ANNUAL REPORT
OF THE
CITY ENGINEER

1995

CITY OF FREDERICTON

PUBLIC WORKS DEPARTMENT

INDEX

	PAGE
Letter of Transmittal	3
Capital Programs	37
Common Services (General Fund)	9
Environmental Health Services	18
Parks and Trees Services	20
Road Transport Services	9
Utility Fund (Sanitary Sewer & Water)	24
Water Pumping and Quality	53

TO HIS WORSHIP THE MAYOR AND COUNCILLORS
OF THE CITY OF FREDERICTON

I submit herewith this report which is a statement of work done under the supervision of the City Engineer.

This report covers the period from 1995 01 01 to 1995 12 31 and is written for the purpose of maintaining an accurate record on file of the activities and costs associated with the various operations.

During the year, along with regular maintenance, City forces and Contractors constructed the following works:

Concrete Curb and Gutter		.....	14.537	km
Sidewalk		.....	8.281	km
New Street Construction		.....	3.768	km
* New Pavement	- Type "B" Asphalt Concrete	.....	4.958	km
Resurface	- Type "D" Asphalt Concrete	.....	11.602	km
Gravity Sanitary Sewer Mains		.....	3.735	km
Sanitary Sewer Forcemain		.....	0.599	km
Storm Sewer Mains		.....	2.177	km
Water Mains		.....	2.337	km

* Type "D" asphalt concrete was also placed on streets in new subdivisions. This was paid for by developers under Local Improvement Agreements.

ALSO

126	Water services were installed
122	Sanitary sewer services were installed
3	Sprinkler lines were installed
12	Water services were renewed
1378	New water meters were installed
15	Existing water service installations were extended
15	Existing sanitary sewer service installations were extended
11	Frozen services were thawed
110	Storm sewer services were installed
16	Sanitary sewer services were renewed

Contractors under contract with the Engineering Department of the City of Fredericton in 1995 supplied materials, completed construction or began construction, as follows:

Mitchco Construction Inc.	-	Storm Sewer Upgrading - Brookside Drive Area
Warren (Maritimes) Limited	-	Supply of Asphalt Concrete for Patching
Charmac Construction Company Limited	-	Smythe/Waggoner's/Dundonald Intersection Upgrading
Diamond Construction (1961) Limited	-	Supply and Delivery of Granular Material
Dunham's Contracting Limited	-	Supply and Delivery of Granular Material
Charmac Construction Company Limited	-	Supply and Delivery of Bedding Sand
Wendell Thomas & Sons Ltd.	-	Supply and Delivery of Topsoil
Leonard H. Cook's Construction Ltd.	-	Burpee Street Trunk Sewer Phase 2
Bemrose & Kilburn Ltd.	-	Brunswick Street Trunk Sewer and Water Main Upgrading Phase 7
Wilson Builders (1978) Ltd.	-	Smythe Street Storm Sewer and Street Upgrading Phase 4
Lafarge Construction Materials (A Division of Lafarge Canada Inc.)	-	Supply and Delivery of Concrete
Warren (Maritimes) Limited	-	Supply and Placement of Asphalt Concrete
Warren H. Dunn Construction Ltd.	-	Supply and Delivery of Winter Sand
Akzo Nobel Salt Ltd.	-	Supply and Delivery of Highway Salt

Ibis Products Ltd.	-	Supply of Traffic Lane Striping Paint
Trius Taxi Ltd.	-	Garbage Collection Services
Mira Construction Ltd.	-	Installation of Curb and Gutter and Sidewalk
Rainsford Contracting Ltd.	-	Contract Services
Hogan Paving Ltd.	-	Supply of Asphalt Concrete for Patching
Fairville Construction Ltd.	-	Water and Sewer Services - Douglas Area Phase 6
Fairville Construction Ltd.	-	Reconstruction of Broadview Avenue and Huron Avenue
Charmac Construction Company Limited	-	Regent Street Upgrading
Charmac Construction Company Limited	-	Burpee Street Trunk Sewer Phase 3
Gladstone Development Ltd.	-	Construction of Youngs Crossing Booster Station

General Fund expenditures for the period 1995 01 01 to 1995 12 31 were as follows:

ITEM	BUDGET	NET EXPENDITURE	OVER	UNDER
COMMON SERVICES (Public Works)	$ 4 190 871	$ 4 136 378	-	$ 54 493
ROAD TRANSPORT SERVICES				
Administration	267 300	288 859	21 559	-
Roadway Surfaces	985 900	1 155 997	170 097	-
Sidewalk Maintenance	547 600	463 052	-	84 548
Culverts, Ditching	40 550	33 621	-	6 929
Storm Sewer Maintenance	170 400	176 869	6 469	-
Street Cleaning	450 900	468 803	17 903	-
Spring Cleanup	25 450	25 032	-	418
Sanding & Salting & Snow Control	1 462 500	1 622 265	159 765	-
Street Lights	669 400	698 364	28 964	-
Traffic Services	458 500	446 904	-	11 596
ENVIRONMENTAL HEALTH SERVICES				
Garbage & Waste Disposal	531 600	526 179	-	5 421
Garbage & Waste Collection	391 000	393 552	2 552	-
Recycling	183 700	178 597	-	5 103
Hazardous Waste	4 625	11 203	6 578	-
Old Burial Ground	12 900	8 645	-	4 255
PARKS & TREES SERVICES				
Wilmot Park	56 300	57 093	793	-
Odell Park	88 750	86 628	-	2 122
Carleton Park	12 320	8 043	-	4 277
Old Government House	13 000	16 516	3 516	-
Trees	376 500	386 297	9 797	-
Greens, Benches, other parks, etc.	206 300	211 700	5 400	-
TOTALS	**$ 11 146 366**	**$ 11 400 597**	**$ 433 393**	**$ 179 162**

OVER: $ 254 231

Utility Fund expenditures for the period 1995 01 01 to 1995 12 31 were as follows:

ITEM	BUDGET	NET EXPENDITURE	OVER	UNDER
COMMON SERVICES				
General Equipment	$ 594 900	$ 526 531	-	$ 68 369
Safety & Benefits	385 200	361 457		23 743
Administration	162 700	195 559	32 859	-
WATER				
Purification & Treatment	438 500	310 745	-	127 755
Source of Supply	468 000	411 310	-	56 690
Power & Pumping	43 600	40 683	-	2 917
Maintenance of Equipment (Plant)	67 300	76 320	9 020	-
Transmission & Distribution (Oper)	303 500	240 647	-	62 853
Transmission & Distribution (Maint)	816 500	688 526	-	127 974
Billing & Collection	189 968	235 189	45 221	-
Meters	321 500	307 715	-	13 785
SANITARY SEWER				
Operation (Lift Stations)	156 000	83 353	-	72 647
Maintenance	502 300	485 993	-	16 307
Treatment & Disposal	2 551 200	2 336 739	-	214 461
FISCAL SERVICES				
Funding (current year's Capital Projects)	2 500 000	2 257 815	-	242 185
Debt Charges	118 010	129 828	11 818	-
TOTALS	**$ 9 619 178**	**$ 8 688 410**	**$ 98 918**	**$ 1 029 686**

UNDER: $ 930 768

Following is a table giving total kilometrage (as of 95 12 31) of municipal roads and streets, provincial designated and regional highways and provincial by-passes & ramps divided with respect to type of surface on the various streets.

LOCATION	MUNICIPAL ROADS & STREETS				DESIGNATED & REGIONAL HIGHWAYS (Asphalt)	T.C.H. BY-PASSES & RAMPS (Asphalt)
	Asphalt	Gravel	Chip Seal	TOTAL		
Fredericton South	109.254	-	4.055	113.309	19.820	29.346
Fredericton North	21.856	0.029	0.578	22.131	9.008	1.378
Nashwaaksis	57.911	0.480	1.700	60.091	2.518	8.194
Marysville	24.524	0.304	0.792	25.620	5.562	3.007
Barker's Point	8.267	-	0.418	8.685	2.037	4.428
Silverwood	4.428	-	0.184	4.612	-	2.748
Garden Creek	17.412	1.101	2.203	20.716	-	2.482
Douglas	3.306	0.191	0.924	4.421	2.560	-
Lincoln	3.633	0.502	0.879	5.014	6.695	2.458
Lower St. Marys	1.970	-	-	1.970	-	2.681
TOTALS	**252.561**	**2.607**	**11.733**	**266.901**	**48.200**	**56.722**

TOTAL (Municipal, Designated & Regional Highways) = 315.101 km

Following in the body of this report is a detailed statement of the work done, associated expenditures and unit costs for the various operations. The report of any particular division may be found by referring to the index.

Respectfully submitted,

E. J. Bliss, P. Eng.
CITY ENGINEER

GENERAL FUND

COMMON SERVICES

The total net expenditure under this heading was **$ 4 136 378** made up as follows:

Administration	$	103 925	
Engineering Services		519 593	
General Equipment		2 060 204	
Service Depots		415 276	
Safety & Benefits		1 037 380	**$ 4 136 378**

ROAD TRANSPORT SERVICES

Road Transport Services is made up of the following items:

Administration	$	288 859	
Roads & Streets		3 945 639	
Street Lighting		698 364	
Traffic Services		446 904	**$ 5 379 766**

(a) **Administration**: The total net expenditure under this heading amounted to **$ 288 859** for personnel costs, general services, etc.

