

A Basic hydrological RQOs (Ecological Reserve requirements) for quaternaries in the Olifants-Doorn WMA

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A.1 Summary of configuration and data sources

A.1.1 Summary of configuration

A summary of the final ecological category configuration is provided Appendix Table 1. Quaternaries are listed in alphabetical order.

Appendix Table 1 **Summary of the final configuration**

	incremental categories	cumulative categories			incremental categories	cumulative categories
E10A	C	C		E24D	AB	C
E10B	B	C		E24E	AB	AB
E10C	B	B		E24F	AB	AB
E10D	C	D		E24G	AB	AB
E10E	C	D		E24H	B	B
E10F	C	D		E24J	B	B
E10G	C	D		E24K	B	B
E10G-Rond	B	B		E24L	B	B
E10H	C	C		E24M	B	B
E10J	C	D		E31A-Q2	B	B
E10J-Q7	D	D		E31B	B	B
E10K	C	D		E31C	B	B
E21A	C	C		E31D	B	B
E21B	D	D		E31E	B	B
E21C	B	C		E31F	B	B
E21D	D	D		E31G	B	B
E21E	B	B		E31H	B	B
E21F	B	B		E32A	B	B
E21G	D	D		E32B	B	B
E21H	B	B		E32C	B	B
E21J	B	B		E32D	B	B
E21K	B	B		E32E	B	B
E21L	B	B		E33A	B	C
E22A	B	B		E33B	B	C
E22B	B	B		E33C	C	C
E22C	AB	AB		E33D	C	C
E22D	AB	AB		E33E	C	C
E22E	B	B		E33F-Q1	D	D
E22F	B	B		E33G	C	D
E22G	B	B		E33H	B	D
E23A	AB	AB		E40A	C	C
E23B	AB	AB		E40B	C	C
E23C	AB	AB		E40C	B	C
E23D	AB	AB		E40D	B	B
E23E	AB	AB		F60A	B	B
E23F	AB	B		F60B	B	B
E23G	AB	AB		F60C	B	B
E23H	AB	AB		F60D	B	B
E23J	AB	AB		F60E	B	B
E23K	AB	B		G30A	C	C
E24A	B	B		G30B	C	C
E24B	B	B		G30C	C	C
E24C	AB	C		G30D	C	C
				G30E	C	B
				G30F	C	C
				G30G	C	C
				G30H	C	C

A.1.2 Data sources

The sources used for the data presented here listed below. The sources for individual quaternaries are given in the relevant sections.

- Department of Water Affairs. 2012. Final Project Report for the Classification of significant water resources in the Olifants-Doorn WMA, Department of Water Affairs, South Africa, Belcher A. and Grobler D. 2012.
- Department of Water Affairs and Forestry. 2005. Olifants/Doring Catchment Ecological Water Requirements Study: Riverine RDM Report. Volume 2: Environmental Water Requirements. Report prepared by Southern Waters.
- Department of Water Affairs and Forestry. 2006. Preliminary determination of the Reserve and resource class: Olifants River (western cape) - Quaternary Catchment Area E10K. Signed off Reserve Template. 5 pp. Enquiries: D Masemola.
- Southern Waters. 2007. Jan Dissels. Compulsory licensing project. Rapid II reserve determinations for the Jan Dissels River. Unpublished Report to Ninham Shand and Department of Water Affairs. 48 pp.
- Southern Waters. 2009. (CAPE) Cape Action for People and the Environment: Olifants-Doring River Ecological Reserve and Resource Protection Capacity Building and Training. Final Report. Prepared by: Southern Waters

A.2 Secondary E1

A.2.1 E10A

A.2.1.1 Cumulative and Incremental .tab

IUA: Upper Olifants Irrigation
Tributary Rivers: None included in 1:50 000 cover, no names available
Mainstem: Olifants
Node: R47
Data source: DWA 2012, default desktop reserve
Adjustments: 60% of natural floods assumed for July, August and September (reflected below)
Target condition: C (PES=C).

CONSTRUCTED

Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :

Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 60.475
S.Dev. = 30.200
CV = 0.499
Q75 = 0.140
Q75/MMF = 0.028
BFI Index = 0.298
CV(JJA+JFM) Index = 3.400

Ecological Category = C

Total IFR = 26.354 (43.58 %MAR)
Maint. Lowflow = 5.440 (9.00 %MAR)
Drought Lowflow = 1.971 (3.26 %MAR)
Maint. Highflow = 20.913 (34.58 %MAR)

Monthly Distributions (Mill. cu. m.)

Distribution Type : W.Cape(wet)

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	2.912	2.448	0.841	0.592	0.250	0.177	0.769
Nov	1.300	1.883	1.448	0.299	0.127	0.050	0.348
Dec	0.444	0.990	2.227	0.104	0.020	0.000	0.104
Jan	0.128	0.260	2.037	0.039	0.000	0.000	0.039
Feb	0.140	0.457	3.261	0.022	0.000	0.000	0.022
Mar	0.312	0.836	2.682	0.030	0.000	0.000	0.030
Apr	1.483	2.822	1.903	0.096	0.010	0.000	0.096
May	5.742	6.824	1.188	0.343	0.080	0.863	1.206
Jun	13.012	9.887	0.760	0.804	0.310	1.933	2.738
Jul	15.258	12.583	0.825	1.080	0.320	8.075	9.155
Aug	13.078	8.298	0.635	1.136	0.478	6.711	7.847
Sep	6.667	4.315	0.647	0.896	0.377	3.104	4.000

A.2.2 E10B

A.2.2.1 *Incremental .tab*

IUA: Upper Olifants Irrigation
 Tributary Rivers: Two main tributaries, names not available, southern one is FEPA
 Mainstem: Olifants (below southern tributary is FEPA)
 Node: R44
 Data source: Extrapolated from DWAF 2005, EWR3 (Rondegat). Classification target was C (80%); AB (20%).
 Adjustments: 80% of natural floods assumed for July, August and September (reflected below).
 Target condition: B (southern one PES=B and other D)

CONSTRUCTED

Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :

Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 68.528
 S.Dev. = 41.531
 CV = 0.606
 Q75 = 0.160
 Q75/MMF = 0.028
 BFI Index = 0.302
 CV(JJA+JFM) Index = 3.205

Ecological Category = B

Total IFR = 44.376 (64.76 %MAR)
 Maint. Lowflow = 14.787 (21.58 %MAR)
 Drought Lowflow = 1.215 (1.77 %MAR)
 Maint. Highflow = 29.59 (43.18 %MAR)

Monthly Distributions (Mill. cu. m.)

Distribution Type : W.Cape(wet)

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	3.429	2.708	0.790	1.669	0.095	0.222	1.891
Nov	1.610	1.898	1.179	1.384	0.000	0.445	1.829
Dec	0.546	1.060	1.940	0.953	0.000	0.000	0.953
Jan	0.118	0.251	2.117	0.953	0.095	0.000	0.953
Feb	0.085	0.186	2.193	0.431	0.086	0.000	0.431
Mar	0.284	0.765	2.692	0.477	0.000	0.000	0.477
Apr	1.591	3.573	2.245	0.461	0.000	0.445	0.906
May	6.535	7.947	1.216	0.477	0.000	1.424	1.901
Jun	15.361	12.348	0.804	0.923	0.231	2.937	3.860
Jul	17.082	18.539	1.085	2.145	0.238	11.521	13.666
Aug	14.679	10.615	0.723	2.145	0.238	9.598	11.743
Sep	7.207	4.547	0.631	2.768	0.231	2.998	5.766

A.2.2.2 Cumulative .tab

IUA: Upper Olifants Irrigation
 Tributary Rivers: Two main tributaries, names not available, southern one is FEPA
 Mainstem: Olifants (below southern tributary is FEPA)
 Node: R44
 Data source: DWA 2012, default desktop reserve
 Adjustments: 60% of natural floods assumed for July, August and September (reflected below)
 Target condition: C (PES = C (upper) and B (lower))

CONSTRUCTED

Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :

Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 129.003
 S.Dev. = 71.303
 CV = 0.553
 Q75 = 0.310
 Q75/MMF = 0.029
 BFI Index = 0.301
 CV(JJA+JFM) Index = 3.269

Ecological Category = C

Total IFR = 57.097 (44.26 %MAR)
 Maint. Lowflow = 11.078 (8.59 %MAR)
 Drought Lowflow = 3.621 (2.81 %MAR)
 Maint. Highflow = 46.018 (35.67 %MAR)

Monthly Distributions (Mill. cu. m.)

Distribution Type : W.Cape(wet)

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	6.341	5.072	0.800	1.240	0.438	0.449	1.689
Nov	2.910	3.762	1.293	0.654	0.231	0.119	0.773
Dec	0.991	2.043	2.062	0.227	0.070	0.000	0.227
Jan	0.246	0.495	2.012	0.076	0.010	0.000	0.076
Feb	0.225	0.617	2.742	0.037	0.000	0.000	0.037
Mar	0.596	1.574	2.642	0.054	0.000	0.000	0.054
Apr	3.074	6.353	2.067	0.186	0.020	0.000	0.186
May	12.277	14.718	1.199	0.692	0.190	2.230	2.921
Jun	28.373	22.128	0.780	1.654	0.583	5.097	6.752
Jul	32.340	30.918	0.956	2.176	0.640	17.228	19.404
Aug	27.757	18.755	0.676	2.290	0.807	14.364	16.654
Sep	13.874	8.604	0.620	1.793	0.632	6.531	8.324

A.2.3 E10C

A.2.3.1 Incremental .tab

IUA: Upper Olifants Irrigation
 Tributary Rivers: Dwars (FEPA) and Ratel (FEPA)
 Mainstem: Olifants (FEPA)
 Node: R42
 Data source: Extrapolated from DWAF 2005, EWR3 (Rondegat)
 Adjustments: 80% of natural floods assumed for July, August and September (reflected below)
 Target condition: B (Dwars PES=B; Ratel PES=C)

CONSTRUCTED

Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :

Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 53.402
 S.Dev. = 24.635
 CV = 0.461
 Q75 = 0.170
 Q75/MMF = 0.038
 BFI Index = 0.309
 CV(JJA+JFM) Index = 2.419

Ecological Category = B

Total IFR = 35.119 (65.76 %MAR)
 Maint. Lowflow = 11.523 (21.58 %MAR)
 Drought Lowflow = 0.947 (1.77 %MAR)
 Maint. Highflow = 23.596 (44.18 %MAR)

Monthly Distributions (Mill. cu. m.)

Distribution Type : W.Cape(wet)

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	3.064	1.652	0.539	1.300	0.074	0.173	1.474
Nov	1.343	1.181	0.880	1.079	0.000	0.347	1.425
Dec	0.393	0.568	1.447	0.743	0.000	0.000	0.743
Jan	0.084	0.146	1.741	0.743	0.074	0.000	0.743
Feb	0.058	0.095	1.619	0.336	0.067	0.000	0.336
Mar	0.195	0.340	1.745	0.372	0.000	0.000	0.372
Apr	1.074	1.920	1.788	0.360	0.000	0.347	0.706
May	4.671	5.415	1.159	0.372	0.000	1.110	1.481
Jun	11.483	8.819	0.768	0.719	0.180	2.289	3.008
Jul	13.261	10.537	0.795	1.672	0.186	8.937	10.609
Aug	11.605	6.833	0.589	1.672	0.186	7.612	9.284
Sep	6.173	2.801	0.454	2.157	0.180	2.781	4.938

A.2.3.2 Cumulative .tab

IUA: Upper Olifants Irrigation
 Tributary Rivers: Dwars (FEPA) and Ratel (FEPA)
 Mainstem: Olifants (FEPA)
 Node: R42
 Data source: DWA 2012, default desktop reserve
 Adjustments: 60% of natural floods assumed for July, August and September (reflected below)
 Target condition: B (PES=B)

CONSTRUCTED

Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :

Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 182.405
 S.Dev. = 95.708
 CV = 0.525
 Q75 = 0.490
 Q75/MMF = 0.032
 BFI Index = 0.304
 CV(JJA+JFM) Index = 3.046

Ecological Category = B

Total IFR = 93.19 (51.09 %MAR)
 Maint. Lowflow = 26.928 (14.76 %MAR)
 Drought Lowflow = 8.602 (4.72 %MAR)
 Maint. Highflow = 66.262 (36.33 %MAR)

Monthly Distributions (Mill. cu. m.)

Distribution Type : W.Cape(wet)

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	9.404	6.691	0.712	3.162	1.275	1.087	4.249
Nov	4.253	4.920	1.157	1.693	0.686	0.244	1.937
Dec	1.384	2.607	1.884	0.560	0.160	0.000	0.560
Jan	0.330	0.636	1.929	0.168	0.020	0.000	0.168
Feb	0.283	0.700	2.470	0.080	0.000	0.000	0.080
Mar	0.791	1.907	2.412	0.123	0.010	0.000	0.123
Apr	4.148	8.262	1.992	0.429	0.070	0.000	0.429
May	16.948	20.082	1.185	1.628	0.340	5.123	6.750
Jun	39.855	30.875	0.775	3.959	1.030	11.929	15.888
Jul	45.601	41.366	0.907	5.227	1.030	22.134	27.361
Aug	39.362	25.469	0.647	5.522	2.219	18.095	23.617
Sep	20.047	11.322	0.565	4.378	1.761	7.650	12.028

A.2.4 E10D

A.2.4.1 Incremental .tab

IUA: Upper Olifants Irrigation
 Tributary Rivers: Four main tributaries: Oudste, Tee (FEPA up to E1H002 gauge), and Noordhoeks (formed by Agterste and Voorste)
 Mainstem: Olifants
 Node: R40
 Data source: Extrapolated from DWAF 2005, EWR3 (Rondegat)
 Adjustments: 60% of natural floods assumed for July, August and September (reflected below)
 Target condition: C (Oudste PES=unknown; Tee PES=C; Noordhoeks PES=unknown, (formed by Agterste (PES=unknown) and Voorste (PES=unknown))

CONSTRUCTED

Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 51.363
 S.Dev. = 18.272
 CV = 0.356
 Q75 = 0.290
 Q75/MMF = 0.068
 BFI Index = 0.321
 CV(JJA+JFM) Index = 1.891

Ecological Category = C

Total IFR = 22.962 (44.71 %MAR)
 Maint. Lowflow = 8.778 (17.09 %MAR)
 Drought Lowflow = 0.911 (1.77 %MAR)
 Maint. Highflow = 14.186 (27.62 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Cape(wet)

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	3.719	1.262	0.339	0.536	0.071	0.167	0.703
Nov	1.756	1.172	0.668	0.519	0.000	0.334	0.852
Dec	0.526	0.482	0.917	0.536	0.000	0.000	0.536
Jan	0.125	0.186	1.486	0.536	0.071	0.000	0.536
Feb	0.076	0.094	1.231	0.484	0.065	0.000	0.484
Mar	0.228	0.225	0.986	0.357	0.000	0.000	0.357
Apr	1.023	1.064	1.040	0.346	0.000	0.000	0.346
May	4.134	4.710	1.139	0.357	0.000	0.000	0.357
Jun	9.879	8.147	0.825	0.519	0.173	0.334	0.852
Jul	11.841	7.017	0.593	1.072	0.179	6.033	7.105
Aug	11.351	6.270	0.552	1.787	0.179	5.024	6.811
Sep	6.705	2.300	0.343	1.729	0.173	2.294	4.023

A.2.4.2 Cumulative .tab

IUA: Upper Olifants Irrigation
 Tributary Rivers: Four main tributaries: Oudste, Tee (FEPA up to E1H002 gauge), and Noordhoeks (formed by Agterste and Voorste)
 Mainstem: Olifants
 Node: R40
 Data source: Extrapolated from DWAF 2005, EWR1 (E10F)
 Adjustments: 60% of natural floods assumed for July, August and September (reflected below)
 Target condition: D (PES=D upper, C lower)

CONSTRUCTED

Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 233.767
 S.Dev. = 110.697
 CV = 0.474
 Q75 = 0.770
 Q75/MMF = 0.040
 BFI Index = 0.309
 CV(JJA+JFM) Index = 2.688

Ecological Category = D

Total IFR = 122.441 (52.38 %MAR)
 Maint. Lowflow = 51.691 (22.11 %MAR)
 Drought Lowflow = 15.073 (6.45 %MAR)
 Maint. Highflow = 70.747 (30.26 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Cape(wet)

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	13.123	7.773	0.592	6.233	0.737	3.491	9.724
Nov	6.008	5.992	0.997	1.645	0.018	4.654	6.299
Dec	1.910	3.049	1.597	0.189	0.019	2.327	2.516
Jan	0.455	0.796	1.749	0.189	0.019	0.000	0.189
Feb	0.360	0.762	2.119	0.171	0.017	0.000	0.171
Mar	1.019	2.036	1.999	0.189	0.019	0.000	0.189
Apr	5.170	9.136	1.767	1.097	0.018	2.327	3.424
May	21.082	24.496	1.162	3.777	0.699	2.327	6.105
Jun	49.734	38.677	0.778	8.225	3.418	4.654	12.880
Jul	57.442	46.646	0.812	11.333	3.192	23.132	34.465
Aug	50.713	30.845	0.608	11.333	4.212	19.095	30.428
Sep	26.751	13.197	0.493	7.311	2.705	8.740	16.051

A.2.5 E10E

A.2.5.1 Incremental .tab

IUA: Upper Olifants Irrigation
 Tributary Rivers: One main tributary: Boontjies (formed by Boskloofs (FEPA up to -32.55906, 19.05945) and Boontjies)
 Mainstem: Olifants
 Node: None
 Data source: Extrapolated from EWR3 (Rondegat; DWAF 2005)
 Adjustments: None
 Target condition: C (Boontjies PES=D; formed by Boskloofs (PES=B) and Boontjies PES=C))

Desktop Version 2, Generated on 15/02/2013
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 59.700
 S.Dev. = 20.203
 CV = 0.338
 Q75 = 0.350
 Q75/MMF = 0.070
 BFI Index = 0.321
 CV(JJA+JFM) Index = 1.769

Ecological Category = C

Total IFR = 12.218 (20.47 %MAR)
 Maint. Lowflow = 10.202 (17.09 %MAR)
 Drought Lowflow = 1.058 (1.77 %MAR)
 Maint. Highflow = 2.016 (3.38 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Cape(wet)

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	4.969	1.445	0.291	0.623	0.083	0.194	0.817
Nov	2.257	1.172	0.519	0.603	0.000	0.388	0.991
Dec	0.644	0.488	0.757	0.623	0.000	0.000	0.623
Jan	0.140	0.179	1.283	0.623	0.083	0.000	0.623
Feb	0.083	0.101	1.224	0.563	0.075	0.000	0.563
Mar	0.251	0.238	0.948	0.415	0.000	0.000	0.415
Apr	1.077	1.010	0.937	0.402	0.000	0.000	0.402
May	4.370	4.784	1.095	0.415	0.000	0.000	0.415
Jun	10.596	8.564	0.808	0.603	0.201	0.388	0.991
Jul	13.224	7.300	0.552	1.246	0.208	0.853	2.099
Aug	13.358	6.584	0.493	2.077	0.208	0.000	2.077
Sep	8.730	2.615	0.300	2.010	0.201	0.194	2.203

A.2.5.2 Cumulative .tab

IUA: Upper Olifants Irrigation
 Tributary Rivers: One main tributary: Boontjies (formed by Boskloofs (FEPA up to -32.55906, 19.05945) and Boontjies)
 Mainstem: Olifants
 Node: None
 Data source: Extrapolated from DWAF 2005, EWR1 (E10F)
 Adjustments: None
 Target condition: D (PES=C)

Desktop Version 2, Generated on 14/11/2012
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 293.467
 S.Dev. = 128.214
 CV = 0.437
 Q75 = 1.190
 Q75/MMF = 0.049
 BFI Index = 0.313
 CV(JJA+JFM) Index = 2.440

Ecological Category = D

Total IFR = 110.838 (37.77 %MAR)
 Maint. Lowflow = 64.892 (22.11 %MAR)
 Drought Lowflow = 18.922 (6.45 %MAR)
 Maint. Highflow = 45.946 (15.66 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Cape(wet)

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	18.091	9.043	0.500	7.825	0.925	4.382	12.207
Nov	8.266	7.077	0.856	2.065	0.023	5.843	7.908
Dec	2.554	3.503	1.372	0.237	0.024	2.921	3.159
Jan	0.595	0.961	1.616	0.237	0.024	0.000	0.237
Feb	0.442	0.834	1.886	0.214	0.021	0.000	0.214
Mar	1.270	2.190	1.725	0.237	0.024	0.000	0.237
Apr	6.248	9.989	1.599	1.377	0.023	2.921	4.298
May	25.452	29.069	1.142	4.742	0.877	2.921	7.664
Jun	60.331	46.929	0.778	10.326	4.291	5.843	16.169
Jul	70.666	52.477	0.743	14.227	4.007	5.754	19.981
Aug	64.070	36.777	0.574	14.227	5.288	13.899	28.125
Sep	35.481	15.471	0.436	9.178	3.396	1.461	10.639

A.2.6 E10F

A.2.6.1 *Incremental .tab*

IUA: Upper Olifants Irrigation
 Tributary Rivers: Two main tributaries: Palmietfontein (FEPA) and Heks (FEPA)
 Mainstem: Olifants
 Node: R33
 Data source: Extrapolated from DWAF 2005, EWR3 (Rondegat)
 Adjustments: None
 Target condition: C (Palmietfontein PES=D; Heks PES=C)

Desktop Version 2, Generated on 15/02/2013
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 62.090
 S.Dev. = 22.696
 CV = 0.366
 Q75 = 0.390
 Q75/MMF = 0.075
 BFI Index = 0.319
 CV(JJA+JFM) Index = 2.197

Ecological Category = C

Total IFR = 12.707 (20.47 %MAR)
 Maint. Lowflow = 10.611 (17.09 %MAR)
 Drought Lowflow = 1.101 (1.77 %MAR)
 Maint. Highflow = 2.097 (3.38 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Cape(wet)

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	5.562	1.642	0.295	0.648	0.086	0.202	0.850
Nov	2.342	0.917	0.391	0.627	0.000	0.403	1.030
Dec	0.627	0.489	0.779	0.648	0.000	0.000	0.648
Jan	0.136	0.237	1.743	0.648	0.086	0.000	0.648
Feb	0.113	0.184	1.632	0.585	0.078	0.000	0.585
Mar	0.306	0.384	1.257	0.432	0.000	0.000	0.432
Apr	1.262	1.609	1.275	0.418	0.000	0.000	0.418
May	4.486	4.972	1.108	0.432	0.000	0.000	0.432
Jun	11.327	11.021	0.973	0.627	0.209	0.403	1.030
Jul	13.034	7.014	0.538	1.296	0.216	0.887	2.183
Aug	13.226	5.926	0.448	2.160	0.216	0.000	2.160
Sep	9.668	3.160	0.327	2.090	0.209	0.202	2.292

A.2.6.2 Cumulative .tab

IUA: Upper Olifants Irrigation
 Tributary Rivers: Two main tributaries: Palmietfontein (FEPA) and Heks (FEPA)
 Mainstem: Olifants
 Node: R33
 Data source: Extrapolated from DWAF 2005, EWR1 (E10F)
 Adjustments: None
 Target condition: D (PES=D to confluence with Heks and Palmietfontein then C)

Desktop Version 2, Generated on 13/11/2012
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 355.557
 S.Dev. = 146.922
 CV = 0.413
 Q75 = 1.630
 Q75/MMF = 0.055
 BFI Index = 0.315
 CV(JJA+JFM) Index = 2.315

Ecological Category = D

Total IFR = 134.288 (37.77 %MAR)
 Maint. Lowflow = 78.622 (22.11 %MAR)
 Drought Lowflow = 22.926 (6.45 %MAR)
 Maint. Highflow = 55.667 (15.66 %MAR)

Monthly Distributions (Mill. cu. m.)

Distribution Type : W.Cape(wet)

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	23.654	10.345	0.437	9.480	1.120	5.309	14.789
Nov	10.608	7.792	0.735	2.502	0.028	7.079	9.581
Dec	3.182	3.929	1.235	0.287	0.029	3.540	3.827
Jan	0.731	1.169	1.599	0.287	0.029	0.000	0.287
Feb	0.555	0.989	1.782	0.260	0.026	0.000	0.260
Mar	1.575	2.418	1.535	0.287	0.029	0.000	0.287
Apr	7.510	11.424	1.521	1.668	0.028	3.540	5.207
May	29.938	33.608	1.123	5.745	1.063	3.540	9.285
Jun	71.658	57.156	0.798	12.511	5.199	7.079	19.590
Jul	83.700	57.792	0.690	17.237	4.855	6.972	24.208
Aug	77.297	41.740	0.540	17.237	6.406	16.839	34.076
Sep	45.150	18.035	0.399	11.120	4.115	1.770	12.890

A.2.7 EWR 3 (Rondegat) in E10G

A.2.7.1 Cumulative and Incremental .tab

IUA: Upper Olifants Irrigation
Tributary Rivers: Rondegat in E10G at EWR Site 3 (FEPA until 32°15'27.05"S 18°56'47.22"E (confluence with dam))
Mainstem: Olifants
Node: R34
Data source: Extrapolated from DWAF 2005, EWR3 (Rondegat), Hydrology for EWR 3 also from DWAF (2005)
Adjustments: None
Target condition: B (PES is B at EWR site; deteriorates downstream).

Desktop Version 2, Generated on 14/11/2012

Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :

Total Runoff : REGION S (MI

Annual Flows (Mill. cu. m or index values):

MAR = 7.411
S.Dev. = 3.611
CV = 0.487
Q75 = 0.110
Q75/MMF = 0.178
BFI Index = 0.366
CV(JJA+JFM) Index = 1.953

Ecological Category = B

Total IFR = 3.168 (42.75 %MAR)
Maint. Lowflow = 1.599 (21.58 %MAR)
Drought Lowflow = 0.131 (1.77 %MAR)
Maint. Highflow = 1.569 (21.17 %MAR)

Monthly Distributions (Mill. cu. m.)

Distribution Type : W.Cape(wet)

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.526	0.297	0.564	0.180	0.010	0.024	0.205
Nov	0.338	0.209	0.618	0.150	0.000	0.048	0.198
Dec	0.183	0.128	0.698	0.103	0.000	0.000	0.103
Jan	0.128	0.135	1.049	0.103	0.010	0.000	0.103
Feb	0.096	0.087	0.906	0.047	0.009	0.000	0.047
Mar	0.089	0.078	0.869	0.052	0.000	0.000	0.052
Apr	0.132	0.165	1.251	0.050	0.000	0.048	0.098
May	0.509	0.611	1.202	0.052	0.000	0.154	0.206
Jun	1.259	1.558	1.237	0.100	0.025	0.318	0.417
Jul	1.485	1.418	0.955	0.232	0.026	0.318	0.550
Aug	1.580	1.331	0.842	0.232	0.026	0.529	0.761
Sep	1.085	0.854	0.787	0.299	0.025	0.130	0.429

A.2.8 E10G

A.2.8.1 *Incremental.tab*

IUA: Upper Olifants Irrigation
 Tributary Rivers: Elandskloof, plus remainder of Rondegat downstream of EWR 3 FEPA until 32°15'27.05"S 18°56'47.22"E (confluence with dam)
 Mainstem: Olifants
 Node: None
 Data source: DWA 2012, default desktop reserve
 Adjustments: None (TAB below is constructed by subtracting the contribution from Rondegat up to EWR3 from the whole of E10G incremental)
 Target condition: C (Remainder of Rondegat is a B/C; Elandskloof PES =D).

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Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 74.306
 S.Dev. = 29.869
 CV = 0.366
 Q75 = 0.510
 Q75/MMF = 0.075
 BFI Index = 0.319
 CV(JJA+JFM) Index = 2.191

Ecological Category = C

Total IFR = 15.586 (20.98 %MAR)
 Maint. Lowflow = 7.678 (10.33 %MAR)
 Drought Lowflow = 3.638 (4.9 %MAR)
 Maint. Highflow = 7.908 (10.64 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Cape(wet)

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	6.794	2.160	0.295	1.267	0.561	0.566	1.833
Nov	2.744	1.206	0.391	0.861	0.398	0.001	0.862
Dec	0.642	0.644	0.780	0.212	0.125	0.000	0.212
Jan	0.052	0.312	1.730	0.001	0.023	0.000	0.001
Feb	0.053	0.242	1.626	0.001	0.001	0.000	0.001
Mar	0.313	0.506	1.258	0.011	0.010	0.000	0.011
Apr	1.529	2.118	1.275	0.094	0.063	0.000	0.094
May	5.396	6.543	1.108	0.371	0.182	0.824	1.195
Jun	13.648	14.504	0.973	0.974	0.421	2.033	3.007
Jul	15.668	9.230	0.538	1.229	0.562	2.761	3.990
Aug	15.827	7.799	0.448	1.360	0.661	0.582	1.942
Sep	11.640	4.158	0.327	1.297	0.631	1.141	2.438

A.2.8.2 Cumulative .tab

IUA: Upper Olifants Irrigation
 Tributary Rivers: Elandskloof, plus remainder of Rondegat downstream of EWR 3 FEPA until 32°15'27.05"S 18°56'47.22"E (confluence with dam)
 Mainstem: Olifants
 Node: None
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: D (PES = C until Clanwilliam Dam)

Desktop Version 2, Generated on 2011/09/20
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 437.273
 S.Dev. = 173.002
 CV = 0.396
 Q75 = 2.210
 Q75/MMF = 0.061
 BFI Index = 0.317
 CV(JJA+JFM) Index = 2.231

Ecological Category = D

Total IFR = 116.278 (26.59 %MAR)
 Maint. Lowflow = 78.127 (17.87 %MAR)
 Drought Lowflow = 24.084 (5.51 %MAR)
 Maint. Highflow = 38.151 (8.72 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Cape(wet)

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	30.974	12.183	0.393	10.860	3.384	1.769	12.629
Nov	13.690	8.790	0.642	6.845	2.133	0.196	7.042
Dec	4.007	4.509	1.125	2.263	0.705	0.000	2.263
Jan	0.911	1.456	1.597	0.634	0.160	0.000	0.634
Feb	0.704	1.206	1.713	0.401	0.020	0.000	0.401
Mar	1.977	2.771	1.402	0.531	0.070	0.000	0.531
Apr	9.171	13.374	1.458	1.285	0.380	0.000	1.285
May	35.843	39.739	1.109	4.144	1.291	4.381	8.525
Jun	86.565	70.979	0.820	9.997	3.115	10.529	20.526
Jul	100.853	65.276	0.647	13.319	4.150	13.929	27.247
Aug	94.703	48.601	0.513	14.828	4.620	2.449	17.277
Sep	57.874	21.651	0.374	13.019	4.056	4.898	17.917

A.2.9 E10H

A.2.9.1 Cumulative and Incremental .tab

IUA: Upper Olifants Irrigation
 Tributary Rivers: Jan Dissels
 Mainstem: Olifants
 Node: R24
 Data source: Extrapolated from Jan Dissels Compulsory Licensing Project (Southern Waters 2007)
 Adjustments: None
 Target condition: C (PES is B to causeway, then C to gauge).

