

Scottish Executive Environment Group

**PUBLIC WATER SUPPLIES IN
SCOTLAND**

Water Resources Survey 2000-2001

December 2001

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2000 - 2001 WATER RESOURCES SURVEY

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COMMENTARY

Survey Data

The Water Resources Survey Data in this report have been provided by the three Water Authorities; North of Scotland Water Authority, West of Scotland Water Authority and East of Scotland Water Authority. The figures relate to the twelve-month period 1 April 2000 to 31 March 2001 and any reference to the single year 2000 means the period 2000-2001. The Water Services Unit of the Scottish Executive collected the data from the authorities.

Demand Figures

Throughout this report figures are given as demand figures. Demand is the total volume of water put into the supply to satisfy the requirements of consumers. It also includes leakage and any other waste, which may be incurred. The two main elements of water demand are metered and unmetered supplies. Metered demand represents the volume of potable water supplied to industry and is charged for on the basis of measured quantity. Industry also uses a small quantity of non-potable water and this is indicated separately where appropriate. The unmetered element of demand includes domestic supplies, small unmetered industrial supplies, water used for operational purposes, public supplies (fire-fighting, sewer-flushing, etc.) unmetered standpipes used for temporary supplies and field troughs in rural areas. Unmetered demand also includes leakage from the distribution system and consumers' supply pipes in addition to wastage associated with any of the above activities or from the burst pipes.

Per Capita Demand

The connected population for 2000 was 5,130,000. This means that, for the total quantity of water used for public water supplies in Scotland, per capita demand is almost static being 474 l/h/d in 1999 and 479 l/h/d in 2000.

Unmetered Demand

There has been an increase in unmetered demand from 1,912 Ml/d in 1999 to 1,963 Ml/d in 2000. In the autumn of 1999 the three Scottish water authorities undertook a joint study of unmetered domestic water consumption in Scotland. This project followed two similar studies undertaken in 1982 and 1991 which reported median domestic per capita consumption (pcc) figures for Scotland as a whole of 119 l/h/d and 148 l/h/d, respectively. The 1999 study which was published in October 2000 reported a median pcc figure of 139 l/h/d. The report identified the need for a continuous Domestic Water Consumption Monitor across Scotland. This would provide the Water Authorities and regulatory bodies with valuable information on seasonal use and trends in demand, times and levels of peak conditions, sustainability of water resources, priorities for investment and impact of demand management methods. It would also support the Authorities in developing charging policies for both its domestic and non-domestic customers.

Metered Demand

There has been a decrease in metered demand from 520 MI/d in 1999 to 428 MI/d in 2000. This decrease is probably mostly due to industry being more careful in its use of water to reduce the charges they have to pay.

Total Daily Demand

Total daily demand is the total of unmetered and metered demand plus a small amount of non-potable use. There has been an increase in total demand from 2,363 MI/d in 1999 to 2,401 MI/d in 2000.

Yield Assessment

The joint project undertaken by the Scotland and Northern Ireland Forum for Environmental Research (SNIFFER) and the Scottish Water Authorities to establish a consistent methodology for Surface Water Yield Assessment and Operational Reliability was successfully concluded at the end of 2000. The Project delivered a modelling suite comprising HYSIM, a rainfall/runoff model adapted specifically to account for Scottish climatic and soil conditions, linked to a resource management model AQUATOR, allowing the assessment of the reliability of singular or conjunctively-used sources. A number of operational rules and definitions were agreed by the Project Partners to try to ensure consistency in interpretation of results. Yield is assessed through scenario generation during several model runs linked to the statistical probability of “failure”.

Following initial software teething problems, the models are now in use within the Water Authorities, particularly to assess the management of large linked supply schemes. Many of these schemes are included amongst the top 90 sources in Scotland identified in “Public Water Supplies in Scotland. An Assessment of Demands and Resources at 1994” report (published 1995) as requiring confirmation of their yield. The model is not so applicable to single run-of-river abstractions from very small catchments which will continue to be assessed by traditional flow-duration techniques. The Project and its outcomes have been the subject of several public presentations and the Final Report is available through SNIFFER.

Comparison of actual demand with forecast demand

The 1994 Assessment of Demands and Resources gave principal, upper and lower projections of the total water demand for Scotland from 1991 to 2017. Figure 10 compares actual demand for the years 1991 to 2000 with projected demand from the 1994 report. It appears from the reported data to date that the trend in total water demand is presently following the upper projection. The upper projection assumed an increase in domestic demand of 1.5 l/h/d/year from 1991 and no progress in reducing leakage. For metered non-household demand, the upper projection assumed an industrial efficiency gain of 1% per annum and relative price of metered water increasing at the same rate as in the past (using the economic approach to forecast industrial demand).

Key Facts

The following Key Facts table summarises the demands and resources position for Scotland for 2000/2001 and also illustrates how the position has changed since the previous survey of 1999/2000.

Key Facts

| Total for Scotland | 2000/2001 | 1999/2000 | Increase/Decrease (+) (-) |
|------------------------------|-----------|-----------|------------------------------|
| Average Daily Demand (MI/d) | 2401 | 2363 | +1.6 % |
| Unmetered (MI/d) | 1963 | 1912 | +2.7 % |
| Metered + Non-Potable (MI/d) | 438 | 530 | -17.4 % |
| Developed Resources (MI/d) | 3564 | 3678 | -3.1 % |
| Demand Yield (Ratio) | 0.67 | 0.64 | + 4.7 % |

The Surface Waters (Abstraction for Drinking Water) (Classification) (Scotland) Regulations 1996

In implementation of directive 75/440/EEC (quality required of surface water intended for the abstraction of drinking water), these Regulations prescribe a system for classifying the quality of inland waters according to their suitability for abstraction for supply as drinking water. They provide mandatory values for the classifications DW1, DW2 and DW3 in Schedule 1 to the Regulations and guideline values for those classifications in Schedule 2 to the Regulations. The source classification below gives the total number of sources classified in accordance with the Regulations, DW1 being better quality water than DW2.

| Number of Sources | DW1 | DW2 | DW3 |
|-----------------------------------|------------|------------|----------|
| North of Scotland Water Authority | 215 | 97 | 0 |
| West of Scotland Water Authority | 86 | 99 | 0 |
| East of Scotland Water Authority | 75 | 13 | 0 |
| Total for Scotland | 376 | 209 | 0 |

Leakage

The following is a brief summary of each water authority's current position on leakage and its policy on leakage control.

