

# Water Resources Planning Tables 2019

v15 - June 2018

All queries on the content of this workbook should be sent to:  
[water-company-plan@environment-agency.gov.uk](mailto:water-company-plan@environment-agency.gov.uk)



**Environment Agency**



**Cyfoeth Naturiol Cymru  
Natural Resources Wales**

## Water resource zone information

<b>Company:</b>	Northumbrian Water
<b>Resource Zone Name:</b>	Kielder
<b>Resource Zone Number:</b>	2
<b>Planning Scenario Name:</b>	Dry Year Annual Average
<b>Chosen Level of Service:</b>	Planned
<b>Base Year:</b>	2016/17
<b>Responsible Officer:</b>	William Robinson
<b>Version:</b>	Draft Final

Signed: William Robinson      Dated:

[Digital signature is acceptable]

## Key to cells

- Clear cells - indicate an input is required
- Yellow shaded cells - indicates a formula.
- Blue shaded cells - indicate base year data.
- Light grey shaded cells - indicate preceding years.
- Dark grey cells - indicate that no data entry is required.

## Worksheet

- WRZ summary**
- 1. BL Licences**
- 2. BL Supply**
- 3. BL Demand**
- 4. BL SDB**
- 5. Feasible options**
- 6. Preferred options**
- 7. FP Supply**
- 8. FP Demand**
- 9. FP SDB**
- 10. Drought plan links**

## Content

- Supply-Demand Balance and components
- Baseline water resources
- Baseline water supplies
- Baseline demand
- Baseline supply demand balance
- Fixed and Variable costs, Net Present Value, AIC and AISC of all feasible options (confidential)
- High level costs of preferred options (Dry Year) - publicly available
- Final Planning water supplies (impact of Scenario options)
- Final Planning demand (impact of Scenario options)
- Final Planning supply demand balance
- Drought plan links



**Table 1: Baseline licences**

Row ref	Derivation	Licence number	Source name	Source type	Deployable output (MI/d)	Annual licensed quantity (MI/d)	Constraints on deployable output	Additional notes (if desired)
<b>All individual licences:</b>								
0.1BL	Sum (0.1BL+...)	-	-	-	792.32	3203.05	-	
-	Input	1/22/3/12	Source Kielder 1	GW	4.56	6.82		
	Input	1/22/3/7	Source Kielder 2	GW	0.00	1.14		
	Input	1/22/5/13	Source Kielder 3	SW:Reservoir	15.60	30.00		
	Input	1/22/03/008	Source Kielder 4	SW:River	42.50	55.00		
	Input	1/23/01/001	Source Kielder 5	SW:Reservoir	92.93	181.82		
	Input	1/23/1/002	Source Kielder 6	SW:River	150.00	136.38		
	Input	1/23/01/159	Source Kielder 7	SW:River	0.00	54.55		
	Input	1/23/2/207	Source Kielder 8	GW	0.06	0.06		
	Input	1/23/01/004	Source Kielder 10	GW	0.04	0.04		
	Input	1/23/02/005	Source Kielder 11	GW	0.03	0.03		
	Input	1/23/4/073	Source Kielder 13	SW:Reservoir	130.00	137.00		
	Input	1/24/1/34	Source Kielder 14	SW:Reservoir	67.60	122.74		
	Input	1/24/5/34	Source Kielder 15	SW:River	42.00	45.46		
	Input	1/23/3/113	Source Kielder 16	SW:River	0.00	909.22		
	Input	1/23/04/075	Source Kielder 17	SW:River	0.00	909.22		
	Input	1/23/4/073	Source Kielder 18	SW:River	0.00	164.00		
	Input	1/25/1/1	Source Kielder 19	SW:Reservoir	97.00	145.47		
	Input	1/25/2/127	Source Kielder 20	GW	0.00	9.10		
	Input	1/25/2/103	Source Kielder 21	SW:River	150.00	295.00		
	Input							
<b>Grouped licences</b>								
0.2BL	Sum (0.2BL+...)	-	<b>Total</b>	-	44.00	-	-	
-	-	<b>Group #:</b>	<b>[Enter name of group]</b>	-	44.00	-	-	
-	Input	1/25/5/4	Source Kielder 22	GW	0.00	11.82		
-	Input	1/25/5/2	Source Kielder 23	GW	0.00	13.18		
	Input	1/24/5/35	Source Kielder 24	GW	0.00	5.46		
	Input	1/25/5/7	Source Kielder 25	GW	0.00	6.18		
	Input	1/25/5/6	Source Kielder 26	GW	0.00	4.55		
-	Input	1/25/5/3	Source Kielder 27	GW	0.00	6.82		
-	Input	1/25/5/8	Source Kielder 28	GW	0.00	10.64		
-	Input	1/24/5/1	Source Kielder 29	GW	44.00	5.27		
<b>Unused licences:</b>								
0.3BL	Sum (0.3BL+...)	-	-	-	0.00	0.00	-	
-	Input							
-	Input							
<b>New licences (within current AMP):</b>								
0.4BL	Sum (0.4BL+...)	-	-	-	0.00	0.00	-	
-	Input							
-	Input							

