Department of Water and Sanitation

NATIONAL WATER RESOURCE INFRASTRUCTURE (NWRI)

Resource Management Plan

ALBERT FALLS DAM

REPORT – Volume 4 of 5

December 2016

WATER IS LIFE - SANITATION IS DIGNITY

water & sanitation

Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

2030 NDP

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- Department of Water and Sanitation;
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- Msinsi Resorts and Game Reserves;
- South African Maritime Safety Authority;
- The Ward councillor who represented the community;
- Umgeni Water delegated for the operation and maintenance of the dam;
- uMshwathi Local Municipality; and
- Wildlife and Environmental Society of South Africa.

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

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

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

AMENDMENTS PAGE

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

LIST OF ACRONYMS

ADU	Animal Demography Unit
AGIS	Agriculture Geo Referenced Information System
BID	Background Information Document
BOD	Biological Oxygen Demand
BP	Business Plan
CATHSSETA	Culture, Arts, Tourism, Hospitality, Sports Sector, Education and Training Authority
CD: IO MANCO	Chief Director: Infrastructure Operations Management Committee
CIWSP	Cooperative Inland Waterways Safety Programme
CoGTA	Corporative Governance and Traditional Affairs
CPSI	Centre for Public Services Innovation
DAFF	Department of Agriculture, Forestry and Fisheries
DEA	Department of Environmental Affairs
DHS	Department of Human Settlements
DMC	Dam Management Committee
DMR	Department of Mineral Resources
DoT	Department of Transport
DPW	Department of Public Works
DRDLR	Department of Rural Development and Land Reform
DSR	Department of Sports and Recreation
DWAF	Department of Water Affairs and Forestry
DWS	Department of Water and Sanitation
EA	Environmental Authorization
ECC	Effective Carrying Capacity
EIA	Environmental Impact Assessment
EMF	Environmental Management Framework
GIAMA	Government Immovable Asset Management Act
GPS	Global Positioning System
GWWs	Government Waterworks
I&APs	Interested and Affected Parties
IALA	International Association of Marine Aids to Navigation and Lighthouse Authorities
IDP	Integrated Development Plan
IRMP	Integrated Resource Management Plan
KPA	Key Performance Areas
LAAP	Local Accountable Aton Parties
MFMA	Municipal Finance Management Act
MRGR	Msinsi Resorts and Game Reserves
MSA	Municipal Systems Act
NDT	National Department of Tourism
NEMA	National Environmental Management Act
NPSC	National Project Steering Committee
NT	National Treasury
NWA	National Water Act

NWRI	National Water Resource Infrastructure
OMC	Operations Management Committee
PCC	Physical Carrying Capacity
PFMA	Public Finance Management Act
PP	Public Participation
PPP	Public Private Partnership
PSP	Professional Service Provider
QDS	Quarter Degree Square
RCC	Real Carrying Capacity
RMP	Resource Management Plan
RSA	Republic of South Africa
SAMSA	South African Maritime Safety Authority
SAPS	South African Police Services
SASCOC	South African Sports Confederation and Olympic Committee
SDF	Spatial Development Framework
SWOT	Strengths, Weaknesses, Opportunities, Threats
TAL	Total Alkalinity
WfW	Working for Water
WUL	Water Use Licence
WWTWs	Wastewater Treatment Works

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 Albert Falls 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 Albert Falls Dam.

Purpose of the RMP: The RMP is a plan which aims to regulate access and the recreational utilisation of a water resource and the surrounding state land, in ways which promote community participation and beneficiation, environmental conservation and unlock socio-economic potential of the water resource.

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

Location of the dam: The Albert Falls Dam is a composite earthfill dam inpounding the uMngeni River. It falls under the judistriction of uMshhwathi Local Municipality of uMgungundlovu District Municipality in the KwaZulu-Natal Province. Its GPS coordinates are: **29°26'55.65"S 30°23'40.75"E**.

Purpose of the dam: The primary purpose of Albert Falls Dam is to provide raw water for irrigation use.

The dam also currently offers recreational activities such as boating and fishing. Swimming at the dam is not recommended due to the occasionally presence of crocodiles.

Dam ownership and management: Albert Falls Dam is owned by DWS. The dam is operated by Umgeni Water which has an agreement with DWS to operate and maintain the water resource. Msinsi Resorts and Game Reserves is a subsidiary of Umgeni Water and is delegated with the task of managing the dam basin for recreational activities. There are two (2) access controlled areas for public use: Albert Falls Nature Reserve and Bon Accorde.

This RMP proposes an improvement on the current institutional structure to include other relevant role players to assist in effectively managing the dam.

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 was formulated by the stakeholders.

The identified key common objectives are:

- To ensure that there is accelerated scrutiny in the process of attaining lease agreements. Further ensure that the agreements are reviewed and promote regular monitoring of the leased property**;**
- To undertake a legal audit to clarify legal right;
- To ensure the re-establishment of native species that belong to the Albert Falls area;
- To maintain, control and minimize the impacts of Alien Aquatic Vegetation in order to further maintain the ecological value of the water resource and surrounding state land;
- To ensure the protection and sustainable utilization of the water resource;
- To promote equitable access to the dam.
- To introduce water based recreational activities that are regulated and meet the user satisfaction of the previously disadvantaged communities;
- To initiate events such as music festivals at the dam that will be part of community beneficiation;
- To ensure that the local communities participate and benefit from economic development occurring within and around the dam;
- To allow local fishermen access to fish for subsistence purposes;
- To reestablishment of the swimming pools which were closed by Msinsi;
- To participation in the management of the dam;
- To improve the lives of Albert Falls communities by implementing skills development and training. Furthermore this will ensure safety of community members at the dam; and
- To develop and implement an effective Institutional Plan for the dam to serve the purpose of managing the water resource and the surrounding environment including the recreational activities within the dam.

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

"A dam in which the biological diversity, water quality and ecological processes are maintained, whilst promoting socio-economic benefits, with the continued support of its primary purpose".

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 Albert Falls Dam that could enhance tourist attraction:

- Introduction of water sports to the community (Sailing and canoeing); and
- Introduction of fishing activities to the local community and not only focus on the tourists.

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CHAPTER 1: INTRODUCTION

1.1 BACKGROUND OF ALBERT FALLS DAM

Albert Falls Dam is a composite earthfill dam inpounding the uMngeni River under the judistriction of uMshhwathi Local Municipality of uMgungundlovu District Municipality in the KwaZulu-Natal Province. Three (3) other important streams include Nculwane, Karkloof and Doringspruit. The dam is adjacent to Thokozani Village and ±24km from Pietermaritzburg at coordinates (**29°26'55.65"S 30°23'40.75"E)** and 1.5km deviating the R33 (Greytown Road) in KwaZulu-Natal Province, South Africa. See **Figure 1** for a Locality Map.

The dam is owned by DWS and there are two access controlled areas for public utilization: Albert Falls Nature Reserve and Bon Accorde.

The dam was commissioned in 1976 as a storage dam to supplement water to Nagle Dam which is about 53km downstream of Albert Falls Dam and for agricultural utilization. It is surrounded by Albert Falls Dam Nature Reserve (Msinsi Nature Reserve) which covers an area of 3590 hectors including the dam and there are also adjacent land users (Private Landowners).

The dam receives water from Midmar Dam and the Karkloof River, and feeds the Nagle and Inanda Dams. Umgeni Water is delegated with the management, operation, administration and maintenance of the Mgeni System which includes Albert Falls Dam. Umgeni Water sources water primarily from twelve (12) impoundments on three (3) major water resource systems. The Mgeni System comprises of four (4) dams on the Mgeni River, namely, Midmar Dam, Albert Falls Dam, Nagle Dam and Inanda Dam (Umgeni Water, 2013/2014). See quaternary catchment which falls under Mgeni catchment management area (U20E) in **Figure 2.**

The dam is an important part of the KZN Province as it stores water to be released to Nagle Dam, abstracted for treatment at the Durban Heights Water Works and then supplied to eThekwini and the dam also supports the industries and agriculture sectors that produce 20% of South Africa's Gross National Product. The primary purpose of the dam is mainly irrigation and domestic utilization. The dam has a capacity of 288.1 mil.m^3 and major farming activities that are practiced around the dam area includes sugarcane and citrus plantations which depends on the dam for water (uMshwathi Local Municipality IDP, 2013-2014). **Table 1** summarizes the catchment and dam profile.

The dam is a significant asset. It forms an integral part of the water supply system to the Pietermaritzburg and Durban area and has a good assimilative capacity[2]. It plays a major role in supporting tourism and recreation at a local and regional scale, and also has real estate value which is significant at a local level to the municipality (uMshwathi Local Municipality, 2013).

Overview of Umgeni River Catchment

The catchment of the Mgeni River, comprising 1 654 km^2, is situated in the Province of Natal of the Republic of South Africa. The 257 km long perennial river is considered one of the most reliable of the larger rivers in South Africa. It comprises the complete magisterial district of Lions River, most of the New Hanover and Pietermaritzburg districts and parts of Camper down, Ndwedwe, Pinetown, Inanda, Durban and Mpendle districts.

[2] **Assimilative capacity** refers to the ability of a body of water to cleanse itself; its capacity to receive waste waters or toxic substances without deleterious effects and without damage to aquatic life or humans who consume the water.

The upper Mgeni catchment above Albert Falls consists of a rolling pastoral landscape where stock farming and forestry are practised. The veld is well-preserved and the silt load of the river is low. Below Albert Falls Dam, however, the river passes through rugged country with a thin vegetal cover. The river flows in a deep gorge carved in the surrounding country to a depth of many hundreds of metres through parts of the Zulu Homeland with little intensive farming until near the coast where cane fields are very limited and the metropolitan area of Pinetown and Durban partly falls within the catchment, before the water runs into the sea.

Table 1: Albert Falls Dam Profile

Albert Falls Dam Profile	
Location	South Africa
Province	Kwa Zulu-Natal
District Municipality	uMgungundlovu District Municipality
Local Municipality	uMshwathi Local Municipality
Nearest Town	New Hanover
Completion Year	1976
Co-Ordinates	29°26’55.65”S; 30°23’40.75”E
Purpose	Irrigation
Owner	Department of Water and Sanitation
Water Management Area	Umngeni River Catchment Area
Quaternary Catchment	U20E
Catchment Area (km^2)	0.0
River	Umgeni River
Capacity (m^3)	290.108
Surface Area (ha)	2 354.0
Wall type	Arch & gravity
Wall Height (m)	30
Length (m)	2006

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

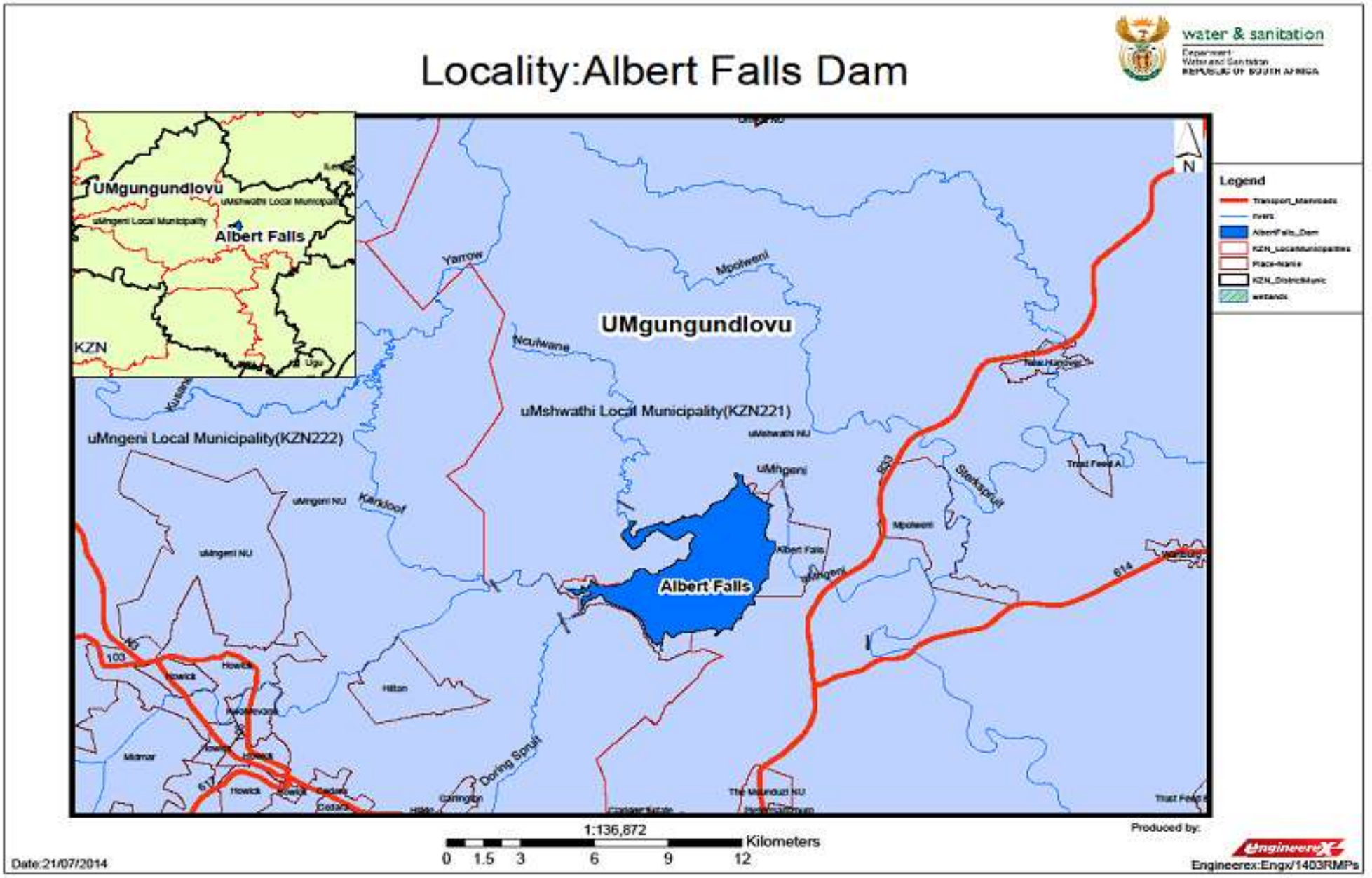

Figure 1: Locality Map for Albert Falls Dam

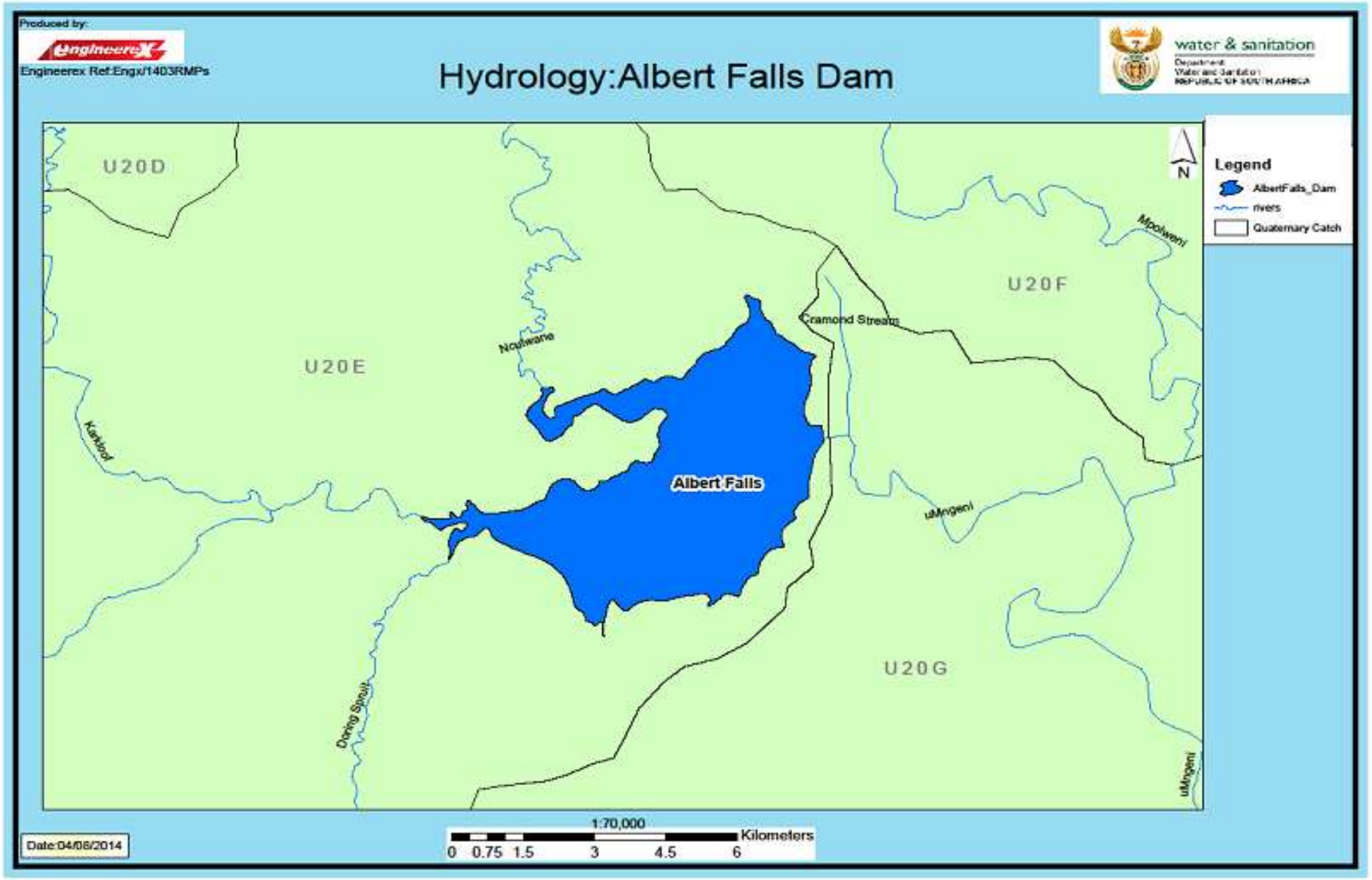

Figure 2: Hydrology Map for Albert Falls Dam

1.2 BIO-PHYSICAL ENVIRONMENT

1.2.1 Climate

Albert Falls normally receives about 790mm of rain per year, with most rainfall occurring mainly during mid-summer. It receives the lowest rainfall (6mm) in June and the highest (129mm) in January. The monthly distribution of average daily maximum temperatures for the area ranges from 20.9°C in June to 27.6°C in February. The region is the coldest during July when the mercury drops to 5.3°C on average during the night. The maximum temperature at Albert Falls is 42°C and the lowest with 3°C. The average summer temperature is 29°C and average winter temperature is 14°C. The Albert Falls area often experience frost in winter and heavy storms. Heavy thunders storms with hail and wind is experienced from November until February.

