



SOUTH DERBYSHIRE
WATER BOARD

A Review
1961-1974

INTRODUCTION

This brochure has been compiled to mark the ending of the comparatively short life of the South Derbyshire Water Board on 31st. March, 1974. On the following day it will become part of the new Severn-Trent Water Authority, which will be responsible for the whole of the water cycle over a wide area of the Midlands of England.

In retrospect, it will be seen that the Board has played its part in the transition from a multiplicity of undertakings responsible for water supply, sewerage and sewage disposal to the ten very large Authorities, which will serve the whole of England and Wales.

The Board will have existed for only thirteen years, but its achievements in that period have not been inconsiderable and I feel that the members and the public they represent can take satisfaction in what has been accomplished. Our thanks, as members, are due to our staff and employees for their sustained effort and loyalty over the years. I have much pleasure in commending to you this brief account of the maintenance and improvement of the water supply to nearly half a million people in South Derbyshire.

A handwritten signature in black ink, appearing to read 'J. J. B. B. B.', written in a cursive style.

CHAIRMAN

SOUTH DERBYSHIRE WATER BOARD

A REVIEW, 1961-1974

Formation of the Board

The need for the formation of joint water boards was formulated in Circular 52 of 1956 issued by the Ministry of Housing and Local Government, which laid down a programme to reduce drastically the number of water supply undertakings in England and Wales. The various water undertakers in Derbyshire, as might be expected, each had differing views as to how the re-grouping should be accomplished and for a long time no generally acceptable solution emerged. For instance, at one stage, there were proposals for the promotion of separate Parliamentary Bills to establish Boards with differing groupings, but finally, and on the insistence of the Ministry, agreement was reached, if with some reluctance. From then on events moved swiftly and the South Derbyshire Water Board Order, 1961 was made to come into effect on 4th March, 1961, which provided for the Board to commence operations on 1st April of that year.

The Order empowered the transfer to the Board of the water supply undertakings of the Ilkeston and Heanor Water Board (which was dis-solved) and those of fourteen local authorities in the southern half of the County.

The Board was to consist of 31 members, each constituent authority having at least one member, with the larger authorities having increased representation roughly proportionate to the population supplied. The Derbyshire County Council in addition was to have one member.

The representation on the Board and the areas of the transferred undertakings were:

Alfreton Urban District Council	1	representative	5,176	Acres
Ashbourne Rural District Council	1	„	86,188	„
Ashbourne Urban District Council	1	„	1,070	„
Belper Rural District Council	1	„	48,074	„
Belper Urban District Council	1	„	4,294	„
Derby County Borough Council	13	„	8,116	„
Heanor Urban District Council	1	„	4,417	„
Ilkeston Borough Council	2	„	3,017	„
Long Eaton Urban District Council	2	„	3,559	„
Matlock Urban District Council	1	„	16,599	„
Repton Rural District Council	1	„	30,640	„

Ripley Urban District Council	1	representative	5,415	Acres
South East Derbyshire Rural		”		”
District Council	3	..	44,204	”
Wirksworth Urban District Council	1	..	4,016	”
			<hr/>	
			264,793	Acres
			<hr/>	
			(413.74)	sq.miles

The Chairman of the new Board was to be elected from the representatives appointed by Derby Corporation and the Vice-Chairman from among the other members. The Engineer of the Derby Corporation Undertaking and the Town Clerk and Borough Treasurer of Derby were named in the Order to be the first Engineer, Clerk and Treasurer of the Board.

The Board met for the first time on 7th March, 1961 and elected Councillor G. N. Perry of Derby as Chairman and Alderman J. C. Britton of Ilkeston as Vice-Chairman. After confirming the appointment of the three officers, and in the case of the Engineer of appointing him Engineer and General Manager, it was resolved to divide the Board into two Committees, a Finance and General Purposes Committee and a Works and Establishment Committee with wide delegated powers and the same Committee structure has been retained

The new Board's statutory area of supply, which has remained unaltered, covered most of the southern half of the County and contained an estimated population of 466,300. The Board replaced Derby Corporation as a constituent authority of the Derwent Valley Water Board, eventually becoming entitled to the largest share of water from the Works of that Board. The capital expenditure on the works of the undertakings transferred was £4,759,491.