<b>Company:</b>	Northumbrian Water
<b>Resource Zone Name:</b>	Kielder
<b>Resource Zone Number:</b>	2
<b>Planning Scenario Name:</b>	Dry Year Annual Average
<b>Chosen Level of Service:</b>	Planned

**README**

Table 2: Baseline supply

Row ref	Component	Derivation	Unit	decimal places	2016/17	For info 2017-18	For info 2018-19	For info 2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31	2031-32	2032-33	2033-34	2034-35	2035-36	2036-37	2037-38	2038-39	2039-40	2040-41	2041-42	2042-43	2043-44	2044-45	2045-46	2046-47	2047-48	2048-49	2049-50	2050-51	2051-52	2052-53	2053-54	2054-55	2055-56	2056-57	2057-58	2058-59	2059-60					
1BL	Raw water abstracted	input	Mgd	2	680.42	682.48	681.80	681.14	680.75	679.80	679.14	678.44	677.87	677.13	676.16	675.17	674.29	673.46	673.06	672.82	672.28	672.34	672.55	672.86	673.10	673.31	674.20	675.18	676.05	677.02	678.03	679.08	680.08	681.26	682.56	682.23	683.68	685.12	686.64	688.17	689.77	691.23	692.56	693.87	695.07	696.27	697.58	698.89					
2BL	Total raw water imported	sum(1BL+3.2BL+3.3BL...)	Mgd	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
3.1BL*	Raw water imported from None	input	Mgd	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
3BL	Total potable water imported	sum(3.1BL+3.2BL+3.3BL...)	Mgd	2	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01			
3.1BL*	Potable water imported from None	input	Mgd	2	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01			
5BL	Total raw water exported (raw water export to None)	sum(5.1BL+5.2BL+...)	Mgd	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
5.1BL	Non potable water supplied to	input	Mgd	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
5.2BL*	Raw water export to None	input	Mgd	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
6BL	Total potable water exported	sum(5.1BL+5.2BL+...)	Mgd	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
6.1BL*	Potable water export to None	input	Mgd	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
7BL	Deployable Output (baseline production)	sum(7.1BL+7.2BL+7.3BL+7.4BL)	Mgd	2	836.00	836.00	836.00	836.00	836.00	836.00	836.00	836.00	836.00	836.00	836.00	836.00	836.00	836.00	836.00	836.00	836.00	836.00	836.00	836.00	836.00	836.00	836.00	836.00	836.00	836.00	836.00	836.00	836.00	836.00	836.00	836.00	836.00	836.00	836.00	836.00	836.00	836.00	836.00	836.00	836.00	836.00	836.00	836.00	836.00	836.00	836.00	836.00	
8BL	Baseline forecast changes to DI (input reductions must be increased at site)	sum(8.1BL+8.2BL+8.3BL)	Mgd	2	0.00	0.00	0.00	-2.61	-4.02	-6.03	-8.04	-10.05	-12.07	-14.08	-16.09	-18.10	-20.11	-22.12	-24.13	-26.14	-28.15	-30.16	-32.17	-34.18	-36.19	-38.20	-40.21	-42.22	-44.23	-46.24	-48.25	-50.26	-52.27	-54.28	-56.29	-58.30	-60.31	-62.32	-64.33	-66.34	-68.35	-70.36	-72.37	-74.38	-76.39	-78.40	-80.41	-82.42	-84.43				
8.1BL	Change in DI due to climate change	input (reductions must be increased at site)	Mgd	2	0.00	0.00	0.00	-2.61	-4.02	-6.03	-8.04	-10.05	-12.07	-14.08	-16.09	-18.10	-20.11	-22.12	-24.13	-26.14	-28.15	-30.16	-32.17	-34.18	-36.19	-38.20	-40.21	-42.22	-44.23	-46.24	-48.25	-50.26	-52.27	-54.28	-56.29	-58.30	-60.31	-62.32	-64.33	-66.34	-68.35	-70.36	-72.37	-74.38	-76.39	-78.40	-80.41	-82.42	-84.43	-86.44	-88.45	-90.46	
8.2BL	Reductions to restore sustained	sum(8.1BL sub-components)	Mgd	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
8.2BL*	Total for the zone	input (zero or negative number)	Mgd	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8.3BL	Total other changes to DI (input reductions must be increased at site)	input (reductions must be increased at site)	Mgd	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9BL	Raw water losses, treatment and	input	Mgd	2	17.58	17.68	17.73	17.77	17.82	17.86	17.90	17.95	17.99	18.04	18.08	18.11	18.15	18.20	18.24	18.29	18.34	18.40	18.46	18.53	18.59	18.65	18.73	18.80	18.88	18.95	19.03	19.10	19.18	19.26	19.31	19.39	19.48	19.56	19.65	19.74	19.83	19.91	19.99	20.08	20.16	20.24	20.32	20.40	20.48	20.56	20.64		
10BL	Outage allowance	input	Mgd	2	69.90	67.60	67.80	67.60	67.60	67.60	67.60	67.60	67.60	67.60	67.60	67.60	67.60	67.60	67.60	67.60	67.60	67.60	67.60	67.60	67.60	67.60	67.60	67.60	67.60	67.60	67.60	67.60	67.60	67.60	67.60	67.60	67.60	67.60	67.60	67.60	67.60	67.60	67.60	67.60	67.60	67.60	67.60	67.60	67.60	67.60	67.60	67.60	

