DEPARTMENT OF WATER AND SANITATION

NO. 1669

14 January 2022

NATIONAL WATER ACT, 1998 (ACT NO. 36 OF 1998)

RESERVE DETERMINATION FOR WATER RESOURCES OF THE MOKOLO AND MATLABAS CATCHMENTS

I, Senzo Mchunu, in my capacity as Minister of Water and Sanitation, and duly authorised in terms of sections 16(1) of the National Water Act, 1998 (Act No. 36 of 1998), hereby publish the Reserve determination for water resources of the Mokolo and Matlabas catchments.

Director: Reserve Determination Attention: Mr Yakeen Atwaru Department of Water and Sanitation Ndinaye Building 185 Francis Baard Street Private Bag X313 Pretoria 0001 Email: <u>atwaruy@dws.gov.za</u>

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SENZO MCHUNU (MP) MINISTER OF WATER AND SANITATION DATE: 13 10 2021

RESERVE DETERMINATION FOR WATER RESOURCES OF THE MOKOLO AND MATLABAS CATCHMENTS IN TERMS OF SECTION 16(1) AND (2) OF THE NATIONAL WATER ACT, 1998 (ACT NO. 36 OF 1998)

SCHEDULE

1. DESCRIPTION OF WATER RESOURCE

1.1 The Reserve is determined for all or part of every significant water resource within the Mokolo and Matlabas catchments as set out below:

- Water Management Area: Limpopo
- Drainage Regions: A Primary Drainage Region (A41 and A42)
- Rivers: Mokolo, Mamba and Matlabas
- 1.2 The Minister has, in terms of section 12 of the National Water Act, 1998 (Act No.36 of 1998) ("the Act"), prescribed a system for classifying water resources by issuing Government Notice No. R. 810, published in *Gazette* No. 33541 dated 17 September 2010.
- 1.3 The Minister, in terms of section 16(1) of the Act, determines the following Reserve for the Mokolo and Matlabas catchments.

2. ACRONYMS AND DEFINITIONS

2.1 Acronyms

BHN	Basic Human Needs	
EC	Ecological Category	
EcoSpecs	Ecological Specifications	
EIA	Environmental Impact Assessment	
EIS	Ecological Importance and Sensitivity	
ESA	Ecological Support Areas	
EWR	Ecological Water Requirement	
EWR Site	Ecological Water Requirement Site	
GRAII	Groundwater Resource Assessment Phase II	
GRDM	Groundwater Resource Directed Measures	
GRUs	Groundwater Resource Units	
MAR	Mean Annual Runoff	
МСМ	Million Cubic Metres	
MLF	Maintenance Low Flow	
NMAR	Natural Mean Annual Runoff	
PES	Present Ecological Status	
RC	Reference conditions	
REC	Recommended Ecological Category	
TEACHA	Tools for Ecological Aquatic Chemical Habitat Assessment	
TPCs	Thresholds of Potential Concern	
WUL	Water Use Licence	
WQSU	Water quality sub-unit	

2.2 Definitions

In this Notice any word or expression to which a meaning has been assigned in the Act shall have the meaning so assigned and, unless the context otherwise indicates---

"Baseflow" means a sustained low flow in rivers during dry or fair weather conditions, but not necessarily all contributed by groundwater; and includes contribution from delayed interflow and groundwater discharge;

"biophysical node" means the modelling point's which is a representative of an upstream reach or area of an aquatic eco-system such as rivers, wetlands, estuaries and groundwater for which a suite of relationships apply;

"ecological importance and sensitivity" means key indicators in the ecological classification of water resources. Ecological importance relates to the presence, representativeness and diversity of species of biota and habitat. Ecological sensitivity relates to the vulnerability of the habitat and biota to modifications that may occur in flows, water levels and physico-chemical conditions;

"ecological water requirements" means the flow patterns such as the magnitude, timing and duration, and water quality needed to maintain a riverine ecosystem in a particular condition. This term refers to both the quantity and the quality of the components;

"ecological water requirement sites" means specific points on the river, as determined through the site selection process, which consists of a length of a river of various cross-sections for both hydraulic and ecological purposes. These sites provide sufficient indicators to assess environmental flows and assess the condition of biophysical components drivers such as hydrology, geomorphology and physico-chemical and biological responses such as fish, invertebrates and riparian vegetation;

"present ecological status" means a category indicating the current health or integrity of various biological attributes of the water resource, compared to the natural or close to natural reference conditions. The results of the process are provided as Ecological Categories ranging from near natural to completely modified;

"recharge" means the addition of water to the zone of saturation, either by downward percolation of precipitation or surface water or the lateral migration of groundwater from adjacent aquifers;

"recommended ecological category" means an ecological category indicating the ecological management target for a water resource based on its ecological classification that should be attained. Categories range from Category A, which refers to unmodified, natural to Category D, which refers to largely modified;

"reserve" means the quantity and quality of the water required to satisfy the BHN by securing a basic water supply and to protect the aquatic ecosystem in order to secure ecologically sustainable development and use of the relevant water resource; and

"the Act" means the National Water Act, 1998 (Act No. 36 of 1998).

3. **RESERVE DETERMINATION**

(1) The Reserve which includes the EWR and the BHN Reserve for the Rivers at EWR sites and selected biophysical nodes in the Mokolo and Matlabas catchments are set out in Paragraph 4, Table 4.1.

(2) The water quality component of the Reserve for the Rivers at the EWR sites in Mokolo and Matlabas catchments, in terms of section 16(1) of the Act, is set out in Pargraph 5, Tables 5.1 - 5.10.

(3) The Groundwater Reserve for Water Quantity, in terms of section 16(1) of the Act, for the Mokolo and Matlabas catchments are set out in Paragraph 6, Table 6.1.

- (4) The Mokolo and Matlabas catchments locality and EWR sites are indicated in Figure 1.
- (5) The Groundwater Reserve for Water Quality, in terms of section 16(1) of the Act, for the Mokolo and Matlabas catchments are set out in Paragraph 7, Tables 7.1 - 7.5.
- (6) The Reserve will apply from the date signed off as determined in terms of section 16(1) of the Act, unless otherwise specified by the Minister.

4. SURFACE WATER QUANTITY COMPONENT FOR RIVERS

The results for the Reserve determination and ecological categorisation for the Mokolo and Matlabas catchments, where the Reserve amounts are expressed as a percentage of the NMAR for the respective catchments in terms of section (16)(1) of the Act

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Table

Node Name	Quaternary Catchment	River Name	PES	EIS	NMAR (MCM)'	EWR % NMAR ²	BHN Reserve ³ (%NMAR)	Total Reserve ⁴ (%NMAR)
HN51	A42B	Grootspruit (source) to confluence with Sand	٥	Moderate	27.8	21.73	0	21.73
EWR Site MOK_EWR1 A	A42C	Mokolo to confluence with Dwars	CD	High	84.84	16.7	0.048	16.748
EWR Site MOK_EWR1 B	A42E	Mokolo to confluence with Sterkstroom	B/C	High	135.03	13.6	0.090	13.69
HN54	A42D	Sterkstroam (source) to confluence with Mokolo,	ω	Very high	43.45	52.63	0	52.63
EWR Site MOK EWR2	A42F	Mokolo River in A42F to inflow Mokolo Dam,	B/C	Very high	196.2	11.7	0.103	11.803
EWR Site MOK_EWR3	A42G	Mokolo Dam to upper portion of A42G (10km downstream of dam)	B/C	Very high	214.5	8.9	0.111	9.011
EWR Site MOK EWR4	A42G	Mokolo main stem	υ	Very high	253.3	12.3	0.111	12.411
HN59	A41A	Headwaters Mothlabatsi (Mattabas-Zyn-Kloof, peatlands)	A	Very high	5.23	57.07	0	57.07
MAT Rapid_EWR 3	A41B	Mamba to confluence with Mothlabatsi	B/C	High	9.54	35.49	0	35.49
MAT Rapid_EWR 2	A41B	Mattabas/Motthabatsi confluence (outlet of IUA)	B/C	High	32.80	33.23	0	33.23
MAT Rapid_EWR	A41C	Matlabas	-00	Moderate	35.58	33 42	c	CV 66

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- Represents the percentage of BHN.
- The total Reserve amount accounts for both the Ecological Reserve and the BHN. C Q C

The REC has not been recommended for approval for this preliminary Reserve but the maintenance of the current operating of the system was recommended.

5. SURFACE WATER - QUALITY COMPONENT FOR RIVERS

5.1 Summary of the Quality component at EWR sites

Table 5.1: PES categories and overall site assessment for EWR 1A in the Mokolo River-WQSU1 4

RIVER	Mokolo River		Water Quality Monitoring Points	cring Points
WQSU	4		RC	A4H002001, 77-79, n = 68
EWR SITE	1A		PES	A4H002Q01, '02-'07 (with 1 point in 2007). n = 48 (but 37 for F and SO4)
Confidence assessment		Confidence in the asses is close to the EWR site.	in the assessment is r e EWR site.	Confidence in the assessment is moderate, as little DO, temp., turbidity or toxics data, although the gauging weir is close to the EWR site.
Water Quality Constituents	nts	RC Value	PES Value	Category (Rating) / Comment
	MgS04		4	5
-	Na2S04		f	
	MgCI2		E	
calls	CaCl2		1	I EACHA could not be used and EC used as surrogate
(11)R(11)	NaCI		1	
	CaSO4		I	
Nutrients	SRP	0.011	0.0165	B (1): Benchmark category was recalibrated
(mg/L)	TIN	0.080	0.123	A (0)
	pH (5th and 95th percentiles)	6.68 - 7.70	6.92 - 7.83	A (0)
	Temperature		1	No data, but few impacts expected. Catchment not pristine so A/B (0.5) -
Physical	Dissolved oxygen			qualitative assessment only
variables	Turbidity (NTU)		1	No data, but loads not expected to be high. B (1) - qualitative assessment only
	Electrical conductivity (mS/m)	12.28	12.05	A (0)
	Chl-a: periphyton		EWR 1A: 21.58	C/D (2.5) (n=1)
	Chl-a: phytoplankton		a	
Kesponse variables	Biotic community composition:		SASS: 127	
	macroinvertebrate (ASPT) score		ASPT: 5.3	(0.70) 0

RIVER	Mokolo River		Water Quality Monitoring Points	ing Points
WQSU	4		RC	A4H002001 '77-'79 n = 68
EWR SITE	1A		PES	A4H002001, 102-107 (with 1 noint in 2007) n = 48 (hut 27 for E and COA)
Confidence assessment		Confidence is close to th	Confidence in the assessment is r is close to the EWR site.	Confidence in the assessment is moderate, as little DO, temp., turbidity or toxics data, although the gauging weir is close to the EWR site.
Water Quality Constituents	s	RC Value	PES Value	Category (Rating) / Comment
	Fish		70.3.	C - largely flow-related
	Diatoms		EWR 1A: SPI = 17.3 and 16.8 A/B (0.5) (n = 2)	A/B (0.5) (n = 2)
Toxics	Fluoride	0.10	0.18	A (0)
(mg/L)	Ammonia		0.001	A (0)
OVERALL SITE CLASSIFICATION (from PAI)	ICATION (from PAI)		B/C (80 %)	
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* To be generated using TEACHA when the TPC for EC is exceeded or salt pollution is expected

		EWR Site: 1A Monitoring site: A4H002001	
Water quality metrics		ECOSPEC: PES	
	MgSO4	The 95th percentile of the data must be \$ 16 mg/l.	
	Na2SO4	The 95th percentile of the data must be $\leq 20 \text{ mg/L}$.	
Inorganic salte*	MgCI2	The 95th percentile of the data must be $\leq 15 \text{ mg/L}$.	
	CaCl2	The 95th percentile of the data must be $\leq 21 \text{ mg/L}$.	
	NaCI	The 95th percentile of the data must be $\leq 45 \text{ mg/L}$.	
	CaSO4	The 95th percentile of the data must be \leq 351 mg/L.	
	EC	The 95th percentile of the data must be ≤ 30 mS/m.	
	Hd	The 5th and 95th percentiles of the data must range from 6.5 to 8.0.	
Physical variables	Temperature	Small deviation from the natural temperature range.	
	Dissolved oxygen	The 5th percentile of the data must be \geq 7.5 mg/L.	
	Turbidity	Vary by a small amount from the natural turbidity range; minor silting of instream habitats acceptable.	sam habitats acceptable.
Nutrients	TIN	The 50th percentile of the data must be ≤ 0.25 mg/L.	
(mg/L)	P04-P	The 50th percentile of the data must be ≤ 0.025 mg/L.	
	Chl-a phytoplankton	The 50th percentile of the data must be < 10 µg/L.**	
Response variables	Chl-a periphyton	The 50th percentile of the data must be $\leq 52.5 \text{ mg/m2}$.***	
	Toxics	The 95th percentile of the data must be within the Chronic Effects Value (CEV) as stated in DWAF (1996).	(CEV) as stated in DWAF

Table 5.2: Ecospecs relating to physico-chemical data: PES

** No phytoplankton data were available for this assessment. All EcoSpecs and TPCs need verification as range is based on expert judgement.

*** Periphyton (21.58 mg/m2) is actually in a C/D category (C = 12 - 21 mg/m2 and D = 21 - 84 mg/m2; DWAF, 2008), so therefore the upper boundary of a C/D has been defined as the EcoSpec for the PES.

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RIVER	Mokolo River		Water Quality Monitoring Points	ng Points
WQSU	4		RC	A4H002Q01, '77 - '79, n = 68
EWR SITE	18		PES	A4H002Q01, '02-'07 (with 1 point in 2007), n = 48 (but 37 for F and SO4):
Confidence assessment	#	Confidence in the assessm from A4H002001 is used fo based on on-site indicators.	issessment is moderate, as used for EWR 1A and B, wi dicators.	Confidence in the assessment is moderate, as little DO, temp., turbidity or toxics data. Data from A4H002Q01 is used for EWR 1A and B, with modifications to the PAI table – particularly based on on-site indicators.
Water Quality Constituents	ants	RC Value	PES Value	Category (Rating) / Comment
	MgSO4		t	
	Na2SO4		1	
Inorganic" salts	MgCl2		I	TEACHA could not be used and FC used
saus (ma/L)	CaCl2		1	as surrogate
	NaCI			1
	CaSO4		æ	
Nutrients	SRP	0.011	0.0165	B (1): Benchmark category was recalibrated
(TIN	0.080	0.123	A (0)
	pH (5th and 95th percentiles)	6.68 and 7.70	6.92 - 7.83	A (0)
	Temperature			No data hut faur immante concetad
Physical variables	Dissolved oxygen		1	Catchment not pristine, so B (1) due to the impact of zero flows – qualitative assessment only
	Turbidity (NTU)		1	No data, but loads not expected to be high. B (1) – qualitative assessment only
	Electrical conductivity (mS/m)	12.28	12.05	A (0)
Response variables	Chl-a: periphyton		WQ site 3 (Dwars): 19.04 (high SD)	C (2) (n=1)
	Chl-a: phytoplankton			
	Biotic community composition:		SASS: 130	

KIVER	Mokolo River		Water Quality Monitoring Points	ng Points
WQSU	4		RC	A4H002Q01, '77 - '79, n = 68
EWR SITE	13		PES	A4H002Q01, '02-'07 (with 1 point in 2007), n = 48 (but 37 for F and SO4)
Confidence assessment		Confidence in the assessm from A4H002Q01 is used fo based on on-site indicators.	assessment is moderate, as is used for EWR 1A and B, w ndicators.	Confidence in the assessment is moderate, as little DO, temp., turbidity or toxics data. Data from A4H002Q01 is used for EWR 1A and B, with modifications to the PAI table – particularly based on on-site indicators.
Water Quality Constituents	S	RC Value	PES Value	Category (Rating) / Comment
	macroinvertebrate (ASPT) score		ASPT: 5.4 (Jan '08) SASS: 188 ASPT: 6.1 (June '08)	B/C
	Fish		72.4	U
			EWR 18: SPI = 18.8	A (0) (n=1)
	Liatoms		WQ site 3 (Dwars): 15.9	B (1) (n=2)
Toxics	Fluoride	0.10	0.18	A (0)
(mg/L)	Ammonia		0.001	A (0)
OVERALL SITE CLASSIFICATION (from PAI)	FICATION (from PAI)		B/C (80.8%)	

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Table 5.4: E

River: Mokolo		EWR Site: 1B Monitoring site: A4H002Q01	2001
Water quality metrics		ECOSPEC: PES	
	MgSO4	The 95th percentile of the data must be \leq 16 mg/L.	
	Na2SO4	The 95th percentile of the data must be ≤ 20 mg/L.	
Inorganic salts*	MgCIZ	The 95th percentile of the data must be ≤15 mg/L.	
(mg/L)	CaCl2	The 95th percentile of the data must be $\leq 21 \text{ mg/l.}$	
	NaCl	The 95th percentile of the data must be ≤ 45 mg/L.	
	CaSO4	The 95th percentile of the data must be ≤ 351 mg/L.	
	EC	The 95th percentile of the data must be $\leq 30 \text{ mS/m}$.	
	Hd	The 5th and 95th percentiles of the data must range from 6.5 to 8.0.	
Physical variables	Temperature	Small deviation from the natural temperature range.	
	Dissofved oxygen	The 5th percentile of the data must be \geq 7.0 mg/L.	
	Turbidity	Vary by a small amount from the natural turbidity range; minor silting of instream habitats acceptable.	ilting of instream habitats
Nutrients	TIN	The 50th percentile of the data must be ≤ 0.25 mg/L.	
(mg/L)	P04-P	The 50th percentile of the data must be ≤ 0.025 mg/L.	
	Chi-a phytoplankton	The 50th percentile of the data must be < 10 µg/L.**.	
Response variables	Chl-a periphyton	The 50th percentile of the data must be $\leq 21 \text{ mg/m2}$.	
	Toxics	The 95th percentile of the data must be within the CEV as stated in DWAF (1996).	AF (1996).

** No phytoplankton data were available for this assessment. All EcoSpecs and TPCs need verification as range is based on expert judgement.

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WQSU	4		RC	A4H005Q01, '77 - '80, n = 85 (but 163 for EC)
EWR SITE	2		PES	A4H005Q01, '98 - '01, $n = 39$ (but 47 for TIN)
Confidence assessment		Confidence in the assessi available, and although the only available up until 2001.	assessment is low. Little C ugh the gauging weir is close til 2001.	Confidence in the assessment is low. Little DO, temp., turbidity or toxics data are available, and although the gauging weir is close to the EWR site, present state data is only available up until 2001.
Water Quality Constituents	ents	RC Value	PES Value	Category (Rating) / Comment
	MgSO4		1	
-	Na2SO4			
Inorganic Salte	MgCl2		1	TEACHA could not be used and EC
(mod)	CaCl2		3	used as surrogate
(NaCI		1)
	CaSO4		a	
Nutrients	SRP	0.011	0.0059	A (0): Benchmark category was recalibrated – RC data very variable
1	TIN	0.06	0.02	A (0). RC data very variable
	pH (5th and 95th percentiles)	6.00 and 7.25	7.46 - 7.87	A (0): Benchmark category recalibrated for lower A category
	Temperature		1	No data, but few impacts expected.
				Some temperature and DO
Physical variables	Ulssolved axygen		1	fluctuations may occur at tow flows - B (1) – qualitative assessment only
	Turbidity (NTU)			No data, but loads not expected to be high. A/B (0.5) – qualitative
	Electrical conductivity (mS/m)	9.09	9.4	A (0)
			EWR 2: 25.54	D (3) (n=1). SD high across 3
Response variables	Chl-a: periphyton		WQ site 4: 18.68 (high SD)	replicates C (2) (n=1)
	Chl-a: phytoplankton			

RIVER	Mokolo River		Water Quality Monitoring Points	g Points
WQSU	4		RC	A4H005Q01, '77 - '80, n = 85 (but 163 for EC)
EWR SITE	2		PES	A4H005Q01, '98 - '01, n = 39 (but 47 for TIN)
Confidence assessment		Confidence in the assessn available, and although the only available up until 2001.	essment is low. Little D the gauging weir is close 001.	Confidence in the assessment is low. Little DO, temp., turbidity or toxics data are available, and although the gauging weir is close to the EWR site, present state data is only available up until 2001.
Water Quality Constituents	Its	RC Value	PES Value	Category (Rating) / Comment
	Biotic community composition: macro - invertebrate (ASPT) score		Jan '08: SASS 82; ASPT - 5.1 March '08: SASS 106 - ASDT - 6-6	
	Fish		65.1	U
	Diatoms		EWR 2: SPI=16.1 WQ site 4: 18.8	B (1) (n=2) A (0) /n=1)
Toxics	Fluoride	0.19	0.15	A (0)
(mg/L)	Ammonia		0.002	A (0)
OVERALL SITE CLASSIFICATION (from PAI)	FICATION (from PAI)		B (84.2)	

32 No. 45735

River: Mokolo		EWR: 2 Monitorina site: A4H002001	
Water quality metrics		EC: PES	
	MgSO4	The 95th percentile of the data must be < 16 mg/L.	
	Na2SO4	The 95th percentile of the data must be $\leq 20 \text{ mg/L}$.	
Inorganic salts*	MgCI2	The 95th percentile of the data must be ≤15 mg/L.	
(mg/L)	caci2	The 95th percentile of the data must be $\leq 21 \text{ mg/L}$.	
	NaCI	The 95th percentile of the data must be $\leq 45 \text{ mg/L}$.	
	CaSO4	The 95th percentile of the data must be $\leq 351 \text{ mg/L}$.	
	S	The 95th percentile of the data must be < 30 mS/m.	
	Hq	The 5th and 95th percentiles of the data must range from 6.5 to 8.0.	
Physical variables	Temperature	Small deviation from the natural temperature range.	
	Dissolved oxygen	The 5th percentile of the data must be $\geq 7 \text{ mg/L}$.	
	Turbidity	Vary by a small amount from the natural turbidity range; minor silting of instream habitats acceptable.	m habitats
Nutrients	NIT	The 50th percentile of the data must be ≤ 0.25 mg/L.	
(mg/L)	PO4-P	The 50th percentile of the data must be ≤ 0.015 mg/L.	
	Chl-a phytoplankton	The 50th percentile of the data must be < 10 µg/L.**	
Response variables	Chl-a periphyton	The 50th percentile of the data must be $\leq 52.5 \text{ mg/m2}$. ***	
	Toxics	The 95th percentile of the data must be within the TWOR as stated in DWAF (1996)	

Table 5.6: EcoSpecs relating to physico-chemical data: PES

** No phytoplankton data were available for this assessment. All EcoSpecs and TPCs need verification as based on expert judgement.

*** Periphyton (25.54 mg/m2) is actually in a C/D category (C= 12 - 21 and D= 21 - 84 mg/m2, DWAF 2008), so have defined the upper boundary of a C/D as the EcoSpec for PES.