Desktop Version 2, Generated on 10/4/2007

Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :

Total Runoff : E1H06

Annual Flows (Mill. cu. m or index values):

MAR = 44.686
 S.Dev. = 16.495
 CV = 0.369
 Q75 = 0.715
 Q75/MMF = 0.192
 BFI Index = 0.355
 CV(JJA+JFM) Index = 1.080

Ecological Category = C

Total IFR = 8.804 (19.70 %MAR)
 Maint. Lowflow = 6.656 (14.90 %MAR)
 Drought Lowflow = 1.016 (2.27 %MAR)
 Maint. Highflow = 2.147 (4.81 %MAR)

Monthly Distributions (Mill. cu. m.)

Distribution Type : W.Cape(dry)

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	2.790	2.087	0.748	0.406	0.058	0.000	0.406
Nov	1.640	1.541	0.940	0.406	0.058	0.290	0.696
Dec	1.099	0.946	0.860	0.406	0.058	0.000	0.406
Jan	0.720	0.367	0.510	0.435	0.058	0.000	0.435
Feb	0.488	0.165	0.338	0.354	0.058	0.000	0.354
Mar	0.649	0.311	0.479	0.238	0.029	0.290	0.528
Apr	1.033	0.786	0.760	0.226	0.290	0.000	0.226
May	3.903	4.004	1.026	0.157	0.029	0.000	0.157
Jun	7.391	5.605	0.758	0.418	0.087	0.000	0.418
Jul	9.410	5.756	0.612	0.859	0.087	0.638	1.497
Aug	9.392	5.091	0.542	1.364	0.116	0.638	2.002
Sep	6.170	4.916	0.797	1.387	0.087	0.290	1.677

A.2.10 Node Q7 in E10J

A.2.10.1 Incremental .tab

IUA: Upper Olifants Irrigation
 Tributary Rivers: Jan Dissels
 Mainstem: Olifants
 Node: Q7
 Data source: Extrapolated from Jan Dissels Compulsory Licensing Project (Southern Waters 2007).
 Hydrology also from Jan Dissels Compulsory licensing project¹
 Adjustments: None
 Target condition: D (PES is B to causeway, C to gauge, D to confluence)

Desktop Version 2, Generated on 10/4/2007
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : JDNAT

Annual Flows (Mill. cu. m or index values):

MAR = 46.205
 S.Dev. = 17.056
 CV = 0.369
 Q75 = 0.739
 Q75/MMF = 0.192
 BFI Index = 0.355
 CV(JJA+JFM) Index = 1.080

Ecological Category = D

Total IFR = 6.883 (14.90 %MAR)
 Maint. Lowflow = 5.623 (12.17 %MAR)
 Drought Lowflow = 0.780 (1.69 %MAR)
 Maint. Highflow = 1.260 (2.73 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Cape(dry)

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	2.884	2.158	0.748	0.420	0.060	0.000	0.420
Nov	1.696	1.594	0.940	0.132	0.060	0.300	0.432
Dec	1.137	0.978	0.860	0.174	0.060	0.000	0.174
Jan	0.745	0.380	0.510	0.156	0.060	0.000	0.156
Feb	0.505	0.171	0.338	0.144	0.060	0.000	0.144
Mar	0.671	0.322	0.479	0.138	0.030	0.000	0.138
Apr	1.068	0.812	0.760	0.132	0.030	0.000	0.132
May	4.036	4.140	1.026	0.162	0.030	0.000	0.162
Jun	7.642	5.796	0.758	0.432	0.090	0.300	0.732
Jul	9.730	5.952	0.612	0.888	0.090	0.000	0.888
Aug	9.711	5.265	0.542	1.410	0.120	0.660	2.070
Sep	6.380	5.084	0.797	1.434	0.090	0.000	1.434

¹ Note: There is a disjuncture between the hydrology from the Jan Dissels Compulsory licensing project, and that the hydrology used in the Desktop Model (WR90). The Jan Dissels Compulsory licensing hydrology gives a MAR at the confluence of 48 MCM, whereas the WR90 gives a MAR for the whole of the incremental catchment of 29 MCM. We have used Jan Dissels Compulsory licensing hydrology as it is assumed to be groundtruthed.

A.2.11 E10J

A.2.11.1 *Incremental .tab*

IUA: Upper Olifants Irrigation
Tributary Rivers: Kliphuis (FEPA until 32° 7'4.63"S, 18°53'45.48"E @ N7) and Seekoevlei
Mainstem: Olifants
Node: -
Data source: None
Adjustments: None
Target condition: C (PES Seekoevlei is C, and Kliphuis is a B)

There is a disjuncture between the hydrology from the Jan Dissels Compulsory licensing project, and that the hydrology used in the Desktop Model (WR90). The Jan Dissels Compulsory licensing hydrology gives a MAR at the confluence of 48 MCM, whereas the WR90 gives a MAR for the whole of the incremental catchment of 29 MCM. We have used Jan Dissels Compulsory licensing hydrology for the Jan Dissels River as it is assumed to be groundtruthed. However, this means that it is not possible to provide an incremental Reserve for E10J.

However, the Kliphuis is a FEPA until 32° 7'4.63"S, 18°53'45.48"E @ N7, and as such has an allocation of 60% of MAR.

A.2.11.2 Cumulative .tab

IUA: Upper Olifants Irrigation
 Tributary Rivers: Kliphuis (FEPA until 32° 7'4.63"S, 18°53'45.48"E @ N7) and Seekoevlei
 Mainstem: Olifants
 Node: R23
 Data source: Clanwilliam Dam Raising (Southern Waters, 2007)
 Adjustments: See below
 Target condition: D (PES = D)

Note: The default desktop Reserve (D) was used in the balance sheet. This would apply if irrigation releases were no longer made from Clanwilliam Dam.

Minimum Lowflows in May and June: 0.05 m³/s.

Note: These are not minimum dry-season lowflows since, because of the operation of Clanwilliam Dam, lowflows tend to occur in May and June.

- Formal stipulations for lowflows are not appropriate at E10J because the Olifants River in this quaternary is used as a conduit for irrigation releases from Clanwilliam Dam (and to maintain levels at Bulshoek Barrage). Thus lowflows exceed those required for hydrological RQOs in the dry summer months and are probably less than those required in the wet winter months. However, consideration of hydrological RQOs for E10J must take into consideration:
 - The river is in a Category D, despite having been subjected to the operating regime of Clanwilliam for c. 40 years (since 1962/64).
 - Natural variation will be impossible to achieve as long as the river is used as a conduit for irrigation supply. If assessed at the level of overall volume of lowflows in the wet and dry season, seasonal reversal does not currently occur. Seasonal reversal (at the level of overall volume of lowflows) will however occur if Clanwilliam Dam is raised by 10- and 15-m.
 - Cessation of flows in May and June is frequent under the simulated hydrology used for the Clanwilliam Raising Study for present day, the 10- and 15-m raising scenarios. These are NOT acceptable, and minimum flows in the system should not ever drop below 0.05 m³/s.
- The flood requirements for E10J (and the downstream river) should be built into the irrigation releases from the raised Clanwilliam Dam. Class 1 flood releases can be made in September and October (17 m³/s for 12 hrs) providing the water level in Bulshoek Barrage can be drawn down below about 4.4 MCM without affecting the yield of the Clanwilliam Dam/Bulshoek Barrage system. The flood requirements are based on the requirement for spawning releases for yellowfish (Cambray *et al.* 1997; King *et al.* 1998). In wet years it is recommended that Class 1 releases are also made in November and December, as these are key spawning months (table below).
- The Class 2, 3 and 4 floods (table below) occurred in the simulated record presumably as spills and have been included in the RQOs to ensure that the dam operation remains such that they can be supplied, albeit as spill.

Summary of the flood requirements for E10J for Category D

Flood type	Daily average peak (m³/s)	Duration (days)	Volume (MCM)	Number requested²		Months
Intra-annual Class (i.e., each flood has a return period of 1:1)						
Class 1	20	3	4	4 (10 m)	4 (15 m)	Aug-Dec
Class 2	59	4	11	1 (10 m)	1 (15 m)	Jul-Sep
Class 3	117	6	23	0 (10 m)	1 (15 m)	Jul-Aug-8
Class 4	234	7	49	1 (10 m)	0 (15 m)	June-Aug
Inter-annual Class (return period given below)						
1:2	260	8	78	Present		Not stipulated
1:5	255.7	8	134	Present		Not stipulated
1:10	394.8	11	140	Present		Not stipulated
1:20	481.2	8	140	Present		Not stipulated

² The flood requirements differ slightly depending on whether Clanwilliam Dam is raised by 10 or 15 m.

A.2.12 E10K

A.2.12.1 Incremental .tab

IUA: Upper Olifants Irrigation
 Tributary Rivers: Rietvlei
 Mainstem: Olifants
 Node: R13
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: C (PES = C)

Desktop Version 2, Generated on 2011/08/09
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 7.562
 S.Dev. = 8.731
 CV = 1.155
 Q75 = 0.030
 Q75/MMF = 0.048
 BFI Index = 0.303
 CV(JJA+JFM) Index = 2.782

Ecological Category = C

Total IFR = 1.586 (20.97 %MAR)
 Maint. Lowflow = 0.786 (10.39 %MAR)
 Drought Lowflow = 0.190 (2.51 %MAR)
 Maint. Highflow = 0.800 (10.58 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Cape(wet)

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.251	0.242	0.964	0.065	0.020	0.011	0.076
Nov	0.100	0.157	1.564	0.034	0.010	0.001	0.035
Dec	0.054	0.057	1.061	0.020	0.000	0.000	0.020
Jan	0.036	0.029	0.794	0.015	0.000	0.000	0.015
Feb	0.030	0.023	0.775	0.012	0.000	0.000	0.012
Mar	0.030	0.047	1.567	0.011	0.000	0.000	0.011
Apr	0.119	0.287	2.416	0.016	0.000	0.000	0.016
May	0.494	1.300	2.629	0.039	0.000	0.070	0.109
Jun	1.850	3.968	2.145	0.126	0.020	0.269	0.394
Jul	2.021	3.053	1.510	0.159	0.020	0.309	0.469
Aug	1.773	2.757	1.555	0.169	0.070	0.047	0.216
Sep	0.804	1.018	1.266	0.121	0.050	0.093	0.214

A.2.12.2 Cumulative .tab

IUA: Upper Olifants Irrigation
 Tributary Rivers: Cumulative/mainstem
 Mainstem: Olifants
 Node: R13
 Data source: Extrapolated from preliminary (2006) signed-off Reserve data
 Adjustments: None
 Target condition: D (PES = E).

Desktop Version 2, Generated on 11/02/2013
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 505.716
 S.Dev. = 204.783
 CV = 0.405
 Q75 = 2.790
 Q75/MMF = 0.066
 BFI Index = 0.320
 CV(JJA+JFM) Index = 2.065

Ecological Category = D

Total IFR = 47.137 (9.32 %MAR)
 Maint. Lowflow = 17.324 (3.43 %MAR)
 Drought Lowflow = 17.324 (3.43 %MAR)
 Maint. Highflow = 29.813 (5.90 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Cape(wet)

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	37.386	14.516	0.388	2.395	2.395	0.000	2.395
Nov	16.588	10.009	0.603	0.515	0.515	0.000	0.515
Dec	4.949	5.011	1.012	0.532	0.532	0.000	0.532
Jan	1.215	1.683	1.385	0.532	0.532	0.000	0.532
Feb	0.930	1.383	1.488	0.480	0.480	0.000	0.480
Mar	2.331	3.046	1.307	0.532	0.532	0.000	0.532
Apr	10.539	14.981	1.421	0.515	0.515	0.000	0.515
May	40.418	45.233	1.119	2.395	2.395	2.982	5.377
Jun	98.692	84.969	0.861	2.318	2.318	2.982	5.300
Jul	115.029	73.768	0.641	2.395	2.395	11.925	14.320
Aug	108.961	55.962	0.514	2.395	2.395	11.925	14.320
Sep	68.680	26.296	0.383	2.318	2.318	0.000	2.318

A.3 Secondary E2

A.3.1 E21A

A.3.1.1 Cumulative and Incremental .tab

IUA: Kouebokkeveld
Tributary Rivers: Kruis and Sand
Mainstem: Kruis
Node: R48
Data source: DWA 2012, default desktop reserve
Adjustments: 60% of natural floods assumed for July, August and September (reflected below)
Target condition: C (Kruis PES = D, Sand PES=C, Kruis downstream of confluence PES=E)

CONSTRUCTED

Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :

Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 39.425
S.Dev. = 19.766
CV = 0.501
Q75 = 0.196
Q75/MMF = 0.060
BFI Index = 0.273
CV(JJA+JFM) Index = 3.174

Ecological Category = C

Total IFR = 16.549 (41.98 %MAR)
Maint. Lowflow = 3.522 (8.93 %MAR)
Drought Lowflow = 1.087 (2.76 %MAR)
Maint. Highflow = 13.025 (33.04 %MAR)

Monthly Distributions (Mill. cu. m.)

Distribution Type : W.Cape(dry)

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	3.075	1.871	0.609	0.433	0.181	0.315	0.748
Nov	1.633	1.757	1.076	0.330	0.138	0.094	0.424
Dec	0.598	0.998	1.667	0.153	0.065	0.000	0.153
Jan	0.202	0.321	1.590	0.062	0.021	0.000	0.062
Feb	0.242	0.796	3.284	0.040	0.000	0.000	0.040
Mar	0.309	0.698	2.259	0.037	0.000	0.000	0.037
Apr	1.066	2.062	1.934	0.079	0.000	0.000	0.079
May	3.822	4.774	1.249	0.239	0.010	0.561	0.800
Jun	7.365	6.358	0.863	0.464	0.062	1.075	1.539
Jul	8.288	6.749	0.814	0.571	0.144	4.402	4.973
Aug	7.581	5.385	0.710	0.595	0.248	3.954	4.549
Sep	5.242	3.047	0.581	0.521	0.218	2.624	3.145

A.3.2 E21B

A.3.2.1 Cumulative and Incremental .tab

IUA: Kouebokkeveld
 Tributary Rivers: Welgemoed
 Mainstem: Welgemoed
 Node: R49
 Data source: DWA 2012, default desktop reserve
 Adjustments: 60% of natural floods assumed for July, August and September (reflected below)
 Target condition: D (PES = D).

CONSTRUCTED

Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 1.230
 S.Dev. = 2.241
 CV = 1.821
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.207
 CV(JJA+JFM) Index = 8.235

Ecological Category = D

Total IFR = 0.29 (23.56 %MAR)
 Maint. Lowflow = 0.012 (0.99 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 0.277 (22.5 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Cape(dry)

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.023	0.081	3.461	0.000	0.000	0.003	0.003
Nov	0.058	0.188	3.240	0.001	0.000	0.006	0.007
Dec	0.047	0.138	2.939	0.001	0.000	0.000	0.001
Jan	0.093	0.693	7.469	0.001	0.000	0.000	0.001
Feb	0.056	0.258	4.644	0.001	0.000	0.000	0.001
Mar	0.034	0.107	3.175	0.000	0.000	0.000	0.000
Apr	0.117	0.407	3.470	0.001	0.000	0.000	0.001
May	0.119	0.307	2.578	0.001	0.000	0.015	0.016
Jun	0.321	1.203	3.747	0.003	0.000	0.040	0.043
Jul	0.231	0.664	2.882	0.002	0.000	0.136	0.138
Aug	0.102	0.285	2.789	0.001	0.000	0.060	0.061
Sep	0.030	0.080	2.678	0.001	0.000	0.017	0.018

A.3.3 E21C

A.3.3.1 Incremental .tab

IUA: Kouebokkeveld
 Tributary Rivers: Driedam se
 Mainstem: Winkelhaak
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: 60% of natural floods assumed for July, August and September (reflected below)
 Target condition: B (PES = B)

CONSTRUCTED

Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 1.284
 S.Dev. = 2.342
 CV = 1.824
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.207
 CV(JJA+JFM) Index = 8.250

Ecological Category = B

Total IFR = 0.42 (32.71 %MAR)
 Maint. Lowflow = 0.130 (10.11 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 0.288 (22.43 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Cape(dry)

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.024	0.084	3.482	0.003	0.000	0.004	0.008
Nov	0.060	0.196	3.240	0.006	0.000	0.010	0.016
Dec	0.049	0.144	2.950	0.005	0.000	0.000	0.005
Jan	0.097	0.724	7.468	0.009	0.000	0.000	0.009
Feb	0.058	0.269	4.674	0.007	0.000	0.000	0.007
Mar	0.035	0.112	3.183	0.004	0.000	0.000	0.004
Apr	0.122	0.425	3.477	0.011	0.000	0.000	0.011
May	0.125	0.321	2.577	0.012	0.000	0.024	0.037
Jun	0.336	1.257	3.742	0.030	0.000	0.067	0.097
Jul	0.241	0.695	2.886	0.025	0.000	0.119	0.144
Aug	0.106	0.298	2.797	0.013	0.000	0.051	0.064
Sep	0.031	0.083	2.709	0.005	0.000	0.013	0.018

A.3.3.2 Cumulative .tab

IUA: Kouebokkeveld
 Tributary Rivers: Driedam se
 Mainstem: Winkelhaak
 Node: R46
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: C (PES = D) – additional water required for downstream nodes.

Desktop Version 2, Generated on 2011/08/04
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 41.939
 S.Dev. = 22.220
 CV = 0.530
 Q75 = 0.216
 Q75/MMF = 0.062
 BFI Index = 0.275
 CV(JJA+JFM) Index = 3.840

Ecological Category = C

Total IFR = 8.168 (19.48 %MAR)
 Maint. Lowflow = 3.459 (8.25 %MAR)
 Drought Lowflow = 1.004 (2.39 %MAR)
 Maint. Highflow = 4.709 (11.23 %MAR)

Monthly Distributions (Mill. cu. m.)

Distribution Type : W.Cape(dry)

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	3.123	1.900	0.609	0.411	0.162	0.324	0.735
Nov	1.752	2.005	1.144	0.317	0.125	0.107	0.424
Dec	0.694	1.105	1.591	0.155	0.062	0.000	0.155
Jan	0.391	1.596	4.076	0.074	0.021	0.000	0.074
Feb	0.356	0.994	2.797	0.049	0.000	0.000	0.049
Mar	0.378	0.766	2.025	0.041	0.000	0.000	0.041
Apr	1.306	2.446	1.873	0.088	0.000	0.000	0.088
May	4.066	5.215	1.282	0.236	0.010	0.610	0.846
Jun	8.022	8.008	0.998	0.464	0.062	1.200	1.664
Jul	8.760	7.732	0.883	0.558	0.144	1.599	2.157
Aug	7.790	5.772	0.741	0.569	0.223	0.290	0.859
Sep	5.303	3.132	0.591	0.495	0.195	0.579	1.075

A.3.4 E21D

A.3.4.1 Cumulative and Incremental .tab

IUA: Kouebokkeveld
Tributary Rivers: Houdenbeks
Mainstem: Houdenbeks
Node: R45
Data source: DWA 2012, default desktop reserve
Adjustments: 40% of natural floods assumed for July, August and September (reflected below)
Target condition: D (PES = D).

CONSTRUCTED

Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 50.217
S.Dev. = 25.174
CV = 0.501
Q75 = 0.247
Q75/MMF = 0.059
BFI Index = 0.274
CV(JJA+JFM) Index = 3.176

Ecological Category = D

Total IFR = 13.922 (27.72 %MAR)
Maint. Lowflow = 1.884 (3.75 %MAR)
Drought Lowflow = 1.392 (2.77 %MAR)
Maint. Highflow = 12.037 (23.97 %MAR)

Monthly Distributions (Mill. cu. m.)
Distribution Type : W.Cape(dry)

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	3.916	2.383	0.609	0.231	0.231	0.336	0.566
Nov	2.080	2.237	1.075	0.176	0.176	0.100	0.276
Dec	0.763	1.271	1.665	0.083	0.083	0.000	0.083
Jan	0.257	0.409	1.592	0.035	0.021	0.000	0.035
Feb	0.308	1.014	3.293	0.023	0.000	0.000	0.023
Mar	0.394	0.888	2.255	0.021	0.000	0.000	0.021
Apr	1.358	2.626	1.934	0.044	0.000	0.000	0.044
May	4.869	6.080	1.249	0.128	0.021	0.597	0.726
Jun	9.381	8.098	0.863	0.247	0.082	1.145	1.392
Jul	10.558	8.596	0.814	0.304	0.185	3.919	4.223
Aug	9.656	6.859	0.710	0.316	0.316	3.546	3.862
Sep	6.677	3.881	0.581	0.277	0.277	2.394	2.671

A.3.5 E21E

A.3.5.1 Incremental .tab

IUA: Kouebokkeveld
 Tributary Rivers: Two no-name tributaries. Tributary South = FEPA
 Mainstem: Riet (FEPA)
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: 80% of natural floods assumed for July, August and September (reflected below)
 Target condition: B (PES: Tributary North = D; Tributary South = A/B).

CONSTRUCTED

Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 1.616
 S.Dev. = 2.944
 CV = 1.822
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.207
 CV(JJA+JFM) Index = 8.234

Ecological Category = B

Total IFR = 0.623 (38.55 %MAR)
 Maint. Lowflow = 0.163 (10.12 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 0.459 (28.4 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Cape(dry)

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.031	0.106	3.474	0.004	0.000	0.006	0.010
Nov	0.076	0.247	3.234	0.007	0.000	0.013	0.020
Dec	0.062	0.181	2.928	0.007	0.000	0.000	0.007
Jan	0.122	0.910	7.452	0.011	0.000	0.000	0.011
Feb	0.072	0.338	4.672	0.008	0.000	0.000	0.008
Mar	0.045	0.141	3.173	0.005	0.000	0.000	0.005
Apr	0.153	0.535	3.489	0.014	0.000	0.000	0.014
May	0.156	0.403	2.578	0.015	0.000	0.031	0.046
Jun	0.423	1.581	3.742	0.038	0.000	0.084	0.122
Jul	0.303	0.874	2.884	0.032	0.000	0.210	0.242
Aug	0.134	0.373	2.781	0.016	0.000	0.091	0.107
Sep	0.039	0.105	2.705	0.007	0.000	0.024	0.031

A.3.5.2 Cumulative .tab

IUA: Kouebokkeveld
 Tributary Rivers: Two no-name tributaries. Tributary South = FEPA
 Mainstem: Riet (FEPA)
 Node: R43
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: B (PES = B).

Desktop Version 2, Generated on 2011/08/05
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 93.772
 S.Dev. = 48.813
 CV = 0.521
 Q75 = 0.484
 Q75/MMF = 0.062
 BFI Index = 0.275
 CV(JJA+JFM) Index = 3.670

Ecological Category = B

Total IFR = 27.314 (29.13 %MAR)
 Maint. Lowflow = 13.897 (14.82 %MAR)
 Drought Lowflow = 2.333 (2.49 %MAR)
 Maint. Highflow = 13.416 (14.31 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Cape(dry)

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	7.069	4.299	0.608	1.673	0.378	0.936	2.608
Nov	3.908	4.390	1.123	1.283	0.291	0.301	1.584
Dec	1.519	2.429	1.599	0.615	0.143	0.000	0.615
Jan	0.771	2.753	3.572	0.276	0.042	0.000	0.276
Feb	0.736	2.077	2.822	0.177	0.000	0.000	0.177
Mar	0.816	1.684	2.063	0.151	0.000	0.000	0.151
Apr	2.817	5.265	1.869	0.335	0.000	0.000	0.335
May	9.091	11.569	1.273	0.944	0.031	1.739	2.684
Jun	17.825	17.066	0.957	1.861	0.144	3.398	5.259
Jul	19.620	16.934	0.863	2.254	0.329	4.549	6.804
Aug	17.580	12.871	0.732	2.313	0.521	0.831	3.144
Sep	12.018	7.066	0.588	2.014	0.454	1.662	3.676

A.3.6 E21F

A.3.6.1 Incremental .tab

IUA: Kouebokkeveld
 Tributary Rivers: Two no-name tributaries
 Mainstem: Riet
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: 80% of natural floods assumed for July, August and September (reflected below)
 Target condition: B (PES: Tributary North = D; Tributary South = B).

CONSTRUCTED

Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 2.091
 S.Dev. = 3.809
 CV = 1.822
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.207
 CV(JJA+JFM) Index = 8.229

Ecological Category = B

Total IFR = 0.848 (40.52 %MAR)
 Maint. Lowflow = 0.279 (13.32 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 0.571 (27.28 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Cape(dry)

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.040	0.137	3.464	0.007	0.000	0.007	0.014
Nov	0.099	0.319	3.238	0.013	0.000	0.016	0.029
Dec	0.080	0.234	2.932	0.011	0.000	0.000	0.011
Jan	0.158	1.176	7.454	0.019	0.000	0.000	0.019
Feb	0.094	0.438	4.664	0.014	0.000	0.000	0.014
Mar	0.058	0.182	3.164	0.008	0.000	0.000	0.008
Apr	0.199	0.692	3.479	0.023	0.000	0.000	0.023
May	0.202	0.521	2.583	0.026	0.000	0.040	0.065
Jun	0.547	2.045	3.741	0.064	0.000	0.109	0.173
Jul	0.392	1.131	2.886	0.054	0.000	0.259	0.313
Aug	0.174	0.484	2.779	0.028	0.000	0.111	0.139
Sep	0.050	0.136	2.718	0.011	0.000	0.029	0.040

A.3.6.2 Cumulative .tab

IUA: Kouebokkeveld
 Tributary Rivers: Two no name tributaries
 Mainstem: Riet
 Node: R39
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: B (PES = A/B).

Desktop Version 2, Generated on 2011/09/20
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 95.862
 S.Dev. = 51.085
 CV = 0.533
 Q75 = 0.484
 Q75/MMF = 0.061
 BFI Index = 0.323
 CV(JJA+JFM) Index = 3.889

Ecological Category = B

Total IFR = 20.821 (21.72 %MAR)
 Maint. Lowflow = 8.332 (8.69 %MAR)
 Drought Lowflow = 2.691 (2.81 %MAR)
 Maint. Highflow = 12.489 (13.03 %MAR)

Monthly Distributions (Mill. cu. m.)

Distribution Type : W.Cape(wet)

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	7.109	4.328	0.609	1.077	0.474	0.704	1.781
Nov	4.007	4.611	1.151	0.764	0.338	0.223	0.987
Dec	1.599	2.539	1.588	0.349	0.157	0.000	0.349
Jan	0.929	3.907	4.208	0.168	0.042	0.000	0.168
Feb	0.830	2.325	2.802	0.117	0.000	0.000	0.117
Mar	0.874	1.760	2.013	0.100	0.000	0.000	0.100
Apr	3.016	5.661	1.877	0.202	0.000	0.000	0.202
May	9.293	11.948	1.286	0.525	0.031	1.702	2.226
Jun	18.372	18.583	1.011	1.045	0.144	3.333	4.378
Jul	20.012	17.791	0.889	1.309	0.329	4.297	5.606
Aug	17.754	13.203	0.744	1.398	0.614	0.743	2.141
Sep	12.069	7.139	0.592	1.278	0.562	1.487	2.765

A.3.7 E21G

A.3.7.1 Cumulative and Incremental .tab

IUA: Kouebokkeveld
 Tributary Rivers: Lang
 Mainstem: Leeu
 Node: R41
 Data source: DWA 2012, default desktop reserve
 Adjustments: 60% of natural floods assumed for July, August and September (reflected below)
 Target condition: D (PES = D).

CONSTRUCTED

Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 55.220
 S.Dev. = 27.676
 CV = 0.501
 Q75 = 0.278
 Q75/MMF = 0.060
 BFI Index = 0.322
 CV(JJA+JFM) Index = 3.171

Ecological Category = D

Total IFR = 21.288 (38.55 %MAR)
 Maint. Lowflow = 2.332 (4.22 %MAR)
 Drought Lowflow = 1.743 (3.16 %MAR)
 Maint. Highflow = 18.955 (34.33 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Cape(wet)

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	4.311	2.621	0.608	0.313	0.313	0.299	0.612
Nov	2.294	2.460	1.072	0.221	0.221	0.079	0.300
Dec	0.843	1.398	1.658	0.094	0.094	0.000	0.094
Jan	0.284	0.450	1.584	0.041	0.031	0.000	0.041
Feb	0.339	1.114	3.285	0.028	0.000	0.000	0.028
Mar	0.433	0.978	2.257	0.027	0.000	0.000	0.027
Apr	1.493	2.887	1.934	0.051	0.000	0.000	0.051
May	5.353	6.683	1.249	0.146	0.021	0.678	0.824
Jun	10.311	8.901	0.863	0.284	0.093	1.291	1.575
Jul	11.606	9.449	0.814	0.364	0.206	6.600	6.964
Aug	10.615	7.539	0.710	0.396	0.396	5.973	6.369
Sep	7.339	4.266	0.581	0.368	0.368	4.035	4.403

A.3.8 Twee EWR Site (A1) in E21H

A.3.8.1 *Incremental .tab*

IUA: Kouebokkeveld
 Tributary Rivers: Suurvlei and Middeldeer
 Mainstem: Twee (FEPA)
 Node: A1
 Data source: CAPE project (Southern Waters, 2009)
 Adjustments: 80% of natural floods assumed for July, August and September (reflected below)
 Target condition: B (PES = A/B).

CONSTRUCTED

Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :

Total Runoff : twee-

Annual Flows (Mill. cu. m or index values):

MAR = 55.055
 S.Dev. = 25.758
 CV = 0.468
 Q75 = 0.616
 Q75/MMF = 0.134
 BFI Index = 0.350
 CV(JJA+JFM) Index = 2.335

Ecological Category = B

Total IFR = 38.655 (70.21 %MAR)
 Maint. Lowflow = 24.196 (43.95 %MAR)
 Drought Lowflow = 1.800 (3.27 %MAR)
 Maint. Highflow = 14.458 (26.26 %MAR)

Monthly Distributions (Mill. cu. m.)

Distribution Type : W.Cape(wet)

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	3.704	2.845	0.768	1.799	0.130	0.359	2.158
Nov	2.296	3.207	1.396	0.974	0.000	0.156	1.130
Dec	1.171	1.217	1.039	0.325	0.000	0.000	0.325
Jan	0.867	1.469	1.694	0.325	0.000	0.000	0.325
Feb	1.044	1.592	1.525	0.649	0.000	0.000	0.649
Mar	0.922	1.164	1.262	0.974	0.000	0.000	0.974
Apr	2.369	2.978	1.257	1.623	0.000	0.000	1.623
May	6.923	8.588	1.241	2.597	0.250	1.758	4.355
Jun	9.588	8.905	0.929	3.895	0.341	2.286	6.181
Jul	9.816	7.044	0.718	3.895	0.269	3.958	7.853
Aug	10.811	9.481	0.877	3.895	0.442	4.753	8.648
Sep	5.543	3.745	0.676	3.246	0.368	1.188	4.434

A.3.9 E21H

A.3.9.1 Incremental .tab

IUA: Kouebokkeveld
 Tributary Rivers: Twee (FEPA) (from Middeldeur (FEPA) and Suurvlei (FEPA)) plus one with no name
 Mainstem: Leeu, FEPA downstream of Twee confluence
 Node: -
 Data source: Extrapolated from A1, CAPE project (Southern Waters, 2009)
 Adjustments: 60% of natural floods assumed for July, August and September (reflected below)
 Target condition: B (PES: A/B).