Company:	Northumbrian Water
Resource Zone Name:	Kieldor
Resource Zone Number:	2
Planning Scenario Name:	City Year Annual Average
Chosen Level of Service:	Planned



Table 4: Baseline supply demand balance

Row ref	Component	Derivation	Unit	Decimal places	2016/17	For info 2018-18	For info 2019-19	For info 2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31	2031-32	2032-33	2033-34	2034-35	2035-36	2036-37	2037-38	2038-39	2039-40	2040-41	2041-42	2042-43	2043-44	2044-45	2045-46	2046-47	2047-48	2048-49	2049-50	2050-51	2051-52	2052-53	2053-54	2054-55	2055-56	2056-57	2057-58	2058-59	2059-60	
118c	Distribution Input	$108L+208L+218L+228L+338L+308L$	Mm3	2	602.63	602.63	602.63	602.63	602.93	601.94	601.24	600.50	599.88	599.09	598.09	597.06	596.13	595.26	594.42	593.62	592.84	592.09	591.35	590.63	589.93	589.25	588.58	587.92	587.27	586.63	586.00	585.38	584.77	584.17	583.58	583.00	582.43	581.87	581.32	580.78	580.25	579.73	579.22	578.72	578.23	577.75	577.28	576.82	
128c	Water Available For Use (own sources)	$176L+186L+196L+108L+118L$	Mm3	2	748.52	748.52	748.52	748.52	756.68	754.51	752.43	750.43	748.54	746.73	745.07	743.56	742.10	740.70	739.37	738.10	736.88	735.70	734.57	733.49	732.45	731.45	730.49	729.56	728.66	727.79	726.95	726.14	725.36	724.61	723.88	723.17	722.48	721.82	721.18	720.56	719.96	719.38	718.82	718.28	717.75	717.24	716.74	716.25	
138c	Water Available For Use (own sources)	$129L+139L+149L+159L+169L$	Mm3	2	747.85	747.85	747.85	747.85	755.97	753.82	751.76	749.77	747.86	746.03	744.36	742.84	741.37	739.95	738.58	737.26	735.95	734.68	733.45	732.26	731.11	730.00	728.93	727.89	726.88	725.90	724.95	724.03	723.14	722.28	721.44	720.62	719.82	719.04	718.28	717.54	716.82	716.12	715.44	714.78	714.14	713.52	712.92	712.34	711.78
148c	Target headroom (climate change component)	Input	Mm3	2	0.00	0.00	0.00	0.00	2.26	3.42	5.40	8.75	9.56	11.09	11.95	13.70	11.98	11.63	12.27	13.71	12.44	12.62	13.13	14.38	13.27	13.93	14.59	14.54	15.17	15.05	14.85	15.11	15.35	16.03	16.02	16.54	16.73	16.74	16.79	16.47	16.59	17.27	16.94	17.39	16.85	18.00	17.35	18.20	
158c	Target headroom (all other components)	Input	Mm3	2	0.00	0.00	0.00	0.00	44.78	44.71	43.84	43.49	42.89	41.89	40.72	39.81	37.71	37.33	36.01	34.73	34.24	32.46	31.79	30.14	29.10	28.59	27.21	26.46	25.69	25.51	23.89	23.61	23.11	22.48	22.13	21.87	20.79	20.50	20.58	18.99	18.94	18.51	17.23	17.29	16.17	16.17	15.27		
168c	Target Headroom	$148L+158L$	Mm3	2	0.00	0.00	0.00	0.00	47.04	48.14	49.24	52.25	52.35	52.94	51.76	50.31	49.69	49.96	48.28	48.44	48.68	45.07	44.82	44.51	43.37	43.03	42.48	42.70	42.36	42.00	40.35	39.14	38.65	38.67	37.65	37.24	36.79	36.55	36.16	36.20	35.44	34.14	34.14	33.14	33.14	32.52	33.53		
178c	Available Headroom	$138L-118L$	Mm3	2	85.02	85.02	85.02	85.02	92.94	91.87	90.52	89.21	87.77	86.51	84.79	82.91	80.82	78.57	76.19	73.66	70.92	68.00	64.87	61.51	57.99	54.28	50.43	46.45	42.20	37.81	33.28	28.69	24.03	19.28	14.44	9.51	4.49	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28
188c	Supply Demand Balance	$178L-168L$	Mm3	2	85.02	85.02	85.02	85.02	49.93	43.74	41.79	39.87	38.42	37.87	36.43	34.80	32.83	30.63	28.12	25.31	22.24	18.92	15.34	11.52	7.49	3.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Company: Northumbrian Water  
 Resource Zone Name: Kielder  
 Resource Zone Number: 2  
 Planning Scenario Name: Dry Year Annual Average  
 Chosen Level of Service: Planned