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RIVER	Mokolo River		Water Quality Monitoring Points	ints
WQSU	Q		RC	A4H007Q01, '77 - '80, n = 82
EWR SITE	3		PES	A4H010Q01, '92 - '96, n = 27 (but 19 for temp. and 6 for NH3)
Confidence assessment		Confidence in the assessment i gauging weir is close to the A4H007Q01 on the Tambotie R	is low as little DO, temp., turbidi EWR site, present state data iver (same EcoRegion level II).	Confidence in the assessment is low as little DO, temp., turbidity or toxics data are available. Although the gauging weir is close to the EWR site, present state data only until 1996. RC data sourced from A4H007Q01 on the Tambotie River (same EcoRegion level II).
Water Quality Constituents	nts	RC Value	PES Value	Category (Rating) / Comment
	MgSO4		1	
	Na2SO4			
IIIOUGAINC salts	MgCI2			TEACHA could not he used and EC used
(mail)	CaCl2		1	as surrodate
	NaCi			
	CaSO4			
Nutrients	SRP	0.007	0.015	A (0): Benchmark category was recalibrated Data very variable
(III) March	TIN	0.065	0.067	A (0). Data very variable
	pH (5th and 95th percentiles)	5.14 and 6.70	7.2 and 7.76	B (1): RC data 5.14 (5th percentile) and 6.7 (95th percentile) – reliability?
	Temperature (10th and 90th percentiles)		12 – 25	Little data, but site downstream Mokolo Dam (even if multi-level off take. probably
Physical variables	Dissolved oxygen		1	bottom release due to low flows in the dam), so dam impacts on temperature and D0 expected. C (2)
	Turbidity (NTU)			No data, but loads not expected to be high. A/B (0.5) – qualitative assessment only
	Electrical conductivity (mS/m)	15 and 24	10.87	A (0)

WGSU5RCAHH07001, 77 - '80, n = 82EWR SITE3AHH07001, '92 - '96, n = 27 (but 19 for termp. and 6 for NH3)FESAHH010001, '92 - '96, n = 27 (but 19 for termp. and 6 for NH3)Confidence3Confidence in the assessment is (was little DO, termp. turbidity or toxics data are available. Athough the gauging weir is close to the EWR site, present state data only until 1996. RC data sourced from AHH07001 on the Tambole River (same EcoRegion level II).Vater Quality ConstituentsRC ValuePES ValueCategory (Rating) / CommentWater Quality ConstituentsRC ValuePES ValueC (2) (n=1)Mater Quality ConstituentsRC Value17.28C (2) (n=1)Nater Quality ConstituentsNater ScienceSSS 130C (2) (n=1)Response variableASPT1 ScienceSSS 130C (2) (n=1)Response variableKSPT1 scienceSSS 149Response variableResponse variableFishAMM01001SSS 140C (2) (n=1)Response variableResponse variableAMM01001AMM01001C (2) (n=1)Response variableResponse variableAMM01001AMM01001C (2) (n=1)Response VariableResponse VariableAMM01001AMM01001AMM01001Response VariableResponse VariableAMM01001AMM01001AMM01001Response VariableResponse VariableAMM01001AMM01001AMM01001Response VariableResponse VariableAMM01001AMM01001AMM01001Response VariableResponse VariableAMM010	RIVER	Mokolo River		Water Quality Monitoring Points	vints
SITE 3 PES ence 3 Confidence in the assessment is low as little DO, temp., turbidity gauging weir is close to the EWR site, present state data. A4H007Q01 on the Tambotie River (same EcoRegion level I). Quality Constituents RC Value PES Value Ch1-a: phytoplankton RC Value PES Value Biotic Commonity SASS:130 composition: ASPT: 5.0 ASPT: 5.0 nacroinvertebrate ASPT: 5.0 ASPT: 5.0 fish SASS:149 SASS:149 Ise variable Fish SASS:149 Fish SASPT: 5.0 SASS: 149 Diatoms SASS: 149 SASS: 149 Aserti score SASS: 149 SASS: 149 Aserti score SASS: 149 ASPT: 5.7 fish SASS: 149 SASS: 149 Aserti score SASS: 149 SASS Aserti score SASS SASS				RC	A4H007Q01, '77 - '80, n = 82
ence ment Quality Constituents Quality Constituents Chl-a: phytoplankton Biotic community composition: macroinvertebrate (ASPT) score Fish Diatoms Diatoms Ammonia				PES	A4H010Q01, '92 - '96, n = 27 (but 19 for temp. and 6 for NH3)
Quality Constituents RC Value PES Value Ch1-a: periphyton Ch1-a: periphyton 17.28 Ch1-a: periphyton Ch1-a: periphyton 17.28 Ch1-a: phytoplankton Biotic community SASS:130 Elotic community SASS:149 ASPT: 5.0 naecroinvertebrate ASPT: 5.0 SASS: 149 Inaccoinvertebrate ASPT: 5.7 ASPT: 5.7 Inaccoinvertebrate ASPT: 5.7 ASPT: 5.7 Inaccoinvertebrate SPI=16.6 (Sept 07) SPI=17.4 Diatoms SPI=17.4 (Mar 08) SPI=17.4 Fluoride 6.77 0.278 0.278	Confidence Issessment		Confidence in the assessment in gauging weir is close to the A4H007Q01 on the Tambotie Ri	is low as little DO, temp., turbid EWR site, present state data iver (same EcoRegion level II).	lity or toxics data are available. Atthough the a only until 1996. RC data sourced from
Chl-a: periphyton 17.28 Chl-a: phytoplankton 17.28 Chl-a: phytoplankton - Biotic community - Biotic community SASS:130 ASPT: 5.0 SASS:149 Macroinvertebrate SASS:149 ASPT: 5.0 SASS:149 Ish Eish Diatoms 65.8 Putoma SPI=17.4 Diatoms SPI=17.4 Monoia 0.001	Vater Quality Constituents		RC Value	PES Value	Category (Rating) / Comment
Chl-a: phytoplankton - Biotic community Biotic community composition: SASS:130 macroinvertebrate SASS:149 ASPT: 5.0 SASS: 149 ASPT: 5.0 SASS: 149 ASPT: 5.0 SASS: 149 ASPT: 5.1 SASS: 149 ASPT: 5.7 SASS: 149 Biatoms SASS: 140 Biatoms SASS: 140 ASPT: 5.7 SASS: 140 ASPT: 5.7 SASS: 140 ASPT: 5.7 SASS ASPT: 5.7 SASS ASPT: 5.7 S	O	Chl-a: periphyton		17.28	C (2) (n=1)
Biotic community SASS:130 composition: macroinvertebrate ASPT: 5.0 macroinvertebrate ASPT: 5.0 ASPT: 5.0 ASPT: score ASPT: 5.0 ASPT: 5.1 Ise variable Fish ASPT: 5.7 Ise variable Fish 65.8 Inatoms SPI=16.6 (Sept 07) Inatoms SPI=17.4 Inatoms SPI=18.4 Mar 08) SPI=18.4 Mar 08) SPI=18.4 Ammonia 0.278	O	Chl-a: phytoplankton			E
Revariable ASPT: 5.0 nacroinvertebrate ASPT: 5.7 ASPT: 5.7 ASPT: 5.7 ASPT: 5	8			SASS:130	0
macroinvertebrate SASS: 149 ASPT: 5.7 ASPT: 5.7 Inse variable ASPT: 5.7 Fish ASPT: 5.7 Diatoms 65.8 Diatoms SPI=16.6 (Sept 07) SPI=17.4 0.00) Ammonia 0.160	Ö	composition:		ASPT: 5.0	
The variable Fish ASPL 3.7 Rish E5.8 ASPL 3.7 Diatoms E5.8 E5.8 Diatoms SPI=17.4 Namonia (Mar 08) Ammonia 0.278		nacroinvertebrate		SASS: 149	
Tise variable Fish 65.8 Piertons SPI=17.4 Diatoms SPI=17.4 Marcons SPI=17.4 Fluonide 6.77 Ammonia 0.278 Ammonia 0.160	_1	AGE I SCOLE		ASPI: 5./	
Diatoms SPI=16.6 (Sept 07) Diatoms SPI=17.4 Clan 08) SPI=18.4 (Mar 08) SPI=18.4 Fluoride 6.77 0.278 Ammonia 0.160 0.001		ish		65.8	U
Diatoms SPI=17.4 Diatoms (Jan 08) Fluoride 6.77 Ammonia 0.278	1			SPI=16.6 (Sept 07)	B (1) (n=3)
Diatoms (Jan 08) SPI=18.4 Fluoride 6.77 0.278 Ammonia 0.160 0.001				SPI=17.4	
Fluoride 6.77 0.278 Ammonia 0.160 0.001		Diatoms		(Jan 08)	A (0)
Fluoride 6.77 0.278 Ammonia 0.160 0.001				SPI=18.4	
Fluoride 6.77 0.278 Ammonia 0.160 0.001				(Mar 08)	A (0)
Ammonia 0.160 0.001		luoride	6.77	0.278	A (0)
		Ammonia	0.160	0.001	A (0)
OVERALL SITE CLASSIFICATION (from PAI)	DVERALL SITE CLASSIFIC	CATION (from PAI)		B/C (79.2)	

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Table	

River: Makala		EWR: 3	Monitoring site: A4H010Q01
Water quality metrics		ECOSPEC: PES	
	MgSO4	The 95th percentile of the data must be \leq 16 mg/L.	mg/L.
	Na2SO4	The 95th percentile of the data must be \leq 20 mg/L.	mg/L.
Inorganic salts*	MgCI2	The 95th percentile of the data must be ≤15 mg/l.	mg/L.
(mg/L)	CaCl2	The 95th percentile of the data must be $\leq 21 \text{ mg/L}$.	mg/t.
	NaCI	The 95th percentile of the data must be ≤ 45 mg/L.	mg/l
	CaSO4	The 95th percentile of the data must be \leq 351 mg/L.	1 mg/L.
	EC	The 95th percentile of the data must be ≤ 30 mS/m.	mS/m.
	ΡH	The 5th and 95th percentiles of the data must range from 6.5 to 8.0.	it range from 6.5 to 8.0.
Physical variables (mg/L)	Temperature	Vary by more than 2°C, i.e. a large chang temperature sensitive species would be in Ic for reference. Biological assessments therr variable if Level II or higher of the DSS.	Vary by more than 2°C, i.e. a large change to the temperature regime occurs often. Most moderately temperature sensitive species would be in lower abundances and frequency of occurrence than expected for reference. Biological assessments therefore recommended and initiate baseline monitoring for this variable if Level II or higher of the DSS.
	Dissolved oxygen	The 5th percentile of the data must be $\ge 6 \text{ mg/L}$.	0/L
	Turbidity	Vary by a small amount from the natural turb	Vary by a small amount from the natural turbidity range; minor silting of instream habitats acceptable.
Nutriante	NIT	The 50th percentile of the data must be \leq 0.25 mg/L	5 mg/L.
	P04-P	The 50th percentile of the data must be \leq 0.015 mg/L.	15 mg/L.
	Chl-a phytoplankton	The 50th percentile of the data must be < 10 μ g/L.**	µg/L.**
Response variables	Chi-a periphyton	The 50th percentile of the data must be ≤ 21 mg/m2.	mg/m2.
	Toxics	The 95th percentile of the data must be within the TWQR as stated in DWAF (1996).	n the TWQR as stated in DWAF (1996).

^{**} No phytoplankton data were available for this assessment. All EcoSpecs and TPCs need verification as based on expert judgement.

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RIVER	Mokolo River		Water Quality Monitoring Points	ring Points
WQSU	Q		RC	A4H007Q01, '77 - '80, n = 82
EWR SITE	4		PES	A4H010Q01, '92-'96, n = 27 (but 19 for temp. and 6 for NH3)
Confidence assessment		Confidence in the a Data from A4H010 particularly based o Mokolo River betwe from A4H007Q01 o	Confidence in the assessment is low as little DO, temp., turbidity or Data from A4H010Q01 is used for EWR 3 and 4, with modifics particularly based on on-site indicators and the influence of Poer-s Mokolo River between the two sites. Present state data only until 1; from A4H007Q01 on the Tambotie River (same EcoRegion level II).	Confidence in the assessment is low as little DO, temp., turbidity or toxics data are available. Data from A4H010Q01 is used for EWR 3 and 4, with modifications to the PAI table – particularly based on on-site indicators and the influence of Poer-se-loop tributary joining the Mokolo River between the two sites. Present state data only until 1996 and RC data sourced from A4H007Q01 on the Tambotie River (same EcoRegion level II).
Water Quality Constituents	ints	RC Value	PES Value	Category (Rating) / Comment
	MgSO4			
	Na2SO4			
inoigariic ealte	MgCl2		1	TEACHA could not be used and EC used
(mr/l)	CaCl2		1	as surrogate
	NaCi		T	
	CaSO4			
Nutrients	SRP	0.007	0.015	A (0): Benchmark category was recalibrated – Data very variable
(mg/L)	TIN	0.065	0.067	A (0). Data very variable
	pH (5th and 95th percentiles)	5.14 and 6.70	7.2 - 7.76	B (1): RC data 5.14 (5th percentile) and 6.7 (95th percentile) – reliability?
	Temperature			
Physical variables	Dissolved oxygen		,	No data, but no impacts expected. Small temperature and DO fluctuations may occur - B (1) – qualitative assessment only
	Turbidity (NTU)			No data, but loads not expected to be too high and river generally clear. A (0) – qualitative assessment only
Response variable	Electrical conductivity (mS/m) Chl-a: periphyton	15 and 24	10.87	A (0)

Mok	Mokolo River			Water Quality Monitoring Points	ig Points
ۍ				RC	A4H007Q01, '77 - '80, n = 82
4				PES	A4H010Q01, $92-96$, n = 27 (but 19 for temp. and 6 for NH3)
			Confidence in the asse Data from A4H010Q0 ⁻ particularly based on ol Mokolo River between from A4H007Q01 on th	Confidence in the assessment is low as little DO, temp., turbidity or Data from A4H010Q01 is used for EWR 3 and 4, with modifice particularly based on on-site indicators and the influence of Poer-si Mokolo River between the two sites. Present state data only until 1 from A4H007Q01 on the Tambotie River (same EcoRegion level II).	Confidence in the assessment is low as little DO, temp., turbidity or toxics data are available. Data from A4H010Q01 is used for EWR 3 and 4, with modifications to the PAI table – particularly based on on-site indicators and the influence of Poer-se-loop tributary joining the Mokolo River between the two sites. Present state data only until 1996 and RC data sourced from A4H007Q01 on the Tambotie River (same EcoRegion level II).
Constituents			RC Value	PES Value	Category (Rating) / Comment
Chl€	Chl-a: phytoplankton				E
Biotic	community	composition.		SASS: 126	

EWR SITE

RIVER

assessment		particularly based Mokolo River betw from A4H007Q01 (particularly based on on-site indicators and the influence of Poer-se Mokolo River between the two sites. Present state data only until 1; from A4H007Q01 on the Tambotie River (same EcoRegion level II).	particularly based on on-site indicators and the influence of Poer-se-loop tributary joining the Mokolo River between the two sites. Present state data only until 1996 and RC data sourced from A4H007Q01 on the Tambotie River (same EcoRegion level II).
Water Quality Constituents	Jents	RC Value	PES Value	Category (Rating) / Comment
	Chl-a: phytoplankton			
	Biotic community composition: macroinvertebrate (ASPT) score		SASS: 126 ASPT: 4.8	U
	Fish		63.73	c
	Diatoms		Sept '07: SPI=17.8 March '08: SPI=17.4	A (0) (n=2)
Toxics	Fluoride	6.77	0.278	A (0)
(mg/L)	Ammonia	0.160	0.001	A (0)
OVERALL SITE CLAS	OVERALL SITE CLASSIFICATION (from PAI)		B (86.8)	

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data:
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Table 5.10:

River: Mokolo		EWR: 4 Monitoring site: A4H010001
Water quality metrics		ECOSPEC: PES
	MgSO4	The 95th percentile of the data must be \leq 16 mg/L.
	Na2SO4	The 95th percentile of the data must be $\leq 20 \text{ mg/L}$.
Inorganic salts*	MgCI2	The 95th percentile of the data must be $\leq 15 \text{ mg/L}$.
(mg/L)	CaCl2	The 95th percentile of the data must be $\leq 21 \text{ mg/L}$.
	NaCI	The 95th percentile of the data must be $\leq 45 \text{ mg/L}$.
	CaSO4	The 95th percentile of the data must be $\leq 351 \text{ mg/L}$.
	EC	The 95th percentile of the data must be $\leq 30 \text{ mS/m}$.
	ΡΗ	The 5th and 95th percentiles of the data must range from 6.5 to 8.0.
Physical variables	Temperature	Small to moderate deviation from the natural temperature range. Some highly temperature sensitive species in lower abundances and frequency of occurrence than expected for reference.
	Dissolved oxygen	The 5th percentile of the data must be $\geq 7 \text{ mg/L}$.
	Turbidity	No known concerns about turbidity; changes in turbidity appear to be natural.
Nutrients	TIN	The 50th percentile of the data must be \leq 0.25 mg/L.
(mg/L)	P:04-P	The 50th percentile of the data must be \leq 0.015 mg/L.
	Chl-a phytoplankton	The 50th percentile of the data must be < 10 µg/L.**
Response variables	Cht-a periphyton	The 50th percentile of the data must be ≤ 21 mg/m2 .
	Toxics	An impact is expected if the 95th percentile of the data exceeds the TWQR as stated in DWAF (1996).

**: No phytoplankton data were available for this assessment. All EcoSpecs and TPCs need verification as range is based on expert judgement.

The groundwater quantity component was determined using values such as recharge, baseflow, and stress index, obtained during the determination of water resource classes and associated resource quality objectives in the Mokolo and Matlabas catchments, DWS 2015, shown in Table 6.1. The average annual groundwater recharge for the entire catchment based on the GRA II dataset is estimated to be more than 16.25 Mm³/a. The EWR_MLF values were obtained from the Intermediate groundwater Reserve determination study for the Limpopo catchment (Water Geosciences Consulting, 2011).

Population values were obtained from the Water Services dataset of 2011. BHN provides for the essential needs of individuals served by the water resource in guestion and includes water for drinking, food preparation and for personal hygiene. A life-line amount of 25 litres per person per day was used. The current study approach also took cognisance of the GRA II and WARMS 2013 datasets to achieve a more balanced estimate of groundwater use. The groundwater stress index reflects groundwater used versus recharge.

Stress Index	0.07	0.02	0.02	0.16	0.14	0.25	0.28	0.20	0.17	0.24	0.12	0.004	0.004	0.16
Current Groundwat er Use (Min3(a)	1:23	0.15	0.25	2.76	1.79	4.56	4.47	5.51	2.93	8.10	2.66	0.13	0.09	2.12
Reserve as % of Recharge		10.18	3.48	3.53	4.83	22.54	26.90	10.69	54.62	25.17	11.13	10.30	4.35	3.04
Reserve (<u>M</u> m3/a)	3.24	0.80	0.46	0.59	0.60	4.10	4.08	2.89	9.21	8.30	2.50	2.72	0.79	0.39
BHN Reserve (Mm3/a)	0.06	0.05	0.07	0.05	0.07	0.03	0.03	0.06	0.02	0.12	0.02	0.02	0.16	0.03
EWR_MLF (Mm3/a)	3.18	0.75	0.39	0.54	0.53	4.07	4.05	2.83	9.19	8.18	2.48	2.70	0.63	0.36
Baseflow (Mm3/a)	5.06	1.79	0.85	0.54	0.17	9.46	8.93	11.56	6.49	11.87	4.23	2.53	2.02	0.74
Population (Water services) 2011)	6785	5175	7749	5483	7886	3793	3443	6031	2662	13391	1958	2188	17266	2812
Recharge (Mm3/a)	17.66	7.86	13.23	16.71	12.41	18.19	15.77	27.02	16.86	32.98	22.46	26.40	18.15	12.81
Area (km)	692	358	1111	1913	1940	573	522	698	497	1007	1022	1207	1057	1 812
Quat	A41A	A41B	A41C	A41D	A41E	A42A	A42B	A42C	A42D	A42E	A42F	A42G	A42H	A42J

6.1 Summary of the Quantity component of the Groundwater Reserve

Table 6.1: Mokolo and Matlabas Quantity component of the Groundwater Reserve

					A Property in	ð	uaternary	Catchine	entes A41	Quaternary Catchmentss A41A, A41B, A41C & A41D	1C & A41D			
Chemical Parameter	Unit		No. of Samples	Sample	50	Ambiei	nt GW qu	Ambient GW quality or median ^{tj}	edian ¹⁾	DUM	Gro	Groundwater Quality Reserve ³⁾	uality Reserv	e ³⁾
		A41 A	A41 B	A41 C	A41D	A41A	A41B	A41C	A41D	Reserve ²⁾	A41A	A41B	A41C	A41D
Hq		02	259	70	259	7.51	7.61	7.51	7.61	5.0 - 9.5 (±0.1)	6.76-8.26	6.85-8.37	7.85-8.26	6.85-8.37
Electrical Conductivity	nS/	20	259	70	259	97.50	130.00	97.50	130.00	<150	107.25	143.00	107.25	143.00
Calcium as Ca	l/gm	70	259	70	259	49.90	76.50	49.90	76.50	<150	54.89	84.15	54.89	84.15
Magnesium as Mg	mg/l	70	259	70	259	37.55	52.80	37.55	52.80	<100	41.31	58.08	41.31	58.08
Sodium as Na	l/gm	70	259	70	259	105.70	129.10	105.70	129.10	<200	116.27	142.01	116.27	142.01
Chloride as Cl	l/gm	70	259	70	259	78.30	143.10	78.30	143.10	<200	86.13	157.41	86.13	157.41
Sulphate as SO₄	l/gm	70	259	70	259	21.65	38.87	21.65	38.87	<400	23.82	42.76	23.82	42.76
Nitrate as NO _x -N	∥gm	70	259	70	259	3.90	4.53	3.90	4.53	<10	4.29	4.98	4.29	4,98
Ē	mg/l	70	259	70	259	1.28	0.85	1.28	0.85	<1.0	1.28	0.94	1.28	0.94
(1) Based on data obtained from the National Groundwater Archive. Values reported are the statistical median of each parameter.	ed from the	National	Groundwa	tter Archiv	/e. Values repo	sported are th	he statistical	I median of e	each paraine	ter.				

7.1 Summary of the Quality component of the Groundwater Reserve

GROUNDWATER - QUALITY COMPONENT

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Table 7.1: Groundwater quality per Quatemary Catchments (A41A, A41B, A41C and A41D)

Ref: Quality of Domestic Water Supplies, Volume 1: Assessment Guide, 2rd Ed.1998. Water Research Commission Report No: TT 101/98. Pretoria, South Africa (Set for a Class 1).

Where a difference in the water quality values for the ambient groundwater quality and BHN was found, the lesser or more protective value was selected for the groundwater quality Reserve. Where the (3)

ambient groundwater quality was selected as the groundwater quality Reserve, the value was scaled up by 10 per cent provided that the value does not exceed the BHN Reserve.

Chemical	Links	Contraction of the	No. of Samples	amples		Ambier	Ambient GW quality or median ¹	lity or m	edian ¹⁾		0	roundwater	Groundwater Quality Pesania	
Parameter	CIENC	A41 F	A42	A42 B	A42 C	A41E	A42A	A42B	A42C	Reserve ²¹	A41E	A42A	A42B	A42C
H		ß	4	4	47	7.70	6.88	7.55	8 10	5.0 – 9.5 (+0 1)	6 93-8 47	6 19-7 57	6 80-8 30	7 20-8 01
Electrical Conductivity	NS ^m E	66	4	4	47	163.20	14.10	23.75	33.30	<150	163.20	15.51	26.13	36.63
Calcium as Ca	mg/l	96	ŝ	4	41	79.50	3.40	18.85	17.70	<150	87.45	3.74	20.74	19.47
Magnesium as Mg	mg/l	96	e	4	41	47.20	6.10	9.75	5.61	<100	51.92	6.71	10.73	6.17
Sodium as Na	mg/l	96	n	4	41	213.05	5.60	12.30	52.50	<200	213.05	6.16	13.53	57.75
Chloride as Cl	l/gm	97	4	4	41	280.00	14.10	7.25	11.00	<200	280.00	15.51	7.98	12.10
Sulphate as SO4	mg/l	96	ო	4	41	76.50	10.20	8.60	7.78	<400	84.15	11.22	9.46	8.55
Nitrate as NO _X -N	mg/l	97	4	4	42	6.70	0.07	0.19	1.64	<10	7.37	0.07	0.20	1.80
Fluoride as F	l/gm	97	ო	4	41	1.10	0.38	0.57	0.42	<1.0	1.10	0.42	0.62	0.46

Table 7.2: Groundwater quality per Quaternary Catchments (A41E, A42A, A42B and A42C)

Ref: Quality of Domestic Water Supplies, Volume 1: Assessment Guide, 2nd Ed.1998. Water Research Commission Report No: TT 101/98. Pretoria, South Africa (Set for a Class 1).

0 B

Where a difference in the water quality values for the ambient groundwater quality and BHN was found, the lesser or more protective value was selected for the groundwater quality Reserve. Where the ambient groundwater quality was selected as the groundwater quality Reserve, the value was scaled up by 10 per cent provided that the value does not exceed the BHN Reserve.

Chemical Parameter							and a state of the	A P P P P P P P P P P P P P P P P P P P	Annana a a fundada a a	Public in spart france in the second of the			
		No. of Samples	amples		Ambier	Ambient GW quality or median ¹	ality or m	edian"		Gr	Groundwater Ouslin, Recenses	Instity Reco	(cost)
	A42 D	A42 E	A42 F	A42 G	A42D	A42E	A42F	A42G	BHN Reserve ²⁾	A42D	A42E	A42F	A42G
Hq		12	m	20	7.07	7.56	7 93	7.34	5.0 - 9.5	6 36_7 79	6 00 0 31	02 0 11 2	100
Electrical mS/ Conductivity m	m	13	ω	20	42.10	58.85	25.50	27.60	<150	46.31	64.74	28.05	30.36
Calcium as Ca mg/l	e	12	2	20	41.60	30.25	10.25	8.35	<150	45.76	33.28	11 28	010
Magnesium as mg/l	e	12	2	20	8.30	17.10	7.55	5.60	<100	9.13	18.81	8.31	5 9 2 9
Sodium as Na mg/l	2	12	5	20	26.20	24.35	17.10	15.40	<200	28.82	26.79	18.81	16.94
Chloride as Ct mg/l	n	12	e	20	17.00	33.70	6.85	10.90	<200	18.70	37.07	7.54	11 99
Sulphate as SO4 mg/l	m	12	2	20	14.00	8.55	5.30	6.65	<400	15.40	9.41	5.83	7.32
Nitrate as NO _x -N mg/l	2	12	5	20	0.22	0.06	0.16	0.09	<10	0.24	0.06	0.18	010
Fluoride as F mg/l 3 12 3 20 0.12 0.35 0.50 0.22 <1.0	e	12	e	20	0.12	0.35	0.50	0.22	<1.0	0.13	0.39	0.55	0.24

Table 7.3: Groundwater quality per Quaternary Catchment (A42D, A42E, A42F, and A42G)

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Ref: Quality of Domestic Water Supplies, Volume 1: Assessment Guide, 2rd Ed:1998. Water Research Commission Report No: TT 101/98. Pretoria, South Africa (Set for a Class 1).

