DEPARTMENT OF WATER AFFAIRS AND FORESTRY
Recreational Water Use Manual
Guidelines

Subject: Water Resource Safety Guidelines for Recreational Water Use.

Purposes: To discuss various pertinent water resource safety factors, mitigation measures and access to information regarding these factors

Authority: National Water Act, 1998 (Act No. 36 of 1998).

Approval: Director: Water Abstraction and Instream Use

Contact: Department of Water Affairs and Forestry, Sub-directorate Environment and Recreation, Private Bag X 313, PRETORIA, 0001, Republic of South Africa, Tel: (012) 336 8224; Fax: (012) 336 6608; E-mail: deb@dwaf.gov.za.

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1. INTRODUCTION

The country's inland water resources comprise 22 major rivers; 165 large dams; and in excess of 4000 medium and small dams, mainly located on private land. These waters have varying geographic characteristics and differ in amenity and associated safety concerns. What is clear, however, is that they sustain many different sport, recreation and related activities. These activities potentially conflict with each other and all have different associated hazards thus, serious incidents on inland waters occur regularly.

In order to respond to this apparent problem, give effect to Section 145 of the National Water Act (NWA), 1998 (Act no.36 of 1998) concerning the duty to make information available to the public and DWAF's policy imperative regarding the Recreational Water Use (RWU) policy statement (which states that the use of water for recreational purposes will be safe, both from a resource and industry perspective and regulated in cooperation with stakeholders), the Water Abstraction and Instream Use component Sub-Directorate Environment and Recreation (E&R) has compiled water resource safety guidelines to be utilised by DWAF officials for reference and/or provide support to the Regional Offices in respect of compilation of specific rules, relating to safety considerations such as water quality, hydrology etc., where so required during their operations.

2. PURPOSE OF GUIDELINE

As the use of water for recreational purposes has been recognised in the NWA as a legitimate water use, it is imperative that DWAF ensures that the use of water is safe, and that it contributes to attaining the objectives of the Act.

With the steady increase in the use of water resources for recreational purposes, an increase in the level of serious accidents and incidents can be expected, unless the manner, purpose and extent to which water resources are utilised can be planned and managed, ensuring the safety of users. Despite various initiatives undertaken by concerned forums from the private sector to raise the profile of the problem, no tangible results have been delivered, possibly due to the ad-hoc and uncoordinated nature of these initiatives. As already mentioned DWAF has a critical role to play in, among others, providing information on water resource safety considerations (hydrology, navigability, water quality etc.) in respect of its specific mandate. This very reason, including continuous requests from the Regional Offices and the public for the Department to provide guidance and information on how to deal with the water safety considerations, triggered the need for this guideline document.

A comprehensive consultation process was conducted with the relevant DWAF business units in order to ascertain the information to develop the water safety guidelines contained herein. In the development of this guideline document the following information, that determined the scope and extent for these guidelines, was gathered from the relevant DWAF business units:

- The resource safety factors that pertain (within the unit's roles & responsibilities);
- Considerations regarding these factors i.e. how do they influence or impact recreational water use/activities;
- Information available with regards to the resource safety factors; and
- Partnerships/institutional relationships in place regarding coordination of water safety information.

In summary this guideline document informs the user of the pertinent water resource safety factors within the Department's mandate, what the various DWAF business units are doing to prevent or mitigate the impacts on the water resource hence information and/or direction to the user on how to react in the event of any of the listed water safety factors.

3. WATER RESOURCE SAFETY FACTORS

3.1 Floods

The issue of flooding i.e. hydrology studies or hydrological information as it pertains to water resource safety has various aspects and as such is managed in three main ways in the Department:

- Directorate: Hydrological Studies deals with information on rivers to support Local Government as the lead agent;
- Studies on water resources infrastructure such as dams and weirs are mandated to Directorate: Civil Design; and
- Directorate: Water Resource Planning Systems is responsible for flood release schemes.

3.1.1 Hydrology

3.1.1.1 Description

For Hydrological Studies, water resource safety factors that pertain involve:

- The technique of flood frequency analysis which is done every 5 years;
- The determination of floodlines and servitude lines; and
- Calculating flood peaks.

