gums can reduce the water level within the dam since they tend to consume lots of water;
- Currently, there is no proper management of outside boats to avoid the introduction of invasive alien plants species (e.g. establishment of wash bays);
- The dam is managed by Buffelspoort Dam Committee (BDC). However there is no support from the DWS with regard to the management of the dam;

- There are lot of incidence that are currently occurring within the dam (e.g. near misses);
- The dam is too small to accommodate large number of recreational activities. It has been under severe pressure since 2008 due to an increase of visitors to the dam (i.e. there was a major increase of dam users since December 2008 and this resulted in inadequate facilities (ablution) which required lots of money for sewage removal);
- Pollution level is increasing at an alarming rate and the source of pollution to the dam is currently unknown;
- There is a concern that the abstraction of water by the mines (Tharisa and Karee) will drop the water level of the dam at an alarming rate; and
- The previously disadvantaged Local Communities is generally not aware of the recreational opportunities that the dam can to offer, and as such their interest and use is very low.

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 Objective Identification (Phase 3)

The users put forward their specific objectives during the development of the existing Buffelspoort Dam RMP in order to establish common goals among the user groups. However, none of the identified objectives were achieved.

No new objectives were put forward by the Stakeholders as the previously identified objectives are still relevant. However, the action projects have been updated by including other relevant programmes or actions that will assist in achieving the identified objectives.

Furthermore, the management support has also been expanded to include other relevant Stakeholders to assist in undertaking the identified action projects.

The 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 common key objectives have been categorized into three (3) Key Performance Areas (KPAs) as illustrated below:

KPA1: Resource Management Plan

- To manage the resource according to sound policies, effective monitoring techniques as well as clear communication strategies and information flow;
- To sustain water based recreational use whilst not retarding the primary function of Buffelspoort Dam;
- To maintain the water quality, sustain inflows and protect the aquatic resource for recreational use as well as to ensure a healthy environment;
- To maintain and enhance the eco-system's composition, functioning, integrity and character over time and space;
- To have Buffelspoort Dam free of invasive alien vegetation;
- To identify, acknowledge and conserve resources of archaeological, cultural and religious significance within the dam basin; and
- To promote spatial and institutional linkages as well as the alignment with other planning frameworks.

KPA 2: Resource Utilisation

- To promote, accommodate and manage a variety of activities and facilities at the dam in a manner that enhances the user experience and minimizes the impact on the resource;

- To enable broad public enjoyment of a variety of recreational uses at the dam supported by appropriate infrastructure;
- To unlock the potential of the dam for commercial opportunities;
- To provide exclusive and dedicated space for organized sporting events to take place
- activities in an aesthetically pleasing, functional, safe and environmentally sound manner;
- To provide recreational users with clear dam rules as well as communication signage at the dam; and
- To ensure safety regarding all aspects of utilisation as well as the resource and associated infrastructure.

KPA 3: Benefit Flow Management

- To uplift the local economy and increase benefit flows to the surrounding communities through employment opportunities, empowerment as well as social and education programs; and
- To meet the user needs and satisfy government requirements regarding the standard of activities and facilities, in a manner that is safe and meets the participant's expectations;
- To promote sustainable fishing by local community;
- To provide suitable infrastructure that will effectively support and service identified

appropriateness of land use, compliance with applicable legislation and rights of use and access.

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:

"A commitment to manage, conserve, develop and utilise the resource in a sustainable, equitable and appropriate manner in order to maximise the recreational potential of 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 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 by **Figure 14**.

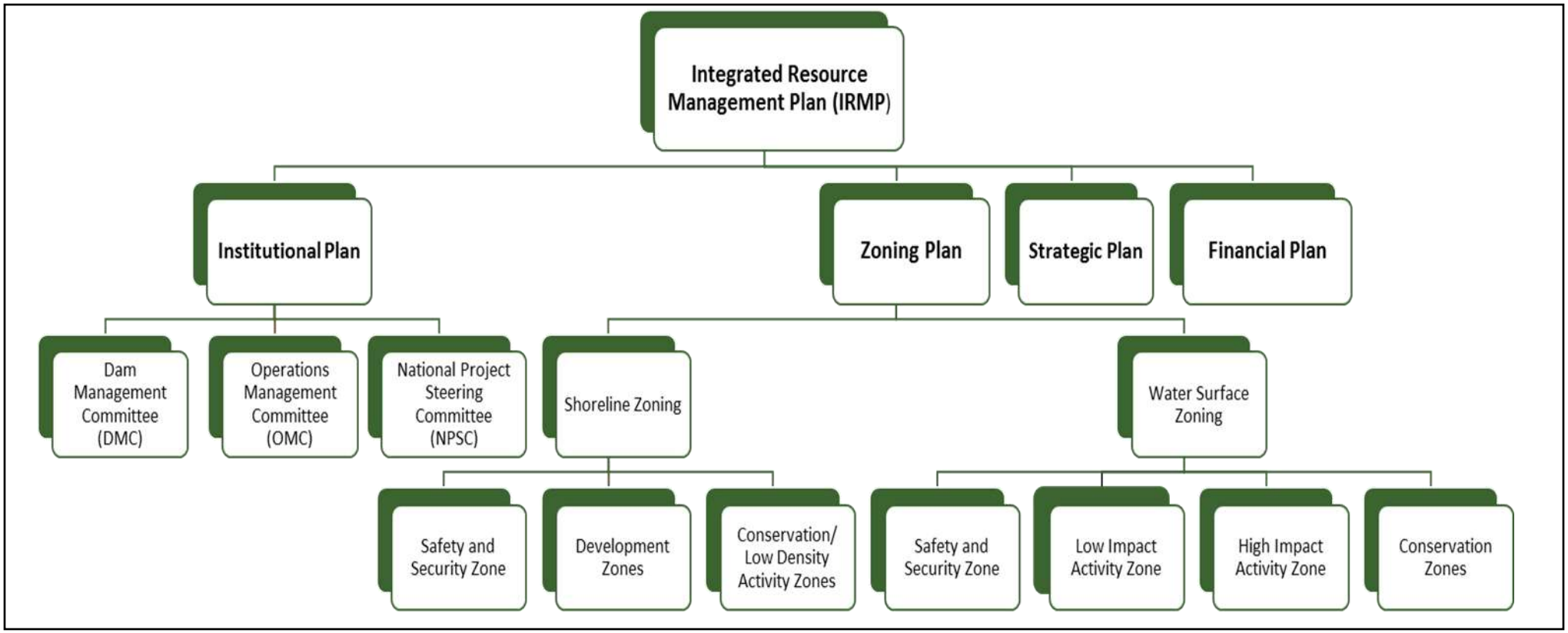

Figure 14: Integrated Resource Management Plan

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 DWS 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 15 illustrates the proposed user groups that will form part of the DMC.