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Where a difference in the water quality values for the ambient groundwater quality and BHN was found, the lesser or more protective value was selected for the groundwater quality Reserve. Where the ambient groundwater quality was selected as the groundwater quality Reserve, the value was scaled up by 10 per cent provided that the value does not exceed the BHN Reserve.

					and a manufacture of the	Pake o little pilotitions finitions	74.4	
Chemical Parameter	Unit	No. of	No. of Samples	Ambient G	It GW quality or median ¹⁾	BHN Reserve ²⁾	Groundwater	Quality Reserve ³⁾
I THE REAL PROPERTY OF		A42H	A42J	A42H	A42J		A42H	A42.1
рН		48	2	8.23	7.44	5.0-9.5 (±0.1)	7 41-9 06	6 70 8 18
Electrical Conductivity	mS/	Ş				<150		01-0-0-0
	ε	48	54	159.50	199.85		159.50	199.85
Calcium as Ca	l/gm	47	54	7.50	71.00	<150	8.25	78.10
Magnesium as Mg	mg/l	47	54	1.20	40.35	<100	1.32	44.39
Sodium as Na	mg/l	47	54	313.56	196.45	<200	313.56	200
Chloride as Cl	mg/l	47	54	284.00	302.60	<200	284.00	302.60
Sulphate as SO₄	mg/l	47	54	135.33	129.05	<400	148.86	141 96
Nitrate as NO _x -N	mg/l	47	54	0.08	7.50	<10	0.09	8 25
Fluoride as F mg/l 43 54 12.62 1.21 <1.0	mg/l	43	54	12.62	1.21	<1.0	12.62	1.21

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Table

Ref: Quality of Domestic Water Supplies, Volume 1: Assessment Guide, 2rd Ed. 1998. Water Research Commission Report No: TT 101/98. Pretoria, South Africa (Set for a Class 1),

Where a difference in the water quality values for the ambient groundwater quality and BHN was found, the lesser or more protective value was selected for the groundwater quality Reserve. Where the ଡ

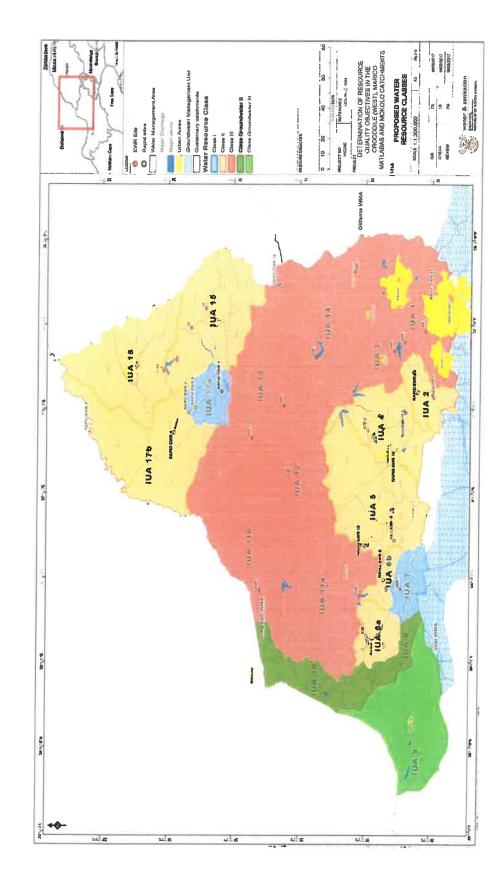
ambient groundwater quality was selected as the groundwater quality Reserve, the value was scaled up by 10 per cent provided that the value does not exceed the BHN Reserve.

A total of 2 quaternary catchmentss (A41A and A41B) do not have adequate groundwater chemistry data for comprehensive analysis of the ambient status. The ambient groundwater quality for A41A and A41B was therefore extrapolated from neighbouring quaternary catchments (A41C and A41D) with a similar geology because geology has a huge bearing on the water quality of an area.

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ters of concern		Chloride and Sodium		Chloride and Sodium	Iductivity and sodium									ndindivity and fluorida
Water quality class Water quality parameters of concern (WRC, 1998)	Fluoride	Electrical Conductivity. Chloride and Sodium	Fluoride	Electrical Conductivity. Chloride and Sodium	Chloride. Electrical Conductivity and sodium	None	Fluoride	Chloride Electrical Conductivity and fluoride						
Water quality class (WRC, 1998)					-	0	0	0	0	0	0	0	-	-
Quaternary catchment	A41A	A41B	A41C	A41D	A41E	A42A	A42B	A42C	A42D	A42E	A42F	A42G	A42H	A42.J





WATER EN SANITASIE, DEPARTEMENT VAN

NO. 1669

14 Januarie 2022

NASIONALE WATERWET, 1998 (WET NO. 36 VAN 1998)

RESERWEBEPALING VIR WATERHULPBRONNE VAN DIE MOKOLO- EN DIE MATLABAS-OPVANGGEBIED

Ek, Senzo Mchunu, in my hoedanigheid van Minister van Water en Sanitasie, behoorlik daartoe gemagtig by artikel 16(1) van die Nasionale Waterwet, 1998 (Wet No. 36 van 1998), bepaal hierby die Reserve vir waterhulpbronne van die Mokolo- en die Matlabas-opvanggebied.

Direkteur: Reserwebepaling Aandag: Mnr. Yakeen Atwaru Departement van Water en Sanitasie Ndinaye-gebou Francis Baard-straat 185 Privaat Sak X313 Pretoria 0001 E-pos: <u>atwaruv@dws.gov.za</u>

Meneer. SENZO MCHUNU (MP)

MINISTER VAN WATER EN SANITASIE DATUM:

RESERWEBEPALING INGEVOLGE ARTIKEL 16(1) VAN DIE NASIONALE WATERWET, 1998 (WET NO. 36 VAN 1998), VIR WATERHULPBRONNE VAN DIE MOKOLO- EN DIE MATLABAS-OPVANGGEBIED

BYLAE

1. BESKRYWING VAN WATERHULPBRON

1.1 Die Reserwe word bepaal vir die geheel of 'n gedeelte van elke betekenisvolle waterhulpbron in die Mokolo- en die Matlabas-opvanggebied, soos hier onder uiteengesit:

- Waterbestuursgebied: Limpopo
- Dreineerstreek: 'n Primêre dreineerstreek (A41 en A42)
- Riviere: Mokolo, Mamba en Matlabas
- 1.2 Die Minister het ingevolge artikel 12 van die Nasionale Waterwet, 1998 (Wet No. 36 van 1998), by Goewermentskennisgewing No. R.810, gepubliseer in *Staatskoerant* No. 33541 van 17 September 2010, n stelsel voorgeskryf vir die klassifisering van waterhulpbronne.
- 1.3 Die Minister bepaal ingevolge artikel 16(1) van die Wet onderstaande Reserwe vir die Mokolo- en die Matlabas-opvanggebied.

2. AKRONIEME EN WOORDOMSKRYWING

2.1 Akronieme

AEK	Aanbevole ekologiese kategorie
BMB	Basiese menslike behoeftes
DPK's	Drempels van potensiële kommer
EBS	Ekologiese belang en sensitiwiteit
EK	Ekologiese kategorie
ES	Ekologiese spesifikasies
ESG	Ekologiese steungebiede
EWB	Ekologiese waterbenodigdhede
EWB-terrein	Ekologiese waterbenodigdhedeterrein
GHE's	Grondwaterhulpbroneenhede
GHE II	Grondwaterhulpbronevaluering, Fase II
GHGM	Grondwaterhulpbrongerigte maatreëls
GJA	Gemiddelde jaarlikse afloop
HES	Huidige ekologiese status
ILF	Instandhoudings- lae vloei
MEACHE	Middele vir ekologiese akwatiese chemiese habitatevaluering
МКМ	Miljoen kubieke meter
NGJA	Natuurlike gemiddelde jaarlikse afloop
OIE	Omgewingsinwerkingsevaluasie
VT	Verwysingstoestande
WGL	Watergebruikslisensie
WGSE	Watergehalte-subeenheid

2.2 Woordomskrywing

In hierdie Kennisgewing het 'n woord of uitdrukking waaraan 'n bekenis in die Wet geheg is, daardie betekenis en, tensy uit die samehang anders blyk, beteken-

"aanbevole ekologiese kategorie" 'n ekologiese kategorie wat die ekologiese bestuursdoelwit aandui wat behaal moet word vir 'n waterhulpbron op grond van sy ekologiese klassifikasie, welke kategorie kan wissel van Kategorie A, wat 'n ongewysigde, natuurlike waterhulpbron behels, tot Kategorie D, wat 'n grotendeels gewysigde waterhulpbron behels;

"aanvulling" die byvoeging van water tot die versadigingsone, hetsy deur afwaartse deursypeling van neerslag of oppervlakwater, of deur die sywaartse migrasie van grondwater uit naasliggende waterdraers;

"basisvloei" volgehoue vloei in riviere gedurende droë of redelike mooiweerstoestande wat nie noodwendig aan grondwater toegeskryf kan word nie, met inbegrip van bydraes deur vertraagde bolaagvloei en grondwaterafloop;

"biofisiese nodus" die modelleringspunt wat verteenwoordigend is van 'n boloop of 'n gebied van 'n waterekosisteem, soos 'n rivier, 'n vleiland, 'n riviermonding en grondwater, waarop 'n stel verhoudings van toepassing is;

"die Wet" die Nasionale Waterwet, 1998 (Wet No. 36 van 1998);

"ekologiese belang en sensitiwiteit" sleutelaanwysers in die ekologiese klassifisering van waterhulpbronne, waarin ekologiese belang betrekking het op die aanwesigheid, verteenwoordigendheid en diversiteit van spesies in die biota en habitat, en ekologiese sensitiwiteit betrekking het op die kwesbaarheid van die habitat en biota vir wysigings wat in watervloei, watervlakke en fisies-chemiese toestande kan intree; "ekologiese watervereistes" die vloeipatrone, soos die grootte, tydbepaling en duur, en die watergehalte, wat nodig is om 'n rivierekosisteem in 'n bepaalde toestand te hou, en die term het betrekking op sowel die hoeveelheid as die gehalte van die komponente;

"ekologiese waterbenodigdhedeterreine" bepaalde punte in die rivier soos vasgestel deur die terreinseleksieproses, wat bestaan uit 'n stuk van 'n rivier met verskillende dwarssnitte vir sowel hidrouliese as ekologiese doeleinde, welke terreine voldoende aanwysers bied om omgewingsvloei te evalueer en om die toestand van die aandrywers van die biofisiese komponente, soos hidrologie, geomorfologie en fisieschemiese biologiese reaksies, soos vis, ongewerweldes en oewerplantegroei te evalueer;

"huidige ekologiese status" h kategorie wat die huidige gesondheid of integriteit van verskillende biologiese kenmerke van die waterhulpbron aandui, vergeleke met die natuurlike of bykans natuurlike

verwysingstoestande; die resultate van die proses verstrek word as ekologiese kategorieë wat strek van amper natuurlik tot heeltemal gewysig; en

"reserwe" die hoeveelheid en gehalte van die water wat benodig word om aan die BMB te voldoen deur 'n basiese watervoorraad te verseker en om die waterekosisteem te beskerm ten einde ekologies volhoubare ontwikkeling en gebruik van die betrokke waterhulpbron te verseker.

3. RESERWEBEPALING

(1) Die Reserwe, wat die EWB en die BMB-reserwe vir die riviere by EWB-terreine en geselekteerde biofisiese nodusse in die Mokolo- en die Matlabas-opvanggebied insluit, word in Tabel 4.1 in paragraaf 4 uiteengesit.

(2) Die watergehaltekomponent van die Reserwe vir die riviere by die EWB-terreine in die Mokolo- en die Matlabas-opvanggebied ingevolge artikel 16(1) van die Wet word in Tabelle 5.1 tot 5.10 in paragraaf 5 uiteengesit.

(3) Die grondwaterreserwe vir waterhoeveelheid vir die Mokolo- en die Matlabas-opvanggebied ingevolge artikel 16(1) van die Wet word in Tabel 6.1 in paragraaf 6 uiteengesit.

(4) Die ligging van die Mokolo- en die Matlabas-opvanggebied en die EWB-terreine word in Figuur 1 aangedui.

(5) Die grondwaterreserwe vir watergehalte vir die Mokolo- en die Matlabas-opvanggebied ingevolge artikel 16(1) van die Wet word in Tabelle 7.1 tot 7.5 in paragraaf 7 uiteengesit.

(6) Die Reserve geld vanaf die datum bepaal ingevolge artikel 16(1) van die Wet, tensy die Minister anders bepaal.

4. DIE KOMPONENT OPPERVLAKWATERHOEVEELHEID VIR RIVIERE

Die uitslae van die Reserwebepaling en ekologiese kategorisering vir die Mokolo- en die Matlabasopvanggebied verskyn hier onder, waarin die Reserwehoeveelhede uitgedruk word as 'n persentasie van die NGJA vir die verskillende opvanggebiede, ingevolge artikel 16(1) van die Wet:

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BMB vir die
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Tabel 4.1

Nodusnaam	Kwater- nêre opvang- gebied	Riviemaam	HES	EBS	NGJA (MKM)	EWB % NGJA ²	BMB-reserve ³ (% NGJA)	Totale Reserwe ⁴ (% NGJA)
HN51	A42B	Grootspruit (oorsprong) tot samevloeiing met Sand	0	Matig	27,8	21,73	0	21,73
EWB-terrein MOK_EWB1 A	A42C	Mokolo tot samevloeiing met Dwars	CD	Hoog	84,84	16,7	0,048	16,748
EWB-terrein MOK_EWB1 B	A42E	Mokolo tot samevloeiing met Sterkstroom	B/C	Hoog	135,03	13,6	060'0	13,69
HN54	A42D	Sterkstroom (oorsprong) tot samevloeiing met Mokolo,	۵	Baie hoog	43,45	52,63	0	52,63
EWB-terrein MOK_EWB2	A42F	Mokolorivier in A42F tot invloei Mokolodam	B/C	Baie hoog	196,2	11,7	0,103	11,803
EWB-terrein MOK_EWB3	A42G	Mokolodarn tot boonste gedeelte van A42G (10 km stroomaf van dam)	B/C	Baie hoog	214,5	8 8	0.111	9,011
EWB-terrein MOK EWB4	A42G	Mokolo-hoofstam	U	Baie hoog	253,3	12,3	0,111	12,411
HN59	A41A	Bolope Mothlabatsi (Matlabas- Zyn-Kloof, veengrond)	۲	Baie hoog	5,23	57.07	0	57,07
MAT Stroomver- snelling_EW B3	A41B	Mamba tot samevloeiing met Mothlabatsi	B/C	Hoog	9,54	35,49	0	35,49
MAT Stroomver- snelling EWB2	A41B	Matlabas-Motlhabatsi- samevloeiing (uitlaat van IUA ⁴)	B/C	Hoog	32,80	33,23	0	33,23
MAT Stroomver- snelling EWB4	A41C	Matlabas	œ	Matig	35,58	33,42	o	33,42

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- Verteenwoordig die persentasie van BMB.
- Die totale Reserwehoeveelheid behels sowel die ekologiese reserwe as die BMB. £ 2 2 1
 - IUA: integrated unit of analysis geïntegreerde ontledingseenheid

Die AEK word nie vir hierdie voorlopige reserwe vir goedkeuring aanbeveel nie, maar die handhawing van die huidige bedryf van die stelsel word aanbeveel.

5. OPPERVLAKWATER – GEHALTEKOMPONENT VIR RIVIERE

5.1 Samevatting van die gehaltekomponent by EWB-terreine

Tabel 5.1: HES-kategorieë en oorhoofse terreinevaluering vir EWB 1A in die Mokolorivier – WGSE 14

RIVIER	Mokolorivier		Watergehaltemoniteringspunte	sringspunte
WGSE	4		VT	A4H002Q01. '77-'79. n = 68
EWB-TERREIN	1A		HES	A4H002Q01, '02-'07 (met 1 punt in 2007), n = 48 (maar 37 vir F en SO ₄)
Vertrouensevaluering		Vertroue in (hoewel die n	Vertroue in die evaluering is matig, aangesien r hoewel die meetwal na aan die EWB-terrein is.	Vertroue in die evaluering is matig, aangesien min OS-, temperatuur-, troebelheids- of toksiendata beskikbaar is, hoewel die meetwal na aan die EWB-terrein is.
Watergehalte-bestanddele	lele	VT-waarde	HES-waarde	Kategorie (waardebepaling) / Kommentaar
	MgSO4			
	Na ₂ SO₄			
Anorganiese soute *	MgCl ₂		a	
(mg/L)	CaCl ₂		Þ	MEACHE Kon nie gebruik word nie; EK is in plaas daarvan gebruik
	NaCI		3	
	CaSO ₄		1	
Aluteičnéc	SRP	0,011	0,0165	B (1): Normkategorie is geherkalibreer
(mg/L)	Totale anorganiese stikstof	0,080	0,123	A (0)
	pH (5de en 95ste persentiel)	6,68 – 7,70	6,92 - 7,83	A (0)
	Temperatuur		r	Geen data nie, maar min uitwerkings word verwag. Opvanggebied nie
Fisiese veranderlikes	Opgeloste suurstof		•	ongerep nie; A/B (05) dus - slegs kwalitatiewe evaluering
	Troebelheid (NTU ²)		1	Geen data nie, maar groot ladings word nie verwag nie. B (1) – slegs kwalitatiewe evaluering
	Elektriese geleivermoë (mS/m)	12,28	12,05	A (0)
Responsveranderlikes	Chl-a: perifiton		EWB 1A: 21,58	C/D (2,5) (n=1)
	Chl-a: fitoplankton			E

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RIVIER	Mokolorivier		Watergehaltemoniteringspunte	ingspunte
WGSE	4		VT	A4H002001. '77-'79. n = 68
EWB-TERREIN	1A		HES	A4H002Q01, '02-'07 (met 1 punt in 2007). n = 48 (maar 37 vir F en SO.)
Vertrouensevaluering		Vertroue in o	Vertroue in die evaluering is matig, aangesien hoewel die meetwal na aan die EVVB-terrein is.	Vertroue in die evaluering is matig, aangesien min OS-, temperatuur-, troebelheids- of toksiendata beskikbaar is, hoewel die meetwal na aan die EWB-terrein is.
Watergehalte-bestanddele	delė	VT-waarde	VT-waarde HES-waarde	Kategorie (waardebenaling) / Kommentaar
	Samestelling van biotiese			
	gemeenskap: telling van makro-		SASS ⁴ : 127 ASPT ³ : 5,3	C (62.3)
	ongewerweldes (ASPT ³)			
	Vis		70,3	C – grotendeels vloeiverwant
	Diatome		EWR 1A: SPI ⁶ = 17,3 en 16,8	A/B (0,5) (n = 2)
Toksiene	Fluoried	0,10	0,18	A (0)
(mg/L)	Ammoniak		0,001	A (0)
ALGEHELE KLASSIFIKASIE (volgens PAl ³)	KASIE (volgens PAl ³)		B/C (80 %)	

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Rivier: Mokolo		EWB-terrein: 1A Moniteringsterrein: A4H002001
Watergehaltemetrie		ES: HES
	MgSO₄	Die 95ste persentiel van die data moet ≤ 16 mg/L wees.
	Na ₂ SO ₄	Die 95ste persentiel van die data moet ≤ 20 mg/L wees.
Anomioro solito *	MgCl ₂	Die 95ste persentiel van die data moet ≤15 mg/L wees.
	CaCl ₂	Die 95ste persentiel van die data moet ≤ 21 mg/L wees.
	NaCI	Die 95ste persentiel van die data moet ≤ 45 mg/L wees.
	CaSO4	Die 95ste persentiel van die data moet \leq 351 mg/L wees.
	Ϋ́Ξ	Die 95ste persentiel van die data moet ≤ 30 mS/m wees.
	ΡH	Die 95ste persentiel van die data moet strek van 6,5 tot 8,0.
Ficiece veranderlikec	Temperatuur	Klein afwyking van die natuurlike temperatuurstrek.

Tabel 5.2: ES in verband met fisies-chemiese data: HES

* Moet bereken word met behulp van MEACHE warmeer die DPK vir EK oorskry word of soutbesoedeling verwag word.

Gifstowwe

Responsveranderlikes

** Geen fitoplanktondata was vir hierdie evaluering beskikbaar nie. Al die ES en DPK's moet geverifieer word aangesien strek berus op deskundige oordeel.

Die 50ste persentiel van die data moet ≤ 52,5 mg/m² wees.*** Die 95ste persentiel van die data moet binne die Chroniese-effekwaarde (CEW) wees soos vermeld in DWAF (1996).

Die 50ste persentiel van die data moet ≤ 0,25 mg/L wees. Die 50ste persentiel van die data moet ≤ 0,025 mg/L wees.

Die 50ste persentiel van die data moet < 10 µg/L wees.**

Chl-a: fitoplankton Chl-a: perifiton *** Perifiton (21,58 mg/m²) is eintlik 'n C/D-kategorie (C = 12 - 21 mg/m² and D = 21 - 84 mg/m², DV/AF, 2008); die boonste grens van 'n C/D word dus gedefinieer as die ES vir die HES.

instroomhabitats

Verskil in klein mate van die natuurlike troebelheidstrek; geringe aanslikking van

aanvaarbaar.

Totale anorganiese

stikstof PO₄-P

Die 5de persentiel van die data moet ≥ 7,5 mg/L wees.

Opgeloste suurstof

Troebelheid

Nutriënte (mg/L)

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RIVIER	Mokolorivier		Watergehaltemoniteringspunte	jspunte
WGSE	4		٨٢	A4H002Q01, '77 - '79, n = 68
EWB-terrein	8		HES	A4H002Q01, '02-'07 (met 1 punt in 2007), n = 48 (maar 37 vir F en SO_4)
Vertrouensevaluering		Vertroue in die eve toksienedata beskik wysigings aan die P/	ituering is matig, aangesit baar is. Data van A4H002 \\-tabel [†] – veral gebaseer o	Vertroue in die evaluering is matig, aangesien min OS-, temperatuur-, troebelheids- of toksienedata beskikbaar is. Data van A4H002Q01 word gebruik vir EWB 1A en B, met wysigings aan die PAI-tabel ¹ – veral gebaseer op aanwysers op terrein.
Watergehalte-bestanddele	sle	VT-waarde	HES-waarde	Kategorie (Waardebepaling) / Kommentaar
	Mg SO4			
*	Na ₂ SO ₄			
Anorganiese	MgCl ₂		3	MEACHE kon nie gebruik word nie en EK is
(mn/l)	CaCl ₂			in plaas daarvan gebruik
(11,8,11)	NaCI		1	
	CaSO ₄		f	
Nutriënte	SRP ²	0,011	0,0165	B (1): Normkategorie is geherkalibreer
(ITIG/L)	Totale anorganiese stikstof	0,080	0,123	A (0)
	pH (5de en 95ste persentiel)	6,68 en 7,70	6,92 - 7,83	A (0)
	Temperatuur		1	Geen data nie. maar min uitwerkings word
Fisiese veranderlikes	Opgeloste suurstof		I	verwag. Opvanggebied nie ongerep nie; dus B(1) as gevolg van die uitwerking van zero vloei – slegs kwalitatiewe evaluering.
	Troebelheid (NTƯ³)		I	Geen data nie, maar ladings waarskynlik nie hoog nie. B (1) – slegs kwalitatiewe evaluering.
	Elektriese geleivermoë (mS/m)	12,28	12,05	A (0)
Responsveranderlikes	Chl-a: perifiton		WG-terrein 3 (Dwars): 19,04 (hoë SA ⁴)	C (2) (n=1)

Vertroue in die evaluering is matig, aangesier toksienedata beskikbaar is. Data van A4H002(wysigings aan die PAI-tabel ¹ – veral gebaseer op vysigings aan die PAI-tabel ¹ – veral gebaseer op biotiese VT-waarde HES-waarde VT-waarde ASPT ⁵ : 5,4 (Jan. '08) SASS ⁶ : 130 ASPT ⁵ : 6,1 (Jun. '08) SASS ⁶ : 188 ASPT ⁵ : 6,1 (Jun. '08) 72,4 FWB 18: SPI ⁷ = 18,8 WG-terrein 3 (Dwars): 15,9 0,10	RIVIER	Mokolorivier		Watergehaltemoniteringspunte	gspunte
errein 1B errein 1B hES hES herroue in die evaluering is matig, aangesier toksienedata beskikbaar is. Data van A4H002 wysigings aan die PAI-tabel [†] - veral gebaseer op wysigings aan die PAI-tabel [†] - veral gebaseer op wysigings aan die PAI-tabel [†] - veral gebaseer op wysigings aan die PAI-tabel [†] - veral gebaseer op behatte-bestanddet ChI-ar fitoplankton Samestelling van makro- gemeenskap: telling van makro- ongewerweldes (ASPT ⁵) vis biotiese benetek biotiese biotiese Biatome Felvonie Ammoniak ne Fuonied Ammoniak	WGSE	4		7	A4H002Q01, '77 - '79, n = 68
Jensevaluering Jehalte-bestanddele ChI-a: fitoplankton ChI-a: fitoplankton Samestelling van biotiese gemeenskap: telling van makro- ongewerweldes (ASPT ⁵) Vis Diatome Fluoried Ammoniak	EWB-terrein	18		HES	A4H002Q01, '02-'07 (met 1 punt in 2007), n = 48 (maar 37 vir F en SO4)
gehatte-bestanddel VT-waarde HES-waarde Chl-a: fitoplankton Samestelling Samestelling gemeenskap: gemeenskap: Ongewenweldes (ASPT ⁵) Vis Vis Diatome Fluoried Association Onide	Vertrouensevaluering		Vertroue in die eva toksienedata beskikl wysigings aan die P/	aluering is matig, aangesi baar is. Data van A4H00 \I-tabel⁺ – veral gebaseer o	en min OS-, temperatuur-, troebelheids- o 2001 word gebruik vir EWB 1A en B, me p aanwysers op terrein.
Chl-a: fitoplankton - Samestelling van biotiese gemeenskap: telling van makro- ongewerweldes (ASPT ⁵) SASS ⁵ : 130 ASPT ⁵ : 5,4 (Jan. '08) SASS ⁶ : 188 ASPT ⁵ : 6,1 (Jun. '08) 72,4 Vis - Diatome 72,4 Diatome 72,4 Ploted 0,10 Amoniak 0,10	Watergehalte-bestandd	ele	VT-waarde	HES-waarde	Kategorie (Waardebepaling) / Kommentaar
Samestelling van biotiese gemeenskap: telling van makro- ongewerweldes (ASPT ⁵) SASS ⁵ : 130 ASPT ⁵ : 6,1 (Jun. '08) SASS ⁶ : 188 ASPT ⁵ : 6,1 (Jun. '08) 72,4 Vis 72,4 Diatome 72,4 Biatome 0,10 Amnoniak 0,10		Chl-a: fitoplankton		1	
Vis 72,4 Diatome 72,4 Diatome EWB 1B: SPI ⁷ = 18,8 MG-terrein 3 (Dwars): 571 Ammoniak 0,10 0,18				SASS": 130 ASPT ⁵ : 5,4 (Jan. '08) SASS ⁶ : 188 ASPT ⁵ : 6,1 (Jun. '08)	B/C
Diatome EWB 18: SPI ⁷ = 18,8 WG-terrein 3 (Dwars): 15,9 ne Fluoried 0,10 0,18 Ammoniak 0,001 0,001		Vis		72,4	O
ne Fluoried 0,10 Ammoniak		Diatome		EWB 1B: SPI ⁷ = 18,8	A (0) (n=1)
ne Fluoried 0,10 0,18 Ammoniak 0,001				VVG-terrein 3 (Dwars): 15,9	B (1) (n=2)
Ammoniak 0,001	Toksiene	Fluoried	0,10	0,18	A (0)
	(mg/L)	Ammoniak		0,001	A (0)
OORHOOFSE TERREINKLASSIFIKASIE (volgens PAI')	OORHOOFSE TERREI	NKLASSIFIKASIE (volgens PAI ¹)		B/C (80,8%)	

bet bereken word met behulp van MEACHE wanneer die DPK vir EK oorskry word of soutbesoedeling verwag word.