The afore-mentioned information has a bearing on the safety of recreational water use/rs in and around the water resource. The key concern is the increasing developments next to rivers which increase the impact of flood occurrences having a direct effect on recreational water use/rs.

During flood situations warnings are given to the public through various communication media by the local authorities as the responsible/lead agent, Directorate: Hydrological Studies provides scientific and technical support by having direct linkages and processes with Local Government to make relevant information available promptly to the public to prevent or mitigate detrimental impacts. In this respect, DWAF has a real time satellite based system in place which provides essential data such as flow characteristics of a water resource at a particular point in time.

With reference to the increasing developments next to (and in other cases in the water resource), the Directorate proposes that public awareness campaigns, led by Local Government, are conducted in particular for the communities in/around the water resource, to educate and inform the public about floodlines (including the power of water realised after flooding) e.g. a 1:100 year floodlines means you have 1% chance of getting flooded even if you are outside this line. People thus need to understand that this line or percentage decreases and shifts with more obstructions and developments in and/or around the water resource. For water safety of recreational water use/activities housing or development plans must always indicate 1:100 year floodlines.

3.1.1.2 Procedures to obtain information to support RWU policy implementation

A formal request has to be submitted to the Director or Chief Director: Hydrological Studies.

For more information contact:
Senior Specialist Engineer: Danie van der Spuy
012 336 7871 (t), email: sea@dwaf.gov.za

3.1.2 Flood releases

3.1.2.1 Description

Flood releases buffer the impacts of the dry seasons on the aquatic environment of the affected areas e.g. down stream of a dam in certain regions. The Directorate: Water Resource Planning Systems (WRPS) deals with the development of operating rules of dams and systems (including groundwater) i.e. information related to when? rates? who? what? and how? for operations and releases. In addition WRPS is responsible for observing and noting changes in water levels in order to plan i.e. reconcile demand and supply to ensure sustainability in a system.

Subsequently D: WRPS is concerned:

- Firstly, with water quality planning i.e. what needs to be done to protect the water resource from pollution at a large scale e.g. catchment; and

- Secondly, water must be fit for use (i.e. with no algae or bad odours) and attractive for users, this means that guidelines, protocol or tools must be in place including signage or buoyants in the water therefore leading to resource protection as an enabling environment for recreational water use/activities.

The key water resource safety factor for WRPS is the timing of release of water in a system which is often a challenge because too much water is problematic as it may lead to flooding and too little might be fruitless with respect to minimum requirements for the aquatic environment. However, the DWAF Regional Offices are involved in the planning and decision making for a release. Recreational water users are often part of the stakeholder group for consultation before releases in order to cater for their requirements.

3.1.2.2 Procedures to obtain information to support RWU policy implementation

The user should consult the unit's:

- Website with all relevant documentation;
- Specialists for further information relating to groundwater and engineering services; and
- Link to the one-stop toll free DWAF call centre (0800 200 200) mainly to accommodate external information requirements.

For more information contact:
Director: Chris Moseki
012 336 7867 (t), email: ika@dwaf.gov.za

3.2 Water Quality

3.2.1 Description

Similar to the issue of floods, water quality aspects in DWAF are housed in several units, however for the purposes of this document, the focus is on water use and, water quality in this respect is discussed as the mandated function of Directorate: Water Resource Protection and Waste (WRP&W). Due to the fact that some of the recreational water uses require contact with the water resource the main water resource safety factors that pertain to water quality are:

- Eutrophication from the nutrients in the water- this results algae in the water which may obstruct the user or the vessels thereby impeding on their safety or that of the resource;
- *Ecoline* and *Phicole* pollution from sanitation/sewage- leading to issues of human health where the well being of the user might be negatively affected when in contact with the affected water; and
- Pesticides from neighbouring farmers- also result in the pollution of the water resource leading to impacts discussed for eutrophication, *ecoline* and *phicole*.

According to D: WRP&W what needs to be considered regarding these water safety factors is basic strategies and practices by all water users e.g. prevention, minimise and responsible disposal in the case of waste in order to reduce the risk posed to the water user and the aquatic environment.

3.2.2 Procedures to obtain information to support RWU policy implementation

The user should consult the unit's communication framework available on the Departmental intranet to access various documentation.