(b) **Roads & Streets**: The total net expenditure under this item was made up as follows:

(1)	Roadway Surfaces (maintenance) $	1 155 997	
(2)	Sidewalk Maintenance	463 052	
(3)	Culverts & Ditching	33 621	
(4)	Storm Sewer Maintenance	176 869	
(5)	Street Cleaning (includes Spring Cleanup)	493 835	
(6)	Winter Maintenance	1 622 265	**$ 3 945 639**

The expenditures for the above items, as well as a brief description of work done, are summarized as follows:

(1) Roadway Surfaces (maintenance)

The net expenditure of **$ 1 155 997** was made up as follows:

Paved Streets	----------	$	796 518	
Curb & Gutter Repair	----------		147 295	
Right-of-way Maintenance	----------		212 184	**$ 1 155 997**

Paved Streets this includes the patching and repairing of pavement and the asphalt concrete resurfacing program.

The following streets or portions of streets were resurfaced. Except where otherwise noted Type "D" asphalt concrete was used.

	Location	Length (metres)
	Avondale Court	154
	Balsa Street	53
	Beaverbrook / Regent Intersection	239
*	Bishop Drive Extension	2196
	Cambridge Crescent	573
	Canada Street (selected sections)	1020
	Canterbury Drive - Liverpool Street to Kimble Drive	835
**	Cityview Avenue	107
	Crocket Street	356
	Currie Avenue	76
	Gilbert Street (selected sections)	114
	Grasse Circle	527
	Highland Avenue (selected sections)	165
	Johnston Avenue	183
	King Street - St. John Street to Regent Street	212
	Lincoln Road (selected sections)	545
	Main Street near Stone Bridge	76
	Merrithew Avenue	234
	Northumberland Street - Queen Street to King Street	147
	Preston Drive	42
	River Street (selected sections)	482
	Royal Road (Sunset Drive to Barton Crescent)	781
	Ruby Street	588
	St. Marys Street - Union Street to Balsa Street	103
	St. John Street - Queen Street to Brunswick Street	219

	Location	Length (metres)
	Union Street - St. Marys Street to Cliffe Street	170
	Waterloo Row - Elmcroft Place to end of curb	632
***	Westmorland Street - Queen Street to Brunswick Street	274
	Whiting Road (selected sections)	354
***	Wilsey Road (selected sections)	145
	TOTAL	**11 602**

11 602 metres = 11.602 kilometres

* **Done under Capital Special Projects**
** **Type "B" asphalt concrete used**
*** **Type "B" and Type "D" asphalt concrete used**

(2) **Sidewalk Maintenance**

The net expenditure of **$ 463 052** for sidewalk repairs was made up as follows:

Personnel Costs ----------	$ 76 128	
Materials ----------	48 510	
General Services (use of equipment, special projects & contract services) ----------	338 414	**$ 463 052**

(3) **Culverts and Ditching** - the maintenance and installation of culverts and ditches

The net expenditure of **$ 33 621** was made up as follows:

Personnel Costs ----------	$ 9 690	
Materials ----------	5 287	
General Services (use of equipment & contract services)	18 644	**$ 33 621**

(4) **Storm Sewer Maintenance** - the flushing of mains, cleaning and repair of catch basins and the repair of mains

The net expenditure of **$ 176 869** was made up as follows:

Personnel Costs ----------	$ 77 251	
Materials ----------	38 746	
General Services (use of equipment & contract services)	60 872	**$ 176 869**

(5) **Street Cleaning and Flushing**

The City of Fredericton used a number of sweepers, trackless units and a Vac-all unit for street cleaning purposes in 1995.

The net expenditure under this heading amounted to **$ 493 835 *** and was made up as follows:

Personnel Costs ----------	$ 287 528	
General Services (use of equipment & contract services) ----------	178 952	
Goods (brooms, litter cans, dust control) ----------	27 355	**$ 493 835**

* **Includes an amount of $ 25 032 for Spring Cleanup.**

(6) **Winter Maintenance**

(a) **Sanding and Salting Streets and Sanding Sidewalks**

Storing sand and salt in winter storage piles and spreading same on slippery streets and sidewalks.

(b) **Snow Control**

Blowing, shovelling and hauling snow, plowing or scraping roads, cleaning gutters, thawing catch basins and any other means of snow control.

The City of Fredericton was responsible for plowing, sanding and salting 327.053 km of roads and streets in 1995 (156.308 km on the north side and 170.745 km on the south side). Included in these figures is the Westmorland Street Bridge along with adjacent highways and ramps which are maintained through an agreement with the Department of Transportation.

During the winter months of 1995, 182.107 km of sidewalk were plowed and sanded. (69.469 km on the north side and 112.638 km on the south side)

Streets:

The total net cost for plowing streets amounted to **$ 903 099** and was made up as follows:

Personnel Costs	$ 549 343	
General Services (use & maintenance of equipment)	339 895	
Goods	831	
Fixed Assets (new equipment)	13 030	**$ 903 099**

The total net cost of sanding and salting streets amounted to **$ 460 626** and was made up as follows:

Personnel Costs	$ 152 747	
General Services (use & maintenance of equipment)	91 955	
Materials (salt and sand)	215 924	**$ 460 626**

The overall net expenditure of **$ 1 363 725** for plowing, sanding, and salting City roads and streets was made up as follows:

Personnel Costs	$ 702 090	
General Services (use & maintenance of equipment)	431 850	
Fixed Assets (new equipment)	13 030	
Materials (salt & sand)	215 924	
Goods	831	**(1) $1 363 725**

Sidewalks:

The total net expenditure for plowing sidewalks amounted to **$ 178 014** and was made up as follows:

Personnel Costs	$ 109 869	
General Services (use & maintenance of equipment)	67 979	
Goods	166	**$ 178 014**

The total net expenditure for sanding sidewalks amounted to **$ 80 526** and was made up as follows:

Personnel Costs	$ 30 550	
General Services (use & maintenance of equipment)	18 391	
Materials (sand)	10 825	
Fixed Assets (new equipment)	20 760	**$ 80 526**

The overall net expenditure for snow plowing and sanding of sidewalks was **$ 237 780** and was made up as follows:

Personnel Costs	$ 140 419	
General Services (use & maintenance of equipment)	86 370	
Materials (sand)	10 825	**(2)**
Goods	166	**$ 237 780**

TOTAL NET COST OF WINTER MAINTENANCE - ADD (1) & (2) **$ 1 601 505**

Snowfall in Fredericton for the last five years was as follows:

1991	Airport Weather Office	290.4 cm
1992	Airport Weather Office	205.7 cm
1993	Airport Weather Office	205.1 cm
1994	Airport Weather Office	250.4 cm
1995	Airport Weather Office	292.7 cm

(c) **Street Lighting**

The total street lighting costs for 1995 were as follows:

Salaries & Benefits ----------	$ 7 401	
Municipal Lighting System Contract ----------	683 490	
General Services - Maintenance of Equipment & Contract Services	5 038	
Government Services (Power to City Owned Lights) ---	580	
New Poles ----------	1 078	
New Bulbs ----------	777	**$ 698 364**

(d) **Traffic Services**

The expenditure under this heading is made up as follows:

(1) Street Signs
(2) Paint Department
(3) Traffic Signals
(4) Railway Crossings

(1) **Street Signs**

Purchasing, repairing and installing street signs on City streets.

The net expenditure under this heading amounted to **$ 103 606** made up as follows:

Personnel Costs	$ 45 159	
General Services (use of equipment & contract services)	11 398	
Goods (posts, street sign purchases, etc.)	47 049	**$ 103 606**

(2) **Paint Department**

The net expenditure under this heading was **$ 142 326** made up as follows:

Personnel Costs	$ 67 919	
General Services (use & maintenance of equipment & contract services).....	13 577	
Goods (paint & misc. supplies)	44 475	
Fixed Asets (new equipment)	16 355	**$ 142 326**

(3) **Traffic Signals**

The net expenditure under this heading was **$ 194 931** made up as follows:

Personnel Costs	$ 57 847	
General Services (use of equipment & contract services)	16 687	
Government Services (electric power)	76 002	
Goods (materials)	44 395	**$ 194 931**

(4) **Railway Crossings**

The net expenditure under this heading was **$ 6041** for maintenance done by railway companies.

ENVIRONMENTAL HEALTH SERVICES

The following items are included under the above heading.

(1) Garbage and Waste Collection
(2) Garbage and Waste Disposal
(3) Recycling
(4) Hazardous Waste
(5) Old Burial Ground

(1) Garbage and Waste Collection

In 1995, the net amount paid for the garbage and waste collection operation was **$ 393 552** made up as follows:

General Services - (Garbage Collection Contract).....	$ 386 894	
General Services - (Advertising)	6 658	**$ 393 552**

(2) Garbage and Waste Disposal

The net expenditure under this section was **$ 526 179** made up as follows:

General Services (Solid Waste Commission payments)	$ 494 568	
General Services (land rental)	30 024	
Government Services (taxes)	1 587	**$ 526 179**

(3) Recycling

The net expenditure under this section was **$ 178 597** made up as follows:

General Services (Recycling Collection Contract)	$ 186 030	
General Services (Recovery Account)	(7 433)	**$ 178 597**

(4) **Hazardous Waste**

Cleanup of oil spills from accidents, etc.