North of Scotland Water Authority (NOSWA)

NOSWA's leakage level in 2000 was 114 MI/d, which equates to 26% of the total 446 MI/d supplied. The Authority is prioritising leakage reduction efforts through both its Integrated Network Management Programme and Water Quality Undertakings Programme where new Water Orders are required. They are continuing to improve their metering through a meter audit project and a parallel programme of new meter installations and meter replacement. Zonal studies are ongoing on a prioritised basis and will produce water balance and leakage information for the selected areas. These programmes will continue to improve their information accuracy year on year. The reduction towards an economic level will follow the same prioritised basis, with the mains rehabilitation efforts, pressure control and value being focussed on the priority areas.

West of Scotland Water Authority (WOSWA)

WOSWA's leakage level in 2000 was 512 MI/d, which equates to 42% of the total 1216 MI/d supplied.

East of Scotland Water Authority (EOSWA)

EOSWA's leakage level in 2000 was 234 MI/d, which equates to 32% of the total 739 MI/d supplied. The Authority is currently undertaking studies as part of their Integrated Network Management System (INMS) to identify the economic level of leakage in each area.

WATER: PUBLIC SUPPLIES AVERAGE DAILY DEMAND 2000/2001

TABLE A

Total, Potable (unmetered & metered) and Non-potable supply (MI/d)

| Year | Total Daily Demand (1) | Total Potable Demand | Potable Unmetered (2) | Metered (3) | Non-Potable (4) |
|-------------|-------------------------------|-----------------------------|------------------------------|--------------------|------------------------|
| 1976 | 2,245 | 2,194 | 1,464 | 730 | 51 |
| 1977 | 2,279 | 2,223 | 1,470 | 753 | 56 |
| 1978 | 2,294 | 2,243 | 1,493 | 750 | 51 |
| 1979 | 2,301 | 2,248 | 1,495 | 753 | 53 |
| 1980 | 2,237 | 2,191 | 1,533 | 657 | 47 |
| 1981 | 2,262 | 2,218 | 1,588 | 630 | 44 |
| 1982 | 2,246 | 2,219 | 1,568 | 651 | 27 |
| 1983 | 2,236 | 2,210 | 1,601 | 609 | 23 |
| 1984 | 2,199 | 2,172 | 1,537 | 635 | 27 |
| 1985 | 2,198 | 2,169 | 1,540 | 629 | 29 |
| 1986 | 2,243 | 2,214 | 1,602 | 612 | 30 |
| 1987 | 2,194 | 2,172 | 1,553 | 619 | 22 |
| 1988 | 2,205 | 2,189 | 1,576 | 613 | 16 |
| 1989 | 2,248 | 2,225 | 1,571 | 654 | 23 |
| 1990 | 2,301 | 2,281 | 1,645 | 636 | 19 |
| 1991 | 2,239 | 2,222 | 1,596 | 626 | 17 |
| 1992 | 2,206 | 2,188 | 1,603 | 585 | 18 |
| 1993 | 2,272 | 2,258 | 1,662 | 596 | 14 |
| 1994 | 2,263 | 2,246 | 1,651 | 595 | 17 |
| 1995 | 2,322 | 2,306 | 1,748 | 558 | 16 |
| 1996 | 2,312 | 2,255 | 1,686 | 568 | 57 |
| 1997 | 2,336 | 2,320 | 1,782 | 539 | 16 |
| 1998 | 2,329 | 2,317 | 1,775 | 541 | 12 |
| 1999 | 2,363 | 2,352 | 1,912 | 520 | 11 |

| 2000 by Water Authority | | | | | |
|--------------------------------|---------------|----------------|----------------|--------------|-------------|
| North of Scotland | 446.2 | 445.6 | 357.6 | 88.0 | 0.6 |
| West of Scotland | 1,215.3 | 1,205.7 | 1,060.0 | 145.7 | 9.6 |
| East of Scotland | 739.1 | 738.8 | 544.9 | 193.9 | 0.3 |
| 2000 Total | 2400.6 | 2,390.1 | 1,962.5 | 427.6 | 10.5 |

NOTES: (1) Total quantity put into supply to satisfy consumers plus leakage and other waste

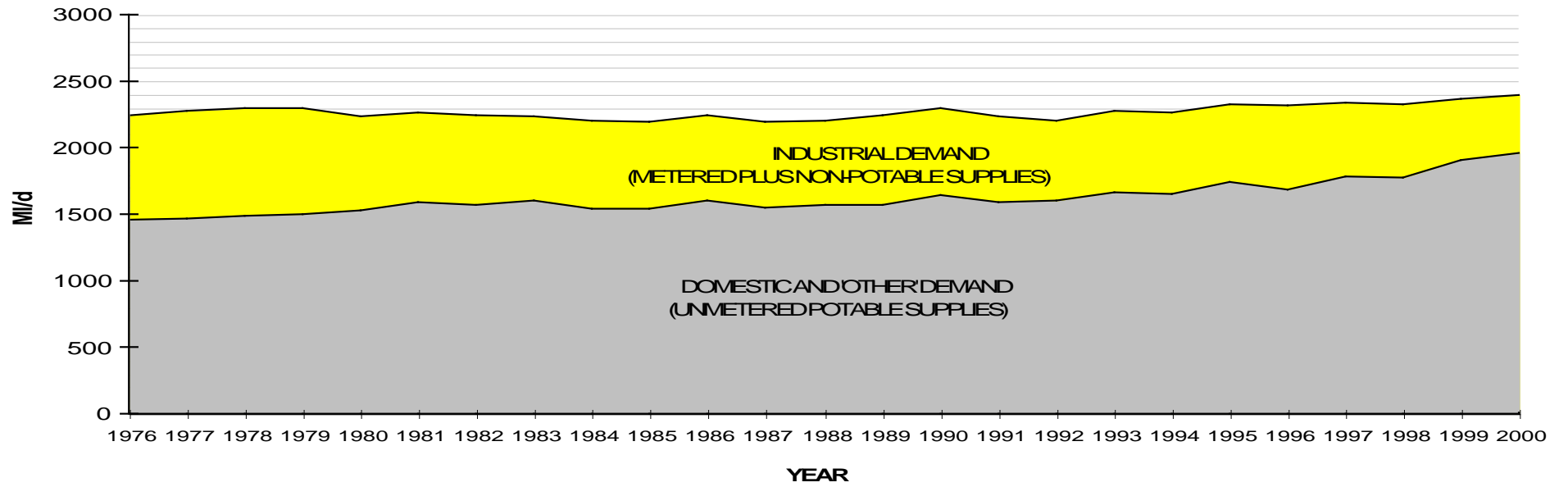
(2) Household, non-household/non-metered (small commercial supplies, operational use, fire fighting, sewer cleaning, temporary supplies for construction sites etc.) and leakage

(3) Industry and commerce charged for on measured quantity

(4) Non-potable water is used by some industries.