1.2.2 Flora

The Albert Falls area is highly valued in terms of its natural habitats and the ability of the area to support a large number and variety of flora and fauna of the Albert Falls Nature Reserve. The reserve was established due to its ecological diversity. The western side of the dam is covered with sugar cane, forest and unimproved grassland whilst small patches of thicket and bush land have been identified on the eastern side of the dam. See Land Cover Map in **Figure 3.**

1.2.2.1 Alien Invasive Species

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

Water lettuce (*Pistia Stratoites*) species occurs within the Albert Falls Dam. Water lettuce form dense mats which completely cover a water surface. The mats clog waterways and reduce water flow, impede navigation, fishing and provides a breeding place for mosquitos.

1.2.3 Fauna

Albert Falls Nature Reserve is prolific with wild life, particularly birds. For example, approximately 280 bird species were spotted at the dam. Bird’s sanctuary of the west bank has been identified as a sensitive area. See a photograph of bird species at the dam illustrated below. The dam is also rich in fish and other fauna and flora. The dam area is renowned for its fish eagle and raptors, furthermore crocodiles are often spotted at the dam (Albert Falls Dam bass fishing, 2014).

1.2.3.1 Amphibians

According to Animal Demography Unit, 2015 a total of twenty two (22) frog species have been recorded in the 2930AD Quarter Degree Square (QDS). Within the 2930AD QDS *Afrixalus spirifrons* is the only vulnerable species. **Table 2** illustrate the Amphibians identified within the 2930AD QDS**:**

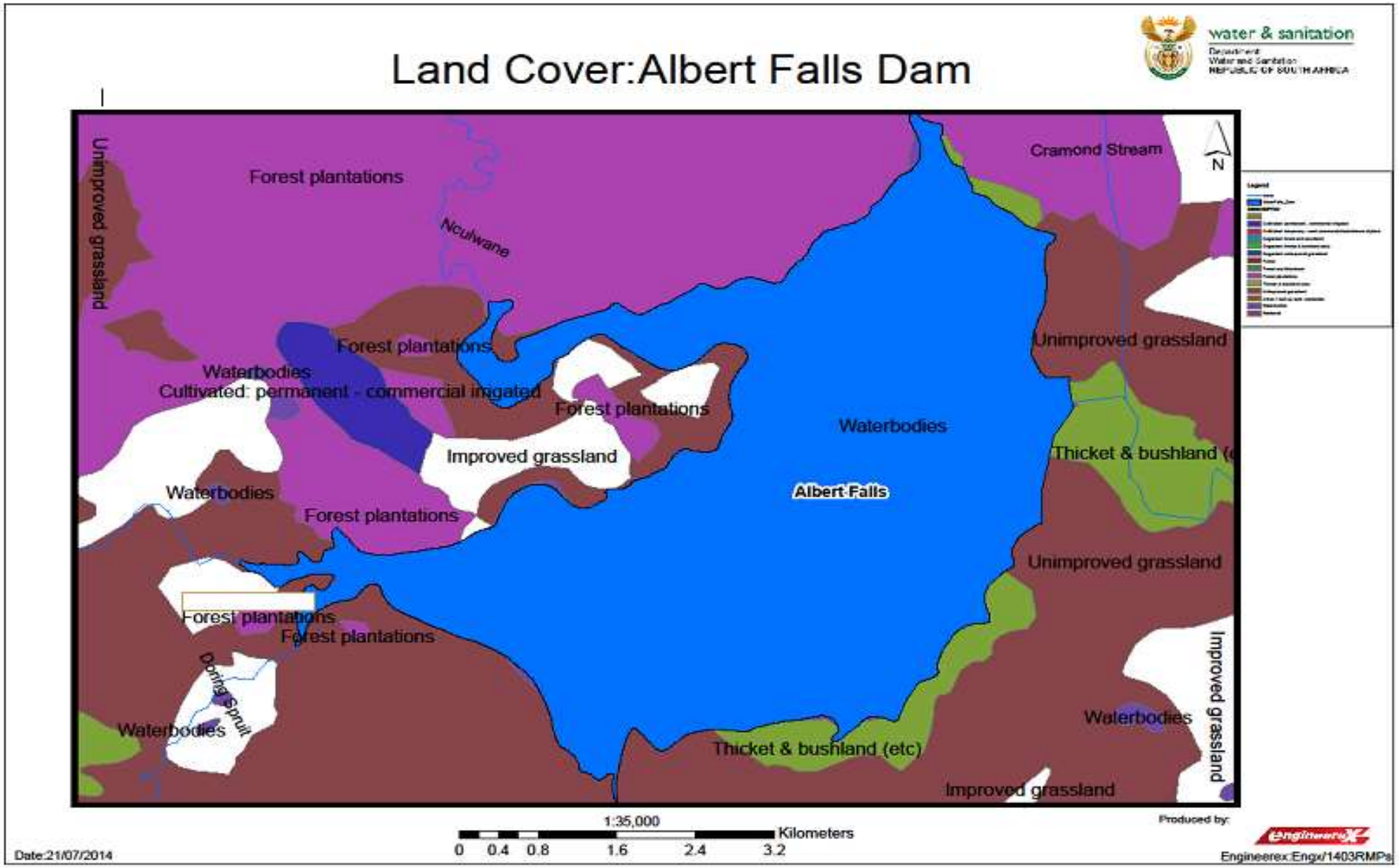

Figure 3: Land Cover Map for Albert Falls Dam

Table 2: Some of the Frog Species occurring within 2930AD

Genus	Species	Common name	Red list category
Breviceps	*verrucosus*	Plaintive Rain Frog	Least Concern
Amietophrynus	*gutturalis*	Guttural Toad	Least Concern
Amietophrynus	*rangeri*	Raucous Toad	Least Concern
Schismaderma	*carens*	Red Toad	Least Concern
Hadromophryne	*natalensis*	Natal Ghost Frog	Least Concern
Afrixalus	*spinifrons*	Natal Leaf-folding Frog	Vulnerable
Hyperolius	*marmoratus*	Painted Reed Frog	Least Concern
Hyperolius	*pusillus*	Water Lily Frog	Least Concern
Hyperolius	*semidiscus*	Yellowstriped Reed Frog	Least Concern
Kassina	*senegalensis*	Bubbling Kassina	Least Concern
Phrynobatrachus	*natalensis*	Snoring Puddle Frog	Least Concern
Xenopus	*laevis*	Common Platanna	Least Concern
Ptychadena	*oxyrhynchus*	Sharpnosed Grass Frog	Least Concern
Ptychadena	*porosissima*	Striped Grass Frog	Least Concern
Amietia	*fuscigula*	Cape River Frog	Least Concern
Amietia	*quecketti*	Drakensberg River Frog	Least Concern
Anhydrophryne	*hewitti*	Hewitt's Moss Frog	Least Concern
Cacosternum	*boettgeri*	Common Caco	Least Concern
Cacosternum	nanum	Bronze Caco	Least Concern
Strongylopus	fasciatus	Striped Stream Frog	Least Concern
Strongylopus	grayii	Clicking Stream Frog	Least Concern
Tomopterna	natalensis	Natal Sand Frog	Least Concern

1.2.3.2 **Reptiles**

According to Animal Demography Unit, 2015 reptile species are common in 2930AD QDS. Approximately twenty seven (27) reptile species have been recorded. Crocodiles are often spotted at the dam. Within the 2930AD QDS *Macrelaps microlepidotus* is the only reptile species near threatened with *Crocodylus niloticus* as vulnerable on the red list category**.** Tabulated in **Table 3** are the reptile species within the 2930AD QDS:

Table 3: Reptile species occurring within 2930AD

Genus	Species	Common name	Red list category
Agama	*aculeata*	Distant's Ground Agama	Least Concern (SARCA 2014)
Macrelaps	*microlepidotus*	Natal Black Snake	Near Threatened (SARCA 2014)
Bradypodion	*melanocephalum*	KwaZulu Dwarf Chameleon	Vulnerable (SARCA 2014)
Chamaeleo	*dilepis*	Common Flap-neck Chameleon	Least Concern (SARCA 2014)
Boaedon	*capensis*	Brown House Snake	Least Concern (SARCA 2014)
Crotaphopeltis	*hotamboeia*	Red-lipped Snake	Least Concern (SARCA 2014)
Dasypeltis	*inornata*	Southern Brown Egg-eater	Least Concern (SARCA 2014)
Dispholidus	*typus*	Boomslang	Least Concern (SARCA 2014)
Duberria	*lutrix*	South African Slug-eater	Least Concern (SARCA 2014)

Genus	Species	Common name	Red list category
Lycodonomorphus	*rufulus*	Brown Water Snake	Least Concern (SARCA 2014)
Lycophidion	*capense*	Cape Wolf Snake	Least Concern (SARCA 2014)
Philothamnus			Not listed
Philothamnus	*natalensis*	Western Natal Green Snake	Least Concern (SARCA 2014)
Psammophis	*brevirostris*	Short-snouted Grass Snake	Least Concern (SARCA 2014)
Chamaesaura	*anguina*	Cape Grass Lizard	Least Concern (SARCA 2014)
Cordylus	*vittifer*	Common Girdled Lizard	Least Concern (SARCA 2014)
Pseudocordylus	*melanotus*	Drakensberg Crag Lizard	Least Concern (SARCA 2014)
Crocodylus	*niloticus*	Nile Crocodile	Vulnerable (SARCA 2014)
Hemachatus	*haemachatus*	Rinkhals	Least Concern (SARCA 2014)
Hemidactylus	*mabouia*	Common Tropical House Gecko	Least Concern (SARCA 2014)
Lygodactylus	*capensis*	Common Dwarf Gecko	Least Concern (SARCA 2014)
Afroablepharus	*wahlbergii*	Wahlberg's Snake-eyed Skink	Least Concern (SARCA 2014)
Trachylepis	*capensis*	Cape Skink	Least Concern (SARCA 2014)
Trachylepis	*punctatissima*	Speckled Rock Skink	Least Concern (SARCA 2014)
Trachylepis	*varia*	Variable Skink	Least Concern (SARCA 2014)
Afrotyphlops	*bibronii*	Bibron's Blind Snake	Least Concern (SARCA 2014)
Varanus	*niloticus*	Water Monitor	Least Concern (SARCA 2014)

1.2.3.3 **Mammals**

Wildlife in the reserve includes zebra, several antelope species, such as the springbok, the red hartebeest, and Oribi (endangered), rhino and giraffe (Msinsi, 2013). According to Animal Demography Unit, 2015 a total of 59 mammal species were recorded. Table four below illustrates mammal' species that are identified to be Vulnerable, near threatened and endangered within the Msinsi Resorts and Game Reserves:

Table 4: Endangered mammal species occurring in 2930AD

Genus	Species	Common name	Red list category
Ourebia	*ourebi*	Oribi	Endangered
Cercopithecus	*albogularis*	Sykes's Monkey	Endangered
Cercopithecus	*mitis*	Blue Monkey	Vulnerable
Leptailurus	*serval*	Serval	Near Threatened
Dasymys	*incomtus*	Common Dasymys	Near Threatened
Mellivora	*capensis*	Honey Badger	Near Threatened

1.2.4 Topography

Topography is an important determinant of land utilization patterns in a given area (Archer et al., 1995). It plays a major role in the distribution or zoning of recreational activities on the environment, therefore it is crucial to consider topography during the allocation of activities in the dam. The topography of the Albert Falls area is generally undulating.

In terms of relative relief, it varies from mountainous in the south and relatively flat from the middle to the northern boundary of the dam. It is relatively hilly in the western part and becomes relatively flat towards eastern and southern parts of the dam. Generally the area has an altitude that ranges from approximately 658m to 760m especially within the purchased boundary. (See **Figure 4** for Slope Map)**.**

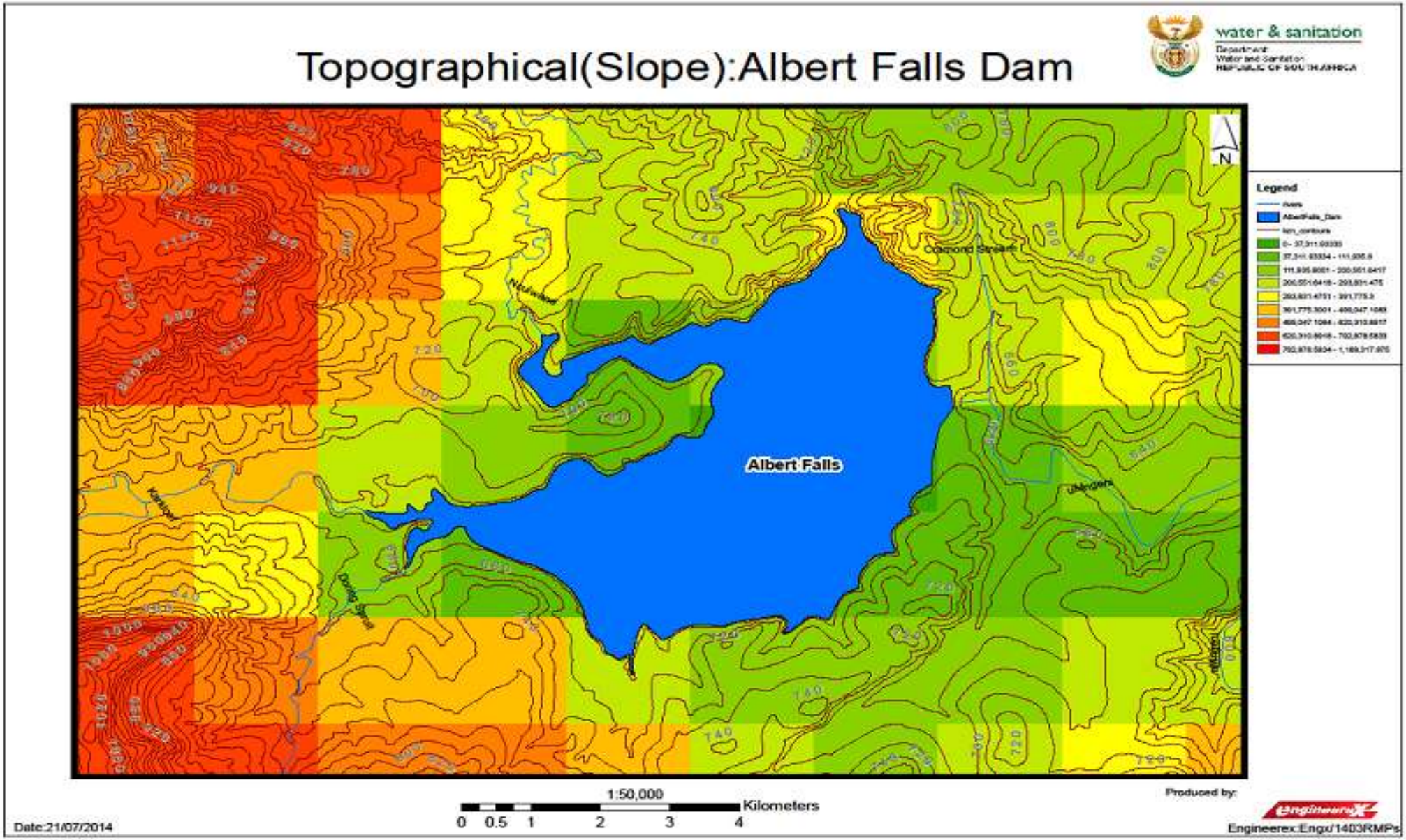

Figure 4: Slope Map for Albert Falls Dam

1.2.5 Geology and Soils

The Albert Falls Area lies within the Ecca Group of KwaZulu-Natal geological formations which has a total thickness of about 7000m with laid down extensive bodies of fresh water during a cold temperature period. The Ecca shales and sandstones lie above the Dwyka (Moll, 1976). Sandstones of the Ecca group crown the prominent escarpment (Schulze, 1982). Dwyka tillites are prominent downstream of the dam. Upstream of the dam the Dwyka tillites traverse alternating dark grey shale's of the volksrust formation and intrusive dolerite. Most of the area around the dam consists of horizontally bedded sandstones, shales and mudstones belonging to Beaufort and Ecca series of the upper Karoo system. The underlying geology at the dam consists mainly of shale[3] and arenite, with patches of tillit*e*s on the eastern sides of the dam. See Geological Map in **Figure 5**.