The net expenditure under this section was **$ 11 203** made up as follows:

Personnel Costs	$	661	
General Services (use of equipment & contract services)		10 071	
Goods (materials)		471	**$ 11 203**

(5) **Old Burial Ground**

The net expenditure under this section was **$ 8 645** made up as follows:

Personnel Costs	$	7 118	
General Services (use of equipment)		481	
Government Services (lighting)		684	
Goods (materials)		362	**$ 8 645**

PARKS AND TREES SERVICES

The following items are included under the above heading:

(1) Wilmot Park
(2) Odell Park
(3) Carleton Park
(4) Old Government House
(5) Trees
(6) Greens, Benches & Other Parks

(1) Wilmot Park

The net expenditure for this item was **$ 57 093** made up as follows:

Personnel Costs	$ 43 457		
General Services (use & maintenance of equipment, building repairs)	3 916		
Government Services (water & sewer rates, light & power)	2 885		
Goods (materials; fuels & lubricants)	6 835	**$**	**57 093**

(2) Odell Park

The net expenditure for this item was **$ 86 628** made up as follows:

Personnel Costs	$ 64 291		
General Services (use & maintenance of equipment, communications; building repairs)	5 440		
Government Services (water & sewer rates, lights & power)	2 264		
Goods (materials; fuels & lubricants)	14 633	**$**	**86 628**

(3) Carleton Park

The net expenditure for this item was **$ 8 043** made up as follows:

Personnel Costs	$ 4 616		
General Services (use of equipment & land rental)	3 168		
Goods (materials)	259	**$**	**8 043**

(4) **Old Government House**

The net expenditure for this item was **$ 16 516** made up as follows:

Personnel Costs	$ 11 434	
General Services (use of equipment)	2 273	
Goods (materials)	2 652	
Government Services (light & power)	157	**$ 16 516**

(5) **Trees**

The net expenditure for this item was **$ 386 297** made up as follows:

Personnel Costs	$ 286 331	
General Services (use & maintenance of equipment & contract services)	55 960	
Goods (fuels & lubricants, materials, new trees, small tools & equipment)	44 006	**$ 386 297**

TREE REMOVAL

In 1995, 287 trees were removed. These trees were either in a decadent condition, a menace to public safety or possible breeding places for the Elm Bark Beetle.

Following is a list of trees removed in 1995:

Species	Number Removed
Ash	2
Birch	5
Butternut	1
Cedar	6
Cottonwood	3
Elm	83
Hemlock	1
Horse Chestnut	1
Ironwood	3
Linden	27
Maple	83
Mountain Ash	4
Pine	6
Poplar	36
Red Oak	7
Siberian Elm	2
Spruce	12
Willow	5
TOTAL	**287**

In 1995 , 23 trees were removed because of Dutch Elm Disease.

Following is a summary of Elm trees removed from 1964 to 1995.

Year	No. Lost (% Lost) To Dutch Elm Disease	No. Removed For Other Reasons	Total No. Removed
1964	14 (29)	34	48
1965	8 (24)	25	33
1966	12 (21)	44	56
1967	18 (20)	73	91
1968	33 (16)	174	207
1969	30 (21)	108	138
1970	49 (39)	78	127
1971	57 (42)	77	134
1972	61 (42)	84	145
1973	92 (46)	108	200
1974	132 (33)	266	398
1975	75 (19.6)	307	382
1976	118 (28.2)	300	418
1977	681 (91.6)	62	743
1978	680 (92)	56	736
1979	937 (91.8)	84	1021
1980	1146 (95.7)	51	1197
1981	500 (59.7)	327	827
1982	487 (90.7)	50	537
1983	133 (36.5)	231	364
1984	121 (63.4)	70	191
1985	77 (80.2)	19	96
1986	45 (60.8)	29	74
1987	49 (53.8)	42	91
1988	43 (54.4)	36	79
1989	47 (48.0)	51	98
1990	55 (79.7)	14	69
1991	42 (89.4)	5	47
1992	52 (76.5)	16	68
1993	18 (51.4)	17	35
1994	39 (52.7)	35	74
1995	23 (27.7)	60	83
TOTALS	**5874**	**2933**	**8807**

TREE PLANTING

There were 650 trees planted (609 new plantings and 41 replacements) along City Streets and in parks in 1995. Street trees were planted in new subdivisions as well as on newly curbed streets.

Over 200 shrubs were planted in City parks and City-owned properties in various beautification projects.

In addition, over 300 seedlings received from the New Brunswick Department of Natural Resources and Energy were planted along the Valley Trail.

(6) Greens, Benches & Other Parks

The net expenditure for this item was **$ 211 700** made up as follows:

Personnel Costs	----------	$ 139 003	
General Services (use & maintenance of equipment and special projects)	--------	17 773	
Goods (fuels & lubricants materials, small tools & equipment)	--------	40 450	
Fixed Assets (new equipment)	--------	14 474	**$ 211 700**

UTILITY FUND

The above item is made up of the following headings:

(1) Common Services
(2) Sanitary Sewer
(3) Water

(1) COMMON SERVICES

In 1995 the net expenditure for this item was **$ 1 083 547** made up as follows:

General Equipment	$ 526 531	
Safety & Benefits	361 457	
Administration	195 559	**$ 1 083 547**

(2) SANITARY SEWER

In 1995 the net expenditure for this item was **$ 2 961 405** made up as follows:

Operating: Lift Stations

Personnel Costs	$ 41 794	
General Services (use & maintenance of equipment)	14 662	
Government Services (light & power)	25 695	
Goods (materials)	1 202	**$ 83 353**

Maintenance:

Personnel Costs	$ 305 894	
General Services (use & maintenance of equipment & contract services)	89 953	
Goods (repair parts & tools)	90 146	**$ 485 993**

Sewage Treatment & Disposal:

Personnel Costs	----------	$ 15 591	
General Services	- use & maintenance of equipment	9 424	
	- treatment (F.A.P.C.C) ----------	2 283 447	
Government Service:	Water & Sewer Rates -------	880	
	Lights & Power ----------	26 646	
Goods (Miscellaneous Supplies)	----------	751	$ 2 336 739

Debt Charges:

Principal	----------	$ 54 499	
Interest	----------	821	$ 55 320

TOTAL $ 2 961 405

The Fredericton sanitary sewer system consists of approximately 287 kilometres of mains made up as follows:

SIZE	SILVERWOOD GARDEN CREEK	NASHWAAKSIS **DOUGLAS**	MARYSVILLE	LR.ST.MARYS BARKER'S PT.	FREDERICTON	TOTAL
100 mm	-	0.158	-	-	-	0.158
100 mm F. M.	0.013	-	-	-	1.103	1.116
150 mm	-	1.433	0.314	-	0.253	2.000
150 mm F.M.	0.031	1.016	0.539	0.712	3.008	5.306
200 mm	16.045	40.947	18.417	10.864	118.971	205.244
200 mm F.M.	0.254	0.463	0.314	-	0.064	1.095
250 mm	1.959	4.798	0.955	0.298	9.731	17.741
250 mm F.M.	1.178	-	-	-	-	1.178
300 mm	1.267	4.077	1.006	1.868	17.858	26.076
300 mm F.M.	0.420	0.489	-	-	0.739	1.648
350 mm	0.287	0.765	-	-	0.713	1.765
350 mm F.M.	-	-	0.528	-	0.254	0.782
375 mm	1.138	3.005	0.500	0.174	2.193	7.010
400 mm	0.018	0.122	-	-	0.210	0.350
450 mm	1.039	0.117	1.350	-	2.879	5.385
500 mm	2.979	-	-	-	-	2.979
525 mm	-	1.613	-	-	-	1.613
600 mm	0.156	0.964	-	-	3.108	4.228
750 mm	-	-	-	-	0.322	0.322
900 mm	-	-	-	-	1.432	1.432
TOTALS	**26.784**	**59.967**	**23.923**	**13.916**	**162.838**	**287.428**

NOTE: Fredericton includes the Lincoln area.

The above figures do not include mains at the Fredericton Exhibition Grounds, U.N.B. and St. Anne's Point on the Woodstock Road or the Fredericton Area Pollution Control Commission sewer system which has approximately 11.4 kilometres of main.

(3) WATER

There are, at year's end, 14 separately monitored water systems, comprising 22 wells (11 active), 19 reservoir tanks or cells on 12 reservoir sites, 6 active booster stations and the Water Treatment Plant.

The Water Treatment Plant treats the water from the 7 Wilmot Park wells, which provide 95% of the City's water. The following describes the 14 water systems and their normal sources.

SYSTEM	SOURCE	STORAGE
South Low	7 wells via W.T.P. 1 emergency standby well	18200 kL
North Low	South Low via River Crossing (same top reservoir elevations) 5 emergency wells	8540 kL
South Intermediate	South Low via Booster	9090 kL
South High	South Interm. via Booster	4550 kL
Golf Club Road	South High via Pressure Reducing Valve	0 kL
Rosewood	South Low via Booster	0 kL
Lincoln	South Low via Booster	3750 kL
Alison	South High via Pressure Reducing Valve	0 kL
Hanwell	South High via Pressure Reducing Valve 1 Emergency Well	460 kL
Silverwood	2 Wells Direct	2550 kL
Rainsford	Golf Club Road via Booster 1 Emergency Well	0 kL
Killarney	South Low via Booster 2 Emergency Wells	3750 kL
Marysville	2 Wells Direct 1 Emergency Well	6580 kL
Canterbury	South High via Altitude Valve	1070 kL

The water account includes all expenditures other than capital expenditures for water.