**AVERAGE DAILY DEMAND
(1976-2000)**

Figure 1



Source: The Scottish Executive Water Services Unit

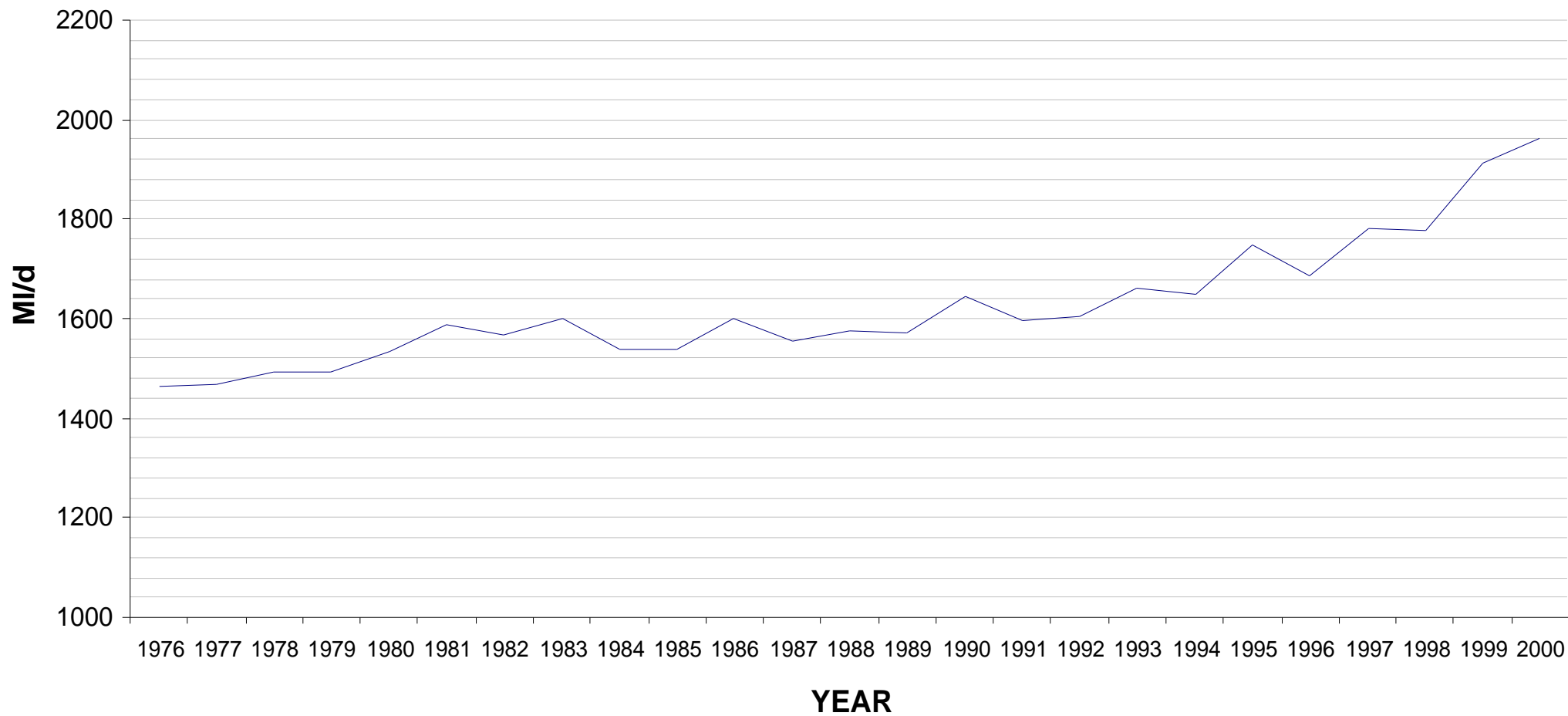
TOTAL DEMAND 1976-2000

Figure2



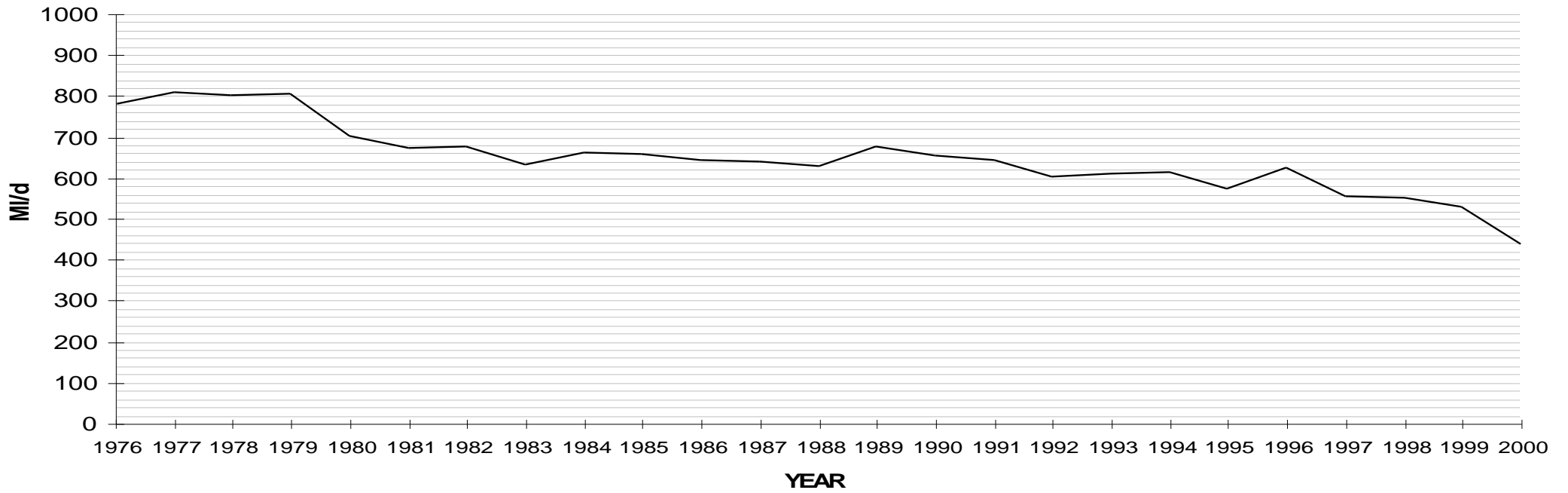
UNMETERED POTABLE DEMAND 1976-2000

Figure 3



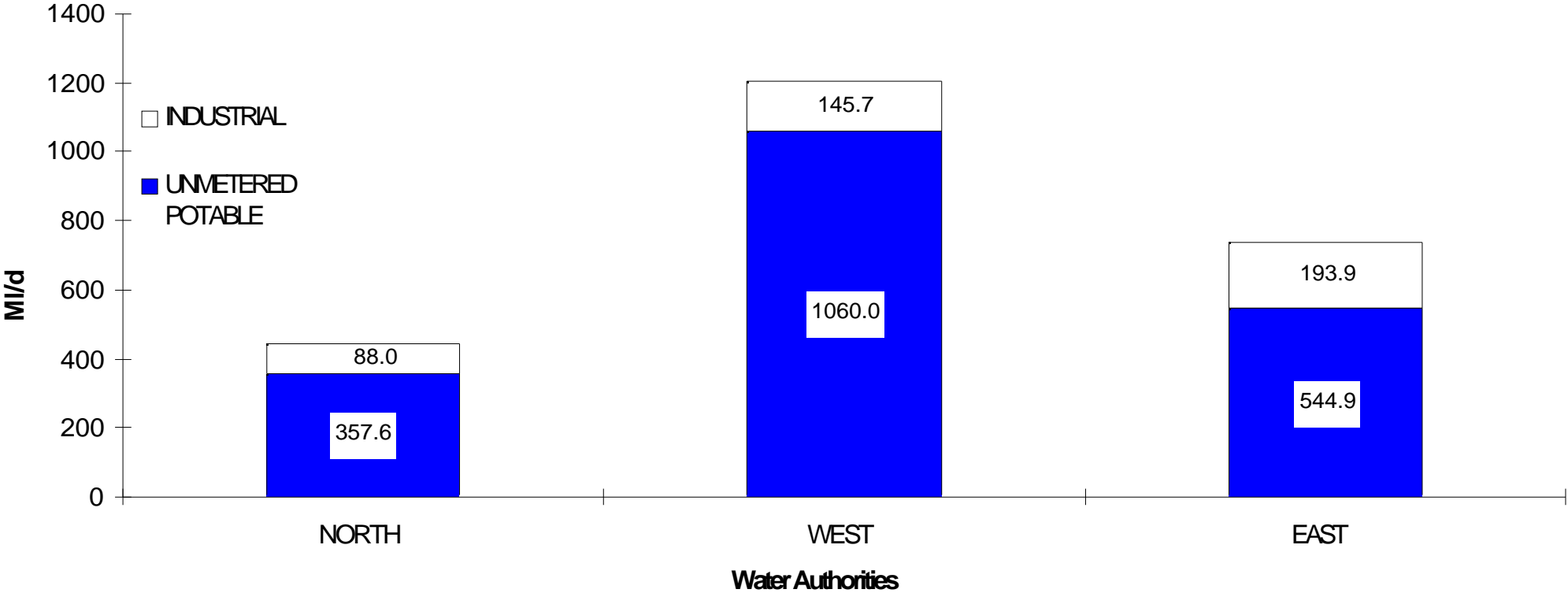
INDUSTRIAL DEMAND 1976-2000
METERED+NON-POTABLE SUPPLIES

Figure 4



**AVERAGE DAILY DEMAND 2000/2001
(INDUSTRIAL+UNMETERED POTABLE SUPPLIES)
(By Water Authority)**

Figure 5



WATER: PER CAPITA DAILY DEMAND 2000/2001

TABLE B

| Year | Total Population (x1000) | Unit Demand (l/h/d) | | | Demand % | |
|--------------------------|--|---------------------|----------------|-------------------------------|----------------|-------------------------------|
| | | Total | Un- Metered | Metered and Non Potable | Un- Metered | Metered and Non Potable |
| | | | | | | |
| 1976 | 5,205 | 431 | 281 | 150 | 65 | 35 |
| 1977 | 5,196 | 439 | 283 | 156 | 65 | 35 |
| 1978 | 5,179 | 443 | 288 | 155 | 65 | 35 |
| 1979 | 5,167 | 445 | 289 | 156 | 65 | 35 |
| 1980 | 5,153 | 434 | 298 | 137 | 69 | 31 |
| 1981 | 5,149 | 439 | 308 | 131 | 70 | 30 |