CONSTRUCTED (subtracting A1 from E21J incremental and adding floods)
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 29.782
 S.Dev. = 41.961
 CV = 0.503
 Q75 = 0.402
 Q75/MMF = 0.058
 BFI Index = 0.322
 CV(JJA+JFM) Index = 3.183

Ecological Category = B

Total IFR = 20.264 (68.04 %MAR)
 Maint. Lowflow = 12.497 (41.96 %MAR)
 Drought Lowflow = 0.931 (3.13 %MAR)
 Maint. Highflow = 7.767 (26.08 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Cape(wet)

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	2.774	3.969	0.613	0.929	0.067	0.185	1.114
Nov	1.145	3.732	1.085	0.503	0.000	0.080	0.583
Dec	0.091	2.119	1.679	0.167	0.000	0.000	0.167
Jan	0.000	0.682	1.601	0.167	0.000	0.000	0.167
Feb	0.000	1.692	3.295	0.336	0.000	0.000	0.336
Mar	0.000	1.483	2.259	0.503	0.000	0.000	0.503
Apr	0.000	4.384	1.936	0.838	0.000	0.000	0.838
May	1.200	10.149	1.249	1.341	0.130	0.908	2.249
Jun	6.050	13.515	0.864	2.012	0.176	1.181	3.193
Jul	7.762	14.339	0.816	2.012	0.140	2.645	4.657
Aug	5.237	11.436	0.713	2.012	0.228	1.131	3.143
Sep	5.523	6.468	0.584	1.677	0.190	1.637	3.314

A.3.9.2 Cumulative .tab

IUA: Kouebokkeveld
 Tributary Rivers: Twee (FEPA) (from Middeldeer (FEPA) and Suurvlei (FEPA)) plus one with no name
 Mainstem: Leeu, FEPA downstream of Twee confluence
 Node: -
 Data source: Extrapolated from A1, CAPE project (Southern Waters, 2009)
 Adjustments: 60% of natural floods assumed for July, August and September (reflected below)
 Target condition: B (PES = A/B).

E21H Cumulative B(60%)

CONSTRUCTED

Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :

Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 138.715
 S.Dev. = 69.637
 CV = 0.502
 Q75 = 0.680
 Q75/MMF = 0.059
 BFI Index = 0.322
 CV(JJA+JFM) Index = 3.178

Ecological Category = B

Total IFR = 89.194 (64.3 %MAR)
 Maint. Lowflow = 60.964 (43.95 %MAR)
 Drought Lowflow = 4.534 (3.27 %MAR)
 Maint. Highflow = 28.231 (20.35 %MAR)

Monthly Distributions (Mill. cu. m.)

Distribution Type : W.Cape(wet)

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	10.789	6.590	0.611	4.533	0.327	0.904	5.437
Nov	5.735	6.192	1.080	2.454	0.000	0.392	2.846
Dec	2.105	3.517	1.671	0.818	0.000	0.000	0.818
Jan	0.710	1.132	1.594	0.818	0.000	0.000	0.818
Feb	0.853	2.806	3.291	1.636	0.000	0.000	1.636
Mar	1.090	2.460	2.258	2.454	0.000	0.000	2.454
Apr	3.757	7.271	1.935	4.088	0.000	0.000	4.088
May	13.475	16.833	1.249	6.542	0.631	4.430	10.972
Jun	25.949	22.416	0.864	9.814	0.858	5.759	15.573
Jul	29.184	23.788	0.815	9.814	0.679	7.697	17.511
Aug	26.663	18.975	0.712	9.814	1.112	6.184	15.998
Sep	18.405	10.734	0.583	8.178	0.928	2.865	11.043

A.3.10 E21J

A.3.10.1 Incremental .tab

IUA: Kouebokkeveld
 Tributary Rivers: Brandkraals (FEPA), Riet and one with no name (FEPA)
 Mainstem: Groot (FEPA)
 Node: R38
 Data source: Extrapolated from A1, CAPE project (Southern Waters, 2009)
 Adjustments: None
 Target condition: B (Brandkraals PES = B, Riet PES= A/B, no name PES = A/B).

Desktop Version 2, Generated on 18/02/2013
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 1.747
 S.Dev. = 3.186
 CV = 1.823
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.232
 CV(JJA+JFM) Index = 8.246

Ecological Category = B

Total IFR = 1.055 (60.37 %MAR)
 Maint. Lowflow = 0.768 (43.95 %MAR)
 Drought Lowflow = 0.057 (3.27 %MAR)
 Maint. Highflow = 0.287 (16.42 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Cape(wet)

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.033	0.115	3.490	0.057	0.004	0.011	0.068
Nov	0.082	0.266	3.239	0.031	0.000	0.005	0.036
Dec	0.067	0.196	2.938	0.010	0.000	0.000	0.010
Jan	0.132	0.984	7.468	0.010	0.000	0.000	0.010
Feb	0.078	0.366	4.668	0.021	0.000	0.000	0.021
Mar	0.048	0.153	3.189	0.031	0.000	0.000	0.031
Apr	0.166	0.579	3.485	0.052	0.000	0.000	0.052
May	0.170	0.437	2.574	0.082	0.008	0.056	0.138
Jun	0.457	1.710	3.741	0.124	0.011	0.073	0.196
Jul	0.327	0.946	2.888	0.124	0.009	0.094	0.218
Aug	0.145	0.404	2.784	0.124	0.014	0.016	0.140
Sep	0.042	0.114	2.706	0.103	0.012	0.032	0.135

A.3.10.2 Cumulative .tab

IUA: Kouebokkeveld
 Tributary Rivers: Brandkraals (FEPA), Riet and one with no name (FEPA)
 Mainstem: Groot (FEPA)
 Node: R38
 Data source: Extrapolated from DWAF 2005, EWR6 (E21J)
 Adjustments: 80% of natural floods assumed for July, August and September (reflected below)
 Target condition: B (PES = B).

E21J Cumulative B/C(80%)

CONSTRUCTED

Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :

Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 140.463
 S.Dev. = 71.137
 CV = 0.506
 Q75 = 0.700
 Q75/MMF = 0.060
 BFI Index = 0.323
 CV(JJA+JFM) Index = 3.287

Ecological Category = B/C

Total IFR = 71.144 (50.65 %MAR)
 Maint. Lowflow = 25.783 (18.36 %MAR)
 Drought Lowflow = 3.260 (2.32 %MAR)
 Maint. Highflow = 45.361 (32.29 %MAR)

Monthly Distributions (Mill. cu. m.)

Distribution Type : W.Cape(wet)

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	10.822	6.607	0.611	1.979	0.109	1.018	2.997
Nov	5.818	6.351	1.092	0.475	0.026	0.000	0.475
Dec	2.172	3.572	1.645	0.109	0.003	0.000	0.109
Jan	0.842	1.822	2.165	0.030	0.003	0.000	0.030
Feb	0.931	2.862	3.075	0.025	0.002	0.000	0.025
Mar	1.138	2.490	2.189	0.055	0.003	0.000	0.055
Apr	3.923	7.466	1.903	0.158	0.003	1.018	1.176
May	13.645	17.128	1.255	0.627	0.027	1.018	1.645
Jun	26.406	23.424	0.887	2.783	0.106	2.036	4.819
Jul	29.512	24.436	0.828	5.485	0.409	18.124	23.609
Aug	26.808	19.233	0.717	8.179	1.145	13.267	21.446
Sep	18.447	10.792	0.585	5.878	1.425	8.880	14.758

A.3.11 E21K

A.3.11.1 Cumulative and Incremental .tab

IUA: Kouebokkeveld
 Tributary Rivers: Matjies (FEPA)
 Mainstem: Matjies (FEPA)
 Node: -
 Data source: Extrapolated from A1, CAPE project (Southern Waters, 2009)
 Adjustments: 80% of natural floods assumed for July, August and September (reflected below)
 Target condition: B (PES = B).

CONSTRUCTED

Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 1.819
 S.Dev. = 3.317
 CV = 1.823
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.232
 CV(JJA+JFM) Index = 8.242

Ecological Category = B

Total IFR = 1.144 (62.86 %MAR)
 Maint. Lowflow = 0.800 (43.95 %MAR)
 Drought Lowflow = 0.059 (3.27 %MAR)
 Maint. Highflow = 0.345 (18.96 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Cape(wet)

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.034	0.120	3.503	0.059	0.004	0.012	0.071
Nov	0.086	0.278	3.229	0.032	0.000	0.005	0.037
Dec	0.069	0.203	2.928	0.011	0.000	0.000	0.011
Jan	0.138	1.025	7.450	0.011	0.000	0.000	0.011
Feb	0.082	0.381	4.662	0.021	0.000	0.000	0.021
Mar	0.050	0.159	3.202	0.032	0.000	0.000	0.032
Apr	0.173	0.602	3.488	0.054	0.000	0.000	0.054
May	0.176	0.455	2.575	0.086	0.008	0.058	0.144
Jun	0.476	1.781	3.744	0.129	0.011	0.076	0.204
Jul	0.341	0.984	2.884	0.129	0.009	0.144	0.273
Aug	0.151	0.421	2.785	0.129	0.015	0.016	0.145
Sep	0.044	0.118	2.712	0.107	0.012	0.034	0.141

A.3.12 E21L

A.3.12.1 Incremental .tab

IUA: Kouebokkeveld
 Tributary Rivers: Matjies (FEPA) and one with no name (FEPA)
 Mainstem: Groot (FEPA)
 Node: -
 Data source: Extrapolated from EWR 6 (DWAF 2005)
 Adjustments: 80% of natural floods assumed for July, August and September (reflected below)
 Target condition: B (PES: Matjies = B; no name = A/B).

E21L Incremental B(80%)

CONSTRUCTED

Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :

Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 1.076
 S.Dev. = 1.959
 CV = 1.822
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.232
 CV(JJA+JFM) Index = 8.256

Ecological Category = B

Total IFR = 0.536 (49.86 %MAR)
 Maint. Lowflow = 0.197 (18.36 %MAR)
 Drought Lowflow = 0.025 (2.32 %MAR)
 Maint. Highflow = 0.339 (31.53 %MAR)

Monthly Distributions (Mill. cu. m.)

Distribution Type : W.Cape(wet)

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.021	0.071	3.451	0.015	0.001	0.008	0.023
Nov	0.051	0.164	3.228	0.004	0.000	0.000	0.004
Dec	0.041	0.120	2.926	0.001	0.000	0.000	0.001
Jan	0.081	0.605	7.467	0.000	0.000	0.000	0.000
Feb	0.048	0.225	4.670	0.000	0.000	0.000	0.000
Mar	0.029	0.094	3.212	0.000	0.000	0.000	0.000
Apr	0.102	0.356	3.478	0.001	0.000	0.008	0.009
May	0.104	0.269	2.577	0.005	0.000	0.008	0.013
Jun	0.281	1.052	3.745	0.021	0.001	0.016	0.037
Jul	0.202	0.581	2.882	0.042	0.003	0.120	0.162
Aug	0.089	0.249	2.792	0.063	0.009	0.132	0.195
Sep	0.026	0.070	2.661	0.045	0.011	0.047	0.092

A.3.12.2 Cumulative .tab

IUA: Kouebokkeveld
 Tributary Rivers: Matjies (FEPA) and one with no name (FEPA)
 Mainstem: Groot (FEPA)
 Node: R37
 Data source: Extrapolated from EWR 6 (DWAF 2005)
 Adjustments: 80% of natural floods assumed for July, August and September (reflected below)
 Target condition: B (PES = B).

CONSTRUCTED

Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : R

Annual Flows (Mill. cu. m or index values):

MAR = 239.220
 S.Dev. = 124.804
 CV = 0.522
 Q75 = 1.226
 Q75/MMF = 0.061
 BFI Index = 0.323
 CV(JJA+JFM) Index = 3.686

Ecological Category = B

Total IFR = 1119.659 (50.02 %MAR)
 Maint. Lowflow = 43.910 (18.36 %MAR)
 Drought Lowflow = 5.552 (2.32 %MAR)
 Maint. Highflow = 75.747 (31.66 %MAR)

Monthly Distributions (Mill. cu. m.)

Distribution Type : W.Cape(wet)

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	17.985	10.962	0.610	3.371	0.186	1.733	5.104
Nov	9.961	11.232	1.128	0.809	0.045	0.000	0.809
Dec	3.881	6.210	1.600	0.186	0.005	0.000	0.186
Jan	1.989	7.200	3.620	0.051	0.005	0.000	0.051
Feb	1.891	5.330	2.819	0.042	0.004	0.000	0.042
Mar	2.091	4.307	2.060	0.093	0.005	0.000	0.093
Apr	7.214	13.488	1.870	0.270	0.004	1.733	2.003
May	23.219	29.569	1.273	1.068	0.046	1.733	2.801
Jun	45.535	43.759	0.961	4.740	0.180	3.467	8.207
Jul	50.066	43.318	0.865	9.342	0.696	30.711	40.053
Aug	44.803	32.869	0.734	13.929	1.950	21.913	35.842
Sep	30.586	18.026	0.589	10.011	2.426	14.457	24.468

A.3.13 E22A

A.3.13.1 Cumulative and Incremental .tab

IUA: Doring rangelands
 Tributary Rivers: Patats, and three with no name
 Mainstem: Groot
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: 80% of natural floods assumed for July, August and September (reflected below)
 Target condition: A/B (PES = A/B).

CONSTRUCTED

Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 4.138
 S.Dev. = 7.537
 CV = 1.821
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.170
 CV(JJA+JFM) Index = 8.231

Ecological Category = A/B

Total IFR = 1.966 (47.5 %MAR)
 Maint. Lowflow = 0.508 (12.27 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 1.458 (35.23 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	
				Maint.	Drought	Maint.	Total Flows
Oct	0.079	0.272	3.442	0.011	0.000	0.000	0.011
Nov	0.195	0.631	3.236	0.024	0.000	0.038	0.062
Dec	0.158	0.462	2.930	0.020	0.000	0.031	0.051
Jan	0.312	2.328	7.470	0.037	0.000	0.000	0.037
Feb	0.186	0.866	4.650	0.024	0.000	0.000	0.024
Mar	0.114	0.360	3.170	0.015	0.000	0.000	0.015
Apr	0.393	1.369	3.480	0.047	0.000	0.078	0.125
May	0.401	1.032	2.575	0.048	0.000	0.089	0.137
Jun	1.083	4.047	3.738	0.127	0.000	0.403	0.530
Jul	0.775	2.236	2.883	0.095	0.000	0.525	0.620
Aug	0.344	0.956	2.782	0.045	0.000	0.230	0.275
Sep	0.099	0.268	2.710	0.015	0.000	0.064	0.079

A.3.14 E22B

A.3.14.1 Incremental .tab

IUA: Doring rangelands
 Tributary Rivers: Muishond, Smitswinkel and Adamskraal (FEPA)
 Mainstem: Groot
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: A/B (PES = A/B).

Desktop Version 2, Generated on 2011/08/05
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 3.522
 S.Dev. = 6.410
 CV = 1.820
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.170
 CV(JJA+JFM) Index = 8.225

Ecological Category = A/B

Total IFR = 1.124 (31.93 %MAR)
 Maint. Lowflow = 0.432 (12.27 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 0.692 (19.66 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.067	0.231	3.465	0.010	0.000	0.000	0.010
Nov	0.166	0.537	3.239	0.020	0.000	0.033	0.053
Dec	0.134	0.393	2.932	0.017	0.000	0.026	0.043
Jan	0.266	1.981	7.459	0.032	0.000	0.000	0.032
Feb	0.159	0.736	4.644	0.020	0.000	0.000	0.020
Mar	0.097	0.307	3.169	0.013	0.000	0.000	0.013
Apr	0.335	1.165	3.475	0.040	0.000	0.066	0.106
May	0.341	0.878	2.573	0.041	0.000	0.076	0.117
Jun	0.920	3.443	3.741	0.108	0.000	0.342	0.451
Jul	0.660	1.903	2.882	0.080	0.000	0.076	0.156
Aug	0.293	0.814	2.780	0.039	0.000	0.057	0.095
Sep	0.085	0.228	2.695	0.013	0.000	0.016	0.029

A.3.14.2 Cumulative .tab

IUA: Doring rangelands
 Tributary Rivers: Muishond, Smitswinkel and Adamskraal (FEPA)
 Mainstem: Groot
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: 80% of natural floods assumed for July, August and September (reflected below)
 Target condition: B (PES = B).

E22B Cumulative B(80%)

CONSTRUCTED

Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :

Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 7.660
 S.Dev. = 13.947
 CV = 1.821
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.170
 CV(JJA+JFM) Index = 8.228

Ecological Category = B

Total IFR = 3.302 (43.1 %MAR)
 Maint. Lowflow = 0.729 (9.52 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 2.573 (33.59 %MAR)

Monthly Distributions (Mill. cu. m.)

Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.146	0.502	3.452	0.017	0.000	0.000	0.017
Nov	0.361	1.168	3.237	0.035	0.000	0.060	0.094
Dec	0.292	0.855	2.931	0.029	0.000	0.048	0.077
Jan	0.577	4.309	7.465	0.054	0.000	0.000	0.054
Feb	0.345	1.602	4.647	0.034	0.000	0.000	0.034
Mar	0.210	0.667	3.170	0.022	0.000	0.000	0.022
Apr	0.729	2.534	3.477	0.067	0.000	0.121	0.188
May	0.742	1.910	2.574	0.069	0.000	0.138	0.207
Jun	2.003	7.489	3.740	0.181	0.000	0.624	0.805
Jul	1.436	4.139	2.883	0.135	0.000	1.013	1.148
Aug	0.636	1.770	2.781	0.065	0.000	0.444	0.509
Sep	0.184	0.496	2.703	0.022	0.000	0.125	0.147

A.3.15 E22C

A.3.15.1 Cumulative and Incremental .tab

IUA: Doring rangelands
 Tributary Rivers: Three with no name
 Mainstem: No name
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: 80% of natural floods assumed for July, August and September (reflected below)
 Target condition: A/B (PES = C).

CONSTRUCTED

Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 2.704
 S.Dev. = 4.923
 CV = 1.821
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.170
 CV(JJA+JFM) Index = 8.229

Ecological Category = A/B

Total IFR = 1.284 (47.47 %MAR)
 Maint. Lowflow = 0.332 (12.27 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 0.952 (35.19 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.052	0.177	3.425	0.007	0.000	0.000	0.007
Nov	0.127	0.412	3.235	0.016	0.000	0.025	0.041
Dec	0.103	0.302	2.924	0.013	0.000	0.020	0.033
Jan	0.204	1.521	7.468	0.024	0.000	0.000	0.024
Feb	0.121	0.565	4.657	0.015	0.000	0.000	0.015
Mar	0.075	0.236	3.163	0.010	0.000	0.000	0.010
Apr	0.257	0.895	3.475	0.031	0.000	0.051	0.081
May	0.262	0.674	2.577	0.031	0.000	0.058	0.090
Jun	0.707	2.643	3.741	0.083	0.000	0.263	0.346
Jul	0.507	1.461	2.883	0.062	0.000	0.343	0.405
Aug	0.225	0.625	2.774	0.030	0.000	0.150	0.180
Sep	0.065	0.176	2.714	0.010	0.000	0.042	0.052

A.3.16 E22D

A.3.16.1 Incremental .tab

IUA: Doring rangelands
 Tributary Rivers: Kolkies (FEPA) (from Karee (FEPA) and no-name (FEPA)
 Mainstem: Doring (FEPA)
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: A/B (PES = A/B).

Desktop Version 2, Generated on 2011/08/05
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 2.736
 S.Dev. = 4.984
 CV = 1.822
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.170
 CV(JJA+JFM) Index = 8.232

Ecological Category = A/B

Total IFR = 0.874 (31.92 %MAR)
 Maint. Lowflow = 0.336 (12.27 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 0.538 (19.66 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.052	0.179	3.441	0.007	0.000	0.000	0.007
Nov	0.129	0.418	3.239	0.016	0.000	0.025	0.041
Dec	0.105	0.306	2.925	0.013	0.000	0.021	0.034
Jan	0.206	1.540	7.465	0.025	0.000	0.000	0.025
Feb	0.123	0.572	4.662	0.016	0.000	0.000	0.016
Mar	0.075	0.238	3.163	0.010	0.000	0.000	0.010
Apr	0.260	0.905	3.474	0.031	0.000	0.052	0.082
May	0.265	0.683	2.579	0.032	0.000	0.059	0.091
Jun	0.715	2.676	3.741	0.084	0.000	0.266	0.350
Jul	0.513	1.479	2.886	0.062	0.000	0.059	0.121
Aug	0.227	0.632	2.780	0.030	0.000	0.044	0.074
Sep	0.065	0.178	2.724	0.010	0.000	0.012	0.022

A.3.16.2 Cumulative .tab

IUA: Doring rangelands
 Tributary Rivers: Kolkies (FEPA) (from Karee (FEPA) and no-name (FEPA)
 Mainstem: Doring (FEPA)
 Node: R50
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: A/B (PES = A/B).

Desktop Version 2, Generated on 10/06/2013
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 5.440
 S.Dev. = 9.908
 CV = 1.821
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.170
 CV(JJA+JFM) Index = 8.230

Ecological Category = A/B

Total IFR = 1.737 (31.93 %MAR)
 Maint. Lowflow = 0.667 (12.27 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 1.069 (19.66 %MAR)

Monthly Distributions (Mill. cu. m.)

Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.104	0.356	3.433	0.015	0.000	0.000	0.015
Nov	0.256	0.830	3.237	0.032	0.000	0.051	0.082
Dec	0.208	0.609	2.925	0.026	0.000	0.041	0.067
Jan	0.410	3.061	7.466	0.049	0.000	0.000	0.049
Feb	0.244	1.138	4.660	0.031	0.000	0.000	0.031
Mar	0.150	0.475	3.163	0.020	0.000	0.000	0.020
Apr	0.518	1.799	3.474	0.061	0.000	0.102	0.164
May	0.526	1.357	2.578	0.063	0.000	0.117	0.180
Jun	1.422	5.319	3.741	0.167	0.000	0.529	0.696
Jul	1.019	2.940	2.885	0.124	0.000	0.117	0.241
Aug	0.453	1.257	2.777	0.060	0.000	0.088	0.147
Sep	0.130	0.353	2.719	0.019	0.000	0.025	0.044

A.3.17 E22E

A.3.17.1 Incremental .tab

IUA: Doring rangelands
 Tributary Rivers: Groot and five no-name tributaries (southernmost and two northernmost are FEPA)
 Mainstem: Doring (FEPA)
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: A/B (PES = A/B).

Desktop Version 2, Generated on 30/10/2012
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 5.588
 S.Dev. = 10.179
 CV = 1.822
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.170
 CV(JJA+JFM) Index = 8.236

Ecological Category = A/B

Total IFR = 1.784 (31.93 %MAR)
 Maint. Lowflow = 0.686 (12.27 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 1.098 (19.66 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.106	0.366	3.454	0.015	0.000	0.000	0.015
Nov	0.263	0.853	3.236	0.032	0.000	0.052	0.084
Dec	0.213	0.625	2.934	0.027	0.000	0.042	0.069
Jan	0.421	3.144	7.466	0.050	0.000	0.000	0.050
Feb	0.251	1.169	4.657	0.032	0.000	0.000	0.032
Mar	0.153	0.487	3.184	0.020	0.000	0.000	0.020
Apr	0.532	1.849	3.479	0.063	0.000	0.105	0.168
May	0.541	1.395	2.578	0.065	0.000	0.120	0.185
Jun	1.461	5.466	3.741	0.172	0.000	0.544	0.715
Jul	1.048	3.021	2.883	0.128	0.000	0.120	0.248
Aug	0.465	1.291	2.778	0.061	0.000	0.090	0.151
Sep	0.134	0.362	2.710	0.020	0.000	0.025	0.045

A.3.17.2 Cumulative .tab

IUA: Doring rangelands
 Tributary Rivers: Groot and five no-name tributaries (southernmost and two northernmost are FEPA)
 Mainstem: Doring (FEPA)
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: 80% of natural floods assumed for July, August and September (reflected below)
 Target condition: B (PES = B).

CONSTRUCTED

Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :

Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 18.688
 S.Dev. = 34.033
 CV = 1.821
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.170
 CV(JJA+JFM) Index = 8.231

Ecological Category = B

Total IFR = 8.057 (43.11 %MAR)
 Maint. Lowflow = 1.779 (9.52 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 6.277 (33.59 %MAR)

Monthly Distributions (Mill. cu. m.)

Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.355	1.225	3.447	0.041	0.000	0.000	0.041
Nov	0.881	2.850	3.237	0.085	0.000	0.145	0.230
Dec	0.713	2.089	2.930	0.071	0.000	0.117	0.188
Jan	1.408	10.514	7.466	0.131	0.000	0.000	0.131
Feb	0.840	3.909	4.654	0.083	0.000	0.000	0.083
Mar	0.513	1.629	3.172	0.054	0.000	0.000	0.054
Apr	1.778	6.182	3.477	0.164	0.000	0.294	0.458
May	1.810	4.662	2.576	0.168	0.000	0.337	0.505
Jun	4.886	18.274	3.740	0.442	0.000	1.522	1.964
Jul	3.503	10.100	2.883	0.329	0.000	2.473	2.802
Aug	1.554	4.318	2.779	0.159	0.000	1.084	1.243
Sep	0.447	1.212	2.710	0.053	0.000	0.305	0.358

A.3.18 E22F

A.3.18.1 Incremental .tab

IUA: Doring rangelands
 Tributary Rivers: One no-name tributary (FEPA)
 Mainstem: Doring (FEPA)
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: 80% of natural floods assumed for July, August and September (reflected below)
 Target condition: B (PES = B).

CONSTRUCTED

Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 2.206
 S.Dev. = 4.020
 CV = 1.822
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.170
 CV(JJA+JFM) Index = 8.237

Ecological Category = B

Total IFR = 1.261 (57.19 %MAR)
 Maint. Lowflow = 0.210 (9.51 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 1.052 (47.71 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.042	0.145	3.462	0.005	0.000	0.000	0.005
Nov	0.104	0.336	3.237	0.010	0.000	0.017	0.027
Dec	0.084	0.247	2.935	0.008	0.000	0.014	0.022
Jan	0.166	1.242	7.467	0.015	0.000	0.000	0.015
Feb	0.099	0.462	4.671	0.010	0.000	0.000	0.010
Mar	0.060	0.192	3.176	0.006	0.000	0.000	0.006
Apr	0.210	0.731	3.478	0.019	0.000	0.035	0.054
May	0.213	0.551	2.583	0.020	0.000	0.040	0.060
Jun	0.577	2.158	3.740	0.052	0.000	0.180	0.232
Jul	0.413	1.193	2.885	0.039	0.000	0.489	0.528
Aug	0.184	0.510	2.773	0.019	0.000	0.215	0.234
Sep	0.053	0.143	2.718	0.006	0.000	0.062	0.068

A.3.18.2 Cumulative .tab

IUA: Doring rangelands
 Tributary Rivers: One no-name tributary (FEPA)
 Mainstem: Doring (FEPA)
 Node: R36
 Data source: DWA 2012, default desktop reserve
 Adjustments: 80% of natural floods assumed for July, August and September (reflected below)
 Target condition: B (PES = B).

CONSTRUCTED

Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :

Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 20.894
 S.Dev. = 38.053
 CV = 1.821
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.170
 CV(JJA+JFM) Index = 8.232

Ecological Category = B

Total IFR = 9.007 (43.11 %MAR)
 Maint. Lowflow = 1.989 (9.52 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 7.018 (33.59 %MAR)

Monthly Distributions (Mill. cu. m.)

Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.397	1.369	3.449	0.046	0.000	0.000	0.046
Nov	0.984	3.187	3.237	0.095	0.000	0.162	0.257
Dec	0.797	2.335	2.931	0.079	0.000	0.131	0.210
Jan	1.575	11.756	7.466	0.146	0.000	0.000	0.146
Feb	0.939	4.371	4.656	0.093	0.000	0.000	0.093
Mar	0.574	1.821	3.172	0.060	0.000	0.000	0.060
Apr	1.988	6.913	3.477	0.183	0.000	0.329	0.512
May	2.023	5.213	2.577	0.188	0.000	0.377	0.565
Jun	5.463	20.432	3.740	0.494	0.000	1.701	2.195
Jul	3.916	11.293	2.884	0.368	0.000	2.765	3.133
Aug	1.738	4.828	2.778	0.178	0.000	1.212	1.390
Sep	0.500	1.355	2.710	0.059	0.000	0.341	0.400

A.3.19 E22G

A.3.19.1 Incremental .tab

IUA: Doring rangelands
 Tributary Rivers: Brakfontainspruit (FEPA) and Groot (FEPA)
 Mainstem: Doring (FEPA)
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: B (PES = A/B).

Desktop Version 2, Generated on 11/7/2012
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 6.493
 S.Dev. = 8.527
 CV = 1.313
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.211
 CV(JJA+JFM) Index = 6.327

Ecological Category = B

Total IFR = 2.921 (44.99 %MAR)
 Maint. Lowflow = 0.964 (14.85 %MAR)
 Drought Lowflow = 0.055 (0.85 %MAR)
 Maint. Highflow = 1.957 (30.14 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Cape(dry)

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.142	0.419	2.954	0.083	0.006	0.099	0.182
Nov	0.103	0.472	4.569	0.001	0.001	0.049	0.051
Dec	0.082	0.394	4.782	0.000	0.000	0.000	0.000
Jan	0.020	0.100	4.998	0.000	0.000	0.000	0.000
Feb	0.016	0.086	5.425	0.000	0.000	0.000	0.000
Mar	0.015	0.042	2.876	0.000	0.000	0.000	0.000
Apr	0.183	0.684	3.746	0.002	0.000	0.049	0.051
May	0.691	1.775	2.568	0.021	0.000	0.000	0.021
Jun	1.887	3.598	1.907	0.120	0.000	0.220	0.340
Jul	1.874	3.732	1.991	0.248	0.001	0.312	0.561
Aug	0.937	1.672	1.784	0.248	0.043	0.482	0.731
Sep	0.543	1.142	2.103	0.240	0.004	0.745	0.986

A.3.19.2 Cumulative .tab

IUA: Doring rangelands
 Tributary Rivers: Brakfontein spruit (FEPA) and Groot (FEPA)
 Mainstem: Doring (FEPA)
 Node: R28
 Data source: Extrapolated from EWR 4 9DWAF 2005)
 Adjustments: 80% of natural floods assumed for July, August and September (reflected below)
 Target condition: B (PES = B).