For more information contact:
Deputy Director: Magda Lighthelm
012 336 8648 (t), email: tch@dwaf.gov.za

3.3 Water Uses

3.3.1 Section 21 (a) pumps and submerged equipment; Section 21 (c) and (i) infrastructure

3.3.1.1 Description

Most RWU activities require the use water crafts and vessels such as boats and jet skis and these vessels/water crafts have an impact on water resources[1]. Furthermore these RWU activities also take place in and/or around the Departmental infrastructure and structures such as dam walls, spillways, abstraction pumps and associated infrastructure, weirs etc

The use of water crafts e.g. jetties, launching areas and sporting activities in various water resources, in particular where water sports are concentrated such as in the Hartebeespoort Dam, is the main resource safety factor:

- This is mainly due to the irresponsible/inappropriate manner in which the use of the water crafts is being performed leading to incidents and/or accidents which is normally the case with jetties;
- The safety of mooring facilities is not sufficient on users at times ,e.g. during a storm;
- Requests to use the dam wall structures for sporting activities, e.g. climbing and diving is increasing, these activities have water safety risks and are currently dealt with on an ad hoc basis; and
- Another general water safety from the Water Resource Infrastructure Branch's (WRIB)[2] point of view is the fact that water users, particularly recreational water users have a tendency of using infrastructure irresponsibly, this in turn poses safety risks and water quality related costs to the Department.

3.3.1.2 Procedures to obtain information to support RWU policy implementation

- Liaison between water resource managers (P&R) and operations/area managers (WRIB); and
- A formal written request to Chief Director: Water Use (CD: WU) as the delegated authority for the RWU policy implementation and management.

For more information contact:

- Area Operations Directors (WRIB) for section 21 (a), (c) and (i) infrastructure and equipment in dams
    - Eastern Cluster: Phila Madondo
      033 330 2051 (t), email: MadondoP@dwaf.gov.za
    - Central Cluster: Walther van der Westhuizen
      012 392 1305 (t), email: VdwestW@dwaf.gov.za
    - Northern Cluster: Mark-Anthony Williams

[1] See draft report on ecological impacts of RWU on the water resource available from E&R on request
[2] It will be the role of the Water Resource Infrastructure Branch (WRIB) to ensure that structures (infrastructure) i.e. dams, bridges, spillways and weirs are safe for water users, in this case RWU.

012 253 1093 (t), email: hek@dwaf.gov.za

- Southern Cluster: De Wald Coetzee
  041 586 4884 (t), email: coetzeed@dwaf.gov.za

- Regional Directors: Water Use and Regulation

  - Eastern Cape: Mr Andrew Lucas (South Region)
    043 722 3805 (t), email: LucasA@dwaf.gov.za

    Mr Z Keke
    043 604 5403 (t), kekez@dwaf.gov.za

    Miss Dale Cobban
    043 748 5342 (t), cobband@dwaf.gov.za

  - Free State: Mr Jackie van Bosch
    051 405 9258 (t), email: VanBoschJ@dwaf.gov.za

  - Gauteng: Walther van der Westhuizen
    012 392 1305 (t), email: VdwestW@dwaf.gov.za

  - KwaZulu-Natal: Patty Moothelal
    031 336 2715 (t), email: MoothelalP@dwaf.gov.za

  - Limpopo: Mrs Martha Komapi
    015 290 1463 (t), email: komapim@dwaf.gov.za

    Mrs Hester Labuschagne (Northern Region)
    015 290 1221(t), email: labuschagneh@dwaf.gov.za

  - Mpumalanga: Mr Brian Jackson
    013 759 7339 (t), email: jacksonb@dwaf.gov.za

  - Northern Cape: Mr Jurgen Streit
    053 830 8800 (t), email: 4MC@dwaf.gov.za

  - North-West: Pako Mokati
    018 387 9500 (t), email: mokatip@dwaf.gov.za

  - Western Cape: Mr Willie Enright
    021 950 7205 (t), email: enrighw@dwaf.gov.za

3.3.2 Section 21 (k) irresponsible water use/rs

3.3.2.1 Description

The issue of irresponsible use/rs is linked to the factors discussed in 3.3.1 and for the purposes of this document pertains to the factors of incidents (injuries and damage) and accidents of recreational water users in the Department's water resources. The Directorate: Legal Services responsible for litigation for and/or against the Department in such matters is of the view incidents and accidents, due to irresponsible water use, are increasing wherever DWAF allows access to its water resources.