| 1982 | 5,166 | 435 | 304 | 131 | 70 | 30 |
| 1983 | 5,150 | 434 | 311 | 123 | 72 | 28 |
| 1984 | 5,146 | 427 | 300 | 127 | 70 | 30 |
| 1985 | 5,137 | 428 | 301 | 127 | 70 | 30 |
| 1986 | 5,121 | 438 | 313 | 125 | 71 | 29 |
| 1987 | 5,112 | 429 | 304 | 125 | 71 | 29 |
| 1988 | 5,094 | 433 | 309 | 124 | 71 | 29 |
| 1989 | 5,090 | 442 | 309 | 133 | 70 | 30 |
| 1990 | 5,102 | 451 | 322 | 129 | 71 | 29 |
| 1991 | 5,100 | 439 | 313 | 126 | 71 | 29 |
| 1992 | 5,107 | 432 | 314 | 118 | 73 | 27 |
| 1993 | 5,120 | 444 | 325 | 119 | 73 | 27 |
| 1994 | 5,132 | 441 | 322 | 119 | 73 | 27 |
| 1995 | 5,137 | 452 | 340 | 112 | 75 | 25 |
| 1996 | 4,996 ⁽¹⁾ | 463 | 338 | 117 | 74 | 26 |
| 1997 | 4,986 | 469 | 357 | 110 | 77 | 24 |
| 1998 | 5,005 | 465 | 383 | 82 | 82 | 18 |
| 1999 | 4,981 | 474 | 384 | 106 | 78 | 22 |
| 2000 | Connected Population in area served (x1000) | | | | | |
| Authority | | | | | | |
| North of Scotland | 1,105 | 403.9 | 323.7 | 79.6 | 80.2 | 19.8 |
| West of Scotland | 2,321 | 523.8 | 456.8 | 66.9 | 87.2 | 12.8 |
| East of Scotland | 1,587 | 465.7 | 343.3 | 122.2 | 73.8 | 26.2 |
| 2000 TOTAL | 5,013 | 479.0 | 391.5 | 87.2 | 81.8 | 18.2 |