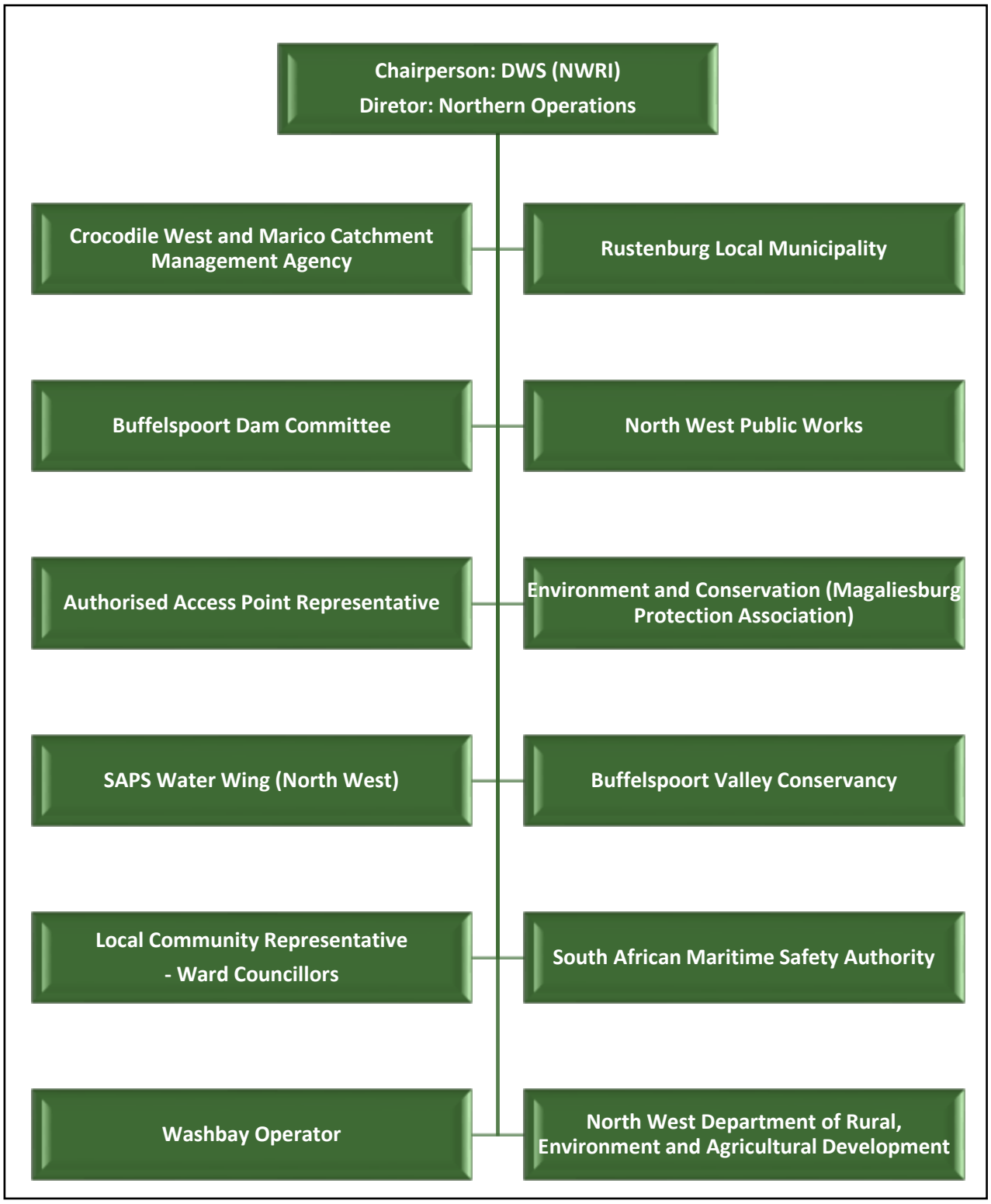

Figure 15: Proposed DMC

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

4.1.1.1 **Management Tools**

Terms of Reference

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

- Roles and responsibility of chairperson;
- 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.

The existing agreement will be review within the 12 months of the RMP being approved. This is to ensure that the agreements are aligned with the objectives of the RMP.

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 Aids to Navigation (AtoN)[3] for general navigation.

Agreements between SAMSA and DWS/ other relevant Parties/ 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 DWS. Further, a formal agreement with DWS will be required for all adjacent landowners and recreational clubs that have direct access to the water surface of the dam through constructed slipways, natural slipways or jetties for angling and/ or launching of vessels.

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

[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.

Event Applications

The dam is used for a number of organised events including cross triathlon competition, PUMA Trail Running and XTERRA which involves swimming, trail running, mountain riding and biking.

All events must be managed through an event application process. 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 by **Figure 16**.

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

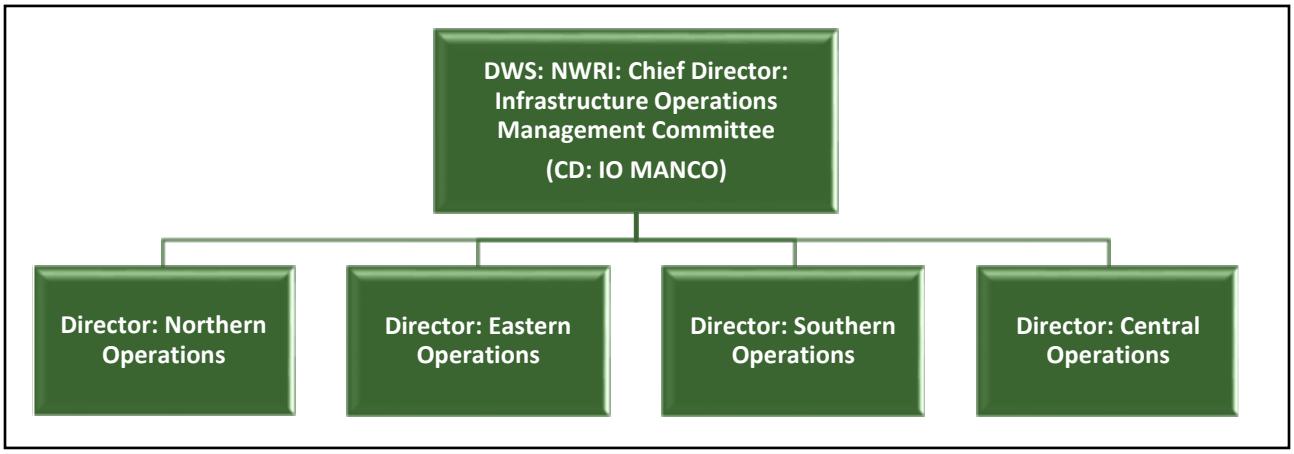

Figure 16: Existing CD: IO MANCO

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 17** illustrates a typical example of Governmental Departments that will form part of the NPSC:

Figure 17: Proposed NPSC

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

4.2 ZONING PLAN

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

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

4.2.1 Water Surface Zoning

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

Safety and Security Zone:

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

Management of this zone is aimed at protecting the dam wall and outlet works, as well as to ensure the safety of the public. This is a no-go zone to the public unless 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 10: Proposed Water Surface Zoning Description

Zone Name	Permissible Activities	Non Permissible Activities	Recommendation
• Safety and Security Zone.	• 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 Zones.	• None	• Public activities (to 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.	• Angling • Swimming • Canoeing • Rowing • Paddle boating • Kayaks • Float tubes	• Motorised boating • Water Skiing	• Area should be demarcated by demarcation makers and AtoN.
• High Impact Activity Zone.	• Motorised boat • Water-Skiing	• Angling • Swimming • Canoeing • Rowing • Paddle boating • Kayaks • Float tubes • Jet skis are currently prohibited due to the size of the dam.	• 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

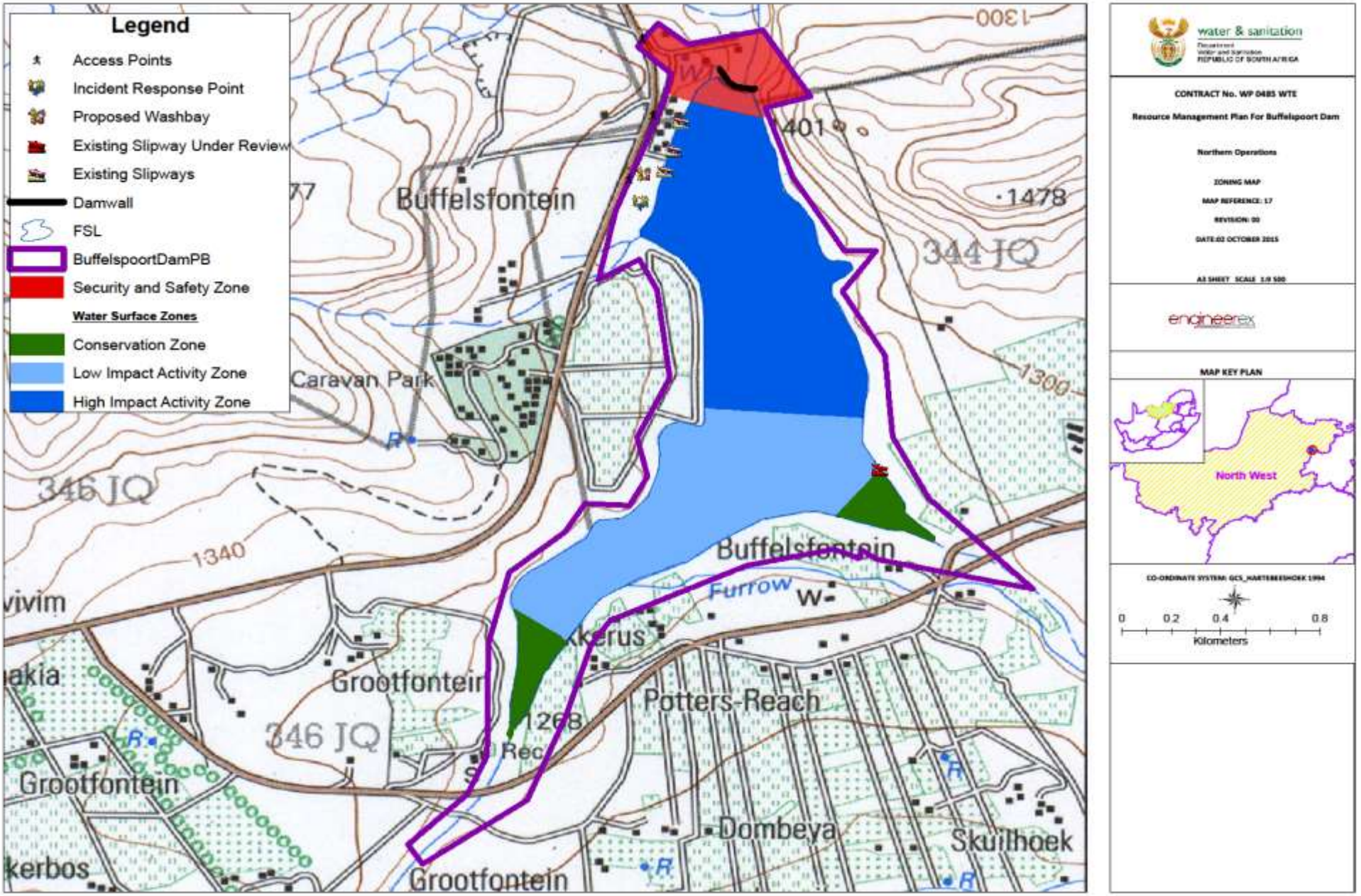

Figure 18: Proposed Water Surface Zoning Map

4.2.2 Shoreline Zoning[4]

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

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

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

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

Conservation / Low Density Activity Zone:

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

Medium Density Activity Zone:

This area is reserved for small scale activities such as day visitors, picnic areas, shoreline fishing, 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.