CONSTRUCTED

Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 266.606
 S.Dev. = 154.867
 CV = 0.581
 Q75 = 1.360
 Q75/MMF = 0.061
 BFI Index = 0.275
 CV(JJA+JFM) Index = 4.383

Ecological Category = B

Total IFR = 1134.428 (50.42 %MAR)
 Maint. Lowflow = 39.592 (14.85 %MAR)
 Drought Lowflow = 2.271 (0.85 %MAR)
 Maint. Highflow = 94.835 (35.57 %MAR)

Monthly Distributions (Mill. cu. m.)

Distribution Type : W.Cape(dry)

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	18.524	11.432	0.617	3.400	0.255	4.063	7.463
Nov	11.049	13.786	1.248	0.049	0.049	2.031	2.081
Dec	4.761	7.678	1.613	0.000	0.000	0.000	0.000
Jan	3.584	18.846	5.259	0.000	0.000	0.000	0.000
Feb	2.846	8.447	2.968	0.000	0.000	0.000	0.000
Mar	2.679	5.283	1.972	0.000	0.000	0.000	0.000
Apr	9.385	18.520	1.973	0.082	0.000	2.031	2.114
May	25.933	34.643	1.336	0.850	0.017	0.000	0.850
Jun	52.884	63.088	1.193	4.936	0.016	9.014	13.950
Jul	55.857	54.137	0.969	10.201	0.034	34.484	44.685
Aug	47.477	37.350	0.787	10.201	1.751	27.781	37.982
Sep	31.629	19.457	0.615	9.872	0.148	15.431	25.303

A.3.20 E23A

A.3.20.1 Cumulative and Incremental .tab

IUA: Doring rangelands
 Tributary Rivers: Wilgebos, Kleinpoorts, plus one no-name tributary
 Mainstem: Tankwa
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: A/B (PES = A/B).

Desktop Version 2, Generated on 2011/08/05
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 8.001
 S.Dev. = 12.705
 CV = 1.588
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.169
 CV(JJA+JFM) Index = 6.570

Ecological Category = A/B

Total IFR = 2.594 (32.42 %MAR)
 Maint. Lowflow = 1.048 (13.10 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 1.546 (19.32 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.128	0.411	3.205	0.020	0.000	0.000	0.020
Nov	0.319	1.160	3.635	0.042	0.000	0.062	0.104
Dec	0.410	1.210	2.948	0.054	0.000	0.080	0.133
Jan	0.324	1.132	3.497	0.042	0.000	0.000	0.042
Feb	0.203	0.948	4.672	0.028	0.000	0.000	0.028
Mar	0.181	0.541	2.982	0.025	0.000	0.000	0.025
Apr	0.692	2.147	3.101	0.089	0.000	0.134	0.223
May	1.021	2.725	2.669	0.130	0.000	0.200	0.329
Jun	1.822	5.545	3.043	0.230	0.000	0.666	0.897
Jul	1.820	5.563	3.056	0.234	0.000	0.200	0.433
Aug	0.745	1.833	2.461	0.105	0.000	0.142	0.247
Sep	0.335	1.205	3.598	0.050	0.000	0.063	0.113

A.3.21 E23B

A.3.21.1 Incremental .tab

IUA: Doring rangelands
 Tributary Rivers: Bobbejaanskraans (FEPA), Windheuwels, plus on no-name tributary
 Mainstem: Tankwa
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: A/B (PES = A/B).

Desktop Version 2, Generated on 2011/08/05
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 7.402
 S.Dev. = 11.755
 CV = 1.588
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.169
 CV(JJA+JFM) Index = 6.572

Ecological Category = A/B

Total IFR = 2.400 (32.42 %MAR)
 Maint. Lowflow = 0.970 (13.10 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 1.430 (19.32 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.119	0.381	3.200	0.019	0.000	0.000	0.019
Nov	0.295	1.073	3.634	0.039	0.000	0.057	0.096
Dec	0.379	1.119	2.949	0.050	0.000	0.074	0.123
Jan	0.299	1.047	3.498	0.039	0.000	0.000	0.039
Feb	0.188	0.876	4.673	0.025	0.000	0.000	0.025
Mar	0.168	0.501	2.982	0.023	0.000	0.000	0.023
Apr	0.640	1.986	3.101	0.082	0.000	0.124	0.206
May	0.944	2.521	2.670	0.120	0.000	0.185	0.305
Jun	1.686	5.129	3.042	0.213	0.000	0.617	0.830
Jul	1.684	5.148	3.057	0.216	0.000	0.185	0.401
Aug	0.689	1.697	2.463	0.097	0.000	0.131	0.228
Sep	0.310	1.115	3.598	0.046	0.000	0.059	0.104

A.3.21.2 Cumulative .tab

IUA: Doring rangelands
 Tributary Rivers: Bobbejaanskraans (FEPA), Windheuwels, plus on no-name tributary
 Mainstem: Tankwa
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: A/B (PES = A/B).

Desktop Version 2, Generated on 2011/08/29
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 15.403
 S.Dev. = 24.460
 CV = 1.588
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.169
 CV(JJA+JFM) Index = 6.571

Ecological Category = A/B

Total IFR = 4.994 (32.42 %MAR)
 Maint. Lowflow = 2.018 (13.10 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 2.977 (19.32 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.247	0.792	3.203	0.039	0.000	0.000	0.039
Nov	0.614	2.232	3.634	0.081	0.000	0.119	0.200
Dec	0.790	2.329	2.949	0.103	0.000	0.153	0.256
Jan	0.623	2.179	3.498	0.082	0.000	0.000	0.082
Feb	0.390	1.824	4.672	0.053	0.000	0.000	0.053
Mar	0.349	1.041	2.982	0.048	0.000	0.000	0.048
Apr	1.333	4.133	3.101	0.170	0.000	0.259	0.429
May	1.966	5.246	2.669	0.250	0.000	0.384	0.634
Jun	3.508	10.674	3.043	0.443	0.000	1.283	1.727
Jul	3.504	10.711	3.056	0.450	0.000	0.384	0.834
Aug	1.434	3.530	2.462	0.202	0.000	0.273	0.475
Sep	0.645	2.320	3.598	0.095	0.000	0.122	0.217

A.3.22 E23C

A.3.22.1 Cumulative and Incremental .tab

IUA: Doring rangelands
 Tributary Rivers: Houdhoek
 Mainstem: Houdhoek
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: A/B (PES = A/B).

Desktop Version 2, Generated on 2011/08/10
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 3.339
 S.Dev. = 5.301
 CV = 1.588
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.169
 CV(JJA+JFM) Index = 6.577

Ecological Category = A/B

Total IFR = 1.082 (32.42 %MAR)
 Maint. Lowflow = 0.437 (13.09 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 0.645 (19.33 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.053	0.171	3.203	0.008	0.000	0.000	0.008
Nov	0.133	0.483	3.636	0.018	0.000	0.026	0.043
Dec	0.171	0.505	2.950	0.022	0.000	0.033	0.056
Jan	0.135	0.473	3.495	0.018	0.000	0.000	0.018
Feb	0.084	0.396	4.689	0.011	0.000	0.000	0.011
Mar	0.076	0.226	2.986	0.010	0.000	0.000	0.010
Apr	0.289	0.896	3.101	0.037	0.000	0.056	0.093
May	0.426	1.137	2.670	0.054	0.000	0.083	0.137
Jun	0.760	2.314	3.043	0.096	0.000	0.278	0.374
Jul	0.759	2.322	3.057	0.097	0.000	0.083	0.181
Aug	0.311	0.765	2.460	0.044	0.000	0.059	0.103
Sep	0.140	0.503	3.599	0.021	0.000	0.026	0.047

A.3.23 E23D

A.3.23.1 Incremental .tab

IUA: Doring rangelands
 Tributary Rivers: Karee, Kranskraal, plus one no-name tributary
 Mainstem: Tankwa
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: A/B (PES = A/B).

Desktop Version 2, Generated on 2011/08/06
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 7.875
 S.Dev. = 12.506
 CV = 1.588
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.169
 CV(JJA+JFM) Index = 6.571

Ecological Category = A/B

Total IFR = 2.553 (32.42 %MAR)
 Maint. Lowflow = 1.031 (13.10 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 1.522 (19.32 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.126	0.405	3.214	0.020	0.000	0.000	0.020
Nov	0.314	1.141	3.637	0.041	0.000	0.061	0.102
Dec	0.404	1.190	2.949	0.053	0.000	0.078	0.131
Jan	0.319	1.114	3.497	0.042	0.000	0.000	0.042
Feb	0.200	0.932	4.672	0.027	0.000	0.000	0.027
Mar	0.178	0.532	2.984	0.025	0.000	0.000	0.025
Apr	0.682	2.113	3.101	0.087	0.000	0.132	0.219
May	1.005	2.682	2.668	0.128	0.000	0.196	0.324
Jun	1.793	5.458	3.043	0.227	0.000	0.656	0.883
Jul	1.792	5.476	3.056	0.230	0.000	0.196	0.427
Aug	0.733	1.805	2.462	0.103	0.000	0.139	0.243
Sep	0.330	1.186	3.593	0.049	0.000	0.062	0.111

A.3.23.2 Cumulative .tab

IUA: Doring rangelands
 Tributary Rivers: Karee, Kranskraal, plus one no-name tributary
 Mainstem: Tankwa
 Node: R32
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: A/B (PES = A/B).

Desktop Version 2, Generated on 2011/08/06
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 26.617
 S.Dev. = 42.267
 CV = 1.588
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.169
 CV(JJA+JFM) Index = 6.572

Ecological Category = A/B

Total IFR = 8.630 (32.42 %MAR)
 Maint. Lowflow = 3.486 (13.10 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 5.144 (19.33 %MAR)

Monthly Distributions (Mill. cu. m.)

Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.427	1.368	3.206	0.067	0.000	0.000	0.067
Nov	1.061	3.857	3.635	0.140	0.000	0.206	0.346
Dec	1.365	4.024	2.949	0.179	0.000	0.264	0.443
Jan	1.077	3.766	3.497	0.141	0.000	0.000	0.141
Feb	0.674	3.153	4.674	0.092	0.000	0.000	0.092
Mar	0.603	1.799	2.983	0.084	0.000	0.000	0.084
Apr	2.303	7.142	3.101	0.295	0.000	0.447	0.742
May	3.397	9.066	2.669	0.431	0.000	0.664	1.095
Jun	6.062	18.446	3.043	0.766	0.000	2.217	2.984
Jul	6.056	18.509	3.056	0.777	0.000	0.664	1.441
Aug	2.478	6.100	2.462	0.350	0.000	0.471	0.821
Sep	1.115	4.009	3.597	0.165	0.000	0.210	0.375

A.3.24 E23E

A.3.24.1 Cumulative and Incremental .tab

IUA: Doring rangelands
 Tributary Rivers: Malansgat (FEPA) and one no-name tributary
 Mainstem: Renoster
 Node: R31
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: A/B (Malansgat PES = A/B, Renoster PES=A/B and B, no name PES=A/B).

Desktop Version 2, Generated on 2011/08/06
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 5.922
 S.Dev. = 9.403
 CV = 1.588
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.169
 CV(JJA+JFM) Index = 6.574

Ecological Category = A/B

Total IFR = 1.920 (32.42 %MAR)
 Maint. Lowflow = 0.776 (13.10 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 1.144 (19.33 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.095	0.305	3.212	0.015	0.000	0.000	0.015
Nov	0.236	0.858	3.639	0.031	0.000	0.046	0.077
Dec	0.303	0.896	2.953	0.040	0.000	0.059	0.098
Jan	0.239	0.838	3.506	0.031	0.000	0.000	0.031
Feb	0.150	0.701	4.675	0.020	0.000	0.000	0.020
Mar	0.134	0.401	2.983	0.019	0.000	0.000	0.019
Apr	0.513	1.590	3.098	0.066	0.000	0.100	0.165
May	0.756	2.017	2.668	0.096	0.000	0.148	0.244
Jun	1.349	4.104	3.042	0.171	0.000	0.493	0.664
Jul	1.347	4.118	3.057	0.173	0.000	0.148	0.321
Aug	0.551	1.357	2.461	0.078	0.000	0.105	0.183
Sep	0.248	0.893	3.594	0.037	0.000	0.047	0.084

A.3.25 E23F

A.3.25.1 Incremental .tab

IUA: Doring rangelands
 Tributary Rivers: Renoster
 Mainstem: Tankwa
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: A/B (PES = A/B).

Desktop Version 2, Generated on 2011/08/06
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 4.964
 S.Dev. = 7.887
 CV = 1.589
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.169
 CV(JJA+JFM) Index = 6.579

Ecological Category = A/B

Total IFR = 1.610 (32.42 %MAR)
 Maint. Lowflow = 0.650 (13.09 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 0.959 (19.33 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.080	0.256	3.214	0.013	0.000	0.000	0.013
Nov	0.198	0.720	3.635	0.026	0.000	0.038	0.064
Dec	0.254	0.750	2.949	0.033	0.000	0.049	0.083
Jan	0.201	0.703	3.502	0.026	0.000	0.000	0.026
Feb	0.126	0.589	4.677	0.017	0.000	0.000	0.017
Mar	0.112	0.336	2.996	0.016	0.000	0.000	0.016
Apr	0.430	1.332	3.100	0.055	0.000	0.083	0.138
May	0.633	1.691	2.670	0.080	0.000	0.124	0.204
Jun	1.131	3.442	3.044	0.143	0.000	0.414	0.556
Jul	1.130	3.453	3.057	0.145	0.000	0.124	0.269
Aug	0.462	1.138	2.463	0.065	0.000	0.088	0.153
Sep	0.208	0.749	3.597	0.031	0.000	0.039	0.070

A.3.25.2 Cumulative .tab

IUA: Doring rangelands
 Tributary Rivers: Renoster
 Mainstem: Tankwa
 Node: R29
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: B (PES = C). River now part of Tankwa National Park.

Desktop Version 2, Generated on 2011/08/06
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 37.503
 S.Dev. = 59.558
 CV = 1.588
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.169
 CV(JJA+JFM) Index = 6.573

Ecological Category = B

Total IFR = 9.895 (26.38 %MAR)
 Maint. Lowflow = 3.824 (10.20 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 6.071 (16.19 %MAR)

Monthly Distributions (Mill. cu. m.)

Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.601	1.928	3.208	0.076	0.000	0.000	0.076
Nov	1.495	5.434	3.636	0.155	0.000	0.243	0.398
Dec	1.922	5.670	2.949	0.197	0.000	0.312	0.509
Jan	1.517	5.306	3.499	0.157	0.000	0.000	0.157
Feb	0.950	4.443	4.675	0.103	0.000	0.000	0.103
Mar	0.850	2.536	2.985	0.094	0.000	0.000	0.094
Apr	3.246	10.064	3.100	0.323	0.000	0.528	0.851
May	4.786	12.774	2.669	0.472	0.000	0.784	1.255
Jun	8.541	25.991	3.043	0.835	0.000	2.617	3.452
Jul	8.533	26.079	3.056	0.847	0.000	0.784	1.631
Aug	3.492	8.596	2.462	0.383	0.000	0.556	0.939
Sep	1.571	5.650	3.596	0.182	0.000	0.248	0.431

A.3.26 E23G

A.3.26.1 Cumulative and Incremental .tab

IUA: Doring rangelands
 Tributary Rivers: Jakkalshok, plus two no-name tributaries (northern one a FEPA)
 Mainstem: Ongeluks
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: A/B (PES = A/B, apart from middle section of Ongeluks=B).

Desktop Version 2, Generated on 2011/08/06
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 7.844
 S.Dev. = 12.454
 CV = 1.588
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.169
 CV(JJA+JFM) Index = 6.571

Ecological Category = A/B

Total IFR = 2.543 (32.42 %MAR)
 Maint. Lowflow = 1.027 (13.10 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 1.516 (19.32 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.126	0.403	3.209	0.020	0.000	0.000	0.020
Nov	0.313	1.137	3.636	0.041	0.000	0.061	0.102
Dec	0.403	1.186	2.947	0.053	0.000	0.078	0.131
Jan	0.317	1.110	3.496	0.042	0.000	0.000	0.042
Feb	0.199	0.928	4.673	0.027	0.000	0.000	0.027
Mar	0.178	0.531	2.984	0.025	0.000	0.000	0.025
Apr	0.679	2.105	3.100	0.087	0.000	0.132	0.219
May	1.001	2.671	2.670	0.127	0.000	0.196	0.323
Jun	1.786	5.435	3.044	0.226	0.000	0.653	0.879
Jul	1.785	5.454	3.056	0.229	0.000	0.196	0.425
Aug	0.730	1.797	2.461	0.103	0.000	0.139	0.242
Sep	0.329	1.181	3.593	0.049	0.000	0.062	0.111

A.3.27 E23H

A.3.27.1 Cumulative and Incremental .tab

IUA: Doring rangelands
 Tributary Rivers: Brak, Blesmerrie se Spruit, plus two no-name tributaries (western-most a FEPA)
 Mainstem: Gemsbok
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: A/B (PES = A/B).

Desktop Version 2, Generated on 2011/08/06
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 6.930
 S.Dev. = 11.004
 CV = 1.588
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.169
 CV(JJA+JFM) Index = 6.578

Ecological Category = A/B

Total IFR = 2.247 (32.42 %MAR)
 Maint. Lowflow = 0.907 (13.09 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 1.339 (19.33 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.111	0.356	3.202	0.017	0.000	0.000	0.017
Nov	0.276	1.004	3.633	0.037	0.000	0.054	0.090
Dec	0.356	1.048	2.947	0.047	0.000	0.069	0.115
Jan	0.280	0.981	3.497	0.037	0.000	0.000	0.037
Feb	0.175	0.821	4.683	0.024	0.000	0.000	0.024
Mar	0.157	0.469	2.992	0.022	0.000	0.000	0.022
Apr	0.600	1.859	3.101	0.077	0.000	0.116	0.193
May	0.885	2.360	2.668	0.112	0.000	0.173	0.285
Jun	1.578	4.802	3.043	0.200	0.000	0.577	0.777
Jul	1.577	4.819	3.056	0.202	0.000	0.173	0.375
Aug	0.645	1.588	2.463	0.091	0.000	0.123	0.214
Sep	0.290	1.044	3.596	0.043	0.000	0.055	0.098

A.3.28 E23J

A.3.28.1 Incremental .tab

IUA: Doring rangelands
 Tributary Rivers: Koffiewater se Laagte, Tandskoonmaak se Laagte (upper portion and one tributary of which are FEPAs), Sandlaagte (FEPA), plus one no-name tributary (one tributary of which is a FEPA)
 Mainstem: Ongeluks
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: A/B (PES = A/B).

Desktop Version 2, Generated on 2011/08/06
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 9.396
 S.Dev. = 14.924
 CV = 1.588
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.169
 CV(JJA+JFM) Index = 6.573

Ecological Category = A/B

Total IFR = 3.046 (32.42 %MAR)
 Maint. Lowflow = 1.231 (13.10 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 1.816 (19.33 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.150	0.483	3.212	0.024	0.000	0.000	0.024
Nov	0.374	1.362	3.636	0.049	0.000	0.073	0.122
Dec	0.482	1.421	2.948	0.063	0.000	0.093	0.156
Jan	0.380	1.330	3.499	0.050	0.000	0.000	0.050
Feb	0.238	1.113	4.675	0.032	0.000	0.000	0.032
Mar	0.213	0.635	2.981	0.030	0.000	0.000	0.030
Apr	0.814	2.522	3.100	0.104	0.000	0.158	0.262
May	1.199	3.200	2.669	0.152	0.000	0.234	0.387
Jun	2.140	6.512	3.043	0.270	0.000	0.783	1.053
Jul	2.138	6.535	3.056	0.274	0.000	0.234	0.509
Aug	0.874	2.154	2.463	0.123	0.000	0.166	0.289
Sep	0.393	1.416	3.599	0.058	0.000	0.074	0.132

A.3.28.2 Cumulative .tab

IUA: Doring rangelands
 Tributary Rivers: Koffiewater se Laagte, Tandskoonmaak se Laagte (upper portion and one tributary of which are FEPAs), Sandlaagte (FEPA), plus one no-name tributary (one tributary of which is a FEPA)
 Mainstem: Ongeluks
 Node: R30
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: A/B (PES = A/B).

Desktop Version 2, Generated on 2011/09/19
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 61.673
 S.Dev. = 97.940
 CV = 1.588
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.169
 CV(JJA+JFM) Index = 6.573

Ecological Category = A/B

Total IFR = 19.996 (32.42 %MAR)
 Maint. Lowflow = 8.077 (13.10 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 11.919 (19.33 %MAR)

Monthly Distributions (Mill. cu. m.)

Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.988	3.170	3.208	0.155	0.000	0.000	0.155
Nov	2.458	8.937	3.635	0.325	0.000	0.476	0.801
Dec	3.162	9.325	2.949	0.414	0.000	0.613	1.026
Jan	2.494	8.726	3.498	0.327	0.000	0.000	0.327
Feb	1.562	7.305	4.676	0.212	0.000	0.000	0.212
Mar	1.397	4.171	2.985	0.194	0.000	0.000	0.194
Apr	5.338	16.549	3.100	0.683	0.000	1.036	1.719
May	7.870	21.006	2.669	1.000	0.000	1.538	2.538
Jun	14.045	42.741	3.043	1.775	0.000	5.137	6.913
Jul	14.032	42.887	3.056	1.801	0.000	1.538	3.340
Aug	5.741	14.135	2.462	0.810	0.000	1.091	1.901
Sep	2.583	9.291	3.596	0.382	0.000	0.488	0.870

A.3.29 E23K

A.3.29.1 Incremental .tab

IUA: Doring rangelands
 Tributary Rivers: Pakhuislaagte, plus three no-name tributaries, southern one a FEPA
 Mainstem: Tankwa
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: 80% of natural floods assumed for July, August and September (reflected below)
 Target condition: A/B (PES = A/B).

CONSTRUCTED

Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 6.006
 S.Dev. = 9.537
 CV = 1.588
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.169
 CV(JJA+JFM) Index = 6.579

Ecological Category = A/B

Total IFR = 3.093 (51.5 %MAR)
 Maint. Lowflow = 0.786 (13.09 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 2.307 (38.41 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.096	0.309	3.208	0.015	0.000	0.000	0.015
Nov	0.239	0.870	3.635	0.032	0.000	0.046	0.078
Dec	0.308	0.908	2.951	0.040	0.000	0.060	0.100
Jan	0.243	0.850	3.503	0.032	0.000	0.000	0.032
Feb	0.152	0.711	4.684	0.021	0.000	0.000	0.021
Mar	0.136	0.406	2.989	0.019	0.000	0.000	0.019
Apr	0.520	1.611	3.099	0.066	0.000	0.101	0.167
May	0.767	2.045	2.667	0.097	0.000	0.150	0.247
Jun	1.368	4.162	3.042	0.173	0.000	0.500	0.673
Jul	1.366	4.177	3.057	0.175	0.000	0.918	1.093
Aug	0.559	1.376	2.462	0.079	0.000	0.368	0.447
Sep	0.252	0.905	3.594	0.037	0.000	0.164	0.201

A.3.29.2 Cumulative .tab

IUA: Doring rangelands
 Tributary Rivers: Pakhuislaagte, plus three no-name tributaries, southern one a FEPA
 Mainstem: Tankwa
 Node: R27
 Data source: DWA 2012, default desktop reserve
 Adjustments: Generated by adding E23F cum and E23J cum to E23K inc. All for B categories
 Target condition: B (PES = B).

CONSTRUCTED by adding E23F cum and E23J cum to E23K inc
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 105.182
 S.Dev. = 167.035
 CV = 4.764
 Q75 = 0
 Q75/MMF = 0
 BFI Index = 0.507
 CV(JJA+JFM) = 19.725

Ecological Category = B

Total IFR = 27.751 (26.38 %MAR)
 Maint. Lowflow = 10.724 (10.2 %MAR)
 Drought Lowflow = 0 (0 %MAR)
 Maint. Highflow = 17.026 (16.19 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High flows	Total flows
				Maint.	Drought	Maint.	Maint.
Oct	1.685	5.407	9.624	0.213	0.000	0.000	0.213
Nov	4.192	15.241	10.906	0.435	0.000	0.681	1.116
Dec	5.392	15.903	8.849	0.553	0.000	0.875	1.428
Jan	4.254	14.882	10.5	0.44	0.000	0.000	0.44
Feb	2.664	12.459	14.035	0.288	0.000	0.000	0.288
Mar	2.383	7.113	8.959	0.264	0.000	0.000	0.264
Apr	9.104	28.224	9.299	0.906	0.000	1.481	2.387
May	13.423	35.825	8.005	1.324	0.000	2.198	3.52
Jun	23.954	72.894	9.128	2.342	0.000	7.339	9.681
Jul	23.931	73.143	9.169	2.376	0.000	2.198	4.574
Aug	9.792	24.107	7.386	1.073	0.000	1.559	2.632
Sep	4.406	15.846	10.786	0.511	0.000	0.697	1.208

A.3.30 E24A

A.3.30.1 Cumulative and Incremental .tab

IUA: Doring rangelands
 Tributary Rivers: Eselbank and Dassiesboskloof (both FEPAs)
 Mainstem: Tra-tra (FEPA)
 Node: R25
 Data source: Extrapolated from A1, CAPE project (Southern Waters, 2009)
 Adjustments: 80% of natural floods assumed for July, August and September (reflected below)
 Target condition: B (PES = B).

CONSTRUCTED

Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 4.523
 S.Dev. = 5.932
 CV = 1.312
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.238
 CV(JJA+JFM) Index = 6.325

Ecological Category = B

Total IFR = 3.329 (73.6 %MAR)
 Maint. Lowflow = 1.988 (43.95 %MAR)
 Drought Lowflow = 0.148 (3.27 %MAR)
 Maint. Highflow = 1.34 (29.63 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Cape(wet)

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.099	0.291	2.948	0.148	0.011	0.029	0.177
Nov	0.072	0.328	4.564	0.080	0.000	0.013	0.093
Dec	0.057	0.273	4.776	0.027	0.000	0.000	0.027
Jan	0.014	0.069	4.919	0.027	0.000	0.000	0.027
Feb	0.011	0.059	5.403	0.053	0.000	0.000	0.053
Mar	0.010	0.029	2.976	0.080	0.000	0.000	0.080
Apr	0.127	0.475	3.749	0.133	0.000	0.000	0.133
May	0.481	1.234	2.564	0.213	0.021	0.144	0.358
Jun	1.311	2.500	1.907	0.320	0.028	0.188	0.508
Jul	1.302	2.592	1.991	0.320	0.022	0.722	1.042
Aug	0.656	1.168	1.780	0.320	0.036	0.205	0.525
Sep	0.383	0.797	2.083	0.267	0.030	0.039	0.306

A.3.31 E24B

A.3.31.1 Incremental .tab

IUA: Doring rangelands
 Tributary Rivers: Matjiesfontein, plus one no-name tributary (a FEPA)
 Mainstem: Tra-tra (portion to confluence with no-name tributary a FEPA)
 Node: -
 Data source: Extrapolated from A1, CAPE project (Southern Waters, 2009)
 Adjustments: 60% of natural floods assumed for July, August and September (reflected below)
 Target condition: B (PES = B).

CONSTRUCTED

Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 8.281
 S.Dev. = 10.873
 CV = 1.313
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.238
 CV(JJA+JFM) Index = 6.310

Ecological Category = B

Total IFR = 5.233 (63.19 %MAR)
 Maint. Lowflow = 3.639 (43.95 %MAR)
 Drought Lowflow = 0.271 (3.27 %MAR)
 Maint. Highflow = 1.592 (19.22 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Cape(wet)

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.181	0.533	2.947	0.271	0.019	0.054	0.325
Nov	0.132	0.602	4.563	0.146	0.000	0.023	0.170
Dec	0.105	0.502	4.769	0.049	0.000	0.000	0.049
Jan	0.026	0.128	4.967	0.049	0.000	0.000	0.049
Feb	0.020	0.110	5.381	0.098	0.000	0.000	0.098
Mar	0.018	0.053	2.900	0.146	0.000	0.000	0.146
Apr	0.233	0.873	3.747	0.244	0.000	0.000	0.244
May	0.882	2.264	2.567	0.391	0.038	0.264	0.655
Jun	2.407	4.588	1.907	0.586	0.051	0.344	0.930
Jul	2.389	4.758	1.991	0.586	0.041	0.848	1.434
Aug	1.195	2.132	1.785	0.586	0.066	0.131	0.717
Sep	0.693	1.456	2.103	0.488	0.055	-0.072	0.416

A.3.31.2 Cumulative .tab

IUA: Doring rangelands
 Tributary Rivers: Matjiesfontein, plus one no-name tributary (a FEPA)
 Mainstem: Tra-tra (portion to confluence with no-name tributary a FEPA)
 Node: R26
 Data source: Extrapolated from A1, CAPE project (Southern Waters, 2009)
 Adjustments: 60% of natural floods assumed for July, August and September (reflected below)
 Target condition: B (PES = B).

CONSTRUCTED

Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :

Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 12.803
 S.Dev. = 16.805
 CV = 1.313
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.238
 CV(JJA+JFM) Index = 6.315

Ecological Category = B

Total IFR = 8.09 (63.19 %MAR)
 Maint. Lowflow = 5.627 (43.95 %MAR)
 Drought Lowflow = 0.419 (3.27 %MAR)
 Maint. Highflow = 2.464 (19.25 %MAR)

Monthly Distributions (Mill. cu. m.)

Distribution Type : W.Cape(wet)

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.279	0.824	2.948	0.418	0.030	0.083	0.502
Nov	0.204	0.929	4.563	0.226	0.000	0.036	0.263
Dec	0.162	0.775	4.771	0.075	0.000	0.000	0.075
Jan	0.040	0.197	4.950	0.075	0.000	0.000	0.075
Feb	0.031	0.170	5.389	0.151	0.000	0.000	0.151
Mar	0.028	0.083	2.925	0.226	0.000	0.000	0.226
Apr	0.360	1.348	3.748	0.377	0.000	0.000	0.377
May	1.363	3.498	2.566	0.604	0.058	0.409	1.013
Jun	3.718	7.088	1.907	0.906	0.079	0.532	1.437
Jul	3.692	7.350	1.991	0.906	0.063	1.309	2.215
Aug	1.851	3.300	1.783	0.906	0.103	0.205	1.111
Sep	1.075	2.253	2.096	0.755	0.086	-0.110	0.645

A.3.32 E24C

A.3.32.1 Cumulative and Incremental .tab

IUA: Doring rangelands
 Tributary Rivers: Matjiekloof se, Biesra, Oliewenbos se, plus one no-name tributary
 Mainstem: Bos
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: A/B (PES = B).