NOTES: (1) Connected Population from 1996

Source: Scottish Executive Water Services Unit

| WATER:DEVELOPED RESOURCES IN SCOTLAND 2000/2001 | | | | | | | | | | | | TABLE C | | | |
|--|------------|-----------|----------|---------------|---------------|-----------|----|---------|---------------------|----------------------|-----|---------|----------------------|--|--------------------------|
| Number and Yield(Ml/d) of Sources in each category | | | | | | | | | | | | | | | |
| Year | Reservoirs | | | | River Intakes | | | | Underground Sources | | | | Total Supply Sources | | Tot incl Comp Res. |
| | All | Res/Lochs | Feed Int | River Intakes | | Boreholes | | Springs | | Total Supply Sources | | No | | | |
| | Yield | No | No | Yield | No | Yield | No | Yield | No | Yield | No | | | | |
| 1977 | 2,793 | 383 | | 249 | 214 | 12 | 19 | 68 | 178 | 3,222 | 794 | | | | |
| 1978 | 2,921 | 386 | | 257 | 223 | 13 | 19 | 65 | 175 | 3,256 | 803 | | | | |
| 1979 | 2,912 | 366 | 25 | 262 | 227 | 12 | 18 | 67 | 166 | 3,253 | 802 | | | | |
| 1981 | 2,906 | 365 | 28 | 262 | 223 | 15 | 21 | 63 | 159 | 3,246 | 796 | | | | |
| 1982 | 2,992 | 356 | 28 | 264 | 225 | 19 | 28 | 63 | 157 | 3,338 | 794 | | | | |
| 1983 | 2,993 | 368 | 28 | 262 | 222 | 37 | 28 | 67 | 154 | 3,359 | 800 | | | | |
| 1984 | 3,031 | 358 | 29 | 258 | 236 | 36 | 28 | 68 | 162 | 3,393 | 813 | | | | |
| 1985 | 2,973 | 360 | 29 | 409 | 248 | 36 | 29 | 44 | 156 | 3,462 | 822 | | | | |
| 1986 | 2,954 | 345 | 30 | 401 | 238 | 47 | 30 | 41 | 148 | 3,443 | 791 | | | | |
| 1987 | 2,932 | 345 | 31 | 386 | 237 | 56 | 39 | 37 | 161 | 3,411 | 813 | 831 | | | |
| 1988 | 2,988 | 345 | 27 | 415 | 252 | 51 | 40 | 61 | 169 | 3,516 | 833 | 852 | | | |
| 1989 | 2,993 | 355 | 30 | 405 | 247 | 55 | 49 | 62 | 165 | 3,515 | 846 | 864 | | | |
| 1990 | 2,971 | 357 | 30 | 403 | 246 | 55 | 51 | 57 | 160 | 3,486 | 844 | 862 | | | |
| 1991 | 2,982 | 353 | 30 | 402 | 242 | 55 | 52 | 56 | 153 | 3,495 | 830 | 850 | | | |
| 1992 | 3,028 | 330 | 29 | 427 | 237 | 51 | 35 | 54 | 131 | 3,560 | 762 | 780 | | | |
| 1993 | 3,015 | 316 | 27 | 428 | 243 | 50 | 35 | 56 | 129 | 3,547 | 750 | 768 | | | |
| 1994 | 3,019 | 312 | 26 | 425 | 236 | 52 | 36 | 54 | 122 | 3,550 | 732 | 750 | | | |
| 1995 | 2,990 | 308 | 26 | 424 | 233 | 55 | 37 | 32 | 106 | 3,501 | 710 | 728 | | | |
| 1996 | 2,943 | 287 | 23 | 452 | 249 | 100 | 45 | 27 | 84 | 3,487 | 675 | 692 | | | |
| 1997 | 3,018 | 288 | 27 | 422 | 223 | 77 | 35 | 46 | 103 | 3,562 | 676 | 693 | | | |
| 1998 | 3,099 | 321 | 23 | 452 | 247 | 81 | 41 | 27 | 85 | 3,660 | 717 | 732 | | | |
| 1999 | 3,099 | 322 | 23 | 452 | 249 | 100 | 45 | 27 | 84 | 3,678 | 723 | 738 | | | |
| 2000 By Water Authority | | | | | | | | | | | | | | | |
| North | 325 | 125 | 3 | 305 | 150 | 43 | 15 | 17 | 50 | 689 | 343 | 343 | | | |
| West | 1,372 | 138 | 6 | 19 | 62 | 15 | 11 | 5 | 17 | 1,411 | 234 | 240 | | | |
| East | 1,380 | 52 | 13 | 33 | 33 | 43 | 19 | 8 | 12 | 1,464 | 129 | 141 | | | |
| 2000 Total | 3,077 | 315 | 22 | 357 | 245 | 101 | 45 | 30 | 79 | 3,564 | 706 | 724 | | | |

Note: a) Column 2 gives yield from Reservoirs, Lochs, Feeder Intakes and Regulating Reservoirs. The yield recorded for a large number of sources is the abstraction limit prescribed in the relevant Water Order. In many cases the available yield will be different from the legal limit.

b) Column 3 is a count of Reservoirs, Lochs and Regulating Reservoirs (Feeder Intakes are counted in Column 4)

c) Compensation Reservoirs are excluded except in the extreme right-hand column where they are included in the count.

