

APPENDIX F

Flow Tables

TABLE OF CONTENTS

| | |
|---------------------------------------|------|
| General..... | F-1 |
| Institutional..... | F-4 |
| Medical/Personal care..... | F-4 |
| Schools..... | F-5 |
| Prison..... | F-6 |
| Food Service..... | F-6 |
| Commercial..... | F-8 |
| Commercial Shopping..... | F-9 |
| Commercial Automobile..... | F-10 |
| Commercial Hospitality..... | F-10 |
| Industrial Office..... | F-11 |
| Recreational Camping..... | F-12 |
| Parks Beaches Picnic Grounds..... | F-13 |
| Country Club..... | F-13 |
| Recreational General..... | F-14 |
| Recreational Sport..... | F-15 |
| Miscellaneous..... | F-16 |
| Approximate Flushing Frequencies..... | F-16 |

Appendix F

1. The individual on-site sewage disposal system shall be designed and constructed to adequately treat and dispose of the expected maximum flow of sewage.
2. The disposal system must be designed to receive all sewage from the building or structure except cooling water, roof, foundation or surface drains or backwash from water treatment devices, unless otherwise approved by Nova Scotia Environment. Backwash from water treatment devices add an extra hydraulic load and may create additional concerns depending on the specific treatment technology. Discharge of this backwash to an on-site sewage disposal system is only recommended if the system has been specifically designed by a professional engineer to accept the specific discharge.
3. The minimum design sewage flow from any residential structure or dwelling shall be 1000 L/day. When it is anticipated that the sewage flows from the dwelling or structure will exceed the 1000 L/day minimum, it is recommended that the sewage flows as indicated in the following Table F1 be utilized:

| Table F1 Residential Flows | |
|---|-----------------------------------|
| Number of Bedrooms | Average Daily Flow (L/Day) |
| 3 bedroom unit or less | 1000 |
| 3 bedroom with high water use fixtures | 1200 |
| 4 bedroom unit | 1350 |
| 4 bedroom unit with high water use fixtures | 1500 |
| each additional bedroom | 350 |
| each additional bedroom unit with high water use fixtures | 500 |

When the occupancy of a dwelling unit exceeds two persons per bedroom, it is recommended that the sewage flow be determined by adding 175 L/day of sewage flow for each additional person.

4. The minimum design sewage flow from any multi unit residential structure or dwelling such as, apartments, condominiums, cottages, hotels, etc., shall be 1000 L/day. When it is anticipated that the sewage flows from the dwelling or structure will exceed the 1000 L/day minimum, it is recommended that the sewage flows as indicated in the following Table F2 be utilized:

| Table F2 Multi Unit Residential Flows | |
|--|-----------------------------------|
| Unit Type | Average Daily Flow (L/Day) |
| For the first 3 bedroom unit or less | 1000 |
| For each addition unit the following flow rates shall be utilized: | |
| - 1 bedroom unit | 500 |
| - 2 bedroom unit | 750 |
| - 3 bedroom unit | 1000 |
| - 4 bedroom unit | 1500 |
| - each additional bedroom | 500 |

5. Industrial wastewater shall not be discharged into on-site sewage disposal systems designed for sanitary sewage disposal unless prior approval is obtained from Nova Scotia Environment. Special designs or pretreatment may be required for industrial waste-water.
6. All restaurants or other establishments involved in food preparation activities shall install external grease traps when required by Nova Scotia Environment.
7. The design sewage flows from other residential, commercial, industrial and institutional buildings or structures should be based on the design wastewater flows prescribed in Table F3 of this appendix. The minimum design flow from other residential, commercial, industrial and institutional buildings or structures shall be 500 L/day. In the case where a minimum design flow of 500L/day is utilized; the minimum system length must be at least 12.5 meters.
8. Where actual metered flow data indicating maximum daily flows are available, such flow data may be substituted for the sewage flows listed in this appendix, under the following conditions:
- The minimum design flow for a residential structure is 1000 L/day and from commercial, industrial and institutional buildings or structures is 500 L/day.