Community Resource Zone:

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

The shoreline zoning colour coding means the following:

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

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

Table 11: Proposed Shoreline Zoning Description

Zone Name	Permissible Activities	Non-permissible Activities	Recommendation
• Safety and Security Zone.	• Fire management • Alien invasive species clearing • Management of dam infrastructure • Management and maintenance activities by DWS and authorised personnel	• Public access	• A minimum area of 100m wide downstream the dam wall should be demarcated preventing public access and use.
• Conservation/ Low Density Activity Zone.	• Conservation management activities: ○ Bird watching ○ Hiking	• Development	• Permissible activities may only be permitted provided that they are approved by relevant Authorities and they are conduct as per the relevant Legislations or Regulations, such as National Hiking Way Rules.
• Medium Density Activity Zone.	• Camping • Day visitors • Picnic • Shoreline fishing • Allowed facilities: ○ Braai facilities ○ Ablution facilities	• Accommodation facilities such as: • Chalets • Recreational club houses	• The management of this area should follow the PPP process in terms of National Treasury. • Requirements of NWA and NEMA must be taken into account in all recreational activities. • All developments must be approved by DWS or DMC. • No private slipways to be built without approval from DWS.
• High Density Activity Zone.	• Recreational club house	• Picnic • Hiking	• The management of this area should be submitted for PPP in terms of National Treasury. • Requirements of NWA and NEMA must be taken into account in all recreational activities. • All developments must be approved by DWS or DMC. • No private slipways to be built without approval from DWS.
• Community Resource Zone	• Subsistence fishing • Access to the water resource by private land owners on the eastern side of the dam.	• Chalets • Recreational club houses • Braai facilities • Camping • Non-motorised vessels.	• No private slipways to be built without approval from DWS. • Requirements of NWA must be taken into account in all recreational activities.