Desktop Version 2, Generated on 2011/08/06
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 13.855
 S.Dev. = 18.208
 CV = 1.314
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.170
 CV(JJA+JFM) Index = 6.284

Ecological Category = A/B

Total IFR = 4.509 (32.55 %MAR)
 Maint. Lowflow = 1.844 (13.31 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 2.666 (19.24 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.303	0.894	2.949	0.047	0.000	0.000	0.047
Nov	0.221	1.009	4.565	0.033	0.000	0.042	0.074
Dec	0.176	0.841	4.773	0.026	0.000	0.033	0.059
Jan	0.043	0.213	4.953	0.006	0.000	0.000	0.006
Feb	0.034	0.184	5.349	0.005	0.000	0.000	0.005
Mar	0.031	0.089	2.863	0.004	0.000	0.000	0.004
Apr	0.390	1.461	3.744	0.050	0.000	0.076	0.126
May	1.477	3.793	2.567	0.188	0.000	0.334	0.523
Jun	4.031	7.688	1.907	0.516	0.000	1.250	1.766
Jul	4.003	7.970	1.991	0.522	0.000	0.334	0.856
Aug	1.992	3.565	1.790	0.276	0.000	0.380	0.656
Sep	1.151	2.439	2.118	0.171	0.000	0.216	0.387

A.3.33 E24D

A.3.33.1 Incremental .tab

IUA: Doring rangelands
 Tributary Rivers: One no-name tributary
 Mainstem: Bos
 Node: R21
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: A/B (PES = B).

Desktop Version 2, Generated on 2011/08/06
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 17.620
 S.Dev. = 23.154
 CV = 1.314
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.170
 CV(JJA+JFM) Index = 6.287

Ecological Category = A/B

Total IFR = 5.735 (32.55 %MAR)
 Maint. Lowflow = 2.344 (13.31 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 3.390 (19.24 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.385	1.137	2.949	0.060	0.000	0.000	0.060
Nov	0.281	1.282	4.565	0.041	0.000	0.053	0.094
Dec	0.223	1.069	4.785	0.033	0.000	0.042	0.075
Jan	0.055	0.271	4.963	0.008	0.000	0.000	0.008
Feb	0.044	0.234	5.354	0.006	0.000	0.000	0.006
Mar	0.040	0.114	2.859	0.006	0.000	0.000	0.006
Apr	0.497	1.858	3.741	0.064	0.000	0.096	0.160
May	1.879	4.822	2.566	0.240	0.000	0.425	0.665
Jun	5.126	9.775	1.907	0.656	0.000	1.590	2.245
Jul	5.091	10.136	1.991	0.664	0.000	0.425	1.089
Aug	2.534	4.534	1.789	0.352	0.000	0.483	0.835
Sep	1.465	3.102	2.117	0.217	0.000	0.275	0.492

A.3.33.2 Cumulative .tab

IUA: Doring rangelands
 Tributary Rivers: One no-name tributary
 Mainstem: Bos
 Node: R21
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: C (PES = C).

Desktop Version 2, Generated on 2011/08/06
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 31.475
 S.Dev. = 41.363
 CV = 1.314
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.170
 CV(JJA+JFM) Index = 6.286

Ecological Category = C

Total IFR = 5.575 (17.71 %MAR)
 Maint. Lowflow = 1.706 (5.42 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 3.869 (12.29 %MAR)

Monthly Distributions (Mill. cu. m.)

Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.688	2.030	2.949	0.044	0.000	0.000	0.044
Nov	0.502	2.291	4.565	0.031	0.000	0.060	0.091
Dec	0.400	1.910	4.779	0.024	0.000	0.048	0.072
Jan	0.098	0.485	4.959	0.006	0.000	0.000	0.006
Feb	0.078	0.418	5.352	0.005	0.000	0.000	0.005
Mar	0.071	0.203	2.861	0.005	0.000	0.000	0.005
Apr	0.887	3.320	3.742	0.047	0.000	0.110	0.157
May	3.356	8.615	2.567	0.174	0.000	0.485	0.659
Jun	9.157	17.462	1.907	0.476	0.000	1.814	2.290
Jul	9.094	18.106	1.991	0.482	0.000	0.485	0.967
Aug	4.527	8.099	1.789	0.255	0.000	0.551	0.807
Sep	2.616	5.540	2.118	0.158	0.000	0.314	0.472

A.3.34 E24E

A.3.34.1 Cumulative and Incremental .tab

IUA: Doring rangelands
 Tributary Rivers: Kliprug, Rietpoort and two no-name tributaries
 Mainstem: Wolf
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: A/B (PES = A/B).

Desktop Version 2, Generated on 2011/08/06
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 11.855
 S.Dev. = 15.585
 CV = 1.315
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.170
 CV(JJA+JFM) Index = 6.305

Ecological Category = A/B

Total IFR = 3.858 (32.54 %MAR)
 Maint. Lowflow = 1.576 (13.29 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 2.282 (19.25 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.259	0.765	2.954	0.040	0.000	0.000	0.040
Nov	0.189	0.863	4.570	0.028	0.000	0.036	0.063
Dec	0.151	0.719	4.779	0.022	0.000	0.028	0.050
Jan	0.037	0.183	4.963	0.005	0.000	0.000	0.005
Feb	0.029	0.157	5.390	0.004	0.000	0.000	0.004
Mar	0.027	0.076	2.874	0.004	0.000	0.000	0.004
Apr	0.334	1.250	3.741	0.043	0.000	0.065	0.108
May	1.265	3.245	2.566	0.161	0.000	0.286	0.447
Jun	3.450	6.580	1.907	0.441	0.000	1.070	1.511
Jul	3.426	6.822	1.991	0.446	0.000	0.286	0.732
Aug	1.705	3.051	1.790	0.236	0.000	0.325	0.561
Sep	0.986	2.087	2.118	0.146	0.000	0.185	0.331

A.3.35 E24F

A.3.35.1 Incremental .tab

IUA: Doring rangelands
 Tributary Rivers: Draaikraal
 Mainstem: Wolf
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: A/B (PES = A/B).

Desktop Version 2, Generated on 2011/08/06
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 10.285
 S.Dev. = 13.516
 CV = 1.314
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.170
 CV(JJA+JFM) Index = 6.284

Ecological Category = A/B

Total IFR = 3.348 (32.55 %MAR)
 Maint. Lowflow = 1.369 (13.31 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 1.979 (19.24 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.225	0.664	2.950	0.035	0.000	0.000	0.035
Nov	0.164	0.748	4.566	0.024	0.000	0.031	0.055
Dec	0.131	0.624	4.781	0.019	0.000	0.025	0.044
Jan	0.032	0.159	4.972	0.005	0.000	0.000	0.005
Feb	0.026	0.137	5.347	0.004	0.000	0.000	0.004
Mar	0.023	0.066	2.847	0.003	0.000	0.000	0.003
Apr	0.290	1.085	3.747	0.037	0.000	0.056	0.093
May	1.097	2.815	2.566	0.140	0.000	0.248	0.388
Jun	2.993	5.706	1.907	0.383	0.000	0.928	1.311
Jul	2.972	5.917	1.991	0.387	0.000	0.248	0.636
Aug	1.479	2.647	1.790	0.205	0.000	0.282	0.487
Sep	0.855	1.811	2.118	0.127	0.000	0.161	0.287

A.3.35.2 Cumulative .tab

IUA: Doring rangelands
 Tributary Rivers: Draaikraal
 Mainstem: Wolf
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: A/B (PES = A/B).

Desktop Version 2, Generated on 2011/08/29
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 22.140
 S.Dev. = 29.101
 CV = 1.314
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.170
 CV(JJA+JFM) Index = 6.295

Ecological Category = A/B

Total IFR = 7.205 (32.54 %MAR)
 Maint. Lowflow = 2.945 (13.30 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 4.261 (19.24 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.484	1.428	2.952	0.075	0.000	0.000	0.075
Nov	0.353	1.611	4.568	0.052	0.000	0.067	0.118
Dec	0.281	1.344	4.780	0.041	0.000	0.053	0.094
Jan	0.069	0.341	4.967	0.010	0.000	0.000	0.010
Feb	0.055	0.294	5.370	0.008	0.000	0.000	0.008
Mar	0.050	0.142	2.861	0.007	0.000	0.000	0.007
Apr	0.624	2.335	3.744	0.080	0.000	0.121	0.201
May	2.362	6.060	2.566	0.301	0.000	0.534	0.835
Jun	6.443	12.286	1.907	0.824	0.000	1.998	2.822
Jul	6.397	12.739	1.991	0.834	0.000	0.534	1.368
Aug	3.184	5.698	1.790	0.441	0.000	0.607	1.048
Sep	1.840	3.898	2.118	0.272	0.000	0.346	0.618

A.3.36 E24G

A.3.36.1 Incremental .tab

IUA: Doring rangelands
 Tributary Rivers: Soutpans (FEPA) and two with no names
 Mainstem: Wolf
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: A/B (PES = A/B).

Desktop Version 2, Generated on 2011/08/06
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 11.186
 S.Dev. = 14.702
 CV = 1.314
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.170
 CV(JJA+JFM) Index = 6.301

Ecological Category = A/B

Total IFR = 3.640 (32.54 %MAR)
 Maint. Lowflow = 1.487 (13.30 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 2.153 (19.25 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.245	0.722	2.950	0.038	0.000	0.000	0.038
Nov	0.178	0.814	4.566	0.026	0.000	0.034	0.060
Dec	0.142	0.679	4.776	0.021	0.000	0.027	0.048
Jan	0.035	0.172	4.975	0.005	0.000	0.000	0.005
Feb	0.028	0.148	5.369	0.004	0.000	0.000	0.004
Mar	0.025	0.072	2.870	0.004	0.000	0.000	0.004
Apr	0.315	1.180	3.743	0.040	0.000	0.061	0.102
May	1.193	3.062	2.566	0.152	0.000	0.270	0.422
Jun	3.255	6.207	1.907	0.416	0.000	1.009	1.426
Jul	3.232	6.435	1.991	0.421	0.000	0.270	0.691
Aug	1.609	2.879	1.789	0.223	0.000	0.307	0.530
Sep	0.930	1.969	2.118	0.138	0.000	0.175	0.312

A.3.36.2 Cumulative .tab

IUA: Doring rangelands
 Tributary Rivers: Soutpans (FEPA) and two with no names
 Mainstem: Wolf
 Node: R22
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: A/B (PES = A/B).

Desktop Version 2, Generated on 2011/09/19
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 33.327
 S.Dev. = 43.803
 CV = 1.314
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.170
 CV(JJA+JFM) Index = 6.297

Ecological Category = A/B

Total IFR = 10.846 (32.54 %MAR)
 Maint. Lowflow = 4.432 (13.30 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 6.414 (19.24 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.729	2.150	2.951	0.113	0.000	0.000	0.113
Nov	0.531	2.425	4.567	0.078	0.000	0.100	0.178
Dec	0.423	2.022	4.779	0.062	0.000	0.080	0.142
Jan	0.103	0.513	4.970	0.015	0.000	0.000	0.015
Feb	0.082	0.443	5.370	0.011	0.000	0.000	0.011
Mar	0.075	0.215	2.864	0.011	0.000	0.000	0.011
Apr	0.939	3.516	3.744	0.120	0.000	0.182	0.302
May	3.555	9.122	2.566	0.453	0.000	0.804	1.257
Jun	9.698	18.492	1.907	1.240	0.000	3.007	4.247
Jul	9.629	19.174	1.991	1.255	0.000	0.804	2.059
Aug	4.792	8.577	1.790	0.664	0.000	0.914	1.578
Sep	2.770	5.866	2.118	0.410	0.000	0.521	0.931

A.3.37 E24H

A.3.37.1 Incremental .tab

IUA: Doring rangelands
 Tributary Rivers: Wolf and three with no names
 Mainstem: Doring
 Node: -
 Data source: Extrapolated from EWR 4 (DWAF 2005)
 Adjustments: None
 Target condition: B (PES = A/B).

Desktop Version 2, Generated on 15/11/2012
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 8.534
 S.Dev. = 11.219
 CV = 1.315
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.170
 CV(JJA+JFM) Index = 6.321

Ecological Category = B

Total IFR = 3.840 (44.99 %MAR)
 Maint. Lowflow = 1.267 (14.85 %MAR)
 Drought Lowflow = 0.073 (0.85 %MAR)
 Maint. Highflow = 2.572 (30.14 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.187	0.551	2.948	0.109	0.008	0.130	0.239
Nov	0.136	0.621	4.563	0.002	0.002	0.065	0.067
Dec	0.109	0.518	4.775	0.000	0.000	0.000	0.000
Jan	0.027	0.132	4.967	0.000	0.000	0.000	0.000
Feb	0.021	0.113	5.413	0.000	0.000	0.000	0.000
Mar	0.019	0.055	2.897	0.000	0.000	0.000	0.000
Apr	0.240	0.900	3.745	0.003	0.000	0.065	0.068
May	0.910	2.337	2.567	0.027	0.001	0.000	0.027
Jun	2.483	4.736	1.907	0.158	0.001	0.289	0.447
Jul	2.466	4.911	1.992	0.327	0.001	0.410	0.737
Aug	1.227	2.196	1.789	0.327	0.056	0.634	0.961
Sep	0.709	1.502	2.119	0.316	0.005	0.979	1.295

A.3.37.2 Cumulative .tab

IUA: Doring rangelands
 Tributary Rivers: Wolf and three with no names
 Mainstem: Doring
 Node: R20
 Data source: Extrapolated from EWR 4 (DWAF 2005)
 Adjustments: None
 Target condition: B (PES = A/B).

Desktop Version 2, Generated on 11/7/2012
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 420.425
 S.Dev. = 328.453
 CV = 0.781
 Q75 = 1.854
 Q75/MMF = 0.053
 BFI Index = 0.265
 CV(JJA+JFM) Index = 4.436

Ecological Category = B

Total IFR = 189.163 (44.99 %MAR)
 Maint. Lowflow = 62.435 (14.85 %MAR)
 Drought Lowflow = 3.581 (0.85 %MAR)
 Maint. Highflow = 126.728 (30.14 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Cape(dry)

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	21.492	16.129	0.750	5.362	0.402	6.406	11.769
Nov	15.119	25.301	1.673	0.078	0.078	3.203	3.281
Dec	9.325	18.969	2.034	0.000	0.000	0.000	0.000
Jan	6.588	27.127	4.118	0.000	0.000	0.000	0.000
Feb	4.773	15.790	3.308	0.000	0.000	0.000	0.000
Mar	4.405	8.611	1.955	0.000	0.000	0.000	0.000
Apr	17.669	40.521	2.293	0.130	0.000	3.203	3.333
May	43.755	70.728	1.616	1.341	0.027	0.000	1.341
Jun	93.354	148.865	1.595	7.784	0.026	14.214	21.998
Jul	96.136	130.221	1.355	16.087	0.054	20.220	36.307
Aug	66.175	64.812	0.979	16.087	2.762	31.232	47.318
Sep	41.634	38.396	0.922	15.568	0.234	48.249	63.816

A.3.38 E24J

A.3.38.1 Incremental .tab

IUA: Olifants-Doring dryland farming
 Tributary Rivers: Avontuur, Putslaagte, Biedou (FEPA) and one with no name (upper portion a FEPA)
 Mainstem: Doring
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: 80% of natural floods assumed for July, August and September (reflected below)
 Target condition: B (PES = A/B).

CONSTRUCTED

Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 19.050
 S.Dev. = 25.037
 CV = 1.314
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.170
 CV(JJA+JFM) Index = 6.296

Ecological Category = B

Total IFR = 10.942 (57.44 %MAR)
 Maint. Lowflow = 2.279 (11.96 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 8.663 (45.47 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	
				Maint.	Drought	Maint.	Total Flows
Oct	0.417	1.229	2.950	0.058	0.000	0.000	0.058
Nov	0.304	1.386	4.568	0.040	0.000	0.048	0.088
Dec	0.242	1.155	4.774	0.032	0.000	0.038	0.070
Jan	0.059	0.293	4.969	0.008	0.000	0.000	0.008
Feb	0.047	0.253	5.372	0.006	0.000	0.000	0.006
Mar	0.043	0.122	2.859	0.006	0.000	0.000	0.006
Apr	0.537	2.010	3.744	0.062	0.000	0.087	0.149
May	2.031	5.214	2.567	0.233	0.000	0.385	0.618
Jun	5.543	10.569	1.907	0.637	0.000	1.440	2.077
Jul	5.504	10.959	1.991	0.644	0.000	3.759	4.403
Aug	2.740	4.902	1.789	0.342	0.000	1.850	2.192
Sep	1.584	3.354	2.117	0.211	0.000	1.056	1.267

A.3.38.2 Cumulative .tab

IUA: Olifants-Doring dryland farming
 Tributary Rivers: Avontuur, Putslaagte, Biedou (FEPA) and one with no name (upper portion a FEPA)
 Mainstem: Doring
 Node: R19
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: B (PES = B).

Desktop Version 2, Generated on 11/7/2012
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 439.475
 S.Dev. = 351.085
 CV = 0.799
 Q75 = 1.854
 Q75/MMF = 0.051
 BFI Index = 0.264
 CV(JJA+JFM) Index = 4.443

Ecological Category = B

Total IFR = 213.035 (48.47 %MAR)
 Maint. Lowflow = 69.410 (15.79 %MAR)
 Drought Lowflow = 1.113 (0.25 %MAR)
 Maint. Highflow = 143.625 (32.68 %MAR)

Monthly Distributions (Mill. cu. m.)

Distribution Type : W.Cape(dry)

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	21.908	17.001	0.776	5.275	0.069	6.880	12.155
Nov	15.423	26.395	1.711	0.067	0.067	3.440	3.507
Dec	9.566	19.889	2.079	0.000	0.000	0.000	0.000
Jan	6.647	27.196	4.092	0.000	0.000	0.000	0.000
Feb	4.820	15.885	3.296	0.000	0.000	0.000	0.000
Mar	4.448	8.678	1.951	0.000	0.000	0.000	0.000
Apr	18.206	42.266	2.322	0.111	0.000	3.440	3.552
May	45.787	75.430	1.647	1.889	0.000	3.440	5.329
Jun	98.896	158.886	1.607	11.146	0.000	12.900	24.046
Jul	101.640	140.336	1.381	19.119	0.138	23.221	42.340
Aug	68.915	69.208	1.004	18.428	0.438	73.963	92.391
Sep	43.218	41.500	0.960	13.375	0.401	16.341	29.716

A.3.39 E24K

A.3.39.1 Incremental .tab

IUA: Olifants-Doring dryland farming
 Tributary Rivers: Kransgat (formed by Brak and Paalkraal)
 Mainstem: Doring
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: 80% of natural floods assumed for July, August and September (reflected below)
 Target condition: B (PES = A/B).

CONSTRUCTED

Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 11.521
 S.Dev. = 15.143
 CV = 1.314
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.211
 CV(JJA+JFM) Index = 6.295

Ecological Category = B

Total IFR = 6.029 (52.33 %MAR)
 Maint. Lowflow = 1.820 (15.79 %MAR)
 Drought Lowflow = 0.029 (0.25 %MAR)
 Maint. Highflow = 4.208 (36.52 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Cape(dry)

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.252	0.743	2.950	0.138	0.002	0.180	0.319
Nov	0.184	0.839	4.567	0.002	0.002	0.090	0.092
Dec	0.146	0.699	4.776	0.000	0.000	0.000	0.000
Jan	0.036	0.178	4.987	0.000	0.000	0.000	0.000
Feb	0.029	0.153	5.335	0.000	0.000	0.000	0.000
Mar	0.026	0.075	2.875	0.000	0.000	0.000	0.000
Apr	0.325	1.216	3.741	0.003	0.000	0.090	0.093
May	1.229	3.154	2.566	0.050	0.000	0.090	0.140
Jun	3.352	6.393	1.907	0.292	0.000	0.338	0.630
Jul	3.328	6.628	1.991	0.501	0.004	2.162	2.663
Aug	1.657	2.965	1.789	0.483	0.011	0.843	1.326
Sep	0.958	2.028	2.117	0.351	0.011	0.415	0.766

A.3.39.2 Cumulative .tab

IUA: Olifants-Doring dryland farming
 Tributary Rivers: Kransgat (formed by Brak and Paalkraal)
 Mainstem: Doring
 Node: R16
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: B (PES = A/B).

Desktop Version 2, Generated on 11/7/2012
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 450.996
 S.Dev. = 364.926
 CV = 0.809
 Q75 = 1.854
 Q75/MMF = 0.049
 BFI Index = 0.263
 CV(JJA+JFM) Index = 4.447

Ecological Category = B

Total IFR = 218.620 (48.47 %MAR)
 Maint. Lowflow = 71.230 (15.79 %MAR)
 Drought Lowflow = 1.142 (0.25 %MAR)
 Maint. Highflow = 147.390 (32.68 %MAR)

Monthly Distributions (Mill. cu. m.)

Distribution Type : W.Cape(dry)

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	22.160	17.550	0.792	5.413	0.071	7.061	12.474
Nov	15.606	27.070	1.735	0.069	0.069	3.530	3.599
Dec	9.713	20.457	2.106	0.000	0.000	0.000	0.000
Jan	6.683	27.239	4.076	0.000	0.000	0.000	0.000
Feb	4.849	15.944	3.288	0.000	0.000	0.000	0.000
Mar	4.474	8.719	1.949	0.000	0.000	0.000	0.000
Apr	18.531	43.332	2.338	0.114	0.000	3.530	3.645
May	47.016	78.305	1.666	1.938	0.000	3.530	5.469
Jun	102.249	164.981	1.614	11.438	0.000	13.239	24.677
Jul	104.969	146.512	1.396	19.620	0.142	23.830	43.450
Aug	70.572	71.899	1.019	18.911	0.449	75.902	94.813
Sep	44.176	43.395	0.982	13.726	0.412	16.769	30.495

A.3.40 E24L

A.3.40.1 Incremental .tab

IUA: Olifants-Doring dryland farming
 Tributary Rivers: Brandewyn, Kilpmekaar
 Mainstem: Doring
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: 80% of natural floods assumed for July, August and September (reflected below)
 Target condition: B (PES = C)

CONSTRUCTED

Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 9.127
 S.Dev. = 11.985
 CV = 1.313
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.211
 CV(JJA+JFM) Index = 6.291

Ecological Category = B

Total IFR = 4.987 (54.64 %MAR)
 Maint. Lowflow = 1.014 (11.11 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 3.972 (43.52 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Cape(dry)

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.199	0.588	2.953	0.029	0.000	0.035	0.064
Nov	0.145	0.663	4.562	0.020	0.000	0.022	0.042
Dec	0.116	0.553	4.782	0.016	0.000	0.000	0.016
Jan	0.028	0.141	4.974	0.004	0.000	0.000	0.004
Feb	0.023	0.122	5.353	0.003	0.000	0.000	0.003
Mar	0.021	0.059	2.862	0.003	0.000	0.000	0.003
Apr	0.257	0.962	3.738	0.024	0.000	0.000	0.024
May	0.973	2.496	2.566	0.092	0.000	0.192	0.284
Jun	2.653	5.059	1.907	0.257	0.000	0.521	0.778
Jul	2.634	5.245	1.991	0.280	0.000	1.827	2.107
Aug	1.316	2.350	1.786	0.176	0.000	0.877	1.053
Sep	0.762	1.606	2.108	0.111	0.000	0.498	0.609

A.3.40.2 Cumulative .tab

IUA: Olifants-Doring dryland farming
 Tributary Rivers: Brandewyn, Kilpmekaar
 Mainstem: Doring
 Node: -
 Data source: Extrapolated from EWR 5 (DWAF 2005)
 Adjustments: 80% of natural floods assumed for July, August and September (reflected below)
 Target condition: B (PES=B)

CONSTRUCTED

Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 508.227
 S.Dev. = 434.953
 CV = 0.856
 Q75 = 1.854
 Q75/MMF = 0.044
 BFI Index = 0.260
 CV(JJA+JFM) Index = 4.465

Ecological Category = B

Total IFR = 2255.586 (50.29 %MAR)
 Maint. Lowflow = 80.269 (15.79 %MAR)
 Drought Lowflow = 1.287 (0.25 %MAR)
 Maint. Highflow = 1175.316 (34.5 %MAR)

Monthly Distributions (Mill. cu. m.)

Distribution Type : W.Cape(dry)

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	23.411	20.456	0.874	6.100	0.080	7.957	14.057
Nov	16.519	30.541	1.849	0.077	0.077	3.978	4.056
Dec	10.439	23.382	2.240	0.000	0.000	0.000	0.000
Jan	6.860	27.470	4.004	0.000	0.000	0.000	0.000
Feb	4.991	16.258	3.258	0.000	0.000	0.000	0.000
Mar	4.603	8.931	1.940	0.000	0.000	0.000	0.000
Apr	20.144	48.733	2.419	0.129	0.000	3.978	4.107
May	53.118	92.853	1.748	2.184	0.000	3.978	6.163
Jun	118.898	195.529	1.645	12.890	0.000	14.919	27.808
Jul	121.502	177.670	1.462	22.110	0.160	75.091	97.201
Aug	78.806	85.533	1.085	21.311	0.506	41.734	63.045
Sep	48.936	52.952	1.082	15.468	0.464	23.681	39.149

A.3.41 E24M

A.3.41.1 Incremental .tab

IUA: Olifants-Doring dryland farming
 Tributary Rivers: Olienhouts (FEPA), Gifberg (FEPA), and one with no name
 Mainstem: Doring (below Gifberg confluence is a FEPA)
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: 80% of natural floods assumed for July, August and September (reflected below)
 Target condition: B (PES = C).

CONSTRUCTED

Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 9.350
 S.Dev. = 12.286
 CV = 1.314
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.170
 CV(JJA+JFM) Index = 6.317

Ecological Category = B

Total IFR = 5.382 (57.56 %MAR)
 Maint. Lowflow = 1.136 (12.15 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 4.247 (45.42 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.204	0.603	2.955	0.029	0.000	0.000	0.029
Nov	0.149	0.680	4.564	0.020	0.000	0.024	0.044
Dec	0.119	0.567	4.781	0.016	0.000	0.019	0.035
Jan	0.029	0.144	4.991	0.004	0.000	0.000	0.004
Feb	0.023	0.125	5.404	0.003	0.000	0.000	0.003
Mar	0.021	0.060	2.870	0.003	0.000	0.000	0.003
Apr	0.263	0.986	3.743	0.031	0.000	0.043	0.074
May	0.997	2.559	2.567	0.116	0.000	0.189	0.305
Jun	2.720	5.187	1.907	0.317	0.000	0.707	1.024
Jul	2.701	5.378	1.991	0.321	0.000	1.840	2.161
Aug	1.346	2.406	1.788	0.170	0.000	0.907	1.077
Sep	0.778	1.645	2.114	0.105	0.000	0.518	0.623

A.3.41.2 Cumulative .tab

IUA: Olifants-Doring dryland farming
 Tributary Rivers: Olienhouts (FEPA), Gifberg (FEPA), and one with no name
 Mainstem: Doring (below Gifberg confluence is a FEPA)
 Node: R14
 Data source: Extrapolated from EWR 5 (DWAF 2005)
 Adjustments: 80% of natural floods assumed for July, August and September (reflected below)
 Target condition: B (PES = B).

CONSTRUCTED

Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :

Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 517.577
 S.Dev. = 446.554
 CV = 0.863
 Q75 = 1.854
 Q75/MMF = 0.043
 BFI Index = 0.260
 CV(JJA+JFM) Index = 4.467

Ecological Category = B

Total IFR = 2260.479 (50.33 %MAR)
 Maint. Lowflow = 81.746 (15.79 %MAR)
 Drought Lowflow = 1.311 (0.25 %MAR)
 Maint. Highflow = 1178.732 (34.53 %MAR)

Monthly Distributions (Mill. cu. m.)

Distribution Type : W.Cape(dry)

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	23.615	20.954	0.887	6.212	0.081	8.103	14.315
Nov	16.668	31.125	1.867	0.079	0.079	4.051	4.130
Dec	10.558	23.874	2.261	0.000	0.000	0.000	0.000
Jan	6.889	27.510	3.993	0.000	0.000	0.000	0.000
Feb	5.014	16.312	3.253	0.000	0.000	0.000	0.000
Mar	4.624	8.966	1.939	0.000	0.000	0.000	0.000
Apr	20.407	49.629	2.432	0.131	0.000	4.051	4.183
May	54.115	95.264	1.760	2.225	0.000	4.051	6.276
Jun	121.617	200.555	1.649	13.127	0.000	15.193	28.320
Jul	124.203	182.819	1.472	22.517	0.163	76.845	99.362
Aug	80.152	87.794	1.095	21.703	0.515	42.419	64.122
Sep	49.714	54.531	1.097	15.752	0.473	24.019	39.771

A.4 Secondary E3

A.4.1 E31A

A.4.1.1 Cumulative and Incremental .tab

IUA: Knersvlakte
Tributary Rivers: Saraip se Laagte, Nabaab se Laagte, plus one tributary with no name
Mainstem: Saraip
Node: Q2
Data source: DWA 2012, default desktop reserve
Adjustments: None
Target condition: B (PES = B).

Desktop Version 2, Generated on 2011/08/06
Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 0.223
S.Dev. = 0.753
CV = 3.382
Q75 = 0.000
Q75/MMF = 0.000
BFI Index = 0.260
CV(JJA+JFM) Index = 13.813

Ecological Category = B

Total IFR = 0.058 (25.82 %MAR)
Maint. Lowflow = 0.021 (9.26 %MAR)
Drought Lowflow = 0.000 (0.00 %MAR)
Maint. Highflow = 0.037 (16.57 %MAR)

Monthly Distributions (Mill. cu. m.)
Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.061	0.557	9.183	0.011	0.000	0.000	0.011
Nov	0.004	0.021	5.737	0.000	0.000	0.001	0.001
Dec	0.010	0.082	8.250	0.001	0.000	0.002	0.002
Jan	0.003	0.027	9.220	0.000	0.000	0.000	0.000
Feb	0.000	0.001	9.220	0.000	0.000	0.000	0.000
Mar	0.001	0.005	9.220	0.000	0.000	0.000	0.000
Apr	0.011	0.065	6.037	0.001	0.000	0.002	0.003
May	0.017	0.089	5.369	0.001	0.000	0.004	0.005
Jun	0.058	0.293	5.030	0.003	0.000	0.020	0.024
Jul	0.034	0.154	4.567	0.002	0.000	0.004	0.006
Aug	0.020	0.083	4.183	0.001	0.000	0.004	0.005
Sep	0.006	0.025	4.359	0.000	0.000	0.001	0.001

A.4.2 E31B

A.4.2.1 Cumulative and Incremental .tab

IUA: Knersvlakte
 Tributary Rivers: Droelaagte, Handelskrral, and two with no names
 Mainstem: Krom (portions between Droelaagte and no-name and below Handelskraal are FEPAs)
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: B (PES = B).

