App PoE, Water Resources, Appendix D – Cambridge Water Household and Non-Household Data

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Date:	May 5 2023
Reference:	PJA TM Cambridge North 20230428 V2.1
Subject:	Cambridge Water 2019 & Draft 2024 WRMP Data Assessment

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Background

Cator & Co has been appointed to assist Brookgate Land Ltd (Brookgate) with water resource issues arising from the proposed Cambridge North development. This includes working with Phil Jones Associates Ltd (PJA) on the "Proof of Evidence" for a planning appeal due to be held in June 2023.

Purpose of Note

In support of the Proof of Evidence, PJA has requested the following:

1. An assessment of household and non-household demand data from the Cambridge Water (CW) draft 2024 Water Resource Management Plan (draft WRMP24), and
2. An assessment household and non-household demand data from the equivalent 2019 WRMP.

This note summarises data available from the two WRMPs and compares it to the demand expected from the proposed Cambridge North development.

Approach

To complete the assessment, data from the CW 2019 WRMP & draft WRMP24 Water Resource Planning (WRP) tables has been used. This has been downloaded as excel spreadsheets from the CW website and then interrogated. The two spreadsheets are:

- 2019 WRMP: final-cam-wrmp-2019-tables-v15-dyaa.xlsx, and
- Draft WRMP24: wrmp24_template-tables_final-july_ver_-cam-dwrmp-230223.xlsx.

Assessment

Cambridge Water draft WRMP24 household & non-household data

Cambridge Water (CW) state in their draft WRMP24 that their population and property forecasts have been produced in accordance with industry best practice. This means that they account for recent trends in population and property growth, Local Authority planned levels of growth and the number of customers that are billed by CW for water supplies.

This approach is the same as that used for the 2019 CW WRMP.

Evidence to support the use of Local Authority projections can be found in the draft WRMP24 technical appendices. These include a demand forecasting report for the Water Resources East (WRE) draft regional plan[1]. This states that CW used a "Housing-Plan-Preferred" growth scenario for their draft WRMP24, which specifically accounts for Local Authority planned levels of growth.

Over the 25-year period from 2025/26 to 2049/50 the CW draft WRMP24 WRP tables[2] show:

- A net increase in the total number of household & non-household properties of 38,930, and
- An increase in non-household properties of 840.

The WRP tables also show that from 2025/26 to 2049/50 the number of new-build properties average 1,650 per year, reducing from a peak of 2,900 per year in 2025/26 to 1,080 per year in 2049/50. Figure 1 shows the related dry year annual average (DYAA) household and non-household demands[3]. From this:

1. Unmeasured non-household & non-potable consumption is not material
2. There is an initial reduction in measured total & non-household demand, which is attributed to the effects of the COVID19 pandemic

[1] Demand Forecast, Draft Regional Water Resources Plan for Eastern England, Water Resources East, November 2022

[2] From CW Draft WRMP24 Baseline (BL) WRP table data

[3] From CW Draft WRMP24 Final Planning (FP) WRP table data, measured as water delivered

3. Total demand varies between 72Ml/d[4] & 84Ml/d, increasing from the COVID19 impact in response to growth and then reducing as the impact of demand management measures become apparent
4. In detail:
    a. Non-household measured demand increases by 7.52Ml/d, from 23.01Ml/d in 2020/21 to 30.53Ml/d in 2029/30. This is followed by a reduction to 28.39Ml/d in 2049/50 owing to the effect of water efficiency measures
    b. Unmeasured household demand reduces from 18.77Ml/d in 2019/20 to 1Ml/d in 2035/36 and then remains at this level. The reduction is attributed to the effects of metering, and
    c. Measured household demand increases from 29.24Ml/d in 2019/20 to 49.42Ml/d in 2035/36 before reducing to 45.79Ml/d in 2049/50, reflecting:
        i. New housing development
        ii. Metering and the switching of unmeasured household customers to measured household customers, and
        iii. The effect of water efficiency measures (see note below).