EARLY DAYS

From the beginning the Undertaking was managed as a corporate unit, without separate departments, but the staff was organised in three Divisions, Supplies, Distribution and Administration, soon to be amended to four by the creation of a New Works Division. The Administration Division was centralised at 1 Tenant Street, Derby in the offices of the former Derby Undertaking together with the Supplies Division, which also had staff at the major supply works, but the Distribution Divisions was framed on a basis of four Districts-South, covering Derby and district and based at Tenant Street; East, housed at premises taken over at Heanor Road, Ilkeston, dealing with the Ilkeston and Long Eaton ...

areas; North, initially based at Matlock (subsequently moved to Homesford and later to Ripley) to service the Matlock, Alfreton, Ripley and Belper areas and West, based at Board premises at Derby Road, Ashbourne, covering the two Ashbourne Council areas and part of Repton. This arrangement, with some modification, has been maintained through-out the Board's existence

At the outset the Board took over a total of forty-four different sources of supply, many of which, it was immediately apparent, could not continue to be used. The three principal sources accounting for 80 per cent of the available reliable yield were the works transferred to the Board at Little Eaton and at Homesford and their share from the Derwent Valley Water Board. There were seventeen groundwater sources, the remainder being springs, which when combined with the three just mentioned had a reliable yield of some 25 million gallons per day available for the area. This compared with an average area consumption of 23.7 million gallons per day during the first year of the Board's operations. However, this apparent surplus had, in the first year, to be discounted by the springs and wells it was necessary to retire as unsuitable for further use and, taking into consideration the growth rate of demand in the area over earlier years, it was necessary to seek to increase the resources available to the Board at the earliest possible time

There was, moreover, the position regarding distribution. When the Board assumed control the shortcomings of the distribution system became all too obvious in the first weeks and months. The major deficiencies included that in the northern part of the Ashbourne Rural District where the system was totally inadequate to meet existing demand and where mobile pumps had to be brought into use for prolonged periods, and in Matlock and Wirksworth where alternative arrangements were required to replace existing unsuitable sources. In Ilkeston and Long Eaton industrial demand was not being met satisfactorily and in the extreme south, Melbourne, Hartshorne and Woodville, works were required which would enable existing inadequate and unsatisfactory sources of supply to be augmented or replaced

There was little scope in the first year to do more than ameliorate these difficulties, proceed with the organisation of staff and the design of the first series of works to overcome the major shortcomings in supply and distribution. Notwithstanding this, the period saw the foundation laid for the successful integration of the Undertaking.

From the constituent authorities forming the Board, only Derby, Matlock and South East Derbyshire had separate water departments. The undertakings of the others were administered by Surveyors' Departments

This resulted in a deficiency in numbers of staff transferred to the new undertaking, and it was essential to build up an organisation not only to enable the design and construction of new works to be accomplished, but to operate the works for which the Board had assumed responsibility so as to meet the water needs of consumers. Such an organisation had to include the means of collection of revenue, of financing the operations and of performing all those administrative, legal and financial duties which were previously in the hands of the various departments of the constituent authorities. There was also the provision of satisfactory transport arrangements and of constructional plant and, of course, the invaluable radio communication, which the Board wisely introduced at an early stage, together with the continuous manning of the telephone at Head Office, In the early days the Board was fortunate in having the assistance of the Clerk and Treasurer of Derby Corporation and in having access to the Corporation's computer, which bridged the gap until adequate staff was available to the Board and suitable accounting machinery provided. Seventy-seven staff and 204 weekly paid personnel were transferred to the Board on 1st April, 1961. The total numbers of employees at the end of the first year and at present are given in the attached table.

