*SRK – article on EWRs for Water Week*

# Considering ecology in defining society’s water needs

With Water Week being celebrated from 20 to 26 March, SRK principal hydrologist Kerry Grimmer reflects on the importance of maintaining a balance between human water needs and the ecological health of our rivers.

Grimmer highlights the significance of considering ecological water requirements (EWRs) in ensuring the sustainability of our water systems – requirements which are fundamental to responsible water management.

"The ‘reserve’, as outlined in South Africa’s National Water Act, is designed to ensure that water is allocated not just for human consumption but also to sustain the health of our aquatic ecosystems," she explains. “The reserve comprises two components: the basic human needs reserve, which ensures essential water supply for people, and the ecological reserve, which maintains the integrity of river systems.”

**Understanding ecology**

She emphasises the importance of incorporating EWRs into hydrological models, ensuring that water projects do not compromise the health of rivers.

“When SRK assesses water resources for projects, we take into account the needs of existing downstream users," she says. “We also recognise that, if we don’t protect the natural flow and quality of our water systems, we risk long-term degradation of the river.”

She highlights that water management demands a fair distribution of water between human consumption (domestic water supply), agricultural irrigation, mining and industry, and environmental conservation. If too much water is extracted, the consequences could include loss of biodiversity and habitat destruction.

In addition, the return water into a river system can result in poor water quality, especially when coupled with unnaturally decreased river flows. This can be caused by applying fertilizer to irrigation water, for example, which can be washed into the river system or seep into the groundwater. Non-compliant return water from a water treatment plant could also compromise water quality.

SRK’s methodology includes determining how much water must remain in a river to support its natural ecosystem.

“This is especially important when assessing the yield of a dam or a water supply system,” she continues. “The more water allocated to the EWR, the less is available for allocation to users. However, this sacrifice is necessary to preserve the long-term health of our rivers.”

**Classifying river systems**

Different river systems and catchments require varying levels of EWRs, depending on their condition. They are therefore classified on a scale from Class A, which represents pristine conditions, to Class E, which indicates severe degradation.

“A Class A river system represents a pristine catchment, and it decreases to a Class E, which represents a severely degraded catchment,” said Grimmer. “A degraded catchment may have a significant number of abstractions, poor water quality or other factors which influence the natural flow regime, such as dams.

“For a Class A catchment, there are likely to be fewer abstractions and therefore a greater portion of flows is available for EWR allocation. However, in a Class E catchment, it is assumed that there may be significant abstraction, therefore leaving less water which is practically available for the EWR.”

Using the Desktop Reserve Model developed by Professor Denis Hughes and Rhodes University, SRK determines the appropriate EWRs for different river systems.

**Mimicking nature**

“The calculations take into account natural flow patterns, which are the flows that would occur without any man-made impacts,” she explains. “Our goal is to mimic natural conditions as closely as possible, ensuring that our rivers continue to function as healthy ecosystems.”

She notes that people often think of an EWR as a baseflow – that is, a minimum volume of water to keep in the river so it does not run dry – but this is incorrect.

“In natural climatic conditions, floods and droughts occur, and these also need to be mimicked in the EWR,” she says. “Some riverine ecology, such as fish, actually rely on floods to travel downstream and spawn.

“Where applicable, releases are made from dams to ensure that the downstream EWRs are met, and these are built into the operating rules of dams. However, this is not always possible to do with small or farm dams, for example, as they lack the infrastructure required to make releases.”

**Ethical responsibility**

Grimmer highlights that the protection of water resources is increasingly considered not just as a legal requirement but as an ethical responsibility. With rivers under increasing pressure from urban expansion, agriculture and industry, it is crucial to prioritise ecological water needs to avoid depleting and polluting the country’s scarce water resources. Fortunately, she points out, there are advancements in water management practices to help mitigate these risks.

“Through responsible planning and scientifically supported water allocation strategies, we can ensure that both people and nature thrive,” says Grimmer. “Water Week is a time to celebrate these efforts and commit to safeguarding our water resources for generations to come.”

*Words: 788*

**Images and captions:**



**Caption:** It is important to incorporate ecological water requirements into hydrological models, to ensure that water projects do not compromise the health of rivers

**Video:**

Peter Shepherd, partner and principal hydrologist at SRK Consulting, discusses the importance of considering ecological water requirements (EWRs) to ensure the long-term sustainability of our water systems. To watch his informative video, please visit the link below:

https://www.srk.com/en/videos/water-week-balancing-human-water-needs-and-ecological

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