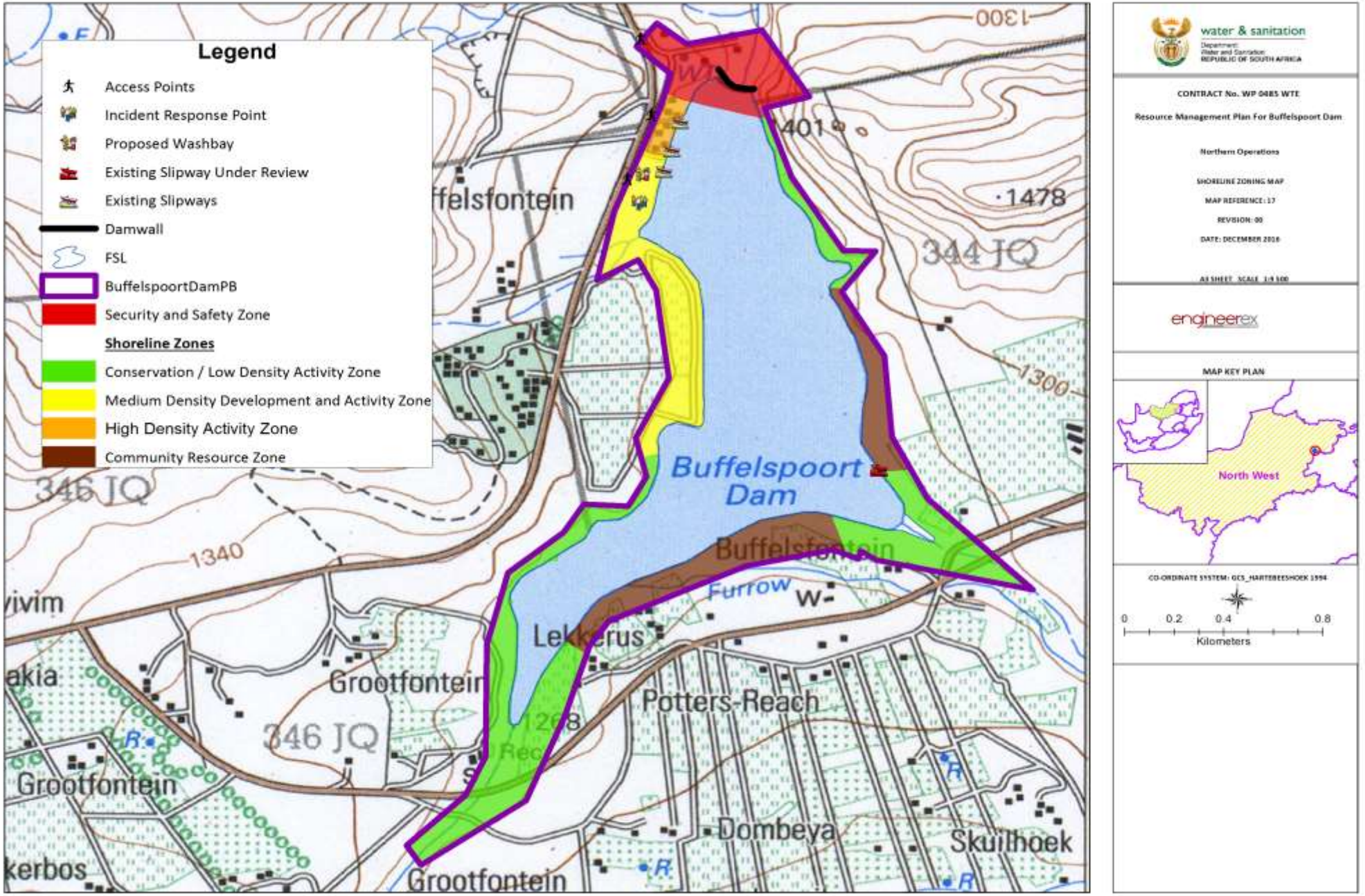

Figure 19: Proposed Shoreline Zoning Map

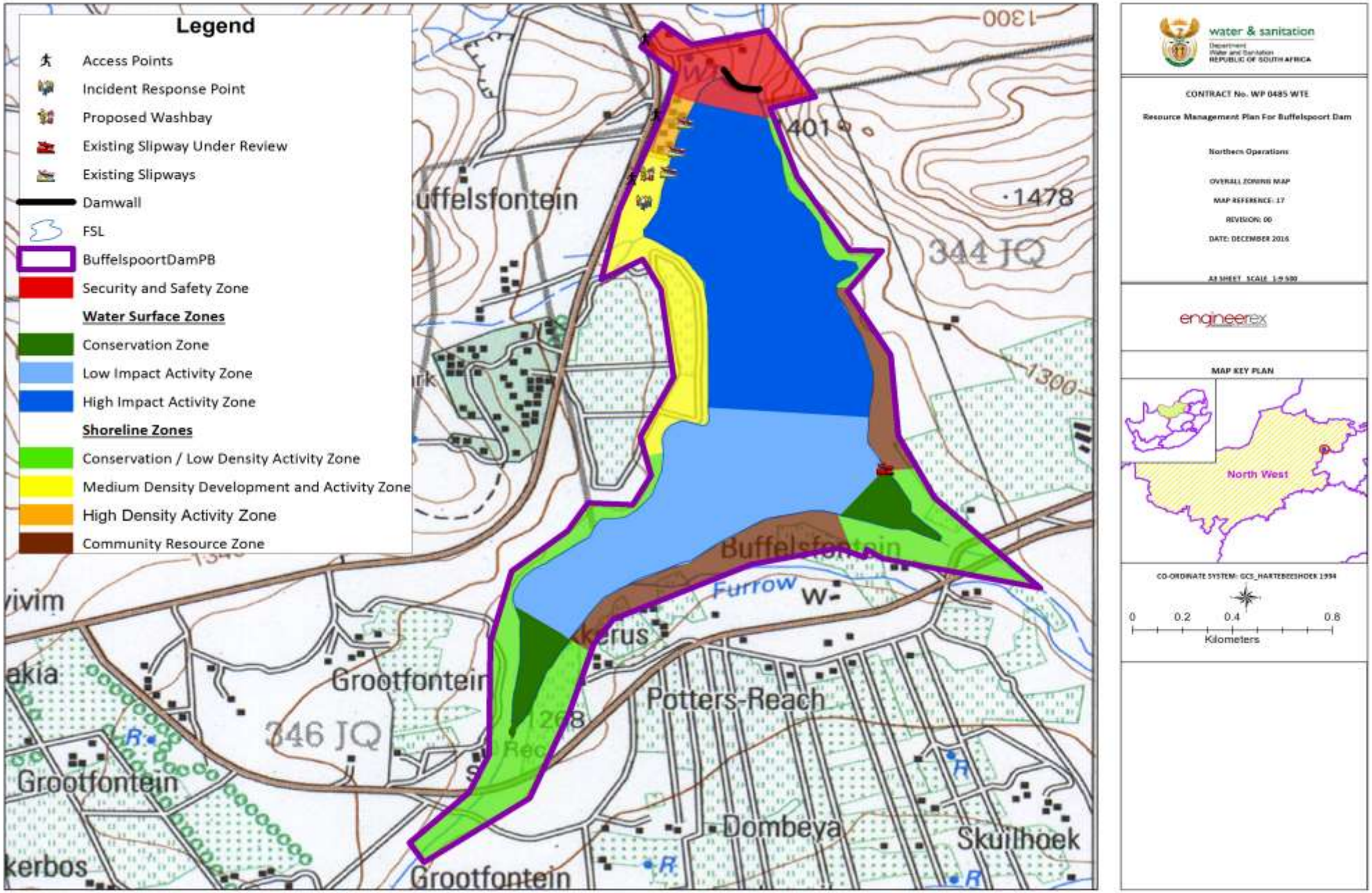

Figure 20: Proposed Overall Zoning Map

4.2.3 Carrying Capacity

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

In order to determine the degree 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 Buffelspoort 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 = **135.7 ha** (FSL of the dam)

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.

Craft	U/A (ha/craft)
Rowing	0.5
Canoe	1.0
Dinghies	1.0
Water-Skiing	2.0
Fishing	3.0
Powerboats	4.0
Sailing	5.0
Average	**2.4**

Based on the table above the average hectare per user is 2.4 ha (24 000 m^2), the value of 5.0 ha (50 000 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
= 135.7 ha x (1 craft/5 ha) x 1
= **27 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.

Formula: 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 Buffelspoort Dam these factors includes sensitive areas, such as conservation areas (12.6 ha) as well as aspects regarding the safe operation and management of the dam (2.5 ha), buffer zone (5472m shoreline x 70m = 38.3 ha), and demarcation markers (1 ha).

These factors accounts for 54.4 ha, which is 40.1%

RCC = PCC x (100 – Cf1)% x (100 – Cf2)% x … (100 – Cfn)%
= 27 x (100 – 40.1)%/100
= **16 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 are currently Six (6) slipways around the dam (2 at boat club, 1 at Primary launching site, 1 at secondary and 2 unregistered slipway at the private properties. As a results Infrastructure capacity = [12 hours available per day/20 min] x 5 slipways for public use, therefore:

[720/20] x 6 = 216

As 20 minutes would apply either to entering or retrieving of vessel from the water, 180 would need to be halved: 216 / 2 = 108. This is the maximum amount of boats that can launched on a given day.

Management Capacity

The current management capacity consists of 5 people: consisting of Chairman, Treasurer, Public Area Manager, Gate Attendant as well as Boat Club Manager.

The required management capacity for safe functioning of the dam would include 1 x General Manager, 1 x Treasurer, 2 x Safety Officers for boats on the water surface and 3 x Enforcement Officers present along the shoreline = 7 people.

Management Capacity = current capacity/ required capacity x 100

= 5/7 x 100 = 71.4%

Therefore:

ECC = (108 x 0.714) x 100/RCC
= (108 x 0.714) x 100/ 16
= **481 %**

Therefore the ECC for the dam remains at **16** crafts that can be allowed at the dam.

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 of this plan are broken down into management fields:

- 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 13 - 15**, the Strategic Plan on how to achieve the identified objectives identified regarding the dam is outlined.

Table 12: Strategic Plan for KPA 1: Resource Management

KPA 1: Resource Management			
Objective (What do we want)	**Motivation (Why do we want to achieve this)**	**Action Projects (How do we achieve this)**	**Management Support (Who will be involved)**
Primary Function of the dam: • To sustain water based recreational use whilst not retarding the primary function of Buffelspoort Dam.	• According to DWS List if Registered Dams (2015), the primary function of the dam is for irrigation and industrial use. However, Recreational use as a secondary function can only operate successfully and be effectively managed if it takes into consideration the primary function of the dam.	• Secondary uses of the dam must be accommodated in such a manner as not to compromise the primary function of the dam. • Develop a long term strategy regarding the cooperation and relationship of the primary and recreational use and their respective management bodies. • Sudden flash floods, storms, veld fires and other disasters can affect the resource as well as the recreational use of the dam and as such it is essential that an Emergency Preparedness Plan is in place.	• All institutions that are involved with the primary function of the dam, be this in the form of oversight, monitoring, manager, operator, service provider or beneficiary of the resource should be involved in the RMP.
Water Quality: • To maintain the exceptional high standard of water quality within the dam.	• Buffelspoort Dam is often referred to as the 'cleanest dam in the North West' and as such it is extremely popular and well suited for recreational use. However, the recreational activities do impact on the water quality in the form of oil spillages from boat. Other threats which do exist relate to runoff and seepage from adjacent developments as well as possible upstream pollution by various agricultural and residential related uses.	• All recreational activities must be monitored and evaluated to ascertain if there is any pollution threat to the dam. • Frequent monitoring of water quality. • Implementation of Co-operative Inland Waterways Safety Programme (CIWSP) at the dam.	• DWS Water Quality and River Health section should monitor water quality regularly to ensure its suitability for recreational activities. • Involvement of DMC. • Other Government Departments such as Environmental Affairs and NGOs that concern themselves with water quality and environmental health must be involved, this includes the RLM.