While it may, in some respects, be convenient to review the work of the Board since that first year in terms of that of the four Divisions of the Undertaking, this may give an impression of personnel being isolated in separate compartments rather than indicating the high degree of co-operation which has existed among the staff and with members of the Board who had early combined into a harmonious entity.

It is therefore considered appropriate in the remainder of this review to describe briefly some of the installations, together with aspects of the work of the Board and a comparison of relative statistics, 1961/62 and 1973/74, for which reference may be made to the table appended

SOURCES OF SUPPLY

The sources of supply in the Board's area afford, generally speaking, hard water except for the springs in the Matlock and Wirksworth areas which produce only a very small part of the total, while the bulk supply from the Derwent Valley Water Board, about 35 per cent of present total resources available to the Board's area of supply, is a soft water. At an early stage the Board took an important policy decision that wherever possible consumers should receive water of standard hardness, and this principle has been the Underlying factor in the design and layout of all the major capital developments relative to the supply and distribution of water This decision has resulted In waters from the different sources being blended together before distribution in regulated proportions so as to ...

produce a medium soft water with a minimum of softening and, therefore, a lower cost in treatment than would otherwise have been necessary to maintain a similar maximum hardness of water in supply

Having regard to availability of the source, topographical siting, water quality and cost, the most satisfactory way of increasing the Board's resources of water was by increasing the quantity taken from the Meer brook Sough. The Board's application to enable this to be done was successful, an Order being made in 1967.

The development of the source to the permitted capacity necessitated complete re-building and extension of the sixty-year-old Homesford Works, which had been extensively modernised twice in that period. This site, near Whatstandwell is bounded by river, road and railway, water being abstracted from the Meerbrook Sough, which drains disused mine workings in the Wirksworth area. The reconstruction demanded the demolition by degrees and the re-building of the complete works, at the same time maintaining output throughout the construction period. As the photographs (Plates I and II) show, works of an entirely different nature were installed with a capacity increased from 4 to 10 million gallons per day and provided with ion exchange softening plant to enable treatment to be carried out on part of the water when required, in place of a plant employing lime softening.

Although in use some months prior to this, the official opening of the reconstructed works was performed in 1970 by Dr. Glass, the President at the time of the British Waterworks Association.

It is of interest to note also that the replacement of the works resulted in the cessation of the sale of precipitated chalk, which was a by-product of the old plant process, the largest annual revenue obtained by the Board from the sale of this product, which was sent to many buyers at home and overseas, being £14,909.

The works at Little Eaton, the other major source, were reconstructed only a few years before the formation of the Board, but a large covered reinforced concrete service reservoir of 10 million gallons capacity (Plate 111. shows this under construction) was built at Drum Hill as an adjunct to the works and to provide for storage of treated water for use in the south and south-east of the area of supply generally. At the Little Eaton works water is abstracted directly from the adjacent River Derwent and from infiltration galleries laid down in the alluvial deposits on either side of the river. The works, after the reconstruction of the river intake at present proceeding, will have a capacity of 11.44 million gallons per day, an increase of a further 4 million gallons per day over the original quantity available In 1961 .

The other sources of supply comprise the groundwater (underground) Sources at Wirksworth, Stanton-by-Bridge, Belper, Matlock, Lea, Lindway, Coxbench and in the Ashbourne area and the spring sources in the Matlock and Wirksworth areas. Of the groundwater sources, the first four have been completely modernised over the years. The reliable yield of these sources is now 3.5 million gallons per day. It can be said that all the sources of supply at present in use will stand the area in good stead for many years

There remains to mention the water received from the Derwent Valley Water Board, some 13.3 million gallons per day after deducting the part of this entitlement sold to the North Derbyshire Water Board. The water is impounded in the well-known reservoirs at Bamford in the north of the county. Some 78 per cent. of the water released for supply is treated and passed down an aqueduct to augment the local resources of the Board and those of the Leicester and Nottingham Corporations

The aggregate reliable resources of the Board, some 41 million gallons her day, exceed by 10 million gallons per day those available in 1961.