The dam area is associated with a variety of soil patterns (Camp, 1999) and this is based on the interaction of geology and climate (Scotney, 1978). In dry areas around Albert Falls Plinthic, duplex [4]soils exists with the dominant soil being Mispah soil. Margalitic soils are found in cool, moist upland landscapes, furthermore a wider spectrum of soils occur on Sandstones (Camp, 1999).

[3] Shale is a fine-grained sedimentary rock that forms from the compaction of silt and clay-size mineral particles that we commonly call "mud". This composition places shale in a category of sedimentary rocks known as "mudstones". Shale is distinguished from other mudstones because it is fissile and laminated. "Laminated" means that the rock is made up of many thin layers. "Fissile" means that the rock readily splits into thin pieces along the laminations.

[4] Duplex soils is highly variable, with the top-soils ranging from coarse sand to clay loam and the subsoil from light to heavy clay.

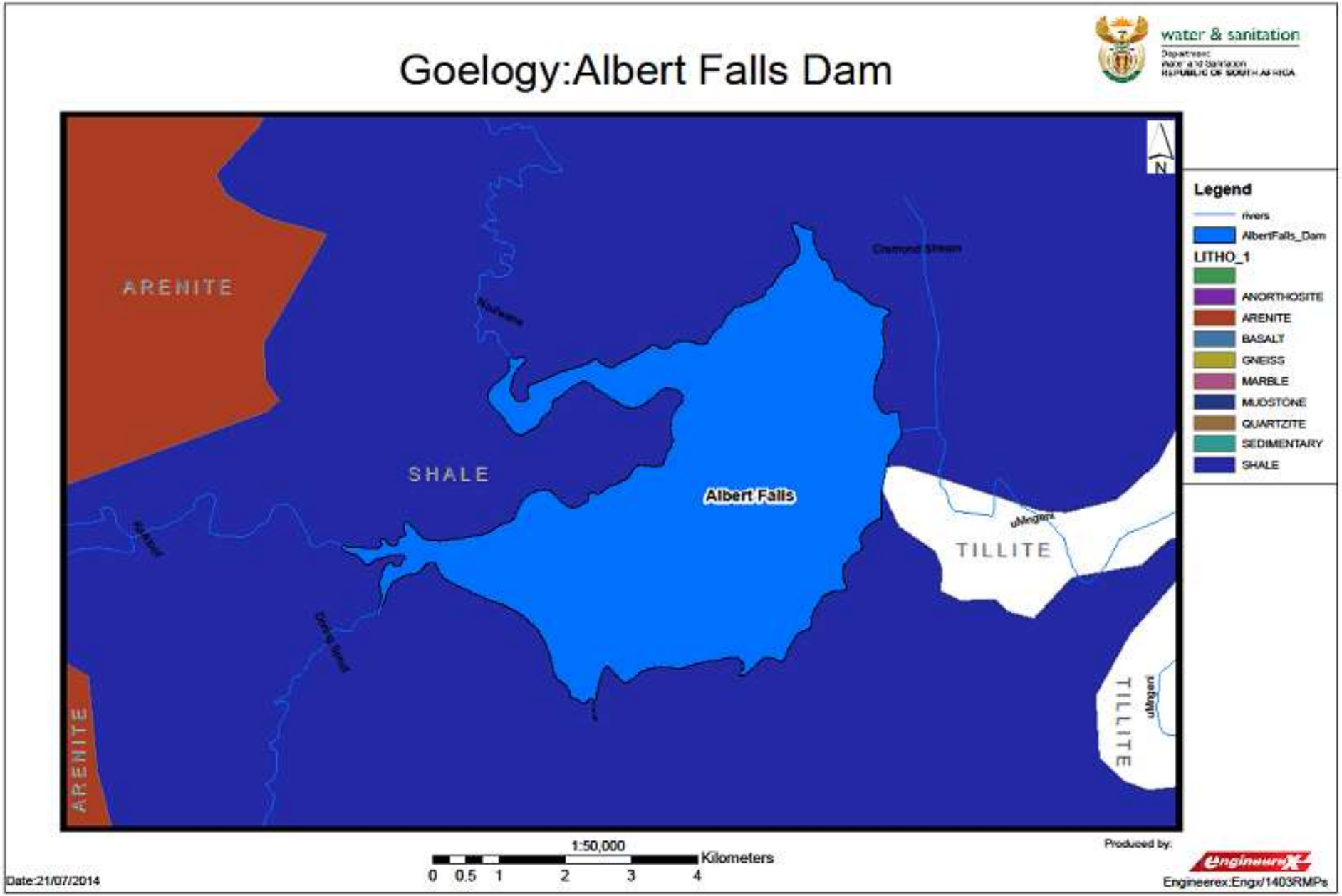

Figure 5: Geological Map for Albert Falls Dam

1.2.6 Hydrology

1.2.6.1 Surface Water

The Umgeni catchment covers about 1654 km^2 of central KwaZulu-Natal Province, South Africa. It is a crucial water source for the Greater Durban and Pietermaritzburg Metropolitan areas. The Albert Falls Dam receives water from Midmar Dam and feeds the Nagle and Inanda Dams. The Umgeni System comprises of four dams on the Umgeni River which include Midmar Dam, Albert Falls Dam, Nagle Dam and Inanda Dam. The Albert Falls Dam has a full storage capacity of **290.108 million m^3. Figure 6** depicts the fluctuations of the dam water levels over a year.

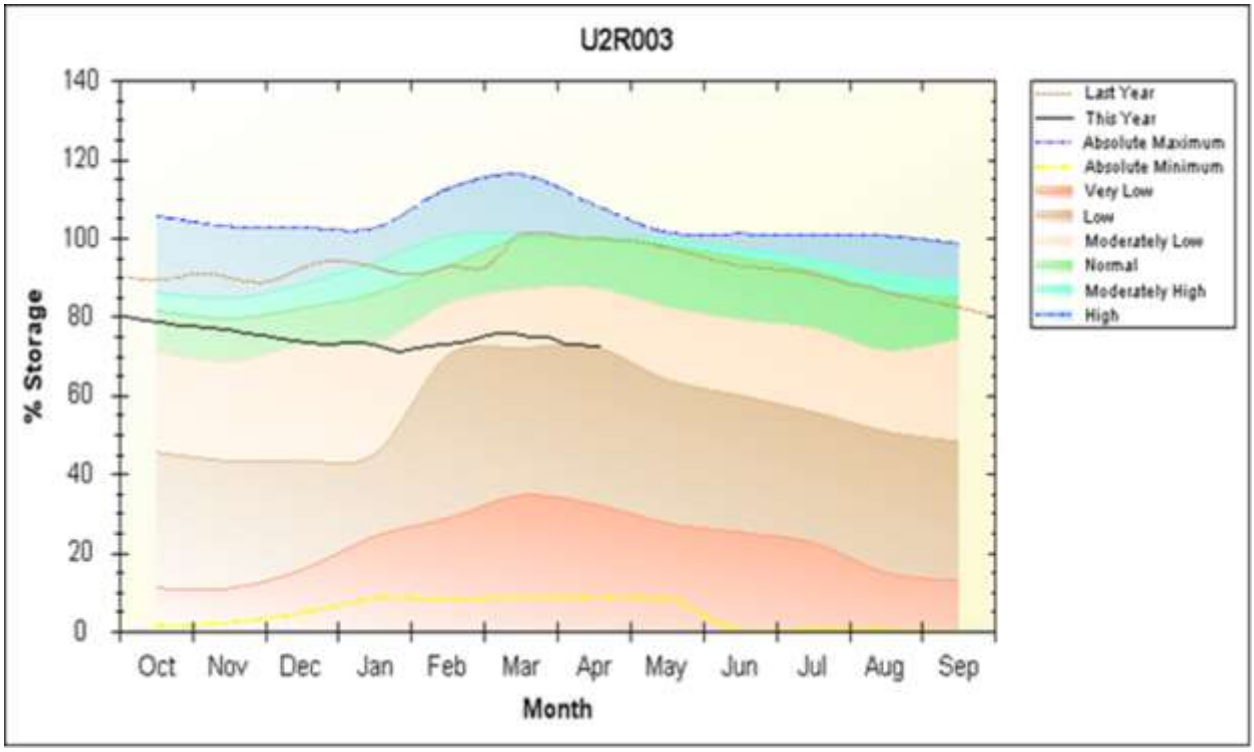

Figure 6: Fluctuations of the dam's water level over a year (DWS, 2015)

1.2.6.2 Water Quality

The increasing deterioration of water quality in the Umgeni River has been a concern in recent years due to various factors. The river gets impacted by the Howick Wastewater Treatment Works (WWTW) impact on the Umgeni River. Considerable impacts contribute to turbid and eutrophication in the Umgeni Catchment and this influences.

Table 6 shows the water quality variables for recreational purpose while **Figure 7** shows the E.Coli formation between the years 2010 to 2015.

Table 5: Water Quality variables at Albert Falls Dam

Characteristic	Tests Results	Water Quality Target Range (Recreational Purposes))	Effect
E- Coli	21	Greater than 20(DP)	Significant and increasing risk of infectious disease amount of water ingested required to cause infection decreases.
Turbidity	7.4	3.0 (RP)	Unsuitable for swimming. However, if lack of clarity (or turbidity) is the only consideration preventing the use of a water body for swimming, then it may be allowed, provided all subsurface, potential hazards are removed and signs indicating water depth are clearly posted. Risk of disease transmission by organisms associated with particulate matter increases but this cannot solely be determined on the basis of clarity measurements. May be some depreciation in aesthetic quality and enjoyment of the water body.
pH (pH units)	7.8	6.5 - 8.5 (RP)	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 absent.
Algae (Chlorophyll-a method, µg/chl-a)	1.37	0 - 15	No nuisance conditions may be encountered.
Ammonia (mg/L)	0.002	0 – 1.0 (DP)	No health and or Aesthetic effects can occur.
Magnesium (mg/L)	3.006	0 – 30 (DP)	No health effects
Potassium (mg/L)	1.51	0 – 50(RP)	No aesthetic or health effects
		1,38 - 2,76 (DP)	There is a strong possibility of other beta emitters, such as radium 228 being present, except where the potassium concentration in the water is or exceeds 100 mg/R, in which case there is no significant health risk
Sulphate (mg/l)	3.37	0 – 200 (RP)	No health or aesthetic effects are experienced
Electrical Conductivity (mS/m)	3.4	0 – 70 (DP)	No health effects associated with electrical conductivity of water are expected < 45 mS/m

Source: (Umgeni Water, 2010-2016)

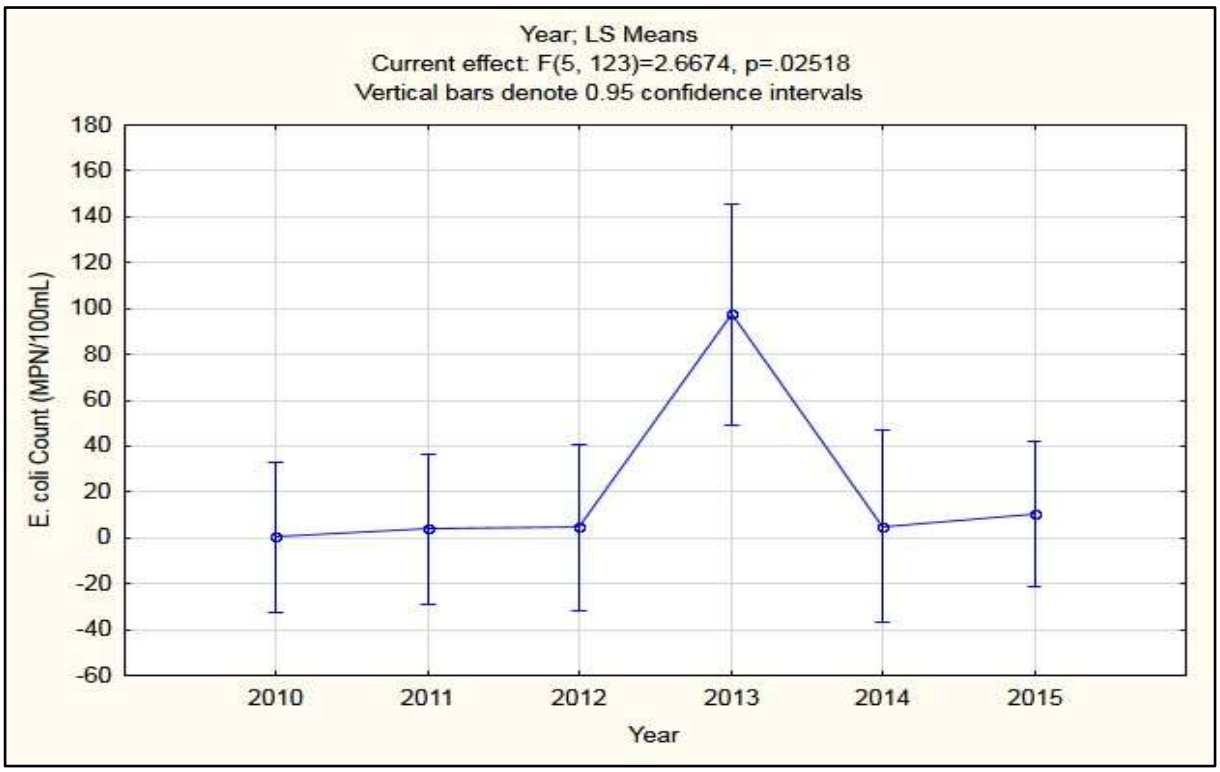

Figure 7: E-coli formation between 2010 and 2015 with Albert Falls Dam

Presence of *Escherichia coli* (e-coli)

The presence of *Escherichia Coli (E.coli)* bacteria in water indicates that there is faecal contamination of water through direct discharge of untreated sewage. The presence of *E.coli* in Albert Falls Dam comes from the Howick Waste Water Treatment Works (WWTW) in the upper stream. In 2013, the *E. coli* formation was highest in Mgeni River and could be attributed to poor management of the WWTW which at the time did not meet the standard limits for *E.coli* discharge. See **Figure 7** above *E-coli* counts between 2010 and 2015.

The chlorine dosage in the water could not have been optimal in treating the effluent to the acceptable Standards. The minimal chlorine dosage causes the minimal production of Free Chlorine in water to continue disinfecting the final effluent until to the point of discharge. If the conditions of the bacterial growth (faecal coliform) were favorable, the nutrients could have been abundant in the water.

High bacteria content in water systems are not suitable for recreational activities such as swimming because they can lead to fever, Nausea or stomach cramps for users.

1.3 BUILT ENVIRONMENT

1.3.1 Access

There are two formal access points managed by Msinsi Resorts and Game Reserves. Visitors pay an entrance fee for the facility to be used. The fees for infants up to the age of three years is free entrance and entrance fees for children under the age of 12 years are reduced by almost 50%. Pensioners over 60 also benefit from a special reduced entrance rate. **Table 6** illustrates different entrance fees for different age groups:

Table 6: Albert Falls Dam Entrance Rate (Msinsi, 2016)

Item		High Season	Low Season
Gate Entry Fee (Per Person)	Adults	R 32.00	R 32.00
	Children	R 20.00	R 20.00
	Pensioners	R 20.00	R 20.00

Visitors sign an access form which declares how many people are entering the Resort. All craft owners are encouraged to comply with the SAMSA Inland Waters Act at the dam.

1.3.2 Facilities

The dam is accessible to day visitors for picnics and water sports. There are self-catering 16 x 2 sleeper rondavels and 3 x 6 sleeper chalets and a secluded luxury Notuli cottage that can sleep up to 6 people. The area also has 14 shoreline sites, 33 electrical campsites, 7 non electrical campsites and up to 80 open sites. There are four ablutions that are serviced daily for campers.

1.4 USES AND USERS OF THE DAM

1.4.1 Primary Functions

"The purpose of the dam is to supply water to Nagle Dam supplemented with water transferred from the upper Mooi River. The river carries water to Albert Falls and Nagle Dams which are the main supply reservoirs for the greater Durban area, supplying more than 400 million litres of water per day for mainly domestic and industrial purposes. The river between the two dams carries water from Albert Falls dam, a storage reservoir to Nagle Dam from where the water is piped to Durban"(Msinsi, 2013).

1.4.2 Secondary Functions

The dam is also used for water based recreation activities such as boating and fishing. It is considered one of the world's top bass dams (Msinsi, 2013). Khayalami Bay on the western shore between the two conservation areas is an important part of Albert Falls Dam as it is utilised by the fishing clubs for fishing competitions.