Desktop Version 2, Generated on 2011/08/06
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 0.978
 S.Dev. = 1.883
 CV = 1.926
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.174
 CV(JJA+JFM) Index = 10.396

Ecological Category = B

Total IFR = 0.251 (25.66 %MAR)
 Maint. Lowflow = 0.088 (8.95 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 0.163 (16.70 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.010	0.030	3.097	0.002	0.000	0.000	0.002
Nov	0.033	0.154	4.740	0.003	0.000	0.005	0.009
Dec	0.051	0.376	7.306	0.004	0.000	0.009	0.013
Jan	0.014	0.124	9.060	0.001	0.000	0.000	0.001
Feb	0.005	0.032	5.984	0.000	0.000	0.000	0.000
Mar	0.011	0.064	5.830	0.001	0.000	0.000	0.001
Apr	0.076	0.341	4.473	0.006	0.000	0.013	0.019
May	0.115	0.418	3.635	0.010	0.000	0.015	0.025
Jun	0.306	1.114	3.638	0.026	0.000	0.077	0.103
Jul	0.179	0.621	3.472	0.016	0.000	0.015	0.031
Aug	0.130	0.418	3.203	0.012	0.000	0.022	0.034
Sep	0.048	0.140	2.931	0.005	0.000	0.008	0.013

A.4.3 E31C

A.4.3.1 Incremental .tab

IUA: Knersvlakte
Tributary Rivers: Rooiberg (FEPA), Klein-Rooiberg (FEPA), Leeuberg, Sandkraal (tributary to Sandkraal, Groot-Hartbeeslaagte is FEPA)
Mainstem: Krom
Node: -
Data source: DWA 2012, default desktop reserve
Adjustments: None
Target condition: B (PES = B).

Desktop Version 2, Generated on 2011/08/06
Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 1.034
S.Dev. = 1.990
CV = 1.924
Q75 = 0.000
Q75/MMF = 0.000
BFI Index = 0.174
CV(JJA+JFM) Index = 10.359

Ecological Category = B

Total IFR = 0.265 (25.66 %MAR)
Maint. Lowflow = 0.093 (8.96 %MAR)
Drought Lowflow = 0.000 (0.00 %MAR)
Maint. Highflow = 0.173 (16.70 %MAR)

Monthly Distributions (Mill. cu. m.)
Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.010	0.031	3.071	0.002	0.000	0.000	0.002
Nov	0.034	0.164	4.750	0.003	0.000	0.006	0.009
Dec	0.054	0.396	7.323	0.005	0.000	0.009	0.014
Jan	0.014	0.131	9.069	0.001	0.000	0.000	0.001
Feb	0.006	0.033	5.889	0.001	0.000	0.000	0.001
Mar	0.012	0.068	5.818	0.001	0.000	0.000	0.001
Apr	0.081	0.360	4.462	0.007	0.000	0.014	0.020
May	0.122	0.442	3.632	0.010	0.000	0.016	0.026
Jun	0.324	1.176	3.634	0.027	0.000	0.081	0.108
Jul	0.189	0.656	3.470	0.017	0.000	0.016	0.033
Aug	0.138	0.441	3.198	0.013	0.000	0.023	0.036
Sep	0.050	0.147	2.923	0.006	0.000	0.008	0.014

A.4.3.2 Cumulative .tab

IUA: Knersvlakte
 Tributary Rivers: Rooiberg (FEPA), Klein-Rooiberg (FEPA), Leeuberg, Sandkraal (tributary to Sandkraal, Groot-Hartbeeslaagte is FEPA)
 Mainstem: Krom
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: B (PES = B).

Desktop Version 2, Generated on 2011/08/29
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 2.012
 S.Dev. = 3.873
 CV = 1.925
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.174
 CV(JJA+JFM) Index = 10.377

Ecological Category = B

Total IFR = 0.516 (25.66 %MAR)
 Maint. Lowflow = 0.180 (8.96 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 0.336 (16.70 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.020	0.061	3.083	0.004	0.000	0.000	0.004
Nov	0.067	0.318	4.745	0.006	0.000	0.011	0.018
Dec	0.106	0.772	7.315	0.009	0.000	0.018	0.027
Jan	0.028	0.255	9.065	0.003	0.000	0.000	0.003
Feb	0.011	0.065	5.934	0.001	0.000	0.000	0.001
Mar	0.023	0.132	5.824	0.002	0.000	0.000	0.002
Apr	0.157	0.702	4.467	0.013	0.000	0.027	0.040
May	0.237	0.860	3.634	0.020	0.000	0.031	0.051
Jun	0.630	2.290	3.636	0.053	0.000	0.158	0.211
Jul	0.368	1.276	3.471	0.033	0.000	0.031	0.064
Aug	0.268	0.859	3.200	0.025	0.000	0.044	0.069
Sep	0.098	0.287	2.927	0.011	0.000	0.016	0.026

A.4.4 E31D

A.4.4.1 Incremental .tab

IUA: Knersvlakte
Tributary Rivers: Dieplaagte, April se and one with no name
Mainstem: Krom
Node: -
Data source: DWA 2012, default desktop reserve
Adjustments: None
Target condition: B (PES = B).

Desktop Version 2, Generated on 2011/08/06
Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 0.544
S.Dev. = 1.047
CV = 1.923
Q75 = 0.000
Q75/MMF = 0.000
BFI Index = 0.173
CV(JJA+JFM) Index = 10.361

Ecological Category = B

Total IFR = 0.140 (25.65 %MAR)
Maint. Lowflow = 0.049 (8.95 %MAR)
Drought Lowflow = 0.000 (0.00 %MAR)
Maint. Highflow = 0.091 (16.71 %MAR)

Monthly Distributions (Mill. cu. m.)
Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.005	0.017	3.233	0.001	0.000	0.000	0.001
Nov	0.018	0.086	4.744	0.002	0.000	0.003	0.005
Dec	0.028	0.209	7.387	0.002	0.000	0.005	0.007
Jan	0.008	0.069	9.077	0.001	0.000	0.000	0.001
Feb	0.003	0.018	6.092	0.000	0.000	0.000	0.000
Mar	0.006	0.035	5.627	0.001	0.000	0.000	0.001
Apr	0.043	0.189	4.430	0.004	0.000	0.007	0.011
May	0.064	0.233	3.615	0.005	0.000	0.009	0.014
Jun	0.170	0.619	3.639	0.014	0.000	0.043	0.057
Jul	0.100	0.345	3.464	0.009	0.000	0.009	0.017
Aug	0.073	0.232	3.185	0.007	0.000	0.012	0.019
Sep	0.027	0.077	2.910	0.003	0.000	0.004	0.007

A.4.4.2 Cumulative .tab

IUA: Knersvlakte
 Tributary Rivers: Dieplaagte, April se and one with no name
 Mainstem: Krom
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: B (PES = B).

Desktop Version 2, Generated on 2011/08/29
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 2.556
 S.Dev. = 4.920
 CV = 1.925
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.174
 CV(JJA+JFM) Index = 10.373

Ecological Category = B

Total IFR = 0.656 (25.66 %MAR)
 Maint. Lowflow = 0.229 (8.96 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 0.427 (16.70 %MAR)

Monthly Distributions (Mill. cu. m.)

Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.025	0.078	3.109	0.005	0.000	0.000	0.005
Nov	0.085	0.404	4.745	0.008	0.000	0.014	0.022
Dec	0.134	0.980	7.330	0.012	0.000	0.023	0.034
Jan	0.036	0.324	9.067	0.003	0.000	0.000	0.003
Feb	0.014	0.083	5.966	0.001	0.000	0.000	0.001
Mar	0.029	0.167	5.781	0.003	0.000	0.000	0.003
Apr	0.200	0.891	4.459	0.017	0.000	0.034	0.051
May	0.301	1.093	3.630	0.025	0.000	0.040	0.065
Jun	0.800	2.909	3.636	0.067	0.000	0.201	0.268
Jul	0.467	1.621	3.470	0.041	0.000	0.040	0.081
Aug	0.341	1.090	3.197	0.032	0.000	0.056	0.088
Sep	0.125	0.364	2.923	0.014	0.000	0.020	0.034

A.4.5 E31E

A.4.5.1 Incremental .tab

IUA: Knersvlakte
 Tributary Rivers: Abikwa and one with no name
 Mainstem: Krom
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: B (PES = B).

Desktop Version 2, Generated on 2011/08/06
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 0.324
 S.Dev. = 0.628
 CV = 1.938
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.171
 CV(JJA+JFM) Index = 10.537

Ecological Category = B

Total IFR = 0.083 (25.62 %MAR)
 Maint. Lowflow = 0.029 (8.87 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 0.054 (16.74 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.003	0.010	3.624	0.001	0.000	0.000	0.001
Nov	0.011	0.052	4.761	0.001	0.000	0.002	0.003
Dec	0.017	0.126	7.314	0.001	0.000	0.003	0.004
Jan	0.005	0.041	8.983	0.000	0.000	0.000	0.000
Feb	0.002	0.010	6.343	0.000	0.000	0.000	0.000
Mar	0.004	0.022	5.906	0.000	0.000	0.000	0.000
Apr	0.025	0.113	4.463	0.002	0.000	0.004	0.006
May	0.038	0.140	3.658	0.003	0.000	0.005	0.008
Jun	0.102	0.371	3.646	0.009	0.000	0.025	0.034
Jul	0.059	0.207	3.482	0.005	0.000	0.005	0.010
Aug	0.043	0.139	3.251	0.004	0.000	0.007	0.011
Sep	0.016	0.047	3.026	0.002	0.000	0.003	0.004

A.4.5.2 Cumulative .tab

IUA: Knersvlakte
 Tributary Rivers: Abikwa and one with no name
 Mainstem: Krom
 Node: R2
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: B (PES = B).

Desktop Version 2, Generated on 2011/08/10
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 2.880
 S.Dev. = 5.548
 CV = 1.926
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.174
 CV(JJA+JFM) Index = 10.390

Ecological Category = B

Total IFR = 0.739 (25.66 %MAR)
 Maint. Lowflow = 0.258 (8.95 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 0.481 (16.71 %MAR)

Monthly Distributions (Mill. cu. m.)

Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.028	0.087	3.155	0.006	0.000	0.000	0.006
Nov	0.096	0.456	4.747	0.009	0.000	0.016	0.025
Dec	0.151	1.106	7.328	0.013	0.000	0.025	0.038
Jan	0.040	0.366	9.058	0.004	0.000	0.000	0.004
Feb	0.016	0.093	6.005	0.001	0.000	0.000	0.001
Mar	0.033	0.189	5.794	0.003	0.000	0.000	0.003
Apr	0.225	1.004	4.460	0.019	0.000	0.038	0.057
May	0.339	1.233	3.633	0.029	0.000	0.045	0.074
Jun	0.902	3.281	3.637	0.076	0.000	0.226	0.302
Jul	0.527	1.828	3.471	0.047	0.000	0.045	0.092
Aug	0.384	1.230	3.203	0.036	0.000	0.064	0.099
Sep	0.140	0.411	2.934	0.016	0.000	0.022	0.038

A.4.6 E31F

A.4.6.1 Cumulative and Incremental.tab

IUA: Knersvlakte
 Tributary Rivers: One with no name
 Mainstem: Kamdanie
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: B (PES = B).

Desktop Version 2, Generated on 2011/08/06
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 0.324
 S.Dev. = 0.628
 CV = 1.938
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.171
 CV(JJA+JFM) Index = 10.537

Ecological Category = B

Total IFR = 0.083 (25.62 %MAR)
 Maint. Lowflow = 0.029 (8.87 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 0.054 (16.74 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.003	0.010	3.624	0.001	0.000	0.000	0.001
Nov	0.011	0.052	4.761	0.001	0.000	0.002	0.003
Dec	0.017	0.126	7.314	0.001	0.000	0.003	0.004
Jan	0.005	0.041	8.983	0.000	0.000	0.000	0.000
Feb	0.002	0.010	6.343	0.000	0.000	0.000	0.000
Mar	0.004	0.022	5.906	0.000	0.000	0.000	0.000
Apr	0.025	0.113	4.463	0.002	0.000	0.004	0.006
May	0.038	0.140	3.658	0.003	0.000	0.005	0.008
Jun	0.102	0.371	3.646	0.009	0.000	0.025	0.034
Jul	0.059	0.207	3.482	0.005	0.000	0.005	0.010
Aug	0.043	0.139	3.251	0.004	0.000	0.007	0.011
Sep	0.016	0.047	3.026	0.002	0.000	0.003	0.004

A.4.7 E31G

A.4.7.1 Cumulative and Incremental .tab

IUA: Knersvlakte
 Tributary Rivers: Rooiwal se Laagte (made from Alwynfontein se Laagte and no name, upper portion of latter is FEPA) and one other with no name
 Mainstem: Rooisloot
 Node: R1
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: B (PES = B).

Desktop Version 2, Generated on 2011/08/06
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 0.814
 S.Dev. = 1.571
 CV = 1.929
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.174
 CV(JJA+JFM) Index = 10.418

Ecological Category = B

Total IFR = 0.209 (25.65 %MAR)
 Maint. Lowflow = 0.073 (8.94 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 0.136 (16.71 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.008	0.025	3.307	0.002	0.000	0.000	0.002
Nov	0.027	0.129	4.742	0.003	0.000	0.004	0.007
Dec	0.042	0.313	7.377	0.004	0.000	0.007	0.011
Jan	0.011	0.103	9.123	0.001	0.000	0.000	0.001
Feb	0.004	0.026	6.090	0.000	0.000	0.000	0.000
Mar	0.009	0.053	5.722	0.001	0.000	0.000	0.001
Apr	0.064	0.284	4.461	0.005	0.000	0.011	0.016
May	0.096	0.349	3.626	0.008	0.000	0.013	0.021
Jun	0.255	0.929	3.642	0.021	0.000	0.064	0.085
Jul	0.149	0.517	3.467	0.013	0.000	0.013	0.026
Aug	0.109	0.349	3.212	0.010	0.000	0.018	0.028
Sep	0.040	0.116	2.938	0.004	0.000	0.006	0.011

A.4.8 E31H

A.4.8.1 Incremental .tab

IUA: Knersvlakte
Tributary Rivers: Rooisloot and Twee (FEPA)
Mainstem: Krom
Node: -
Data source: DWA 2012, default desktop reserve
Adjustments: None
Target condition: B (PES = B).

Desktop Version 2, Generated on 2011/08/06
Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 0.488
S.Dev. = 0.943
CV = 1.933
Q75 = 0.000
Q75/MMF = 0.000
BFI Index = 0.173
CV(JJA+JFM) Index = 10.486

Ecological Category = B

Total IFR = 0.125 (25.63 %MAR)
Maint. Lowflow = 0.043 (8.91 %MAR)
Drought Lowflow = 0.000 (0.00 %MAR)
Maint. Highflow = 0.082 (16.73 %MAR)

Monthly Distributions (Mill. cu. m.)
Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.004	0.015	3.408	0.001	0.000	0.000	0.001
Nov	0.016	0.078	4.795	0.001	0.000	0.003	0.004
Dec	0.025	0.188	7.388	0.002	0.000	0.004	0.006
Jan	0.007	0.062	9.060	0.001	0.000	0.000	0.001
Feb	0.002	0.015	6.211	0.000	0.000	0.000	0.000
Mar	0.005	0.032	5.854	0.000	0.000	0.000	0.000
Apr	0.038	0.170	4.460	0.003	0.000	0.006	0.010
May	0.058	0.209	3.614	0.005	0.000	0.008	0.013
Jun	0.153	0.557	3.635	0.013	0.000	0.038	0.051
Jul	0.089	0.310	3.480	0.008	0.000	0.008	0.016
Aug	0.065	0.209	3.216	0.006	0.000	0.011	0.017
Sep	0.023	0.070	3.003	0.003	0.000	0.004	0.006

A.4.8.2 Cumulative .tab

IUA: Knersvlakte
 Tributary Rivers: Rooisloot and Twee (FEPA)
 Mainstem: Krom
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: B (PES = B).

Desktop Version 2, Generated on 2011/08/29
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 4.506
 S.Dev. = 8.689
 CV = 1.928
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.174
 CV(JJA+JFM) Index = 10.414

Ecological Category = B

Total IFR = 1.156 (25.65 %MAR)
 Maint. Lowflow = 0.403 (8.94 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 0.753 (16.71 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.042	0.137	3.232	0.009	0.000	0.000	0.009
Nov	0.150	0.714	4.752	0.014	0.000	0.025	0.039
Dec	0.236	1.733	7.342	0.020	0.000	0.040	0.060
Jan	0.063	0.572	9.064	0.006	0.000	0.000	0.006
Feb	0.024	0.145	6.063	0.002	0.000	0.000	0.002
Mar	0.051	0.295	5.795	0.005	0.000	0.000	0.005
Apr	0.352	1.572	4.460	0.029	0.000	0.060	0.089
May	0.532	1.931	3.631	0.045	0.000	0.070	0.115
Jun	1.412	5.138	3.639	0.119	0.000	0.354	0.473
Jul	0.824	2.862	3.472	0.073	0.000	0.070	0.143
Aug	0.600	1.926	3.209	0.056	0.000	0.099	0.155
Sep	0.219	0.645	2.948	0.024	0.000	0.035	0.059

A.4.9 E32A

A.4.9.1 Incremental and Cumulative. tab

IUA: Knersvlakte
 Tributary Rivers: Goort, Toring (FEPA), and Slingersfontein (from Koelfontein, Langfontein and Klipwerf)
 Mainstem: Hantams
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: B (PES = B).

Desktop Version 2, Generated on 2011/08/06
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 4.033
 S.Dev. = 5.835
 CV = 1.447
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.175
 CV(JJA+JFM) Index = 7.341

Ecological Category = B

Total IFR = 1.058 (26.23 %MAR)
 Maint. Lowflow = 0.401 (9.95 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 0.657 (16.28 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.053	0.139	2.620	0.009	0.000	0.000	0.009
Nov	0.083	0.296	3.579	0.009	0.000	0.013	0.022
Dec	0.046	0.195	4.244	0.005	0.000	0.007	0.012
Jan	0.010	0.060	6.020	0.001	0.000	0.000	0.001
Feb	0.046	0.241	5.273	0.004	0.000	0.000	0.004
Mar	0.056	0.203	3.624	0.005	0.000	0.000	0.005
Apr	0.223	0.860	3.852	0.021	0.000	0.037	0.058
May	0.566	2.197	3.881	0.053	0.000	0.070	0.123
Jun	1.404	3.351	2.386	0.131	0.000	0.344	0.476
Jul	0.826	1.903	2.304	0.081	0.000	0.070	0.152
Aug	0.504	1.217	2.415	0.053	0.000	0.081	0.134
Sep	0.216	0.481	2.232	0.027	0.000	0.033	0.060

A.4.10 E32B

A.4.10.1 Incremental .tab

IUA: Knersvlakte
 Tributary Rivers: Theronje, Brassefontein, Brak, and one with no name
 Mainstem: Hantams
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: B (PES = B).

Desktop Version 2, Generated on 2011/08/06
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 2.985
 S.Dev. = 4.323
 CV = 1.448
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.174
 CV(JJA+JFM) Index = 7.322

Ecological Category = B

Total IFR = 0.783 (26.23 %MAR)
 Maint. Lowflow = 0.297 (9.95 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 0.486 (16.28 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.039	0.103	2.656	0.007	0.000	0.000	0.007
Nov	0.061	0.219	3.603	0.007	0.000	0.010	0.016
Dec	0.034	0.144	4.246	0.004	0.000	0.005	0.009
Jan	0.007	0.044	5.958	0.001	0.000	0.000	0.001
Feb	0.034	0.178	5.260	0.003	0.000	0.000	0.003
Mar	0.041	0.150	3.641	0.004	0.000	0.000	0.004
Apr	0.165	0.637	3.853	0.015	0.000	0.027	0.043
May	0.419	1.627	3.884	0.039	0.000	0.052	0.091
Jun	1.040	2.483	2.387	0.097	0.000	0.255	0.352
Jul	0.612	1.410	2.305	0.060	0.000	0.052	0.112
Aug	0.374	0.902	2.414	0.040	0.000	0.060	0.100
Sep	0.160	0.357	2.232	0.020	0.000	0.025	0.045

A.4.10.2 Cumulative .tab

IUA: Knersvlakte
 Tributary Rivers: Theronje, Brassefontein, Brak, and one with no name
 Mainstem: Hantams
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: B (PES = B).

Desktop Version 2, Generated on 2011/08/29
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 7.018
 S.Dev. = 10.159
 CV = 1.447
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.175
 CV(JJA+JFM) Index = 7.332

Ecological Category = B

Total IFR = 1.841 (26.23 %MAR)
 Maint. Lowflow = 0.698 (9.95 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 1.143 (16.28 %MAR)

Monthly Distributions (Mill. cu. m.)

Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.092	0.241	2.634	0.016	0.000	0.000	0.016
Nov	0.144	0.515	3.589	0.016	0.000	0.023	0.039
Dec	0.080	0.340	4.245	0.009	0.000	0.013	0.022
Jan	0.017	0.104	5.993	0.002	0.000	0.000	0.002
Feb	0.080	0.419	5.267	0.008	0.000	0.000	0.008
Mar	0.097	0.353	3.631	0.009	0.000	0.000	0.009
Apr	0.389	1.497	3.852	0.036	0.000	0.064	0.100
May	0.985	3.825	3.882	0.092	0.000	0.123	0.215
Jun	2.444	5.833	2.386	0.228	0.000	0.599	0.828
Jul	1.438	3.313	2.304	0.142	0.000	0.123	0.264
Aug	0.877	2.119	2.415	0.093	0.000	0.141	0.234
Sep	0.375	0.838	2.232	0.047	0.000	0.058	0.105

A.4.11 E32C

A.4.11.1 Incremental .tab

IUA: Knersvlakte
 Tributary Rivers: Klein-Toring (from Beeswater se (FEPA), Hol and one with no name (FEPA)) and Soetlandsfontein
 Mainstem: Hantams
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: B (PES = B).

Desktop Version 2, Generated on 2011/08/06
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 2.302
 S.Dev. = 3.334
 CV = 1.449
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.174
 CV(JJA+JFM) Index = 7.418

Ecological Category = B

Total IFR = 0.603 (26.20 %MAR)
 Maint. Lowflow = 0.228 (9.90 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 0.375 (16.30 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.029	0.079	2.688	0.005	0.000	0.000	0.005
Nov	0.047	0.170	3.626	0.005	0.000	0.008	0.012
Dec	0.026	0.112	4.233	0.003	0.000	0.004	0.007
Jan	0.006	0.035	6.155	0.001	0.000	0.000	0.001
Feb	0.026	0.137	5.326	0.002	0.000	0.000	0.002
Mar	0.032	0.116	3.665	0.003	0.000	0.000	0.003
Apr	0.128	0.492	3.858	0.012	0.000	0.021	0.033
May	0.323	1.255	3.884	0.030	0.000	0.040	0.070
Jun	0.802	1.915	2.388	0.075	0.000	0.197	0.272
Jul	0.472	1.088	2.306	0.046	0.000	0.040	0.087
Aug	0.288	0.696	2.415	0.031	0.000	0.046	0.077
Sep	0.123	0.276	2.235	0.015	0.000	0.019	0.034

A.4.11.2 Cumulative .tab

IUA: Knersvlakte
 Tributary Rivers: Klein-Toring (from Beeswater se (FEPA), Hol and one with no name (FEPA)) and Soetlandsfontein
 Mainstem: Hantams
 Node: R4³
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: B (PES = B).

Desktop Version 2, Generated on 2011/08/06
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 9.320
 S.Dev. = 13.493
 CV = 1.448
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.174
 CV(JJA+JFM) Index = 7.353

Ecological Category = B

Total IFR = 2.444 (26.23 %MAR)
 Maint. Lowflow = 0.926 (9.94 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 1.518 (16.29 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.121	0.320	2.647	0.021	0.000	0.000	0.021
Nov	0.190	0.685	3.598	0.020	0.000	0.031	0.051
Dec	0.106	0.452	4.242	0.011	0.000	0.017	0.029
Jan	0.023	0.139	6.032	0.003	0.000	0.000	0.003
Feb	0.105	0.556	5.282	0.010	0.000	0.000	0.010
Mar	0.129	0.469	3.639	0.012	0.000	0.000	0.012
Apr	0.516	1.989	3.854	0.048	0.000	0.085	0.133
May	1.308	5.080	3.883	0.122	0.000	0.163	0.285
Jun	3.246	7.748	2.387	0.303	0.000	0.796	1.099
Jul	1.909	4.401	2.305	0.188	0.000	0.163	0.351
Aug	1.166	2.815	2.415	0.124	0.000	0.187	0.311
Sep	0.499	1.113	2.233	0.062	0.000	0.077	0.139

³ The node is placed on Klein-Toring River, and named as being on that river, in some records, but this must be an error, as it's the Hantams that "leaves" the quat (i.e. records should be corrected).

A.4.12 E32D

A.4.12.1 Incremental .tab

IUA: Knersvlakte
 Tributary Rivers: Kransgat, FEPA below its tributaries(Koppieskraal and Bloukrans se)
 Mainstem: Hantams
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: B (PES = B).

Desktop Version 2, Generated on 2011/08/06
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 2.225
 S.Dev. = 3.225
 CV = 1.450
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.173
 CV(JJA+JFM) Index = 7.396

Ecological Category = B

Total IFR = 0.583 (26.20 %MAR)
 Maint. Lowflow = 0.220 (9.90 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 0.363 (16.30 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.028	0.077	2.729	0.005	0.000	0.000	0.005
Nov	0.045	0.164	3.621	0.005	0.000	0.007	0.012
Dec	0.026	0.108	4.238	0.003	0.000	0.004	0.007
Jan	0.006	0.034	6.104	0.001	0.000	0.000	0.001
Feb	0.025	0.133	5.299	0.002	0.000	0.000	0.002
Mar	0.031	0.112	3.677	0.003	0.000	0.000	0.003
Apr	0.123	0.475	3.854	0.012	0.000	0.020	0.032
May	0.313	1.215	3.886	0.029	0.000	0.039	0.068
Jun	0.776	1.852	2.388	0.073	0.000	0.190	0.263
Jul	0.456	1.051	2.306	0.045	0.000	0.039	0.084
Aug	0.279	0.673	2.414	0.030	0.000	0.045	0.074
Sep	0.118	0.267	2.250	0.015	0.000	0.018	0.033

A.4.12.2 Cumulative .tab

IUA: Knersvlakte
 Tributary Rivers: Kransgat, FEPA below its tributaries(Koppieskraal and Bloukrans se)
 Mainstem: Hantams
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: B (PES = B).

Desktop Version 2, Generated on 2011/08/29
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 11.544
 S.Dev. = 16.718
 CV = 1.448
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.174
 CV(JJA+JFM) Index = 7.361

Ecological Category = B

Total IFR = 3.027 (26.22 %MAR)
 Maint. Lowflow = 1.146 (9.93 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 1.881 (16.29 %MAR)

Monthly Distributions (Mill. cu. m.)

Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.149	0.397	2.662	0.026	0.000	0.000	0.026
Nov	0.236	0.848	3.603	0.025	0.000	0.038	0.063
Dec	0.132	0.560	4.241	0.014	0.000	0.021	0.035
Jan	0.029	0.173	6.046	0.003	0.000	0.000	0.003
Feb	0.130	0.690	5.285	0.012	0.000	0.000	0.012
Mar	0.160	0.582	3.646	0.015	0.000	0.000	0.015
Apr	0.640	2.465	3.854	0.060	0.000	0.106	0.165
May	1.621	6.294	3.883	0.151	0.000	0.202	0.353
Jun	4.022	9.600	2.387	0.376	0.000	0.986	1.362
Jul	2.365	5.452	2.305	0.233	0.000	0.202	0.434
Aug	1.444	3.488	2.415	0.153	0.000	0.232	0.385
Sep	0.617	1.380	2.236	0.077	0.000	0.095	0.172

A.4.13 E32E

A.4.13.1 Incremental .tab

IUA: Knersvlakte
 Tributary Rivers: Rondekop (FEPA below its tributary Wolfkloofs), Grasberg (FEPA), Soetfontein (FEPA), Bloukrans (FEPA),
 Mainstem: Hantams and Doring (b) (FEPA)
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: B (PES = B).

Desktop Version 2, Generated on 2011/08/06
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 3.604
 S.Dev. = 5.223
 CV = 1.449
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.174
 CV(JJA+JFM) Index = 7.333

Ecological Category = B

Total IFR = 0.945 (26.23 %MAR)
 Maint. Lowflow = 0.358 (9.94 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 0.587 (16.29 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.046	0.124	2.684	0.008	0.000	0.000	0.008
Nov	0.074	0.265	3.606	0.008	0.000	0.012	0.020
Dec	0.041	0.174	4.243	0.004	0.000	0.007	0.011
Jan	0.009	0.053	5.978	0.001	0.000	0.000	0.001
Feb	0.041	0.215	5.268	0.004	0.000	0.000	0.004
Mar	0.050	0.182	3.641	0.005	0.000	0.000	0.005
Apr	0.200	0.770	3.856	0.019	0.000	0.033	0.052
May	0.506	1.966	3.885	0.047	0.000	0.063	0.110
Jun	1.256	2.999	2.388	0.118	0.000	0.308	0.425
Jul	0.738	1.703	2.308	0.073	0.000	0.063	0.136
Aug	0.451	1.090	2.415	0.048	0.000	0.072	0.120
Sep	0.192	0.431	2.241	0.024	0.000	0.030	0.054

A.4.13.2 Cumulative .tab

IUA: Knersvlakte
 Tributary Rivers: Rondekop (FEPA below its tributary Wolfkloofs), Grasberg (FEPA), Soetfontein (FEPA), Bloukrans (FEPA),
 Mainstem: Hantams and Doring (b) (FEPA)
 Node: R3
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: B (PES = B).

Desktop Version 2, Generated on 2011/09/19
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 15.148
 S.Dev. = 21.942
 CV = 1.448
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.174
 CV(JJA+JFM) Index = 7.355

Ecological Category = B

Total IFR = 3.972 (26.22 %MAR)
 Maint. Lowflow = 1.505 (9.93 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 2.468 (16.29 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.195	0.521	2.667	0.034	0.000	0.000	0.034
Nov	0.309	1.114	3.603	0.033	0.000	0.050	0.083
Dec	0.173	0.734	4.242	0.019	0.000	0.028	0.047
Jan	0.038	0.226	6.030	0.005	0.000	0.000	0.005
Feb	0.171	0.905	5.281	0.016	0.000	0.000	0.016
Mar	0.210	0.764	3.645	0.020	0.000	0.000	0.020
Apr	0.839	3.235	3.854	0.078	0.000	0.138	0.217
May	2.127	8.260	3.884	0.199	0.000	0.264	0.463
Jun	5.278	12.600	2.387	0.493	0.000	1.293	1.787
Jul	3.103	7.156	2.306	0.306	0.000	0.264	0.570
Aug	1.896	4.578	2.415	0.201	0.000	0.304	0.505
Sep	0.809	1.811	2.237	0.101	0.000	0.125	0.226

A.4.14 E33A

A.4.14.1 Incremental .tab

IUA: Knersvlakte
 Tributary Rivers: Sout, Lodewyk se Grip, Spitskop se (FEPA) and Twee
 Mainstem: Doring (b) and Sout
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: B (PES = B).