Watergehaltermetrie ES: HES Matergehaltermetrie MgSO ₄ Die 95ste persentiel van die of este persentiel van die of MgCl ₂ Anorganiese soute* MgCl ₂ Die 95ste persentiel van die of este persentiel van die of pH Rig/L) MaCl Die 95ste persentiel van die of este persentiel van die of pH Fisiese veranderlikes Die 95ste persentiel van die of pH Die 95ste persentiel van die of pH Nutriënte Die 95ste persentiel van die of pH Die 95ste persentiel van die of pH Nutriënte Die 95ste persentiel van die of pH Die 95ste persentiel van die of pH Nutriënte Die 95ste persentiel van die of pH Die 95ste persentiel van die of pH Nutriënte Die 95ste persentiel van die of of pH Die 95ste persentiel van die of of pH Nutriënte Die 95ste persentiel van die of of pH Die 95ste persentiel van die of of pH Responsveranderlikes Die 50ste persentiel van die of of pH-a: fitoplankton Die 50ste persentiel van die of of pH-a: fitoplankton	EWB-terrein: 1B Moniteringsterrein: A4H002Q01
MgSO4 MgSO4 Na ₂ SO4 Na ₂ SO4 MgCI ₂ CaCI ₂ NaCi CaCI ₂ NaCi CaCi Naci Caso4 EC PH Troebelheid Ite Stikstof PO4-P Ch1-a: perfition	S: HES
rriese soute* MgCl ₂ MgCl ₂ CaCl ₂ NaCi CaSO4 EC PH Temperatuur Opgeloste suurstof Troebelheid te stikstof PO4-P Chl-a: fittoplankton Tsveranderlikes Chl-a: perifiton	Die 95ste persentiel van die data moet ≤ 16 mg/L wees.
Iniese soute* MgCl ₂ CaCl ₂ NaCi CaSO4 CaSO4 CaSO4 EC PH Temperatuur Opgeloste suurstof Troebelheid te stikstof PO4-P Chl-a: perifiton	Die 95ste persentiel van die data moet ≤ 20 mg/L wees.
cacl2 Cacl2 Naci CasO4 CasO4 CasO4 CasO4 EC PH PH Temperatuur Ppelose suurstof Troebelheid Troebelheid Ite PO4-P Stikstof Chl-a: fitoplankton Tsveranderlikes Chl-a: perifiton	Die 95ste persentiel van die data moet ≾15 mg/L wees.
veranderlikes NaCi CaSO4 EC PH Temperatuur Opgeloste suurstof Troebelheid Troebelheid tie stikstof PO4-P Chl-a: fittoplankton Tsveranderlikes Chl-a: perifiton	Die 95ste persentiel van die data moet ≤ 21 mg/L wees.
veranderlikes CaSO4 EC PH Temperatuur Opgeloste suurstof Troebelheid Troebelheid stikstof PO4-P ChI-a: fitoplankton Tsveranderlikes ChI-a: perifiton	Die 95ste persentiel van die data moet ≤ 45 mg/L wees.
iveranderlikes iveranderlikes iveranderlikes ite ite ite ite ite ite ite ite	Die 95ste persentiel van die data moet ≤ 351 mg/L wees.
veranderlikes pH Temperatuur Opgeloste suurstof Troebelheid te totale anorganiese stikstof PO ₄ -P Chl-a: fittoplankton	Die 95ste persentiel van die data moet ≤ 30 mS/m wees.
veranderlikes Temperatuur Opgeloste suurstof Troebelheid Totale anorganiese stikstof PO ₄ -P Chl-a: fitoplankton Tsveranderlikes Chl-a: perifiton	Die 95ste persentiel van die data moet strek van 6,5 tot 8,0.
te Copeloste suurstof Troebelheid Totale anorganiese stikstof PO ₄ -P Chl-a: fitoplankton Tsveranderlikes Chl-a: perifiton	Klein afwyking van die natuurlike temperatuurstrek wees.
te Troebelheid Troebelheid te anorganiese stikstof PO ₄ -P Chl-a: fitoplankton Isveranderlikes Chl-a: perifiton	Die 95ste persentiel van die data moet ≥ 7,0 mg/L wees.
te Totale anorganiese stikstof PO ₄ -P Chl-a: fitoplankton sveranderlikes Chl-a: perifiton	Verskil in klein mate van die natuurlike troebelheidstrek; geringe aanslikking van instroomhabitats aanvaarbaar.
PO₄-P Chi-a: fitoplankton Sveranderlikes Chi-a: perifiton	anorganiese Die 50ste persentiel van die data moet ≤ 0,25 mg/L wees.
Chl-a: fitoplankton Chl-a: perifiton	Die 50ste persentiel van die data moet ≤ 0,025 mg/L wees.
Chl-a: perifiton	Die 50ste persentiel van die data moet < 10 µg/L wees.**
	Die 50ste persentiel van die data moet ≤ 21 mg/m² wees.
Toksiene Die 95ste persentiel van die da vermeld in DWAF (1996).	Die 95ste persentiel van die data moet binne die Chroniese-effekwaarde (CEW) wees soos vermeld in DWAF (1996).

** Geen fitoplanktondata was vir hierdie evaluering beskikbaar nie. Al die ES en DPK's moet geverifieer word aangesien strek berus op deskundige oordeel.

Tabel 5.4: ES met betrekking totfisies-chemiese data: HES

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RIVIER	Mokolorivier		Watergehaltemoniteringspunte	ringspunte
WGSE	4		VT	A4H005Q01, '77 - '80, n = 85 (maar 163 vir EK)
EWB-TERREIN	2		HES	A4H005Q01, '98 - '01, n = 39 (maar 47 vir TOTALE ANORGANIESE STIKSTOF)
Vertrouensevaluering		Vertroue in die evalu beskikbaar, en hoew tot 2001 beskikbaar.	uering is laag. Min OS-, te wel die meetwal na aan di	Vertroue in die evaluering is laag. Min OS-, temperatuur-, troebelheids- of toksiendata is beskikbaar, en hoewel die meetwal na aan die EWB-terrein is, is huidigestand-data slegs tot 2001 beskikbaar.
Watergehaltebestanddele	ele	VT-waarde	HES-waarde	Kategorie (Waardebepaling) / Kommentaar
	MgSO4		r	
	Na ₂ SO4			
Anorganiese soute	MgCl ₂		1	MEACHE kon nie gebruik word nie:
(mg/L)	CaCl ₂		I	EK is in plaas daarvan gebruik
	NaCI		т	-
	CaSO ₄			
Nutriënte	SRP ¹	0,011	0,0059	A (0): Normkategorie is geherkalibreer - VT baie veranderlik
	Totale anorganiese stikstof	0,06	0,02	A (0). VT-data baie veranderlik
	pH (5de en 95ste persentiel)	6,00 en 7,25	7,46 – 7,87	A (0): Normkategorie is geherkalibreer vir laer A-kategorie.
	Temperatuur			Geen data nie, maar min uitwerkings
Fisiese veranderlikes	Opgeloste suurstof			word verwag. Fluktuasies in temperatuur en OS ⁶ kan by lae vloei voorkom – B (1) – slegs kwalitatiewe evaluering
	Troebelheid (NTU ²)		r	Geen data nie, maar ladings waarskynlik nie hoog nie. A/B (0,5) – slegs kwalitatiewe evaluering
	Elektriese geleivermoë (mS/m)	60'6	9,4	A (0)

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RIVIER	Mokolorivier		Watergehaltemoniteringspunte	spunte
WGSE	4		٧T	A4H005Q01, '77 - '80, n = 85 (maar 163 vir EK)
EWB-TERREIN	2		HES	A4H005Q01, '98 - '01, n = 39 (maar 47 vir TOTALE ANORGANIESE STIKSTOF)
Vertrouensevaluering		Vertroue in die evalueri beskikbaar, en hoewel (tot 2001 beskikbaar.	ng is laag. Min OS-, temp die meetwal na aan die E'	Vertroue in die evaluering is laag. Min OS-, temperatuur-, troebelheids- of toksiendata is beskikbaar, en hoewel die meetwal na aan die EWB-terrein is, is huidigestand-data slegs tot 2001 beskikbaar.
Watergehaltebestanddele	Ð	VT-waarde	HES-waarde	Kategorie (Waardebepaling) / Kommentaar
	Chl-a: perifiton		EWB 2: 25,54 WG-terrein 4: 18,68 (hoë SA ^{5;})	D (3) (n=1). SA* hoog in drie replikate C (2) (n=1)
	Chl-a: fitoplankton		τ	3
Responsveranderlikes	Samestelling van biotiese gemeenskap: telling van makro-ongewerweldes (ASPT ³)		Jan '08: SASS" – 82; ASPT ³ - 5.1 Maart '08: SASS ⁶ - 126 ; ASPT ³ - 6.6	U
	Vis		65,1	U
	Diatome		EWB 2: SPI = 16,1 WG terrein 4: 18.8	B (1) (n=2)
Toksiene	Fluoried	0,19	0,15	A (0)
(mg/L)	Ammoniak		0,002	A (0)
OORHOOFSE TERREIN	00RH00FSE TERREINKLASSIFIKASIE (volgens PAI ⁴)		B (84.2)	

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Tabel 5.6: E

		EWB: 2 Moniteringsterrein: A4H002001
Natergehaltemetrie		ES: HES
	MgSO4	Die 95ste persentiel van die data moet ≤ 16 mg/L wees.
	Na ₂ SO ₄	Die 95ste persentiel van die data moet ≤ 20 mg/L wees.
Anorganiese soute*	MgCl ₂	Die 95ste persentiel van die data moet ≤15 mg/L wees.
(mg/L)	CaCl ₂	Die 95ste persentiel van die data moet ≤ 21 mg/L wees.
	NaCI	Die 95ste persentiel van die data moet $\leq 45 \text{ mg/L}$ wees.
	CaSO4	Die 95ste persentiel van die data moet ≤ 351 mg/L wees.
	EK	Die 95ste persentiel van die data moet ≤ 30 mS/m wees.
	Hd	Die 5de en 95ste persentiel van die data moet van 6,5 tot 8,0 strek.
Fisiese veranderlikes	Temperatuur	Klein afwyking van die natuurlike temperatuurstrek.
	Opgeloste suurstof	Die 5de persentiel van die data moet ≥ 7 mg/L wees.
	Troebelheid	Verskil in klein mate van die natuurlike troebelheidstrek; geringe aanslikking van instroomhabitats aanvaarbaar.
Nutriënte	Totale anorganiese stikstof	anorganiese Die 50ste persentiel van die data moet $\leq 0,25$ mg/L wees.
lig/r/j	PO4-P	Die 50ste persentiel van die data moet \leq 0,015 mg/L wees.
	Chi-a: fitoplankton	Die 50ste persentiel van die data moet < 10 µg/L wees.**
Responsveranderlikes	Chl-a: perifiton	Die 50ste persentiel van die data moet ≤ 52,5 mg/m² wees. ***
	Toksiene	Die 95ste persentiel van die data moet binne die Teikenwatergehaltestrek wees soos vermeld in DWAF (1996).

** Geen fitoplanktondata was vir hierdie evaluering beskikbaar nie. Al die ES en DPK's moet geverifieer word op grond van deskundige oordeel.

*** Perifiton (25,54 mg/m²) is in werklikheld in 'n C/D-kategorie (C= 12 - 21 en D= 21 - 84 mg/m²; DWAF 2008), die boonste grens van 'n C/D word dus gedefinieer as die ES vir die HES.

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RIVIER	Mokolorivier		Watergehaltemoniteringspunte	mte
WGSE	5		4	A4H007Q01, '77 –'80, n = 82
EWB-terrein	8		HES	A4H010Q01, '92 - '96, $n = 27$ (maar 19 vir temperatuur en 6 vir NH ₃)
Vertrouensevaluering		Vertroue in die evaluering is la Hoewel die meetwal na aan o verkry van A4H007Q01 in die	Vertroue in die evaluering is laag, want min OS-, temperatuur-, troebelheids- of tr Hoewel die meetwal na aan die EWB-terrein is, is huidigestand-data slegs tot 1 verkry van A4H007Q01 in die Tambotierivier (dieselfde ekologiese streek, vlak II).	Vertroue in die evaluering is laag, want min OS-, temperatuur-, troebelheids- of toksiendata is beskikbaar. Hoewel die meetwal na aan die EWB-terrein is, is huidigestand-data slegs tot 1996 beskikbaar. VT-data verkry van A4H007Q01 in die Tambotierivier (dieselfde ekologiese streek, vlak II).
Watergehaltebestanddele	٥	VT-waarde	HES-waarde	Kategorie (Waardebepaling) / Kommentaar
	MgSO4			
	Na ₂ SO ₄		1	
Anorganiese	MgCl ₂		1	MEACHE kon nie gebruik word nie: EK is
(ma/l)	CaCl ₂		1	in plaas daarvan gebruik
(1), n	NaCI		E	
	CaSO ₄			
Nutriënte	SRP ¹	0,007	0,015	A (0): Normkategorie is geherkalibreer – data baie veranderlik
(mg/L)	Totale anorganiese stikstof	0,065	0,067	A (0). Data baie veranderlik
	pH (5de en 95ste persentiel)	5,14 en 6.70	7,2 en 7,76	B (1): VT-data 5,14 (5de persentiel) en 6,7 (95ste persentiel) – betroubaarheid?
	Temperatuur (10de en 90de persentiel)		12 – 25	Min data, maar die terrein is stroomaf van die Mokolodam (selfs indien
Fisiese veranderlikes	Opgeloste suurstof		ı	meervlakkige onttrekpunt, waarskynlik bodemuitlaat varweë lae vloei in die dam); dam het dus na verwagting uitwerking op temperatuur en OS. C (2)
	Troebelheid (NTU ²)		1	Geen data nie, maar lading na verwagting nie hoog nie. A/B (0,5) – slegs kwalitatiewe evaluering

RIVIER	Mokolorivier		Watergehaltemoniteringspunte	nte
WGSE	S		VT	A4H007Q01, '77'80, n = 82
EWB-terrein	3		HES	A4H010Q01, '92 - '96, n = 27 (maar 19 vir temperatuur en 6 vir NH_3)
Vertrouensevaluering		Vertroue in die evaluering is laag, want min OS-, temperatuur-, troebelheids- of t Hoewel die meetwal na aan die EWB-terrein is, is huidigestand-data slegs tot 1 verkry van A4H007Q01 in die Tambotierivier (dieselfde ekologiese streek, vlak II).	, want min OS-, temperatuur EWB-terrein is, is huldigesta mbotierivier (dieseffde ekologi	Vertroue in die evaluering is laag, want min OS-, temperatuur-, troebelheids- of toksiendata is beskikbaar. Hoewel die meetwal na aan die EWB-terrein is, is huidigestand-data slegs tot 1996 beskikbaar. VT-data verkry van A4H007Q01 in die Tambotierivier (dieselfde ekologiese streek, vlak II).
Watergehaltebestanddele	Ø	VT-waarde	HES-waarde	Kategorie (Waardebepaling) / Kommentaar
	Elektriese geleivermoë (mS/m)	15 and 24	10,87	A (0)
	Chl-a: perifiton		17,28	C (2) (n=1)
	Chl-a: fitoplankton		1	
	Samestelling van biotiese gemeenskap: Telling van makro-		SASS ² :130 ASPT ³ : 5,0 SASS ⁵ : 149	U
	ongewerweldes (ASPT ³)		ASPT ³ : 5,7	
Responsveranderlike	Vis		65.8	U
			SPI [®] = 16.6 (Sept '07) SPI = 17.4	B (1) (n=3)
	Diatome		(Jan '08) SPI=18.4	A (0)
			(Mrt 108)	A (0)
Toksiene	Fluoried	6,77	0,278	A (0)
(mg/L)	Ammoniak	0,160	0,001	A (0)
OORHOOFSE TERREIN PAI ⁴ }	OORHOOFSE TERREINKLASSIFIKASIE (volgens PAI ⁴)		B/C (79,2)	

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Watergehaltemetrie ES. HES Watergehaltemetrie MgSO ₄ Dle 95ste persentiel van die data moet ≤ 16 mg/L wees. Ma ₂ SO ₄ Dle 95ste persentiel van die data moet ≤ 20 mg/L wees. Ma ₂ SO ₄ Dle 95ste persentiel van die data moet ≤ 17 mg/L wees. Ma ₂ SO ₄ Dle 95ste persentiel van die data moet ≤ 31 mg/L wees. MaCl Dle 95ste persentiel van die data moet ≤ 31 mg/L wees. MaCl Dle 95ste persentiel van die data moet ≤ 31 mg/L wees. MaCl Dle 95ste persentiel van die data moet ≤ 31 mg/L wees. MaCl Dle 95ste persentiel van die data moet ≤ 31 mg/L wees. MaCl Dle 95ste persentiel van die data moet ≤ 30 mS/m wees. PH Dle 56ste persentiel van die data moet ≤ 30 mS/m wees. PH Dle 56ste persentiel van die data moet ≤ 30 mS/m wees. PH Dle 56ste persentiel van die data moet ≤ 10 mg/L wees. PH Dle 56ste persentiel van die data moet ≤ 6 mg/L wees. Img/L Depeloste suurstor PH Dle 56ste persentiel van die data moet ≤ 0.05 mg/L wees. Img/L Depeloste suurstor Img/L Depeloste suurstor Img/L Depeloste suurstor D	Rivier: Mokolo		EWB: 3 Moniteringsterrein: A4H010Q01
mgSO4 aniese soute* MgCl2 MgCl2 CaCl2 MgCl CaCl2 NaCl CaCl2 CaSO4 CaSO4 NaCl CaSO4 CaSO4 CaSO4 Nacl Ch-a: Inverandertikes Ch-a: Inverandertikes Ch-a: Nacl Ch-a:	Watergehaltemetrie		
aniese soute* MgCl ₂ MgCl ₂ CaCl ₂ NaCl CaSO4 EC PH		MgSO4	Die 95ste persentiel van die data moet ≤ 16 mg/L wees.
aniese soute* MgCl ₂ CaCl ₂ NaCl CaCl ₂ CaCl EC PH EC PH CaSO4 EC PH EC PH CaSO4 EC PH		Na ₂ SO ₄	Die 95ste persentiel van die data moet ≤ 20 mg/L wees.
te cact ₂ Nacl CasC4 EC PH EC PH CasC4 EC PH CasC4 EC PH CasC4 EC PH CasC4 PH CasC6 PH CASC6 PH CASCA	Anorganiese soute*	MgCI ₂	Die 95ste persentiel van die data moet ≤ 15 mg/L wees.
e veranderlikes NaCl CaSO4 EC PH Temperature Opgeloste suurstof Troebelheid Troebelheid Totale anorganiese stikstof PO4-P ChI-a: fitoplankton nsveranderlikes Toksiene	(mg/L)	CaCl ₂	Die 95ste persentiel van die data moet ≤ 21 mg/L wees.
e veranderlikes CaSO4 EC PH Temperature Opgeloste suurstof Troebelheid Troebelheid Totale anorganiese stikstof PO4-P Ch-a: fitoplankton nsveranderlikes Toksiene		NaCI	Die 95ste persentiel van die data moet < 45 mg/L wees.
te cc pH Temperature Dpgeloste suurstof Troebelheid Troebelheid Totale anorganiese stikstof PO ₄ -P Ch-a: fitoplankton nsverandertikes Toksiene		CaSO4	Die 95ste persentiel van die data moet ≤ 351 mg/L wees.
e veranderlikes pH Temperature Opgeloste suurstof Troebelheid Totale anorganiese stikstof PO ₄ -P Chl-a: fitoplankton nsveranderlikes Toksiene		ü	Die 95ste persentiel van die data moet ≤ 30 mS/m wees.
e veranderlikes Temperature Copgeloste suurstof Troebelheid Totale anorganiese stikstof PO ₄ -P Chl-a: fitoplankton nsveranderlikes Toksiene		Ha	Die 5de en die 95ste persentiel van die data moet strek van 6,5 tot 8,0.
Opgeloste suurstof Troebelheid Totale anorganiese stikstof PO ₄ -P ChI-a: fitoplankton ChI-a: perfiton Toksiene	Fisiese veranderlikes (mg/L)	Temperature	Wissel met meer as 2°C, d.w.s. 'n groot verandering in die temperatuurregime kom dikwels voor. Die meeste redelik temperatuursensitiewe spesies minder talryk wees en voorkomsfrekwensie sal laer wees as wat vir verwysing verwag word. Biologiese evaluering word dus aanbeveel en basislynmonitering moet vir hierdie veranderlike begin word by Vlak II of hoë van die DSS ¹ .
Troebelheid Totale anorganiese stikstof PO ₄ -P ChI-a: fitoplankton ChI-a: perfition Toksiene		Opgeloste suurstof	Die 5de persentiel van die data moet ≥ 6 mg/L wees.
Totale anorganiese stikstof PO ₄ -P Chl-a: fitoplankton Chl-a: perifiton Toksiene		Troebelheid	Verskil in geringe mate van die natuurlike troebelheidstrek; geringe aanslikking van instroomhabitats is aanvaarbaar.
PO ₄ -P ChI-a: fitoplankton ChI-a: perifiton Toksiene	Nutriënte		Die 50ste persentiel van die data moet ≤ 0.25 mg/L wees.
Chl-a: fitoplankton Chl-a: perifiton Toksiene		PO4-P	Die 50ste persentiel van die data moet ≤ 0.015 mg/L wees.
Chl-a: perifiton Toksiene		Chl-a: fitoplankton	Die 50ste persentiel van die data moet < 10 μg/L wees.**
Toksiene	Resnonsveranderlikes	Chl-a: perifiton	Die 50ste persentiel van die data moet ≤ 21 mg/m ² wees.
		Toksiene	Die 95ste persentiel van die data moet binne die Teikenwatergehaltestrek (TWGS) wees soos vermeld in DWAF (1996).

** Geen fitoplanktondata was vir hierdie evaluering beskikbaar nie. Al die ES en DPK's moet geverifieer word op grond van deskundige oordeel.