1.5 RECREATIONAL INSTITUTIONAL STRUCTURE

Officially, Albert Falls Dam is owned by DWS who functions as the custodian of all state-owned surface water in the Republic of South Africa. Umgeni Water operates and maintains the dam. MRGR manages the secondary use of the dam (recreational and tourism related activities).

1.5.1 Management of Water Surface

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

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

1.5.2 Event Management

Permits must be issued by DWS prior to any event undertaken at the dam.

1.5.3 Zoning Plan

There is an existing zoning plan which describes and demarcates the various zones on the shorelines of the dam. The zoning plan requires updating as it focuses on the zoning of only the shores of the dam.

1.6 LAND OWNERSHIP

The following are legal matters associated with the dam;

1.6.1 Land Claims

There are existing land claims that have been lodged with the Department of Rural Development and Land Reform (DRDLR) (Land

Claims Commission) in terms of the restitution of Land Rights Act, 1994 (Act No .22 of 1994) .The properties around the dam are under the Albert Falls, Mgodi and the Magcekeni Community claims. Some of the properties under claim include government owned properties. The following is the list of properties extracted from the amended notice 333 of 2005 published in the Government Gazette No. 27324 on **4th March 2005**:

- Cramond 1803;
- Spurwing 14537;
- Zeekoe Hoek 968;
- Khayalami Estate 14941;
- Broughton 925;
- Zeekoegat 1173;
- Shooters Hill 908;
- Molden 13797;
- Ottos 13013; and
- Saxony 14444.

1.6.2 Access and Use Agreements

Only one agreement has been concluded with DWS at Albert Falls Dam which will be reviewed to ensure that they are in line with the RMP. Savoi Trust (under the trustee Mr. A. M. Voigte) has entered into a lease agreement with DWS.

1.7 SAFETY

There is a safety system in place at the dam and most of the no-go areas are marked at the dam. The Albert Falls Management Plan has following objectives with regards to safety:

- To put measures in place that ensures a safe and secure environment for visitors.
- To protect and secure the biological assets of Albert Falls.

Regular patrols around the dam and maintenance of the perimeter fence are initiated to ensure the safety of the dam and its surrounding natural resources.

Further safety measures need to be put in place to ensure the protection of fish species from poaching.

1.7.1 Safety of Navigation

There is currently no adequate, standardised and harmonised fixed and floating Aids to Navigation (AtoN)[5] and Demarcation Markers in place.

1.7.2 Incident Management

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

1.8 SENSITIVITY AND SURROUNDING USES

The dam is within a nature reserve. Most of the vegetation types of Albert Falls Area are classified within the Ngongoni Veld and the Natal Hinterland Thornveld. A Bird's sanctuary of the west bank has been identified as a sensitive area. The general land use or cover pattern of the Albert Falls Area during the period of 1944 to 2000 was mainly agricultural. Various governmental departments and policies that have been put in place helped in protecting the remaining patches of indigenous forests. Grassland decreased and also deteriorated in quality during 1944 to 2000.

Commercial Forestry predominates and showed an increasing trend from 1944 to 1967. Cultivated Land was observed to decrease at the expense of commercial forestry plantations and water bodies. Although sugarcane plantations increased after 1967, total cultivated land showed a decreasing trend. The construction of dam and other small Farm Ponds within the agricultural farms increased the land areas

[5] 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".

covered by water bodies (Yemane, 2003). The dam covers 2274 hectares from the total of 3590 hectares of the Msinsi Nature Reserve. The DWS owns 3090 ha while the remaining 500 ha is land leased by Msinsi.

1.8.1 Terrestrial Biodiversity

The area around the Albert Falls Dam has been noted as having low levels of formal protection combined with high levels of transformation and degradation diminishing the options for meeting conservation targets and deriving benefit from the associated tourism/recreational economic opportunities that are supported by areas of high value, well conserved natural areas (uMshwathi Local Municipality, 2013). A portion of Albert Falls was proclaimed and declared a nature reserve under the Nature Conservation Act.

Table 7 shows the terrestrial biodiversity sensitivity value around Albert Falls Dam.

Table 7: Terrestrial biodiversity sensitivity thresholds

Sensitivity Level	Threshold Irreplaceability Value
High Sensitivity	0.8-1.0
Medium Sensitivity	0.6-0.8
Low Sensitivity	0.2-0.6
Very Low Sensitivity	0.0-0.2

Conservation Irreplaceability value- 0. Where a planning unit has an irreplaceability value of 0, all biodiversity features recorded here are conserved to the target amount, and there is unlikely to be a biodiversity concern with the development of the site.

Irreplaceability value- 1. These planning units are referred to as totally irreplaceable and the conservation of the features within them are critical to meet conservation targets. (EIA very definitely required and depending on the nature of the proposal unlikely to be granted). **Irreplaceability value > 0 but < 1.** Some of these planning units are required to meet biodiversity conservation targets. If the value is high (e.g. 0.9) then most units are required (few options available for alternative choices). If the value is low, then many options are available for meeting the biodiversity targets. See **Figure 8** for sensitivity of the areas' biodiversity (uMshwathi Local Municipality, 2013).

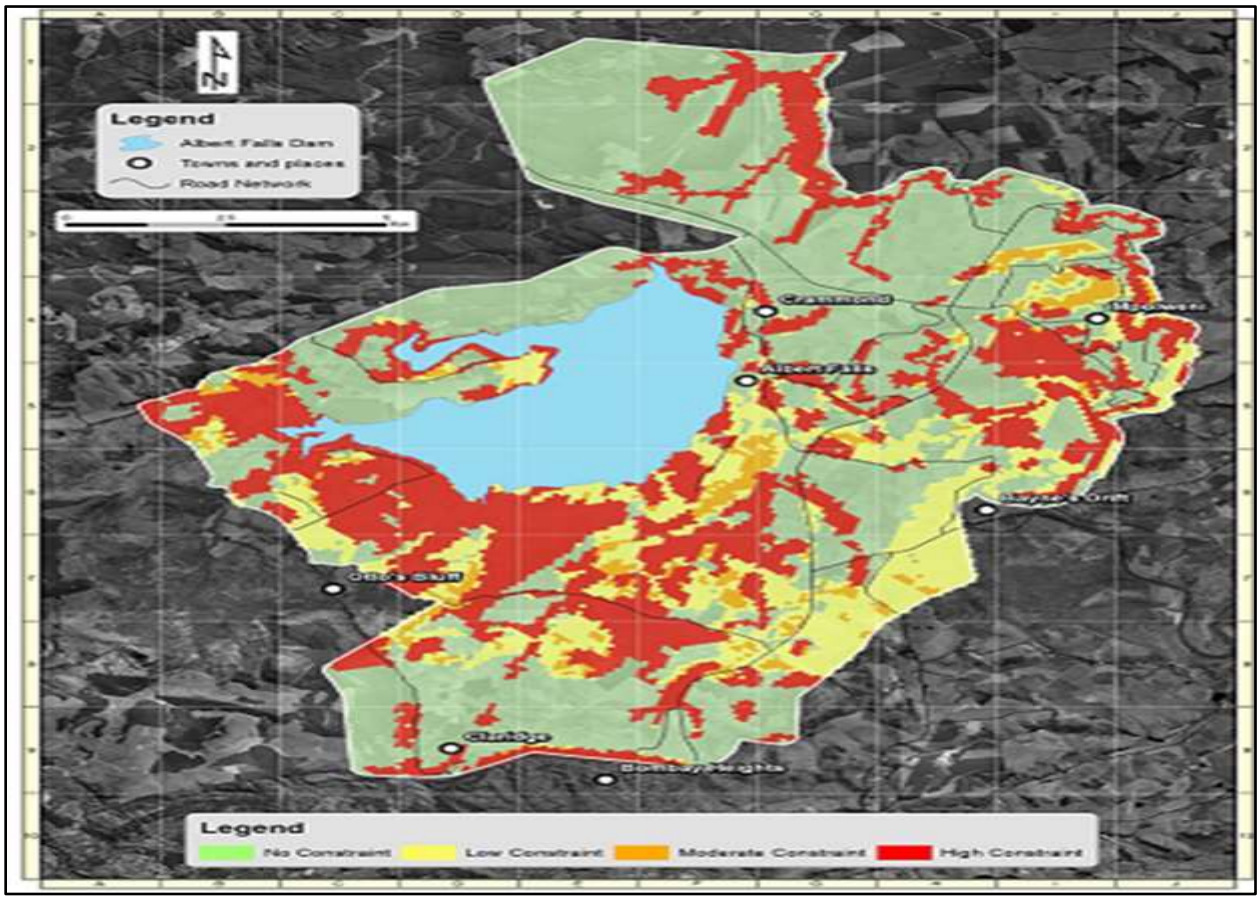

Figure 8: Terrestrial biodiversity sensitivity zone (uMshwathi Local Municipality, 2013)

1.8.2 Wetlands

Extremely high levels of loss and degradation have reduced the capacity of wetlands to ameliorate the serious water quality issues in the catchment and sustain species with high conservation value.

The buffer zones represents a zone of lesser, but still significant sensitivity as activities in the buffer and even the immediate catchment can indirectly alter the condition of a system. It is important to note that within the purchased boundary there no significant wetlands which may negatively affect activities or developments at the dam. Relevant laws must be followed before implementation of any activities. See **Figure 9** for Wetland sensitivity zones.

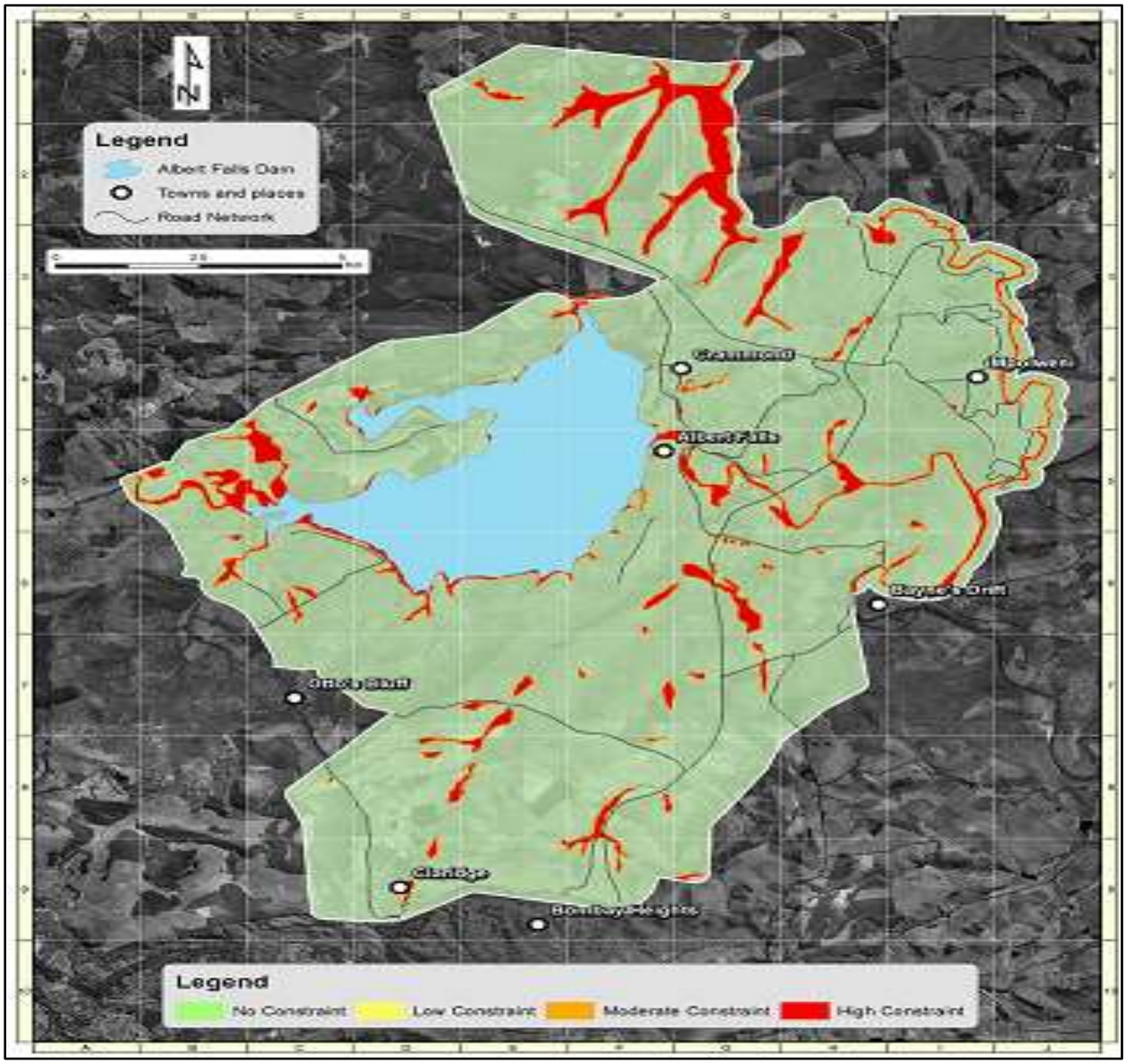

Figure 9: Wetland sensitivity zones (uMshwathi Local Municipality, 2013)

1.9 SOCIO-ECONOMIC ENVIRONMENT

1.9.1 Social Audit

The main purpose of social audit is to examine the general status of the study area and to determine issues that need to be addressed when developing the RMP in order to overcome potential difficulties in an area. The study area falls within Ward 1, 6 and 11 of the uMshwathi Local Municipality. An understanding of socio-economic conditions of Ward 1, 6 and 11 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 and employment status was undertaken and is presented in section 1.9.1.1 and 1.9.1.2, respectively.

1.9.1.1 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. According to the data from census 2011, it shows that a large number of learners reach high school, but only 33% graduate from high school. As indicated by the above table and chart, only a small percentage of the population has furthered their studies in higher institutions. Refer to **Table 8** and **Figure 10**.

Table 8: Education level of ward 1, 6, 11

Description	Ward 1 (2011)	Ward 6 (2011)	Ward 11 (2011)	Total Percentage
Primary level	846	389	460	21.52%
Secondary level	1477	983	764	40.93%
Higher education level	23	38	58	1.51%
No schooling	1351	898	590	36.04%

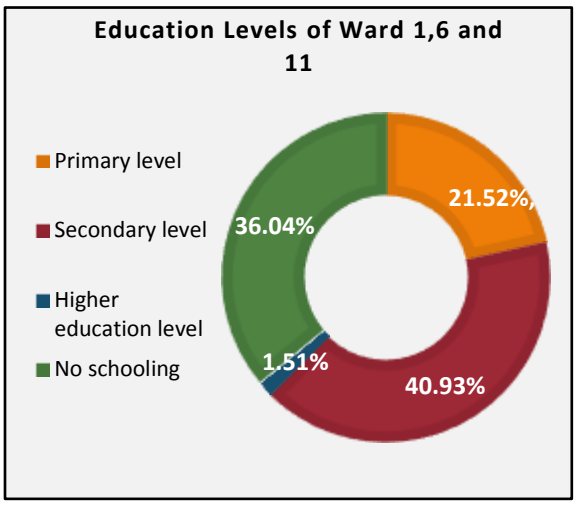

Figure 10: Education levels of ward 1, 6 and 11

1.9.1.2 Employment Status

The uMshwathi Local Municipality has an unemployment rate [6] of 10.76%. So with the development of the RMP the community might benefit from recreational activities. In terms of employment levels within Ward 1, 6 and 11, majority of residents are employed in ward 1 with the least employed in ward 6 and only 10.76% of residents are unemployed. A greater amount of 45.95% of the residents are not economically active[7] whereas 8.42% of them are discouraged work-seekers strongly signifying that they no longer seek to become employed (Census, 2011). Refer to **Table 9** and **Figure 11** below.

Table 9: Employment level of ward 1, 6 and 11

Description	Ward 1 (2011)	Ward 6 (2011)	Ward 11 (2011)	Percentage
Employed	5166	462	465	34.97
Unemployed	642	616	599	10.76
Discouraged work-seekers	336	824	308	8.42
Not economically active	2686	2536	2786	45.95

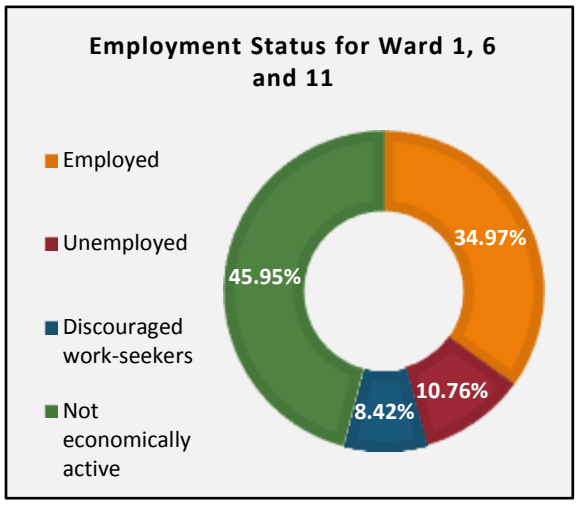

Figure 11: Employment status for ward 1, 6 and 11

1.9.2 Community Beneficiation

It is DWS's belief that Local Communities should equally share the benefits emanating from the utilisation of the dam for recreational purposes, by ensuring that they have both physical access

[6] The unemployment rate is a measure of the number of people who are both jobless *and* looking for a job. This measurement is considered a lagging indicator, confirming but not foreshadowing long-term market trends.

fraction of a **population** that is not employed nor actively seeking employment.