According to Directorate Legal Services water resource safety factors that pertain include:

- Incidents (injury/damage) e.g. Hartebeespoort dam, in this instance recreational water use is permitted under schedule 1 which means that users have lawful access and extent of DWAF's liability is not clear;
- Illegal access to security areas i.e. restricted areas, in this regard these areas are demarcated with either buoys or with fences in the water and users trespass and venture beyond these areas later leading to negative repurcussions;
- Negligence cases wherein the Department is required to provide information to users i.e. DWAF would be liable if it does not take steps to prevent incidents.

3.3.2.2 Procedures to obtain information to support RWU policy implementation

Formal submission to Director: Legal Services requesting legal opinion

For more information contact:
Legal Admin Officer: Casper Human
012 336 8308 (t), email: lbe@dwaf.gov.za

3.4 Aquatic Fauna and Flora

3.4.1 Description

Dangerous animals naturally occurring in water resources such as crocodiles and hippos, which are later confined in certain areas due to infrastructure development such as dam walls, weirs, pump houses, spill ways etc have been viewed as a water safety factor as their movement is restricted and concentrated in one area posing a threat to the water users. The same can be highlighted for aquatic plants causing a nuisance and obstruction of infrastructure, vessels and water users.

3.4.2 Procedures to obtain information to support RWU policy implementation

The user can consult the relevant Regional Office regarding characteristics of a particular water resource.

4. INTERVENTIONS

4.1 DWAF

4.1.1 Classification and Resource Quality Objectives

One of the imperatives of the RWU policy is to zone water resources for better resource management planning for RWU. As part of this process the Chief Directorate Resource Directed Measures (RDM) is involved in classifying the water resource, determining a reserve and setting quality standards for the water resource including standards in which RWU could be undertaken in a safe manner.

According to RDM water resource safety factors that pertain include:

- Resource quality objectives i.e. setting standards so that the water resource does not impede on people's health;
- Section 17 and section 21 of NWA for protection of the water resource and Chapter 3, section 12 for the functioning of resource ecosystem which maintains quality of the

resource which is important for recreational water users/activities as there is contact with the water resources e.g. swimming, fishing, jet skiing.

What needs to be considered for the resource safety factors is the link between the classification systems for quality standards and the fragile/sensitive areas for zoning i.e. the latter may set the scene for the RWU resource management plan process ensuring that water resource is safe for RWU.

4.1.2 Water Resource boundaries, servitudes and/or floodlines

The Directorate Spatial and Land Information Management Systems (SLIMS) keeps spatial information (including plans) on dams and DWAF infrastructure, this is for 350 dams including information on Forestry. It also deals with way-leave applications for companies like Eskom, Network service providers, e.g. Cell C, by the way SLIMS's work closely with water resource boundaries and servitude issues with the involvement of the Department of Land Affairs. As a result of its roles and responsibilities, the unit is usually consulted for developments but certain characteristics, regarding the land around the water resources e.g. catchment patterns, land rights and current information, are not readily available therefore SLIMS interprets the information with assistance from DEAT and the Land Surveyor's office including other technical information to be processed.

According to SLIMS the water resource safety factors that pertain include:

- Residential development within the dam basin raising concerns of public safety e.g. inundation with increasing water levels, servitudes etc;
- The nature of structures in the water e.g. boats in recreational water use;
- The boundary of the water from land (however engineers have more details in this regard), where SLIMS is involved during the construction process;
- Demarcation of areas (some sites will not be available to the public for their own safety i.e. the Department protects public interest).

What should be considered for these water safety factors is that recreational water users must constantly be aware of dam boundaries, in particular, around non-permanent structures in the water resource as these aspects may threaten their safety in the water resource.

Information can be obtained through a formal request on an instruction letter to the unit requesting the following information available from the unit on request:

- Dam boundaries indicated in maps including high flood full supply available at the DWAF drawing offices in Regions and at dams for the public;
- Digitised information on where structures are located including property (but not boundaries, for this specific information referrals have to be made to the unit); and
- An interactive electronic database (currently being constructed) wherein problems such as developments within the water resource boundary or structures can be identified and marked on site and information will be directly sent to SLIMS office for editing (therefore it will be a tool to generate information about dams by all parties involved).

