GAZETTING OF THE RESERVE FOR WATER RESOURCES OF THE THUKELA CATCHMENTS IN THE PONGOLA-MTAMVU WATER MANAGEMENT AREA

Comments and Responses Register

This Comments and Responses Report (CRR) captures the issues raised by stakeholders after the Draft Notice of the proposed Reserve was published for comment in **Government Gazette No. 50071, Gazette Notice No. 4330 of 02 February 2024**. The purpose of this report is to ensure that the concerns and comments raised by stakeholders are noted and adequately and satisfactorily addressed. This study has been commissioned by the Department of Water and Sanitation (DWS). This report will be presented to the Minister with the proposed final Reserve. Once the Minister is duly satisfied with the process and the handling of comments, the final Reserve will be gazetted.

60 Days Public Commenting Period

(02 February 2024 – 02 April 2024)

water & sanitation

Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

Abbreviations / Acronyms:

ARC	Agricultural Research Council
BHN	Basic Human Needs
BWS	Basic Water Supply
CFU	Colony Forming Units
CMS	Catchment Management Strategy
DTM	Digital Terrain Model
DWAF	Department of Water Affairs and Forestry
DWS	Department of Water and Sanitation
EC	Electrical Conductivity
E. coli	Escherichia coli
EWR	Ecological Water Requirements
EFZ	Estuarine Functional Zone
EMP	Estuarine Monitoring Plan
GA	General Authorisation
GRAII	Groundwater Resource Assessment Phase II
IAP	Interested and Affected Parties
IDP	Integrated Development Plan
IUA	Integrated Unit of Analysis
MAR	Mean Annual Run-off
MPA	Marine Protected Area
NWA	National Water Act
NWRS	National Water Resource Strategy
NCMP	National Coastal Management Programme
nMAR	Natural Mean Annual Run-off
NTU	Nephelometric Turbidity Unit
QC	Quaternary Catchment
REC	Recommended Ecological State

REI	River Estuarine Interphase
RQOs	Resource Quality Objectives
RU	Resource Unit
SANS	South African National Standards
SRTM	Shuttle Radar Topography Mission
TDS	Total Dissolved Solids
TEC	Targeted Ecological Category
TSS	Total Suspended Solids
WMS	Water Management System
WQC	Water Quality Concentration
WRCS	Water Resource Classification System
WSA	Water Services Act

NB: The comments recorded are inclusive of the comments from the Draft Notice of the proposed Reserve that was initially/erroneously published for comments in the Provincial Gazette (Provincial Gazette No. 2615, 02 November 2023, General Notice No. 81) for 60 days from 02 November 2023 to 02 January 2024.

	COMMENTS, QUESTIONS AND CONCERNS	COMMENTATOR(S)	SOURCE(S)	RESPONSE(S)
1	The holiday period (from 15 December to 8 January) cannot legally be counted as part of the timeframe for comments. Please ensure that steps are taken to rectify these errors.	Ms Carin Bosman, Carin Bosman Sustainable Solutions	Email on 19 December 2023	This has been corrected. The commenting period was extended from 02 February to 02 April 2024.
2	The publication of the Notice in the KZN Provincial Gazette is legally flawed. Please ensure that steps are taken to rectify these errors.	Ms Carin Bosman, Carin Bosman Sustainable Solutions and Ms Kerisha Govender, Sappi Paper and Paper Packaging, Tugela Mill	Emails on 13 December 2023 and Letter via email on 19 December 2023	This has been corrected. The notice has been re-published on the Government Gazette No. 50071, 02 February 2024, Government Notice No. 4330.
3. A.	**A. General Comments. Comments on quaternary catchment V50D where Sappi Tugela Mill is located. This includes the aspects as contained in Annexure B of the Notice.**			
3. A (1)	The proposed Reserve for the Thukela catchment does not make provision for a review period, and as it is informed by scientific concepts relating to aquatic and riparian health, the sciences of which are fast-growing and constantly evolving, it is strongly recommended that the Reserve be established for a limited timeframe, e.g., ten (10) years, following which it can be reviewed and updated with newly gained scientific knowledge.	Ms Kerisha Govender, Sappi Paper and Paper Packaging, Tugela Mill	Letter via email on 13 December 2023 & 27 March 2024	This concern has been addressed: The revised NWA/amendment bill makes provision for the Reserve to be reviewed every 10 years.
3. A (2)	The Reserve Determination for the surface water quantity component for rivers as contained in Table 1 on page 5 of Annexure B of the Notice indicates a value for the Basic Human Needs ("BHN") component of the Reserve but does not indicate what information was used for the	Ms Kerisha Govender, Sappi Paper and Paper Packaging, Tugela Mill	Letter via email on 13 December 2023 & 27 March 2024	This concern has been addressed since the 2011 Census report was used, now the BHN was determined using the 2023 Census report.