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 Albert Falls 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:

- Communal Land Rights Act, 2004 (Act No.11 of 2004).
- Disaster Management Act, 2002 (Act No.57 of 2002).
- Environmental Conservation Act, 1989 (Act No, 73 of 1989).
- Intergovernmental Relations Framework Act, 2005 (Act No.13 of 2005).
- Land Administration Act, 1995 (Act No.2 of 1995).
- Local Government: Municipal Systems Act, 2000 (Act No.32 of 2000).
- National Heritage Resources Act, 1999 (Act No.25 of 1999)
- Occupation Health and Safety Act, 1993 (Act No.85 of 1993).
- Restitution of Land Rights Act, 1994 (Act No.22 of 1994).
- Spatial Planning and Land Use Management Act, 2013.
- State Land Disposal Act, 1961 (Act No.48 of 1961).
- uMngeni Spatial Planning and Use Management Bylaws, 2016.
- uMshwathi Spatial Planning and Land Use Management Bylaw, 2016.
- **Safety of Navigation:** In addition to its common-law responsibility, DWS is, in terms of the requirements described in the National Water Act, Act No 36 of 1998, amongst others, responsible for the safety of GWWs. DWS, its delegated public sector partner, or a delegated water management institution, has therefore the responsibility to provide

the required fixed and/or floating AtoN for general navigation.

In addition to the DWS, Local Accountable AtoN Parties (LAAP) and other Bodies providing access to Government waterways and watercourses have a responsibility to ensure that the required fixed and/or floating AtoN are provided after obtaining the necessary support from DWS and thereafter the permission by SAMSA. In order to demarcate specific zones/ areas, standardised demarcation markers are to be used in conjunction with the relevant AtoN.

- SAMSA Marine Notices and its Directive on the Standardisation of fixed and floating AtoN and Demarcation Markers on all navigable Inland Waterways in the Republic of South Africa.

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

CHAPTER 3: WHAT IS A RESOURCE MANAGEMENT PLAN

3.1. DEFINITION OF RMP

A Resource Management Plan (RMP) is a plan which aims to regulate access and the recreational 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.

3.2. PURPOSE OF THE RMP

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

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

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

3.3. PROCESS TRIGGERS

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

A number of generic factors have been identified by DWS for the development of RMPs, however, the Process Facilitator identified site specific trigger factors, as illustrated in **Table 10.**

Table 10: Trigger Factors for the Development of Albert Falls Dam RMP

Trigger Factors	Description
Resource Management	**Fish Species** • The fish species within the dam are being poached by surrounding communities because they are unable to afford the entrance fee. As a result the community members are resorting to unlawful access which further poses threat on the aquatic species. **Water Quality** • The water quality of the dam will be negatively impacted if effluent discharge from Howick Wastewater Treatment Works is not remediated accordingly. As a result this will hinder the protection of the water quality for recreational use as well as the primary purpose of the water resource. **Water Utilisation** • The water level of the dam will be impacted if the abstraction of water from the dam is not regulated.
Community Participation and Beneficiation	**Community Beneficiation** • The economic potential of the dam has been noticeable. The dam attracts a lot of tourist therefore the local community must benefit through the establishment of effective Public Private Partnership (PPPs).
Public Policy	**Local Planning Initiatives** • The dam is an important part of the municipality as it supports industries and agriculture sector that produces 20% of South Africa's Gross National Product, therefore the dam needs to be integrated in the uMshwathi Local Municipal Development Plans and Policies such as Integrated Development Plan (IDP), Environmental Management Framework (EMF), and Spatial Development Framework (SDF).

3.4. RMP DEVELOPMENT PROCESS

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

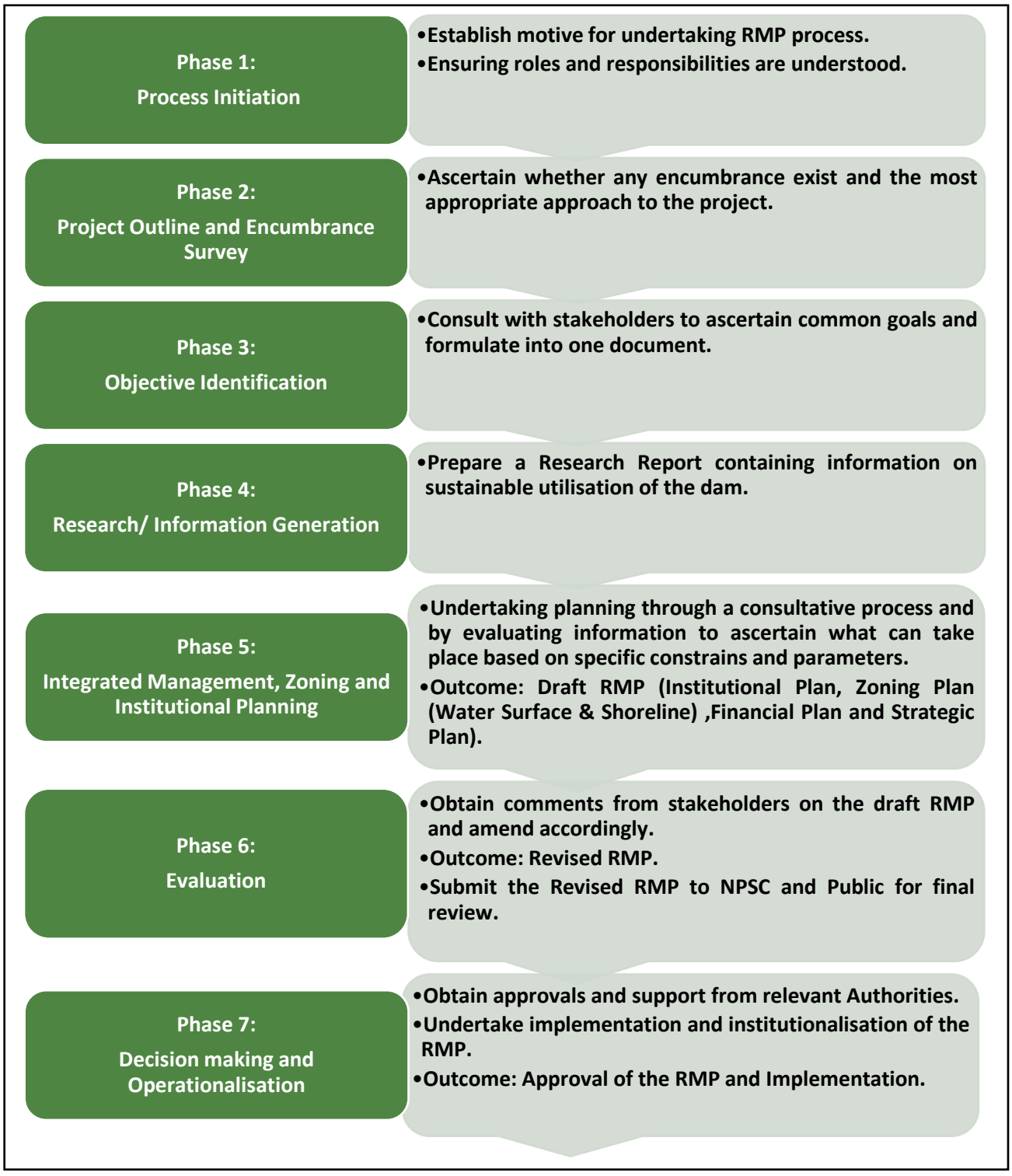

Figure 12: RMP Procedure

3.5. RMP PLANNING STAGES

3.5.1. Desktop Study

The desktop study was conducted with the aim of acquiring background information about the Albert Falls 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 Albert Falls Dam on **21 May 2014** to gather baseline information using a checklist questionnaire. The site inspection was undertaken with officials from DWS (Integrated Environmental Engineering (IEE) and the Eastern Operations) and Msinsi Resorts. 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).

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

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

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

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

3.5.3.1. The Planning Phase

The Planning Phase entails three (3) important aspects namely;

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

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

3.5.3.1.1. The Role Players

It is recognized that different roles and responsibilities of the stakeholders (Authorities and I&APs), and their relationship towards each

other and the steps in the planning procedure are imperative in the successful development of the RMP. It is also important that proper consultation with the public is done in order to produce a credible RMP. 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 A)**. The stakeholder list is updated on a continuous basis throughout the RMP process.

3.5.3.2. The Participation Phase

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

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

3.5.3.3. The Exit Phase

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

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

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

3.5.3.4. The Advertising Process

3.5.3.4.1. Compilation and Distribution of 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 B**).

3.5.3.4.2. Newspaper Advert

A Newspaper advert regarding the RMP project was placed in the **Ilanga Newspaper**. The advert invited the public to attend the Public Participation Meeting. The advert was published in English on **3 July 2014**. Furthermore, an advert for the draft RMP was advertised on 24 **January 2016**. (See attached **Appendix C**).

3.5.3.4.3. Flyers Compilation and Distribution

Flyers were also used as a form of notification, they aimed at informing the I&APs about the public consultative meetings. The flyer detailed a brief description of the RMP, meeting date, time, venue and relevant contact details. The flyers were compiled in English and were distributed on **3 July 2014**.

The flyers for the draft RMP were distributed on 18 January 2015 (See attached **Appendix D).**

3.5.3.5. Direct Communication

3.5.3.5.1. E-mails

Meeting invitations were sent out to authorities and I&APs notifying them about the scheduled consultative meetings. The invitation entailed the BID, meeting venue and time. The email notification was sent out on **3 July 2014**. Moreover, the meeting invites for the draft RMP

were sent out on **24 January 2016** (**See attached Appendix E**).

3.5.3.5.2. Authority Meeting

The initial authority meeting was held on **08 July 2014** at **Albert Falls Dam Hall.**

The purpose of the meeting was:

- To present the RMP, 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 **31 March 2016.**

3.5.3.5.3. Public Meeting

The initial public meeting was held on **08 July 2014** at **Albert Falls Dam Hall.** A platform was also given to I&APs to identify encumbrances / challenges that might hinder the progress of the RMP as well as to identify objectives and vision for the Albert Falls Dam.

3.5.3.5.4. Comments and Responses Register

A copy of the draft report was circulated on **18 January 2016** for commenting. The commenting period was to elapse on **31 March 2016.** (See attached **Appendix F**).

3.5.3.6. **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 11**.

Table 11: Planning Partners and their Respective Mandates

Department/ Agency	Mandate
uMgungundlovu District Municipality/ uMshwathi Local Municipality (EDM/TCLM).	The dam is within the jurisdiction of the municipality which is mandated to provide bulk water services.
Umgeni Water	Water Board which is responsible for providing potable water to most of the local authorities in KZN. Reports to the Minister of Water and Sanitation.
Msinsi Resorts and Game Reserves	Responsible for the management of the biodiversity and recreation facilities in Albert Falls Dam.
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/ Agency	Mandate
Department of Environmental Affairs (DEA).	Responsible for Biodiversity Management within the dam including Invasive Alien Species.
Department of Public Works (DPW).	Has the power to regulate and control the use of state land outside the GWWs. In this regard, lease agreements or permits will be required from the department as some of the recreational activities will overlap into the state land.
Department of Transport (DoT)	Responsible for legislation, policy and regulations for all transportation in South Africa, including shipping and other transport by water or sea also inland waterways.
National Treasury (NT)	The use of State assets is governed by National Treasury Regulations, requiring DWS to plan concessions in compliance or association with National Treasury, guided by the Tourism Public Private Partnership (PPP) Toolkit of 2005.
South African Maritime Safety Authority (SAMSA)	One of SAMSA's three legislative mandates is "to ensure safety of life and property at sea". The Act enables SAMSA to administer and execute the relevant maritime legislation.

3.6. RMP DATA ANALYSIS

3.6.1. Encumbrance Survey (Phase 2)

The purpose of the Encumbrance Survey (Phase 2) is to investigate/ ascertain whether any encumbrances exist around the dam and other factors that may influence the development and implementation of the RMP. It also identifies the information that is required for effective decision-making regarding the RMP (DWAF, 2006).

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

Tables 12- 14 outline the summary of limitations that might affect the development or implementation of the RMP for the dam:

Table 12: Summary of Biophysical Encumbrances

Item	Description
Topography	• Generally the dam has an undulating topography which will alter activity development. Construction of recreational facilities will have challenges (e.g. it might cost a lot of money to construct facilities).
Geology	• Shales are by far the most pervasive and problematic degradable material (Taylor, 1948), therefore development of structures on an unstable rock type will result in crumbling of recreational facilities posing danger to the users.
Water quality	• The dam will be affected by upstream activities such as Howick wastewater treatment works which discharges effluent into the watercourse which will have an impact on the water quality of the dam. As a result water sports such as swimming can eventually become compromised. There have been significant presence of E.coli in the dam but compared to recreational standard limits of DWS, the average count in 2013 was still within acceptable limits (below 130MPN/100ml). The E.coli counts pose threat to the primary purpose of the dam.
Biodiversity	• Introduction of Alien Plant Species to the dam which will result in increased competition amongst native species and also limiting recreational activities such as boating. • Destruction of bird life, their breeding sites and habitat which will impact on their survival and reproduction.

Table 13: Summary of Social Encumbrances

Item	Description
Tourism	• There is only two (2) access point that exists for the public as the dam is surrounded by private farmers and the local communities are unable to afford the access fees to the dam.
Infrastructure	• Currently the tourism infrastructure at Albert Falls Dam are "run-down" which will negatively affect events hosted at the dam.

Table 14: Summary of Existing Plans Encumbrances

Item	Description
Zoning Plan	• The existing zoning only focuses on the land zoning excluding the water zoning therefore sensitive sites inside the dam such as fish breeding sites can be threatened by fishermen.
Existing Institutional Plan	• The institutional plan of Albert Falls Nature Reserve is functioning in isolation from other stakeholders.

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

3.6.2. SWOT Analysis and Objective Identification

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

3.6.2.1 SWOT Analysis Approach

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

Table 15: SWOT Analysis for Albert Falls Dam

Strengths	Weaknesses
• Albert Falls Dam is one of the biggest fishing dam by-far. • The dam is an important part of the Local Municipality as it supports industry and agriculture that produce 20% of South Africa's gross national product. • Tourism is expanding at the dam. • The dam is surrounded by farmers which reduces criminal activities.	• Access fees to the dam are high. • The registration process for the boat users are very strident. • There is currently a problem with adjacent landowners (Access Issue) at Albert Falls Dam due to non-confirmed legal rights, therefore a legal audit needs to be undertaken at the dam. Under the old act the adjacent landowners had riparian rights which is a different case with the new Act. • Lack of access control. • The entrance fee at the dam has a levy which is meant to benefit the community currently that is not occurring. • Dam users receiving discounts only when using a credit card to pay for the entrance, as opposed to cash.
Opportunities	**Threats**

• Introduction of water sports to the community (Sailing and canoeing). • Thokozani community are interested in promoting Zulu Heritage at the dam as a tourist attraction. Local entrepreneurs want to use the dam as a setting for business opportunities. • Community can access the dam without having to pay the hefty entrance fee. • The community can own and manage trail walks which might inject money to the community • Opportunity to introduce the hydro-power generation to the dam. • The community wants to introduce music festival at the dam which will be part of community beneficiation. • The money generated from access fee (levy) should be used to introduce a Natural Scientist at the Albert falls school which will educate the learners about the water and environment programs. • Msinsi should not only employ unskilled labour they should also consider having bursaries for skill development in the community. • Fishing activities should be introduced to the Albert Falls local community and not only focus on the tourists.	• Crocodiles have been observed at the dam by the private land owners which might endanger the life of the public using the dam. • Possible leakage of Septic Tanks located close to the water. • The significant run-down of tourism infrastructure at Albert Falls Dam. • Thermal stratification does occur in the impoundment during the summer period, which will result in the release of cooler water, with lower oxygen concentrations. However, it is also the larger volumes of water which is released and the unnatural pattern of the hydrograph (higher flows than normal during the winter period) that may have an impact on the downstream aquatic life. • The growth of the human settlement (development of houses) around the dam will lead in an increase of septic tanks impacting negatively on the water quality • Activities which are practised by different land uses around the dam (.e.g. untreated effluent from Treatment Plant upstream) will lead to the deterioration of the water quality. • Introduction of Alien Plant Species. • Abstraction of the water from the dam without authorization. • Private landowners owning property adjacent to the dam having a perception that they own the land near the dam causes hindrances for future developments around the dam. • Unlawful fishing poses a major threat causing an imbalance in the fish population.