Water costs for the City of Fredericton were made up as follows:

(1)	Water Administration (Billing & Collection)	$ 235 189	
(2)	Water Ordinary (including meters)	1 236 888	
(3)	Water Treatment Plant	839 058	
(4)	Debt Charges - Principal	99 453	
(5)	Debt Charges - Interest	1 830	**$ 2 412 418**

(1) WATER ADMINISTRATION (BILLING & COLLECTION)

The net expenditure of **$ 235 189** was made up as follows:

Personnel Costs	$ 150 091	
General Services (Postage, Professional Services, Rental of Equipment, Computer External Services)	60 109	
Goods (Computer & Office Supplies)	20 158	
Fixed Assets (Computer & New Equipment)	4 831	**$ 235 189**

(2) WATER ORDINARY (INCLUDING METERS)

The net expenditure of **$ 1 236 888** was made up as follows:

Transmission & Distribution (Operation)

Personnel Costs	$ 35 516	
General Services (use & maintenance of equipment)	84 463	
Government Services (light & power, provincial taxes)	118 634	
Goods (materials)	2 034	**$ 240 647**

Transmission & Distribution (Maintenance)

Personnel Costs ----------	$ 450 013	
General Services (use & maintenance of equipment & hydrants & contract services)--------	123 632	
Goods (fuels & lubricants, tools, materials, parts) ----------	114 881	**$ 688 526**

Meters

Personnel Costs ----------	$ 156 940	
Goods (Meter Parts, miscellaneous supplies, & tools) -	12 260	
General Services (Use of Equipment) ----------	40 548	
Fixed Assets (new meters) ----------	97 967	**$ 307 715**

TOTAL ---------- **$ 1 236 888**

On 1995 12 31 there were 13 003 water services on meter and 190 on flat rate, making a total of **13 193**.

116 new meters (new construction and former flat rate) were installed in 1995.

In 1995, 2 discontinued services were excavated and shut off at the main and 11 frozen meters were replaced. There were also 1251 meters replaced due to their age.

At the end of 1995 there were 1800 units on the Automated Meter Reading (AMR) System.

Sprinklers were installed in 1995 at the following locations:

a) Atlantic Super Store (Smythe Street)
b) Toys R Us (Regent Mall)
c) Carleton Street Armouries

There are in the City, as of 1995 12 31, 1708 hydrants situated in the following areas:

Fredericton South	780
Fredericton North	168
Nashwaaksis / Douglas	341
Marysville	152
Barker's Point / Lower St. Marys	85
Silverwood / Garden Creek	27
SUB TOTAL	**1553**
LOCATED ON PRIVATE PROPERTY ..	**155**
TOTAL	**1708**

Hydrants were installed at the following locations in 1995:

Location		**Number**
Albert Street	----------	1
Barlow Court	----------	1
Carleton Street	----------	1
Charm Court	----------	1
Clements Drive	----------	5
Gabriel Drive	----------	1
Spencer Street	----------	1
Turnbull Court	----------	1
TOTAL	----------	**12**

The Fredericton distribution system consists of approximately 314 kilometres of water main, made up as follows:

SIZE	MARYSVILLE	NASHWAAKSIS DOUGLAS	LR.ST.MARYS BARKER'S POINT	SILVERWOOD GARDEN CREEK	FREDERICTON	TOTAL
32 mm	-	0.153	-	-	-	**0.153**
38 mm	-	0.072	-	-	0.234	**0.306**
50 mm	-	-	-	0.154	-	**0.154**
75 mm	-	-	-	-	0.290	**0.290**
100 mm	0.753	2.232	-	2.508	10.919	**16.412**
150 mm	12.578	21.169	4.053	4.835	58.180	**100.815**
200 mm	7.025	25.058	2.266	7.812	44.311	**86.472**
250 mm	3.199	8.143	5.169	0.966	24.581	**42.058**
300 mm	1.113	6.499	1.070	7.776	29.572	**46.030**
350 mm	-	0.840	-	-	5.441	**6.281**
400 mm	-	2.241	-	-	7.127	**9.368**
450 mm	-		-	-	1.965	**1.965**
500 mm	-	-	-	-	2.797	**2.797**
600 mm	-	-	-	-	0.427	**0.427**
Unknown	0.146	-	-	-	-	**0.146**
TOTALS	**24.814**	**66.407**	**12.558**	**24.051**	**185.844**	**313.674**

Figures for Marysville, Nashwaaksis, Barker's Point, and Silverwood are approximate only, due to measurement from maps in some instances.

The above figures do not include water mains installed at the Exhibition Grounds; the University of New Brunswick and St. Anne's Point Barracks on the Woodstock Road.

(3) WATER PRODUCTION COSTS

The net expenditure of **$ 839 058** was made up as follows:

Source of Supply

Personnel Costs	$ 101 247	
Use of Equipment	16 644	
Maintenance - Wells	48 123	
Communications	5 219	
Power - Wells	238 731	
Materials - Wells	1 346	**$ 411 310**

Power & Pumping (Plant)

Personnel Costs	$ 32 588	
Communications	395	
Light & Power	7 423	
Supplies	277	**$ 40 683**

Water Treatment Plant

Personnel Costs	$ 109 690	
Insurance	14 762	
Maintenance	120 788	
Power	4 764	
Taxes	37 097	
Materials	10 911	
Goods (Chlorine, Soda Ash, Lime, etc.)	89 053	**$ 387 065**

TOTAL ..... **$ 839 058**

The total amount of water pumped into the City's distribution systems from 1995 01 01 to 1995 12 31 for the entire City was 8160 megalitres. The amount of water produced by the Water Treatment Plant in 1995 was 7720 megalitres or 95% of the total City demand. The average daily demand for the City is 22.5 megalitres.

The following table gives a comparison of water production costs for the last ten years:

WATER PRODUCTION COSTS

YEAR	MEGALITRES PRODUCED	PRODUCTION EXPENDITURE	PRODUCTION COST PER MEGALITRE
1986	7781	$ 732 141	$ 94
1987	8177	712 102	87
1988	8740	743 604	85
1989	8440	734 658	87
1990	8600	679 440	79
1991	8450	823 353	97
1992	8570	828 783	97
1993	8023	794 406	99
1994	8340	874 562	105
1995	8160	839 058	103

The total net expenditure for transmission and distribution of water for the City from 1995 01 01 to 1995 12 31 was determined from the following:

Transmission & Distribution:

Operation	----------	$ 240 647	
Maintenance	----------	688 526	**$ 929 173**

Therefore, the net expenditure for transmission and distribution of one megalitre of water from 1995 01 01 to 1995 12 31 was:

$$\frac{\$\ 929\ 173}{8160} = \$\ 114$$

The following table gives a comparison of net expenditures for transmission and distribution of one megalitre of water for the last ten years:

TRANSMISSION AND DISTRIBUTION COSTS

YEAR	NET EXPENDITURE PER MEGALITRE
1986	$ 88
1987	89
1988	93
1989	126
1990	106
1991	117
1992	121
1993	147
1994	125
1995	114

The total net expenditure for administration costs and debt charges for the City from 1995 01 01 to 1995 12 31 was determined from the following:

Water Administration

(1) Billing & Collection ----------	$ 235 189	
(2) Meters (Installation, Reading, Repairs) ----------	307 715	
Debt Charges (Principal & Interest) ----------	101 283	**$ 644 187**

Administration costs per megalitre of water produced:

$$\frac{\$\ 542\ 904}{8160} = \$\ 66.53$$

Debt charges per megalitre of water produced:

$$\frac{\$\ 101\ 283}{8160} = \$\ 12.41$$

The following table gives a comparison of administration costs and debt charges per megalitre of water produced for the last ten years:

ADMINISTRATION COSTS AND DEBT CHARGES PER MEGALITRE
(rounded to nearest dollar)

YEAR	ADMINISTRATION (BILLING & COLLECTION & METERS)	DEBT CHARGES
1986	$ 43	$ 75
1987	37	52
1988	39	46
1989	44	46
1990	44	43
1991	45	43
1992	46	38
1993	62	24
1994	63	19
1995	67	12

The following table gives a comparison of total water costs per megalitre of water produced for the last ten years:

TOTAL COSTS PER MEGALITRE

YEAR	PRODUCTION COSTS	TRANSMISSION & DISTRIBUTION COSTS	ADMINISTRATION	DEBT CHARGES	*TOTAL
1986	$ 94	$ 88	$ 43	$ 75	$ 300
1987	87	89	37	52	265
1988	85	93	39	46	263
1989	87	126	44	46	303
1990	79	106	44	43	272
1991	97	117	45	43	302
1992	97	121	46	38	302
1993	99	147	62	24	332
1994	105	125	63	19	312
1995	103	114	67	12	296

*** TOTAL COST = Production Costs + Transmission & Distribution Costs + Administration Costs + Debt Charges**

SUMMARY

WATER AND SEWER REVENUE & EXPENDITURES

1995

ITEM	NET EXPENDITURE	REVENUE
COMMON SERVICES (WATER & SEWER)		
General Equipment	$ 526 531	$ 535 798
Safety & Benefits	361 457	
Administration	195 559	
WATER		
Water Administration (Billing & Collection)	235 189	
Water Ordinary (Including Meters)	1 236 888	4 890 014
Water Treatment Facility & Well Production Costs	839 058	
Debt Charges - Principal & Interest	101 283	
SANITARY SEWER		
Operating & Maintenance	569 346	
Sewage Treatment & Disposal	2 336 739	3 781 101
Debt Charges	28 544	
TOTALS	**$ 6 430 594**	**$ 9 206 913**

1995 SURPLUS: ----------	$	2 776 319
PLUS: SECOND PREVIOUS YEAR'S SURPLUS @ BEGINNING OF YEAR ----------		300 526
OVERALL SURPLUS: ----------	$	3 076 845
LESS: CAPITAL PROJECT FUNDING ----------		2 257 815
NET SURPLUS ----------	$	819 030

NOTE: **$ 2 257 815 of the above noted overall surplus was appropriated for utility capital expenditures.**

CAPITAL PROGRAMS

The following gives brief descriptions of capital projects begun or completed in 1995:

WATER:

In 1995, water mains were installed on Clements Drive and a portion of Spencer Street in the Douglas area; on Brunswick Street between Regent Street and Carleton Street; and on Marshall Street between Bridge Street and Coronation Street.