Desktop Version 2, Generated on 2011/08/06
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 0.924
 S.Dev. = 1.779
 CV = 1.924
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.174
 CV(JJA+JFM) Index = 10.324

Ecological Category = B

Total IFR = 0.237 (25.67 %MAR)
 Maint. Lowflow = 0.083 (8.97 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 0.154 (16.70 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.009	0.028	3.093	0.002	0.000	0.000	0.002
Nov	0.031	0.146	4.730	0.003	0.000	0.005	0.008
Dec	0.048	0.355	7.319	0.004	0.000	0.008	0.012
Jan	0.013	0.117	9.051	0.001	0.000	0.000	0.001
Feb	0.005	0.030	5.872	0.000	0.000	0.000	0.000
Mar	0.010	0.060	5.740	0.001	0.000	0.000	0.001
Apr	0.072	0.322	4.455	0.006	0.000	0.012	0.018
May	0.109	0.395	3.627	0.009	0.000	0.014	0.024
Jun	0.289	1.052	3.634	0.024	0.000	0.073	0.097
Jul	0.169	0.586	3.471	0.015	0.000	0.014	0.029
Aug	0.123	0.394	3.205	0.011	0.000	0.020	0.032
Sep	0.045	0.132	2.919	0.005	0.000	0.007	0.012

A.4.14.2 Cumulative .tab

IUA: Knersvlakte
 Tributary Rivers: Sout, Lodewyk se Grip, Spitskop se (FEPA) and Twee
 Mainstem: Doring (b) and Sout
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: B (PES = B).

Desktop Version 2, Generated on 2011/08/29
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 20.579
 S.Dev. = 31.738
 CV = 1.542
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.174
 CV(JJA+JFM) Index = 8.191

Ecological Category = B

Total IFR = 5.357 (26.03 %MAR)
 Maint. Lowflow = 1.978 (9.61 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 3.379 (16.42 %MAR)

Monthly Distributions (Mill. cu. m.)

Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.247	0.632	2.560	0.045	0.000	0.000	0.045
Nov	0.490	1.927	3.933	0.051	0.000	0.079	0.130
Dec	0.458	2.773	6.061	0.045	0.000	0.075	0.120
Jan	0.114	0.904	7.959	0.013	0.000	0.000	0.013
Feb	0.200	1.071	5.348	0.019	0.000	0.000	0.019
Mar	0.271	0.937	3.460	0.026	0.000	0.000	0.026
Apr	1.264	5.064	4.007	0.114	0.000	0.210	0.325
May	2.767	10.546	3.811	0.250	0.000	0.350	0.600
Jun	6.979	18.415	2.638	0.629	0.000	1.723	2.352
Jul	4.096	10.490	2.561	0.389	0.000	0.350	0.739
Aug	2.619	6.828	2.607	0.267	0.000	0.424	0.691
Sep	1.073	2.524	2.351	0.130	0.000	0.167	0.297

A.4.15 E33B

A.4.15.1 Incremental .tab

IUA: Knersvlakte
 Tributary Rivers: Gemsbok and one with no name
 Mainstem: Sout
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: B (PES = B).

Desktop Version 2, Generated on 2011/08/06
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 0.694
 S.Dev. = 1.838
 CV = 2.647
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.175
 CV(JJA+JFM) Index = 10.794

Ecological Category = B

Total IFR = 0.178 (25.61 %MAR)
 Maint. Lowflow = 0.062 (8.87 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 0.116 (16.75 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.005	0.014	2.925	0.001	0.000	0.000	0.001
Nov	0.009	0.049	5.651	0.001	0.000	0.001	0.002
Dec	0.008	0.046	6.022	0.001	0.000	0.001	0.002
Jan	0.002	0.014	8.578	0.000	0.000	0.000	0.000
Feb	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mar	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Apr	0.058	0.401	6.936	0.005	0.000	0.010	0.015
May	0.080	0.327	4.077	0.007	0.000	0.012	0.019
Jun	0.287	1.226	4.264	0.024	0.000	0.067	0.091
Jul	0.163	0.556	3.411	0.014	0.000	0.012	0.026
Aug	0.063	0.177	2.807	0.006	0.000	0.010	0.017
Sep	0.020	0.049	2.413	0.003	0.000	0.003	0.006

A.4.15.2 Cumulative .tab

IUA: Knersvlakte
 Tributary Rivers: Gemsbok and one with no name
 Mainstem: Sout
 Node: R5
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: C (PES = C).

Desktop Version 2, Generated on 2011/08/29
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 21.273
 S.Dev. = 33.329
 CV = 1.567
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.174
 CV(JJA+JFM) Index = 8.214

Ecological Category = C

Total IFR = 3.702 (17.40 %MAR)
 Maint. Lowflow = 1.038 (4.88 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 2.664 (12.52 %MAR)

Monthly Distributions (Mill. cu. m.)

Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.252	0.641	2.549	0.024	0.000	0.000	0.024
Nov	0.499	1.943	3.896	0.027	0.000	0.062	0.088
Dec	0.465	2.816	6.054	0.024	0.000	0.058	0.082
Jan	0.115	0.918	7.967	0.007	0.000	0.000	0.007
Feb	0.200	1.071	5.348	0.010	0.000	0.000	0.010
Mar	0.271	0.937	3.460	0.014	0.000	0.000	0.014
Apr	1.322	5.412	4.094	0.061	0.000	0.168	0.229
May	2.848	10.849	3.810	0.130	0.000	0.276	0.406
Jun	7.267	19.524	2.687	0.331	0.000	1.364	1.695
Jul	4.260	11.010	2.585	0.205	0.000	0.276	0.480
Aug	2.682	6.960	2.595	0.139	0.000	0.331	0.470
Sep	1.093	2.560	2.341	0.068	0.000	0.129	0.197

A.4.16 E33C

A.4.16.1 Cumulative and Incremental .tab

IUA: Knersvlakte
 Tributary Rivers: Kraai and Grootdrif
 Mainstem: Vars
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: C (PES = D).

Desktop Version 2, Generated on 2011/08/06
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 1.009
 S.Dev. = 2.671
 CV = 2.649
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.175
 CV(JJA+JFM) Index = 12.566

Ecological Category = C

Total IFR = 0.172 (17.04 %MAR)
 Maint. Lowflow = 0.041 (4.06 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 0.131 (12.98 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.006	0.020	3.014	0.001	0.000	0.000	0.001
Nov	0.012	0.070	5.760	0.001	0.000	0.002	0.002
Dec	0.011	0.067	6.090	0.000	0.000	0.001	0.002
Jan	0.002	0.021	8.765	0.000	0.000	0.000	0.000
Feb	0.000	0.001	9.220	0.000	0.000	0.000	0.000
Mar	0.000	0.001	9.220	0.000	0.000	0.000	0.000
Apr	0.084	0.583	6.936	0.003	0.000	0.011	0.014
May	0.117	0.475	4.069	0.004	0.000	0.013	0.018
Jun	0.418	1.782	4.261	0.016	0.000	0.075	0.091
Jul	0.237	0.809	3.412	0.010	0.000	0.013	0.023
Aug	0.091	0.257	2.821	0.004	0.000	0.011	0.016
Sep	0.029	0.070	2.410	0.002	0.000	0.003	0.005

A.4.17 E33D

A.4.17.1 Cumulative and Incremental .tab

IUA: Knersvlakte
 Tributary Rivers: Klein Riet (its tributary and below its tributary are FEPA), Nabeeb (FEPA) and four with no names (most upstream two are FEPA)
 Mainstem: Geelbek
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: C (PES = C).

Desktop Version 2, Generated on 2011/08/06
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 1.590
 S.Dev. = 4.173
 CV = 2.625
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.177
 CV(JJA+JFM) Index = 11.680

Ecological Category = C

Total IFR = 0.272 (17.09 %MAR)
 Maint. Lowflow = 0.067 (4.21 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 0.205 (12.88 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.013	0.030	2.301	0.002	0.000	0.000	0.002
Nov	0.020	0.111	5.484	0.001	0.000	0.002	0.004
Dec	0.018	0.104	5.882	0.001	0.000	0.002	0.003
Jan	0.004	0.033	8.924	0.000	0.000	0.000	0.000
Feb	0.000	0.002	6.480	0.000	0.000	0.000	0.000
Mar	0.000	0.001	9.220	0.000	0.000	0.000	0.000
Apr	0.132	0.911	6.917	0.005	0.000	0.017	0.022
May	0.183	0.742	4.051	0.007	0.000	0.021	0.028
Jun	0.654	2.784	4.256	0.026	0.000	0.117	0.143
Jul	0.373	1.265	3.392	0.015	0.000	0.021	0.036
Aug	0.145	0.402	2.770	0.007	0.000	0.018	0.025
Sep	0.048	0.109	2.273	0.003	0.000	0.005	0.009

A.4.18 E33E

A.4.18.1 Incremental .tab

IUA: Knersvlakte
 Tributary Rivers: Geelbek, Rooiberg (tributary Groot-Graafwater and sections of Rooiberg itself are FEPA),
 Volstruisleegte, Moedverloor and Vars
 Mainstem: Sout and Hol
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: C (PES = C).

Desktop Version 2, Generated on 2011/08/06
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 1.326
 S.Dev. = 3.506
 CV = 2.645
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.176
 CV(JJA+JFM) Index = 11.686

Ecological Category = C

Total IFR = 0.227 (17.09 %MAR)
 Maint. Lowflow = 0.056 (4.20 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 0.171 (12.89 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.009	0.025	2.761	0.001	0.000	0.000	0.001
Nov	0.016	0.094	5.718	0.001	0.000	0.002	0.003
Dec	0.014	0.088	6.056	0.001	0.000	0.002	0.002
Jan	0.003	0.027	8.868	0.000	0.000	0.000	0.000
Feb	0.000	0.002	6.480	0.000	0.000	0.000	0.000
Mar	0.000	0.001	9.220	0.000	0.000	0.000	0.000
Apr	0.110	0.766	6.931	0.004	0.000	0.014	0.019
May	0.153	0.623	4.068	0.006	0.000	0.017	0.024
Jun	0.549	2.339	4.263	0.022	0.000	0.098	0.120
Jul	0.311	1.062	3.411	0.013	0.000	0.017	0.030
Aug	0.120	0.338	2.816	0.006	0.000	0.015	0.021
Sep	0.039	0.092	2.377	0.003	0.000	0.004	0.007

A.4.18.2 Cumulative .tab

IUA: Knersvlakte
 Tributary Rivers: Geelbek, Rooiberg (tributary Groot-Graafwater and sections of Rooiberg itself are FEPA),
 Volstruisleegte, Moedverloor and Vars
 Mainstem: Sout and Hol
 Node: R8
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: C (PES = C).

Desktop Version 2, Generated on 2011/08/06
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 25.197
 S.Dev. = 42.659
 CV = 1.693
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.175
 CV(JJA+JFM) Index = 8.330

Ecological Category = C

Total IFR = 4.381 (17.39 %MAR)
 Maint. Lowflow = 1.223 (4.85 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 3.158 (12.53 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.280	0.694	2.481	0.028	0.000	0.000	0.028
Nov	0.548	2.049	3.742	0.030	0.000	0.067	0.097
Dec	0.508	3.059	6.019	0.026	0.000	0.064	0.089
Jan	0.124	0.997	8.029	0.007	0.000	0.000	0.007
Feb	0.201	1.071	5.332	0.010	0.000	0.000	0.010
Mar	0.271	0.939	3.460	0.014	0.000	0.000	0.014
Apr	1.648	7.471	4.532	0.075	0.000	0.210	0.284
May	3.301	12.575	3.810	0.150	0.000	0.326	0.476
Jun	8.888	25.972	2.922	0.402	0.000	1.648	2.050
Jul	5.181	13.993	2.701	0.247	0.000	0.326	0.573
Aug	3.038	7.739	2.547	0.158	0.000	0.375	0.532
Sep	1.209	2.771	2.291	0.077	0.000	0.142	0.219

A.4.19 E33F

A.4.19.1 Cumulative and Incremental .tab

IUA: Olifants-Doring dryland farming
 Tributary Rivers: Droë and Langkloof
 Mainstem: Troë-troë
 Node: Q1
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: D (PES = D).

Desktop Version 2, Generated on 2011/08/06
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 4.530
 S.Dev. = 6.995
 CV = 1.544
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.177
 CV(JJA+JFM) Index = 7.034

Ecological Category = D

Total IFR = 0.508 (11.22 %MAR)
 Maint. Lowflow = 0.045 (0.99 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 0.463 (10.22 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.053	0.102	1.920	0.001	0.000	0.000	0.001
Nov	0.041	0.139	3.385	0.001	0.000	0.004	0.004
Dec	0.018	0.063	3.428	0.000	0.000	0.002	0.002
Jan	0.003	0.015	4.839	0.000	0.000	0.000	0.000
Feb	0.002	0.015	6.020	0.000	0.000	0.000	0.000
Mar	0.003	0.011	3.849	0.000	0.000	0.000	0.000
Apr	0.130	0.468	3.590	0.001	0.000	0.014	0.015
May	0.665	2.731	4.109	0.006	0.000	0.052	0.058
Jun	1.883	4.321	2.295	0.017	0.000	0.273	0.291
Jul	1.050	2.110	2.010	0.010	0.000	0.052	0.062
Aug	0.489	1.022	2.089	0.005	0.000	0.049	0.054
Sep	0.193	0.385	1.999	0.003	0.000	0.018	0.021

A.4.20 E33G

A.4.20.1 Incremental .tab

IUA: Lower Olifants irrigation
 Tributary Rivers: Klein (from Troe-troe and Wiedouw)
 Mainstem: Olifants
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: C (PES = C).

Desktop Version 2, Generated on 2011/08/06
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 0.948
 S.Dev. = 2.505
 CV = 2.642
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.175
 CV(JJA+JFM) Index = 12.550

Ecological Category = C

Total IFR = 0.162 (17.04 %MAR)
 Maint. Lowflow = 0.039 (4.07 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 0.123 (12.97 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.006	0.018	2.953	0.001	0.000	0.000	0.001
Nov	0.012	0.067	5.753	0.001	0.000	0.001	0.002
Dec	0.010	0.062	6.077	0.000	0.000	0.001	0.002
Jan	0.002	0.020	8.742	0.000	0.000	0.000	0.000
Feb	0.000	0.001	9.220	0.000	0.000	0.000	0.000
Mar	0.000	0.001	9.220	0.000	0.000	0.000	0.000
Apr	0.079	0.547	6.923	0.003	0.000	0.010	0.013
May	0.110	0.445	4.061	0.004	0.000	0.013	0.017
Jun	0.392	1.671	4.257	0.015	0.000	0.071	0.086
Jul	0.223	0.759	3.405	0.009	0.000	0.013	0.022
Aug	0.086	0.241	2.807	0.004	0.000	0.011	0.015
Sep	0.028	0.066	2.378	0.002	0.000	0.003	0.005

A.4.20.2 Cumulative .tab

IUA: Lower Olifants irrigation
 Tributary Rivers: Klein (from Troe-troe and Wiedouw)
 Mainstem: Olifants
 Node: R9
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: D (PES = D).

Desktop Version 2, Generated on 2011/09/19
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 1028.771
 S.Dev. = 629.333
 CV = 0.612
 Q75 = 5.230
 Q75/MMF = 0.061
 BFI Index = 0.193
 CV(JJA+JFM) Index = 3.632

Ecological Category = D

Total IFR = 124.883 (12.14 %MAR)
 Maint. Lowflow = 25.965 (2.52 %MAR)
 Drought Lowflow = 24.679 (2.40 %MAR)
 Maint. Highflow = 98.918 (9.62 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	61.060	33.540	0.549	1.934	1.934	0.000	1.934
Nov	33.309	40.211	1.207	1.389	1.389	2.732	4.121
Dec	15.535	27.595	1.776	0.927	0.927	1.054	1.980
Jan	8.109	28.171	3.474	0.517	0.364	0.000	0.517
Feb	5.946	17.024	2.863	0.347	0.100	0.000	0.347
Mar	6.958	10.892	1.565	0.350	0.270	0.000	0.350
Apr	31.155	60.000	1.926	0.844	0.420	2.993	3.837
May	95.308	139.348	1.462	2.165	1.783	14.286	16.451
Jun	222.584	283.333	1.273	4.804	4.804	7.143	11.947
Jul	240.504	239.567	0.996	5.285	5.285	40.839	46.124
Aug	189.688	137.563	0.725	4.376	4.376	18.530	22.906
Sep	118.614	75.506	0.637	3.027	3.027	11.341	14.369

A.4.21 E33H

A.4.21.1 Incremental .tab

IUA: Lower Olifants irrigation
 Tributary Rivers: Droekraal se
 Mainstem: Olifants
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: B (PES = B).

Desktop Version 2, Generated on 2011/08/06
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 0.757
 S.Dev. = 2.003
 CV = 2.647
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.236
 CV(JJA+JFM) Index = 10.814

Ecological Category = B

Total IFR = 0.197 (26.07 %MAR)
 Maint. Lowflow = 0.073 (9.68 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 0.124 (16.39 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Cape(wet)

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.005	0.015	2.904	0.001	0.000	0.001	0.002
Nov	0.009	0.053	5.731	0.001	0.000	0.001	0.002
Dec	0.008	0.050	6.017	0.001	0.000	0.000	0.001
Jan	0.002	0.015	8.620	0.000	0.000	0.000	0.000
Feb	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mar	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Apr	0.063	0.438	6.929	0.005	0.000	0.000	0.005
May	0.088	0.356	4.066	0.008	0.000	0.018	0.025
Jun	0.314	1.337	4.261	0.026	0.000	0.065	0.090
Jul	0.178	0.607	3.406	0.020	0.000	0.033	0.052
Aug	0.068	0.193	2.821	0.009	0.000	0.002	0.011
Sep	0.021	0.053	2.480	0.004	0.000	0.005	0.008

A.4.21.2 Cumulative .tab

IUA: Lower Olifants irrigation
 Tributary Rivers: Droekraal se
 Mainstem: Olifants
 Node: R7
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: D (PES = D).

Desktop Version 2, Generated on 2011/08/06
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):
 MAR = 1054.724
 S.Dev. = 655.937
 CV = 0.622
 Q75 = 5.267
 Q75/MMF = 0.060
 BFI Index = 0.318
 CV(JJA+JFM) Index = 3.598

Ecological Category = D

Total IFR = 136.811 (12.97 %MAR)
 Maint. Lowflow = 40.349 (3.83 %MAR)
 Drought Lowflow = 38.017 (3.60 %MAR)
 Maint. Highflow = 96.463 (9.15 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Cape(wet)

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	61.345	34.036	0.555	4.808	4.808	3.338	8.147
Nov	33.866	41.492	1.225	3.052	3.052	1.154	4.206
Dec	16.052	28.436	1.771	1.488	1.488	0.000	1.488
Jan	8.235	28.260	3.432	0.716	0.364	0.000	0.716
Feb	6.147	17.096	2.781	0.484	0.100	0.000	0.484
Mar	7.229	11.091	1.534	0.458	0.270	0.000	0.458
Apr	32.867	64.861	1.973	1.012	0.420	0.000	1.012
May	98.696	148.864	1.508	2.518	1.783	12.573	15.091
Jun	231.785	300.946	1.298	5.722	5.640	29.493	35.215
Jul	245.863	247.732	1.008	7.041	7.041	34.566	41.607
Aug	192.795	142.895	0.741	7.005	7.005	5.113	12.118
Sep	119.845	77.703	0.648	6.046	6.046	10.225	16.271

A.4.22 Estuary (E33H)

A.4.22.1 Estuarine

IUA: Lower Olifants irrigation

Mainstem: Olifants

Node: E

Data source:

Adjustments: None

Target condition: C (PES = C).

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
99%ile	42.17	28.76	21.52	37.04	24.33	7.43	95.80	153.56	471.91	470.40	210.01	149.81
90%ile	23.61	7.85	7.27	3.66	3.84	4.07	9.43	66.69	112.14	150.96	116.78	65.34
80%ile	11.33	3.96	2.33	1.62	1.80	2.11	4.34	17.92	72.07	78.37	81.56	40.07
70%ile	7.85	2.16	1.64	1.53	1.46	1.73	2.24	8.84	44.03	53.49	52.19	30.07
60%ile	5.44	1.67	1.52	1.53	1.45	1.39	1.79	4.84	21.61	38.99	33.68	20.61
50%ile	4.36	1.42	1.52	1.53	1.41	1.32	1.23	2.33	14.39	22.60	27.35	13.96
40%ile	3.17	1.36	1.52	1.53	1.41	1.32	1.15	1.65	9.02	12.62	17.14	12.10
30%ile	2.00	1.36	1.52	1.53	1.41	1.32	1.15	0.90	5.01	8.22	11.91	8.78
20%ile	1.70	1.36	1.52	1.53	1.41	1.32	1.15	0.52	2.19	5.28	8.21	5.68
10%ile	1.43	1.36	1.52	1.24	0.95	0.70	0.80	0.43	0.84	2.91	3.92	3.28
1%ile	1.20	1.19	0.89	0.88	0.40	0.22	0.01	0.04	0.32	0.49	0.84	1.59
Total volume (MCM)											605.7	
% nMAR											56.7%	

A.5 Secondary E4

A.5.1 E40A

A.5.1.1 Cumulative and Incremental.tab

IUA: Doring rangelands
Tributary Rivers: Droë, Varkfontein and one with no name (FEPA)
Mainstem: Oorlogskloof
Node: -
Data source: DWA 2012, default desktop reserve
Adjustments: 60% of natural floods assumed for July, August and September (reflected below)
Target condition: C (PES = C).

CONSTRUCTED

Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
Total Runoff :

Annual Flows (Mill. cu. m or index values):

MAR	=	16.631
S.Dev.	=	21.854
CV	=	1.314
Q75	=	0.000
Q75/MMF	=	0.000
BFI Index	=	0.170
CV(JJA+JFM) Index	=	6.290

Ecological Category = C

Total IFR	=	6.905	(41.51 %MAR)
Maint. Lowflow	=	0.901	(5.42 %MAR)
Drought Lowflow	=	0.000	(0.00 %MAR)
Maint. Highflow	=	6.005	(36.1 %MAR)

Monthly Distributions (Mill. cu. m.)
Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.364	1.073	2.947	0.023	0.000	0.000	0.023
Nov	0.266	1.211	4.560	0.016	0.000	0.032	0.048
Dec	0.211	1.009	4.781	0.013	0.000	0.025	0.038
Jan	0.052	0.257	4.982	0.003	0.000	0.000	0.003
Feb	0.041	0.221	5.353	0.003	0.000	0.000	0.003
Mar	0.038	0.107	2.847	0.002	0.000	0.000	0.002
Apr	0.469	1.755	3.742	0.025	0.000	0.058	0.083
May	1.774	4.552	2.566	0.092	0.000	0.256	0.348
Jun	4.839	9.226	1.907	0.251	0.000	0.959	1.210
Jul	4.805	9.567	1.991	0.254	0.000	2.629	2.883
Aug	2.392	4.279	1.789	0.135	0.000	1.300	1.435
Sep	1.382	2.927	2.118	0.083	0.000	0.746	0.829

A.5.2 E40B

A.5.2.1 Incremental .tab

IUA: Doring rangelands
 Tributary Rivers: Karee and Agterplaas (FEPA)
 Mainstem: Oorlogskloof
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: 60% of natural floods assumed for July, August and September (reflected below)
 Target condition: C (PES = D).

CONSTRUCTED

Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 12.494
 S.Dev. = 16.420
 CV = 1.314
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.170
 CV(JJA+JFM) Index = 6.295

Ecological Category = C

Total IFR = 5.751 (46.03 %MAR)
 Maint. Lowflow = 0.677 (5.42 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 5.075 (40.62 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.273	0.806	2.950	0.017	0.000	0.000	0.017
Nov	0.199	0.909	4.566	0.012	0.000	0.024	0.036
Dec	0.159	0.758	4.772	0.010	0.000	0.019	0.029
Jan	0.039	0.193	4.967	0.002	0.000	0.000	0.002
Feb	0.031	0.166	5.362	0.002	0.000	0.000	0.002
Mar	0.028	0.081	2.868	0.002	0.000	0.000	0.002
Apr	0.352	1.318	3.745	0.018	0.000	0.044	0.062
May	1.332	3.420	2.567	0.069	0.000	0.193	0.262
Jun	3.635	6.932	1.907	0.189	0.000	0.720	0.909
Jul	3.610	7.188	1.991	0.191	0.000	1.975	2.166
Aug	1.797	3.215	1.790	0.101	0.000	1.334	1.435
Sep	1.038	2.199	2.118	0.063	0.000	0.766	0.829

A.5.2.2 Cumulative.tab

IUA: Doring rangelands
 Tributary Rivers: Karee and Agterplaas (FEPA)
 Mainstem: Oorlogskloof
 Node: R12
 Data source: DWA 2012, default desktop reserve
 Adjustments: 60% of natural floods assumed for July, August and September (reflected below)
 Target condition: C (PES = C).

CONSTRUCTED

Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :

Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 29.125
 S.Dev. = 38.274
 CV = 1.314
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.170
 CV(JJA+JFM) Index = 6.292

Ecological Category = C

Total IFR = 12.095 (41.53 %MAR)
 Maint. Lowflow = 1.578 (5.42 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 10.517 (36.11 %MAR)

Monthly Distributions (Mill. cu. m.)

Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.637	1.878	2.948	0.041	0.000	0.000	0.041
Nov	0.465	2.120	4.563	0.028	0.000	0.056	0.084
Dec	0.370	1.767	4.777	0.022	0.000	0.045	0.067
Jan	0.090	0.450	4.976	0.006	0.000	0.000	0.006
Feb	0.072	0.388	5.357	0.005	0.000	0.000	0.005
Mar	0.066	0.188	2.856	0.004	0.000	0.000	0.004
Apr	0.821	3.073	3.744	0.043	0.000	0.102	0.145
May	3.106	7.972	2.567	0.161	0.000	0.449	0.610
Jun	8.474	16.159	1.907	0.440	0.000	1.679	2.119
Jul	8.415	16.754	1.991	0.446	0.000	4.603	5.049
Aug	4.188	7.494	1.789	0.236	0.000	2.277	2.513
Sep	2.420	5.126	2.118	0.146	0.000	1.306	1.452

A.5.3 E40C

A.5.3.1 Incremental .tab

IUA: Olifants-Doring dryland farming
 Tributary Rivers: One with no name
 Mainstem: Oorlogskloof (FEPA)
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: 80% of natural floods assumed for July, August and September (reflected below)
 Target condition: B (PES = B).

CONSTRUCTED

Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 9.365
 S.Dev. = 12.310
 CV = 1.314
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.170
 CV(JJA+JFM) Index = 6.301

Ecological Category = B

Total IFR = 5.309 (56.69 %MAR)
 Maint. Lowflow = 0.970 (10.36 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 4.34 (46.34 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.205	0.604	2.952	0.025	0.000	0.000	0.025
Nov	0.149	0.681	4.564	0.017	0.000	0.024	0.041
Dec	0.119	0.568	4.782	0.014	0.000	0.019	0.032
Jan	0.029	0.144	4.970	0.003	0.000	0.000	0.003
Feb	0.023	0.125	5.376	0.003	0.000	0.000	0.003
Mar	0.021	0.060	2.870	0.002	0.000	0.000	0.002
Apr	0.264	0.988	3.746	0.026	0.000	0.043	0.069
May	0.999	2.563	2.566	0.099	0.000	0.189	0.289
Jun	2.725	5.196	1.907	0.271	0.000	0.708	0.979
Jul	2.706	5.389	1.991	0.274	0.000	1.891	2.165
Aug	1.347	2.410	1.789	0.145	0.000	0.933	1.078
Sep	0.778	1.649	2.118	0.090	0.000	0.533	0.623

A.5.3.2 Cumulative .tab

IUA: Olifants-Doring dryland farming
 Tributary Rivers: One with no name
 Mainstem: Oorlogskloof (FEPA)
 Node: R11
 Data source: DWA 2012, default desktop reserve
 Adjustments: 80% of natural floods assumed for July, August and September (reflected below)
 Target condition: C (PES = C).

CONSTRUCTED

Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :

Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 38.491
 S.Dev. = 50.583
 CV = 1.314
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.170
 CV(JJA+JFM) Index = 6.294

Ecological Category = C

Total IFR = 19.956 (51.84 %MAR)
 Maint. Lowflow = 2.085 (5.42 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 17.87 (46.43 %MAR)

Monthly Distributions (Mill. cu. m.)

Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.842	2.483	2.949	0.054	0.000	0.000	0.054
Nov	0.614	2.801	4.563	0.037	0.000	0.074	0.111
Dec	0.489	2.335	4.778	0.030	0.000	0.059	0.089
Jan	0.119	0.594	4.974	0.008	0.000	0.000	0.008
Feb	0.096	0.512	5.362	0.006	0.000	0.000	0.006
Mar	0.087	0.248	2.859	0.006	0.000	0.000	0.006
Apr	1.085	4.061	3.744	0.057	0.000	0.135	0.191
May	4.105	10.536	2.567	0.213	0.000	0.593	0.806
Jun	11.199	21.355	1.907	0.582	0.000	2.219	2.801
Jul	11.121	22.143	1.991	0.589	0.000	8.308	8.897
Aug	5.536	9.904	1.789	0.312	0.000	4.116	4.428
Sep	3.199	6.775	2.118	0.193	0.000	2.366	2.559

A.5.4 E40D

A.5.4.1 Incremental .tab

IUA: Olifants-Doring dryland farming
 Tributary Rivers: Klein-Koebee (FEPA) and de Hoop
 Mainstem: Koebee (FEPA)
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: 80% of natural floods assumed for July, August and September (reflected below)
 Target condition: B (PES = C/B).

E40D Incremental B(80%)

CONSTRUCTED

Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :

Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 9.613
 S.Dev. = 12.634
 CV = 1.314
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.170
 CV(JJA+JFM) Index = 6.299

Ecological Category = B

Total IFR = 5.448 (56.67 %MAR)
 Maint. Lowflow = 0.996 (10.36 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 4.452 (46.31 %MAR)

Monthly Distributions (Mill. cu. m.)

Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.210	0.620	2.950	0.025	0.000	0.000	0.025
Nov	0.153	0.699	4.564	0.018	0.000	0.024	0.042
Dec	0.122	0.583	4.786	0.014	0.000	0.019	0.033
Jan	0.030	0.148	4.986	0.003	0.000	0.000	0.003
Feb	0.024	0.128	5.363	0.003	0.000	0.000	0.003
Mar	0.022	0.062	2.862	0.003	0.000	0.000	0.003
Apr	0.271	1.014	3.739	0.027	0.000	0.044	0.071
May	1.025	2.631	2.566	0.102	0.000	0.194	0.296
Jun	2.797	5.334	1.907	0.278	0.000	0.727	1.005
Jul	2.777	5.530	1.991	0.282	0.000	1.940	2.222
Aug	1.383	2.473	1.789	0.149	0.000	0.957	1.106
Sep	0.799	1.692	2.117	0.092	0.000	0.547	0.639

A.5.4.2 Cumulative .tab

IUA: Olifants-Doring dryland farming
 Tributary Rivers: Klein-Koebee (FEPA) and de Hoop
 Mainstem: Koebee (FEPA)
 Node: R17
 Data source: DWA 2012, default desktop reserve
 Adjustments: 80% of natural floods assumed for July, August and September (reflected below)
 Target condition: B (PES = B).

