

UTTOXETER URBAN DISTRICT COUNCIL.

SURVEYOR'S DEPT.,

TOWN HALL,

UTTOXETER.

10th. May, 1944.

Dear Sir,

Uttoxeter Water Supply.

As instructed, I now beg to submit a general report on the above.

Consumption of Water.

Population Census 1939 was 7,374.

Amount of water consumed by the Urban Area, part of the Rural Area and part of the Ashbourne Rural Area at the end of September 1943 was 313,200 gallons per day, which was made up as follows:-

Somersal. 21,600
Bramshall. 43,200
Crumpwood. 248,400

313,200 gallons per day.

Total amount of water consumed for week ending Friday the 10th. December 1943 was 349,691 gallons per day, which was made up as follows:-

Somersal. 18,396
Bramshall. 36,808
Crumpwood. 294,487

349,691 gallons per day.

Taking the figure of 313,200 gallons per day, such water is consumed as below:-

Total Consumption per day by all sources	Total Consumption by all sources within Urban Area.	Total Consumption for Domestic purposes within Urban Area.	Total Consumption as metered supplies within Urban Area.	Consumption per head per day including metered supplies within Urban Area.
313,200.	283,901.	235,201.	48,700.	38.5
Consumption per head per day excluding metered supplies within Urban Area.				
31.9				

This quantity has been found to be insufficient to meet

the draw off at all times, and consequently shortage of water has been experienced in the higher parts of the area such as Bramshall Village, Bramshall Road, Highwood Road, Stafford Road, and at Doveridge, and the pressure in other parts of the town has been very low.

Such shortage is also aggravated by the lack of Reservoir Capacity. A test was made of the present pumping plant at Crumpwood for the week ending the 17th. December 1943, with the following results stated in gallons per day.

Date 1943.	Total Duty hours.	Pumped by 2 turbines.	Pumped by Electric Motor.	Total for Crumpwood.	Somersal Supply.
Saturday Dec. 11th.	hrs. mins. 21. 35.	111,600.	172,125.	283,725.	18,396.
12th.	20. 30.	81,000.	179,775.	260,775.	18,396.
13th.	23. -	91,800.	221,850.	313,650.	18,396.
14th.	23. -	102,600.	206,550.	309,150.	18,396.
15th.	23. 15.	75,600.	202,725.	278,325.	18,396.
16th.	23. 30.	91,800.	229,500.	321,300.	18,396.

Date 1943.	Bramshall Supply.	Total Consumption.
Saturday Dec. 11th.	36,808.	338,929.
12th.	36,808.	315,979.
13th.	36,808.	368,854.
14th.	36,808.	364,354.
15th.	36,808.	333,529.
16th.	36,808.	376,504.

Average consumption of the above 349,691 gallons per day.

Sources of Supply. Half Year Ending September 1943.

Quantities already collected at end of September 1943.

Somersal. 21,600 gallons per day.
 Bramshall. 43,200 do.
 Crumpwood. 400,320 do.

465,120 gallons per day.

Quantities consumed at end of September 1943.

Somersal. 21,600 gallons per day.
 Bramshall. 43,200 do.
 Crumpwood. 248,400 do. equal to capacity of two turbines running 23 hrs. each.
 313,200 gallons per day.

Balance of water collected and not pumped

= 465,120 less 313,200 = 151,920 gallons per day.

Quantities not yet collected.

Railway Spring. 237,600 gallons per day.
 Hulme Springs. 381,330 do.

618,930 gallons per day.

Existing Commitments to Uttoxeter Rural District.

Locality.	Max. per day.	Present Rate $\frac{1}{2}$ year ending Sept. 1943 per day.	Balance of supply per day.
Denstone.	6,000	2,358	3,642.
Rocester.	30,000	9,063	20,937.
Bramshall.	7,000	1,382	5,618.
Stramshall.	6,000	4,761	1,239.
Doveridge.	say 12,000	11,735	265
Ellastone.	10,000	NIL	10,000
Wootton.	5,000	NIL	5,000
	76,000	29,299	46,701.

Present Capacity of Service Reservoirs.

Bramshall Reservoir.	150,000 gallons.
Prestwood do.	100,000 do.
	<u>250,000 gallons.</u>

This figure based on the total consumption per day of 313,200 gallons in all areas equals .8 times the daily consumption.

The usual storage capacity of Service Reservoirs is three times the daily consumption when there is no duplicate pumping plant, and from 2 to 2 $\frac{1}{2}$ times the daily consumption if there is duplicate pumping plant, therefore to bring the accommodation of the Service Reservoirs up to a little over twice the present daily consumption it would necessitate an additional Reservoir at Bramshall of 250,000 gallons and one at Prestwood of 200,000 gallons capacity, such Reservoirs could be built in such a manner as to enable them to be added to from time to time.

Present Capacity of Pumping Plant as Tested on Friday 31st. Dec. 1943

Three turbines with Ram Pumps.

Each turbine lifted at the rate of 5,400 gallons per hour running at 42.R.P.M.

Two turbines running for 23.64 hours per day on the 10th. December 1943 pumped 255,312 gallons which is considered the maximum.

Electric Motor, when tested on Friday the 31st. December 1943 pumped at the rate of 15,246 gallons per hour, pumping the maximum of 24 hours per day, the total pumped would be 15,246 x 24 = 365,904 gallons per day.

At the present time however, these two means of pumping cannot be run at the same time owing to the capacity of the 7" rising main being insufficient. Originally the 7" rising main was designed to deliver 10,000 gallons per hour, but is now at certain times required to deliver at the rate of 15,246 gallons per hour.

Three turbines running for 22 hours per day, each pumping 5,000 gallons per hour at 40.R.P.M. would pump 330,000 gallons per day.