- They should cover the most recent 6-12 month period of continuous operation (or 3 full seasons).
 - They must be from the same or a similar facility.
(Size, activity, geographical location, open hours, production or occupancy volume, usage pattern, etc.)
 - A 20 to 50 percent increase factor should be used in the design flow to accommodate potential future flow increases, occasional peaks, etc.
 - If less than 6-12 months of flow data is available, or only average flows for entire measured period exists (*i.e no daily readings only average for the entire period*), they should be increased by up to 100 percent in the design (or seasonal activity)
 - Flow meter data should also include information regarding actual occupancy or production volume when unit flows are calculated.
9. A reduction in the design flows may be allowed by Nova Scotia Environment when permanent low-volume devices are to be installed in the proposed building or structure. However, in no case shall the design flow from a residential building be less than indicated in Table F1 or F2 unless it is related to a malfunctioning system and the lot size cannot accommodate the installation of a system to handle the flows as required by Table F1 or F2. Manufacturer's data sheets should be presented on all water saving plumbing devices proposed for use with on-site sewage disposal systems. Consideration will include contribution of water saving devices to total flow, safety factor.
 10. When the total length of sewer between building and disposal bed exceeds 200 meters the design flow should include allowance for infiltration.
 11. Design flows in this appendix are recommended minimal design flows and if evidence of larger flows exist or are expected, the larger flows should be used.
 12. In many cases the tables provide several flow rates for the same/similar activity (examples: church halls, restaurants, etc) and the qualified person must decide which of the flows provided in the tables is most representative for the specific design. If there is a question related to which flow rate is most appropriate, Nova Scotia Environment will have the final decision.

| TABLE F3 DESIGN WASTEWATER FLOWS | | | |
|--|----------------------------|--------------------------------|-----------------|
| Facility | Unit of measure | Minimum design flow | Comments |
| | | Litres | |
| Institutional | | | |
| Assembly Halls: No kitchen or meals | person | 8 | |
| Assembly Halls: With varying facilities | person | 9 | |
| Churches With kitchen | seat | 26 | |
| Churches No kitchen | seat | 9 | |
| Churches Kitchen & paper service | meal | 4.5 | |
| Churches Kitchen & normal service | meal | 13.5 | |
| Churches Suppers | person | 45 | |
| Fire station Without full time employee, floor drains or food | person | 19 | |
| Town Hall | seat | 19 | |
| Medical/personal care | | | |
| Hospital | bed | 409 | |
| Hospital Including laundry | bed | 750 | |

| TABLE F3 DESIGN WASTEWATER FLOWS | | | |
|--|------------------------|----------------------------|-----------------------------|
| Facility | Unit of measure | Minimum design flow | Comments |
| | | Litres | |
| Hospital Excluding laundry | bed | 550 | |
| Hospital mental | bed | 340 | |
| Hospital mental Add per employee | employee | 23 | |
| Special care home | resident | 136 | |
| Special care home Add per employee | employee | 45 | |
| Medical Office Doctors nurses medical staff | person | 273 | |
| Medical Office Office staff Add | person | 73 | |
| Medical Office Patient Add | person | 23 | |
| Dental Office | chair | 757 | |
| Dental Office Staff Add | person | 132 | |
| Schools | | | |
| School Cafeteria & gym & shower | student | 60 | Add to base flow for school |
| School Cafeteria only | student | 30 | Add to base flow for school |
| School Gym with showers only | student | 30 | Add to base flow for school |
| School Elementary - washrooms only | student | 26 | |

| TABLE F3 DESIGN WASTEWATER FLOWS | | | |
|--|------------------------|----------------------------|-----------------|
| Facility | Unit of measure | Minimum design flow | Comments |
| | | Litres | |
| School High - washrooms only | student | 45 | |
| School Junior high - washrooms only | student | 34 | |
| School Boarding Resident student | student | 136 | |
| School Boarding Non-resident staff | person | 50 | |
| Prison | | | |
| Prison | inmate | 136 | |
| Prison Add for personnel | employee | 23 | |
| Food Service | | | |
| Bakery - Sanitary Only | employee | 68 | |
| Bar/Longue | customer | 8 | |
| Bar/longue | seat | 125 | |
| Restaurant Not 24 hr | meal | 9 | |
| Restaurant Not 24 hr | seat | 31 | |
| Restaurant Auto dishwasher - Add | seat | 12 | |
| Restaurant 24hr dishwasher and/or food waste disposer | seat | 23 | |

| TABLE F3 DESIGN WASTEWATER FLOWS | | | |
|--|--------------------------------|----------------------------|-----------------|
| Facility | Unit of measure | Minimum design flow | Comments |
| | | Litres | |
| Restaurant 24 hr | seat | 189 | |
| Restaurant 24 hr highway | seat | 265 | |
| Restaurant 24 hr highway & showers | seat | 400 | |
| Restaurant Highway (not 24 hr) Kitchen & toilet waste only | seat | 113 | |
| Restaurant Highway (not 24 hr) Kitchen & toilet waste only | patron | 30 | |
| Restaurant Highway (not 24 hr) Kitchen waste only | meal | 11 | |
| Restaurant Banquet rooms-each banquet | seat | 30 | |
| Restaurant Drive in | seat | 125 | |
| Restaurant Drive in, all paper | car space | 57 | |
| Restaurant Drive in all paper inside seat | seat | 57 | |
| Taverns/Bars/Longues with minimal food service | seat | 76 | |
| Night Club/Restaurant | seat | 113 | |
| Restaurant/Dinning rooms/Dinning longues | square foot of dinning area | 9 | |