KPA 1: Resource Management			
Objective (What do we want)	**Motivation (Why do we want to achieve this)**	**Action Projects (How do we achieve this)**	**Management Support (Who will be involved)**
Biodiversity: • To maintain and enhance the eco-system's composition, functioning, integrity and character over time and space.	• Buffelspoort Dam is located within the Magaliesberg region which has been designated in the SDF (for 2015) as a protected natural area as well as a tourism node. For these reasons it is desirable to maintain and improve the ecological state and also to minimize, remediate and mitigate any adverse effects.	• Develop an Integrated Environmental Management System (IEMS) for the dam. • Undertake a biodiversity assessment and prepare a Biodiversity Management Plan. • Install demarcation markers at the Conservation Zones. • Identify areas with erosion problems and implement remediation measures, with specific reference to areas of intense use and concentrated storm water. • Identify areas where vegetation has deteriorated and rehabilitate accordingly. • Plant additional shade trees and screening vegetation at the Active Recreation Zone.	• Involvement of the responsible government departments such as Department of Environmental Affairs (DEA), etc. • Involvement of DMC as well as the local conservation initiatives (Buffelspoort Valley Conservancy (BVC), Magaliesberg Protection Association (MPA), etc).
Alien Plant Control: • To have Buffelspoort Dam free of invasive alien vegetation.	• The dam is infested with alien invasive plant species along the shoreline (Blue gums) and within the water resource (Parrot feathers). The further spreading can have a detrimental effect on the ecology of the dam.	• Remove all invasive alien vegetation within the purchased line and the surrounding area. • Rehabilitate areas infested with invasive alien vegetation with suitable species that are indigenous to the area. • Develop an inspection and cleaning mechanism (Wash bays) to ensure that vessels entering the dam do not contaminate it with alien vegetation.	• Working for Water (WfW) programmes within DEA and Land use and soil Management section of DAFF must be involved in order to eradicate and control invasive alien plant species within and around the dam. • Involve the North West Expanded Public Works Programme (NEPWP) regarding the alien vegetation clearing projects. • South African Biodiversity Institute (SANBI) must be considered as well. • Involvement of DMC.
Cultural and Heritage Resources: • To identify, acknowledge and conserve resources of archaeological, cultural and	• The dam is located within Magaliesberg mountains region which are rich with history. Other significant findings may be discovered as human activity increases at	• Conduct a Heritage Impact Assessment in order to confirm the presence of the possible grave sites and implement protection measures thereof. • Establish a relationship with the faith based organizations and develop a	• The South African Heritage Resources Agency (SAHRA) is the national body responsible for the protection of South Africa's cultural heritage resources. • Involvement of local conservation and social initiatives (BVC, RGKB, etc.).

KPA 1: Resource Management			
Objective (What do we want)	**Motivation (Why do we want to achieve this)**	**Action Projects (How do we achieve this)**	**Management Support (Who will be involved)**
religious significance within the dam basin.	the dam and as history continues to reveal itself. • Signs of possible graves were recently discovered, with one sighting located in the day visitor's area where there is a risk of damage occurring (RMP, 2008). • Furthermore, the Sterkstroom inlet, due to its exceptionally clean water, is used for religious activities (baptism).	procedure with regards to the use of the Sterkstroom inlet for ritual activities.	• Involvement of DMC.
Integration and Cooperation: • To promote spatial and institutional linkages as well as the alignment with other planning frameworks.	• The region around the dam is often referred to as the buffer zone between the mining areas on the north and the Magaliesberg Protected Natural Environment (MPNE) on the south. This rural environment is characterized to some degree by human activity, although large areas of land remain untransformed. Nature reserves do exist in the region, although none link up directly with the dam.	• Settle joint-management partnerships with nearby conservation entities. • Facilitate the incorporation of this RMP into the next Municipal IDP. • Establish communication channels and procedures with regional nature reserves, conservation and other initiatives as well as with relevant government departments.	• Local Environment and Conservation Initiatives (MPA, BVC, etc.). • Relevant Municipal, Provincial and National Government Departments that deal with environmental and planning matters. • Buffelspoort Dam as a leisure and tourism attraction should be incorporated into regional tourism brands (Magalies Meander, Crocodile Ramble, etc.) as well as governmental databases (Local Municipality, DEA, etc.) and other information centres.
Safety: • Improved safety of navigation	• There is no standardised and harmonised AtoN and demarcation markers available on the dam.	• To improve safety of navigation through the implementation of standardised and harmonised AtoN and demarcation markers as directed by SAMSA	• DWS to facilitate the process • Agreements between SAMSA, DWS, LAAPs and other relevant parties to be concluded

Table 13: Strategic Plan for KPA 2: Resource Utilisation

KPA 2: Resource Utilisation			
Objective (What do we want)	**Motivation (Why do we want to achieve this)**	**Action Projects (How do we achieve this)**	**Management Support (Who will be involved)**
Carrying Capacity: • To promote, accommodate and manage a variety of activities and facilities at the dam in a manner that enhances the user experience and minimizes the impact on the resource.	• Carrying capacity is an effective management tool to control access, utilization and development within the dam basin. • Buffelspoort Dam is extremely popular for a variety of uses and users and it is ironic that one of the greatest threats to the dam is commonly seen as its increasing popularity. • Excessive use of the resource may not only impact on the water resource (e.g. water pollution) and surrounding environment (e.g. soil compaction, littering, destruction of vegetation, etc.), but will also negatively impact on safety and users experience. Increasing numbers of users can cause greater social impacts measured by overcrowding, accidents, conflicts, noise, etc.	• Establish density controls for activities and facilities that requires carrying capacity assessments (i.e. number of boats per hectare). • Implement density controls as per approved accepted utilization level.	• The involvement of the relevant industry with regards to user experience and other aspects such as safety is imperative. • Environmental and other planning institutions including relevant government departments need to be consulted when establishing density controls.
Access Control: • To enable broad public enjoyment of a variety of recreational uses at the dam supported by appropriate infrastructure.	• The dam is a very popular destination within RLM. Public leisure facilities are becoming scarce and as such the presence of this dam remains relevant and valuable as a local destination. Public needs, be it sporting recreation or nature based activities, need to be catered for.	• Only areas requiring security measures should be fenced, demarcated, and only if approved by the DWS. However, effective co-management agreements with adjacent landowners are preferred, as opposed to having fences along the entire purchase line. • Access to the dam must be equitable and safe to all users.	• DWS support is required to sanction any kind of public access, use and development. • Consultation might be further be required with other relevant governmental departments as well as other public Stakeholders (adjacent landowners, environmental institutions, etc.).