	COMMENTS, QUESTIONS AND CONCERNS	COMMENTATOR(S)	SOURCE(S)	RESPONSE(S)
	determination of the BHN for the surface water quantity component of the Reserve.			
3.A (3)	The Reserve Determination for the groundwater quantity component is described on page 54 of Annexure B of the Notice and indicates that the population data used for the determination of the BHN for the groundwater quantity component of the Reserve was obtained from the 1996 census, based on a total population of 11,600. This leads to the assumption that 1996 population data have also been used for the determination of the BHN component for the surface water quantity in rivers. As the population data from the 1996 census is almost 30 years old, and significant population growth has occurred since 1996, the use of this data in 2023 is simply not justifiable. In addition, the Reserve determination should make provision for future population growth, and the Notice as it currently stands contains no provisions for future population growth. This is not acceptable.	Ms Kerisha Govender, Sappi Paper and Paper Packaging, Tugela Mill	Letter via email on 13 December 2023 & 27 March 2024	This concern has been addressed. The population data has been updated based on the most recent census, and the BHN has been determined based on the census data of 2023.
3. B	**B. Comments on the proposed surface water quality ecological specifications for the upper portions of quaternary catchment V50D**			
3. B (1)	The proposed surface water quality ecological specifications for quaternary catchment V50D as contained in Table 2.14 on page 47 of Annexure B unfortunately did not take cognisance of the following scientific facts: (1) Neither the Notice nor its Annexure B contain a description of the methods or data used to determine the	Ms Kerisha Govender, Sappi Paper and Paper Packaging, Tugela Mill	Letter via Email on 13 December 2023 & 27 March 2024	The technical reports and description of the methods applied in this study can be accessed in the link below: https://www.dws.gov.za/rdm/WRCS/doc/2.a)/EWR%20Report.pdf

	COMMENTS, QUESTIONS AND CONCERNS	COMMENTATOR(S)	SOURCE(S)	RESPONSE(S)
	proposed surface water quality ecological specifications for any catchment.			
3. B (2)	In this Table, the Mandini River is grouped with the lower reaches of the freshwater component of the Thukela River and the upper portions of the Thukela Estuary, and only one set of surface water quality ecological specifications is provided for these three significantly different bodies of water. This is scientifically flawed: (a) The water quality of the Mandini River is significantly different from the water quality of both the lower reaches of the freshwater component of the Thukela River and the upper portions of the Thukela Estuary (see Figure 1 in Appendix A of this letter, which illustrates the differences in the salt balances for these bodies of water by means of Mauchino diagrams): The Mandini River demonstrates a sodium-chloride dominated salt-balance due to the influence of the underlying Dwyka geology, while the lower reaches of the freshwater component of the Thukela River is dominated by calcium-carbonates. (b) A middle or upper estuarine environment is regularly influenced by tidal influences from the ocean, resulting in much higher salt and nutrient content than the fresher water higher upstream. (c) Rivers, before they are diluted by the enormous body of ocean water, have generally high	Ms Kerisha Govender, Sappi Paper and Paper Packaging, Tugela Mill	Letter via email on 13 December 2023 & 27 March 2024	The delineation of a catchment into RUs is done primarily on a biophysical basis, and where the hydrology, geomorphic characteristics (i.e. geomorphic zone), water quality attributes and river size remain relatively similar, a RU can be defined. In addition, management requirements also play a role in the delineation of a RU (DWAF, 1999, Volume 3). The purpose of distinguishing a RU of management requirements is to identify a management unit within which the EWR can be implemented and managed based on one set of identified flow requirements. It is noted that the aspects described in point (1) (a – g) in the adjacent column are descriptions of the possible estuarine conditions that would occur in the estuarine component of the Thukela River. The department also welcome such comments which shows the effort, knowledge and effort put in by the commenter. Most of the conditions that are referred to 2b -2g are based on the natural functioning of an estuarine environment and it illustrates the unique habitat that is created between the interaction of freshwater with the marine environment. It is thus expected that the River Estuarine Interphase (REI) might not have the diversity of species that a freshwater or marine environment will have. It is therefore important to have estuarine indicators and freshwater indicators to indicate stress.

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	concentrations of many chemical elements needed by plants and animals to build their tissues. Organic particulates draining from the land tend to be sedimented out in the estuary. Their breakdown on the muddy bottoms recycles these elements and nutrients to the estuarine communities of organisms. (d) The mixing of seawater and fresh water in estuaries provide high levels of salts and nutrients, both in the water column and in sediment, making estuaries among the most productive natural terrestrial and aquatic habitats in the world. (e) Truly estuarine species are those that complete their whole life cycle within the transitional waters where saline and fresh water become mixed. Species permanently dwelling there are mostly hardy, stress-tolerant species able to handle salinity fluctuations and high suspended solid levels, as well as additional stresses during temporary emersion at low tide, such as exposure to air, dehydration and temperature variations. Not many species can perform well under such conditions. (f) Estuarine ecosystems are thus characterised by relatively low species diversity compared to freshwater or full salinity conditions. Along the estuary, from head to mouth, freshwater species become rarer as salinity increases, and are			This has been set as ecological specifications. This will indicate that if any change is to be introduced (to the system drivers i.e., hydrology, hydraulics, hydrodynamics, biophysical chemistry including diatoms etc.), how this will impact the responses (the biotic components, microphytes, invertebrates, diatoms, dinoflagellates – macrophytes – in and adjacent to estuarine functional zone, fish, birds etc., to the freshwater input into the estuary. Any change to the latter will mean that there is a disturbance in the equilibrium of freshwater input into the estuarine systems. These eco-specs or indicators should also be presented in the Estuarine monitoring plan (EMP) a requirement under the National Coastal Management Programme (NCMP). The lower boundary is approximately 12.7km upstream of the Estuary Mouth, approximately 4 km upstream of the upper boundary of the Estuarine Functional Zone (EFZ) described in the National Biodiversity Assessment of 2018 (van Niekerk et al. 20191) which recognises the upper boundary as being 8.7km from the estuary mouth. This is the same boundary used in the uThukela MPA in terms of Section 22A of the National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003) at GPS point 29°11’59.1” S, 31°25’27.1” E (which corresponds with -29.199736,