3.6.2.2 **Objective Identification (Phase 3)**

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

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

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

KPA 1: Resource Management

- To ensure that there is accelerated scrutiny in the process of attaining lease agreements. Further ensure that the agreements are reviewed and promote regular monitoring of the leased property**;**
- To ensure the re-establishment of native species that belong to the Albert Falls area;
- To maintain, control and minimize the impacts of Alien Aquatic Vegetation in order to further maintain the ecological value of the water resource and surrounding state land; and
- To ensure the protection and sustainable utilization of the water resource in the dam.

KPA 2: Resource Utilisation

- To promote equitable access to the dam;
- To introduce water based recreational activities that are regulated and meet the user satisfaction to the previously disadvantaged communities; and
- To initiate events such as music festivals at the dam that will be part of community beneficiation and participation.

KPA 3: Benefit Flow Management

- To ensure that the local communities participate and benefit from economic development occurring within and around the dam;
- To allow local fishermen access to fish for subsistence purposes and encourage participation in the management of the dam;
- To improve the lives of Albert Falls communities by implementing skills development and training. Furthermore this will ensure safety of community members at the dam; and
- To update the institutional structure to ensure the effective management of the dam.

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 dam in which the biological diversity, water quality and ecological processes are maintained, whilst promoting socio-economic benefits, with the continued support of its primary purpose".

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

3.6.3. Research/ Information Generation (**Phase 4**)

The aim of undertaking the research process was to collect the relevant data about the dam so as to assist the decision makers regarding the sustainable utilization of the dam and the surrounding State Land where applicable. The report will serve as a decision-making tool, guided by the objectives set for the dam and any limitations due to encumbrances. The report documents the following data as Illustrated in **Figure 13**.

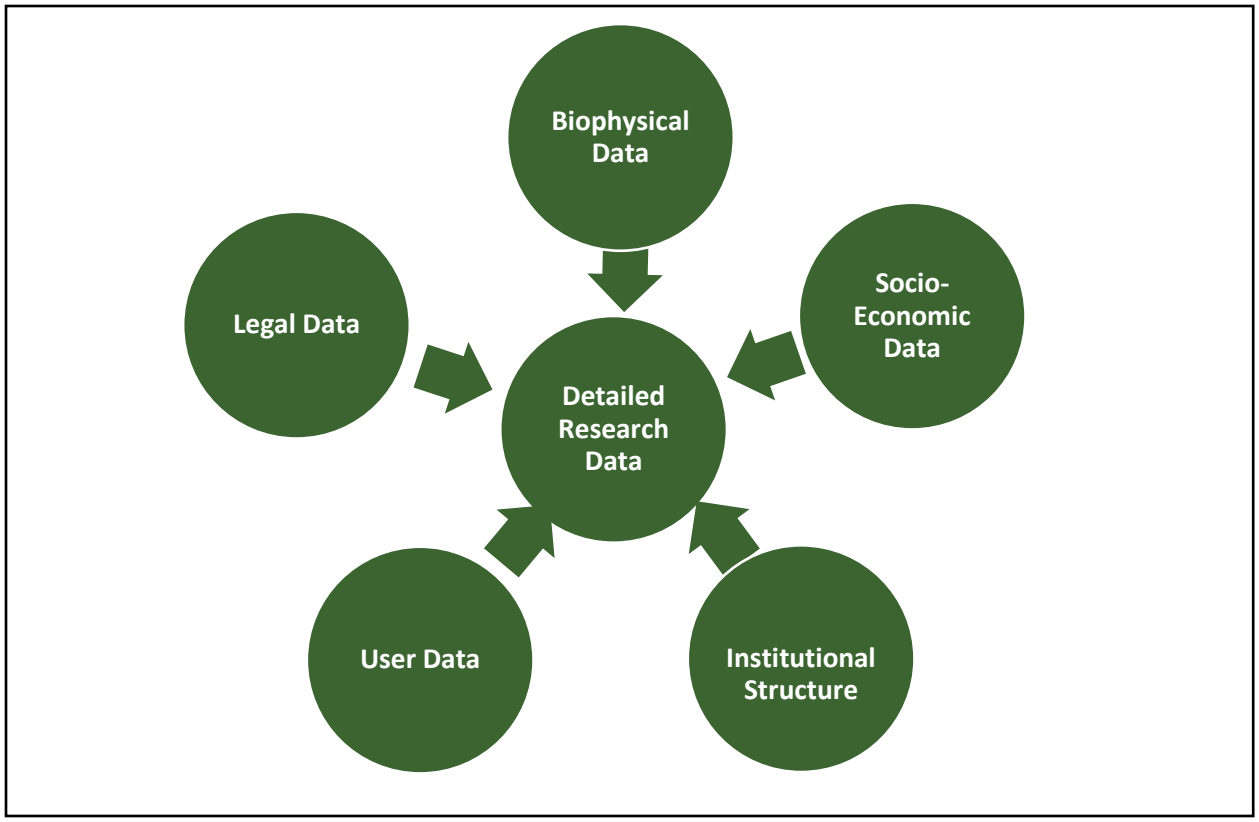

Figure 13: Research Data

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

3.6.3.1 **Tourism Development Potential**

According to municipal IDP Albert Falls Dam plays a major role in supporting tourism and recreation at a local and regional scale, and also has real estate value which is significant at a local level to the municipality. Albert Falls Dam and Nagle Dam are the most substantial tourist attraction in the uMshwathi Local Municipality.

Based on the availability of these two large dams, the municipality is fairly well positioned as an alternative tourism destination with the focus on eco-tourism. Presently within the municipality there is lack of coordinated planning, development and marketing efforts, with the result that the potential of the tourism sector has not yet been realized.

3.6.3.1.1. Current recreational Activities

The dam and its surrounding environment offers water-skiing, sailing, nature trails, fishing, bird watching and game viewing. Along the shoreline are well appointed campsites from where there are antelope grazing close by. Game viewing will reveal White Rhino (only two left at the reserve), Blesbok, Giraffe, Warthog, Zebra, Impala and a wide variety of birdlife. Clean hot and cold water showers and washing facilities ensure the popularity of this venue every holiday. Spend days enjoying the ±250 species of birdlife amid an atmosphere of serenity. Conference facilities are available at the dam in formal or casual settings.

3.6.3.2 **Feasibility of Identified Potential Objectives**

According to DWAF (2006), the feasibility of the proposed objectives needs to be determined in light of the local environmental conditions.**Table 16** shows the practicability of all proposed recreational objectives.

Table 16: Feasibility of Potential Recreational Objectives

KPA 1: Resource Management		
Objectives	**Status Quo**	**Practicability**
• To ensure that lease agreements comply with the stipulated conditions.	• The dam is surrounded by private properties. There is only one (1) formal agreement that exist between Savoi Trust and DWS.	• Coordination between DWS and lessee will ensure compliance of the lessee with the conditions of the lease. All the lease agreements should be in accordance with National Treasury Regulation (Public Finance Management Act No. 1 of 1999) and the implemented RMP.
• To ensure the re-establishment of indigenous species at the dam.	• The general land use or cover pattern of the Albert Falls area is mainly agricultural and the grassland in the area has been degraded. Commercial forestry plantations are generally the dominating land use.	• Re-establishment of indigenous Species might be considered as a challenge on the western, northern and eastern sides of the dam, due to the current land uses (agricultural land use).
• To control the Alien Invasive Vegetation in the area.	• The dam has Invasive Species. MRGR is currently involved in Alien Species control programmes assisting in the removal of such species.	• Alien Invasive control falls within the Working for Water Programme of DEA as well as Land Use Management within the Department of Agriculture, Forestry and Fisheries (DAFF). • The use of wash bays assist to prevent the spread of Aquatic Alien Species, this has to be established in accordance with the NWA Regulations.
• To preserve and maintain the high standard of water quality of the dam.	• The water quality in the Umngeni River is of concern because of effluent discharges from Howick Wastewater Treatment Works (WWTW) contribute to the turbidity and nutrient-rich water which might lead to eutrophication in the dam.	• Enforcement of all relevant environmental legislations (e.g. NWA and NEMA) and continuous monitoring of the dam will inform the state of the dam. • Rehabilitation of the Howick WWTW.

KPA 2: Resource Utilisation		
Objectives	**Status Quo**	**Practicability**
• To promote equitable access to the dam.	• The dam is within a Nature Reserve and limited number of local community utilize the dam mainly because of the entry fee. The fee is considered to be high, which, makes it difficult for the community to access the dam.	• A cost structure that is market related and will be affordable to local visitors and tourists.
• To introduce water based recreational activities that are regulated and meet the user satisfaction.	• The dam offers recreational activities such as water-skiing, sailing, nature trails, fishing, bird watching and game viewing, however, there are often crocodiles spotted at the dam which restricts water contact sports like swimming.	• The presence of bass fish species do not have a negative impact in the dam, however, the monitoring programme should be implemented to maintain the balance between the indigenous and the alien species. • The presence of crocodiles in the dam will limit a number of water based activities.
KPA 3: Benefit Flow Management		
Objectives	**Status Quo**	**Practicability**
• To ensure that the local communities participate and benefit from economic development occurring within and around the dam.	• Currently the communities adjacent the dam are poverty stricken, have poor basic service delivery and low literacy levels. The lack of resources (finance) and capacity (education) is currently limiting the ability of community members to participate in the recreational industry.	• The training of the locals to equip themselves and become active participants in the tourism sector Identifying the marketing strategies and funding mechanisms that can assist the local communities to invest in the recreational industry at the dam.
• To allow local fishermen access to the dam for subsistence fishing purposes.	• There is currently two (2) access open for the public, other accesses to the dam are through private properties and cannot be used by the public. • The local fishermen are unable to afford the access fees to the dam, which lead to unlawful fishing at the dam.	• Funding mechanism that will provide local fishermen with equitable and affordable access to the dam for fish harvesting. • The management structure should ensure that the fishery industry is in line with regulation such as the Marine Living Resources Act, 1998 which will assist in regulating fishing at the dam. • An agreement should be in place between local community, Msinsi and DWS for fish harvesting.

• To improve the livelihood of Albert Falls communities by implementing skills development and training.	• Albert Falls Dam currently provides job opportunities for the greater number of people in the local community which assist in poverty alleviation in the community. Preference is given to community members for job opportunities that arise within the Reserve.	• MRGR has implemented community programmes such as Alien Species Control which assist in skills development within the local community. Similar programmes that assist in community development and beneficiation should be supported. • Identifying the marketing strategies and funding mechanisms that can assists the local communities to invest in recreational activities at the dam.
• To update the existing Institutional Plan to assist in effectively managing the recreational utilization of the dam and the surrounding environment.	• Currently the operations and maintenance at the dam are managed by Umgeni Water whereas MRGR manages the recreational utilization of the dam and surrounding environment.	• To appoint Umgeni Water as the Implementing Agency (IA). • Roles and Responsibilities of the IA to be clearly defined.

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 in **Figure 14.**

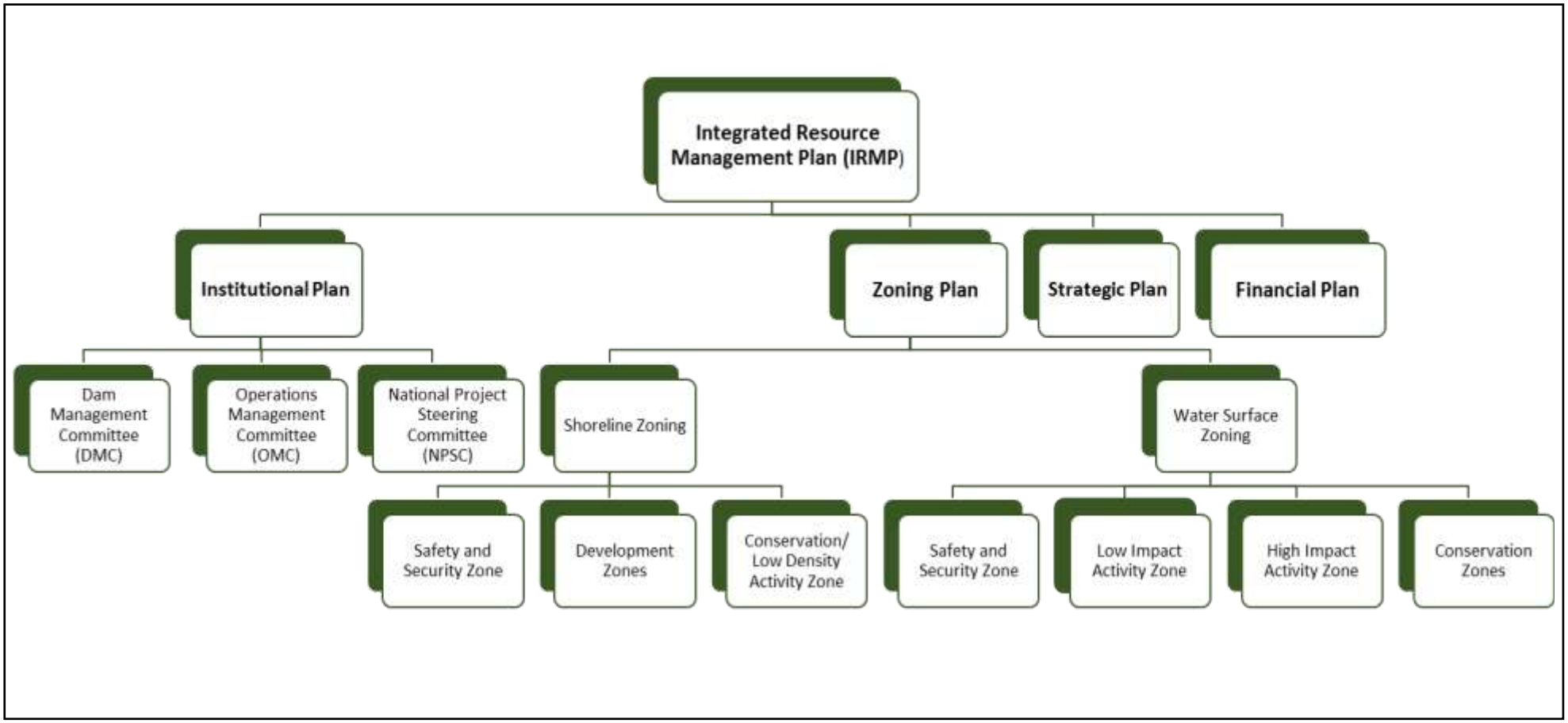

Figure 14: Integrated Resource Management Plan

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, will also form part of the institutional structure.

4.1.1. Dam Management Committee (DMC)

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

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

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

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

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

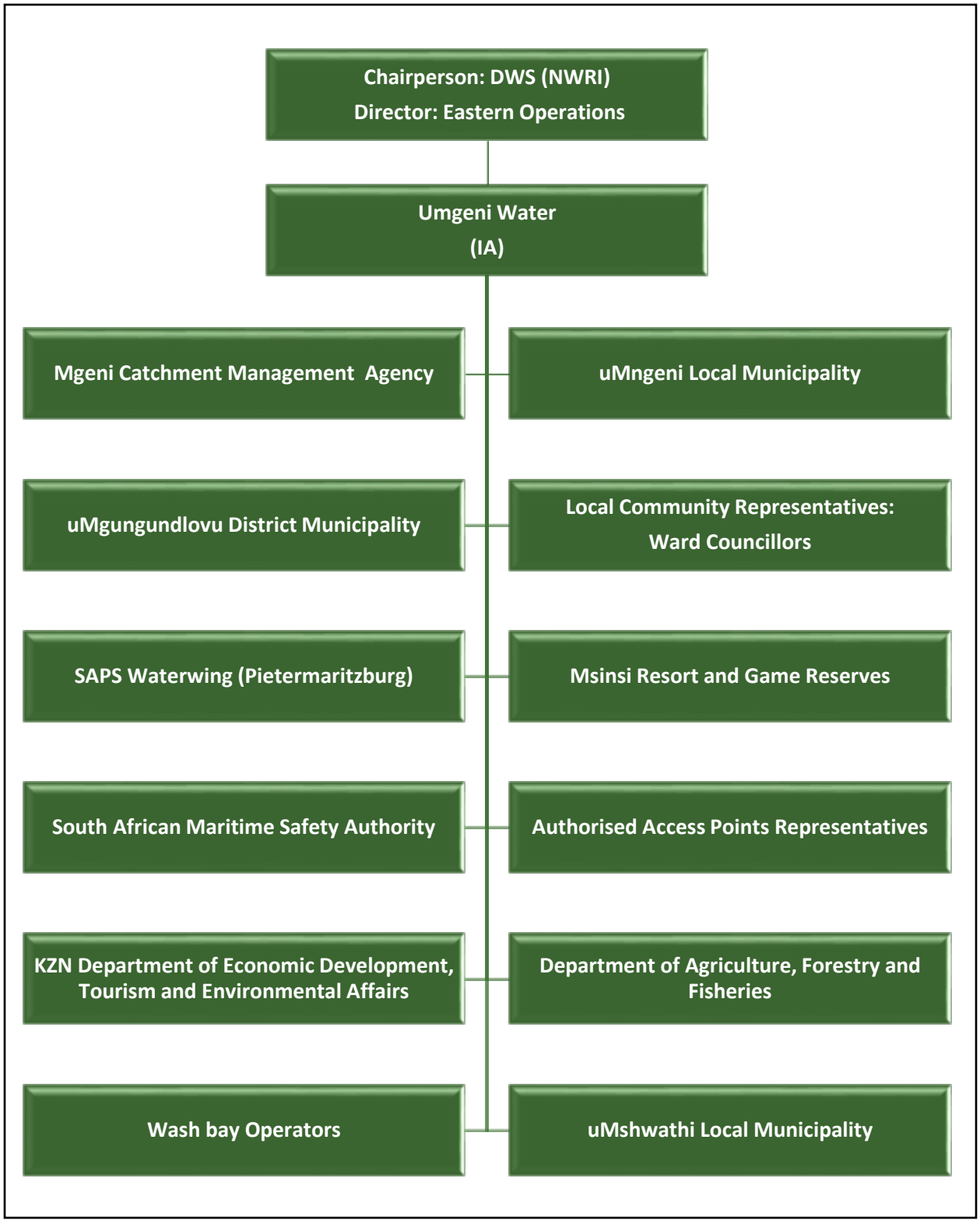

Figure 15: Proposed DMC

The DMC will have a number of management tools which will enable proper management of the dam in line with legislative requirements.