The whole of the water supplied by the Board is sterilised before distribution and undergoes different and complex treatments at the different works according to the characteristics of the waters concerned, the treatment and the results being monitored continuously by the laboratory staff, who also deal with the many aspects associated with water quality

Not the least of these is the fluoridation of supplies. This additional treatment of the water supplied was requested by the two Health Authorities, Derbyshire County Council and Derby Corporation and an agreement with the Board in 1969 has resulted in over 90 per cent. of the Board's consumers now receiving water so treated. A scheme, uniquely advantageous in the particular circumstances, depending on the blending of waters previously mentioned has been installed, which includes stringent automatic safety precautions built into the plant employed, itself overlooked and checked continuously by the laboratory staff

DISTRIBUTION

When the Board's Undertaking was formed, there were effectively fourteen separate distribution systems. These have been integrated by a series of schemes which have cost, including the cost of improvements to the supply works and that of extending the distribution system generally, some £5,400,000 of which over 80 per cent. is for works in the form of mains and reservoirs.

A brief description of the method of- utilising the source works and ...

the distribution of water may be of interest. Hard water from the Homesford Works is pumped to service reservoirs at Crich and Chadwick Nick. From Crich part of the water is re-pumped in a northerly direction to Wolds and to Lea Moor, while the greater proportion gravitates in a southerly direction to Bessalane, Highwood, Drum Hill and the Little Eaton Service Reservoirs. Water delivered to all points except the first mentioned is blended with Derwent Valley water taken from the aqueduct, while that delivered to Matlock is also blended with a soft spring water. Up to half the Homesford water is taken into Drum Hill and the other reservoirs at Little Eaton where it is also blended with water abstracted from the River Derwent via the Board's Little Eaton Works. About 60 per cent. of the total water supplied by the Board is passed through the complex of works at Little Eaton.

The remaining Homesford water delivered to Chadwick Nick Reservoir is also mixed with water from the Derwent Valley Aqueduct before passing eastwards to provide supplies to Alfreton, Ripley, Heanor and parts of Ilkeston and the adjacent rural areas. At Alfreton water from the Lindway Works is received direct into the system.

There are three other sub-systems, one based on Breamfield Lane, near Wirksworth in the north of the area and those associated with the Stanton-by-Bridge works in the south and the Belper Meadows works in the centre of the area.

In the case of the first, waters from the Derwent Valley aqueduct, the Washgreen Spring when available and from the hard water Ladyflatte Well are blended at the Washgreen Works and used to supply Wirksworth and the Ashbourne Rural District area. Water from the boreholes at Rodsley, Cubiey, Ladyhole and Sturston supplement supplies into this area in addition to providing supplies to the Ashbourne Urban District.

The other systems blend hard local groundwater with Derwent Valley water and provide supplies to the extreme south and central parts of the area. Wastage of water has been maintained at an acceptable level by keeping the distribution system under- close surveillance, by the inspection of plumbing installations for compliance with, the Byelaws, by the scheme of authorisation of plumbers to assist the public in the selection of plumbers for their work, by fostering public relations and by the judicious use by the Board of their powers to enforce the appropriate Byelaws. Nevertheless, the growth of demand in the area since the Inception of the Board is indicated in the statistical table attached and has been some 36 per cent. compared with population increase of over 4.9 per cent to 489,170. Other figures relative to distribution -- premises supplied and miles of main laid -- are also given in the table.

The maintenance and extension of the system has been an unending process and has included the laying of mains for housing, their renewal and diversion as with the important instance of reconstruction in Derby town centre and the cleaning and re- lining with concrete of vital trunk mains.

A plan showing the source works, the eighty-two service reservoirs and twenty-six booster stations presently in use in the area is attached.