WGSE 5
Makolorivier -
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j vir EWB
evaluering
e terreine
oorhoofs
gorieë en
HES-kate
Tabel 5.9: I

RIVIER	Mokolorivier		Watergehaltemoniteringspunte	Ispunte
WGSE	ŝ		5	A4H007Q01, '77 - '80, n = 82
EWB-TERREIN	4		PES	A4H010Q01, '92-'96, n = 27 (maar 19 vir temperatuur en 6 vir NH_3)
Vertrouensevaluering		Vertroue is laag, wan Data van A4H010Q01 op grond van aanwyse twee terreine by die afkomstig van A4H007	t min OS-, temperatuur-, word gebruik vir EWB 3 e ers op terrein en die invloe Mokolorivier aansluit. Hu Q01 in die Tambotierivier	Vertroue is laag, want min OS-, temperatuur-, troebelheids- of toksiendata is beskikbaar. Data van A4H010Q01 word gebruik vir EWB 3 en 4, met wysigings aan die PAI ³ -tabel – veral op grond van aanwysers op terrein en die invloed van die sytak Poer-se-loop, wat tussen die twee terreine by die Mokolorivier aansluit. Huidigestand-data slegs tot 1996 en VT-data afkomstig van A4H007Q01 in die Tambotierivier (dieselfde ekostreek, vlak II).
Watergehaltebestanddele		VT-waarde	HES-waarde	Kategorie (Waardebepaling) / Kommentaar
	MgSO4		1	
	Na ₂ SO ₄			
Anorganiese	MgCl ₂			MEACHE kon nie gebruik word nie: EK is
source (modil)	CaCl ₂			in plaas daarvan gebruik
	NaCI			
	CaSO4		1	
Nutriënte	Oplosbare reaktiewe fosfor (SRP)	0,007	0,015	A (0): Normkategorie is geherkalibreer data baie veranderlik
(mg/L)	Totale anorganiese stikstof	0,065	0,067	A (0). Data baie veranderlik
	pH (5de en 95ste persentiel)	5,14 en 6,70	7,2 - 7,76	B (1): VT-data 5,14 (5de persentiel) and 6,7 (95ste persentiel) – betroubaarheid?
Fisiese veranderlikes	Temperatuur		1	Geen data nie maar geen uitwerkings
	Opgeloste suurstof		ı	word verwag nie. Klein OS- en temperaturfluktuasies kan voorkom – B (1) – slegs kwalitatiewe evaluering

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RIVIER	Mokolorivier		Watergehaltemoniteringspunte	gspunte
WGSE	ŝ		Ч	A4H007Q01, '77 - '80, n = 82
EWB-TERREIN	4		PES	A4H010Q01, '92-'96, n = 27 (maar 19 vir temperatuur en 6 vir NH ₃)
Vertrouensevaluering		Vertroue is laag, w Data van A4H010Q0 op grond van aanwy twee terreine by di afkomstig van A4H0	ant min OS-, temperatuur- 11 word gebruik vir EWB 3 e sers op terrein en die invloe e Mokolorivier aansluit. Ht 07Q01 in die Tambotierivier	Vertroue is laag, want min OS-, temperatuur-, troebelheids- of toksiendata is beskikbaar. Data van A4H010Q01 word gebruik vir EVVB 3 en 4, met wysigings aan die PAI ³ -tabel – veral op grond van aanwysers op terrein en die invloed van die sytak Poer-se-loop, wat tussen die twee terreine by die Mokolorivier aansluit. Huidigestand-data slegs tot 1996 en VT-data afkomstig van A4H007Q01 in die Tambotierivier (dieselfde ekostreek, vlak II).
Watergehaltebestanddele	e	VT-waarde	HES-waarde	Kategorie (Waardebepaling) / Kommentaar
	Troebelheid (NTU ¹)		1	Geen data nie, maar daar word nie verwag dat ladings te hoog sal wees nie en rivier is oor die algemeen helder. A (0) – slegs kwalitatiewe evaluering
	Elektriese geleivermoë (mS/m)	15 en 24	10,87	A (0)
	Chl-a: perifiton		E	E
	Chl-a: fitoplankton		t	1
Responsveranderlike	Samestelling van biotiese gemeenskap: Telling van makro- ongewerweldes (ASPT ²)		SASS ⁴ : 126 ASPT ² : 4.8	O
	Vis		63,73	U
	Diatome		Sept '07: SPI [*] = 17.8 Mrt '08: SPI = 17.4	A (0) (n=2)
Toksiene	Fluoried	6,77	0,278	A (0)
(mg/L)	Ammoniak	0,160	0,001	A (0)
JORHOOFSTE TERRE	OORHOOFSTE TERREINKLASSIFIKASIE (volgens PAI³)		B (86,8)	

HES
data:
fisies-chemiese
đ
ES met betrekking
Tabel 5.10:

Rivier: Mokolo		EWB: 4 Moniterinosterrein: A4H010001
Watergehaltemetrie		ES: HES
	MgSO4	Die 95ste persentiel van die data moet ≤ 16 mg/L wees.
	Na ₂ SO ₄	Die 95ste persentiel van die data moet ≤ 20 mg/L wees.
Anorganiese soute*	MgCl ₂	Die 95ste persentiel van die data moet ≤15 mg/L wees.
(mg/L)	CaCl ₂	Die 95ste persentiel van die data moet ≤ 21 mg/L wees.
	NaCi	Die 95ste persentiel van die data moet ≤ 45 mg/L wees.
	CaSO4	Die 95ste persentiel van die data moet ≤ 351 mg/L wees.
	EC	Die 95ste persentiel van die data moet ≤ 30 mS/m wees.
	На	Die 5de en 95ste persentiel van die data moet van 6,5 tot 8,0 strek.
Fisiese veranderlikes	Temperatuur	Klein tot matige afwyking van die natuurlike temperatuurstrek. Party hoogs temperatuursensitiewe spesies in kleiner getalle en voorkomsfrekwensies as wat vir verwysings verwag is.
	Opgeloste suurstof	Die 5de persentiel van die data moet ≥ 7 mg/L wees.
	Troebelheid	Geen bekende kommer oor troebelheid nie; veranderinge in troebelheid skynbaar natuurlik.
Nutriënte	Totale anorganiese stikstof	Die 50ste persentiel van die data moet ≤ 0,25 mg/L wees.
mg/L)	PO₄-P	Die 50ste persentiel van die data moet ≤ 0,015 mg/L wees.
	Chi-a: fitoplankton	Die 50ste persentiel van die data moet < 10 µg/L wees.**
Responsveranderlikes	Chl-a: perifiton	Die 50ste persentiel van die data moet ≤ 21 mg/m² wees.
	Toksiene	h Uitwerking word verwag indien die 95ste persentiel van die data die Teikenwatergehaltestrek oorskry soos vermeld in DWAF (1996).

** Geen fitoplanktondata was vir hierdie evaluering beskikbaar nie. Al die ES en DPK's moet geverifieer word aangesien die strek op deskundige oordeel berus.

waterhulpbronklasse en gepaardgaande hulpbrongehalteoogmerke in die Mokolo- en die Matlabas-opvanggebied, DWS 2015, getoon in Tabel 6.1. Die gemiddelde jaarlikse grondwateraanvulling vir die hele opvanggebied gebaseer op die GHE II-datastel word geraam op meer as 16,25 Mm³/a. Die EWB-ILF-waardes is verkry uit die Die grondwaterhoeveelheidskomponent is bepaal aan die hand van waardes soos aanvulling, basisvloei en spanningsindeks verkry tydens die bepaling van studie vir die Tussentydse Grondwaterreserwebepaling vir die Limpopo-opvanggebied (Intermediate Groundwater Reserve Determination Study, Water Geosciences Consulting, 2011) Bevolkingswaardes is verkry uit die Waterdienste-datastel van 2011. BMB maak voorsiening vir die noodsaaklike behoeftes van individue wat deur die betrokke <u>.</u> gebruik. Die benadering van die huidige studie het kennis geneem van die GHE II- en die WARMS 2013-datastel om 'n meer gebalanseerde beraming van waterhulpbron gedien word en dit sluit water vir drink- en kookdoeleindes en vir persoonlike higiëne in. 'n Oorlewingshoeveelheid van 25 liter per persoon per dag grondwatergebruik te maak. Die grondwaterspanningsindeks toon grondwatergebruik teenoor grondwateraanvulling.

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Spannings- indeks	0,07	0,02	0,02	0.16	0.14	0,25	0.28	0,20	0.17	0,24	0,12	0.004	0.004	0,16
Huidige grond- water- gebruik (Mm ³ /a)	1,22	0,15	0,25	2,76	1,79	4,56	4,47	5,51	2,93	8,10	2,66	0,13	60'0	2,12
Reserve as % of Aanvulling	18,34	10,18	3,48	3,53	4,83	22,54	26,90	10,69	54,62	25,17	11,13	10,30	4,35	3,04
Reserve (Mm ³ /a)	3,24	0,80	0,46	0,59	0,60	4,10	4,08	2,89	9,21	8,30	2,50	2,72	0,79	0,39
BMB- reserve (Mm ³ /a)	0,06	0,05	0,07	0,05	0,07	0,03	0,03	0,06	0,02	0,12	0,02	0,02	0,16	0,03
EWB ILF (M <u>11³1</u> a)	3,18	0,75	0,39	0,54	0,53	4,07	4,05	2,83	9,19	8,18	2,48	2,70	0,63	0,36
Basisvioei [6] ² 00]	5,06	1,79	0,85	0,54	0,17	9,46	8,93	11,56	6,49	11,87	4,23	2,53	2,02	0,74
Bevolking (Water- dienste) 2011)	6 785	5 175	7 749	5 483	7 886	3793	3 443	6 031	2 662	13 391	1 958	2 188	17 266	2 812
Aanvulling (Mm ³ /a)	17,66	7,86	13,23	16,71	12,41	18,19	15,77	27,02	16,86	32,98	22,46	26,40	18,15	12,81
Opper- vlakte (km ²)	692	358	1111	1 913	1 940	573	522	698	497	1 007	1 022	1 207	1 057	1 812
Kwat.	A41A	A41B	A41C	A41D	A41E	A42A	A42B	A42C	A42D	A42E	A42F	A42G	A42H	A42J

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- GEHALTEKOMPONENT
GRONDWATER
7.

7.1 Samevatting van die gehaltekomponent van die Grondwaterreserwe

	rondwatergeh	A41B	6,85-8,37
ggeblede A41A, A41B, A41C & A41D	Gr	A41A	7,51 7,61 7,61 5,0-9,5 6,76-8,26 6,85-8,37
41A, A41B, A	BMB-	reserve	5,0 – 9,5 (±0,1)
blede A	le of	A41D	7,61
apprangge	ende GW-gehalte of mediaan	A41A A41B A41C A41D	7,51
aternère o	ngende GW mediaar	A41B	7,61
Kwa	Omri	A41A	7,51
	50	A41D	259
	nonster	A41 C	70
N. Carl	Aantal n	A41 A41 B C	259 70
		A41 A	70
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No. of the other states of the	Chemiese parameter		Hd

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	Elektriese geleivermoë	mS/	02	259	20	259					<150				
		E					97,50	130,00	97,50	130,00	2	107,25	143,00	107,25	143,00
	Kalsium as Ca	l/gm	2	259	20	259	49,90	76,50	49,90	76,50	<150	54,89	84,15	54,89	84.15
	Magnesium as Mg	mg/l	70	259	20	259	37,55	52,80	37,55	52,80	<100	41,31	58,08	41.31	58.08
	Natrium as Na	mg/l	20	259	20	259	105,70	129,10	105,70	129,10	<200	116,27	142,01	116.27	142.01
	Chloried as CI	mg/I	70	259	20	259	78,30	143,10	78,30	143,10	<200	86,13	157,41	86.13	157.41
	Sulfaat as SO4	l/gm	70	259	20	259	21,65	38,87	21,65	38,87	<400	23,82	42,76	23.82	42.76
	Nitraat as NO _x -N	mg/l	70	259	20	259	3,90	4,53	3,90	4,53	<10	4,29	4.98	4.29	4
	Fluoried as F	l/gm	2	259	20	259	1,28	0.85	1.28	0.85	<1.0	1 28	0.94	1 28	PO O
Ē) Gebaseer op data verkry uit die Nasionale Grondwaterargief. Die waardes aangegee is die statistiese mediaan van elke parameter.	kry uit die l	Nasionale	Grondwat	erargief. C	Die waardes	aangegee i	s die statistie	ese mediaan	van elke pa	rameter.			241	5
3	> Verwysing: Quality of Domestic Water Supplies, Volume 1: Assessment Guide, 2nd Ed.1998. Water Research Commission Report No: TT 101/98. Pretoria, Suid-Afrika (Stel vir h Klas 1).	Domestic 1	Nater Sup	plies, Volu	ime 1: Ass	sessment G	uide, 2nd Ec	1.1998. Wate	er Research	Commission	Report No: TT	101/98. Pretoria, (Suid-Afrika (Stel	vir 'n Klas 1).	

Indien 'n verskil tussen die watergehaltewaardes vir die omingende grondwatergehalte en die BMB gevind is, is die laer of meer beskermende waarde vir die Grondwatergehaltereserwe gekies. Indien $\widehat{\mathbb{C}}$

die omringende grondwatergehalte as die Grondwatergehaltereserve gekies is, is die waarde met 10 persent opgeskaleer, mits die waarde nie die BMB-reserve oorskry nie

6,85-8,37

7,85-8,26

A410

A41C

altereserwe³⁾

Chemiese Een-		Marine and			Contral	South States and States	AND A COLUMN A WAY	and the second se		and the second s			
raramatar haid		Aantal monsters	onster	12		mediaan	umringende uw-genalte of mediaan	ite of	BMB-		Grondwaten	Grondwatergehaltereserwe ³	le ^{a)}
	E A41	A42 A	A42 B	A42 C	A41E	A42A	A42B	A42C	reserwe ²⁾	A41E	A42A	A42B	A42C
Ha	66	4	4	47	7,70	6.88	7.55	8.10	5,0 - 9,5 (±0.1)	6.93-8.47	6,19-7.57	6 80-8 30	7 29-8 91
Elektriese mS/ geleivermoë m	66	4	4	47	163,20	14,10	23,75	33,30	<150	163,20	15,51	26,13	36.63
Kalsium as Ca mg/l	96	ო	4	41	79,50	3,40	18,85	17,70	<150	87,45	3,74	20.74	19.47
Magnesium as mg/l	90	m	4	41	47,20	6,10	9,75	5,61	<100	51,92	6,71	10,73	6,17
Natrium as Na mg/l	98	ო	4	41	213,05	5,60	12,30	52,50	<200	213,05	6,16	13,53	57,75
Chloried as Cl mg/l	97	ব	4	41	280,00	14,10	7,25	11,00	<200	280,00	15,51	7,98	12.10
Sulfaat as SO4 mg/l	96	e	ষ	41	76,50	10,20	8,60	7,78	<400	84,15	11,22	9.46	8.55
Nitraat as NO _x -N mg/I	97	4	4	42	6,70	0,07	0,19	1,64	<10	7,37	0,07	0,20	1,80
Fluoried as F mg/l 97 3 4 41 1,10 0,38 0,57 0,42 <1,0	97	e	4	41	1,10	0,38	0,57	0,42	<1,0	1,10	0,42	0.62	0.46

Tabel 7.2: Grondwatergehalte per kwaternêre opvanggebied (A41E, A42A, A42B en A42C)

Indien 'n verskil tussen die watergehaltewaardes vir die omringende grondwatergehalte en die BMB gewind is, is die laer of meer beskermende waarde vir die Grondwatergehaltereserwe gekies. Indien <u>@</u>

die omringende grondwatergehalte as die Grondwatergehaltereserwe gekies is, is die waarde met 10 persent opgeskaleer, mits die waarde nie die BMB-reserwe oorskry nie.

							LIGITO ANY	ando aloi	variable in	JE AGAU, AGAU	AMAISTINE UPVAILING A42LI, A42E, A42F & A42G			
Chemiese	Een-	P	Aantal monsters	onster	0	Omr	Omringende GW-gehalte of mediaan	aw-geha	tte of	BMB-	9	Grondwatergehaltereserwe ^{a)}	chaltereserv	ve ^{a)}
		D D	A42 E	A42 F	A42 G	A42D	A42E	A42F	A42G	reserve	A42D	A42E	A42F	A42G
Ηd		ო	4	<i>с</i> о	20	7.07	7,56	7.93	7.34	5,0-9,5 (±0.1)	6.36-7.78	680-831	7 14-8 72	6.61-8.07
Elektriese geleivermoë	лSr т	ო	42	ო	20	42,10	58,85	25,50	27,60	<150	46,31	64,74	28,05	30,36
Kalsium as Ca	l/ĝm	m	12	2	20	41,60	30,25	10,25	8,35	<150	45,76	33,28	11,28	0 0 0
Magnesium as Mg	l/gm	ო	12	2	20	8,30	17,10	7,55	5,60	<100	9,13	18,81	8,31	6.16
Natrium as Na	l/gm	2	12	8	20	26,20	24,35	17,10	15,40	<200	28,82	26,79	18,81	16,94
Chloried as Cl	mg/i	n	12	en	20	17,00	33,70	6,85	10,90	<200	18,70	37,07	7,54	11,99
Sulfaat as SO₄	l/ĝm	m	12	2	20	14,00	8,55	5,30	6,65	<400	15,40	9,41	5,83	7,32
Nitraat as NO _x -N	mg/l	2	12	2	20	0,22	0,06	0,16	60'0	<10	0,24	0,06	0,18	0,10
Fluoried as F	mg/l	e	12	3	20	0,12	0,35	0,50	0,22	ed as F mg/i 3 12 3 20 0,12 0,35 0,50 0,22 <1.0	0,13	0,39	0,55	0.24

Tabel 7.3: Grondwatergehalte per kwaternêre opvanggebied (A42D, A42E, A42F, en A42G)

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Indien 'n verskil tussen die watergehaltewaardes vir die omringende grondwatergehalte en die BMB gevind is, is die laer of meer beskermende waarde vir die Grondwatergehaltereserwe gekies. Indien ଡ

die omringende grondwatergehatte as die Grondwatergehaltereserve gekies is, is die waarde met 10 persent opgeskaleer, mits die waarde nie die BMB-reserve oorskry nie.

	The second se			The second se				
emiese parameter	heid	Aantal n	Aantal monsters	Omringende GW-g mediaan	nde GW-gehalte of mediaan	BMB-reserve ²⁾	Grondwaterg	ehaltereserwe ³⁾
		A42H	A42J	A42H	A42J		A42H	A42J
Ηđ		48	54	8,23	7,44	5,0-9,5 (±0,1)	7.41-9.06	6.70-8.18
Elektriese geleivermoë	mS/	48	54	159,50	199,85	<150	159,50	199.85
Kalsium as Ca	mg/l	47	54	7,50	71,00	<150	8,25	78.10
Magnesium as Mg	₩g/I	47	54	1,20	40,35	<100	1,32	44.39
Natrium as Na	₩9⁄I	47	54	313,56	196,45	<200	313,56	200
Chloried as Cl	mg/l	47	25	284,00	302,60	<200	284,00	302,60
Sulfaat as SO4	mg/l	47	54	135,33	129,05	<400	148,86	141.96
Nitraat as NO _x -N	µ∂∥	47	5	0,08	7,50	<10	60'0	8,25
Fluoried as F	mg/l	43	5	12,62	1,21	uoried as F mg/l 43 54 12,62 1,21 <1,0	12.62	1.21

Tabel 7.4: Grondwatergehalte per kwaternêre opvanggebied (A42H en A42J)

/erwysing: Quality of Domestic Water Supplies, Volume 1: Assessment Guide, 2nd Ed.1998. Water Research Commission Report No: TT 101/98. Pretoria, Suid-Afrika (Stel vir h, Klas 1).

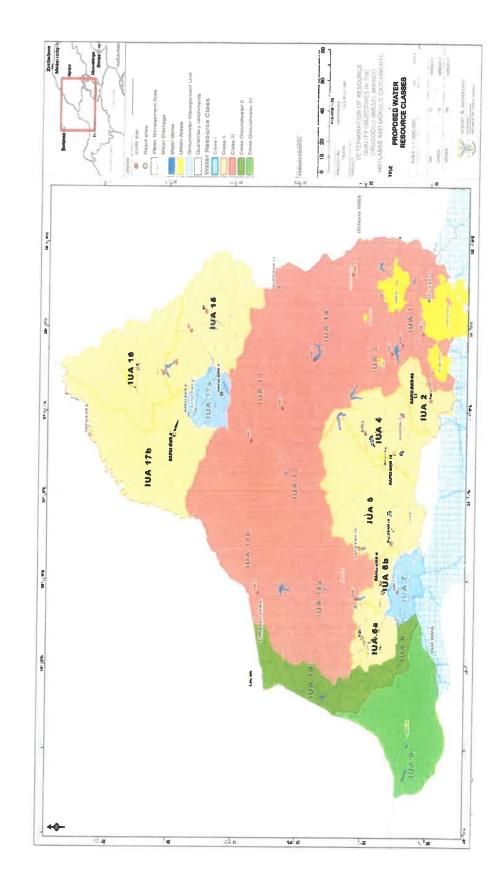
die watergehaltewaardes vir die omringende grondwatergehalte en die BMB gevind is, is die laer of meer beskermende waarde vir die Grondwatergehaltereserve gekies. Indien ndien 'n verskil tussen 1 E

die omringende grondwatergehalte as die Grondwatergehaltereserve gekies is, is die waarde met 10 persent opgeskaleer, mits die waarde nie die BMB-reserve oorskry nie.

Twee kwaternêre opvanggebiede (A41A en A41B) het nie voldoende chemiese data oor grondwater om omvattende ontleding van die omringende status te doen nie. Die omringende grondwatergehalte vir A41A en A41B is dus uit naasliggende kwaternêre opvanggebiede met soortgelyke geologie geëkstrapoleer, want die geologie het 'n enorme uitwerking op die watergehalte van 'n gebied.

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Fabel 7
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Watergehalteparameters van belang	Fluoried	Elektriese geleivermoë, chloried en natrium	Fluoried	Elektriese geleivermoë, chloried en natrium	Chloried, elektriese geleivermoë en natrium	Geen	Fluoried	Chloried. elektriese geleivermoë en fluoried						
Watergehalteklas (WRC, 1998)	-					0	0	0	0	0	0	0	=	=
Kwaternêre opvanggebied	A41A	A41B	A41C	A41D	A41E	A42A	A42B	A42C	A42D	A42E	A42F	A42G	A42H	A42J



STAATSKOERANT, 14 JANUARIE 2022

Figuur 1: Liggingskaart vir die Krokodil (Wes)-, die Marico-, die Mokolo- en die Matlabas-opvanggebied wat die waterhulpbronklas en EWB-terreine toon

TSEBIŠOKAKARETŠO

No ...

2021

KGORO YA MEETSE LE KELELATŠHILA

MOLAO WA MEETSE WA SETŠHABA, 1998 (MOLAO WA 36 WA 1998)

TAETŠO YA TEKANO YA MEETSE YA METHOPO YA MEETSE A BOELELAMEETSE BJA MOKOLO LE MATLABAS

Nna, Senzo Mchunu, ka maemo a ka bjalo ka Tona ya Meetse le Kelelatšhila, gomme ke dumeletšwe ka maemo a a swanelago go ya ka dikarolo 16(1) tša Molao wa Bosetšhaba wa Meetse wa 1998 (Molao wa 36 wa 1998), ke phatlalatša taetšo ya tekano ya meetse a boelelameetse bja Mokolo le Matlabas.

Molaodi: Taetšo ya Tekano ya meetse Go: Mna Yakeen Atwaru Kgoro ya Meetse le Kelelatšhila Moago wa Ndinaye 185 Mmila wa Francis Baard Mokotlana wa Praebete X313 Pretoria 0001

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MR'SENZO MCHUNU (MP) TONA YA BODULO BJA BATHO, MEETSE LE KELELATŠHILA LETŠATŠIKGWEDI:

TAETŠO YA TEKANO YA MEETSE YA METHOPO YA MEETSE A MAELELAMEETSE A MOKOLO LE MATLABAS GO YA KA KAROLO YA 16(1) LE (2) YA MOLAO WA MEETSE WA SETŠHABA, 1998 (MOLAO WA 36 WA 1998)

ŠETULE

1. TLHALOŠO YA MOTHOPO WA MEETSE

1.1 Tekano ya meetse e laetšwa ka moka goba go karolo ya mothopo ka gare ga makgobelameetse a Mokolo le Matlabas bjalo ka ge go hlalošitšwe ka fase:

- Mafelo a Taolo ya Meetse Limpopo
- Dilete sa Kaloboelatšhila: Seletekgolo sa Kaloboelatšhila (A41 le A42)
- Dinoka: Mokolo, Mamba le Matlabas
- 1.2 Tona ya Madulo a Batho, Meetse le Kelelatšhila, gomme ke dumeletšwe ka maemo a a swanelago go ya ka dikarolo 16(1) tša Molao wa Bosetšhaba wa Meetse wa 1998 (Molao wa 36 wa 1998), ke phatlalatša taetšo ya tekano ya meetse a boelelameetse bja Mokolo le Matlabas. R. 810, e phatlaladitšwe ka Kuranteng ya Mmušo ya No. ya 33541 e ngwadilwego letšatšikgwedi la 17 Lewedi 2010.
- 1.3 Tona, go ya ka karolo ya 16(1) ya Molao, o laetša dikgoboketšo tše di latelago tša Tekano ya meetse ya mafelo a Boelelameetse bja Mokolo le Matlabas

2. DIAKHERONIMI LE DITLHALOŠO

2.1 Dikopafatšo

BHN	Dinyakwa tša Motho tša Motheo
EC	Legoro la Tikologo
EcoSpecs	Ditlhalošo tša Tikologo
EIA	Tekolo ya Khuetšo ya Tikologo
EIS	Bohlokwa le Boikarabelo bja Tikologo
ESA	Mafelo a Tlhokego ya Tikologo
EWR	Senyakwa sa Meetse a Tikologo
Lefelo la EWR	Lefelo la Senyakwa sa Meetse a Tikologo
GRAII	Kgato ya II ya Tekolo ya Mothopo wa Meetsefase
GRDM	Magato a a Lebišitšwego go Mothopo wa Meetsefase
GRUs	Diyuiti tša Mothopo wa Meetsefase
MAR	Palomoka ya Ngwaga ka ya Tselaboelelo
MCM	Dikhupikimetara tše Milione
MLF	Tlhokomelo ya Kelelo ya Tiase
NMAR	Palomoka ya Ngwaga ka ya Tselaboelelo ya Tlhago
PES	Seemo sa Bjale sa Tikologo
RC	Maemo a tšhupetšo
REC	Legoro la Tikologo le le Digetswego
TEACHA	Ditlabelo tša Tekolo ya Bodulo bja Tikologo ya ka Meetseng
Di-TPC	Ditekanyo tša Kamego ye e ka Bago gona
WUL	Laesense ya Tšhomišo ya Meetse
WQSU	Yuniti ya fasana ya boleng bja meetse

2.2 Ditlhalošo

Ka Tsebišong ye lentšu lefe goba lefe goba polelo ye e filwego tihalošo ka Molaong e tia ba le tihalošo ye e filwego bjalo, ntle le ge kamano e laetša ka mokgwa wo mongwe—

"Kelelo ya fase" ke kelelo ye e tšweletšwago ya mo dinokeng ka nako ya maemo a bosa a a omilego goba a lokilego, fela a sa abelwa ka moka ke meetse a ka fase ga mabu; gomme a akaretša kabelo go tšwa kelelong ya ka gare ye e diegilego le go tšwa ga meetse a ka fase ga mobu.