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	gradually replaced by marine organisms in the lower estuarine reaches, with some truly estuarine species found only at intermediate salinities. This pattern is reflected by the overall species richness, where the least diverse fauna is found in the middle estuary zone. (g) Aquatic species often migrate between the fresh water and saline reaches of an estuary, and for some species, these reaches are critical for their life cycles. For example, fish species such as the dusky sleeper (*Eleotris fusca*) and the near-threatened golden sleeper (*Hypseleotris cyprinoides*) are only found in lowland rivers such as the Thukela and need a higher salt content for their juvenile stages. They are therefore considered as an important indicator species for monitoring natural biodiversity within the ecosystem. The estuary head waters are of particular importance as nursery areas for young estuary and marine-spawned fishes in temperate climates, such as in the Thukela Estuary.			31.424198 as defined in the Government Gazette No. 42478, 2019). The river in quaternary catchment V50D is seen as river (fresh) water, and no salinity gradient has been measured there. Hence a REC zone could not be detected in this part of the river in the said quad.
3. B (3)	The following are of particular note with regard to the proposed surface water quality ecological specifications for quaternary catchment V50D as contained in Table 2.14 on page 47 of Annexure B: (a) The value of 500 mg/ℓ proposed for Total Dissolved Solids (“TDS”) is not appropriate for an upper estuarine environment which is regularly influenced by tides, and where the higher salinity	Ms Kerisha Govender, Sappi Paper and Paper Packaging, Tugela Mill	Letter via email on 13 December 2023 & 27 March 2024	Quaternary catchment V50D falls within the upper resource unit of the Integrated Unit of Analysis (IUA) 15: Thukela Estuary and lower Thukela Reach. As described in the response to comment 3B, RU 15.1 does not have a River/Estuarine interface and hence is considered fresh at that point. RU15.1 boundary is upstream of the Thukela’s Estuarine upper boundary, which is measured as fresh. The data collected at the

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	is necessary for the spawning of estuarine species. Moreover, the comparable TDS value in the General Authorisations ("GAs") 6,7 for fresh surface water (derived from an approximation of the Electrical Conductivity ("EC") of 150 mS/m specified in the GA or the discharge of effluent into a surface water resource), is 1,050 mg/ℓ. The proposed value will therefore cause both a legal conundrum and will lead to harmful effects on estuarine species.			John Ross Bridge (coordinates: -29.1733; 31.43847) for the period December 2014 to May 2018 indicate a 95% electrical conductivity of 28.6 mS/m equating to a total dissolved solids concentration of 186 mg/L, using a factor of 6.5. The link to the estuaries and the Water Quality Report which will be part of the EWR report is below: https://www.dws.gov.za/rdm/WRCS/doc/2.a)/EWR%20Report.pdf
	(b) The low values proposed for chloride (<175 mg/ℓ) and sodium (<115 mg/ℓ) are therefore also not appropriate for an upper estuarine environment which is regularly influenced by tides, and where the higher salinity is necessary for the spawning of estuarine species, as both these salts are present in high concentrations in such environments. For example, the current average background concentration of sodium in the Upper Thukela Estuary is 260 mg/ℓ, and the value of 115 mg/ℓ specified for the Mandini River will therefore have a detrimental impact on the aquatic environment of the Upper Thukela Estuary. It is simply non-sensical to specify values for sodium and chloride for an estuary influenced by the natural influence of seawater with extremely high levels of these two variables, and it makes no sense to specify these values in the Mandini River, which is naturally influenced by elevated	Ms Kerisha Govender, Sappi Paper and Paper Packaging, Tugela Mill	Letter via email on 13 December 2023 & 27 March 2024	As described in the response to comment 3B, RU 15.1 is not estuarine. RU15.1 boundary is upstream of the Estuaries upper boundary, so it is considered as a freshwater system.

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	sodium and chlorides from its underlying Dwyka formation.			
	(c) As discussed under paragraph B (2) above, established science shows that healthy estuarine environments require higher levels of nutrients for proper functioning. It is therefore quite peculiar that the values specified for the nutrient levels, orthophosphate and total inorganic nitrogen, are much lower than the limit values for the same nutrients listed under the GAs, which will cause a legal conundrum and contradiction, should these proposed values be implemented.	Ms Kerisha Govender, Sappi Paper and Paper Packaging, Tugela Mill	Letter via email on 13 December 2023 & 27 March 2024	Water quality Eco-specs that are gazetted are not necessarily aligned to the General Authorisation (GA) limits. GA limits, as well as any Water Use Licence limits may need to be reviewed considering the water quality limits that have been set. Such a review would be undertaken should the contaminant load at the monitoring site at the downstream point of the RU be greater than the load that could be expected if the water quality limit was being met, and if this is the case then the contributing water users may need to implement stricter measures to improve effluent discharge quality.
	(d) Due to the higher nutrient loads and the inflow- and outflow processes taking place in estuaries, the turbidity of estuaries is quite high, and a high turbidity (high levels of suspended solids) is necessary for the proper ecological functioning of the estuary. The low values proposed for turbidity are therefore also not defendable from a scientific perspective. Furthermore, it is scientifically more accurate to measure suspended solids rather than to use an estimate for turbidity, and the limit value for turbidity should therefore be replaced with a lower and upper limit value range for	Ms Kerisha Govender, Sappi Paper and Paper Packaging, Tugela Mill	Letter via email on 13 December 2023 & 27 March 2024	Refer to the response above. Also take into consideration that this estuarine type is considered to be a Freshwater estuarine mouth and hence will not have the same typical estuarine characteristics you keep referring to for an Estuarine system like, for instance, the Mdloti, that has freshwater inflow a River Estuarine Interphase (REI) zone and connected to a marine environment. Originally the Water quality limits indicated that turbidity and TSS should not exceed 20 NTU and 20 mg/L, respectively, and Secchi (or clarity tube) depth should exceed 20 cm. However, an analysis of DWAF (2004)