4.1.1.1 Management Tools

Terms of Reference

The DMC and NPSC will be guided by Terms of Reference (ToR) regarding roles and responsibilities. ToR is not required for the **OMC** as this is existing reporting structure. The ToR provides guidance on the following management aspects:

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

Agreements

One of the main management tool available is the use of agreements to ensure proper use of the dam in line with the RMP vision and objectives. Only one agreement has been concluded with DWS at Albert Falls Dam which will be reviewed to ensure that they are in line with the RMP. Savoi Trust (under the trustee Mr. A. M. Voigte) has entered into a lease agreement with DWS.

All the existing agreements would be reviewed within the 12 months of the RMP being approved. This is to ensure that the agreements are aligned with the objectives of the RMP.

Agreements between DWS and Implementing Agency

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

The minimum requirements of an IA include the following:

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

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

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

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

Recreational Use Agreements

Recreational clubs must enter into an agreement with the IA who will be responsible for the surface water and shoreline management of the dam. All recreational use at the dam must be through an appropriate Legal Framework.

However all agreements must be approved in writing by DWS and the IA. Recreational Use Agreements must be developed in line with the conditions stipulated in the agreement between DWS and the IA. All agreements must be finalised within twelve (12) months of the RMP being approved.

Safety of Navigation Agreements

In addition to its common-law responsibility, DWS is, in terms of the requirements described in the National Water Act, 1998 (Act 36 of 1998), amongst others, responsible for the safety of GWWs and watercourses, including its dams. DWS, its delegated public sector partner, or a delegated water management institution, has therefore the responsibility to provide the required fixed and/or floating AtoN[8] 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 IA. Further, a formal agreement with IA will be required for all adjacent landowners and recreational clubs that have direct access to the water surface of the dam through constructed slipways, natural slipways or jetties for angling and/ or launching of vessels.

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

Event Applications

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

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

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

National Affiliations

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

4.1.2. Operations Management Committee (OMC)

There is an existing Chief Director: Infrastructure Operations Management Committee (CD: IO MANCO) within Infrastructure Operations which comprises of all directors of four (4) operations (Northern, Southern, Eastern and Central) and is chaired by the Chief Director: Infrastructure Operations within NWRI as illustrated in **Figure 16**.

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

The 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.

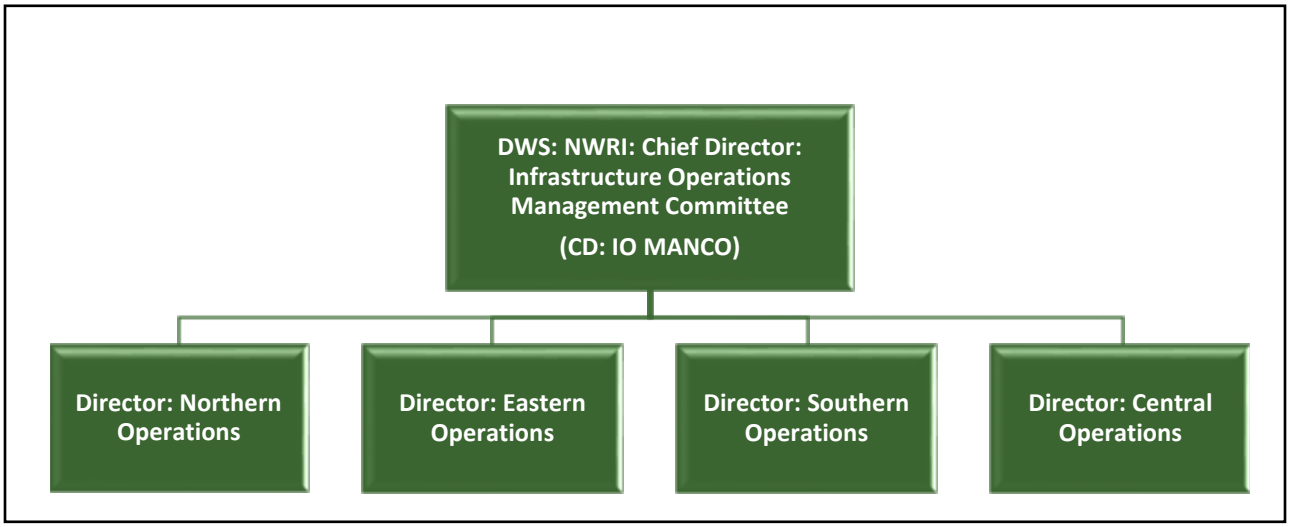

Figure 16: Existing CD: IO MANCO

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 17: Proposed Water Surface 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	• Area should be demarcated by AtoN and demarcation markers.
• Conservation Zone.	• None	• Public activities (in order to prevent aquatic habitats disturbance)	• Area should be demarcated by demarcation makers and AtoN. • Strict management and control of these areas.
• Low Impact Activity Zone.	• Shoreline Fishing • Launching/Mooring of vessels • Rowing • Sailing • Canoeing	• Motorised boating • Jet Skiing • Swimming	• Area should be demarcated by demarcation markers and AtoN. • No private slipways and/or Floating Jetties to be built without approval from DWS. • Launching and mooring of low gear vessels should take place at this zone.
• High Impact Activity Zone.	• Motorised boating • Jet Skis	• Launching/ Mooring of vessels • Canoeing • Sailing • Rowing • Canoeing • Wind surfing • Paddling boat • Float tubes • Swimming	• Area should be demarcated by demarcation makers and AtoN. • All activities within the high impact zone shall take place beyond 100m 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.

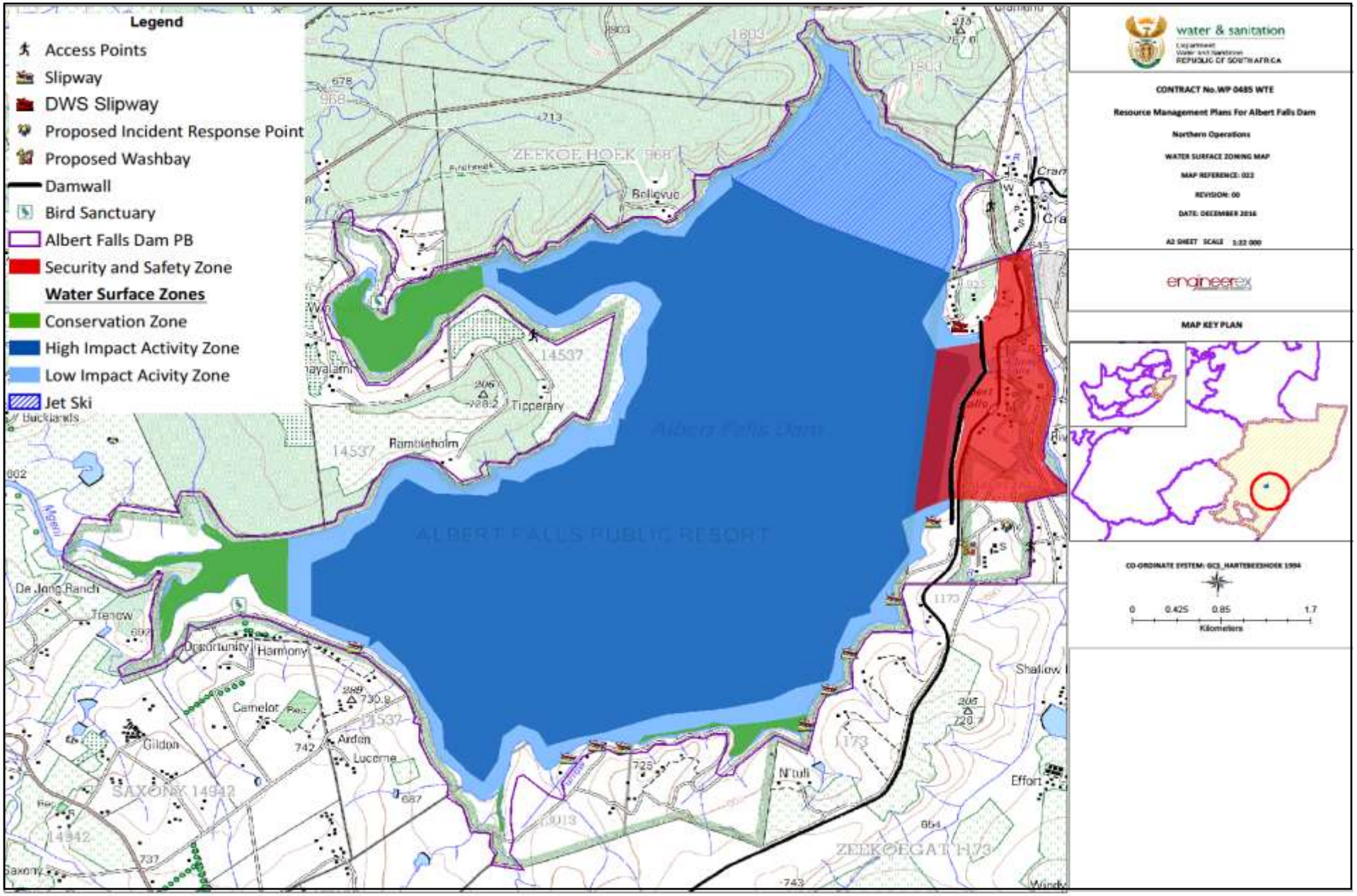

Figure 18: Proposed Water Surface Zoning Map

4.2.2 Shoreline Zoning[9]

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

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

Table 18: Proposed Shoreline Zoning Description

Zone Name	Permissible Activities	Non-permissible Activities	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	• 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
	• Picnicking
	• Braai facilities
	• Shoreline fishing
	• Launching (as well access to surface water for recreational Purposes)
	• Infrastructure for services
		• Accommodation facilities such as :
		  ○ Chalets
		  ○ Recreational club houses
		  ○ Permanent structures
			• The management of this area should follow PPP in terms of National Treasury.
			• All developments must be approved by IA and DWS.
			• Requirements of NWA and NEMA must be taken into account in all developments.
			• All developments should have an approved Environmental Management Plan (EMP) to ensure construction does not impact on dam and must blend in with the natural environment.
			• Camping and access to the water must be done in accordance to access agreements.
			• Camping is allowed only in designated areas.
			• Noise levels to be kept at a minimum.
			• No littering at Camping spots.
			• No private slipways to be built without approval from DWS.

• High Density Activity Zone.	• Recreational club houses	• Camping • Picnicking • Permanent Structures	• 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.

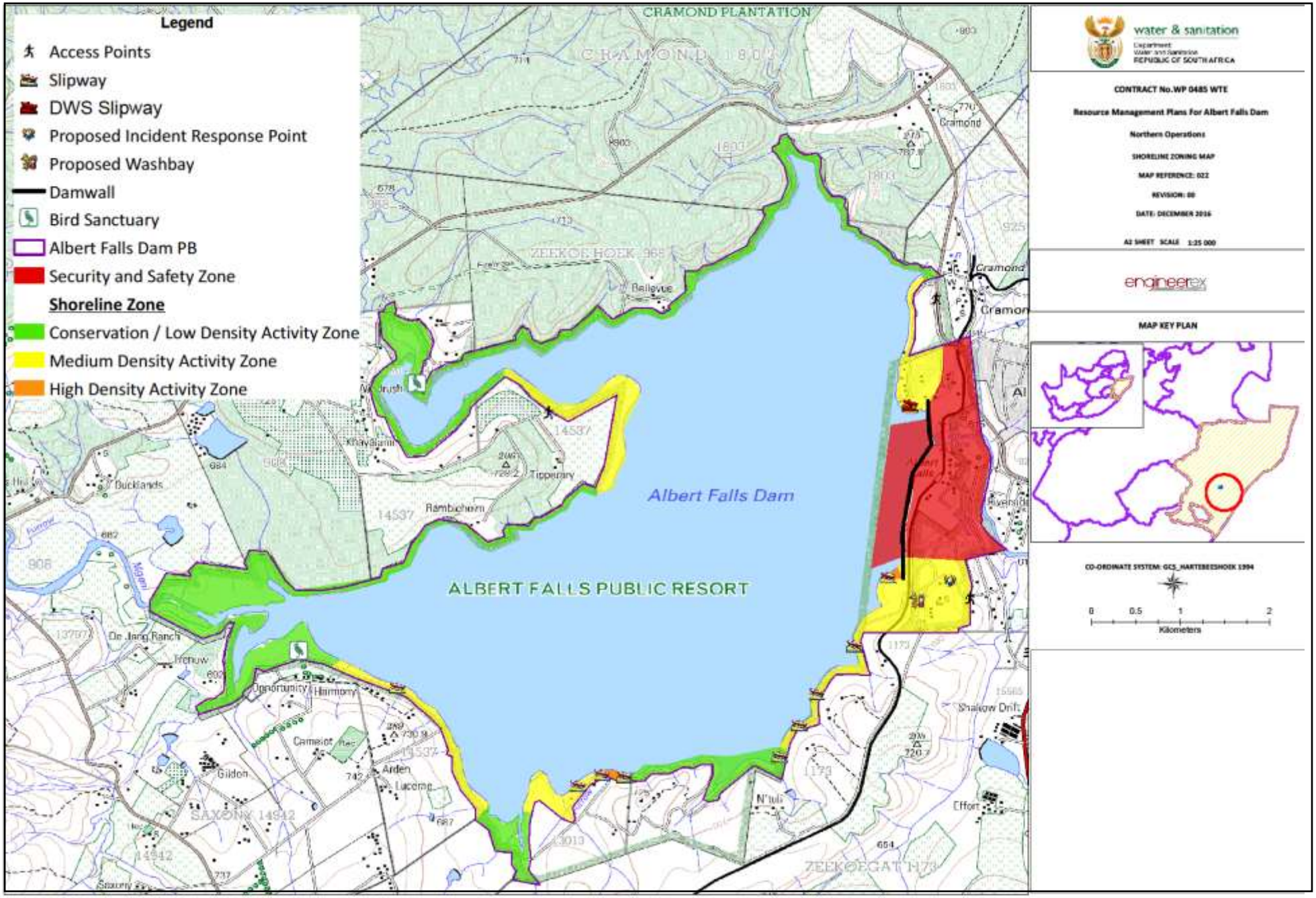

Figure 19: Proposed Shoreline Zoning Map

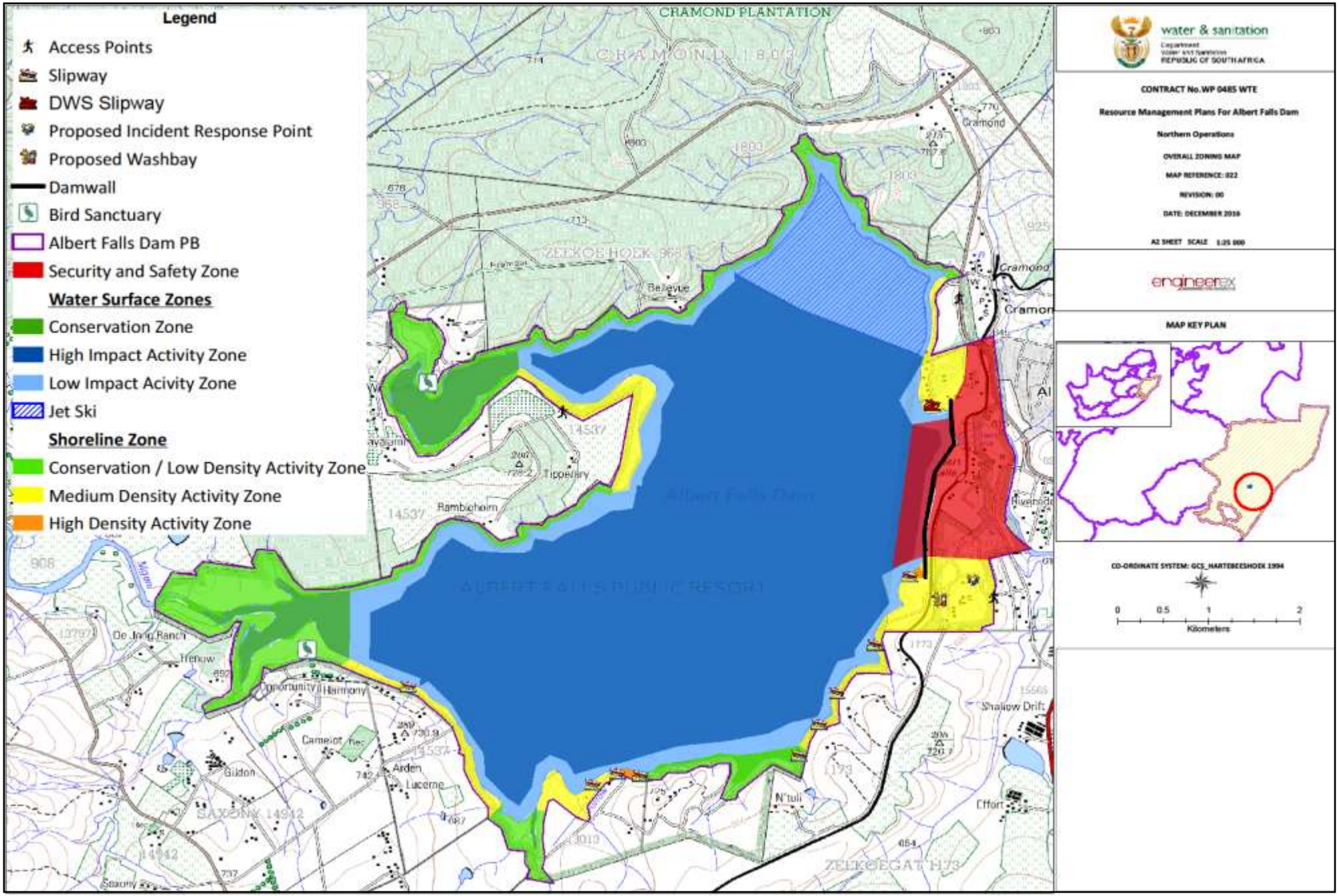

Figure 20: The Proposed Overall Zoning Map

4.2.3 Carrying Capacity

The carrying capacity of a water resource represents the maximum level of visitor use and related infrastructure that the water resource and surrounding area can accommodate, without diminishing user satisfaction or adverse impacts upon the Local Communities, 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, 2006) was used as a guideline to determine the level of activity that would be sustainable at Albert Falls 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 is calculated using the formula: PCC = A x U/a x Rf

- Where: A = Area of the water surface available for recreational use
- The U/a = area required for each user.
- Rf = Rotation factor (the number of visits per day) and is assumed to be 1.