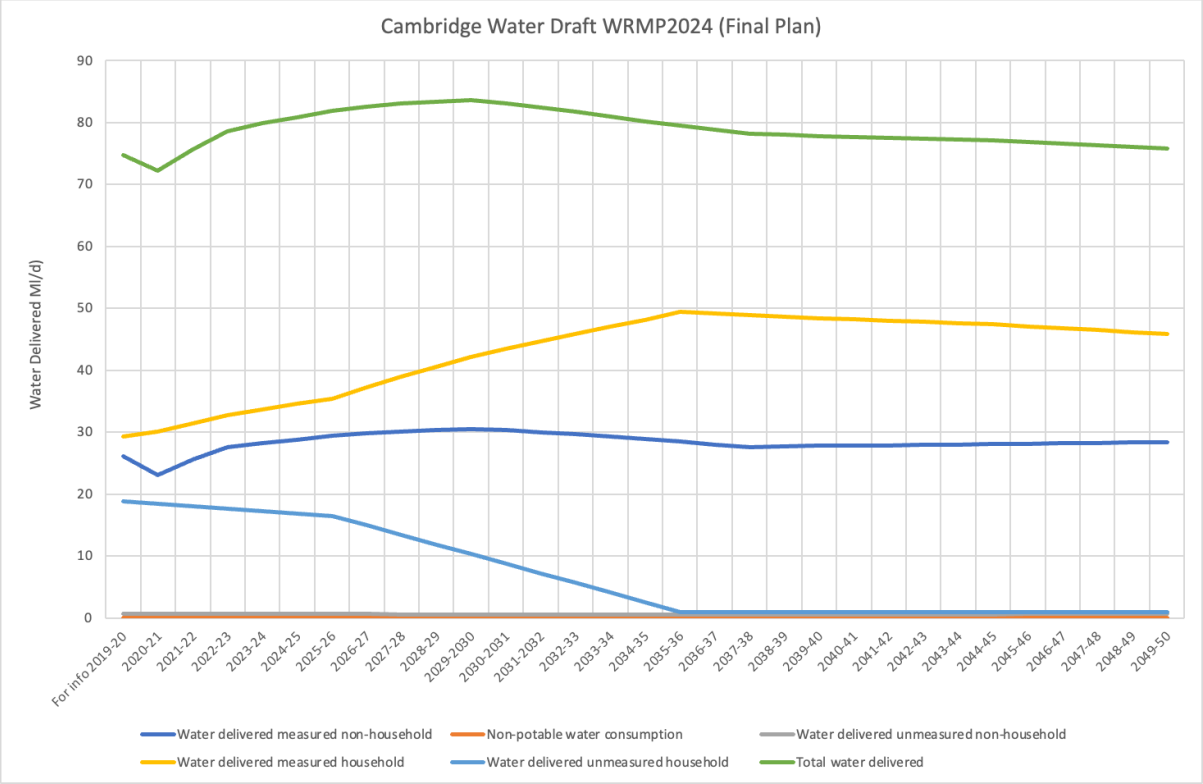

Figure 1: Draft WRMP24 water demands for measured & unmeasured households & non-households

[4] Ml/d – mega litres per day

As well as leakage reduction & metering, the proposed CW demand management programme includes the following water efficiency measures:

- Household water efficiency measures, with home visits
- A targeted programme of engagement with Housing Associations
- Innovative tariffs
- Water neutrality (without smart metering)
- Community water efficiency schemes (without smart metering)
- A developer incentive programme
- A Government-led water labelling scheme, and
- Work with water-retailers on a non-household water efficiency programme.

The projected 2027/28 peak demands from the Cambridge North development are given below. These are a very small proportion of the equivalent CW Dry Year Critical Period[5] (DYCP) demands for 2049/50:

- Household demand: **0.12Ml/d**. This is 0.20% of the 2049/50 measured household demand (60.32Ml/d)
- Non-household demand: **0.07Ml/d**. This is 0.25% of the 2049/50 measured non-household demand (29.03Ml/d):
- Total demand: **0.19Ml/d**. This is 0.22% of the total 2049/50 demand (89.35Ml/d).

Cambridge Water 2019 WRMP household & non-household data
The CW 2019 WRMP states that the related population & property forecasts are based, in part, on Local Authority development plans and associated projections for new housing need.

Over the 25-years from 2020/21 to 2044/45[6]:

- The total number of properties is forecast to increase by 37,030, and
- The number of non-household properties is forecast to increase by 2,520.

Equivalent estimates of new-build properties average 1,490 per year, reducing from a peak of 2,540 per year in 2020/21 to 1,230 per year in 2044/45.

[5] Dry Year Critical Period is a technical term used for "peak"
[6] From CW 2019 WRMP Baseline (BL) WRP table data

Figure 2 shows the related household & non-household demands[7]. From this:

- Unmeasured non-household demand is not material
- Total demand gradually increases from 70Ml/d to 74Ml/d
- Measured non-household demand increases by 0.63Ml/d over the forecast period, from 20.60Ml/d in 2017/18 to 21.23Ml/d in 2044/45
- Measured household demand increases by 14.10Ml/d over the forecast period, from 29.44Ml/d in 2017/18 to 43.54Ml/d in 2044/45. This reflects an increase in demand from new development and the switching of customers from unmeasured to measured supplies.