Streets such as Albert Street between Connaught Street and York Street; Carleton Street between King Street and Brunswick Street; York Street between King Street and Brunswick Street; and Turnbull Court had their water mains upgraded or installed under the System Replacement and Oversizing account.

A new main was also installed on Charm Court by the developer.

Following are lengths and sizes of water mains installed in 1995:

LENGTH OF MAINS - metres						
LOCATION	100 mm D.I.	150 mm D.I.	200 mm D.I. & P.V.C.	250 mm D.I.	300 mm D.I.	500 mm D.I.
* Albert St. - Connaught St. to York St.		15	406			
* Carleton St. - King St. to Brunswick St.				91		
** Charm Court	92	68				
Douglas Area (Clements Dr.; Spencer St.)		27	184		600	
Brunswick St. - Regent St. to Carleton St.		11		8		208
* York St. - King St. to Brunswick St.				92		
* Turnbull Court		110				
* Marshall St. - Coronation St. to Bridge St.			6	128		
*** Devon Indian Reserve (Barlow Ct.; Gabriel Dr.)		7	104	180		
TOTALS	92	238	700	499	600	208

OVERALL TOTAL - 2337 metres = 2.337 kilometres

* Done under system replacement and oversizing.
** Paid for by the developer through Local Improvement Agreement.
*** Paid for by the Department of Indian and Northern Affairs.

SANITARY SEWER:

In 1995, sanitary sewer mains were installed on Clements Drive and a portion of Spencer Street in the Douglas Area; on Brunswick Street between Regent Street and Carleton Street; and at the Smythe/Waggoners/Dundonald intersection.

Albert Street between Connaught Street and York Street and the reliever sewer within the former railway right-of-way between Smythe Street and Rookwood Avenue had their sanitary sewer mains upgraded under the System Replacement and Oversizing account. A trunk sewer was also installed across the Golf Course between Golf Club Road and the Valley Trail under this account.

A new main was also installed on Charm Court by the developer.

Following are lengths and sizes of sanitary sewer mains installed in 1995:

LENGTH OF MAINS - metres								
LOCATION	200 mm P.V.C.	250 mm P.V.C. & D.I.	300 mm P.V.C.	375 mm P.V.C. & D.I.	450 mm P.V.C.	600 mm P.V.C.	525 mm P.V.C.	150 mm D.I.F.M.
* Albert St - Connaught St. to York St.	342							
Brunswick St. - Regent St. to Carleton St.	9				3	205		
** Charm Court	143							
Douglas Area (Clements Dr; Spencer St.)	507	142	14	79				599
* Smythe/Waggoners/Dundonald Intersection		78	176					
*** Devon Indian Reserve (Barlow Ct; Gabriel Dr.)	276							
Burpee Trunk	8			75	86		1084	
* Trunk Sewer (Golf Club Rd. to Valley Trail)		301						
* Reliever Sewer (Smythe St. to Rookwood Ave.)			207					
TOTALS	1285	521	397	154	89	205	1084	599

OVERALL TOTAL - 4334 metres = 4.334 kilometres

* **Done under System Replacement and Oversizing.**

** **Paid for by the developer through Local Improvement Agreement.**

*** **Paid for by the Department of Indian and Northern Affairs.**

STORM SEWER:

In 1995, storm sewer mains were installed on Brookside Drive near York Funeral Home; on Canada Street from Civic #357 to Hollybrook Street; on Clements Drive and a portion of Spencer Street in the Douglas area; on Smythe Street between Heather Terrace and Montgomery Street; on Regent Street near Priestman Street and at the Smythe / Waggoners / Dundonald intersection.

Albert Street between Connaught Street and York Street had its storm sewer main upgraded under the System Replacement and Upgrading account.

A new main was also installed on Charm Court by the developer.

Following are lengths and sizes of storm sewer mains installed in 1995:

LOCATION	250 mm	300 mm	450 mm	525 mm	600 mm	750 mm	900 mm	1500 mm
* Albert St. - Connaught St. to York St.	49	254						
Brookside Dr. near York Funeral Home	4	12				8	102	96
**** Canada St. - Hollybrook to Civic # 357		91						
Douglas Area (Clements Dr.; Spencer St.)		100	61	48	60	483		
** Charm Court	18	139						
Smythe St. - Heather Terrace to Montgomery St.	7	19				107		
*** Smythe / Waggoners / Dundonald Intersection	131	71	12					
**** Regent St. near Priestman St.	6							
***** Devon Indian Reserve (Barlow Ct.; Gabriel Dr.)	23	276						
TOTALS	238	962	73	48	60	598	102	96

OVERALL TOTAL - 2177 metres = 2.177 kilometres

* **Done under System Replacement and Upgrading.**
** **Paid for by developer through Local Improvement Agreement.**
*** **Done under Capital Special Projects.**
**** **Done under Capital Designated Provincial Routes.**
***** **Paid for by the Department of Indian and Northern Affairs.**

CURB AND GUTTER

Concrete curb and gutter was constructed at the following locations in 1995:
(Notes indicate budget item under which work was done)

	Location	Length (metres)
(1)	Broadview Avenue/Adney Street (insulated area)	441
(2)	Brookside Homes Subdivision (Jeremy, Terrance)	586
(3)	Brookside Drive/Ring Road Intersection	56
(1)	Brunswick Street - Regent Street to Carleton Street	450
(6)	Canada Street - Civic #315 to Civic #369 (west side)....	543
	Canada Street - near Perley Avenue	80
(2)	Chippins Lincoln Heights Subdivision (Edward, Gerrard, Trainor)	704
	Cityview Avenue	203
(1)	Crocket Street	624
	Golf Club Road - Kingswood Drive to Lamson Court	75
(2)	Hill Brothers Subdivision (McKnight, Ashley)	1012
(1)	Huron Avenue (insulated area)	254
(1)	MacLaren Avenue - Clark Street to Hughes Street	668
(5)	Mainstreet Program (Regent, Carleton, York, Queen)...	934
(4)	Massey Street/Lorne Street area	23
(3)	Montgomery Street/York Street intersection	549
(2)	Northwood Subdivision (Manresa, Miro)	1110
(4)	Queen Street (in front of Legion)	78
(6)	Regent Street - Priestman to CBC	107
(1)	Smythe Street - Shamrock Terrace to Heather Terrace	1467
(7)	Smythe Street / Waggoners Lane / Dundonald Street Intersection	1047
(4)	Town Plat	66
(4)	Union Street / Smith Street area	433
	Urquhart Crescent	1387
(4)	Veterans Drive	739
(1)	York Street - Kings College Road to Montgomery Street	901
	TOTAL ----------	**14 537**

(1) Done under Capital Street Reconstruction.
(2) Paid for by developer through Local Improvement Agreement.
(3) Done under Capital Traffic Management.
(4) Done in conjunction with sidewalk construction.
(5) Reconstruction of existing under Capital Mainstreet Program.
(6) Done under Capital Designated Routes.
(7) Done under Capital Special Projects.

PAVING:

In 1995, **Warren (Maritimes) Limited** was awarded a contract to supply and place asphalt concrete on a number of City streets.

The street preparatory work was done by City forces.

The paving program required the supply and placement of the following grades of asphalt concrete:

1) Binder Course - Type "B" at $ 40.70 plus G.S.T. per tonne in place

2) Surface Course - Type "D" at $ 43.00 plus G.S.T. per tonne in place

(1) **BINDER COURSE - TYPE "B"**

The following streets were paved with Type "B" asphalt concrete in 1995:

	LOCATION	Length (metres)
(1)	Adney Street (insulated area)	50
(2)	Ashley Crescent	110
(1)	Broadview Avenue (insulated area)	175
(1)	Brunswick Street - Regent Street to Carleton Street	234
(2)	Edward Street	245
(2)	Gerrard Court	53
(1)	Huron Avenue (insulated area)	130
(2)	Jeremy Street / Cres. A	279
(1)	MacLaren Avenue - Clark Street to Hughes Street	305
(2)	Manresa Drive - Willis Street to Civic #173	366
(2)	McKnight Street - Barton Crescent to Civic # 150	451
(2)	Miro Court	182
(4)	Montgomery Street/York Street Intersection	160
(1)	Smythe Street - Tamarack Terrace to Montgomery Street	745
(5)	Smythe Street/Waggoners Lane/Dundonald Street Intersection	310
(2)	Terrance Street	420
(2)	Trainor Court	53
(3)	Urquhart Crescent	690
	TOTAL	**4958**

(1) Done under Capital Street Reconstruction.
(2) Paid for by developer through Local Improvement Agreement.
Type "D" asphalt was also placed on these streets.
(3) Done under Capital Curb and Gutter
(4) Done under Capital Traffic Management
(5) Done under Capital Special Projects

CONCRETE SIDEWALKS:

New sidewalks were constructed at the following locations in 1995:

	LOCATION	Length (metres)
(3)	Brunswick Street - Regent Street to Carleton Street	355
(3)	Crocket Street - near Civic #117 to Long Court	173
(2)	Douglas Avenue; Evans Street; Estey Lane	610
(3)	MacLaren Avenue - Clark Street to Hughes Street	285
(1)	Mainstreet Program - (Regent St., Carleton St., King St., York St., Queen St.)	933
(2)	Manresa Drive - Sunset Drive to Miro Court	260
(4)	Massey Street / Lorne Street Area	276
(5)	Montgomery Street / York Street Intersection	484
(6)	Regent Street - Priestman Street to the CBC (Civic # 1160)	168
(3)	Smythe Street - Shamrock Terrace to Heather Terrace	1603
(6)	Smythe Street/ Waggoners Lane/ Dundonald Street Intersection	1028
(4)	Town Plat	844
(4)	Union Street / Smith Street area	169
(4)	University Avenue area	433
(4)	Veterans Drive	386
(4)	Waterloo Row - Elmcroft Place to Alexandra Street	191
(4)	York Street - Kings College Road to Montgomery Street	83
	TOTAL	**8281**

(1) Reconstruction of existing sidewalk under Capital Mainstreet Program.
(2) Paid for by developer through Local Improvement Agreement.
(3) Done under Capital Street Reconstruction.
(4) Capital Sidewalk Construction done under O & M Budget.
(5) Done under Capital Traffic Management.
(6) Done under Capital Special Projects.