"Moo noka e kopanago le ye nngwe gona" (kopano ya payofisikale) e ra dintlha tša mohlala tše di emetšego kelelo godimo goba bophelodulo bja ka meetseng bjalo ka dinoka, dinagamenoga, melomonoka le meetse a ka fase ga mabu moo sehlopha sa dikamano se dirang gona.

"bohlokwa le boikarabelo bja tikologo" e ra ditaetši tše bohlokwa mo go tlhopho ya tikologo ya methopo ya meetse. Bohlokwa bja tikologo bo amana le go ba gona, go emelwa le mehutahuta ya diphedi tša lefelo le itšego le bodulo. Boikarabelo bja tikologo bo amana le go ba kotsing ga bodulo le diphedi lefelong le itšego mo diphetogong tše di ka diragalago dikelelong, maemo a meetse le maemo a tikologopopego ye e nago le dikhemikale.

"dinyakwa tša meetse a tikologo" e ra mekgwa ya kelelo ye bjalo ka bogolo, nako le lebaka, le boleng bja meetse a a hlokegago go hlokomela tikologo ya dinoka maemong a itšego. Lereo le le dirišwa go ra dikarolo tša bokaakang bja boleng bja ka bobedi;

"lefelo goba setsha sa tihokego ya meetse a tikologo" e ra dintiha tše itšego tša noka, bjalo ka ge go laeditšwe ka tshepedišo ya kgetho yeo ya setšhaba, ye e nago le botelele bja noka ya dikarolo tše di fapanego bakeng sa haedroliki le tikologo. Ditsha tše di fana ka ditaetšo tše di lekanego go lekola dikelelo tša tikogolo le go hlahloba maemo ditihohleletšo tša tikologopopego tše di nago le dikhemikale tše bjalo ka haedrolotši, tšeomofolotši, le dikhemikale tša fisika le dikarabelo tša payolotši tše bjalo ka dihlapi, diphedi tše di se nago mokolo, le dimela tše di lego maribeng a noka;

"maemo a bjalo a tikologo" e ra legoro leole laetšago maphelo a bjale a mehuta ya boleng bja payolotši ya mothopo wa meetse, ge go bapetšwa le maemo a tihago goba a a swanago le tšhupetšo ya tihago. Dipoelo tša tshepedišo di fanwa bjalo ka Magoro a Tikologo go thoma kgauswi le tihago go fihla tše di fetotšwego ka botlalo;

"tsošološo" e ra koketšo ya meetse lefelong la go tlala monola, e ka ba ka nwelelo ya fase ya pula goba meetse a a lego boalong le/goba go elela ga meetse a ka fase ga mobu a a lego kgauswi le maswikameetse;

"legoro le le digetšwego la tikologo" e ra legoro le le laetšago nepišo ya taolo ya tikologo ya mothopo wa meetse ye e theilwego go tihopho ya tikologo yeo e swanetšego go fihlelelwa. Magoro a tioga ka Legoro la A leo le šupetšago go se se sa fetolwago, tihago go fihla go Sehlopha sa D se se fetotšwego kudu.

"tekano ya meetse" e ra bokaakang le boleng bja meetse ao a hlokagala go kgotsofatša BHN ka go boloka kabo ya motheo ya meetse le go šireletša bophelodulo bja ka meetseng tikologo ya meetse bakeng sa go tiiša tlhabollo ya maleba ya mothopo wa meetse;

"Molao" e ra Molao wa Bosetšhaba wa Meetse, 1998 (Molao wa 36 wa 1998);

3. TAETŠO YA TEKANO YA MEETSE

(1) Tekano ya meetse e akaretša tekano ya meetse ya EWR le BHN bakeng sa Dinoka ka ditsheng tša EWR le mafelo a a kgethilwego a go kgobela meetse a Mokolo le Matlabas bjalo ka ge go hlalošitšwe ka go Temana ya 4, Lenaneotlhophong la 4.1.

(2) Tekano ya meetse e akaretša tekano ya meetse ya EWR le BHN bakeng sa Dinoka ka ditsheng tša EWR le makgobelameetse a Mokolo le Matlabas, go ya ka karolo ya 16(1) ya Molao, e laeditšwe ka go Temana ya 5, Lenaneotlhophong la 5.1 - 5.10.

(3) Tekano ya meetse ya Meetse a ka fase ga mabu ya Boleng bja Meetse, go ya ka karolo ya 16(1) ya Molao, bakeng sa makgobelameetse a Mokolo le Matlabas bjalo ka ge go hlalošitšwe ka go Temana ya 6, Lenaneotlhophong la 6.1.

- Mafelo a bolokelameetse a Mokolo le Matlabas le ditsha tša EWR di laeditšwe ka go Seswantšho sa
 1.
- (5) Tekano ya meetse ya Meetse a ka fase ga mabu ya Boleng bja Meetse, go ya ka karolo ya 16(1) ya Molao, bakeng sa makgobelameetse a Mokolo le Matlabas bjalo ka ge go hlalošitšwe ka go Temana ya 7, Mananeotihophong a 7.1 7.5.
- (6) Tekano ya meetse e tla šoma go tloga ka letšatšikgwedi le le saennwego bjalo ka ge go laeditšwe go ya ka karolo ya 16 (1) ya Molao, ntle le ge go laeditšwe ka mokgwa wo mongwe ke Tona.

4. KAROLO YA BOKAAKANG BJA MEETSE A KA GODIMO A DINOKA

Dipoelo tša taetšo ya Tekano ya meetse le tihopho ya tikologo ya maelelameetse a Mokolo le Matlabas, moo dipalo tša Tekano ya meetse di hlagišwago e le diphesente tša NMAR go maelelameetse go ya ka karolo ya (16) (1) ya Molao.

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Leina la Lefelo	Bokgobela meetse bja Tatelano ya bone	Leina la Noka	BES	EIS	NMAR (MCM)	EWR % NMAR ²	Tekano ya meetse ya BHN ya 3 (%NMAR)	Palomoka ya Tekano ya meetse ya 4 (%NMAR)
HN51	A42B	Grootspruit (mothopo) e tla gahlana le Sand	٩	Magareng	27.8	21.73	0	21.73
Lefelo la EWR MOK_EWR1 A	A42C	Mokolo e tla gahlana le Dwars	С	Godimo	84.84	16.7	0.048	16.748
Lefelo la EWR la MOK_EWR1 B	A42E	Mokolo e tla gahlana le Sterkstroom	B/C	Godimo	135.03	13.6	0.090	13.69
HN54	A42D	Sterkstroom (mothopo) e tla gahlana le Mokolo,	8	Godimo kudu	43.45	52.63	0	52.63
Lefelo la EWR MOK EWR2	A42F	Noka ya Mokolo go A42F e swanetše go elela ka gare ga Letarno la Mokolo,	B/C	Godimo kudu	196.2	11.7	0.103	11.803
Lefelo la EWR MOK_EWR3	A42G	Letamo la Mokolo go Noka ya Mokolo go iša karolong ya godimo ya A42G (10km go elela le letamo)	B/C	Godimo kudu	214.5	8. 8	0.111	9.011
Lefelo la EWR MOK EWR4	A42G	Noka ye kgolo ya Mokolo	U	Godimo kudu	253.3	12.3	0.111	12.411
HN59	A41A	Methopo ya meetse a Mothlabatsi (Matlabas-Zyn- Kloof, mehlaka)	¥	Godimo kudu	5.23	57.07	0	57.07
MAT Ya ka pela EWR3	A41B	Mamba e tia gahlana le Mothlabatsi	B/C	Godimo	9.54	35.49	0	35.49
MAT Ya ka pela_EWR2	A41B	Magahlano a Mattabas/Motthabatsi (boelelo bja IUA)	B/C	Godimo	32.80	33.23	0	33.23
MAT Ya ka	A41C	Matlabas	ш	Magareng	35.58	33.42	c	22.47

Palomoka ya Tekano ya meetse ya 4 (%NMAR)	
Tekano ya meetse ya BHN ya 3 (%NMAR)	
EWR % NMAR ²	
NMAR (MCM) ¹	
EIS	
PES	
Leina la Noka	
Bokgobela meetse bja Tatelano ya bone	
Leina la Lefelo	pela_EWR4

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- Dipalomoka tše di emela tekanyo ya lebaka le letelele go ya ka NMAR. Ge NMAR e fetoga, bolumo ye le yona e ila fetoga. Ξ
- E emela phesente ya BHN.
- Palomoka ya bokaalo bja Tekano ya meetse e ikarabela go Tekano ya meetse ya Tikologo le BHN. <u>(</u>2)

REC ga se ya digelwa go dumelela Tekano ye ya meetse ya mathomo eupša thokomelo ya tiro ya bjale ya tshepedišo e digetšwe.

5. MEETSE A KA GODIMO - BOLENG BJA KAROLO BJA DINOKA

5.1 Kakaretšo ya karolo ya boleng mafelong a EWR

Lenaneolthopho la 5.1: Magoro a PES le tekolo ya setsha ka kakaretšo ya EWR 1A nokeng ya Mokolo- WQSU1 4

NOKA	Noka ya Mokolo		Mafelo la do Lekoli	Matelo la go Lekola Boleng bia Meetse
WQSU	4		RC	A4H002001 '77.'79 n = 68
LEFELO LA EWR	1A		PES	A4H002Q01. '02-'07 (ka ntha ya 1 do 2007). n = 48 (eunša 37 on F le SO4)
Tekolo ya potego		Potego ka g ge e le gore	o tekolo e magareng seelaboleng bja me	Potego ka go tekolo e magareng, gannyane DO, temp., go se bonale gabotse goba datha ya dilo tsa mpholo, le ge e le gore seelaboleng bia meetse se kgauswi le lefelo la EWR.
Dikarolo tša Boleng bja Meetse	Meetse	Mohola wa RC	Mohola wa PES	Legoro (Tekanyo) / Tshwayotshwayo
	MgSO4		1	
	Na2SO4			
Indrawai a a sa Dologot	MgCI2			
(mu/l)	CaCl2			I EACHA e be e ka se šomišwe gomme EC e šomišwa bjalo ka kemedi
1-1-10-1-1	NaCI			
	CaSO4			
Phepo	SRP	0.011	0.0165	B (1): Legoro la go bea maemo le ile la beakanvaleswa
(mg/L)	TIN	0.080	0.123	A (0)
	pH (phesenthaele yabo 5 le yabo 95)	6.68 - 7.70	6.92 - 7.83	A (0)
	Thempheretšha			
Diphapano tša Iefalo	Oksitšene ye e tološitšwego		J	Ga go na datha, eupša go holofelwa diabe tše mmalwa. Boelelameetse bo na le bosodi, ka gona A/B (0.5) – tekolo ya boleng fela
	Go se bonale gabotse (NTU)		з	Ga go na datha, eupša go holofelwa diabe tše mmalwa. B (1) - tekolo ya boleno fela
	Tshepedišo ya mohlagase (mS/m)	12.28	12.05	A (0)
2	Chl-a: perifaetone		EWR 1A: 21.58	C/D (2.5) (n=1)
Diphapano tša phetolo	Chl-a: faetoplanketone		3	4

NOKA	Noka ya Mokolo		Mafelo la go Lekola	Mafelo la do Lekoja Bolend bia Meetse
WQSU	4		RC	A4H002001 '77'79 n = 68
LEFELO LA EWR	1A		PES	A4H002Q01, 02-07 (ka ntiha va 1 do 2007) n = 48 (elinéa 37 do F la SO4)
Tekolo ya potego		Potego ka gi ge e le gore	o tekolo e magareng seelaboleng bia mee	Potego ka go tekolo e magareng, gannyane DO, temp., go se bonale gabotse goba datha ya dilo tša mpholo, le ge e le gore seelaboleng bia meetse se kgauswi le lefelo la EWR.
Dikarolo tša Boleng bja Meetse	Meetse	Mohola wa RC	Mohola wa PES	Legoro (Tekanyo) / Tshwayotshwayo
	Sebopego sa setšhaba sa diphedi: ntlha ya dihlokamekokotlo tše kgolo (ASPT)		SASS: 127 ASPT: 5.3	C (62.3)
	Hlapi		70.3	C - gagolo tša go amana le kelelo
	Ditaeathomo		EWR 1A: SPI = 17.3 le 16.8	A/B (0.5) (n = 2)
Dilo tša mpholo	Floraete	0.10	0.18	A (0)
(mg/L)	Amonia		0.001	A (0)
TLHOPHOKAKARETS tšwa go PAI)	ruhophokakaretšo ya lefelo (go šwa go PAI)		B/C (80 %)	

* E tta hlagišwa go šomišwa TEACHA ge TPC ya EC e feta goba tšhilafalo ya letswai e holofetšwe

Noka: Mokolo		Lefelo la EWR: 1A
Dimetriki tša boleng bja meetse		
	MgSO4	Phesenthaele yabo 95 ya datha e swanetše go ba ≤ 16 mg/L.
	Na2SO4	Phesenthaele yabo 95 ya datha e swanetše go ba ≤ 20 mg/L.
Matswai a a sa holend*	MgCI2	Phesenthaele yabo 95 ya datha e swanetše go ba ≤ 15 mg/L.
	CaCl2	Phesenthaele yabo 95 ya datha e swanetše go ba ≤ 21 mg/L.
	NaCI	Phesenthaele yabo 95 ya datha e swanetše go ba ≤ 45 mg/L.
	CaSO4	Phesenthaele yabo 95 ya datha e swanetše go ba ≤ 351 mg/l.
	EC	Phesenthaele yabo 95 ya datha e swanetše go ba ≤ 30 mS/m.
	Hd	Phesenthaele yabo 5 le yabo 95 ya datha e swanetše go tloga go 6.5 go va go 8.0.
	Thempheretšha	Phapogo ye nnyane go tloga go tekanyo ya tlhago ya thempheretšha.
Uphapano tsa letelo	Oksitšene ye tološitšwego	e Phesenthaele yabo 5 ya datha e swanetše go ba ≥ 7.5 mg/L
	Go se bonale gabotse	Go fapafapana ka palo ye nnyane go tłoga go tekanyo go se bonale gabotse ya tłhago; go oketšega gannyanegannyane ga go elela ga dibaka tša tikologo go a amogelena
Phepo	TIN	Phesenthaele yabo 50 ya datha e swanetše go ba ≤ 0.25 mg/L.
(mg/L)	P04-P	Phesenthaele yabo 50 ya datha e swanetše go ba ≤ 0.025 mg/L. mg/L.
	Chl-a: faetoplanketone	Phesenthaele yabo 50 ya datha e swanetše go ba < 10 µg/L.**
Diphapano tša phetolo	Chl-a: perifaetone	Phesenthaele yabo 50 ya datha e swanetše go ba ≤ 52.5 mg/m2.***
-	Dilo tša mpholo	Phesenthaele yabo 95 ya datha e swanetše go ba ka gare ga Boleng bja Diabe tša Nako ye telele (CEV) bjalo ka ge go boletšwe go DVVAF (1996).
* E tla hlagišwa go šomišwa TEACHA ge TPC ya EC e feta goba Išhilafalo ya letswai e holofetšwe ** Ga go na datha va faethonlantone ve e beon e hwetšanala hakam sa takho va Di Emcondo ta	le TPC ya EC e feta goba Išhilafa t e beon e hwetšanala hakano sa t	o ya letswai e holofetšwe kolo ve. Di Ensenne te mir monur uniter et al.
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Lenaneothopho la 5.2: Di-EcoSpecs tše do amanago le datha ya go amana le popego ya khemikhale PES

*** Perifactone (21.58 mg/m2) ka kgonthe e legorong la C/D (C = 12 - 21 mg / m2 le D = 21 - 84 mg/m2; DWAF, 2008), ka gona moltwane wa ka godimo wa C/D o htatošitšwe bjalo ka EcoSpec bakeng sa PES.

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NOKA	Noka ya Mokolo		Mafeio la go Lekola Boleng bja Meetse	eng bja Meetse
WQSU	4		RC	A4H002Q01, '77 - '79, n = 68
LEFELO LA EWR	8		PES	A4H002Q01, '02-'07 (ka ntiha ya 1 go 2007), n = 48 (eupša 37 go F le SO4)
Tekolo ya potego		Potego ka go tekolo e datha ya dilo tša mp diphetolo go lenaneot	e magareng, bjalo ka DO e holo. Datha go tšwa go A lhopho la PAI – kudukudu	Potego ka go tekolo e magareng, bjalo ka DO e nnyane, temp., go se bonale gabotse goba datha ya dilo tša mpholo. Datha go tšwa go A4H002Q01 e šomišetšwa EWR 1A le B, ka diphetolo go lenaneotlhopho la PAI – kudukudu e theilwe go ditaetši tša lefelo.
Dikarolo tša Boleng bja Meetse	Meetse	Mohola wa RC	Mohola wa PES	Legoro (Tekanyo) / Tshwayotshwayo
	MgSO4			
-	Na2SO4			
Matswal a a sar bolooc*	MgCl2		1	TEACHA e be e ka se šomišwe gomme EC
	CaCl2			e šomišwa bjalo ka kemedi
(118) (1)	NaCI		a	
	CaSO4		1	
Phepo (ma/L)	SRP	0.011	0.0165	B (1): Legoro la go bea maemo le ile la beakanyaleswa
	TIN	0.080	0.123	A (0)
	pH (phesenthaele yabo 5 le yabo 95)	6.68 and 7.70	6.92 - 7.83	A (0)
	Thempheretšha		r	Ga go na datha, eupša go holofelwa diabe
Diphapano tša lefelo	Oksitšene ye e tološitšwego		r	tše mmalwa. Boelelameetse bo na le bosodi, ka gona B (1) ka baka la khuetšo ya kelelo yeo e sego ya lefeela – tekolo ya boleng fela
	Go se bonale gabotse (NTU)		r	Ga go na datha, eupša go holofelwa diabe tše mmalwa. B (1) – tekolo ya boleng fela
	Tshepedišo ya mohlagase (mS/m)	12.28	12.05	A (0)
Diphapano tša phetolo	Chl-a: perifaetone		Lefelo la 3 la WQ (Dwars): 19.04 (SD ya godimo)	C (2) (n=1)

NOKA	Noka ya Mokolo		Mafelo la go Lekola Boleng bja Meetse	bleng bja Meetse
WQSU	4		RC	A4H002Q01, '77 - '79, n = 68
LEFELO LA EWR	18		PES	A4H002Q01, '02-'07 (ka ntlha ya 1 go 2007), n = 48 (eupša 37 go F le SO4)
Tekolo ya potego		Potego ka go tekolo datha ya dilo tša m diphetolo go lenaneo	e magareng, bjalo ka DO o pholo. Datha go tšwa go <i>l</i> othopho la PAI – kudukudu	Potego ka go tekolo e magareng, bjalo ka DO e nnyane, temp., go se bonale gabotse goba datha ya dilo tša mpholo. Datha go tšwa go A4H002Q01 e šomišetšwa EWR 1A le B, ka diphetolo go lenaneothopho la PAI – kudukudu e theitwe go ditaetši tša lefelo.
Dikarolo tša Boleng bja Meetse	a Meetse	Mohola wa RC	Mohola wa PES	Legoro (Tekanyo) / Tshwayotshwayo
	Chl-a: faetoplanketone			
	Sebopego sa setšhaba sa diphedi: ntlha va dihlokamekokotlo tša krolo		SASS: 130 ASPT: 5.4 (Jan '08)	
	(ASPT)		SASS: 188 ASPT: 6.1 (June '08)	B/C
	Hlapi		72.4	0
	Ditocothomo		EWR 1B: SPI = 18.8	A (0) (n=1)
			Lefelo la 3 la WQ B (1) (n=2) (Dwars): 15.9	B (1) (n=2)
Dilo tša mpholo	Floraete	0.10	0.18	A (0)
(mg/L)	Amonia		0.001	A (0)
TLHOPHOKAKARETŠ	TLHOPHOKAKARETŠO YA LEFELO (go tšwa go PAI)		B/C (80.8%)	

E tla hlagišwa go šomišwa TEACHA ge TPC ya EC e feta goba tšhilafalo ya letswai e holofetšwe

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8 CEV bjalo ka ge go boletšwe go Go fapafapana ka palo ye nnyane go tloga go tekanyo go se bonale gabotse ya tlhago; oketšega gannyanegannyane ga go elela ga dibaka tša tikologo go a amogelega. Phesenthaele yabo 5 le yabo 95 ya datha e swanetše go tloga go 6.5 go ya go 8.0. Lefelo la tihokomelo: A4H002Q01 mg/L. Phapogo ye nnyane go tloga go tekanyo ya tlhago ya thempheretšha. Phesenthaele yabo 50 ya datha e swanetše go ba \leq 0.025 mg/L. Phesenthaele yabo 95 ya datha e swanetše go ba ka gare ga Phesenthaele yabo 50 ya datha e swanetše go ba < 10 µg/L.**. Phesenthaele yabo 50 ya datha e swanetše go ba ≤ 21 mg/m2. Phesenthaele yabo 95 ya datha e swanetše go ba ≤ 30 mS/m. Phesenthaele yabo 50 ya datha e swanetše go ba ≤ 0.25 mg/L Phesenthaele yabo 95 ya datha e swanetše go ba ≤ 351 mg/L Phesenthaele yabo 95 ya datha e swanetše go ba ≤ 16 mg/L. Phesenthaele yabo 95 ya datha e swanetše go ba ≤ 45 mg/L. Phesenthaele yabo 95 ya datha e swanetše go ba ≤ 20 mg/l.. Phesenthaele yabo 95 ya datha e swanetše go ba ≤ 15 mg/L. Phesenthaele yabo 95 ya datha e swanetše go ba ≤ 21 mg/L. ^e Phesenthaele yabo 5 ya datha e swanetše go ba ≥ 7.0 mg/L -efelo la EWR: 1B * E tla hlagišwa go šomiśwa TEACHA ge TPC ya EC e feta goba tšhilafalo ya letswai e holofetšwe ECOSPEC: PES DWAF (1996) Chl-a: faetoplanketone Go se bonale gabotse Š Chl-a: perifaetone [hempheretšha Dilo tša mpholo ološitšwego Oksitšene **Va2SO4** MgSO4 CaSO4 MgCl2 P04-P CaCl2 NaCI NIL <u>с</u> 님 Dimetriki tša boleng bja meetse Matswai a a sa boleng* Diphapano tša phetolo Diphapano tša lefelo Voka: Mokolo (mg/L) Phepo (mg/L)

Lenaneotlhopho la 5.4: Di-EcoSpecs tše do amanago le datha ya go amana le popego ya khemikhale PES

** Ga go na datha ya faethoplantone ye e bego e hwetšagala bakeng sa tekolo ye. Di-EcoSpecs ka moka le di-TPC di hloka netefatšo ka ge mehuta e ithekgile ka kahlolo ya ditsebi.