| TABLE F3 DESIGN WASTEWATER FLOWS | | | |
|--|-----------------------------|----------------------------|-----------------|
| Facility | Unit of measure | Minimum design flow | Comments |
| | | Litres | |
| Take-Out | square foot (total area) | 2 | |
| Banquet and Dinning rooms | Meal | 18 | |
| Caterers | patron | 45 | |
| Cafeteria | customer | 4.5 | |
| Coffee Shop | customer | 19 | |
| Coffee Shop Add per employee | employee | 36 | |
| Dinning Halls | meal | 18 | |
| Commercial | | | |
| Airport | passenger | 9 | |
| Airport Add for each employee | employee | 41 | |
| Beauty salon | station | 400 | |
| Beauty salon Add for personnel | person | 38 | |
| Veterinary clinic(3 doctors or less) - No boarding | total | 2900 | |
| Veterinary clinic(3 doctors or less) - Boarding | total | 5700 | |
| Dog kennel | enclosure | 73 | |
| Laundromat Self serve | machine | 1514 | |
| Laundromat Per wash | wash | 168 | |

| TABLE F3 DESIGN WASTEWATER FLOWS | | | |
|--|-----------------------------|----------------------------|-----------------|
| Facility | Unit of measure | Minimum design flow | Comments |
| | | Litres | |
| Laundromat In apartment building | machine | 1135 | |
| Commercial/Shopping | | | |
| Department store | toilet room | 1513 | |
| Department store | employee | 36 | |
| Shopping center No food, laundry | parking space | 4 | |
| Shopping center | employee | 40 | |
| Shopping center Washrooms only | square metre of store space | 5 | |
| Shopping center Toilet rooms | each | 1665 | |
| Shopping center Excluding café and laundry | l/square metre | 7 | |
| Shopping center Large dry goods | l/square metre | 2 | |
| Shopping center Large supermarket & meat department, no garbage grinder | l/square metre | 3 | |
| Shopping center Large supermarket & meat department, no garbage grinder | l/square metre | 5 | |
| Shopping center Small dry goods store | each | 379 | |
| Convenience Store Only (No Food Preparation) | each | 500 | |

| TABLE F3 DESIGN WASTEWATER FLOWS | | | |
|---|----------------------------|--------------------------------|--------------------------------|
| Facility | Unit of measure | Minimum design flow | Comments |
| | | Litres | |
| Commercial/Automobile | | | |
| Automobile gas station Single hose pump | unit | 568 | Does not include restaurant |
| Automobile gas station Double hose pump | unit | 1136 | Does not include restaurant |
| Automobile gas station Island | island | 1893 | Does not include restaurant |
| Automobile gas station Vehicle served | vehicle | 38 | |
| Car wash | car | 189 | |
| Car wash | truck | 378 | |
| Commercial/Hospitality | | | |
| Motel Bath & toilet only | person | 118 | |
| Motel Full housekeeping | person | 180 | |
| Motel Central bath | person | 150 | |
| Motel | unit | 318 | |
| Motel | housekeeping unit | 454 | |
| Motel Dinning room add | seat | 122 | |
| Motel Bar & lounge add | seat | 68 | |

| TABLE F3 DESIGN WASTEWATER FLOWS | | | |
|---|------------------------|----------------------------|-----------------|
| Facility | Unit of measure | Minimum design flow | Comments |
| | | Litres | |
| Motel Non residential staff add | employee | 40 | |
| Motel Bed & breakfast | person | 227 | |
| Hotel | guest | 136 | |
| Hotel Add for employees | employee | 36 | |
| Boarding house | resident | 150 | |
| Dormitory Bunkhouse | person | 91 | |
| Senior citizen home | resident | 227 | |
| Day Care Centers Staff & children | person | 73 | |
| Industrial/Office | | | |
| Industrial buildings Excluding industrial waste, cafeteria and showers | employee | 45 | |
| Industrial buildings Excluding industrial waste, Including showers | employee | 75 | |
| Heavy Industry Excluding industrial waste, Including cafeteria & shower | employee | 132 | |
| Warehouse | employee | 132 | |
| Industrial Park | acre | 63,644 | |
| Industrial Park | employee | 68 | |