PASSIVE PARKS

In 1995, work was done on the roads and Botanical Garden at Odell Park; on the passive park at the entrance of Gibson Trail; on the nature trail and landscaping of Reading Street Park; on the parking area for the North Riverfront Trail; and additional work on the Valley Trail beyond the Bucket Club.

STREET RECONSTRUCTION

In 1995, a number of streets were upgraded with curb and gutter and paving and in some instances sidewalk. These streets included Brunswick Street between Regent Street and Carleton Street; Smythe Street between Shamrock Terrace and Heather Terrace; MacLaren Avenue between Clark Street and Hughes Street; a portion of Broadview Street and Adney Street; a portion of Huron Avenue; York Street between Kings College Road and Montgomery Street; and selected sections of Crocket Street between Harrison Court and Pickard Street.

WORKS FACILITIES

In 1995, fuel tanks were replaced at the Regent Street Depot and a new hoist was installed at the St. Marys Street Depot.

TRAFFIC MANAGEMENT

In 1995, traffic signal improvements were undertaken at the Brookside Drive/Ring Road intersection and the Montgomery Street/York Street intersection was upgraded. Land was also acquired on Bishop Drive and Dunns Crossing Road for future traffic management improvements on these streets.

SPECIAL PROJECTS

In 1995, the Smythe/Waggoners/Dundonald intersection was re-aligned; Bishop Drive was extended as a temporary two lane road from near Avonlea Court to Arnold Drive; Regent Street was widened between the CBC (Civic #1160) and Priestman Street; and a number of improvements were made to the G.I.S. system under this account.

MAINSTREET PROGRAM

In 1995, the upgrading of the downtown of the City continued. Work was finalized on Regent Street between Queen Street and King Street; on Carleton Street between King Street and Brunswick Street; on the west side of York Street between King Street and Brunswick Street; on King Street in front of Kings Place; on the north side of Queen Street between Westmorland Street and Northumberland Street; and on the south side of Queen Street between Northumberland Street and Smythe Street.

NEW STREET CONSTRUCTION:

The following new streets or portions of streets were constructed in 1995:

LOCATION	Length (metres)
Ashley Crescent	79
Barlow Court	100
Bishop Drive	2196
Charm Court	146
Gabriel Drive	167
Jeremy Street	226
McKnight Street	401
Terrance Street	453
TOTAL	**3768**

3768 metres = 3.768 kilometres

PROVINCIAL DESIGNATED AND REGIONAL HIGHWAYS

In 1995 the City of Fredericton had a total of 48.2 km of provincial designated and regional highways within its boundaries. In 1995, the Provincial Government paid $320.13 (winter) and $80.78 (summer) per lane kilometre towards maintenance of the routes. If any improvements such as new curb and gutter, paving or storm sewer installations are done to these routes, authorization by the Department of Transportation is required.

The following authorized projects were undertaken in 1995:

(1)	Route 8 - Canada Street (Phase 3) Civic #315 to Civic # 369 Storm Sewer and Curb & Gutter	$	125 439
(2)	Route 101 - Regent Street Priestman Street to Civic # 1160 Street Reconstruction		41 524
	TOTAL ----------	**$**	**166 963**

CAPITAL PROGRAMS
SUMMARY OF EXPENDITURES

ITEM	BUDGET	EXPENDITURE	REMARKS
UTILITY FUND			
System replacement & oversizing - **WATER & SANITARY SEWER**	$ 500 000	$ 461 084	
Automation of meter reading - **WATER**	300 000	295 111	
Youngs Crossing Booster - **WATER**	300 000	284 541	
Dougas Area - **WATER & SANITARY SEWER**	550 000	562 902	
Brunswick Street Trunk - **WATER & SANITARY SEWER**	250 000	206 512	
Burpee Street Trunk - **SANITARY SEWER**	600 000	419 316	
GENERAL FUND			
Odell Park Roads & Botanical Garden - **PASSIVE PARKS**	40 000	41 945	
Gibson Trail (Passive Park at entrance) - **PASSIVE PARKS**	10 000	37 142	Expenditure includes for parking area upgrade and associated landscaping
Reading Street (Nature Trail & Landscaping) - **PASSIVE PARKS**	10 000	4 248	
North Riverfront Trail (parking) - **PASSIVE PARKS**	30 000	43 837	Expenditure includes for land acquisition
Valley Trail (completion) - **PASSIVE PARKS**	10 000	38 160	
System Replacement & Upgrading - **STORM SEWER**	200 000	87 757	
Storm Water Management Planning - **STORM SEWER**	50 000	10 254	To be finalized in 1996
Douglas Area (includes associated roadway) - **STORM SEWER**	200 000	183 432	
Brookside Drive - **STORM SEWER**	160 000	133 244	
Smythe Street - **STORM SEWER**	250 000	105 649	
Chartwell Court - **CURB & GUTTER & PAVING**	60 000	60 000	Constructed in 1994
Urquhart Crescent - **CURB & GUTTER & PAVING**	220 000	165 990	

CAPITAL PROGRAMS
SUMMARY OF EXPENDITURES

ITEM	BUDGET	EXPENDITURE	REMARKS
GENERAL FUND (continued)			
Brunswick Street (Regent to Carleton) - **STREET RECONSTRUCTION**	$ 120 000	$ 165 602	
Smythe Street (Shamrock to Heather) - **STREET RECONSTRUCTION**	600 000	734 399	
MacLaren Avenue (Clark to Hughes) - **STREET RECONSTRUCTION**	240 000	222 632	
Marshall Street (including Bridge Street) - **STREET RECONSTRUCTION**	120 000	-	Work to be done in 1996
Broadview Avenue/Adney Street - **STREET RECONSTRUCTION**	150 000	130 595	
Crocket Street (Phase 2) - **STREET RECONSTRUCTION**	100 000	96 943	
York Street (Kings College to Montgomery) - **STREET RECONSTRUCTION**	80 000	142 990	
Huron Avenue - **STREET RECONSTRUCTION**	70 000	70 033	
Regent Street Depot (Fuel tank replacement) - **WORKS FACILITIES**	160 000	183 990	
St. Marys Street Depot (hoist) - **WORKS FACILITIES**	170 000	211 851	
Brookside Drive / Ring Road (Traffic Signal Improvements) - **TRAFFIC MANAGEMENT**	70 000	90 091	
Montgomery Street / York Street Intersection - **TRAFFIC MANAGEMENT**	140 000	188 177	
Bishop Drive (land acquisition) - **TRAFFIC MANAGEMENT**	200 000	93 266	
Dunns Crossing Road (land acquisition) - **TRAFFIC MANAGEMENT**	80 000	80 000	
Miscellaneous (land acquisition) - **TRAFFIC MANAGEMENT**	200 000	120 647	
Smythe / Waggoners / Dundonald Intersection - **SPECIAL PROJECTS**	1 000 000	952 160	
Mainstreet Program - **SPECIAL PROJECTS**	300 000	810 707	Cost shared with DDFI, ACOA, and Kings Place Mall
Bishop Drive Extension (City share) - **SPECIAL PROJECTS**	50 000	472 668	Reflects City & D.O.T. expenditures only

CAPITAL PROGRAMS
SUMMARY OF EXPENDITURES

ITEM	BUDGET	EXPENDITURE	REMARKS
GENERAL FUND (continued)			
G.I.S. System Improvements - **SPECIAL PROJECTS**	$ 50 000	$ 55 308	
Regent Street (City share) - **SPECIAL PROJECTS**	40 000	37 957	
Regent Street South - **DESIGNATED PROVINCIAL ROUTES**	120 000	41 524	To be finalized in 1996
Canada Street Phase 3 - **DESIGNATED PROVINCIAL ROUTES**	150 000	125 439	
Brookside Drive / Route 105 Exit Lane	40 000	30 380	
Vanier / Doak Intersection - **TRAFFIC MANAGEMENT**		56 886	Paid for by D.O.T.
NEW SIDEWALK (DONE UNDER O & M BUDGET AND LOCAL IMPROVEMENT			
Veterans Drive	80 000	115 029	
Waterloo Row (Elmcroft to Alexandra)	20 000	11 210	
Union Street / Smith Street area	50 000	56 840	
University Avenue area	50 000	36 497	
Massey / Lorne Area	50 000	23 705	
Town Plat	90 000	68 498	
Manresa Drive	18 000	17 837	
Evans Sreet; Estey Lane; Douglas Avenue Area	61 000	58 596	

CITY OF FREDERICTON
1995 WATER PUMPING RECORD

WATER SUPPLY

The City of Fredericton is supplied with water from twenty-two (22) municipally owned wells. Eleven of these wells were regularly active, while the remaining 11 were on emergency standby duty at year end. The names of these wells, water analyses, and 1995 pumpages are compiled on the last page of this report.