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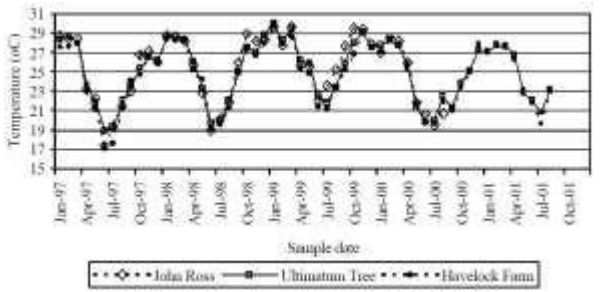
	suspended solids that will reflect healthy estuarine aquatic conditions. Such a limit value range for suspended solids could be set at between 100 – 500 mg/ℓ.			and Sappi reports for the period 2010 to 2016 show that turbidity ranges from 3.0 to 281 NTU, only a small fraction of measurements were lower than 20 NTU, and there was no clear link to high and low flows. There were no clear links between turbidity and salinity during samplings sessions in May 1996, August 2001 and February 2002 (DWAF 2004). Strong winds are also likely to suspend fine sediments in water that is less than 2 m deep. It is therefore necessary to provide a rather generic description as the river and estuary are naturally turbid, so it is necessary to maintain the turbidity within a range that is suitable for the TEC. In this respect, amendments have been made as follows: no water quality limits are set for TSS, and the turbidity has been amended to read: Must not deviate more than 10% from background levels.
	(e) None of the values proposed for the so-called "toxic substances" (ammonia (<0.1 mg/ℓ) and the heavy metals aluminium (<0.10 mg/ℓ), manganese (<0.2 mg/ℓ), iron (<0.1 mg/ℓ), lead (<0.009 mg/ℓ), copper (<0.007 mg/ℓ), nickel (<0.07 mg/ℓ), cobalt (<0.05 mg/ℓ), and zinc (<0.002 mg/ℓ)) correlate with the values for the same variables listed in the GAs. The proposed values seem to be calculated arbitrarily.	Ms Kerisha Govender, Sappi Paper and Paper Packaging, Tugela Mill	Letter via email on 13 December 2023 & 27 March 2024	Water quality Eco-specs are not necessarily aligned to the General Authorisation (GA) limits. GA limits, as well as any Water Use Licence limits may need to be reviewed in light of the water quality limits that have been set. Such a review would be undertaken should the contaminant load at the monitoring site at the downstream point of the RU be greater than the load that could be expected if the water quality limits was being met, and if this is the case then the contributing

	COMMENTS, QUESTIONS AND CONCERNS	COMMENTATOR(S)	SOURCE(S)	RESPONSE(S)
				water users may need to implement stricter measures to improve effluent discharge quality. The values were calculated in conjunction with the fish and macroinvertebrate specialists by considering historic and recent data for the site.
	(f) With regard to temperature, it appears that the drafters of the proposed values did not take cognisance of the fact that the Thukela Estuary is located in a hot and humid climate, with background water temperatures averaging 36^{O}C (long term Sappi data, can be made available if necessary). This high-water temperature is required and necessary for the reproduction of a number of estuarine fish and macro-invertebrates. The proposed limit value range of 17 – 30^{O}C is therefore not indicative of the natural conditions in a sub-tropical estuary, and not based on verifiable scientific evidence.	Ms Kerisha Govender, Sappi Paper and Paper Packaging, Tugela Mill	Letter via email on 13 December 2023 & 27 March 2024	Considering the temperature range proposed for the RU15.2 (the estuary component is in the MPA), the following is relevant: Water temperature, based on the January 1997 to October 2001 dataset Thukela Estuarine Flow Requirements Report (DWAF 2004) and subsequent Sappi reports, shows a very strong seasonal pattern with temperatures reaching a maximum of 30^{O}C during summer and 17^{O}C in winter.  Fig 6.1 Source -Thukela Estuarine Flow Requirements Report (DWAF 2004). However, there have been a number of anomalies: 1) temperatures exceeding 30^{O}C: such as 33^{O}C

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				measured at Ultimatum Tree in 2012 (high flow), 36.5^{O}C at John Ross Bridge in 2010 (high flow) and 36.2^{O}C just upstream of the N2 Bridge (low flow) 2) temperatures <17^{O}C: such as 15.5^{O}C at Mandini Weir in 2006 (low flow) and 16.6^{O}C at John Ross Bridge in 2006 (low flow). Given this range, the temperatures for the estuary and river up to Mandini should fall within the 17^{O}C to 30^{O}C range with <5% of measurements outside of this range within a given year.
	(g) It is unclear as to why *Escherichia coli ("E. coli*") is used as the indicator for pathogens in rivers and dams, instead of Total coliforms. *E coli* is typically used as indicator for the suitability of water treated for human consumption and serves as a specific indicator of human faecal contamination with associated human health risk, and not as an indicator of the health of a natural water body. The measurement of Total (faecal) coliforms will also provide information on algal growth (indicating resource health) as well as treatment efficiency, which the measurement of *E.coli* alone does not provide. Total (faecal) coliforms should therefore be the variable specified for surface water, not *E.coli*. The limit value for Total (faecal) coliforms should furthermore be the same as that specified in the GAs, namely 1,000 counts/100 mℓ water, instead	Ms Kerisha Govender, Sappi Paper and Paper Packaging, Tugela Mill	Letter via email on 13 December 2023 & 27 March 2024	The use of *Escherichia coli* as an indicator is because communities do use river water for domestic use, and due to the concern around poorly performing domestic wastewater treatment works, it is important to identify faecal contamination. The limit of 130 counts per 100mL is related to domestic use and the impacts for full-contact recreational use and downstream domestic use proposed in the South African Water Quality Guidelines for domestic use and recreational use. The term CFU has been replaced by 'counts'