CONSTRUCTED

Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :

Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 48.104
 S.Dev. = 63.217
 CV = 1.314
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.170
 CV(JJA+JFM) Index = 6.295

Ecological Category = B

Total IFR = 27.268 (56.69 %MAR)
 Maint. Lowflow = 4.984 (10.36 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 22.284 (46.33 %MAR)

Monthly Distributions (Mill. cu. m.)

Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	1.052	3.103	2.949	0.128	0.000	0.000	0.128
Nov	0.767	3.501	4.563	0.088	0.000	0.121	0.210
Dec	0.611	2.918	4.780	0.070	0.000	0.097	0.167
Jan	0.149	0.742	4.977	0.017	0.000	0.000	0.017
Feb	0.119	0.640	5.362	0.013	0.000	0.000	0.013
Mar	0.108	0.310	2.859	0.013	0.000	0.000	0.013
Apr	1.356	5.075	3.743	0.135	0.000	0.221	0.356
May	5.130	13.167	2.567	0.509	0.000	0.973	1.482
Jun	13.996	26.689	1.907	1.393	0.000	3.637	5.030
Jul	13.899	27.673	1.991	1.409	0.000	9.710	11.119
Aug	6.918	12.377	1.789	0.747	0.000	4.788	5.535
Sep	3.998	8.467	2.118	0.461	0.000	2.737	3.198

A.6 Secondary F6

A.6.1 F60A

A.6.1.1 Cumulative and Incremental .tab

IUA: Knersvlakte
Tributary Rivers: -
Mainstem: Brak
Node: Q3
Data source: DWA 2012, default desktop reserve
Adjustments: None
Target condition: B (PES = B).

Desktop Version 2, Generated on 2011/08/06
Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 0.201
S.Dev. = 0.400
CV = 1.990
Q75 = 0.000
Q75/MMF = 0.000
BFI Index = 0.198
CV(JJA+JFM) Index = 7.895

Ecological Category = B

Total IFR = 0.053 (26.33 %MAR)
Maint. Lowflow = 0.020 (10.11 %MAR)
Drought Lowflow = 0.000 (0.00 %MAR)
Maint. Highflow = 0.033 (16.22 %MAR)

Monthly Distributions (Mill. cu. m.)
Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.005	0.007	1.487	0.001	0.000	0.000	0.001
Nov	0.002	0.007	2.643	0.001	0.000	0.000	0.001
Dec	0.003	0.013	4.951	0.001	0.000	0.000	0.001
Jan	0.001	0.005	4.614	0.000	0.000	0.000	0.000
Feb	0.000	0.002	4.527	0.000	0.000	0.000	0.000
Mar	0.001	0.004	4.219	0.000	0.000	0.000	0.000
Apr	0.017	0.087	5.273	0.002	0.000	0.003	0.004
May	0.017	0.044	2.533	0.002	0.000	0.003	0.005
Jun	0.058	0.216	3.704	0.005	0.000	0.015	0.020
Jul	0.049	0.181	3.690	0.004	0.000	0.003	0.008
Aug	0.034	0.101	2.931	0.003	0.000	0.006	0.009
Sep	0.013	0.028	2.191	0.002	0.000	0.002	0.004

A.6.2 F60B

A.6.2.1 Cumulative and Incremental .tab

IUA: Knersvlakte
 Tributary Rivers: Bitterfontein and one with no name
 Mainstem: Klein-Goerap
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: B (PES = B).

Desktop Version 2, Generated on 2011/08/06
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 0.174
 S.Dev. = 0.341
 CV = 1.954
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.201
 CV(JJA+JFM) Index = 7.855

Ecological Category = B

Total IFR = 0.046 (26.37 %MAR)
 Maint. Lowflow = 0.018 (10.18 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 0.028 (16.19 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.004	0.006	1.438	0.001	0.000	0.000	0.001
Nov	0.002	0.007	2.643	0.001	0.000	0.000	0.001
Dec	0.002	0.011	4.586	0.000	0.000	0.000	0.001
Jan	0.001	0.005	4.614	0.000	0.000	0.000	0.000
Feb	0.000	0.002	4.527	0.000	0.000	0.000	0.000
Mar	0.001	0.004	4.219	0.000	0.000	0.000	0.000
Apr	0.014	0.075	5.212	0.001	0.000	0.002	0.004
May	0.015	0.037	2.475	0.001	0.000	0.003	0.004
Jun	0.050	0.183	3.659	0.004	0.000	0.013	0.017
Jul	0.042	0.154	3.637	0.004	0.000	0.003	0.007
Aug	0.029	0.086	2.910	0.003	0.000	0.005	0.008
Sep	0.011	0.024	2.102	0.001	0.000	0.002	0.003

A.6.3 F60C

A.6.3.1 Incremental .tab

IUA: Knersvlakte
 Tributary Rivers: Klein-Goerap and one with no name
 Mainstem: Sout
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: B (PES = B).

Desktop Version 2, Generated on 2011/08/06
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 0.344
 S.Dev. = 0.635
 CV = 1.845
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.203
 CV(JJA+JFM) Index = 5.806

Ecological Category = B

Total IFR = 0.093 (27.05 %MAR)
 Maint. Lowflow = 0.039 (11.27 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 0.054 (15.78 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.010	0.010	1.030	0.002	0.000	0.000	0.002
Nov	0.008	0.011	1.386	0.002	0.000	0.001	0.003
Dec	0.007	0.022	3.128	0.001	0.000	0.001	0.002
Jan	0.003	0.009	2.714	0.001	0.000	0.000	0.001
Feb	0.002	0.004	2.089	0.001	0.000	0.000	0.001
Mar	0.003	0.007	2.540	0.001	0.000	0.000	0.001
Apr	0.029	0.140	4.900	0.003	0.000	0.005	0.008
May	0.030	0.069	2.293	0.003	0.000	0.006	0.009
Jun	0.096	0.346	3.606	0.009	0.000	0.024	0.033
Jul	0.079	0.289	3.647	0.008	0.000	0.006	0.013
Aug	0.057	0.160	2.823	0.006	0.000	0.009	0.015
Sep	0.021	0.043	1.997	0.003	0.000	0.003	0.006

A.6.3.2 Cumulative .tab

IUA: Knersvlakte
 Tributary Rivers: Klein-Goerap and one with no name
 Mainstem: Sout
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: B (PES = B).

Desktop Version 2, Generated on 2011/09/18
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 0.519
 S.Dev. = 0.976
 CV = 1.881
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.206
 CV(JJA+JFM) Index = 6.105

Ecological Category = B

Total IFR = 0.140 (26.97 %MAR)
 Maint. Lowflow = 0.058 (11.14 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 0.082 (15.83 %MAR)

Monthly Distributions (Mill. cu. m.)

Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.014	0.016	1.097	0.003	0.000	0.000	0.003
Nov	0.010	0.017	1.629	0.002	0.000	0.001	0.004
Dec	0.010	0.033	3.480	0.002	0.000	0.001	0.003
Jan	0.004	0.013	3.099	0.001	0.000	0.000	0.001
Feb	0.002	0.005	2.238	0.001	0.000	0.000	0.001
Mar	0.004	0.010	2.857	0.001	0.000	0.000	0.001
Apr	0.043	0.215	5.004	0.004	0.000	0.007	0.011
May	0.045	0.106	2.351	0.005	0.000	0.008	0.013
Jun	0.146	0.529	3.624	0.013	0.000	0.037	0.050
Jul	0.121	0.442	3.643	0.012	0.000	0.008	0.020
Aug	0.086	0.246	2.852	0.009	0.000	0.014	0.023
Sep	0.033	0.066	2.027	0.004	0.000	0.005	0.009

A.6.4 F60D

A.6.4.1 Incremental .tab

IUA: Knersvlakte
Tributary Rivers: Groot-Goerap
Mainstem: Sout
Node: -
Data source: DWA 2012, default desktop reserve
Adjustments: None
Target condition: B (PES = B).

Desktop Version 2, Generated on 2011/08/06
Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 0.280
S.Dev. = 0.496
CV = 1.772
Q75 = 0.000
Q75/MMF = 0.000
BFI Index = 0.206
CV(JJA+JFM) Index = 5.543

Ecological Category = B

Total IFR = 0.076 (27.19 %MAR)
Maint. Lowflow = 0.032 (11.50 %MAR)
Drought Lowflow = 0.000 (0.00 %MAR)
Maint. Highflow = 0.044 (15.69 %MAR)

Monthly Distributions (Mill. cu. m.)
Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.009	0.008	0.900	0.002	0.000	0.000	0.002
Nov	0.007	0.009	1.222	0.001	0.000	0.001	0.002
Dec	0.006	0.017	2.729	0.001	0.000	0.001	0.002
Jan	0.003	0.007	2.336	0.001	0.000	0.000	0.001
Feb	0.002	0.004	2.089	0.001	0.000	0.000	0.001
Mar	0.002	0.006	2.329	0.001	0.000	0.000	0.001
Apr	0.023	0.109	4.771	0.002	0.000	0.004	0.006
May	0.025	0.055	2.192	0.003	0.000	0.005	0.007
Jun	0.076	0.270	3.560	0.007	0.000	0.019	0.027
Jul	0.063	0.225	3.573	0.006	0.000	0.005	0.011
Aug	0.046	0.125	2.742	0.005	0.000	0.007	0.012
Sep	0.018	0.033	1.846	0.002	0.000	0.003	0.005

A.6.4.2 Cumulative .tab

IUA: Knersvlakte
 Tributary Rivers: Groot-Goerap
 Mainstem: Sout
 Node: R58
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: B (PES = B).

Desktop Version 2, Generated on 2011/08/06
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 0.799
 S.Dev. = 1.472
 CV = 1.843
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.206
 CV(JJA+JFM) Index = 5.847

Ecological Category = B

Total IFR = 0.216 (27.07 %MAR)
 Maint. Lowflow = 0.090 (11.30 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 0.126 (15.77 %MAR)

Monthly Distributions (Mill. cu. m.)

Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.023	0.023	1.009	0.004	0.000	0.000	0.004
Nov	0.018	0.025	1.444	0.004	0.000	0.002	0.006
Dec	0.016	0.050	3.178	0.003	0.000	0.002	0.005
Jan	0.007	0.020	2.759	0.002	0.000	0.000	0.002
Feb	0.004	0.009	2.136	0.002	0.000	0.000	0.002
Mar	0.006	0.016	2.613	0.002	0.000	0.000	0.002
Apr	0.066	0.324	4.922	0.007	0.000	0.011	0.017
May	0.070	0.161	2.294	0.007	0.000	0.013	0.020
Jun	0.222	0.799	3.602	0.021	0.000	0.056	0.077
Jul	0.184	0.668	3.619	0.018	0.000	0.013	0.031
Aug	0.132	0.371	2.814	0.014	0.000	0.021	0.035
Sep	0.051	0.099	1.961	0.007	0.000	0.008	0.014

A.6.5 F60E

A.6.5.1 Cumulative and Incremental .tab

IUA: Knersvlakte
 Tributary Rivers: None
 Mainstem: None
 Node: Q4
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: B (PES unknown)

Desktop Version 2, Generated on 2011/08/06
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 0.055
 S.Dev. = 0.120
 CV = 2.187
 Q75 = 0.000
 Q75/MMF = 0.000
 BFI Index = 0.169
 CV(JJA+JFM) Index = 12.842

Ecological Category = B

Total IFR = 0.014 (25.38 %MAR)
 Maint. Lowflow = 0.005 (8.36 %MAR)
 Drought Lowflow = 0.000 (0.00 %MAR)
 Maint. Highflow = 0.009 (17.02 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.001	0.003	3.650	0.000	0.000	0.000	0.000
Nov	0.000	0.002	9.220	0.000	0.000	0.000	0.000
Dec	0.001	0.004	7.581	0.000	0.000	0.000	0.000
Jan	0.000	0.001	9.220	0.000	0.000	0.000	0.000
Feb	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mar	0.000	0.001	9.220	0.000	0.000	0.000	0.000
Apr	0.005	0.027	5.432	0.000	0.000	0.001	0.001
May	0.005	0.014	2.870	0.000	0.000	0.001	0.001
Jun	0.017	0.065	3.797	0.001	0.000	0.004	0.006
Jul	0.014	0.054	3.824	0.001	0.000	0.001	0.002
Aug	0.010	0.031	3.246	0.001	0.000	0.002	0.002
Sep	0.003	0.008	3.091	0.000	0.000	0.000	0.001

A.7 Secondary G3

A.7.1 G30A

A.7.1.1 Cumulative and Incremental .tab

IUA: Sandveld
Tributary Rivers: -
Mainstem: Papkuil
Node: R51
Data source: DWA 2012, default desktop reserve
Adjustments: None
Target condition: C (PES = D).

Desktop Version 2, Generated on 2011/08/06
Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 9.837
S.Dev. = 15.551
CV = 1.581
Q75 = 0.060
Q75/MMF = 0.073
BFI Index = 0.257
CV(JJA+JFM) Index = 3.492

Ecological Category = C

Total IFR = 1.922 (19.54 %MAR)
Maint. Lowflow = 0.821 (8.35 %MAR)
Drought Lowflow = 0.159 (1.61 %MAR)
Maint. Highflow = 1.101 (11.19 %MAR)

Monthly Distributions (Mill. cu. m.)
Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.242	0.260	1.076	0.045	0.010	0.000	0.045
Nov	0.207	0.236	1.142	0.043	0.010	0.012	0.055
Dec	0.167	0.156	0.933	0.040	0.010	0.008	0.048
Jan	0.132	0.127	0.961	0.037	0.010	0.000	0.037
Feb	0.123	0.158	1.293	0.034	0.010	0.000	0.034
Mar	0.104	0.103	0.996	0.031	0.010	0.000	0.031
Apr	0.278	0.588	2.114	0.038	0.010	0.026	0.064
May	0.865	1.670	1.930	0.066	0.010	0.098	0.164
Jun	2.930	7.802	2.663	0.166	0.020	0.517	0.684
Jul	1.881	3.391	1.802	0.119	0.020	0.098	0.217
Aug	2.078	5.740	2.762	0.130	0.010	0.250	0.380
Sep	0.830	1.945	2.343	0.072	0.029	0.091	0.164

A.7.2 G30B

A.7.2.1 Cumulative and Incremental .tab

IUA: Sandveld
 Tributary Rivers: Huis (FEPA), Southkloof and two with no names (both FEPA)
 Mainstem: Kruismans (FEPA below first no name tributary)
 Node: R55
 Data source: DWA 2012, default desktop reserve
 Adjustments: 60% of natural floods assumed for July, August and September (reflected below)
 Target condition: C (PES = D).

CONSTRUCTED

Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 15.248
 S.Dev. = 15.784
 CV = 1.035
 Q75 = 0.040
 Q75/MMF = 0.031
 BFI Index = 0.271
 CV(JJA+JFM) Index = 2.536

Ecological Category = C

Total IFR = 6.39 (41.91 %MAR)
 Maint. Lowflow = 1.494 (9.80 %MAR)
 Drought Lowflow = 0.507 (3.32 %MAR)
 Maint. Highflow = 4.896 (32.11 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Cape(dry)

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	1.123	0.754	0.671	0.180	0.080	0.109	0.289
Nov	0.552	0.284	0.514	0.133	0.059	0.027	0.160
Dec	0.203	0.116	0.572	0.069	0.031	0.000	0.069
Jan	0.058	0.034	0.594	0.022	0.010	0.000	0.022
Feb	0.020	0.014	0.713	0.008	0.000	0.000	0.008
Mar	0.015	0.019	1.252	0.006	0.000	0.000	0.006
Apr	0.302	1.568	5.189	0.023	0.000	0.000	0.023
May	1.396	3.818	2.735	0.094	0.010	0.199	0.292
Jun	3.652	7.849	2.149	0.246	0.040	0.519	0.765
Jul	2.854	4.048	1.418	0.228	0.060	1.484	1.712
Aug	2.985	4.418	1.480	0.260	0.116	1.531	1.791
Sep	2.088	2.192	1.050	0.226	0.101	1.027	1.253

A.7.3 G30C

A.7.3.1 Cumulative and Incremental .tab

IUA: Sandveld
 Tributary Rivers: Kleinvlei and Jansekraal
 Mainstem: Bergvallei
 Node: R54
 Data source: DWA 2012, default desktop reserve
 Adjustments: 60% of natural floods assumed for July, August and September (reflected below)
 Target condition: C (PES = D).

CONSTRUCTED

Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 17.495
 S.Dev. = 14.373
 CV = 0.822
 Q75 = 0.120
 Q75/MMF = 0.082
 BFI Index = 0.298
 CV(JJA+JFM) Index = 1.989

Ecological Category = C

Total IFR = 7.823 (44.72 %MAR)
 Maint. Lowflow = 1.984 (11.34 %MAR)
 Drought Lowflow = 0.895 (5.11 %MAR)
 Maint. Highflow = 5.839 (33.38 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Cape(dry)

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	1.597	0.865	0.542	0.250	0.119	0.158	0.408
Nov	0.830	0.389	0.469	0.198	0.095	0.043	0.241
Dec	0.314	0.186	0.592	0.113	0.055	0.000	0.113
Jan	0.132	0.069	0.524	0.054	0.027	0.000	0.054
Feb	0.091	0.050	0.549	0.039	0.020	0.000	0.039
Mar	0.083	0.065	0.780	0.033	0.010	0.000	0.033
Apr	0.326	1.057	3.240	0.048	0.010	0.000	0.048
May	1.217	2.438	2.002	0.107	0.030	0.160	0.267
Jun	2.895	4.693	1.621	0.223	0.100	0.391	0.614
Jul	3.229	4.083	1.264	0.270	0.120	1.668	1.938
Aug	4.012	4.929	1.228	0.347	0.165	2.060	2.407
Sep	2.768	2.593	0.937	0.302	0.144	1.359	1.661

A.7.4 G30D

A.7.4.1 Incremental .tab

IUA: Sandveld
Tributary Rivers: Krom Antonies, Hol (upper portion FEPA) and one with no name
Mainstem: Verlorevlei (from Kruismans-FEPA)
Node: -
Data source: DWA 2012, default desktop reserve
Adjustments: 60% of natural floods assumed for July, August and September (reflected below)
Target condition: C (PES = D).

CONSTRUCTED

Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 14.098
S.Dev. = 17.889
CV = 1.269
Q75 = 0.040
Q75/MMF = 0.034
BFI Index = 0.252
CV(JJA+JFM) Index = 2.847

Ecological Category = C

Total IFR = 6.454 (45.78 %MAR)
Maint. Lowflow = 1.274 (9.03 %MAR)
Drought Lowflow = 0.140 (0.99 %MAR)
Maint. Highflow = 5.182 (36.76 %MAR)

Monthly Distributions (Mill. cu. m.)
Distribution Type : W.Cape(dry)

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.344	0.642	1.869	0.084	0.020	0.020	0.103
Nov	0.178	0.243	1.364	0.052	0.020	0.005	0.057
Dec	0.106	0.115	1.083	0.034	0.010	0.000	0.034
Jan	0.055	0.034	0.624	0.022	0.000	0.000	0.022
Feb	0.042	0.040	0.959	0.016	0.000	0.000	0.016
Mar	0.046	0.073	1.582	0.013	0.000	0.000	0.013
Apr	0.329	1.209	3.676	0.029	0.000	0.000	0.029
May	1.259	2.716	2.157	0.088	0.000	0.178	0.266
Jun	2.896	5.396	1.863	0.198	0.010	0.410	0.608
Jul	3.357	5.804	1.729	0.247	0.020	1.767	2.014
Aug	3.928	7.006	1.784	0.303	0.020	2.054	2.357
Sep	1.558	3.088	1.982	0.187	0.040	0.748	0.935

A.7.4.2 Cumulative .tab

IUA: Sandveld
 Tributary Rivers: Krom Antonies, Hol (upper portion FEPA) and one with no name
 Mainstem: Verlorevlei (from Kruismans-FEPA)
 Node: R53
 Data source: DWA 2012, default desktop reserve
 Adjustments: 60% of natural floods assumed for July, August and September (reflected below)
 Target condition: C (PES = D).

CONSTRUCTED

Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :

Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 46.842
 S.Dev. = 47.207
 CV = 1.008
 Q75 = 0.210
 Q75/MMF = 0.054
 BFI Index = 0.282
 CV(JJA+JFM) Index = 2.329

Ecological Category = C

Total IFR = 20.706 (44.2 %MAR)
 Maint. Lowflow = 4.843 (10.34 %MAR)
 Drought Lowflow = 1.780 (3.80 %MAR)
 Maint. Highflow = 15.863 (33.87 %MAR)

Monthly Distributions (Mill. cu. m.)

Distribution Type : W.Cape(dry)

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	3.063	2.197	0.717	0.553	0.253	0.268	0.822
Nov	1.561	0.867	0.556	0.409	0.188	0.065	0.473
Dec	0.623	0.404	0.648	0.219	0.102	0.000	0.219
Jan	0.244	0.132	0.541	0.097	0.046	0.000	0.097
Feb	0.153	0.097	0.636	0.063	0.020	0.000	0.063
Mar	0.144	0.151	1.051	0.052	0.010	0.000	0.052
Apr	0.957	3.823	3.994	0.100	0.010	0.000	0.100
May	3.873	8.950	2.311	0.288	0.040	0.537	0.825
Jun	9.444	17.910	1.897	0.667	0.160	1.320	1.987
Jul	9.440	13.307	1.410	0.749	0.200	4.915	5.664
Aug	10.925	15.885	1.454	0.920	0.420	5.635	6.555
Sep	6.414	7.749	1.208	0.726	0.332	3.123	3.849

A.7.5 G30E

A.7.5.1 *Incremental .tab*

IUA: Sandveld
 Tributary Rivers: -
 Mainstem: Verlorevlei (RAMSAR)
 Node: -
 Data source: DWA 2012, default desktop reserve
 Adjustments: 60% of natural floods assumed for July, August and September (reflected below)
 Target condition: C (PES = D).

CONSTRUCTED

Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 6.791
 S.Dev. = 10.367
 CV = 1.527
 Q75 = 0.030
 Q75/MMF = 0.053
 BFI Index = 0.279
 CV(JJA+JFM) Index = 3.343

Ecological Category = C

Total IFR = 2.912 (42.88 %MAR)
 Maint. Lowflow = 0.598 (8.81 %MAR)
 Drought Lowflow = 0.060 (0.88 %MAR)
 Maint. Highflow = 2.313 (34.06 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Cape(dry)

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.157	0.272	1.736	0.034	0.010	0.010	0.044
Nov	0.106	0.136	1.275	0.028	0.010	0.003	0.031
Dec	0.080	0.073	0.910	0.024	0.000	0.000	0.024
Jan	0.058	0.048	0.825	0.019	0.000	0.000	0.019
Feb	0.056	0.087	1.558	0.017	0.000	0.000	0.017
Mar	0.045	0.044	0.988	0.014	0.000	0.000	0.014
Apr	0.164	0.388	2.364	0.019	0.000	0.000	0.019
May	0.556	1.093	1.967	0.040	0.000	0.079	0.119
Jun	1.825	4.631	2.537	0.109	0.010	0.269	0.379
Jul	1.505	2.667	1.773	0.105	0.010	0.798	0.903
Aug	1.598	3.754	2.349	0.117	0.010	0.842	0.959
Sep	0.641	1.348	2.104	0.072	0.010	0.312	0.384

A.7.5.2 Cumulative .tab

IUA: Sandveld
 Tributary Rivers: -
 Mainstem: Verlorevlei (RAMSAR)
 Node: R52
 Data source: DWA 2012, default desktop reserve
 Adjustments: 60% of natural floods assumed for July, August and September (reflected below)
 Target condition: B (PES = D).

CONSTRUCTED

Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :

Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 53.633
 S.Dev. = 55.924
 CV = 1.043
 Q75 = 0.270
 Q75/MMF = 0.060
 BFI Index = 0.284
 CV(JJA+JFM) Index = 2.420

Ecological Category = B

Total IFR = 26.276 (48.99 %MAR)
 Maint. Lowflow = 9.488 (17.69 %MAR)
 Drought Lowflow = 1.969 (3.67 %MAR)
 Maint. Highflow = 16.79 (31.31 %MAR)

Monthly Distributions (Mill. cu. m.)

Distribution Type : W.Cape(dry)

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	3.220	2.444	0.759	1.044	0.273	0.336	1.379
Nov	1.667	0.932	0.559	0.764	0.201	0.080	0.844
Dec	0.703	0.438	0.623	0.420	0.113	0.000	0.420
Jan	0.302	0.171	0.566	0.198	0.056	0.000	0.198
Feb	0.208	0.173	0.830	0.134	0.030	0.000	0.134
Mar	0.189	0.181	0.957	0.109	0.010	0.000	0.109
Apr	1.122	4.145	3.696	0.203	0.010	0.000	0.203
May	4.429	9.812	2.216	0.567	0.040	0.770	1.337
Jun	11.269	22.211	1.971	1.354	0.180	1.984	3.338
Jul	10.945	15.647	1.430	1.486	0.220	5.081	6.567
Aug	12.523	18.860	1.506	1.810	0.471	5.704	7.514
Sep	7.055	8.896	1.261	1.398	0.365	2.835	4.233

A.7.6 G30F

A.7.6.1 Cumulative and Incremental .tab

IUA: Sandveld
 Tributary Rivers: Lambertshoek
 Mainstem: Langvlei
 Node: R56
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: C (PES = C/D).

Desktop Version 2, Generated on 2011/08/06
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 13.256
 S.Dev. = 20.418
 CV = 1.540
 Q75 = 0.060
 Q75/MMF = 0.054
 BFI Index = 0.226
 CV(JJA+JFM) Index = 3.473

Ecological Category = C

Total IFR = 2.553 (19.26 %MAR)
 Maint. Lowflow = 1.049 (7.91 %MAR)
 Drought Lowflow = 0.140 (1.06 %MAR)
 Maint. Highflow = 1.504 (11.35 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.293	0.391	1.338	0.052	0.010	0.000	0.052
Nov	0.218	0.280	1.289	0.047	0.010	0.013	0.060
Dec	0.158	0.146	0.920	0.042	0.010	0.007	0.049
Jan	0.108	0.094	0.865	0.035	0.010	0.000	0.035
Feb	0.103	0.176	1.711	0.032	0.010	0.000	0.032
Mar	0.085	0.091	1.069	0.027	0.000	0.000	0.027
Apr	0.336	0.811	2.413	0.039	0.000	0.034	0.073
May	1.154	2.284	1.978	0.082	0.000	0.144	0.226
Jun	3.842	9.854	2.565	0.228	0.020	0.681	0.909
Jul	2.842	4.949	1.742	0.179	0.020	0.144	0.323
Aug	2.952	7.288	2.469	0.189	0.020	0.351	0.540
Sep	1.166	2.464	2.112	0.097	0.030	0.130	0.227

A.7.7 G30G

A.7.7.1 Cumulative and Incremental .tab

IUA: Sandveld
 Tributary Rivers: Peddies
 Mainstem: Jakkals
 Node: R57
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: C (PES = D).

Desktop Version 2, Generated on 2011/08/06
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 5.330
 S.Dev. = 8.735
 CV = 1.639
 Q75 = 0.020
 Q75/MMF = 0.045
 BFI Index = 0.238
 CV(JJA+JFM) Index = 3.844

Ecological Category = C

Total IFR = 1.021 (19.16 %MAR)
 Maint. Lowflow = 0.413 (7.75 %MAR)
 Drought Lowflow = 0.030 (0.56 %MAR)
 Maint. Highflow = 0.608 (11.41 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.122	0.157	1.288	0.021	0.000	0.000	0.021
Nov	0.102	0.141	1.392	0.020	0.000	0.007	0.026
Dec	0.078	0.088	1.125	0.018	0.000	0.004	0.022
Jan	0.059	0.066	1.130	0.016	0.000	0.000	0.016
Feb	0.056	0.088	1.554	0.015	0.000	0.000	0.015
Mar	0.048	0.053	1.102	0.013	0.000	0.000	0.013
Apr	0.155	0.359	2.314	0.018	0.000	0.016	0.033
May	0.518	1.027	1.982	0.035	0.000	0.058	0.094
Jun	1.862	5.180	2.782	0.102	0.010	0.324	0.426
Jul	1.110	2.153	1.939	0.067	0.010	0.058	0.125
Aug	0.863	2.610	3.025	0.056	0.000	0.103	0.159
Sep	0.357	0.910	2.550	0.032	0.010	0.039	0.071

A.7.8 G30H

A.7.8.1 Cumulative and Incremental .tab

IUA: Sandveld
 Tributary Rivers: -
 Mainstem: Sandlaagte
 Node: Q5
 Data source: DWA 2012, default desktop reserve
 Adjustments: None
 Target condition: C (PES = D).

Desktop Version 2, Generated on 2011/08/06
 Summary of Desktop (Version 2) estimate for Quaternary Catchment Area :
 Total Runoff : Runoff :

Annual Flows (Mill. cu. m or index values):

MAR = 6.845
 S.Dev. = 9.145
 CV = 1.336
 Q75 = 0.040
 Q75/MMF = 0.070
 BFI Index = 0.248
 CV(JJA+JFM) Index = 3.128

Ecological Category = C

Total IFR = 1.349 (19.71 %MAR)
 Maint. Lowflow = 0.589 (8.61 %MAR)
 Drought Lowflow = 0.158 (2.32 %MAR)
 Maint. Highflow = 0.760 (11.10 %MAR)

Monthly Distributions (Mill. cu. m.)
 Distribution Type : W.Karoo

Month	Natural Flows			Modified Flows (IFR)			
	Mean	SD	CV	Low flows		High Flows	Total Flows
				Maint.	Drought	Maint.	Maint.
Oct	0.415	0.367	0.883	0.046	0.019	0.000	0.046
Nov	0.171	0.174	1.017	0.033	0.014	0.012	0.045
Dec	0.088	0.098	1.109	0.027	0.010	0.002	0.029
Jan	0.062	0.073	1.164	0.023	0.000	0.000	0.023
Feb	0.058	0.089	1.516	0.020	0.000	0.000	0.020
Mar	0.051	0.058	1.133	0.018	0.000	0.000	0.018
Apr	0.155	0.337	2.181	0.023	0.000	0.014	0.037
May	0.515	1.003	1.950	0.042	0.010	0.072	0.114
Jun	1.957	5.384	2.751	0.119	0.010	0.362	0.480
Jul	1.418	2.423	1.708	0.093	0.037	0.072	0.165
Aug	1.134	1.261	1.112	0.080	0.032	0.132	0.212
Sep	0.820	0.786	0.958	0.065	0.026	0.093	0.158