THE FREDERICTON WATER TREATMENT PLANT

The Water Treatment Plant was put on line in July of 1984. It initially treated water from five Wilmot Park wells. A sixth well was fully developed and running in January 1991. A seventh well was in production in May 1993.

The filter room was doubled in size during 1992, with equipment to expand capacity by 66% on line by April 1993.

DISTRIBUTION SYSTEMS

There are fourteen (14) individually metered water systems in the city. Together they make up the following statistics:

Total kilometres of mains			-	314
Hydrants	-	City owned	-	1553
		Private	-	155
		Total	-	1708
Water Services			-	13193
Sprinkler Services			-	198
Total storage, ML			-	58

Detailed system descriptions follow:

South Fredericton Low Level System

This system services the south side of the city below elevation 38 m near Kings College Road and from Monteith Drive to the Fredericton Boat Club on the Lincoln Road. Its water supply is received from eight (8) wells; four (4) in Wilmot Park, the fifth, sixth, and seventh located at Saint Anne's Point, and the eighth, an emergency well, located opposite Angelview Court on Woodstock Road.

The seven (7) active wells pump water through the Water Treatment Plant and into the system. Pressure control and storage is provided by two 9090 kL in-ground reservoirs on Smythe Street.

Ten (10) other separately metered systems are directly or indirectly supplied by this system:

South Intermediate System
South High Level System
Rosewood System
Lincoln System
Canterbury System
Golf Club Road System
Hanwell System
North Low System
North High System
Rainsford System

An eleventh area, Vanier South, is separate but not metered. It is supplied through a P.R.V. from the South High Level System.

South Intermediate System

This system serves an area generally bounded by elevation 38 m, elevation 76 m, Odell Park, and the eastern side of the University of New Brunswick. The water is received via the Smythe Street booster station from the low level system. Pressure control and storage are provided by two 4540 kL reservoirs with a top water level of 105.6 m. These are located in Odell Park at Montgomery Street.

South High Level System

The Montgomery Street booster draws water from the intermediate system to supply the area above elevation 76 m. The south high level system stretches from Hanwell Road to Kimble Road, and extends to the City Depot on Regent Street. Pressure control and storage is provided by two (2) 2300 kL reservoirs, one at the top of Smythe Street and a second one at the top of Regent Street. Both have a top water level of 146.1 m.

Hanwell System

A section of Hanwell Road, the upper reaches of Colonial Heights, and Cameron, Foley, Burnham and Eagle Courts, are served by the Hanwell system. Supply is via an altitude valve from the south high system, and a 460 kL reservoir with a top water elevation of 81.9 m is connected to the system above Cameron Court. A well on Cameron Court provides emergency supply.

Canterbury System

The Canterbury system is supplied from the South High System through a meter and altitude valve at Canterbury Drive. This valve maintains the water level within the Canterbury reservoirs at 99.76 m. These reservoirs, with a total capacity of 1070 kL, serve lower Skyline Acres, Dunns Crossing Road, and the area eastward to and including Wetmore Road. This area contains the former Flemming water system, which was connected in 1989. Emergency water supply is available to this system from the Lincoln water system via two electric pumps at the Flemming booster station.

Golf Club Road System

This system serves the general area of Golf Club Road and Glengarry Place. It works similarly and serves the same elevations as the south intermediate system, but presently has no storage. The system receives water from the south high system through a pressure reducing valve assembly near the Prospect/Hanwell intersection which is capable of providing reasonable fire protection.

Rainsford Park System

This system supplies the Rainsford Park subdivision only, and has no reservoir. Prior to 1983 this system was privately owned. 1991 construction provided a tie between this system and the Golf Club Road system. The connection, which was activated on 1992-01-20, provides domestic flows through a small booster station and lower pressure fire flows through a check valve. Fire hydrants were installed in 1991. The original well and pressure tanks still serve as emergency supply and control.

Rosewood System

The Rosewood booster station pumps water from the low level system for use by the upper elevations of the Rosewood and Monteith subdivisions. As the Rosewood system has no reservoir, a jockey pump system has been installed to maintain pressures.

Lincoln System

This system receives its supply from the low level system, through the Lincoln booster station situated across from the Fredericton Boat Club on Lincoln Road.

The system, which extends almost to the City boundary and includes the Vanier Industrial Park and the Wilsey Road area, is served by the 3750 kL reservoir on Flemming Road. The top water level is 85.45 m.

Silverwood System

Silverwood is supplied by two wells; one at the intersection of Mountain Drive and Fairview Drive; and another above Silverwood outside the City limits. The two celled reservoir on the top of the system holds 2250 kL and has a top water elevation of 134 m. Presently, for better turn-over of storage, only one cell is in use. Pressure control valves halfway down Orchard Drive and Fairview Drive separate the system into two parts, allowing both to develop reasonable static pressures.

North Fredericton Low Level System

In November 1987, the St. John River Crossing water main was activated, and this system began receiving water from the south low system. There are also five (5) wells available on emergency standby duty to serve this system. A sixth well, Greenwood Well #1, was demolished in 1992.

As well, a pressure reducing valve can provide water to the North Low System from the North High System on an emergency basis.

The system serves all areas of north Fredericton below elevation 37 m. Four reservoirs, all with a top water elevation of 57.9 m float on the system. These are:

Highland Avenue Reservoir	-	4500 kL
Longwood Reservoir #1	-	1300 kL
Longwood Reservoir #2	-	1500 kL
Dewitt Reservoir	-	1140 kL

With the commissioning of the Longwood booster station on 1990 12 09, this system now provides water to the north Fredericton high level system.

A check valve separates this system and the Marysville system to provide water to a limited portion of Marysville should its well supply fail.

North Fredericton High Level System

Until 1991-12-09 this system received its supply from two wells situated on the west side of St. Mary's Street, 2.8 km north of Maple Street. On that date, the new Longwood booster station was commissioned, providing water from the north low system. Storage for the north high level system is provided by a 3800 kL reservoir on the south side of Killarney Lake with a top water elevation of 97.3 m. This system serves upper St. Mary's Street and Nashwaaksis above elevation 38 m.

Marysville System

Marysville has two wells on Tower Road and an emergency supply well on McGloin Street. A 6600 kL reservoir with a top water elevation of 78.8 m allows the system to serve the Marysville area between elevations 14 m and 52 m. A booster station is presently under construction at 1 Canada Street. This will provide water to this system from the North Low System after its completion in 1996.

Tables

The following pages provide the pumpage from the Wilmot Park Wells, the Net System Demands, the Annual Chemical Dosages and costs for the Water Treatment Plant.

1995 PUMPAGE - WILMOT PARK WELLS, ML

MONTH	WELL 1	WELL 2	WELL 3	WELL 4	WELL 5	WELL 6	WELL 7	MONTHLY
January	160	110	53	2	133	78	138	675
February	158	135	61	10	0	69	168	600
March	102	115	28	1	125	151	130	652
April	142	128	0	0	114	138	129	652
May	85	26	163	0	68	173	143	660
June	90	52	163	0	46	188	149	689
July	144	118	121	3	0	163	146	695
August	159	144	91	24	49	104	113	684
September	132	119	63	14	143	137	69	676
October	148	141	103	0	65	140	83	680
November	107	34	85	48	170	137	72	654
December	111	146	82	24	57	86	144	650
TOTALS	1538	1268	1018	128	970	1564	1484	7967

1995 NET SYSTEM DEMANDS, ML

SYSTEM ZONE	QUARTERS, 1995					AVERAGE DAILY DEMAND
	1ST	2ND	3RD	4TH	TOTALS	
SOUTH LOW	935	952	985	822	3693	10.2
SOUTH INTERMEDIATE	176	168	191	188	723	2.0
SOUTH HIGH	297	281	249	240	1068	2.9
CANTERBURY	85	87	84	79	335	0.9
LINCOLN	58	63	74	63	257	0.7
ROSEWOOD	11	11	10	10	41	0.1
GOLF CLUB ROAD	12	13	17	19	60	0.2
HANWELL	9	11	11	9	39	0.1
RAINSFORD PARK	4	4	4	4	16	0.5
SILVERWOOD	14	16	17	14	61	0.2
NORTH LOW	205	266	275	395	1142	3.2
NORTH HIGH	77	83	89	90	340	0.9
MARYSVILLE	100	100	91	91	383	1.1
QUARTERLY TOTALS	1983	2055	2098	2024	8160	22.5

FREDERICTON WATER TREATMENT PLANT
CHEMICAL DOSAGE AND COSTS, 1995

CHEMICAL	UNIT COST $/t	ANNUAL USAGE, t	ANNUAL COST	DOSAGE mg/L	COST / ML OF WATER	COST / DAY
CHLORINE	850	25	22 000	3.18	2.84	60.00
SULPHUR DIOXIDE	249	4	10 500	0.50	1.37	29.00
LIME	120.54	177	23 000	22.19	2.99	63.00
SODA ASH	303.50	33	10 600	4.09	1.38	29.00
TOTALS			**66 000**		**8.58**	**181.00**

NOTES:
(1) DOSAGES ARE BASED ON PLANT INFLUENT: 7970 ML
(2) COSTS / ML ARE BASED ON PLANT EFFLUENT: 7680 ML

WATER QUALITY - 1995

GENERAL

Fredericton's Water Treatment Plant was put into service in July 1984, and with the commissioning of the pipeline to Fredericton North in late 1987, and the commissioning of the Longwood Booster Station in late 1990, is now treating approximately 95% of the City supply. The plant removes iron and manganese and raises the pH to approximately 8 pH units, thus reducing the damage by corrosion to the water system, and controlling the leaching of harmful heavy metals from plumbing. The chlorine content of the treated water is 1.0 - 1.4 mg/L as it leaves the Water Treatment Plant measured as free chlorine. This water is odourless, colourless, and has an agreeable taste.