A major project presently verging on completion, is the Remote Supervisory Control Scheme which comprises twenty-nine outstations scattered over the Board's area of supply where reservoir levels and important flow rates are monitored and transmitted over Post Office lines to the Control Room at the Raynesway Offices. A computer is installed here and its function is to reproduce the levels and flow rates on a mimic diagram which shows the prevailing situation at all the outstations. It will also, when finally commissioned calculate the quantity of water being taken through all the major connections to the Derwent Valley Water Board's Aqueduct and control the valve regulating the flow of Derwent Valley water into the Drum Hill Reservoir so that, at all times, the total quantity of water taken from the aqueduct is exactly equal to that authorised. The computer will also calculate the quantity of water taken from each of the Board's principal source works and the quantity passed into the various zones of supply. It further provides for the monitoring of alarm conditions at important points in the supply and distribution system and for the remote operation of key valves. Figures of consumption will be produced on a teleprinter daily or at will instead of at weekly intervals as has so far only been practicable with data collection by personnel visiting sites. Far more efficient control of the system will be exercised when the new installation is fully operational. A view of the mimic diagram is given on Plate IV.

OFFICES AND DEPOTS

To carry out developments on the scale described and to operate and maintain the enlarged undertaking, including the administrative matters mentioned earlier, it has been necessary to increase the number of employees, salaried and weekly paid, from the figure of 317 in April, 1961 by about 100.

This expansion resulted in very cramped conditions in the Head Office premises at Tenant Street, which did not allow the efficient deployment of staff and lacked a meeting place for Board members. Moreover the staff of the New Works Division including Drawing Offices had been established at King Street, Derby and later a further small office was set in premises at Green Lane.

The Depot at Duke Street - the Derby Corporation Water Department Depot - was totally inadequate as a central depot to house the activities of the Undertaking in servicing the fleet of vehicles, providing space for ready use stock, meter repair and other functions, even with the fortuitous availability which was immediately taken up of adjacent premises.

A similar position, though, of course, on a smaller scale, prevailed in the North and East Districts of Distribution Division. As early as 1964 the Board approved a comprehensive report aimed at setting up combined offices and depots at Ilkeston, Raynesway (Derby) and at Ripley.

New permanent buildings were first completed for the Ilkeston Depot where the need was most pressing, the new premises being occupied in 1967. The offices and depot for North District were transferred in 1969 from the Homesford Works, which was unsuitable for the purpose and placed, because of cost, in temporary buildings erected on a spacious site belonging to the Board at School Lane, Ripley. It was intended to develop this site on a permanent basis after completion of the Head Office and Depot project.

Delay in obtaining Ministerial approval to building prevented the completion of the Central Depot and Stores until the Spring of 1969 and of the new boardroom, offices and laboratory until February, 1971 at which time it may be said that the Undertaking became a complete and separate entity. Until then Derby Corporation had extended to the Board the use of their Council Chamber, Committee Rooms and Reception Suite whenever required. A view of the offices is on Plate V.

ADMINISTRATION AND OTHER MATTERS

The efficiency of the operations of administrative and finance staff has been dependent on the installation of accounting machinery which has progressed from the relatively simple mechanical machines obtained in 1964, (when an arrangement with Derby Corporation to produce certain accounting information ceased) to larger electronic units on which work has been processed since 1970. This is now working at full capacity and with the increasing volume of work a fully computerised system including billing, costing and stock control is now being installed, and should be in partial operation by the end of the financial year. Throughout the period, unmeasured charges have been collected by the constituent authorities together with the general rate, but the demand and collection of metered and miscellaneous charges have been the responsibility of the Board's staff.

In the period of the Board's existence there have been many strands in the tapestry of events which go to make up the total of the Board's ...

effort in providing adequate supplies of good quality water to their consumers, efficiently and at least cost. These cannot be detailed unless this Review is to be of inordinate length. However, one might conclude by referring to a few points of interest.