KPA 2: Resource Utilisation			
Objective (What do we want)	**Motivation (Why do we want to achieve this)**	**Action Projects (How do we achieve this)**	**Management Support (Who will be involved)**
		• The entry fee need to be reasonable to ensure that the dam remains an affordable destination for all. • Dam rules must be enforced to all users in order to promote safety within the dam as well as among users.	• Management authority, operators and contractors will be responsible for the planning, development and maintenance of infrastructure at the dam, in accordance with conditions of contracts and agreements.
Commercial Access, Use and Development: • To unlock the potential of the dam for commercial opportunities.	• The dam is situated in an established tourism destination whereby various opportunities exist for recreation and tourism ventures. Such concession opportunities are intended to address existing use and possible additional commercial enterprises.	• Fees should be levied for the rights to operate commercial activities at the dam, based on DWS policy and determined in terms of the NWA, as well as criteria such as exclusivity, equity, size, location, and impact of the activity. • Prepare a strategy to procure and award concessions for different commercial operations. • Verify and regularize the existing use of the Boat Club area in order to ensure that it contribute to local community empowerment.	• All commercial concessions and operations within the dam basin should be subject to lease or management contracts with DWS taking into account the PPP toolkit. • Depending on the nature of the contract, National Treasury (NT), Department Public Works (DPW), or other relevant government departments' involvement may be require. • Involvement of DMC.
Organised Events: • To provide exclusive and dedicated space for organized sporting events to take place in a manner that is safe and meets the participant's expectations.	• Events, especially those that involve swimming are very popular due the exceptional quality of the water combined with its scenic location as well as its relative accessibility from Gauteng Province. • It is more than likely, that the demand for organised events will increase due to the limited size of the dam, the natural and rural context, the limitations of infrastructure capacity and the	• Event Organizers in conjunction with DWS and DMC should develop an Events Management Plan (EMP) which will identify significant environmental risks (impacts) associated with recreational and competitive events and provide the appropriate control measures to minimize or avoid potential adverse impacts. • Event Organizers must ensure that participants are well trained. • Event organisers should develop an emergency preparedness plan.	• Events Permit must be acquired from the Management Authority (DWS) with assistance/ recommendations from the DMC. • Depending on the nature of the event, other organ of state or similar related services need to be involved e.g. Municipal Disaster Management, Police, Emergency Ambulance, Local Fire Watch, etc. to ensure that all events are well planned beforehand.

KPA 2: Resource Utilisation			
Objective (What do we want)	**Motivation (Why do we want to achieve this)**	**Action Projects (How do we achieve this)**	**Management Support (Who will be involved)**
	popularity among the general public to use the dam, events will need to be well managed and coordinated.	• Stakeholders need to be kept informed of events calendars and their implications, especially if it will affect access and use of the dam. • Clear communication signage must be put in place in order to inform recreational users about the dam rules. This will also promote safety within the dam. • Events will have clearly defined limits placed on sizes, numbers and levels of use, as well as type of activity and restrictions of zones. • Development of an emergency preparedness plan. • A database should be in place containing all registered events, scheduled operation dates (event calendar), event operators as well as relevant governmental, industry, business and tourism role players.	
Sustainable Subsistence Fishing: • To promote sustainable fishing by local community	• Subsistence fishing by the local community remains an active use of the dam, however, this must be regulated by relevant policy to avoid overfishing within the dam.	• Appoint Safety Officers that will monitor compliance with the dam fishing rules. • Preserve the core habitats for nesting, resting, feeding and breeding of fish within the inlets. • Fishing for food needs to be prioritised and formalised as an activity at the dam. However, there must be an agreement with the local fishing for food community regarding access and use of the dam for subsistence fishing.	• The Angling clubs and industry can provide guidance regarding the codes of conduct relating to good fishing practices. • Involvement of DAFF and DMC.

KPA 2: Resource Utilisation			
Objective (What do we want)	**Motivation (Why do we want to achieve this)**	**Action Projects (How do we achieve this)**	**Management Support (Who will be involved)**
Infrastructure: • To provide suitable infrastructure that will effectively support and service identified activities in an aesthetically pleasing, functional, safe and environmentally sound manner.	• There is no appropriate infrastructure at the dam such as braai stands and toilets, and this hampers the effective management, enjoyable utilisation of the dam. Although infrastructures are often perceived to be detrimental to the environment, their improvements can be beneficial to users and the environment alike.	• Existing recreational infrastructure within the dam must be upgraded to meet the users' needs and expectations e.g. braai stands and adequate toilets at the picnic area. • An agreement needs to be formalized between DWS and the dam management body outlining the duties and responsibilities in terms of control, operation, management, use and development of the public facility. • Should the design, development and operation of the public facility be outsourced, then contracts need to be obtained from local business. • Any major infrastructural development within the Active Recreation Zone should be subjected to a master planning exercise to determine the compatibility with other structures and uses. • Environmentally friendly waste management must be adopted at the dam. Solid waste, including building rubble, must be removed to a registered waste disposal facility. Where possible solid waste should be separated and sorted, with the purpose of recycling. • Liquid waste that is released back into the environment must be done according to DWS standards. • Ensure that all necessary routes are formalised and legible so to avoid the	• DWS, Municipality and Provincial Authorities should be involved in approving design, planning, environmental and issuing of water related authorisations. • Consultation might be further be required with other relevant governmental departments as well as other public Stakeholders (adjacent landowners, environmental institutions, etc.) • Management authority, operators and contractors will be responsible for the planning, development and maintenance of infrastructure at the dam, in accordance with conditions of contracts and agreements. • The Business Plan will detail the market analysis and feasibility of infrastructure at the dam.