README

Administrative													Financial													Operational																					
ID	Name	Status	Type	Priority	Project Phases										Revenue												Expenses																				
					Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8	Phase 9	Phase 10	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28	Q29	Q30			
001	Project A	Active	Major	High	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100		
002	Project B	Completed	Minor	Low	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
003	Project C	On Hold	Medium	Medium	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

**Legend:**

**Phase 1-10:** Planning, Design, Procurement, Construction, Commissioning, Handover, Evaluation, Monitoring, Maintenance, Reporting.

**Q1-Q30:** Quarterly periods.

**Status Legend:** Active (Green), Completed (Grey), On Hold (Yellow), Cancelled (Red).

**Priority Legend:** High (Red), Medium (Yellow), Low (Green).









Table 9: Final planning water supply

Row Ref	Component	Derivation	Unit	Decimal places	2016/17	For info 2017	For info 2018	For info 2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31	2031-32	2032-33	2033-34	2034-35	2035-36	2036-37	2037-38	2038-39	2039-40	2040-41	2041-42	2042-43	2043-44	2044-45	2045-46	2046-47	2047-48	2048-49	2049-50	2050-51	2051-52	2052-53	2053-54	2054-55	2055-56	2056-57	2057-58	2058-59	2059-60					
11FP	Distribution Input	10FP+20FP+21FP+22FP+23FP+24FP+25FP	Mld	2	662.83	664.80	664.13	663.43	658.84	652.32	646.07	639.79	633.62	629.16	624.56	619.94	616.44	611.00	607.23	603.42	599.73	596.42	593.27	590.44	587.54	585.56	584.56	583.63	582.70	582.04	581.34	580.58	579.96	581.10	580.79	582.03	583.42	584.80	586.26	587.72	589.24	590.65	591.62	593.19	594.35	595.51	596.76	598.02					
12FP	Water Available For Use (own sources)	7FP-8FP+10FP	Mld	2	749.52	750.72	750.67	750.62	750.56	754.51	752.45	750.40	748.34	746.29	745.97	745.66	745.34	745.02	744.70	744.37	744.05	743.71	743.38	743.04	742.70	742.36	742.01	741.66	741.31	740.96	740.60	740.25	739.90	739.54	739.21	738.89	738.60	738.33	738.07	737.81	737.55	737.29	737.03	736.77	736.51	736.25	736.00	735.74					
13FP	Total Water Available For Use	10FP+12FP+13FP+14FP+15FP	Mld	2	1377.85	1381.09	1381.80	1381.97	1381.92	1381.76	1381.71	1381.61	1381.50	1381.40	1381.30	1381.20	1381.10	1381.00	1380.90	1380.80	1380.70	1380.60	1380.50	1380.40	1380.30	1380.20	1380.10	1380.00	1379.90	1379.80	1379.70	1379.60	1379.50	1379.40	1379.30	1379.20	1379.10	1379.00	1378.90	1378.80	1378.70	1378.60	1378.50	1378.40	1378.30	1378.20	1378.10	1378.00					