Lenaneolthopho la 5.5: Magoro a PES le tekolo ya setsha ka kakaretšo ya EWR 1B Nokeng ya Mokolo- WQSU4

NOKA	Noka ya Mokolo		Mafelo la go Lekola Boleng bia Meetse	pleng bia Meetse
WQSU	4		RC	A4H005C01, '77 - '80, n = 85 (eupša 163 bakeng sa EC)
LEFELO LA EWR	2		PES	A4H005Q01, '98 - '01, n = 39 (eupša 47 bakeng sa TIN)
Tekolo ya potego		Potego ka go tekolo dilo tša mpholo, le hlagiša datha ya mr	Potego ka go tekolo e fase. DO ye nnyane, temp., go se bonale gabotse dilo tša mpholo, le ge e le gore seelaboleng bja meetse se kgauswi le i hlagiša datha ya mmušo go fihlela ka 1996.	Potego ka go tekolo e fase. DO ye nnyane, temp., go se bonale gabotse goba datha ya dilo tša mpholo, le ge e le gore seelaboleng bja meetse se kgauswi le lefelo la EWR, hlagiša datha ya mmušo go fihlela ka 1996.
Dikarolo tša Boleng bja Meetse	I Meetse	Mohola wa RC	Mohola wa PES	Leooro (Tekanvo) / Tshwavotshwavo
	MgSO4		1	
	Na2SO4			
Indiswal a sa Colto	MgCl2			A e be e ka se
(mails	CaCl2			gomme EC e šomišwa bjalo ka
	NaCi		7	Kemeal
	CaSO4			
Phepo (mg/L)	SRP	0.011	0.0059	A (0): Legoro la go bea maemo le ile la beakanyaleswa- Datha ya RC e
	TIN	0.06	0.02	A (0). Datha va RC e fanane kudu
	pH (phesenthaele yabo 5 le yabo 95)	6.00 le 7.25	7.46 - 7.87	A (0): Legoro la go bea maemo le ile la beakanvaleswabakeno sa legoro la A
	Thempheretšha		1	Ga go na datha, eupša go holofelwa
				diabe tše mmalwa. Thempheretšha ye
Diphapano tša lefelo	Oksitšene ye e tološitšwego			nngwe le go fetofetoga ga maemo ga DO go ka diragala dikelelong tša fase - B (1) - tekolo va boleno fela
	Go se bonale gabotse (NTU)		1	Ga go na datha, eupša go holofelwa diabe tše mmalwa. A/B (0.5) – tekolo va boleng fela
	Tshepedišo ya mohlagase (mS/m)	9.09	9.4	A (0)

NOKA	Noka ya Mokolo		Mafelo la go Lekola Boleng bia Meetse	and bia Meetse
MQSU	4		RC	A4H005Q01, '77 - '80, n = 85 (eupša 163 bakeng sa EC)
LEFELO LA EWR	2		PES	A4H005Q01, '98 - '01, n = 39 (eupša 47 bakeng sa TIN)
Tekolo ya potego		Potego ka go tekolo e fase. DO ye nnyane, dilo tša mpholo, le ge e le gore seelabole hlagiša datha ya mmušo go fihlela ka 1996.	ase. DO ye nnyane, temp e gore seelaboleng bji b go fihlela ka 1996.	Potego ka go tekolo e fase. DO ye nnyane, temp., go se bonale gabotse goba datha ya dilo tša mpholo, le ge e le gore seelaboleng bja meetse se kgauswi le tefelo la EWR, hlagiša datha ya mmušo go fihlela ka 1996.
Dikarolo tša Boleng bja Meetse	vleetse	Mohola wa RC	Mohola wa PES	Legoro (Tekanvo) / Tshwavotshwavo
	Chl-a: perifaetone		EWR 2: 25.54 Lefelo la 4 la WQ:18.68 (SD ya godimo)	D (3) (n=1). SD e godimo ka makga a mararo C (2) (n=1)
	Chi-a: faetoplanketone			
Diphapano tša phetolo	Sebopego sa setšhaba sa diphedi: ntlha ya dihlokamekokotlo tše kgolo (ASPT)		Jan '08: SASS – 82; ASPT - 5.1 Matšhe '08: SASS - 126: ASPT - 6.6	U
	Hlapi		65.1	0
	Ditaeathomo		EWR 2: SPI=16.1 Lefelo la 3 la WQ: 18.8	B (1) (n=2) A (n) (n=1)
Dito tša mpholo	Floraete	0.19	0.15	A (0)
(mg/L)	Amonia		0.002	A (0)
TLHOPHOKAKARETŠO	TLHOPHOKAKARETŠO YA LEFELO (go tšwa go PAI)		B (84.2)	

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Dimetriki tša boleng bja meetse MgSO4 Matswai a a sa boleng* (mg/L)	PA	
	PA -	ECOSPEC: PES
ai a sa boleng*		Phesenthaele yabo 95 ya datha e swanetše go ba ≤ 16 mg/L.
ai a sa boleng*	04	Phesenthaele yabo 95 ya datha e swanetše go ba ≤ 20 mg/L.
	0	Phesenthaele yabo 95 ya datha e swanetše go ba ≤ 15 mg/L.
NaCI	~	Phesenthaele yabo 95 ya datha e swanetše go ba ≤ 21 mg/l
		Phesenthaele yabo 95 ya datha e swanetše go ba ≤ 45 mg/L.
CaSO4	4	Phesenthaele yabo 95 ya datha e swanetše go ba ≤ 351 mg/L.
EC		Phesenthaele yabo 95 ya datha e swanetše go ba ≤ 30 mS/m.
На		Phesenthaele yabo 5 le yabo 95 ya datha e swanetše go tloga go 6.5 go ya go 8.0.
Themph	pheretšha	Phapogo ye nnyane go tłoga go tekanyo ya tłhago ya thempheretšha.
Diphapano tša lefelo tološitšwe	le ye ego	e Phesenthaele yabo 5 ya datha e swanetše go ba ≥ 7mg/L.
Go se	Go se bonale gabotse	Go fapafapana ka palo ye nnyane go tloga go tekanyo go se bonale gabotse ya tlhago; go oketšega gannyanegannyane ga go elela ga dibaka tša tikologo go a amogelega.
Phepo		Phesenthaele yabo 50 ya datha e swanetše go ba ≤ 0.25 mg/L.
(mg/L) PO4-P	n	Phesenthaele yabo 50 ya datha e swanetše go ba ≤ 0.015 mg/L.
Chl-a: fa	faetoplanketone	Phesenthaele yabo 50 ya datha e swanetše go ba < 10 µg/L.**
Dinhanano tša nhetolo	Chl-a: perifactone	Phesenthaele yabo 50 ya datha e swanetše go ba ≤ 52.5 mg/m2. ***
Dilo tša	ia mpholo	Phesenthaele yabo 95 ya datha e swanetše go ba ka gare ga TWQR bjalo ka ge go boletšwe go DWAF (1996).

Lenaneotlhopho la 5.6: Di-EcoSpecs tše di amanago le datha ya go amana le popego ya khemikhale PES

E tla hlagišwa go šomišwa TEACHA ge TPC ya EC e feta goba tšhilafalo ya letswai e holofetšwe

** Ga go na datha ya faethoplantone ye e bego e hwetšagala bakeng sa tekolo ye. Di-EcoSpecs ka moka le di-TPC di hloka netefatšo bjalo ka ge go ithekgilwe ka kahlolo ya ditsebi.

*** Perifaetone (25.54 mg/m2) ka kgonthe e legorong la C/D (C = 12 - 21 le D = 21 - 84 mg/m2, DV/AF 2008), ka gona mo@wane wa ka godimo wa C/D o hlalošitšwe bjalo ka EcoSpec bakeng sa PES.

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NOKA	Noka ya Mokolo		Mafelo la go Lekola Boleng bja Meetse	ija Meetse
WQSU	5		RC	A4H007Q01, '77 - '80, n = 82
LEFELO LA EWR	n		РЕС	A4H010Q01, '92 - '96, n = 27 (eupša 19 bakeng sa temp. le 6 bakeng sa NH3)
Tekolo ya potego		Potego ka go tekolo e magareng, bji tša mpholo e a hwetšagala. Le ge e datha ya mmušo go fihlela ka 1996 (Maemo a swanago a EcoRegion II).	ng, bjalo ka DO e nnyane, temp. s ge e le gore seelaboleng bja m(1 1996. Datha ya RC e tšerwe go ion II).	Potego ka go tekolo e magareng, bjalo ka DO e nnyane, temp., go se bonale gabotse goba datha ya dilo tša mpholo e a hwetšagala. Le ge e le gore seelaboleng bja meetse se kgauswi le lefelo la EWR, hlagiša datha ya mmušo go fihlela ka 1996. Datha ya RC e tšerwe go tšwa go A4H007Q01 nokeng ya Tambotie (Maemo a swanago a EcoRegion II).
Dikarolo tša Boleng bja Meetse	Meetse	Mohola wa RC	Mohola wa PES	Legoro (Tekanyo) / Tshwayotshwayo
	MgSO4			
	Na2SO4		1	
Matswal a a sa	MgCl2			TEACHA e be e ka se šomišwe gomme
	CaCl2		1	EC e šomišwa bjalo ka kemedi
	NaCI			
	CaSO4			
Phepo	SRP	0.007	0.015	A (0): Legoro la go bea maemo le ile la beakanyaleswa – Datha e fapane kudu
(mg/L)	TIN	0.065	0.067	A (0). Datha e fapane kudu
	pH (phesenthaele yabo 5 le yabo 95)	5.14 le 6.70	7.2 le 7.76	B (1): Datha ya RC datha ya 5.14 (phesenthaele yabo 5) le 6.7 (phesenthaele yabo 95) - tshepagalo?
	Thempheretšha (phesenthaele yabo 10 ie yabo 90)		12 – 25	Datha ye nnyane, eupša lefelo la fase letamong la Mokolo (le ge o tšea maemo a mantši, mohlomongwe go lokollwa ka
Diphapano tša lefelo	Oksitšene ye e tološitšwego		1	fase ka lebaka la kelelo ya fase ka letamong), ka gona letamo le ama thempheretšha mohlomong gomme DO e a holofelwa. C (2)
	Go se bonale gabotse (NTU)		1	Ga go na datha, eupša go holofelwa diabe tše mmalwa. A/B (0.5) – tekolo ya boleng fela

WQSU 5 LEFELO LA EWR 3 Tekolo ya potego 3 Dikarolo tša Boleng bja Meetse mohagase (mS/m) Dikarolo tša Boleng bja Meetse Chl-a: fraetoplanketone	Pl Potego ka go tekolo e magareng, bj tša mpholo e a fwetšagala. Le ge e datha ya mmušo go fihlela ka 1996 (Maemo a swanago a EcoRegion II).	RC A4H0070 A4H0100 PES bakend s	A4H007Q01, '77 - '80, n = 82
pedišo agase (mS/m) : perifaetone : faetoplanketone	Potego ka go tekolo e magar tša mpholo e a hwetšagala. L datha ya mmušo go fihlela k (Maemo a swanago a EcoRe,	PES	
pedišo agase (mS/m) : perifaetone : faetoplanketone	Potego ka go tekolo e magar tša mpholo e a hwetšagala. L datha ya mmušo go fihlela k (Maemo a swanago a EcoRe,		bakeng sa temp. Ie 6 bakeng sa NH3)
pedišo agase (mS/m) : perifaetone : faetoplanketone		eng, bjalo ka DO e nnyane, temp e ge e le gore seelaboleng bja rr a 1996. Datha ya RC e tšerwe gr jion II).	Potego ka go tekolo e magareng, bjalo ka DO e nnyane, temp., go se bonale gabotse goba datha ya dilo tša mpholo e a hwetšagala. Le ge e le gore seelaboleng bja meetse se kgauswi le lefelo la EWR, hlagiša datha ya mmušo go fihlela ka 1996. Datha ya RC e tšerwe go tšwa go A4H007Q01 nokeng ya Tambotie (Maemo a swanago a EcoRegion II).
T shepedišo y mohlagase (mS/m) Chl-a: perifaetone Chl-a: faetoplanketone Sahonoon sa satšhab	Mohola wa RC	Mohola wa PES	Legoro (Tekanyo) / Tshwayotshwayo
Chl-a: perifactone Chl-a: factoplanketone Sahoneon sa satéhab	ya 15 and 24	10.87	A (0)
Chi-a: faetoplanketone Sehnano, sa saréhab		17.28	C (2) (n=1)
Sahnnann ea eatéhah			
	B	SASS:130	0
sa diphedi: ntlha y	19	ASPT: 5.0	1
	tše	SASS: 149	
KGOIO (ASPI)		ASP1: 5.7	
Phapano ya letelo Hlapi		65.8	U
		SPI=16.6 (Sept 07)	B (1) (n=3)
Ditaeathomo		(Jan 08)	A (0)
		SPI=16.4 (Mar 08)	A (0)
Dilo tša moholo Floraete	6.77	0.278	A (0)
(mg/L) Amonia	0.160	0.001	A (0)
TLHOPHOKAKARETSO YA LEFELO (go tšwa go	06	B/C (79.2)	

Noka: Mokolo		EWR: 3 Lefelo la thokomelo: A4H002Q01	
Dimetriki tša boleng bja meetse		ECOSPEC: PES	
	MgSO4	Phesenthaele yabo 95 ya datha e swanetše go ba ≤ 16 mg/L.	
	Na2SO4	Phesenthaele yabo 95 ya datha e swanetše go ba ≤ 20 mg/L.	
Matswai a a sa boleng*	MgC/2	Phesenthaele yabo 95 ya datha e swanetše go ba ≤ 15 mg/L.	
(mg/L)	CaCl2	Phesenthaele yabo 95 ya datha e swanetše go ba ≤ 21 mg/L.	
	NaCi	Phesenthaele yabo 95 ya datha e swanetše go ba ≤ 45 mg/L.	
	CaSO4	Phesenthaele yabo 95 ya datha e swanetše go ba ≤ 351 mg/L.	
	EC	Phesenthaele yabo 95 ya datha e swanetše go ba ≤ 30 mS/m.	
	Hd	Phesenthaele yabo 5 le yabo 95 ya datha e swanetše go tloga go 6.5 go ya go 8.0.	
Diphapano tša lefelo (mg/L)	Thempheretšha	Go fapana ka makga a a fetago 2 ° C, ke gore phetogo ye kgolo go peakanyo ya thempheretšha e diragala kgafetša. Mehuta ye mentši ya diphedi tše di phelago dithempheretšheng tše di lego magareng e tla ba maemong a fase le bokgafetšakgafetšo bja tiragalo go feta ka moo go bego go holofetšwe bakeng sa tšhupetšo. Ditshekatsheko tša payolotši ka gona di ile tša digelwa le go thoma tlhahlobo ya mathomo bakeng sa phapano ye ge Memo a II goba a godimo a DSS	pheretšha e diragala o magareng e tla ba olofetšwe bakeng sa iahlobo ya mathomo
	Oksitšene ye tološitšwego	e Phesenthaele yabo 5 ya datha e swanetše go ba ≥ 6 mg/L.	
	Go se bonale gabotse	Go fapafapana ka palo ye nnyane go tloga go tekanyo go se bonale gabotse ya tlhago; go oketšega gannyanegannyane ga go elela ga dibaka tša tikologo go a amogelega.	tlhago; go oketšega
Dhomo	TIN	Phesenthaele yabo 50 ya datha e swanetše go ba ≤ 0.25 mg/L.	
Liebo	PO4-P	Phesenthaele yabo 50 ya datha e swanetše go ba ≤ 0.015 mg/L.	
	Chl-a: faetoplanketone	Phesenthaele yabo 50 ya datha e swanetše go ba < 10 µg/L.**	
Diphanano tša phetolo	Chl-a: perifactone	Phesenthaele yabo 50 ya datha e swanetše go ba ≤ 21 mg/m2.	
	Dilo tša mpholo	Phesenthaele yabo 95 ya datha e swanetše go ba ka gare ga TWQR bjalo ka ge go boletšwe go DWAF (1996).	boletšwe go DWAF
* E tla hlagišwa go šomišwa TEACHA ge TPC ya		EC e feta goba t	

Lenaneotlhopho la 5.8: Di-EcoSpecs tše do amanago le datha ya go amana le popego ya khemikhale PES

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** Ga go na datha ya faethoplantone ye e bego e hwetsagala bakeng sa tekolo ye. Di-EcoSpecs ka moka le di-TPC di hloka netefatso bjalo ka ge go ithekgiwe ka kahlolo ya ditsebi.

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WOSU 5 RC AHH007001, 17, -90, n = 82 LEFELO LA EWR 4 PES AHH010001, 12, 2, 96, n = 82 LEFELO LA EWR 4 PES AHH010001, 12, 2, 96, n = 82 Tektolo ya polego a AHH010001, 12, 2, 96, n = 82 AHH010001, 12, 2, 96, n = 82 Tektolo ya polego a AHH010001, 12, 2, 96, n = 82 AHH010001, 12, 2, 96, n = 82 Tektolo ya polego a AHH010001, 12, 2, 96, n = 82 AHH010001, 12, 2, 96, n = 82 Tektolo ya polego a AHH010001, 12, 2, 96, n = 82 AHH010001, 12, 2, 96, n = 82 Tektolo ya polego a AHH010001, 12, 14, adolo a magreng as takelo a takelo	NOKA	Noka ya Mokolo		Mafelo la go Lekola Boleng bja Meetse	oleng bja Meetse
VR 4 PES Portego ka Portego ka go tekolo e magareng, bjalo ka DO e n datha ya dilo tša mpholo e a hwetšagala. Datha o si e 4, ka diphetolog go lemaneothropho la PAL-I khuetšo ya nokakeledi ya Poer-se-loop yeo e ga ditsha tše pedi. Datha ya bjale ya muusio go fili A4H007Q01 Nokeng ya Tambotie (maemo a swar RupeSO4 Ieng bja Meetse Mohola wa RC Mohola wa PES MgSO4 Portego ha rokakeledi ya Tambotie (maemo a swar A2SO4 Portego ha rokakeledi ya Tambotie (maemo a swar ditsha tše pedi. Datha ya bjale ya muusio go fili A4H007Q01 Nokeng ya Tambotie (maemo a swar CooRegion II). Ieng bja Meetse Mohola wa RC Mohola wa PES MgSO4 Portego ka RC Mohola wa PES MgSO4 Dortego ka RC Mohola wa PES Macci Dortego ka RC Mohola wa PES Macci Dortego ka RC Mohola wa PES Macci Dortego ka RC Dortego ka Macci Dortego ka Dortego ka Macci Dortego ka Dortego ka Macci Dortego ka Dortego ka Macci Dortego ka <td>WQSU</td> <td>ŝ</td> <td></td> <td>RC</td> <td>A4H007Q01, '77 - '80, n = 82</td>	WQSU	ŝ		RC	A4H007Q01, '77 - '80, n = 82
Minetic Solution Portego ka go tekolo e magareng, bjalo ka DO e n datha ya dilo tša mpholo e a hwetšagala. Datha go 3 e 4, ka dipretolo go tenaneothopho la PAI – I khuetšo ya nokateledi ya Poer-se-dropy yeo e ga ditsha tše pedi. Datha ya bjale ya mrušio go fili A4H007Q1 Nukeng ya Tambotia (maemo a swart EcoRegion II). Ieng bja Mohola wa RC Mohola wa PES MgSO4 – – MgCI2 – – CaCl2 0.007 0.015 NaCl – – CaSO4 0.007 0.055 IN – – CaSO4 0.007 0.057 PHempheretisha – – CaSO4 0.007 0.057 DHompheretisha – – CasO4 0.007 0.057 DHompheretisha – – Okstitisene ye e tolositišwego	LEFELO LA EWR	4		PES	A4H010Q01, '92 - '96, n = 27 (eupša 19 bakeng sa temp. le 6 bakeng sa NH3)
Interset Mohola wa RC Mohola wa PES MgSO4 - - Na2SO4 - - MgCI2 - - NaCi - - CaCI2 NaCi - NaCi - - CaSO4 0.007 0.067 SRP 0.007 0.067 TIN 0.065 0.067 PH (phesenthaele yabo 5 le yabo 95) 5.14 le 6.70 7.2 - 7.76 Ph (phesenthaele yabo 5 le yabo 95) 5.14 le 6.70 7.2 - 7.76 Oksitšene ye e tološitšwego - - - Go se bonale gabotse (NTU) - - -	Tekolo ya potego		Potego ka go tekolo e datha ya dilo tša mph 3 le 4, ka diphetoolo khuetšo ya nokakele dítsha tše pedi. Dath A4H007Q01 Nokeng EcoRegion II).	e magareng, bjalo ka DO olo e a hwetšagala. Dath go lenaneothopho la PAI ii ya Poer-se-loop yeo e a ya bjale ya mmušo go ya Tambotie (maemo a s	e nnyane, temp., go se bonale gabotse goba a go tšwa go A4H.002.001 e šomišetšwa EWR – kudukudu e theilwe go ditaetši tša lefelo le gahlanago le Noka ya Mokolo magareng ga fihlela 1996 le datha ya RC ye e tšwago go wanago a EcoRegion ya maemo a swanago a
MgSO4 - - Na2SO4 - - Na2SO4 - - MgCI2 - - MgCI2 - - MgCI2 - - CaCl2 - - NaCi - - CaCl2 - - NaCi - - CaSO4 0.007 0.015 SRP 0.007 0.067 FIN 0.065 0.067 PH (phesenthaele yabo 5 le yabo 95) 5.14 le 6.70 7.2 - 7.76 Thempheretšha - - Oksitšene ye tološitšwego - - Go se bonale gabotse (NTU) - -	Dikarolo tša Boleng bja	Meetse	Mohola wa RC	Mohola wa PES	Legoro (Tekanyo) / Tshwayotshwayo
Na2SO4 - - MgC12 - - CaCl2 - - CaCl2 - - NaCl - - CaSO4 0.007 0.015 SRP 0.007 0.015 FIN 0.065 0.067 PH (phesenthaele yabo 5 le yabo 95) 5.14 le 6.70 7.2 - 7.76 Thempheretšha - - Oksitšene ye e tološitšwego - - Go se bonale gabotse (NTU) - -		MgSO4		-	•
MgCl2 - - CaCl2 Nacl - - Nacl Nacl - - CaSO4 0.007 0.015 - SRP 0.007 0.065 0.067 - TIN 0.065 0.067 0.067 - PH (phesenthaele yabo 5 le yabo 95) 5.14 le 6.70 7.2 - 7.76 - Thempheretšha - - - - Go se bonale gabotse (NTU) - - - -		Na2SO4			
CaCl2 - - NaCl - - NaCl - - NaCl - - SRP 0.007 0.015 TIN 0.065 0.067 PH (phesenthaele yabo 5 le yabo 95) 5.14 le 6.70 7.2 - 7.76 Thempheretšha - - Oksitšene ye tološitšwego - - Go se bonale gabotse (NTU) - -	IVIATSWAI A A SA	MgCI2		1	TEACHA e be e ka se šomišwe nomme
NaCi - - CaSO4 0.007 0.015 SRP 0.007 0.067 IN 0.065 0.067 PH (phesenthaele yabo 5 le yabo 95) 5.14 le 6.70 7.2 - 7.76 Thempheretšha - - Oksitšene ye tološitšwego - - Go se bonale gabotse (NTU) - -	poleng	CaCl2		1	EC e šomišwa bialo ka kemedi
CaSO4 - SRP 0.007 0.015 TIN 0.065 0.067 0.067 PH (phesenthaele yabo 5 le yabo 95) 5.14 le 6.70 7.2 - 7.76 Thempheretšha - - - Oksitšene ye tološitšwego - - - Go se bonale gabotse (NTU) - - -	(111) (111)	NaC		1	
SRP 0.007 0.015 TIN 0.065 0.067 0.067 PH (phesenthaele yabo 5 le yabo 95) 5.14 le 6.70 7.2 - 7.76 Thempheretšha - - - Oksitšene ye tološitšwego - - - Go se bonale gabotse (NTU) - - -		CaSO4			
TIN0.0650.067PH (phesenthaele yabo 5 ie yabo 95)5.14 ie 6.707.2 - 7.76ThempheretšhaOksitšene ye e tološitšwegoGo se bonale gabotse (NTU)	Phepo	SRP	0.007	0.015	A (0): Legoro la go bea maemo le ile la beakanyaleswa - Datha e fapane kudu
pH (phesenthaele yabo 5 le yabo 95) 5.14 le 6.70 7.2 - 7.76 Thempheretšha - - Oksitšene ye e tološitšwego - - Go se bonale gabotse (NTU) - -	(mg/L)	TIN	0.065	0.067	A (0). Datha e fapane kudu
Thempheretšha - Oksitšene ye e tološitšwego - Go se bonale gabotse (NTU) -		pH (phesenthaele yabo 5 le yabo 95)	5.14 le 6.70	7.2 - 7.76	
Oksitšene ye e tološitšwego Go se bonale gabotse (NTU)		Thempheretšha		1	Ga go na datha, ga go diabe tše di
J	Diphapano tša lefelo	Oksitšene ye e tološitšwego			. Thempheretšha ye nnyane ga ga maemo ga DO go kelelong tša fase - tekolo
		Go se bonale gabotse (NTU)		1	Ga go na datha, eupša go holofelwa diabe tše mmalwa le noka ka kakaretšo di sekile A (0) – tekolo va boleng fela

NOKA	Noka ya Mokolo		Mafelo la go Lekola Boleng bja Meetse	eng bja Meetse
WQSU	ß		RC	A4H007Q01, '77 - '80, n = 82
LEFELO LA EWR	4		PES	A4H010001, '92 - '96, n = 27 (eupša 19 bakeng sa temp. le 6 bakeng sa NH3)
Tekolo ya potego		Potego ka go tekolo datha ya dilo tša mp 3 le 4, ka diphetoolo khuetšo ya nokakel ditsha tše pedi. Dat A4H007Q01 Nokeng EcoRegion II).	e magareng, bjalo ka DO e holo e a hwetšagala. Datha o go lenaneotlhopho la PAI - edi ya Poer-se-loop yeo e ha ya bjale ya mmušo go fi ya Tambotie (maemo a sw	Potego ka go tekolo e magareng, bjalo ka DO e nnyane, temp., go se bonale gabotse goba datha ya dilo tša mpholo e a hwetšagala. Datha go tšwa go A4H002Q01 e šomišetšwa EWR 3 le 4, ka diphetoolo go lenaneothhopho la PAI – kudukudu e theilwe go ditaetši tša lefelo le khuetšo ya nokakeledi ya Poer-se-loop yeo e gahlanago le Noka ya Mokolo magareng ga ditsha tše pedi. Datha ya bjale ya mmušo go fihlela 1996 le datha ya RC ye e tšwago go A4H007Q01 Nokeng ya Tambotie (maemo a swanago a EcoRegion ya maemo a swanago a EcoRegion II).
Dikarolo tša Boleng bja Meetse	Meetse	Mohola wa RC	Mohola wa PES	Legoro (Tekanyo) / Tshwayotshwayo
	Tshepedišo ya mohlagase (mS/m)	15 and 24	10.87	A (0)
	Chl-a: perifactone		I	
	Chl-a: faetoplanketone		L	
Phapano ya lefelo	Sebopego sa setšhaba sa diphedi: ntha ya dihlokamekokotto tše kgolo (ASPT)		SASS: 126 ASPT: 4.8	U
	Hlapi		63.73	O
	Ditaeathomo		Sept '07: SPI=17.8 Matšhe '08: SPI=17.4	A (0) (n=2)
Dito tša mpholo	Floraete	6.77	0.278	A (0)
(mg/L)	Amonia	0.160	0.001	A (0)
TLHOPHOKAKARETŠ	TLHOPHOKAKARETŠO YA LEFELO (go tšwa go PAI)		B (86.8)	