KPA 2: Resource Utilisation			
Objective (What do we want)	**Motivation (Why do we want to achieve this)**	**Action Projects (How do we achieve this)**	**Management Support (Who will be involved)**
		development of disorganised and informal roads and tracks. Where necessary, install regulatory infrastructure (barriers, signage). • Implement a signage system that communicates relevant information, especially where this pertains to zoning restrictions and other rules and regulations. • Compile a database of all infrastructure and related approvals and update on a regular basis.	
Dam Rules and Enforcement: • To provide recreational users with clear dam rules as well as communication signage at the dam.	• The dam is small in size and it is well preferred for recreational activities. However, general visitor's behaviour, especially relating to noise at the public area can be a disturbance to other users and to residents around the dam. • In this regard, the dam rules have been developed and implemented by the BDMC for a number of years. In addition, the Boat Club has also developed a set of Water Rules and Ground Bylaws for its own members.	• An Enforcement officer should be appointed to ensure rules and regulations are followed by all users of the Dam. • Develop information material (signage, pamphlets etc.), to convey the dam rules. • Implementation of Co-operative Inland Waterways Safety Programme (CIWSP) to promote safety at the dam.	• Enforcement Officers may require support and expertise from other security agencies, such as the South African Police Service (SAPS). • Involvement of DMC.

Table 14: Strategic Plan for KPA 3: Benefit Flow Management

KPA 3: Benefit Flow Management			
Objective (What do we want)	**Motivation (Why do we want to achieve this)**	**Action Projects (How do we achieve this)**	**Management Support (Who will be involved)**
Community Participation and Beneficiation: • Uplift the local economy and increase benefit flows to the surrounding communities through community empowerment and recreational opportunities.	• Tourism sector have been identified as a vehicle for skills development, job creation, Broad-based Black Economic Empowerment (BBEE), etc. it is imperative that the local communities derive benefits from recreation activities conducted at the dam. • The previously disadvantaged local community are generally not aware of the recreational opportunities that the dam can offer, and as such their interest and participation is very low. The BDMC is however implementing a community support programme which has thus far benefited various initiatives such as churches, schools, sports as well as visually impaired and disabled associations	• Implement skills development programmes where opportunities exist. • Recognize, train and empower individuals from the surrounding community with proven interest and entrepreneurial skills. Through regular communication with community institutions, it will be possible to become more sensitized to community perceptions, as well as to expose entrepreneurs to the opportunities that are available. • The management authority should develop an awareness programme in order to ensure that all I&APs know what the dam can offer in terms of recreational purposes. This awareness programme should be dynamic and adaptable for variety of audiences, and should clearly highlight the benefits of sustainable utilisation.	• Existing social initiatives, NGOs, churches, schools as well as other relevant government departments such as Local Economic Development (LED) and related organs that deal with social welfare, sport and education must be involved. • Upliftment of programmes that deal with sports should ideally receive support from relevant sporting federations. • Involvement of the DMC

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 Buffelspoort 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 21** shows the RMP & BP review framework.

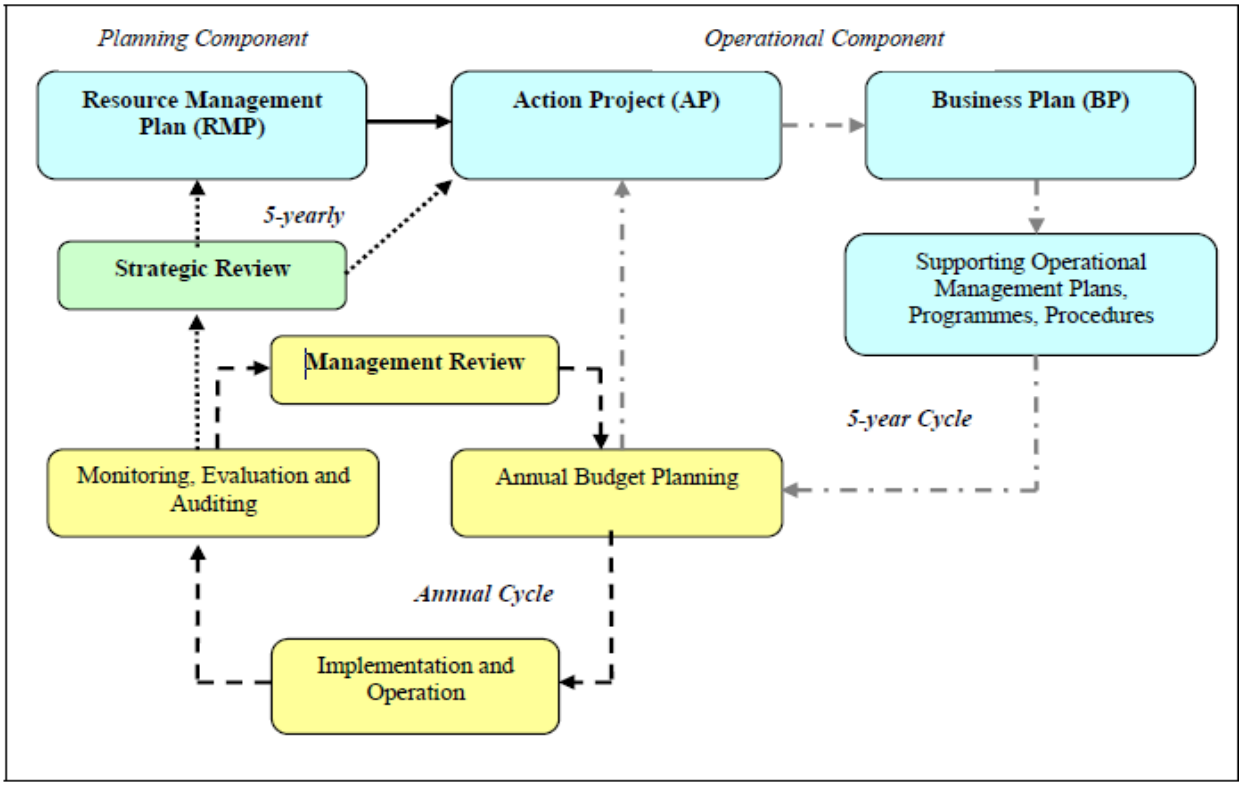

Figure 21: RMP and BP Review Framework

CONCLUSIONS

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

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

Moreover, 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 Buffelspoort Dam, a BP has been developed to describe a manner in which the potential recreational activities are to be financially resourced.

In addition, 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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APPENDICES