Capacity of Mains.

The existing 7" delivery main from Prestwood Reservoir to Bramshall 11,720 yards long and with a hydraulic gradient of 1 in 314 when new was capable of discharging 288,000 gallons in 24 hours at Bramshall, I have no reason to doubt that its discharging capacity remains the same.

The total amount of water available from Crumpwood and the Hulme Springs is as follows:-

Already collected.	400,320	gallons per day.
Railway Spring.	237,600	do.
Hulme Springs.	<u>381,330</u>	do.
	1,019,250	do.

Existing 7" main discharges 288,000 gallons per day, leaving a balance of 731,250 gallons per day to be conveyed by a new pipe line.

A new 9" main would discharge 630,000 gallons per day.

A new 10" do. do. 760,000 do.

If it was desired to convey the above balance a new 10" main should be laid from Prestwood, this I would suggest might be carried along the opposite side of the Uttoxeter Ashbourne Road to that in which the existing 7" main is laid for the greater part of its length, and if possible in the fields between the improvement line, and the building line decided upon by the County Council, or in the footpath of the proposed widened road, until it reached the Spath Crossing, from whence it could be carried along the Urban Boundary until it reached the Potteries Road at the intersection of the Bye Pass Road.

From this point it would follow the proposed link road joining the Potteries Road with the Stone Road near Charnes Villa, and then proceed along the Stone Road to the Bramshall Reservoirs.

The existing 7" main from Prestwood would continue as such to Byrds Lane at which point the portion in Byrds Lane to the Bramshall Reservoir would be cut off, and the 7" main continue as at present as a 5" high pressure main supplying the Timber Lane and Balance Hill Districts.

The portion of the 7" main cut off in Byrds Lane would be utilised as a distribution main from Bramshall Reservoir, and continued along Holly Road to the Three Tuns as a 7" main, and pick up the 3" branch in the New Road, and the service mains of the Council houses at a point near Johnson Road. Such main would also connect up with the 3" main in Holly Road between Byrds Lane and Bramshall Road, thus creating a circuit, and relieving the demands at present made on the existing 8" delivery main from Bramshall Reservoir to the Town.

The portions of the town such as Stone Road from the junction with Smithfield Road and Carter Street, Oldfields Road, Hockley Road, part of Carter Street, part Balance Street, and Fifold Street now served from the high pressure main would be re-connected to the low pressure system, and would undoubtedly result in a reduction of the leakage which is now taking place in these streets under the high pressure system.

Present Consumption and Commitments.

Rates of metered trade consumptions to domestic consumption within the Urban Area is approximately 20.7 per cent, say 20 per cent

Present consumption from all quarters including Urban and Rural areas at end of September 1943 was	313,200 gals per day
Balance of commitments to Rural Area	<u>46,701 do.</u>
	359,901

say 360,000 gallons per day.

Total amount of water available see page 4	1,019,250 gals
Present commitments at September 1943.	<u>365,000 per day</u>
	654,250 gals per day.

654,250 gallons per day available for increased consumption by trade and domestic users, therefore in the rates of 20% trade as against domestic the proportions are as follows:-

80% of 654,250	=	523,400 for domestic,
20% of 654,250	=	130,850 for trade

Assuming the consumption for domestic use to be based on 30 gallons per head per day, this would equal an increase of population of 17,446, say 17,000.

In giving the figure of 1,019,250 gallons as being the amount of available water per day, such figure is based on the present yield of the Springs at the surface, and without making any allowance for compensation water, such compensation water if claimed could I think be met by opening up the outlet of the Hulme Springs and increasing the yield thereby.

The question of increasing the pumping plant, and rising main also need serious consideration.

Sprinkwood Spring present yield	400,320 gallons per day
less at present capable of being pumped on an average between 3 turbines and the electric motor	
	<u>of 348,000</u>

	52,320 Balance.
Railway Spring.	237,600
Hulme Spring.	<u>381,330</u>

466 gals per min = 27,969 per hour = 671,250 gallons per day.

An electric pump similar to the one already installed would pump	280 gals per min.
Duplicate to the above.	<u>280 do.</u>

560 gals per min.

therefore two additional electric units would be capable with a working margin of pumping the total of 466 gals per min, and would necessitate a rising main of 9" diameter.

Such 2 units would deal with the 24 hrs. yield of 671,250 gallons in 20 hours.

Pumpwell.

Provision would have to be made for a new pumpwell, and if the total remaining uncollected yield of 672,000 was to be

pumped in 20 hours, this would necessitate a pumpwell having a capacity of 112,000 gallons which would not be economical, and in order to avoid such a necessity, the pumps would have to be automatically controlled by the rise and fall in the new and smaller pumpwell.

Conclusions.

From a digest of this report, I think it will be obvious that additions to the Waterworks Undertaking should be carried out in the following priorities.

- No. 1. An additional service reservoir at the Bramshall Waterworks of a capacity of 250,000 with ancillary works.
- No. 2. New 9" rising main from Crumpwood to Prestwood.
- No. 3. Collection of Springs Hulme Alton in preference to the Railway Springs because of the higher hardness of the latter. The Railway Spring could be collected later and when bulked with the general supply, the average hardness would probably not be excessive.
- No. 4. 9" delivery main from the Hulme Springs to Crumpwood including provision of new pumpwell.
- No. 5. Provision of a second Electric Pumping Unit in existing pump house.
- No. 6. An additional service reservoir at Prestwood of a capacity of 200,000 gallons.
- No. 7. New 10" trunk main from Prestwood to Bramshall Waterworks, which could be carried out in sections.
- No. 8. Provision of new 7" service main in Holly Road from Byrds Lane to Three Tuns, and connecting up with existing mains.

I am, Gentlemen,

Your obedient servant,