Layers of biofilm, manganese, and corrosion byproducts left in parts of the distribution system by less treated water supplies tend to decrease the free chlorine residual until their own chlorine demand is satisfied. When the resultant chlorine residual is low, reaction byproducts with chemical or bleach like odours can be sensed by the public. As chlorine residuals have continued to rise throughout the systems served by the Water Treatment Plant, complaints concerning objectionable tastes and odours have continued to decrease.

Breakpoint chlorination began in Silverwood during March of 1988, and in the Killarney and Marysville water systems during May 1989. As chlorine residuals made their way through the systems, some taste and odour complaints were received. These have also continued to decrease.

BACTERIAL ANALYSIS

Coliform bacteria counts are accepted as a good index of the degree of bacteriologic safety of water. Although they are not themselves disease producers, coliform bacteria are found in densities roughly proportional to the degree of fecal pollution in polluted water. When members of the coliform group are present, other kinds of microorganisms capable of causing disease may also be present. The absence of coliform bacteria from water is an indication that that water is bacteriologically safe for human consumption, since coliform bacteria are more hardy than disease-causing bacteria.

Thirteen (13) locations related to supply and treatment, 25 distribution system locations, and 10 emergency supply wells are each sampled by water operators, once per month. All samples are tested for total coliform by the membrane filtration technique, by the water operators, and results are monitored by Health and Community Services.

The test results indicated that all water which was delivered was biologically safe. Further, tests done in conjunction with sampling indicate that a stable free chlorine residual was maintained within the distribution system.

WATER QUALITY - 1995

INORGANIC ANALYSIS

Most recent samples for inorganic analysis were taken from wells and the distribution system in April, 1995 and analysed by Environment New Brunswick's laboratory. Results are displayed on the following page. All water delivered to the distribution system meets the Guidelines for Canadian Drinking Water Quality, Health & Welfare Canada.

One column concerning annual pumpage is added for quick reference.

ORGANIC ANALYSIS

The eleven active wells, Water Treatment Plant influent and effluent, and four distribution system locations were sampled and analysed for 15 organic contaminants in April, 1995. With the exception of a low level of trihalomethanes, a byproduct or chlorination, no contaminants were detected.

WATER ANALYSES
1995 04 12

	HARDNESS (CaCO3)	N mg/L	AL ug/L	ALK.TOT (CaCO3)	As ug/L	Ca mg/L	Cd ug/L	CL mg/L	Cond. us/cm	Cu mg/L	F mg/L	Fe mg/L	Hg ug/L	K mg/L	Mg mg/L	Mn mg/L	Na mg/L	N mg/L	Pb ug/L	PH PH Units	Rn Bq/L	S04 mg/L	Turb NTU	U ug/L	Zn mg/L	1995 PUMPAGE
Wilmot 1	73.6	0.160	2.8	59.4	1.	24.2	0.1	15.8	198.	0.021	0.119	0.002	0.05	1.06	3.2	1.304	9.9	0.16	0.0	7.06	28.7	11.1	0.0	0.2	0.016	1540.0
Wilmot 2	82.8	0.430	17.2	45.9	1.	26.4	0.1	35.0	251.	0.006	0.120	0.109	0.05	0.89	4.1	2.37	14.5	0.43	0.0	6.57	14.9	22.09	0.4	0.1	0.050	1270.0
Wilmot 3	158.5	0.980	2.9	97.0	2.	53.1	0.1	55.5	421.	0.009	0.106	0.040	0.05	3.00	6.3	0.063	20.8	0.98	0.0	7.09	25.6	31.1	0.1	0.7	0.054	1020.0
Wilmot 4	88.8	3.400	2.2	38.4	1.	29.8	0.1	73.3	393.	0.009	0.087	0.073	0.05	3.22	3.5	0.012	40.5	3.4	0.0	6.68	29.1	32.9	0.5	0.1	0.034	130.0
Wilmot 5	54.3	0.140	6.3	48.1	1.	18.1	0.0	4.44	130.	0.008	0.105	0.011	0.05	0.82	2.2	0.580	4.5	0.14	1.8	7.06	22.8	10.4	0.0	0.1	0.070	970.0
Wilmot 6	49.8	0.290	6.2	41.3	1.	16.5	0.0	6.94	117.	0.009	0.136	0.009	0.05	0.49	2.1	0.343	4.1	0.29	0.6	7.02	18.6	7.39	0.0	0.1	0.017	1560.0
Wilmot 7	55.2	0.80	3.6	47.5	1.	18.0	0.0	4.90	127.	0.012	0.167	0.028	0.05	0.50	2.5	0.61	4.0	0.08	0.1	6.99	23.8	8.19	0.1	0.1	0.018	1480.0
WTP (INFLU)	48.4	0.280	6.9	42.6	1.	16.1	0.02	3.12	118.	0.159	0.149	0.013	0.5	0.62	2.0	0.357	4.1	0.28	2.6	6.93	18.4	9.15	0.4	0.1	0.001	
WTP (EFFLU)	70.1	0.290	18.6	59.1	1.	24.6	0.04	7.08	158.	0.006	0.150	0.010	0.5	0.57	2.1	0.008	4.7	0.29	0.0	8.47	17.5	9.60	0.1	0.1	0.000	
Silverwood 2	146.6	0.960	10.2	120.	1.	32.5	0.0	35.4	357.	0.003	0.098	0.030	0.05	0.60	15.9	0.002	23.0	0.96	0.3	7.70	60.1	15.3	0.6	0.3	0.135	10.0
Silverwood 3	98.0	0.040	9.6	87.2	1.	22.6	0.0	6.31	191.	0.006	0.078	0.019	0.05	0.33	10.1	0.00	3.8	0.04	1.1	7.79	64.8	6.53	0.7	0.2	0.038	52.0
Tower Rd. 1	102.4	0.020	1.8	72.7	1.	35.4	0.0	11.0	262.	0.012	0.164	0.006	0.05	0.42	3.4	0.021	13.0	0.02	0.1	7.55	57.7	39.1	0.3	0.2	0.023	142.0
Tower Rd. 2	96.3	0.080	1.7	69.9	1.	31.8	0.0	27.5	255.	0.003	0.133	0.009	0.05	0.49	4.1	0.00	14.7	0.08	0.0	7.46	67.8	18.1	0.0	0.2	0.010	241.0
McGloin St.	NOT SAMPLED, SAMPLED EVERY TWO YEARS																									
Cliffe St.	NOT SAMPLED, SAMPLED EVERY TWO YEARS																									
Duval	NOT SAMPLED, SAMPLED EVERY TWO YEARS																									
Highland	NOT SAMPLED, SAMPLED EVERY TWO YEARS																									
Maple 1	NOT SAMPLED, SAMPLED EVERY TWO YEARS																									
Maple 3	NOT SAMPLED, SAMPLED EVERY TWO YEARS																									
K1 Well	NOT SAMPLED, SAMPLED EVERY TWO YEARS																									
K10 Well	NOT SAMPLED, SAMPLED EVERY TWO YEARS																									
Hanwell	NOT SAMPLED, SAMPLED EVERY TWO YEARS																									
Bunker (DIS)	98.3	0.070	0.0	69.4	1.	32.6	0.0	25.8	258.	0.037	0.137	0.014	0.05	0.48	4.1	0.001	14.4	0.7	0.2	7.27	50.2	20.2	0.0	0.2	0.008	
Silverwood Motel (DIS)	9.4	0.120	9.3	100.	1.	2.2	0.0	7.38	229.	0.040	0.079	0.022	0.05	0.08	0.96	0.00	52.4	0.12	0.2	8.02	32.3	9.88	0.5	0.2	0.005	
St. Mary's (DIS)	98.2	0.220	22.2	78.9	1.	34.2	0.0	17.4	241.	0.012	0.128	0.004	0.05	0.86	3.1	0.003	9.9	0.22	0.0	8.08	16.1	13.2	0.1	0.2	0.002	
Rehab (DIS)	94.9	0.220	18.7	75.8	1.	33.1	0.0	14.9	230.	0.028	0.128	0.004	0.05	0.83	2.97	0.006	9.33	0.22	0.8	8.05	12.9	12.8	0.0	0.1	0.009	
York Manor (DIS)	102.1	0.230	19.7	78.4	1.	35.6	0.0	17.3	240.	0.021	0.128	0.007	0.05	0.75	3.2	0.007	9.9	0.23	0.0	8.14	19.1	14.4	0.2	0.2	0.001	

Also Tested:

Antimony - All less than 0.1 ug/L
Boron - All less than 0.02 mg/L
Barium - All less than 0.95 mg/L
Chromium - All less than 0.4 ug/L
Selinium - All less than 1.0 ug/L

(DIS) - Sampled from Distribution System