14FP	Target headroom (climate change component)	Input	Mld	2	0.00	0.00	0.83	0.17	2.26	3.42	5.40	6.75	9.56	11.09	11.05	10.70	11.38	11.83	12.27	13.71	12.44	12.62	13.13	14.38	13.27	13.83	14.09	14.54	15.17	15.05	14.85	15.11	15.35	16.03	16.02	16.54	16.73	16.74	16.79	16.87	16.99	17.27	16.94	17.39	16.85	18.00	17.35	18.26					
15FP	Target headroom (all other components)	Input	Mld	2	0.00	0.00	44.42	46.87	44.75	44.71	43.34	43.49	42.60	41.86	40.72	39.81	37.71	37.33	36.01	34.73	34.24	32.46	31.79	30.14	28.10	28.10	27.21	26.46	25.66	25.11	23.89	23.91	23.11	22.43	22.13	21.87	20.79	20.00	20.00	19.99	19.94	18.81	17.23	17.28	16.17	16.17	15.27						
16FP	Target headroom	14FP+15FP	Mld	2	0.00	0.00	45.25	47.64	47.01	46.14	46.74	46.93	46.95	46.94	46.94	46.94	46.94	46.94	46.94	46.94	46.94	46.94	46.94	46.94	46.94	46.94	46.94	46.94	46.94	46.94	46.94	46.94	46.94	46.94	46.94	46.94	46.94	46.94	46.94	46.94	46.94	46.94	46.94	46.94	46.94	46.94	46.94	46.94	46.94				
17FP	Available headroom	13FP-16FP	Mld	2	85.02	85.23	85.81	85.88	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92		
18FP	Supply Demand Balance	13FP-18FP	Mld	2	85.02	85.23	85.81	85.88	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92	85.92

Company: Northumbrian Water  
 Resource Zone Name: Kielder  
 Resource Zone Number: 2  
 Planning Scenario Name: Dry Year Annual Average  
 Chosen Level of Service: Demand

Table 10: Drought plan links and Deployable Output Overview

10.1 Planning scenarios				10.2 Water resources management plan								10.3 Drought plan						10.4 Demand		
Drought Scenarios	Drought Description	Drought Severity	Plan in which scenario is used (highlights overlaps)		WRMP DO of Sources (not including drought measures)	WRMP Additional Yield from Drought Supply Measures (eg drought permits or orders)			WRMP Impact on DO of drought plan Demand Restrictions (eg TUBs)			WRMP DO Levels of Service	Drought Plan Additional Yield from Further Supply Measures (eg drought permits or orders)			Drought Plan Impact on DO of Further Demand Restrictions (eg TUBs)			Unrestricted Demand	Restricted Demand
			WRMP	Drought Plan	DO (Ml/d)	Description	Marginal Benefit (Ml/d)	DO (Ml/d)	Description	Marginal Benefit (Ml/d)	DO (Ml/d)	DO (Ml/d)	Description	Marginal Benefit (Ml/d)	DO (Ml/d)	Description	Marginal Benefit (Ml/d)	DO (Ml/d)	Ml/d	Ml/d
Historic Droughts	1958/59	0.65% chance in any given year	Y	n	836.0	None	0.0	836.0	Level 1	29.3	836.0	836.0	N/A	N/A	N/A	N/A	N/A	N/A	664.8	641.5
Additional Drought Scenarios	200	0.5% chance in any given year	Y	n	835.0	None	0.0	835.0	Level 1	29.2	835.0	835.0	N/A	N/A	N/A	N/A	N/A	N/A	664.8	641.5