Mention is made of the winter of 1962/63 when unprecedentedly severe cold posed many problems less than two years after the day of transfer. Although the actual number is not known, thousands of homes were affected by frozen plumbing and many hundreds deprived of supplies for lengthy periods by the freezing of service connections and even, in a few cases, the freezing of water in the actual mains. Electrical de-icers were obtained by the Board to defrost many pipes, and tankers were employed which made over 10,000 deliveries to consumers' premises.

To increase productivity, the decision was taken in 1968 to employ consultants to undertake method study and to advise on the introduction of work study and incentive bonus schemes for the Board's manual workers. This resulted in a considerable increase in the number and types of vehicles and plant utilised and the employment of, mainly, two -man teams for much of the work of Distribution Division, to which the first scheme was introduced in 1969.

On the basis of the growth, of demand experienced in the area, the Board proposed to develop the works at Little Eaton to deal ultimately with some 30 million gallons per day. Preliminary design has been completed in respect of the works needed, among which would be a raw water storage reservoir of some 140 million gallons capacity between the river and the works to guard against deterioration of river water quality and to provide a degree of storage for emergencies. To assist in the appreciation a model was constructed in 1972 of the reach of the river concerned, on which the effect of the proposed reservoir on flows in the river under flood conditions could be observed. The model and the experimental works, costing £12,000, proved the viability of the proposal. A view of it is shown on Plate VI.

During the twelve-year period ending 31st March, 1973, the last complete account year at the time of writing, net capital expenditure totalled £6,152,489 for all purposes.

To conclude, it may be said that the Board's achievement in the period has been to weld fifteen separate Undertakings into a single homogeneous unit which now supplies over 30 per cent. more water than in 1961, and to provide a firm basis on which the public water supply needs of the area may be built in the coming years. The Board will hand over on 1st April 1974 a sound public water supply undertaking to the newly established Severn-Trent Water Authority.

TABLE OF COMPARATIVE STATISTICS

Daily Quantities of Water Supplies	1961/62*	1973 **	% age
<i>Gallons per day</i>			<i>Gallons per day Increase</i>
Unmeasured	14,263,376	18,917,974 (a)	
Measured	9,391,041	13,295,572 (a)	36.2
Bulk (other Authorities)	1,898,611	3,243,439 (a)	
	25,566,628	35,456,985 (a)	
Resources of Water			
Reliable yield	27,070,000	41,043,000	
Premises on Charge, Population, Employees and Mains Laid			
Unmeasured Supplies-	No.	No	
Domestic	143,320	164,465	
Domestic and trade combined	3,617	2,978	14.2
Trade	4,660	5,671	
Metered Supplies			
Industrial, trade and other metered supplies	4,738	5,767	21.7
Population supplied based on Registrar			
General's estimate	466,300	489,170	4.9
Staff and weekly paid employees	341	405	18.8
	<i>Miles</i>	<i>Miles</i>	
Length of mains laid (3"--36") dia.	1174.3 (b)	1525.8 (a)	29.9
Revenue, Expenditure and Costs	£	£	
Income from consumers	785,109	1,936,905	146.7
Other income including from bulk supplies.	133,972	183,446	
Total income	919,081	2,120,351	
Working expenses	688,725	1,517,502	120.3
Loan charges and repayments	200,973	648,734	222.8
Revenue contribution to capital	8,157	59,470	
Total expenses	897,855	2,225,706	147.9
Total capital expenditure	4,759,491	10,911,980	129.3
	p	p	
Revenue per 1,000 gallons supplied for all purposes	9.094	16.473	81.1

*To 31st March, 1962 unless marked (b)

**To 31st March, 1973 unless marked (a)

(a) To 31st December, 1973

(b) At 1st April, 1961

SOUTH DERBYSHIRE WATER BOARD STATUTORY AREA OF SUPPLY

SHOWING PRINCIPAL WORKS