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	of the arbitrary value of 130 counts/100 mℓ water for *E.coli* as currently contained in the Notice.			
3. C	**Comments on the proposed groundwater quantity and quality components**			
3. C (1)	As noted in paragraph A(2) above, the use of population data from the 1996 census for the 2023 determination of the BHN for the groundwater quantity component of the Reserve, as indicated on page 54 of the Notice, is simply not justifiable or scientifically defensible.	Ms Kerisha Govender, Sappi Paper and Paper Packaging, Tugela Mill	Letter via email on 13 December 2023 & 27 March 2024	This concern has been addressed. The population data has been updated based on the most recent census, and the BHN has been determined based on the census data of 2023 from Statistics SA.
3. C (2)	With regard to the groundwater quality component, the descriptive paragraph on page 57 of the Notice indicates that "the ambient groundwater quality is compared to the Class 1 potability value (SANS 241:1 2011)". This is also scientifically flawed and indefensible: a) In the first place, it is a scientifically flawed assumption that the quality of groundwater is, or should be, "suitable" to be consumed by humans. b) The SANS 241 Drinking Water Standard has been established to measure the quality of potable water supplied by water purification works, at the point of delivery (after treatment), and describes two classes: potable water that meets the Class I specification, the recommended compliance limit, is considered to be acceptable for lifetime consumption, while potable water that exceeds the Class I specification, but meets the Class II specification, is considered to be acceptable for consumption	Ms Kerisha Govender, Sappi Paper and Paper Packaging, Tugela Mill	Letter via email on 13 December 2023 & 27 March 2024	This was an error. This has been corrected in the draft notice. The guidelines used for Basic Human Needs requirements is titled, Water Research Commission: Quality of Domestic Water Supplies – Volume 1. Report No. TT 101/98, Second Edition, 1998. There is misunderstanding as to what these ranges stand for. Based on the Water Research Commission: Quality of Domestic Water Supplies – Volume 1. Report No. TT 101/98, Second Edition, 1998; these are Class 1 limits for BHN purposes; however, it does not mean that natural water quality is expected to be within these limits and hence where the concentration is already above Class 1, the BHN threshold is left at that value.

	COMMENTS, QUESTIONS AND CONCERNS	COMMENTATOR(S)	SOURCE(S)	RESPONSE(S)
	for a limited period, as it poses an increased risk to consumers. c) It is a basic principle of hydrogeology that the quality of groundwater is invariably influenced by the host rock through which it moves and is often naturally brackish or could contain naturally high levels of substances that could be potentially harmful to people. It is therefore **ludicrous** to use the SANS 241 standard to compare natural groundwater quality against. d) In addition, the Notice refers to the 2011 SANS 241 standard, and not to the latest standard as published in 2015/6. This is a further example of the use of outdated and scientifically flawed information in the preparation of the Reserve Determination for the Thukela as contained in the Notice.			
3. C (3)	Natural hydrogeochemical processes that take place as water moves through the host rock from recharge to discharge areas will influence groundwater quality. Large parts of the Thukela Estuary basin are underlain by the Dwyka and Ecca Groups of the Karoo Supergroup. The Dwyka diamictites were deposited under marine conditions, while the Ecca Group deposits occurred in marine influenced deltaic environments. The Karoo formations have been extensively intruded by dolerites. The hydrogeochemical characteristics of these formations include the following:	Ms Kerisha Govender, Sappi Paper and Paper Packaging, Tugela Mill	Letter via email on 13 December 2023 & 27 March 2024	We expect that due to high rainfall, flushing of these Karoo aquifers are possible over millennia. There are cases where groundwater in the Dwyka Group falls in Good (Class 1) and Marginal (Class 2) water classification. Regarding points (a) to (c), these are regarded as point sources and were identified in the groundwater Reserve study (DWAF, 2009) as “hotspots” throughout the Thukela Catchment. However, the water quality concentration (WQC) and

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	(a) Formations deposited under marine conditions will have naturally high chloride and sodium concentrations. The background Electrical Conductivity ("EC") in aquifers associated with the diamictites of the Dwyka Group can easily reach levels of up to 1,000 mS/m (which converts to a TDS of up to 7,000 mg/ℓ), while aquifers associated with the Ecca Group can have an EC of 500 mS/m (which converts to a TDS of up to 3,500 mg/ℓ). (b) The weathering of dolerite results in the release of calcium, magnesium, sodium, and fluoride into the groundwater. (c) In certain areas of the Karoo, NO_3 and NO_2 levels of between 21–50 mg/ℓ (as N) have been measured by the DWS, as well as high background sulphate concentrations, while in some of the Karoo deposits, elevated levels of arsenic and uranium have been observed.			RQO limitations are based for Quaternary Catchment level and these sites are regarded as "site specific" cases. QCs where these "hotspots" were mapped previously are indicated in the tables in the RQO Report (RDM/WMA04/00/CON/CLA/0221). We agree with the comment/advice re water quality of dolorite-type aquifers, however, according to the hydrogeological information available, these aquifer systems are rather isolated and not regional to conclude that a whole QC will have "dolerite water quality characteristics".