10.5 Summary report	
<p><b>WRMP DO Overview</b></p> <p><b>DO Approach</b> - Aquator modelling was used for all surface water DO calculations. The English &amp; Welsh method was used for the historic drought, and the Scottish method for the 1 in 200 year severe drought scenario. This is outlined in section 3.1.3 of the WRMP.</p> <p><b>LoS</b> - the planned levels of service for our customers are 1 in 20 years for appeal for restraint, 1 in 150 years for temporary use bans, and 1 in 200 years for restriction of use and 1 in 250 years for pressure reduction.</p> <p><b>Constraint on DO</b> - our deployable output is licence-constrained.</p> <p><b>Critical Year</b> - our worst historical drought year in the Kielder WRZ is 1958/59.</p> <p><b>Data length &amp; quality</b> - we have 86-year naturalised river flow series covering 1926-2012.</p> <p><b>Approach to drought severity</b> - estimation of drought severity was carried out using analysis of rainfall data and Tabony tables, outlined in section 3.1.4 of the WRMP.</p>	<p><b>Drought Plan Overview</b></p> <p>The supply and demand side measures included within our Drought Plan are listed below, alongside their associated daily benefit as a reduction in demand.</p>
<p><b>Additional Drought Scenarios</b></p> <p>Drought scenarios chosen and justification - a severe (1 in 200 year) drought scenario was analysed for our surface water sources using the Aquator Scottish method and annual failure analysis, outlined in section 3.1.3 of the WRMP.</p>	<p><b>Drought Supply Measures and Demand Restrictions Further Details</b></p> <p>Demand – Appeals for restraint – 7% demand reduction. May to October.</p>
<p><b>Impact on Supply Demand</b></p> <p>We have not included any demand or supply side drought measures in WRMP deployable output assessments.</p>	
<p><b>Demands</b></p> <p>We have used the Dry Year Distribution Input figures for base year 2017/18 as the Unrestricted Demand. Restricted Demand is the Unrestricted Demand minus the 3.5% demand reduction from Level 1 restrictions.</p>	

**2.3 Making changes to the WRP tables**

Please see below slight changes to the WRP tables

Structure: no changes

Content: see below

Table	Row ref	Component	Derivaion	Unit	DP	What has been amended	Reasoning
2	7BL	Deployable Output (baseline profile with	$sum(0.1BI+0.2BL+0.3BL+0.4BL)$	MI/d	2	Formula has been removed, this row is Input from Supply data	DO is calculated for consistency on Supply calculations, DO is not sum of licences
9	11FP	Distribution Input	$19FP+20FP+21FP+22FP+32FP+33FP+39FP$	MI/d	2	Void SPL removed row 38 from calculation, NWL/ESW following UKWIR/NRA WR1 demand forecasting methodology, void usage which includes SPL is included in Water unbilled. So to not double count this volume of water Void SPL has been removed from the total DI calculation. Unbilled contains both void usage as well as SPL, this row is already included in the DI calculation.	Consistency between WRP and water balance assumptions/calculations Following UKWIR/NRA WR1 demand forecasting methodology. Reflects WRMP report Void SPL ranges from 0.01% to 0.3% of DI
4	11BL	Distribution input	$19BL+20BL+21BL+22BL+32BL+33BL+3$	MI/d	2	As above	As above
8	30FP	Unmeasured Household - PCC	$(26FP*1,000,000)/(52FP*1,000)$	l/h/d	1	Formula amended to 1 decimal place rather than 0 as per table requirement New `=ROUND((H10*1000000)/(H55*1000),1)` Old `=ROUND((H10*1000000)/(H55*1000),1)`	For consistency between BL/FB as well as complying with table requirements
8	29FP	Measured Household - PCC	$(25FP*1,000,000)/(51FP*1,000)$	l/h/d	1	As above	For consistency between BL/FB as well as complying with table requirements
2	8.21BL+	Total for the zone	Input (zero or negative number)	MI/d	2	Row reference	The row reference is a duplicate of 8.2 ie there are two 8.2's so one has been amended to 8.21 to enable an accurate data load of the tables.
7	1FP	Raw Water Abstracted	1BL	MI/d	2	FP should be different than = BP Input from Final Supply demand (DI for BL and FP are different) which means BL and FP raw water abstracted will be different figures	Final plan DI + raw water imports - raw water exports + process losses should = Final Plan Raw water abstracted
6	61.4	Change volume delivered to unmeasured households (input reductions as -ve)	-	MI/d	2	The volume associated in the row if consumption rather than the previous water delivered, changes made due to the version 15 including SPL to the water delivered figure	
6	61.3	Change volume delivered to measured households (input reductions as -ve)	-	MI/d	2	The volume associated in the row if consumption rather than the previous water delivered, changes made due to the version 15 including SPL to the water delivered figure	

amended final v

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amended final v

amended final v

amended final v