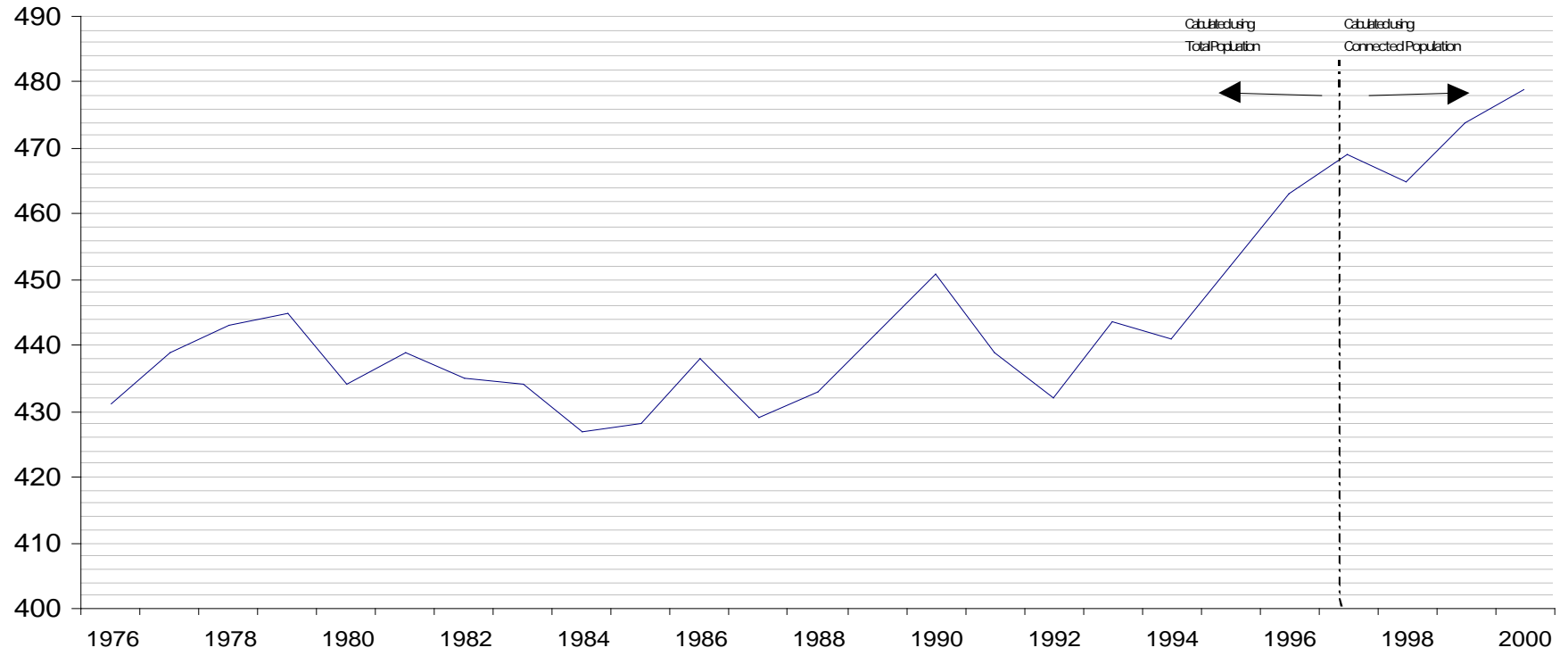
d) Pre 1992 the number of sources recorded include multiple sources at a single location.

e) North of Scotland Water advise that their yield return for 1999 contained 2 errors. These have been corrected for 2000. The reduction in number of sources is due to 18 being no longer in use.

Source: Scottish Executive Water Services Unit

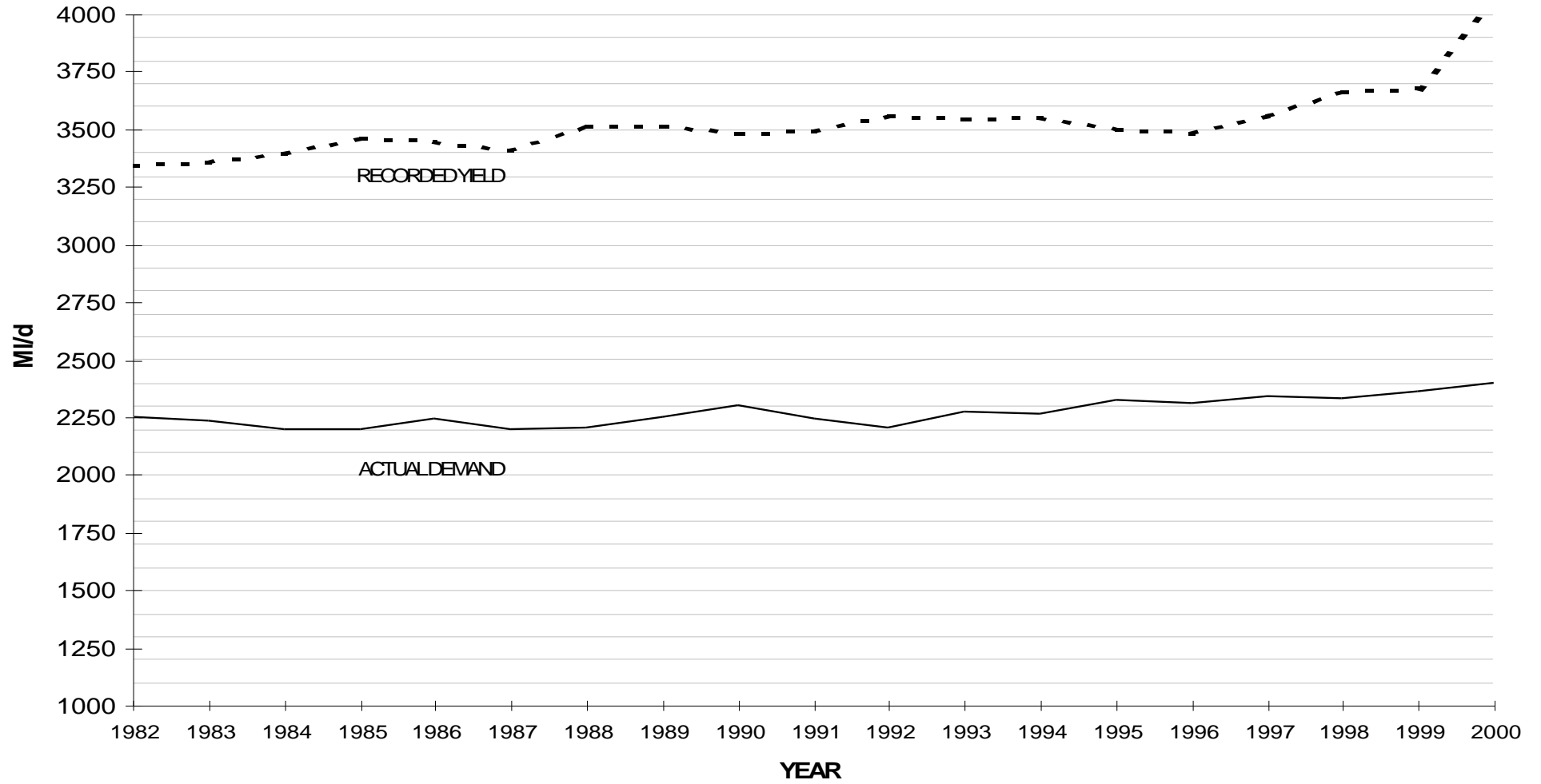
DEMAND PER CAPITA 1976-2000

Figure 6



RECORDED YIELD V DEMAND
(1982 - 2000)