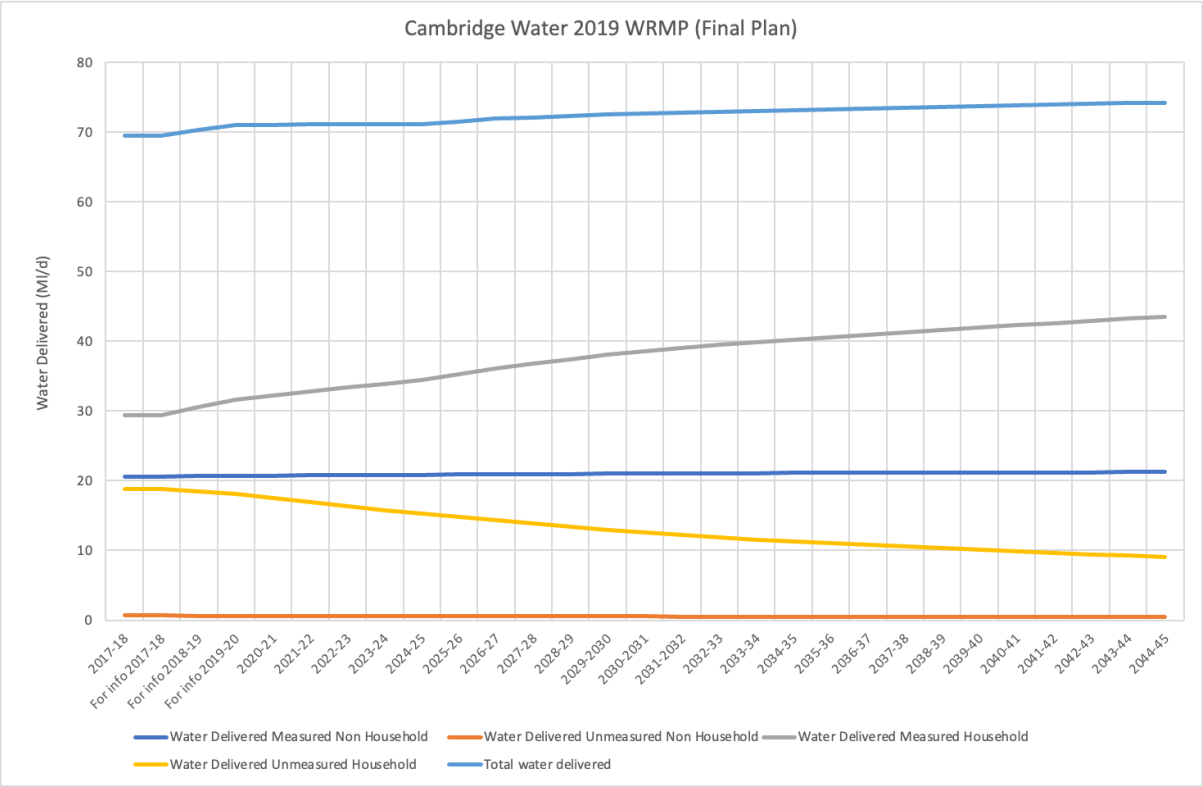

Figure 2: 2019 WRMP water demands for measured & unmeasured households & non-households

While the 2019 & draft 2024 WRMPs are consistent, the draft WRMP24 has:

- A higher number of total new-build properties
- Smaller growth in the number non-household properties
- Higher volumes of household and non-household demand, and
- Greater household & non-household metering & water efficiency savings.

[7] From CW 2019 WRMP Final Planning (FP) WRP table data

Comparison with CW draft WRMP24 Schemes

To further support the Proof of Evidence, a comparison between demands from the Cambridge North development and new schemes in the CW draft WRMP24 is provided:

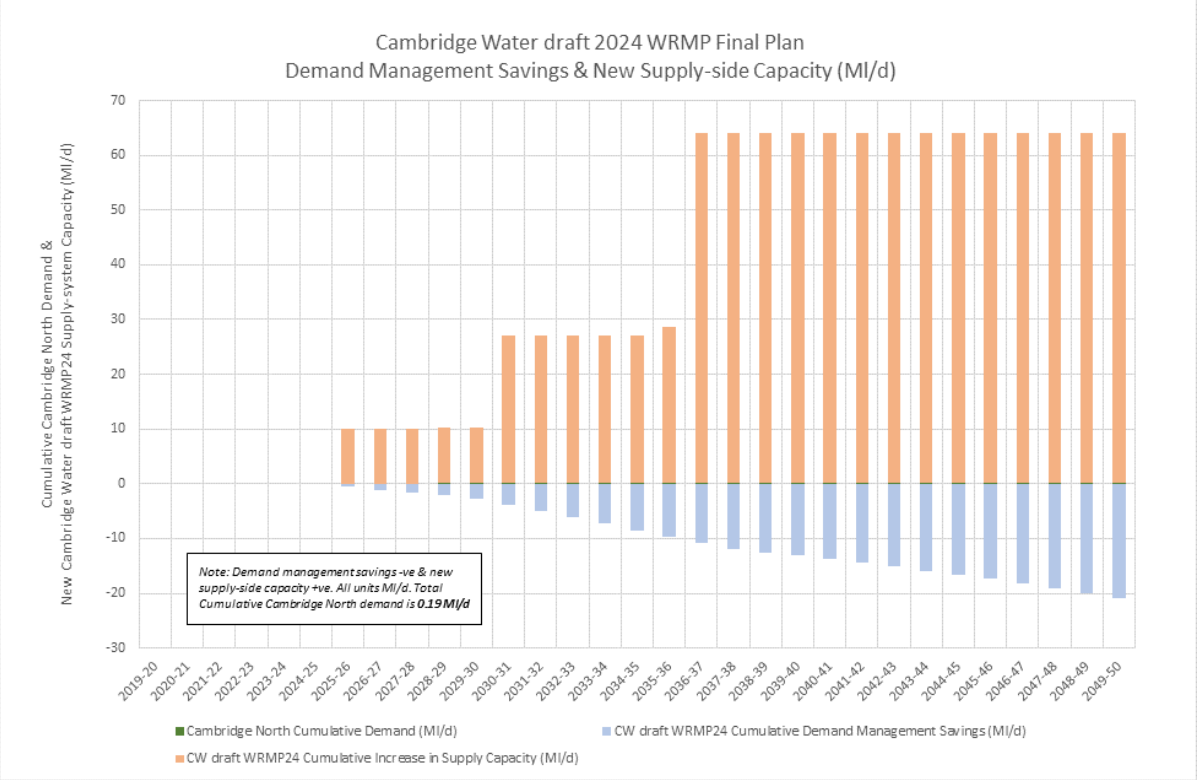

Figure 3: Cumulative Demand[8] from the Cambridge North Development compared to the rate at which demand management savings[9] & new supply-side capacity in the Cambridge Water draft WRMP24 are delivered.

From Figure 3 & Table 1:

- Cumulative demand from the Cambridge North development increases from 0.02Ml/d in 2026/27 to 0.19Ml/d in 2029/30, and then remains at this level
- By 2026/27, CW project demand management savings of 1.06Ml/d, which increase to 2.68Ml/d in 2029/30
- Over the same period, CW project a 10Ml/d increase in supply capacity from demand side drought measures, and

[8] The cumulative demand is so small relative to the increase in supply-system capacity that it is not visible

[9] In the WRP tables, demand management savings are shown as negative (-ve) quantities

- In 2030/31 CW project a further 17Ml/d increase in supply capacity from connection to the Anglian Water system (15Ml/d) and an increase in raw water abstractions (2Ml/d).

Year	CW draft WRMP24 Cumulative Demand Management Savings (Ml/d)	CW draft WRMP24 Cumulative Increase in Supply Capacity (Ml/d)	Cambridge North Cumulative Demand (Ml/d)
2019-20	0.00	0.00	
2020-21	0.00	0.00	
2021-22	0.00	0.00	
2022-23	0.00	0.00	
2023-24	0.00	0.00	
2024-25	0.00	0.00	
2025-26	-0.53	10.00	
2026-27	-1.06	10.00	0.02
2027-28	-1.61	10.00	0.04
2028-29	-2.14	10.00	0.18
2029-30	-2.68	10.00	0.19
2030-31	-3.84	27.00	0.19
2031-32	-4.99	27.00	0.19
2032-33	-6.15	27.00	0.19
2033-34	-7.30	27.00	0.19
2034-35	-8.45	27.00	0.19
2035-36	-9.60	28.40	0.19
2036-37	-10.75	63.90	0.19
2037-38	-11.89	63.90	0.19
2038-39	-12.51	63.90	0.19
2039-40	-13.12	63.90	0.19
2040-41	-13.81	63.90	0.19
2041-42	-14.49	63.90	0.19
2042-43	-15.17	63.90	0.19
2043-44	-15.85	63.90	0.19
2044-45	-16.53	63.90	0.19
2045-46	-17.42	63.90	0.19
2046-47	-18.30	63.90	0.19
2047-48	-19.17	63.90	0.19
2048-49	-20.05	63.90	0.19
2049-50	-20.91	63.90	0.19

Table 1: Cumulative Demand from the Cambridge North Development compared to the rate at which demand management savings & new supply-side capacity in the Cambridge Water draft WRMP24 are delivered.

While the increase in capacity in the CW system over the period 2025/31 is large in comparison to demand from the Cambridge North development, it should be recognised that the DYAA supply-demand balance over the same period is more modest. Over the period from 2025/31 it reduces from a surplus of 3.44Ml/d to a surplus of 0.88Ml/d, before increasing again as supplies become available from

Anglian Water. At minimum, in 2030/31, the surplus balance is approximately 4 times the demand from the development.