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Dimetriki tša boleng bja meetse ECOSPEC: PES MgSO4 Phesenthaele yabo 95 ya datha e swaneti Na2SO4 Phesenthaele yabo 95 ya datha e swaneti Na2SO4 Matswai a a sa boleng* MgCI2 Phesenthaele yabo 95 ya datha e swaneti NaCl Matswai a a sa boleng* MgCI2 Phesenthaele yabo 95 ya datha e swaneti NaCl Matswai a sa boleng* MgCI2 Phesenthaele yabo 95 ya datha e swaneti NaCl Matswai a sa boleng* MgCI2 Phesenthaele yabo 95 ya datha e swaneti NaCl Diphapano tša lefelo Phesenthaele yabo 95 ya datha e swaneti NaCl Phesenthaele yabo 95 ya datha e swaneti NaCl Diphapano tša lefelo Phesenthaele yabo 95 ya datha e swaneti NaCl Phesenthaele yabo 95 ya datha e swaneti NaCl Diphapano tša lefelo Phesenthaele yabo 55 le yabo 95 ya datha e swaneti Nacl Phesenthaele yabo 5 le yabo 95 ya datha e swaneti Phesenthaele yabo 5 ya datha e swaneti Diphapano tša lefelo Diphapano tša lefelo TiN Phesenthaele yabo 5 ya datha e swaneti Diphapano tša phetolo Co se bonale gabotse Phesenthaele yabo 50 ya datha e swaneti Diphapano tša phetolo Diphapano tša phetolo TIN Phesenthaele yabo 50 ya datha e swaneti Diphapano tša phetolo Diphapano tša phetolo Phesenthaele yabo 50 ya datha e swaneti Diphapano tša phetolo	EWR: 4 Lefelo la tihokomelo: A4H002001
Index MgSO4 Na2SO4 Na2SO4 Na2SO4 MgCI2 CaCl2 NaCI CaCl2 NaCI CaSO4 CaCl2 NaCI CaSO4 CaSO4 CaSO4 Anotic Conservertic Anotic Chi-a: facetoplanketone Anotic Chi-a: perifacetone Diol táa mpholo Dilo táa mpholo	
ai a a sa boleng* MgCl2 CaCl2 NaCl CaSO4 EC PH PH DH CaSO4 EC PH P	Phesenthaele yabo 95 ya datha e swanetše go ba ≤ 16 mg/L.
ii a a sa boleng* MgCI2 CaCI2 NaCI CaSO4 EC PH PH PH PH PH PH PH PH PH PH	Phesenthaele yabo 95 ya datha e swanetše go ba ≤ 20 mg/L.
CaCl2 NaCl NaCl CaSO4 CaSO4 EC pH Thempheretšha Oksitšene ye e tološitšwego Go se bonale gabotse TIN PO4-P chl-a: faetoplanketone ano tša phetolo Dilo tša mpholo	Phesenthaele yabo 95 ya datha e swanetše go ba ≤ 15 mg/L.
Nacl CasO4 CasO4 EC PH Thempheretšha Oksitšene ye e tološitšwego Go se bonale gabotse TIN PO4-P ano tša phetolo Dilo tša mpholo	Phesenthaele yabo 95 ya datha e swanetše go ba ≤ 21 mg/L.
ano tša lefelo EC PH EC PH Thempheretšha Oksitšene ye e tološitšwego Go se bonale gabotse TIN PO4-P PO4-P ano tša phetolo Dilo tša mpholo	Phesenthaele yabo 95 ya datha e swanetše go ba ≤ 45 mg/L.
ano tša lefelo PH Thempheretšha Oksitšene ye e tološitšwego Go se bonale gabotse TIN PO4-P PO4-P Chl-a: faetoplanketone Chl-a: perifaetone Dilo tša mpholo	Phesenthaele yabo 95 ya datha e swanetše go ba ≤ 351 mg/l
ano tša lefelo Thempheretšha Oksitšene ye e tološitšwego Go se bonale gabotse TIN PO4-P PO4-P ano tša phetolo Dilo tša mpholo	Phesenthaele yabo 95 ya datha e swanetše go ba ≤ 30 mS/m.
ano tša lefelo Dksitšene ye e tološitšwego Go se bonale gabotse TIN PO4-P PO4-P ano tša phetolo Dilo tša mpholo	Phesenthaele yabo 5 le yabo 95 ya datha e swanetše go tloga go 6.5 go ya go 8.0.
Oksitšene ye e tološitšwego Go se bonale gabotse TIN PO4-P PO4-P Chl-a: faetoplanketone ano tša phetolo Dilo tša mpholo	Phapogo ye nnyane go tloga go tekanyo ya tlhago ya thempheretšha. Mehuta ye emngwe ya diphedi tše di phelago dithepheretšheng tše di lego godimo kudu e tla ba maemong a fase le bokgafetšakgafetšo bja tiragalo go feta ka moo go bego go holofetšwe bakeng sa tšhupetšo.
Go se bonale gabotse TIN PO4-P PO4-P Chl-a: faetoplanketone ano tša phetolo Dilo tša mpholo	Phesenthaele yabo 5 ya datha e swanetše go ba ≥ 7mg/L.
TIN PO4-P Chl-a: faetoplanketone Chl-a: perifaetone Dilo tša mpholo	Ga go na dingongorego tse tsebagalago mabapi le go se bonale gabotse; liphetogo tša go se bonale gabotse di bonagala e le tša tlhago
PO4-P Chl-a: faetoplanketone Chl-a: perifaetone Dilo tša mpholo	Phesenthaele yabo 50 ya datha e swanetše go ba ≤ 0.25 mg/L.
Chl-a: faetoplanketone Chl-a: perifaetone Dilo tša mpholo	Phesenthaele yabo 50 ya datha e swanetše go ba ≤ 0.015 mg/L.
Chl-a: perifaetone Dilo tša mpholo	Phesenthaele yabo 50 ya datha e swanetše go ba < 10 µg/L.**
Dilo tša mpholo	Phesenthaele yabo 50 ya datha e swanetše go ba ≤ 21 mg/m2.
	Khuetšo e holofelwa ge e le gore phesenthaele yabo 95 ya datha e feta TWOR bjało ka ge go boletšwe go DWAF (1996).

** Ga go na datha ya faethoplantone ye e bego e hwetšagala bakeng sa tekolo ye. Di-EcoSpecs ka moka le di-TPC di hloka netefatšo ka ge mehuta e ithekgile ka kahlolo ya ditsebi.

DWS 2015, tše di bontšhitšwego go lenaeotlhopo la 6.1. Palogare ya go tlatša gape ya meetse a ka fase ga mobu ya ngwaga ka ngwaga ya bokgobelameetse ka moka Karolo ya bokaakang bja meetse a ka fase ga mobu e ile ya laetšwa go šomišwa boleng bjo bjalo ka go tlatša gape, kelelo ya fase ya meetse, le tšhupane ya kgatelelo, Ха ye e hweditšwego nakong ya taetšo ya magoro a methopo ya meetse le dinepo tša boleng bja mothopo tše di amanago le bokgobelameetse bja Mokolo le Matlabas, go ya ka sete ya datha ya GRA II e lekanyetšwa go feta 16.25 Mm3/a. Ditekanyetšo tša EWR_MLF di humanwe go tšwa dinyakišišong tša Magareng tša Taetšo Tekano ya meetse ya meetse a ka fase ga mobu a boelelameetse bja Limpopo (Water Geosciences Consulting, 2011). Ditekanyetšo tša setšhaba di humanwe go kgoboketšo ya datha ya Ditirelo tša Meetse tša 2011. BHN e fana ka dinyakwa tše bohlokwa tša batho ba ba diretwago ke mothopo wa meetse wo o amegago gomme e akaretša meetse ao a nwewago, go apea dijo le boipabalelo. Go šomišitšwe palo sekgontšhi ya dilitara tše 25 ka motho ka letšatši. Mokgwa wa bjałe wa go ithuta gape o amogetše didathasete tša GRA II le WARMS 2013 go fihlelela tekanyetšo ye e lekalekanego ya tšhomišo ya meetse a ka fase ga mobu. Tšhupetšo ya kgatelelo ya meetse a ka fase ga mobu e laetša meetse a ka fase ga mobu a o a šomošitšwego kgahlanong le a go tlatša gape.

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Lenaneotlhopho la 6.1: Karolo ya Bokaakang ditsheng tša Tekano ya meetse ya Meetse a ka fase ga mobu

А														
Tshupane ya Kgatelelo	0.07	0.02	0.02	0.16	0.14	0.25	0.28	0.20	0.17	0.24	0.12	0.004	0.004	0.16
Tshomiso ya Bjale ya Meetse a ka fase ga mobu (Mm3/a)	1.22	0.15	0.25	2.76	1.79	4.56	4.47	5.51	2.93	8.10	2.66	0.13	0.09	2.12
Tekano ya meetse bjalo ka % ya Go tlatša gape	18.34	10.18	3.48	3.53	4.83	22.54	26.90	10.69	54.62	25.17	11.13	10.30	4.35	3.04
Tekano ya meetse (Mm3/a)	3.24	0.80	0.46	0.59	0.60	4.10	4.08	2.89	9.21	8.30	2.50	2.72	0.79	0.39
Tekano ya meetse ya BHN (Mm3/a)	0.06	0.05	0.07	0.05	0.07	0.03	0.03	0.06	0.02	0.12	0.02	0.02	0.16	0.03
EWR_MLF (Mm3/a)	3.18	0.75	0.39	0.54	0.53	4.07	4.05	2.83	9.19	8.18	2.48	2.70	0.63	0.36
Kelalo ya fase ya meetse (Mm3/a)	5.06	1.79	0.85	0.54	0.17	9.46	8.93	11.56	6.49	11.87	4.23	2.53	2.02	0.74
Population (Ditirelo tša meetse) 2011)	6785	5175	7749	5483	7886	3793	3443	6031	2662	13391	1958	2188	17266	2812
Go tlatša gape (Mm3/a)	17.66	7.86	13.23	16.71	12.41	18.19	15.77	27.02	16.86	32.98	22.46	26.40	18.15	12.81
Tikologo (km)	692	358	1111	1913	1940	573	522	698	497	1007	1022	1207	1057	1 812
Quat	A41A	A41B	A41C	A41D	A41E	A42A	A42B	A42C	A42D	A42E	A42F	A42G	A42H	A42J

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7.1 Kakaretšo ya karolo ya Boleng mafelong a Tekano ya meetse ya Meetse a ka fase ga mobu

Diparameta tša	Leka	A	Aowa. ya Di	Disampole	ole	Modily	Modikologo GW boleng goba molagare wa 1)	liogo GW boleng molagare wa 1)	gobà	Tekano ya	Tekano ya r	Tekano ya meetse ya 3 ya Boleng bja Meetse a ka fase ga mobu)	ya Boleng b a mobu)	a Meetse
Dikhemikale	a	A41 A	A41 B	A41 C	A41D	A41A	A41B	A41C	A41D	meetse ya BHN ya 2)	A41A	A41B	A41C	A41D
Hq		70	259	70	259	7.51	7.61	7.51	7.61	5.0 – 9.5 (±0.1)	6.76-8.26	6,85-8.37	7.85-8.26	6.85-8.37
Tshepedišo ya mohlagase	/Su E	20	259	70	259	97.50	130.00	97.50	130.00	<150	107.25	143.00	107.25	143.00
Kalasiamo bjalo ka Ca	l/gm	70	259	20	259	49.90	76.50	49.90	76.50	<150	54.89	84.15	54.89	84.15
Maknesiamo bjalo ka Mg	l/gm	20	259	20	259	37.55	52.80	37.55	52.80	<100	41.31	58.08	41.31	58.08
Sodiamo bjalo ka Na	l/gm	70	259	70	259	105.70	129.10	105.70	129.10	<200	116.27	142.01	116.27	142.01
Kloraete bjalo ka Cl	mg/l	70	259	70	259	78.30	143.10	78.30	143.10	<200	86.13	157.41	86.13	157.41
Salafaete bjalo ka SO4	mg/l	70	259	70	259	21.65	38.87	21.65	38.87	<400	23.82	42.76	23.82	42.76
Naetreite bjalo ka NOx- N	l/6m	70	259	20	259	3.90	4.53	3.90	4.53	<10	4.29	4.98	4.29	4.98
Floraete bjalo ka F	mg/l	70	259	70	259	1.28	0.85	1.28	0.85	<1.0	1.28	0.94	1.28	0.94

Lenaneotthopho la 7.1: Boleng bja meetse a ka fase ga mobu ka Bokgobelameetse bja Tatelano ya bone (A41A, A41B, A41C le A41D)

Va hone Add A Add Add 2 Add

Rotroholomosteo his Tatolona

Tshup: Quality of Domestic Water Supplies, Volume 1: Assessment Guide, 2nd Ed.1998. Water Research Commission Report No: TT 101/98. Pretoria, South Africa (Set for a Class 1).

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Moo phapano go ditekanyetšo tša boleng bja meetse bakeng sa boleng bja meetse a ka fase ga bobu a tikologo le BHN e hweditšwego, boleng bjo fase goba bjo bo šireletšago bo ile bja kgettwa bakeng sa Tekano ya meetse ya boleng bja meetse a ka fase ga mobu. Moo boleng bja meetse a ka fase ga mobu a kgethilwego bjalo ka Tekano ya meetse ya boleng bja meetse a ka fase g mobu, boleng bo ile bja oketšwa ka diphesente tše 10 ge fela boleng bo sa fete Tekano ya meetse ya BHN.

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Diparameta tia Leka Aowa ya Disampole Moditologo GW boleng goba Dikhemikale Ia A41 A42 A42 A41E A42B A41 A72O B						AVERGEN TO TO	- A - A - A - A - A - A - A - A - A - A	and the second s	ALTER MANINE MALE	ATHE D THE WALL TILL SHAT BE ANDINE I BE ACCAMERAGE	24455		
A41 A42 A42 A41E E A A A A mS/ 99 4 4 7.70 mS/ 99 4 4 7.70 mS/ 99 4 4 7.70 mS/ 99 4 4 7.50 mg/l 96 3 4 41 79.50 mg/l 96 3 4 41 47.20 mg/l 96 3 4 41 213.05 mg/l 96 3 4 41 213.05		towa. ye	a Disam	pole	Modi	kologo G molagat	logo GW boleng nolagare wa 1)	goba	Tekano ya	Tekano ya	meetse ya 3 fase	s ya 3 ya Bolang bi fase ga mobul	Tekano ya meetse ya 3 ya Boleng bja Meetse a ka fase ga mobu)
99 4 47 7.70 mS/ m 99 4 47 7.70 mS/ m 99 4 47 7.50 mg/l 96 3 4 47 163.20 mg/l 96 3 4 41 79.50 mg/l 96 3 4 41 47.20 mg/l 96 3 4 41 213.05 mg/l 97 97 4 41 213.05 mg/l 97 4 41 213.05 1 mg/l 97 4 41 76.50 1	A41 E				A41E	A42A	A42B	A42C	BHN ya 2)	A41E	A42A	A42B	A42C
ms/ m 99 4 47 163.20 mg/l 96 3 4 41 79.50 mg/l 96 3 4 41 79.50 mg/l 96 3 4 41 79.50 mg/l 96 3 4 41 27.00 mg/l 96 3 4 41 213.05 mg/l 97 4 4 280.00 mg/l 96 3 4 41 76.50	6			47	7.70	6.88	7.55	8.10	5.0-9.5 (±0.1)	6.93-8.47	6.19-7.57	6.80-8.30	7 29-8 91
mg/l 96 3 4 41 79.50 mg/l 96 3 4 41 79.50 mg/l 96 3 4 41 47.20 mg/l 96 3 4 41 213.05 mg/l 96 3 4 41 213.05 mg/l 97 4 41 213.05 1				47	163.20	14.10	23.75	33.30	<150	163.20	15.51	26.13	36.63
mg/l 96 3 4 41 47.20 41 ·mg/l 96 3 4 41 213.05 4 41 213.05 4 41 213.05 4 41 213.05 4 41 213.05 4 41 213.05 4 41 213.05 4 41 213.05 4 41 280.000 1 4 41 280.000 1 4 41 280.000 1 4 41 76.50 1 4 4 41 76.50 1 4				41	79.50	3.40	18.85	17.70	<150	87.45	3.74	20.74	19.47
mg/l 96 3 4 41 213.05 mg/l 97 4 4 280.00 1 mg/l 96 3 4 41 76.50 1				41	47.20	6.10	9.75	5.61	<100	51.92	6.71	10.73	6.17
mg/l g7 4 4 41 280.00 mg/l 96 3 4 41 76.50				41	213.05	5.60	12.30	52.50	<200	213.05	6.16	13.53	57.75
mg/l 96 3 4 41 76.50				41	280.00	14.10	7.25	11.00	<200	280.00	15.51	7.98	12 10
				41	76.50	10.20	8.60	7.78	<400	84.15	11 22	946	8 55
Naetreite bjalo mg/l 97 4 4 42 6.70 0.0				42	6.70	0.07	0.19	1.64	<10	7.37	0.07	0.20	1 80
braete	yi 97		4	41	1.10	0.38	0.57	0.42	<1.0	1.10	0.42	0.62	0.46
 Co ya ka dama yeo e mwetsagalago go Akhaebe ya Bosetišhaba ya Meetse a ka Fase ga mobu. Ditekanyetšo tše di begilwego ke molagare wa dipalopalo go parameta ye nngwe le ye nngwe. Tšhup: Quality of Domestic Water Supplies, Volume 1: Assessment Guide, 2nd Ed 1998. Water Research Commission Report No: TT 101/98. Pretoria, South Africa (Set for a Class 1). 	o e nwetsag Domestic W	jalago go <i>i</i> 'ater Suppl	Akhaebe lies, Volur	ya Bosefšha ne 1: Assesi	iba ya Meets sment Guide	e a ka Fase ^, 2nd Ed.19(ga mobu. D 98. Water Ri	itekanyetšo esearch Cor	tše di begilwego k mmission Report N	ie molagare wa diţ lo: TT 101/98. Pre	balopalo go pari toria, South Afric	ameta ye nngwe li :a (Set for a Class	e ye nngwe. s 1).

Lenaneotthopho la 7.4: Boleng bja meetse a ka fase ga mobu ka Bokgobelameetse bja Tatelano ya bone (A41E, A42A, A42B le A42C)

(3) Moo phapano go ditekanyetšo tša boleng bja meetse bakeng sa boleng bja meetse a ka fase ga bobu a tikologo le BHN e hweditšwego, boleng bjo fase goba bjo bo šireletšago bo ile bja kgethwa	bakeng sa Tekano ya meetse ya boleng bja meetse a ka fase ga mobu. Moo boleng bja meetse a ka fase ga mobu a kgethitwego bjalo ka Tekano ya meetse ya boleng bja meetse a ka fase g mobu,	boleng bo ile bja oketšwa ka diphesente tše 10 ge fela boleng bo sa fete Tekano ya m eet se ya BHN.
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ANY AND SOLA					al a s	Bokg	obelame	etse bja	Tatelano	va bone A42D	Bokgobelameetse bja Tatelano ya bone A42D, A42E, A42F & A42G	1. A42G	and here	Service and
Diparameta tša Dikhemikala	Lekal	Ao	Aowa. ya Disampo	Disamp	ole	Modil	Nodikologo GW boleng goba molagare wa 1)	V boleng	goba .	Tekano ya	Tekano ya n	neetse ya 3 y fase o	e ya 3 ya Boleng bji fase da mobu)	Tekano ya meetse ya 3 ya Boleng bja Meetse a ka fase da mobu)
		A42 D	A42 E	A42 F	A42 G	A42D	A42E	A42F	A42G	BHN ya 2)	A42D	A42E	A42F	A42G
Hd		ო	12	ო	20	7.07	7.56	7.93	7.34	5.0 - 9.5. (±0.1)	6.36-7.78	6.80-8.31	7 14-8 72	6 61-8 N7
Tshepedišo ya mohlagase	mS/	ო	12	ო	50	42.10	58.85	25.50	27.60	<150	46.31	64 74	28.05	0.0-10-0 AF 05
Kalasiamo bjalo ka Ca	l/gm	ო	12	2	50	41.60	30.25	10.25	8.35	<150	45.76	33.28	11.28	0.00 0 0
Maknesiamo bjalo ka as Mg	l/gm	ო	12	2	20	8.30	17.10	7.55	5.60	<100	9.13	18.81	834	9 9 81 8
Sodiamo bjalo ka Na	mg/i	2	5	0	8	26.20	24.35	17.10	15.40	<200	28.82	26.79	18.81	16 94
Kloraete bjalo ka Cl	mg/l	m	5	n	20	17.00	33.70	6.85		<200	18.70	37.07	7 54	11 00
Salafaete bjalo ka SO4	l/gm	m	5	7	20	14.00	8.55	5.30	992	<400	15.40	0 41	283	2011 CG 7
Naetreite bjalo ka NOx-N	mg/l	7	12	5	50 50	0.22	0.06	0.16	0.09	<10	0.24	900	2000 810 810	20.7
Iaete	l/gm	n	12	ი	20	0.12	0.35	0.50	0.22	<1.0	0.13	0.39	0.55	0.24
 Go ya ka da Tšhup: Qua 	atha yeo e lity of Dorr	hwetšagal testic Watu	lago go Ak er Supplie:	thaebe ya s, Volume	Bosetšhal 11: Assess	oa ya Meetsi iment Guide	e a ka Fase 2nd Ed. 199	ga mobu. D 18. Water Re	litekanyetšo esearch Con	tše di begilwego ke mnission Report N	Go ya ka datha yeo e hwetšagalago go Akhaebe ya Bosetšhaba ya Meetse a ka Fase ga mobu. Ditekanyetšo tše di begliwego ke molagare wa dipalopalo go parameta ye nngwe le ye nngwe. Tšhup: Quality of Domestic Water Supplies, Volume 1: Assessment Guide, 2nd Ed, 1998. Water Research Commission Report No: TT 101/98. Pretoria. South Artiva (See for a Chan A)	ilopalo go paran via South Africa	teta ye nngwe le	ye nngwe.
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Moo phapano go ditekanyetšo tša boleng bja meetse bakeng sa boleng bja meetse a ka fase ga bobu a tikologo le BHN e hweditiswego, boleng bjo fase goba bjo bo šireletšago bo ile bja kgethwa bakeng sa Tekano ya meetse ya boleng bja meetse a ka fase ga mobu. Moo boleng bja meetse a ka fase ga mobu a kgethilwego bjalo ka Tekano ya meetse ya boleng bja meetse a ka fase g mobu, boleng bo ile bja oketšwa ka diphesente tše 10 ge fela boleng bo sa fete Tekano ya meetse ya BHN.

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Diparameta tsa Dikhemikale	Leka	Aowa. ya Disampole	Nsampole	Modikolog goba moli	Modikologo GW boleng goba molagare wa 1)	Tekano ya meetse ya BHN ya 2)	Tekano ya meelse ya ka fase	Tekano ya meetse ya 3 ya Boleng bja Meetse a ka fase ga mobu)
- Alter	The second	A42H	A42.J	A42H	A42J		A42H	A42J
Hq		48	54	8.23	7.44	5.0-9.5 (±0.1)	7.41-9.06	6.70-8.18
Tshepedišo ya mohlagase	NS ^m	48	54	159.50	199.85	<150	159.50	199.85
Kalasiamo bjalo ka Ca	mg/l	47	54	7.50	71.00	<150	8.25	78.10
Maknesiamo bjalo ka Mg	l/gm	47	54	1.20	40.35	<100	1.32	44.39
Sodiamo bjalo ka Na	mg/l	47	54	313.56	196.45	<200	313.56	200
Kloraete bjalo ka Cl	l/gm	47	54	284.00	302.60	<200	284.00	302.60
Salafaete bjalo ka SO4	l/ĝm	47	54	135.33	129.05	<400	148.86	141.96
Naetreite bjalo ka NOx- N	l/gm	47	54	0.08	7.50	<10	0.09	8.25
Floraete bjalo ka F	l/6m	43	54	12.62	1.21	<1.0	ete bjalo ka F mg/l 43 54 12.62 1.21 <1.0 12.62 1.21	1.21

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Moo phapano go ditekanyetšo tša boleng bja meetse bakeng sa boleng bja meetse a ka fase ga bobu a tikologo le BHN e hweditšwego, boleng bjo fase goba bjo bo šireketšago bo ile bja kgethwa bakeng sa Tekano ya meetse ya boleng bja meetse a ka fase ga mobu. Moo boleng bja meetse a ka fase ga mobu a kgethilwego bjalo ka Tekano ya meetse ya boleng bja meetse a ka fase g mobu, bolerg bo ile bja oketšwa ka diphesente tše 10 ge fela bolerg bo sa fete Tekano ya meetse ya BHN.

<u>@</u>

Palomoka ya makgobelameetse a tatelano ya bone a 2 (A41A le A41B) ga a na datha ye e lekanego ya khemistri ya meetse a ka fase ga mobu bakeng sa tshekatsheko	ye e feleletšego ya maemo a tikologo. Boleng bja tikologo ya meetse a ka fase ga mobu bja A41A le A41B ka gona bo ile bja ntšhwa ka go bokgobelameetse bja tatelano	ya bone bja boagišaning bja kgauswi (A41C le A41D) ka geologi ye e swanago ka lebaka la gore geologi e na le tšhušumetšo ye kgolo go boleng bja meetse bja tikologo.
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Mafelo la go Lekola Diparameta tša boleng bja meetse tše di swanetšego go sekasekwa Boleng bja Meetse	Floraete	Tshepedišo va mohlagase, Kloraete le Sodiamo	Floraete	Tshepedišo ya mohlagase, Kloraete le Sodiamo	Kloraete, Tshepedišo va mohlagase le sodiamo	Ga go selo	Ga go selo	Ga do selo	Ga do selo	Ga go selo	Ga do selo	Ga gó selo	Floraete	Kloraete, Tshepedišo ya mohlagase le floraete
Mafelo la go Lekola Boleng bja Meetse			-	_	-	0	0	0	0	0	0	0	=	H
Bokgobelameetse bja tatelano va bone	A41A	A41B	A41C	A41D	A41E	A42A	A42B	A42C	A42D	A42E	A42F	A42G	A42H	A42J

iretšo ya boleng bja meetse le diparameta tše di swanetšego go sekasekwa
Kakaret
othopho la 7.5: I
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