The area of the water surface available for recreational use: **2352 ha**.

Craft	U/A (ha/craft)
Sailing	6.0
Boating	1.0
Water skiing	16.0
Fishing	3.0
Canoeing	1.0
Rowing	0.5
Average	**4.6**

Based on the table 21 above the average hectare per user is 4.6 **ha**, the value of **8.0 ha** can be acceptable area per user. This has been estimated in order to ensure that the dam is not overcrowded and leading to conflict between users.

Therefore: PCC = A x U/a x Rf
= 2352 ha x (1 craft/8 ha) x 1
= 294 vessels

Real Carrying Capacity

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

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

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

- Biophysical, such as terrain and sensitive environments
- Safety No Go Zones.

Calculating the area of the surface of the dam, adding a buffer-zone at the dam wall and the restricting factors outlined above, allowed for determination of the real carrying capacity of the water surface with approximately 2352 ha (2352 ha-235.2ha) of the water surface remaining available for recreation. This means that 10 % of the dam is not available for recreational use.

These factors accounts for 235.2 ha, which is 10%

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

= 294 x (100 – 10) %/100

=265 boats

Effective Carrying Capacity

The maximum number of visitors that a site can sustain, given the management capacity (MC) available.

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

Infrastructure Capacity

It takes approximately 20 minutes to launch or retrieve a boat during the day. There is currently 7 slipways at the dam; = [12 hours available per day/20 min] x 7 slipway for public use, therefore:

[720/20] x 7 = 252

As 20 minutes would apply either to entering or retrieving of vessel from the water, 252 would need to be halved: 252/ 2 = 126. This is the maximum amount of boats that can be launched on a given day.

Management Capacity

Msinsi Holdings (Pty) Ltd is the appointed management agency by Umgeni Water to manage the biodiversity and recreation facilities in Albert Falls and Bon Accorde Park. The current management capacity at the dam consist of Reserve Manager who manages the operational aspects and ensuring proper management of the recreation activities at the reserve.

- **Ranger**: To manage the field, this includes ensuring that the company assets, customers and staff are secured properly, wildlife management and maintenance of the Reserve including refuse and sewerage removal and grass cutting. To supervise the Security Guards, Field Rangers, Tractor and Truck Drivers, and the General Assistants
- **Facilities Supervisor**: To manage all the facilities in the Reserve, ensuring that the company assets are taken care of, maintenance of assets is done timeously and properly. To supervise the handyman and camp attendants.
- **Office Supervisor:** To control the administration and finance section of the Reserve and to supervise the gate and the office staff.
- **Customer Service Officers:** To answer the telephones, make bookings and check in and check out customers. To prepare admin and finance daily, weekly and monthly returns.
- **Truck Driver:** To drive the 4 and 8 ton trucks to do refuse and sewerage removal. To also assist during the burning season.
- **Handyman:** To repair and maintain the company buildings and assets.
- **Field Rangers:** To do daily patrol in the game park, check the fence line and law enforcement on the shoreline and accommodated visitor section. To do boat patrols on the dam. To also ensure that the company assets and visitors are secured during the day and at night, especially the wildlife. To also assist during the burning season.
- **Camp Attendants:** To ensure that all facilities, this includes chalets, hall, office, day visitor toilets, campsite ablutions are clean and neat at all times.

- **Gate Attendants:** To control access into the Reserve, ensuring that each person coming into the Reserve has paid and has been registered in our access control books.
- **General Assistants:** To do the overall management of the field, ensuring that the grass is cut and short in all areas and at all times. They use lawnmowers and brush cutters only. Ensuring that the litter has been collected and dumped properly. They also need to ensure the roads and fence line are repaired properly and also ensure that the trees have been trimmed neatly. To assist during the burning season.
- **Tractor Driver:** To cut the grass using the tractor in all the open space areas, this includes day visitor section, front office area, campsites, boat locker etc. To also do fire breaks. To assist in the refuse removal using the 4 ton truck.

The current management capacity consists of 33 people. The required management capacity for safe functioning of the dam would include 34 people.

Management Capacity:
= current capacity/ required capacity x 100
= 33/34 x 100
= 97.05%

Therefore:

ECC = (126 x 0.97) x 100/RCC
= (126 x 0.97) x 100/ 262
= 46.36%

Therefore the ECC is 46% of the RCC given the current management and infrastructural development which is **121** Boats 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 are broken down into management fields which are listed below in a format offering ease of reference:

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

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

Table 19: Strategic Plan for KPA 1: Resource Management

KPA 1: Resource Management			
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)**
Lease Agreements: • To ensure the compliance of existing lease agreements.	• These lease agreements negatively impact the efficient management of the dam basin and do not support equitable access to the dam. The dam is surrounded by private landowners thus restricting access to the dam by the public.	• DWS should ensure that there are formal agreement between the recreation clubs and the department • DWS must monitor compliance of lessee with conditions of lease agreements. • Msinsi must improve monitoring method, of activities taking at the dam.	• DWS Msinsi resort and game reserves.
Indigenous and Alien Invasive Species: • To ensure the re-establishment of indigenous species at the dam. • To control the Alien Invasive Vegetation in the area.	• Over the years there has been a loss of indigenous species due to the introduction of commercial forestry. Alien species survive better than native species in and around the dam which results in the depletion of native species.	• DEA (WfW) must ensure that native species are re-establish and invasive alien vegetation are removed within the purchased boundary. • Develop an inspection and cleaning mechanism such as wash bays to ensure that boats are washed when entering and leaving the dam so that only alien free boats are allowed in the dam.	• Working for Water (WfW) programmes within the Department of Environmental Affairs (DEA).
Water Quality: • To preserve and maintain the high standard of water quality of the dam.	• Effluent discharges resulting from the inadequate treatment from Howick Wastewater Treatment Works and Agriculture have been identified. The effluent contribute significant amount of nutrients in the water body.	• The quality of the inflow and receiving water should be monitored and regulated so as to prevent chemical contamination • DWS needs to initiate environmental education to promote sustainable utilization and protection of the water resource to ensure that the water quality is preserved and maintained. • To ensure that the required financial aid is available for	• All Governmental Departments and Agencies that concerns themselves with water quality and environmental health need to be involved. This will include DWS, and Umgeni Water.

KPA 1: Resource Management			
Objective (What do we want)	**Motivation (Why do we want to achieve this)**	**Action Projects (How do we achieve this)**	**Management Support (Who will be involved)**
		environmental awareness and initiatives to remedy the problem upstream. • Implementation of programmes to monitor the water quality and also rectify problems which lead to detrimental impacts at the dam.	

Table 20: Strategic Plan for KPA 2: Resource Utilisation

KPA 2: Resource Utilization			
Objective (What do we want)	**Motivation (Why do we want to achieve this)**	**Action Projects (How do we achieve this)**	**Management Support (Who will be involved)**
Access: • To promote equitable access to the dam.	• A limited number of local community utilize the dam mainly because of the high entry fee and transportation to the dam. Furthermore limited recreational activities are practiced at the dam.	• Reduced rate on the community's entry fee so that it can enhance their participation and utilization of the dam. • Local communities must be introduced to water recreational activities so as to redress the past imbalances and promote physical access to the water resource and its benefits. • DWS should ensure that a zoning plan with regards to utilization of the water is developed in order to minimize conflict between users.	• Msinsi should implement a concessional tariff for local community Members. The implementing agent should ensure that skills development programmes are initiated and implemented to stretch the local community's opportunities in the recreational industry.
Recreational Activities and Events: • To introduce water based recreational activities that are regulated and meet the user satisfaction. • To initiate events such as music festivals at the dam that	• The local community is not involved in the water based recreational activities.	• DWS should ensure compliance with relevant legislation of any entity with regard to recreational water use, as per the DWA "Guidelines for managing events at GWWs"	• The relevant authorities such as the Department of Sports and Culture should ensure that relevant procedures are followed in implementing sports activities at the dam.

KPA 2: Resource Utilization			
Objective (What do we want)	**Motivation (Why do we want to achieve this)**	**Action Projects (How do we achieve this)**	**Management Support (Who will be involved)**
will be part of community beneficiation and participation.		• Coordination of different entities such as Marine Industry Association South Africa (MIASA), SAMSA and Msinsi to train youth in boating and other water sports. • The Department of Tourism should regulate and rationalize the tourism sector, including measures aimed at the enhancement and maintenance of the standards of facilities and services utilized. • Msinsi must ensure that SAMSA regulations are complied with.	• SAMSA Enforcement Officer, DWS Blue Scorpions and DEA Green Scorpions should ensure routine inspections to ensure that activities are regulated. • Events management should be hands on in the planning of events at the dam.

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

KPA 3: Benefit Flow Management			
Objective (What do we want)	**Motivation (Why do we want to achieve this)**	**Action Projects (How do we achieve this)**	**Management Support (Who will be involved)**
Job Opportunities: • To ensure that the local communities participate and benefit from economic development occurring within and around the dam.	• Albert Falls Dam is one of the biggest fishing dams and tourism is currently expanding, but only a limited number of community members are given job opportunities at the dam.	• Implement skills development programmes where opportunity will exist to local community members. • Ensure that BEE is attained in any PPP projects. • Msinsi Resort must consider the local community for open job opportunities at the dam. • National and Local government should identify the dam as tourist attraction.	• Department of Tourism and the local municipality must identify the dam as a major recreational attraction and this will further create job opportunities for the local community. • Msinsi Resorts and Game Reserves

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)**
Access for fishermen: • To allow local fishermen access to the dam for subsistence fishing purposes.	• The local community members cannot afford the gate fees, therefore resulting in unlawful fishing activities at the dam.	• Determine the status of the required legislative approvals. • DWS should notify the public about the initiative to eradicate poverty. • The implementing agent must ensure compliance with regard to fishing permit at the dam.	• Entities such as DWS, DAFF and also Msinsi Resort and Game Reserve need to be involved to ensure that there fishing permits which regulate local fishermen on the methodology of fishing, where in the dam to fish and quantity of fish to catch.
Skills Transfer: • To improve the livelihood of Albert Falls communities by implementing skills development and training.	• There is lack of involvement from the local community in the management and participation in the functioning of the dam.	• DEA must introduce youth to programmes that will aid in the management of the biodiversity in the dam and surrounding environment. • Skills training programmes such as life guarding, first aid and boat monitoring to enhance safety of users at the dam. • Coordination of different entities such as Marine Industry Association South Africa (MIASA), SAMSA and DWS to train youth in boating and other water sports.	• The relevant departments such as the Department of Environmental Affairs (DEA) must be involved in training youth about biodiversity and its importance. As part of their training learn to identify different alien plant species in order to eradicate and control invasive alien plant species within and around the dam. • DWS should also train different individuals on safety procedures to ensure the safety of users at the dam.
Institutional Arrangement: • To develop and implement an effective Institutional Plan to assist in effectively managing the recreational utilization of the dam and the surrounding environment.	• Currently the operations and maintenance at the dam are managed by Umgeni Waters whereas MRGR manages the recreational utilization of the dam and surrounding environment.	• Establish and implement an institution structure. • According to the manual for the use of water for recreational purpose (2003) the institutional Plan should be reviewed every five years. • There should be integrated management so that there could be input from different governmental departments.	• DWS should ensure that an effective institutional plan is developed and implemented. • Various governmental departments must participate and provide relevant input in terms of their mandates. • I&APs must participate in the management of the dam.

4.4. FINANCIAL PLAN

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

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

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

The BP provides a good description of possible economic recreational activities and the methods that can be used or enhanced to achieve the ultimate vision and the key objectives of Albert Falls 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.

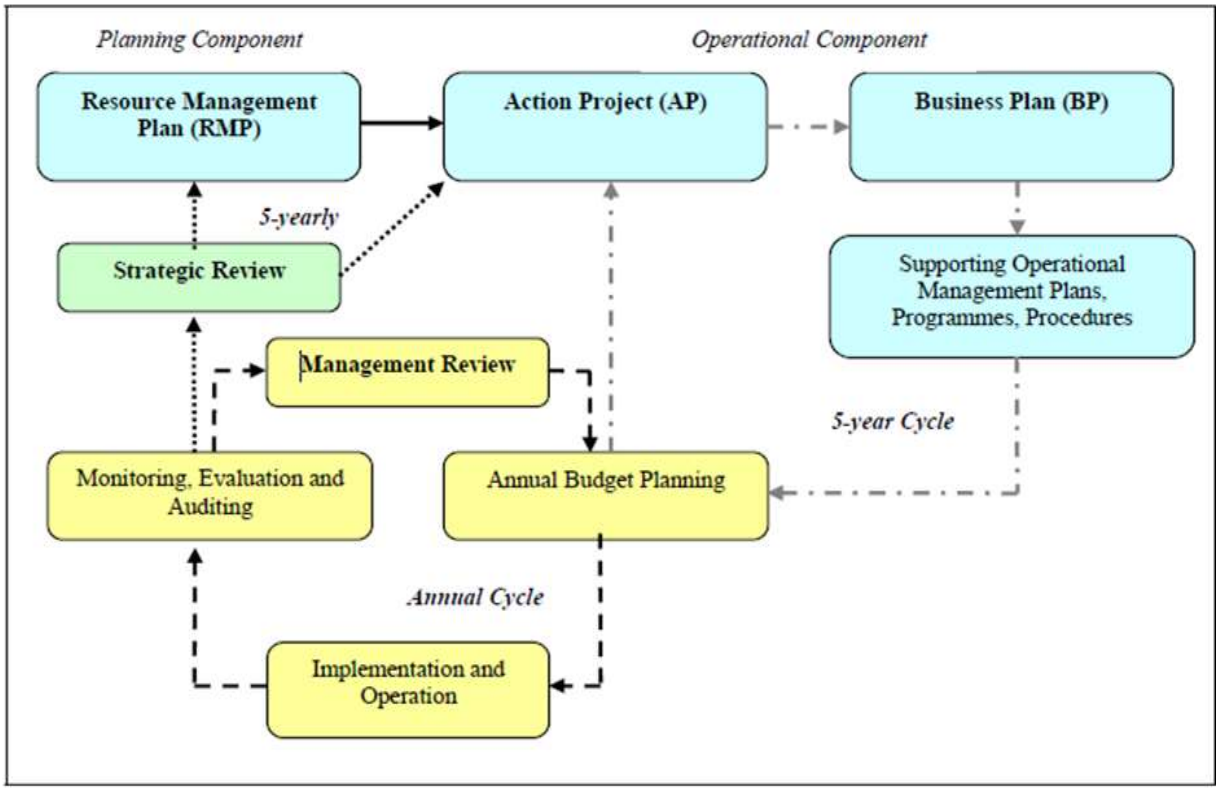

Figure 21: RMP and BP Review Framework

CONCLUSIONS

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

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

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

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APPENDICES