| TABLE F3 DESIGN WASTEWATER FLOWS | | | |
|---|--------------------------------------|----------------------------|-----------------|
| Facility | Unit of measure | Minimum design flow | Comments |
| | | Litres | |
| Office No cafeteria | employee | 50 | |
| Office Including cafeteria | employee | 76 | |
| Town offices Office employees | employee | 57 | |
| Town Offices Transients | person | 19 | |
| Unspecified office space | square metre | 6 | |
| Recreation/Camping | | | |
| Campgrounds Tents only | site | 181 | |
| Campgrounds Trailers water& electrical | site | 227 | |
| Campgrounds Trailers water & sewer & electrical | site | 284 | |
| Campgrounds with central comfort stations | add for dump station per space | 20 | |
| Cabin resort | person | 159 | |
| Day camps No meal | person | 38 | |
| Day camps Meals | person | 68 | |

| TABLE F3 DESIGN WASTEWATER FLOWS | | | |
|--|------------------------|----------------------------|--|
| Facility | Unit of measure | Minimum design flow | Comments |
| | | Litres | |
| Day camps Primitive camps | person | 40 | |
| Construction camps Flush toilets | person | 189 | |
| Construction camps No flush toilets | person | 123 | |
| Construction camps Migrant workers-central bathroom | person | 123 | |
| Summer camps | person | 189 | |
| Luxury camps | person | 378 | |
| Work camps | bed | 227 | |
| Cottages & small seasonal dwellings | bedroom | 189 | No washroom, structure is serviced by a central comfort station. Does not include laundry or kitchen |
| Parks & Beaches and Picnic Grounds | | | |
| Picnic & fairgrounds with bath houses showers toilets | person | 38 | |
| Picnic & fairgrounds with toilets only | person | 18 | |
| Beaches with showers & toilets | person | 40 | |
| Visitor Center | person | 23 | |
| Country Clubs | | | |
| Country club Resident present | person | 372 | |

| TABLE F3 DESIGN WASTEWATER FLOWS | | | |
|---|------------------------|----------------------------|-----------------|
| Facility | Unit of measure | Minimum design flow | Comments |
| | | Litres | |
| Country club Non resident | person | 95 | |
| Country club Showers in use | fixture | 1800 | |
| Country club Water closet | fixture | 550 | |
| Country club Lavatory | fixture | 350 | |
| Country clubs Urinals - hand flush | fixture | 350 | |
| Country clubs Showers | person | 40 | |
| Country clubs Day staff - Add | employee | 50 | |
| Recreation General | | | |
| Halls Washrooms only per day in use | square metre | 11 | |
| Halls Restaurants | seat | 15 | |
| Halls Bar | seat | 10 | |
| Halls Including bar & restaurant | patron | 76 | |
| Theatre | seat | 14 | |

| TABLE F3 DESIGN WASTEWATER FLOWS | | | |
|---|------------------------|----------------------------|-----------------|
| Facility | Unit of measure | Minimum design flow | Comments |
| | | Litres | |
| Theatre Drive in - no food | space | 11 | |
| Theatre Drive in - food | space | 23 | |
| Recreation/Sport | | | |
| Bowling Alleys Without bar & restaurant | alley | 105 | |
| Bowling Alleys With bar or restaurant | alley | 800 | |
| Ice rink | seat | 11 | |
| Ice rink Participant Add | person | 38 | |
| Stadium | seat | 14 | |
| Swimming pool | customer | 14 | |
| Swimming pool Area | square metre | 50 | |
| Water Slide Park | visitor | 15 | |
| Gym Participant | person | 38 | |
| Gym Spectator | person | 11 | |
| Tennis/Racquetball Excluding food | court | 946 | |
| Ski areas Without cafeteria | person | 38 | |

| TABLE F3 DESIGN WASTEWATER FLOWS | | | |
|---|------------------------------------|----------------------------|-----------------|
| Facility | Unit of measure | Minimum design flow | Comments |
| | | Litres | |
| Ski areas With cafeteria | person | 57 | |
| Outdoor sport facilities Toilet waste only | person | 19 | |
| Miscellaneous | | | |
| Floor drains | unit | 189 | |
| Catch basins Garages, service stations etc | unit | 375 | |
| Approximate Flushing Frequencies | | | |
| Residential | 5 flushes per resident per day | | |
| Schools | 2 flushes per student per day | | |
| Hotel/Motel room | 4-6 flushes per guest per night | | |
| Restaurant | 0.5 flushes per meal per day | | |
| General commercial | 2-4 flushes per employee per 8 hr. | | |
| Industrial | 3 flushes per employee per 8 hr | | |
| Ski Areas | 1 flush per skier per day | | |
| Campgrounds with facilities | 3 flushes per person per night | | |
| Public Restrooms Stay under 05 hr. | 0.4 flushes per visitor per hr | | |
| Public Restrooms Stay from 05 hr. To 1 hr | 0.6 flushes per visitor per hr | | |
| Public Restrooms Stay from 1 to 2 hr. | 0.8 flushes per visitor per hr | | |
| Public Restrooms Stay over 2 hr. | 1.0 flushes per visitor per hr | | |