4.1.3 Water Uses

Section 21 (a), (c) and (i)

What needs to be considered for these safety factors is:

- The Department's role in providing relevant information/documentation to the public possibly in a form of user friendly posters, signage etc;
- Individual responsibility i.e. users must take responsibility when entering and in the use of the Departments' infrastrucuture e.g. DWAF can put buoyants as warnings for safety however accountability for action such as going beyond these points rests with the individual despite the fact that they are on a state dam;
- The Department's role to provide information and alert the surrounding communities and users of the existence of dangerous animals in the water resource and to manage the animals introduced into system by the Department for a certain purpose e.g. a fish species for biological control;
- The commercial and individual use of vessels/water crafts particularly for organised sports like angling/canoeing/fishing needs sound regulation for better management of effects like overloading, intoxication, waste management etc. (The boating regulations 654 attempts to control these effects as it does not allow these activities/users after 4pm but this is not adequately enforced); and
- In addition, during infrastructure planning DWAF needs to consider the impacts that the operation of the infrastructure will have on the use and safety of the water users in consultation with the relevant stakeholders

With regard to information available to recreational water users in and around water resources infrastructure the following resources are in place:

- Safety booms upstream of the dam wall and/or spillways;
- Fence walls demarcating areas of high safety risks, e.g. operational valves, gates thereby protecting individual users in the public interest; and
- Detailed drawings/posters for discussions and warnings.

Section 21 (k)

What needs to be considered regarding these resources safety factors is that:

- DWAF structures or infrastructure in and around water resources need to be constantly protected and maintained;
- Enforcement through mechanisms such zoning plans, which forms part of the RWU resource management plan process, are essential and resolve conflict amongst users both within the recreational water use e.g. skiing vs. angling, or with other uses e.g. agriculture;
- Balance between over and/or under policing of irresponsible use should be maintained;
- Establishing water management institutions for the water resource users allows the institutions to charge for their activities therefore improving management and policing which instils a sense of ownership and responsibility among users; and
- Involving Public Private Partnerships (PPPs) could address commercial use but also help ease the problems of safety and resources from the Department.

4.1.4 DWAF Processes (RMPs, WUAs, Regulations)

During the life cycle of projects and programmes (i.e. planning, construction, operational and decommissioning phases) the Department, using these processes and mechanisms, sets the scene and determines the framework and operating environment, in consultation and with participation from the various stakeholders, in order to intervene and lessen/mitigate the water resource safety factors by establishing conditions of operation, specifications, authorisation parameters, management interventions etc.

4.1.5 Water Resource Safety Forum

Establish a safety forum within the Department wherein issues of safety in and/or around water resources could be streamlined and where possible to link to other institutions' initiatives from 2009/10 onwards.

4.2 Users

Recreational water users need to take part in water resource safety interventions by:

- Obtaining information as required by the new RWU regulations;
- Complying with relevant legislation; and
- Participating in DWAF processes e.g. Classification Systems, RMPs, WUAs etc.

5. APPENDICES

A. *Merchant-Shipping (National Small Vessels Safety) Regulations, 2007 -: GNR 704 GG No 30151, 08 August 2007.*
http://www.info.gov.za/gazette/regulation/2007/30151a.pdf

B. *The Boating Regulation 654.*
http://www.dwaf.gov.za/Documents/Other/RMP/RWUM/RWU_RP1.pdf

C. DWAF (2006) Draft RWU Regulations-:GNR 1188 GG No 29413, 01 December 2006.
http://www.dwaf.gov.za/Documents/comments.asp

D. *DWAF, 1996. South African Water Quality Guidelines (second edition), Volume 2: Recreational Use.*
http://www.dwaf.gov.za/IWQS/wq_guide/recrea.pdf

E. *World Health Organisation (1998) draft guidelines for safe recreational-water environments. October, Geneva.*
http://www.crid.or.cr/crid/CD_Agua/pdf/eng/doc14598/doc14598.htm
http://whqlibdoc.who.int/publications/2003/9241545801_contents.pdf (2003 edition)