	COMMENTS, QUESTIONS AND CONCERNS	COMMENTATOR(S)	SOURCE(S)	RESPONSE(S)
3. C (4)	Page 57 of the Notice contain the statement that the water quality of groundwater resource units are to be "well within the drinking water guidelines", and continues to specify the following values for groundwater in Table 4.1 on page 57: pH (5.0 – 9.5), Electrical Conductivity (70 – 150 mS/m), Calcium (80 – 150 mg/ℓ), Magnesium (70 – 100mg/ℓ), Sodium (100 – 200 mg/ℓ), Chloride (100 – 200 mg/ℓ), Sulphate (200 – 400 mg/ℓ), Nitrate (6 – 10 mg/ℓ), and Fluoride (0.7 – 1.0 mg/ℓ). Furthermore, the Notice also states that water quality was not assessed in several of the quaternary catchments due to insufficient information, including V50D. Considering the abovementioned scientific facts relating to aquifers associated with the Karoo deposits, it does not make any scientific sense to specify values based on the expectation that groundwater occurring in marine-based aquifers should meet drinking water standards. *As for surface water, the proposed values are much stricter that the limit values specified in the correlating GA, specifically for the irrigation of wastewater onto land.*	Ms Kerisha Govender, Sappi Paper and Paper Packaging, Tugela Mill	Letter via email on 13 December 2023 & 27 March 2024	Refer to response of 3.C(3) above. The quoted statement "water quality of groundwater resource units is to be "well within the drinking water guidelines", does not appear on page 57. Seemingly, there is misunderstanding as to what these ranges stand for. Based on the Water Research Commission: Quality of Domestic Water Supplies – Volume 1. Report No. TT 101/98, Second Edition, 1998; these are Class 1 limits for BHN purposes; however, it does not mean that natural water quality is expected to be within these limits and hence where the concentration is already above Class 1, the BHN threshold is left at that value e.g., Table 4.3, quaternary catchment V20E sodium is 226.72 while the BHN threshold is 200 mg/l. It would be useful for the commentor to provide the department with water quality data for V50D if available.
3. C (5)	The proposed values for groundwater do not identify sensitive aquifers, for example by making use of the aquifer vulnerability maps published by the DWS as part of the 2005 Groundwater Resource Assessment Phase II (GRAII) project, or the aquifer susceptibility indices. The failure to identify such sensitive aquifers, and the failure to specifically Reserve such aquifers, implies that they are	Ms Kerisha Govender, Sappi Paper and Paper Packaging, Tugela Mill	Letter via email on 13 December 2023 & 27 March 2024	It is not the aim of the Reserve determination process to identify sensitive aquifers, but to ensure the protection of water resources through the quantification of ecological water requirements and BHN that must be set aside before any allocation if effected. This process is inclusive of all areas, including sensitive aquifers

	COMMENTS, QUESTIONS AND CONCERNS	COMMENTATOR(S)	SOURCE(S)	RESPONSE(S)
	not being appropriately protected by the proposed Reserve Determination.			where they are known. Technical studies can be conducted to identify the said areas.
4. 1	The proposed Reserve Determination for the Thukela catchment, specifically for the V50D quaternary catchment (the Mandini River, the lower reaches of the freshwater component of the Thukela River, and the upper portions of the Thukela Estuary), for both surface water (rivers and dams) and for groundwater are not defensible from either a legal or a scientific perspective.	Ms Kerisha Govender, Sappi Paper and Paper Packaging, Tugela Mill	Letter via email on 13 December 2023 & 27 March 2024	Based on the responses in 3 above, this statement is inaccurate. Several studies (High Confidence Reserves, RQO and Classification etc) were conducted in the Thukela catchment including V50D quaternary catchment and the information is contained in the technical reports.
4.2	Accordingly, the decision to publish the proposed Reserve Determination in its current form would potentially be reviewable under the Promotion of Administrative Justice Act 3 of 2000. Recommendation: It is strongly recommended that the scientifically appropriate mechanisms that have been followed in the proposed Classes and RQOs for the Crocodile Marico catchment, to establish Protection Zones and to derive RQOs from changes in natural background, also be used for the setting of RQOs for groundwater in the Thukela catchment, and for establishing the Reserve for both surface and groundwater quantity and quality. It is untenable that census data that is almost 30 years old is being used to determine the BHN component of the Reserve.	Ms Kerisha Govender, Sappi Paper and Paper Packaging, Tugela Mill	Letter via email on 13 December 2023 & 27 March 2024	The issues above have been adequately addressed; therefore, the recommendation is no longer valid and therefore will not be accepted in its entirety.
5	The regulation under S12(2)(b)(i) could not be found.	Mr Hendrik du Toit, Retired from DWS	Letter via email on 23 February 2024	The procedure to determine Water Resource Classification System (WRCS) was published as Regulation 810 in Government Gazette No. 33541 dated 17 September 2010. The WRCS defines:

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				• water resource classes and • the procedure to determine Class, RQOs and Reserve.
6	The required regulations (law) to determine the reserve is not in place yet – The reserve can therefore not be determined accurately.	Mr Hendrik du Toit, Retired from DWS	Letter via email on 23 February 2024	Refer to the above Regulation in number 5.
7	It appears that the quantity of water for the reserve required by the population that are being supplied from or rely on has been ignored or underestimated and the aquatic component has been overestimated.	Mr Hendrik du Toit, Retired from DWS	Letter via email on 23 February 2024	No substantiation given, field studies have been undertaken, technical discussions held, and census data of 2023 has been used.
8	The determined quantity of the reserve in the schedules cannot be approved. And must be scrapped.	Mr Hendrik du Toit, Retired from DWS	Letter via email on 23 February 2024	No reason given; therefore, the statement is unfounded.
9	The BHN in the tables indicate that an internal standard was used to set a quality standard for the reserve. The correct standard for quality is the basic water supply standard (BWS) to be prescribed under WSA. **Without a standard for basic water supply the possible quality of the reserve and part of formula for the reserve is therefore not known.**	Mr Hendrik du Toit, Retired from DWS	Letter via email on 23 February 2024	The BHN is the water abstracted directly from the water resource. It is applicable for communities that are directly dependant on the water resource for subsistence use or use as per schedule 1 water use of the NWA. The basic human needs component of the Reserve hence provides for the essential needs of individuals served by the water resource for their subsistence living which includes water for drinking, food preparation, personal hygiene, and water for their cattle (NOT FOR COMMERCIAL USE)
10	The drinking water standard under SANS 241 is not a basic water supply quality standard and is not set by valid regulations under WSA. That standard is not applicable. The internal research documents and internal policies are not regulations under WSA or NWA.	Mr Hendrik du Toit, Retired from DWS	Letter via email on 23 February 2024	The Reserve specifies the flow and water quality requirements that are necessary to keep the water resource in a certain state of health. For water quality the following information is important to determine a Reserve:

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	The reserve proposed in the draft is therefore invalid and cannot be considered.			• Data from WMS (water management systems)
				  ○ For trend analysis
				  ○ To determine average concentration of variables that are used for determination of the Reserve.
				• Where no data is available either up/downstream of the discharge point, the water quality guidelines (DWAF, 1996) are used to determine a water quality Reserve.
				  ○ Water quality guideline for domestic water use & ecological ecosystems [Volume 1 & 7 of 1996]

11	The classes that were determined under Section 13(1) and (4) does not make sense. A flowing river cannot have the same class as a water course with an intermittent flow in the catchment.	Mr Hendrik du Toit, Retired from DWS	Letter via email on 23 February 2024	Classes are set for an integrated unit of analysis (IUAs). The IUAs represent the spatial units that are defined as significant water resources. Each IUA represents a relatively homogeneous area which requires its own specification of the Water Resources Class. The objective for defining IUAs is to establish broader-scale units for assessing the socio-economic implications of different catchment configuration scenarios and to report on ecological conditions at a sub-catchment scale. Delineation of IUAs is required as it would not be appropriate to set the same Water Resource Class for all water resources in a catchment.
12	The regulations under S12(2)(a) establish guidelines and procedures for determining different classes of water resources was not made.	Mr Hendrik du Toit, Retired from DWS	Letter via email on 23 February 2024	Refer to response for question 11 above. In addition, Classes are set at a higher more strategic level, where the Reserve is set at a particular Ecological Water Requirement (EWR) site on a particular resource. The EWR requirements related to quantity and quality is

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	The 3 classes defined in notice 810 of 2010 and 3141 of 2023 is inadequate because it did not provide for different types of water resources and did not provide for different sizes of the same type of water resources.			captured in the Resource Quality Objectives (RQO's) which also addresses the biota and habitat requirements for the class set for the Integrated Units of Analysis.
13	The water quality objective should be at least the basic water supply standard or better. The quality objectives must also comply with the defined resource quality of water resources in the act.	Mr Hendrik du Toit, Retired from DWS	Letter via email on 23 February 2024	RQOs are set for the class that were determined as per the specifications of setting the Management Class as per the gazetted classification System (Government Gazette No. 48187, Notice 3141) and the Ecological Water Requirements (EWR) determined as per the Reserve. The latter is determined as per the quantity and quality of the water resource to support the riparian and aquatic habitat and its associated biota for a particular water resource at the EWR site. Ecological specifications are determined as part of the implementation plan and is used as the indicators that are required in the Resource Ecological Monitoring Requirement Program. RQOs are aligned with the vision for the resource and the Catchment Management Strategy where the Catchment Management Agencies has been established. The RQO's are essentially narrative, are less subject to change as the understanding of the ecosystem changes.
14	The MAR is therefore not sufficient to base a value on. The quality objective to maintain the present polluted status is not correct.	Mr Hendrik du Toit, Retired from DWS	Letter via email on 23 February 2024	This question is not specific to any page or paragraph. However, the MAR is not used to base a value on. The hydrological nMAR remains the same, it is the present-day MAR that changes based on present day activities in the catchment. Ecological specifications are determined for the water resource requirements and not for the users. Thus, the EWR will be set at a particular

	COMMENTS, QUESTIONS AND CONCERNS	COMMENTATOR(S)	SOURCE(S)	RESPONSE(S)
				site in the water resource for which the Present Ecological State (PES) will be compared to its natural state. The impact that has occurred on the water resource based on the activities in the catchment will indicate the change in the water resources health, and the deviation from natural state will be expressed as the PES (ranging from category A to F: natural to critically modified). The importance and sensitivity of the water resource function and its ecological infrastructure that it provides will guide the setting of the REC for the water resource and that is the management state that is desired for the water resource for it to maintain its natural functions. Some catchments are already so over committed and utilised that in some cases the REC cannot be met with the Present-day state. Hence, the need for urgent regulation, compliance monitoring and enforcement is required.
15	This publication must be for each water resource and considering the comments a publication of the final class and quality objectives can be made for significant resources under Section 13(1). The class and quality objectives for non-significant resources remain as a preliminary classification. The publication that was available for commenting was the final draft under S13(1) and the draft did not contain the required information listed under S13(4).	Mr Hendrik du Toit, Retired from DWS	Letter via email on 23 February 2024	Refer to the response in number 11. Furthermore, Classes and RQO's are determined for significant water resources, water resources that has an ecological, social and economic value and hence a functional ecological infrastructure that provide revenue to the country, has a social, cultural and amenity value and as per the constitution provide for an environment that is safe and healthy.