Figure 7



**DEMAND/YELDRATIO
(1982 - 2000)**

Figure 8



| WATER: SECTORAL BREAKDOWN OF NON-DOMESTIC DEMAND (MI/d) 2000/2001 | | | | | TABLE D | |
|---|--------------|-------|--------|----------|---------|--|
| BY WATER AUTHORITY (LARGE USERS > 1000 cu. m. per quarter) | | | | | | |
| Sector | (1)SIC CLASS | North | West | (2) East | Total | |
| AGRICULTURE | | | | | | |
| 1 Agriculture, forestry and fishing | 01-05 | 2.89 | 53.78 | | 56.67 | |
| MINING AND FUEL EXTRACTION | | | | | | |
| 2 Coal extraction and other solid fuels | 10 | 0.00 | 0.00 | | 0.00 | |
| 3 Oil, mineral oil and natural gas extraction | 11 | 5.22 | 0.06 | | 5.28 | |
| 4 Mining of metal ores | 12,13 | 0.00 | 0.03 | | 0.03 | |
| 5 Other mining, quarrying for construction etc. | 14 | 0.23 | 0.22 | | 0.45 | |
| MANUFACTURING | | | | | | |
| 6 Food and Drink | 15 | 11.26 | 31.23 | | 42.49 | |
| 7 Tobacco | 16 | 0.00 | 0.00 | | 0.00 | |
| 8 Textiles and leather clothing | 17-19 | 1.15 | 4.04 | | 5.19 | |
| 9 Timber and furniture | 20 | 0.02 | 0.17 | | 0.19 | |
| 10 Paper, printing and publishing | 21,22 | 0.82 | 11.23 | | 12.05 | |
| 11 Oil refining and fuel processing | 23 | 1.99 | 0.04 | | 2.03 | |
| 12 Chemicals and man made fibres | 24,25 | 1.96 | 35.37 | | 37.33 | |
| 13 Mineral products | 26 | 0.07 | 1.88 | | 1.95 | |
| 14 Metal manufacturing | 27 | 0.16 | 1.22 | | 1.38 | |
| 15 metal goods | 28 | 0.25 | 1.99 | | 2.24 | |
| 16 Mechanical engineering | 29 | 0.21 | 3.29 | | 3.50 | |
| 17 Office machinery and data processing equipment | 30 | 0.09 | 1.14 | | 1.23 | |
| 18 Electrical and electronic engineering | 31,32 | 0.24 | 12.78 | | 13.02 | |
| 19 Instrument engineering | 33 | 0.17 | 0.04 | | 0.21 | |
| 20 Motor and vehicle parts | 34 | 0.00 | 0.25 | | 0.25 | |
| 21 Shipbuilding and other transport equipment | 35 | 0.02 | 3.17 | | 3.19 | |
| 22 Other manufacturing | 36,37 | 0.23 | 0.28 | | 0.51 | |
| ENERGY & WATER SUPPLY | | | | | | |
| 23 Electricity, gas and other energy production and distribution | 40 | 2.59 | 4.22 | | 6.81 | |
| 24 Water supply | 41 | 0.05 | 2.05 | | 2.10 | |
| CONSTRUCTION | | | | | | |
| 25 Construction industries | 45 | 0.17 | 0.47 | | 0.64 | |
| SERVICES | | | | | | |
| 26 Wholesale & retail distribution (including repairs) | 50-52 | 2.23 | 2.79 | | 5.02 | |
| 27 Hotels & catering | 55 | 5.66 | 7.42 | | 13.08 | |
| 28 Transport & communications | 60-64 | 2.60 | 3.11 | | 5.71 | |
| 29 Banking, finance, insurance, leasing and business services. | 65-74 | 1.05 | 4.06 | | 5.11 | |
| 30 Other services -public administration, defence, health etc. | 75-99 | 15.61 | 54.22 | | 69.83 | |
| NOT YET CLASSIFIED | | | 2.88 | | 2.88 | |
| Total of large users | | 56.94 | 243.43 | 0.00 | 300.37 | |
| Total of metered and non-potable | | 88.62 | 155.29 | 194.21 | 438.12 | |

| Year | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 |
|----------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--------|
| Total of large users | 421 | 368 | 388 | 426 | 383 | 508 | 501 | 439 | 472 | 459 | 420 | 324 | 426 | 241 | (3)200 |
| Total of metered and non-potable | 658 | 642 | 641 | 629 | 678 | 656 | 643 | 603 | 610 | 612 | 574 | 625 | 555 | 553 | 531 |

Note:(1) Standard Industrial Classification 1992 produced by Central Statistical Office

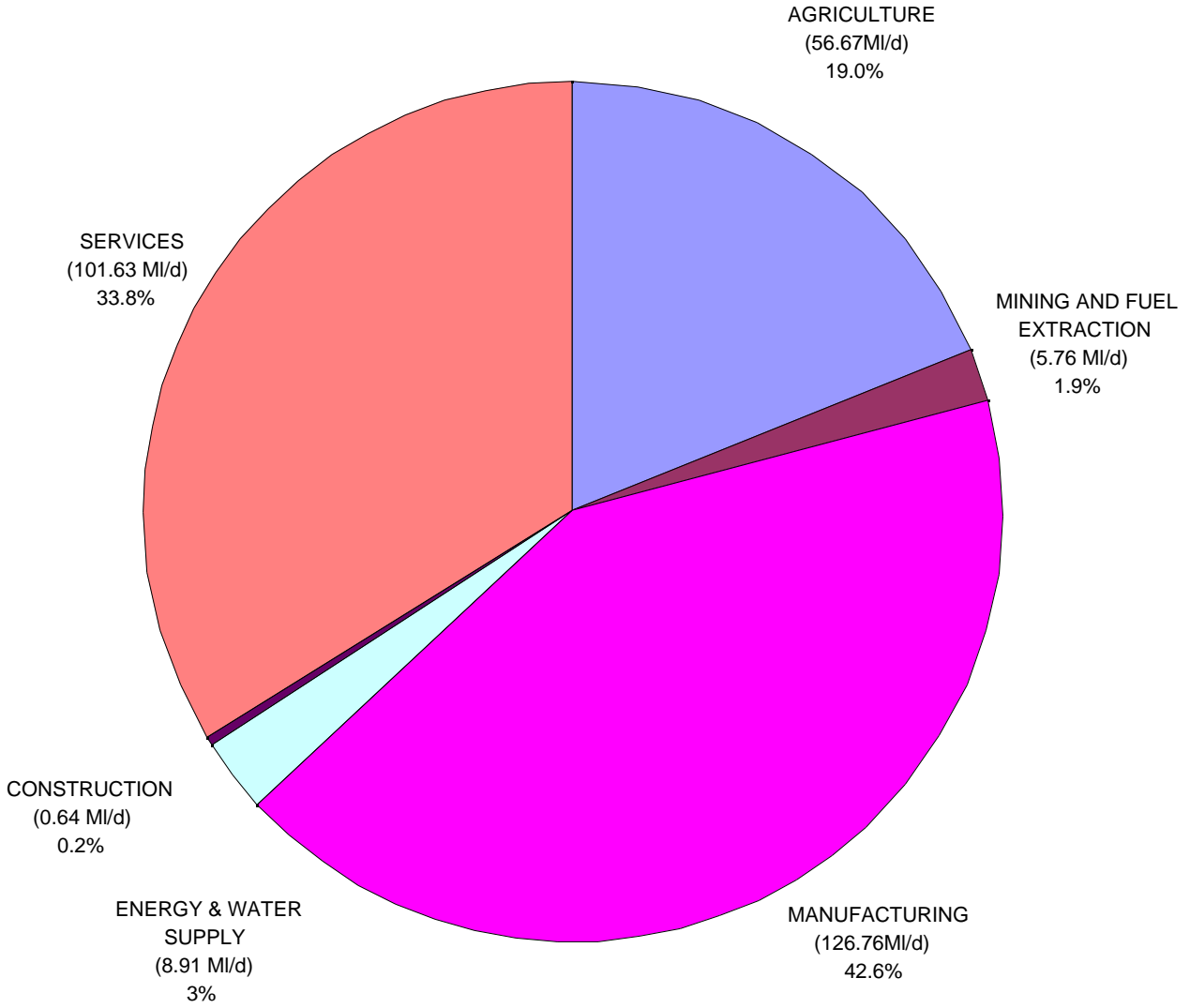
(2) East of Scotland Water Authority figures unavailable for 2000-2001

(3) East of Scotland Authority figure unavailable for 1999-2000

Source: Scottish Executive Water Services Unit

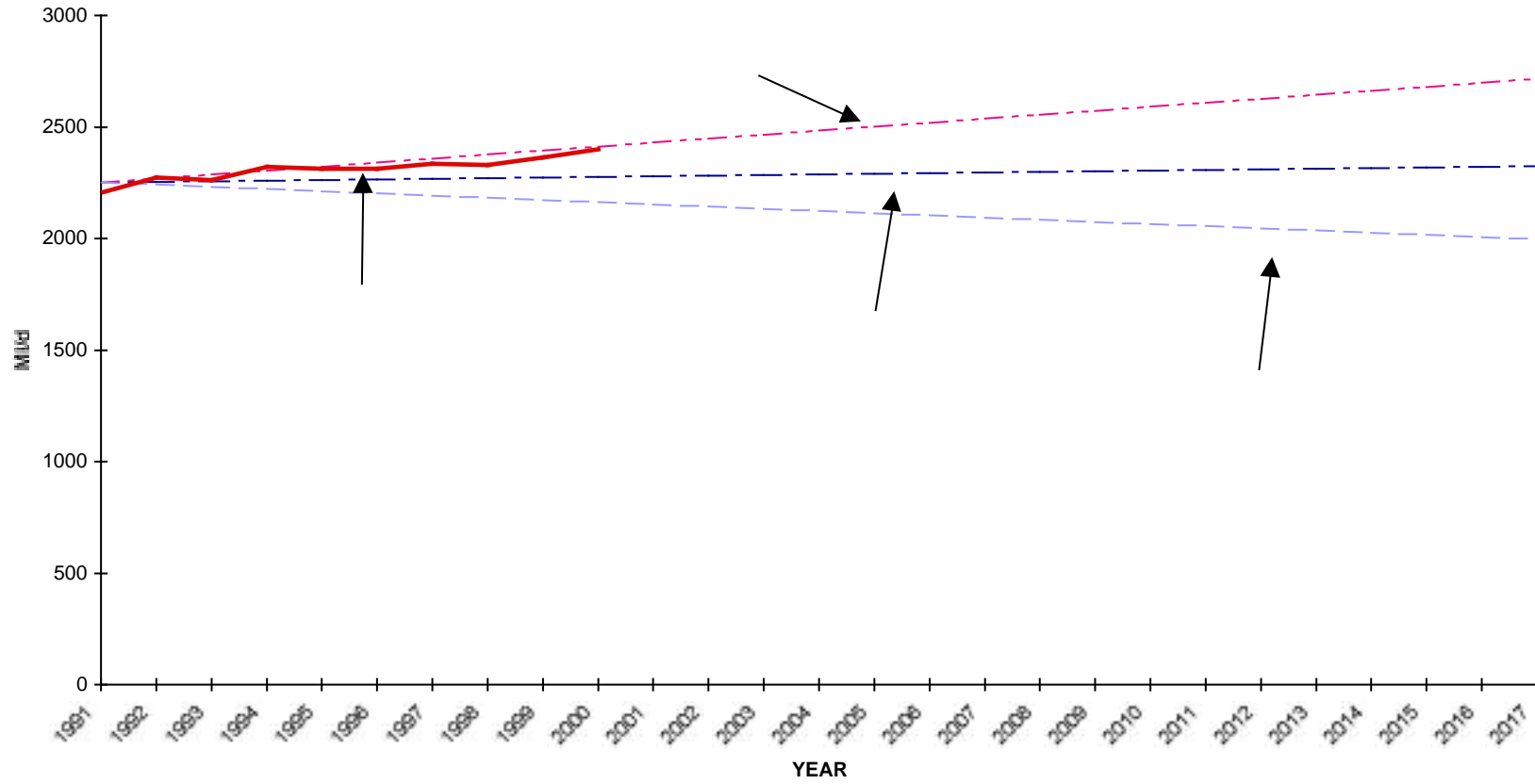
**LARGE INDUSTRIAL USERS
(Sectoral Breakdown 2000)**

Figure 9



COMPARISON OF ACTUAL AND PREDICTED TOTAL DEMAND

Figure





Small changes in the way we perform everyday tasks can have huge impacts on Scotland's environment.

Walking short distances rather than using the car, or being careful not to overfill the kettle are just two positive steps we can all take.

This butterfly represents the beauty and fragility of Scotland's environment. The motif will be utilised extensively by the Scottish Executive and its partners in their efforts to persuade people they can do a little to change a lot.