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16	The draft and final publication did not include items specified in subsections 2 and 3. For example, it was known that some residents of Ladysmith may be affected by the level (flooding) but no regulations were made or noted in the classification to prohibit housing development in low lying areas. The classification and quality objectives published under Section 13(1) may not be valid.	Mr Hendrik du Toit, Retired from DWS	Letter via email on 23 February 2024	This process was concluded in 2023 and the interested and affected parties (IAP) were given sufficient opportunity to raise comments during the comment period of 60 days and also during Public Participation Process. Again, the Class, RQO and EWR are determined for the water resource and its health. Regulations to deal with the flooding issue is a Local Government issue that should be addressed under the IDP and the Water Service Development Plans. This falls under the Water Services Act (No.108 of 1997).
17	There are regulations required to be made under NWA. The regulations of how to determine the reserve and how to determine the class of a resource is also required before an attempt can be made to determine a class, quality objectives or a reserve.	Mr Hendrik du Toit, Retired from DWS	Letter via email on 23 February 2024	Refer to the above Regulation in number 5.
18	Water resource management is not listed in schedule 4 of the Constitution as within the concurrent National and Provincial legislative competence and is not listed in schedule 5 as within the exclusive Provincial legislative competence. Water resource management is therefore a national only legislative competence.	Mr Hendrik du Toit, Retired from DWS	Letter via email on 23 February 2024	Chapter 3 of the National Water Act (No. 36 of 1998) deals with the protection of water resources. The measures for protection of water resources are: • Classification (S13) • Resource Quality Objectives (S13) • Reserve (S16) (S17: Preliminary Reserve Determination) • Water resource protection is not possible if water use is not managed sustainably. Chapter 2 of the NWA refers to the NWRS and Chapter 7 refers to the establishment of CMAs that should develop a CMS that is subject to the NWRS. The NWRS refers to water resources that should be protected, conserved, managed, used and controlled. If water

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				resources are not managed the requirements of the constitution in terms of section 24 cannot be met.
19	The quaternary catchments on which the determinations are based were apparently made using a 1:250000 map. Errors are found if a 1:50000 map or a 1:10000 photo is used. Areas and farms may end up in the wrong catchment.	Mr Hendrik du Toit, Retired from DWS	Letter via email on 23 February 2024	The assumption made by the observer could be based on their knowledge of the previous "manually determined" quaternary catchment areas using mostly 1:50 000 maps (pre-2011). This is however incorrect. The current quaternary catchments were delineated from the SRTM 90m DTM that was hydrologically corrected, and then (together with calculated flow paths and identified pour points) used as input to software developed by the ARC. Furthermore, it is possible for a farm to be in more than one catchment area. More information on the quaternary catchments can be obtained from the Water Research Commission, Research Report No.1908/1/11, Pretoria.
20	The word Baseflow is very similar to Normal flow used in the 1956 Water Act but does not include the 80 percent of the time stipulation. The base flow of many rivers is actually zero.	Mr Hendrik du Toit, Retired from DWS	Letter via email on 23 February 2024	Baseflow and Normal flow are not the same contrary to the suggestion of the comment. This Reserve process is based on the National Water Act 36 of 1998 and not Water Act 54 of 1956. The act of 1956 has been revoked and water resources are managed, protected, conserved, used, and controlled under the legislative mandate of the NWA (Act 36 of 1998). Moreover, technical studies were undertaken to determine baseflow values. Therefore, the comment is misplaced and invalid.
21	The acronyms PES, REC, TEC and other have no meaning without regulations on how to determine the reserve.	Mr Hendrik du Toit, Retired from DWS	Letter via email on 23 February 2024	These are well accepted acronyms and have been in use since the promulgation of the NWA in 1998. Also refer to the response in number 5.

	COMMENTS, QUESTIONS AND CONCERNS	COMMENTATOR(S)	SOURCE(S)	RESPONSE(S)
22	The regulations on how to determine the reserve under Section 12 does not exist.	Mr Hendrik du Toit, Retired from DWS	Letter via email on 23 February 2024	This comment is incorrect since Regulation 810 gives guidance on how to determine the Reserve under Section 12 (Chapter 3 of the NWA). Also refer to the response in number 5.
23	A dam in a resource does not deprive the aquatic organisms of water because dams were required under the 1956 Water Act to release the flow in the resource up to the normal flow (or low flow) and the leaking water from a dam usually cause the organisms to thrive (all dams leak to some extent).	Mr Hendrik du Toit, Retired from DWS	Letter via email on 23 February 2024	This is incorrect. It has been shown that dams are artificial barriers that provides ecological corridors and migratory pathways for the macroinvertebrates and fish species. Your statements all refer to the 1956 Act that is not applicable anymore. Kindly refer to the last 2 decades of research and papers produced on the impacts of artificial structures on the ecological infrastructure.

NB: Most of the comments received from SAPPI have been addressed by the responses finalised in the Classification and RQOs study which was concluded in March 2023. (Government Gazette No. 48187, Notice 3141, Link to Comments and Register:https://www.dws.gov.za/rdm/WRCS/doc/Thukela/Public%20Comments%20and%20Reponses_Thukela%20ClassesRQOs.pdf).
This current process deals with Reserve component.
Comments received from SAPPI, dated, 27 March 2024 were similar to December 2023 comments.