

Indian Programs

Volume 1

Capital Facilities and Maintenance

Water and Sewage Systems

1.0 Purpose

1.1 This directive states the policy of the Department of Indian Affairs and Northern Development (DIAND) on water and sewage systems on reserves. The related levels of service standard (Appendix A), determined on a national basis, are the levels of service that DIAND is prepared to financially support to assist First Nations in providing community services comparable to the levels of service that would generally be available in non-native communities of similar size and circumstances.

1.2 This document supersedes DRM10-7/40 Water Supply and Distribution, DRM 10-7/41 Wastewater Collection, Treatment and Disposal and PD 6.1 Level of Service Standards - Water and Sewage Systems.

2.0 Scope

2.1 This directive is applicable to DIAND staff involved in providing funding and assisting with water and sewage systems services in First Nation communities.

3.0 Authorities

3.1 Treasury Board Specific Authority considered through the 1990-91 Fall Multi-Year Operational Plan Review - Long Term Capital Plan and attached Memorandum of Understanding and Annexes.

4.0 Issuing Authority

4.1 This directive is issued under the authority of the Assistant Deputy Minister, Socio-Economic Policy and Programming and Program Re-design.

5.0 Definitions

5.1 Cost Effectiveness: Cost effectiveness is the relationship between the cost of an asset or services as determined by Life Cycle Costing (LCC) study and how well it meets the intended objective or benefit. In other words, to be effective, a facility should be economical to develop and be able to provide anticipated continuous service over a period of time.

5.2 Housing Density: The number of housing units per hectare/acre of net residential land.

5.3 Life Cycle Costing (LCC): LCC is a mathematical procedure which describes the total costs (e.g. construction, operation, maintenance, major maintenance and disposal) of an asset in terms of a present value which reflects the effects of monetary interest and price escalation. A LCC analysis provides a hypothetical method of comparing competing options on the basis of which alternative makes the better economic sense in terms of total costs.

5.4 Net Residential Land: Land devoted to residential buildings and access to them including informal open space, drives and service areas. This excludes land for streets, playgrounds, hydro rights-of-way, gas pipelines, easements, land used or designated for commercial or institutional use, and land within a residential area that is economically and/or environmentally unsuitable for use due to the presence of bedrock, swamp, steep slopes, etc.

5.5 Sewage System(s): This includes collection systems and treatment facilities and can normally consist of lift stations, force mains, outfalls, house service connections, septic tanks and tile fields, storage tanks, low pressure and grinder systems, small bore sewer, truck-haul systems (includes tankage and pressurization) and various types of mechanical and natural treatment facilities. For the purpose of this document, the sewage systems exclude plumbing and the associated fixtures within all buildings (except those buildings associated with the system itself).

5.6 Water System(s): This includes wells, supply lines, intakes, pumping stations, treatment plants, piping and related components, hydrants, house service connections, trucking, storage reservoirs and appurtenances. For the purpose of this document, the water systems exclude plumbing and the associated fixtures within all buildings (except those buildings associated with the system itself).

5.7 Community Well: A well servicing five (5) and more houses in close proximity (i.e. cluster housing). It includes the well, pump and associated piping. For purposes of this document, the well excludes the indoor water lines and associated fixtures within all buildings (except those associated with the community well itself).

6.0 Policy

- 6.1 Subject to the availability of funds and departmental priorities, DIAND provides funding assistance through the capital and facilities operation and maintenance program to First Nations for construction or reconstruction of water and sewage systems for on-reserve housing units and administrative, operative, institutional and recreational buildings.
- 6.2 Regions will implement this directive within regional resource levels.
- 6.3 In accordance with Paragraphs 6.1 and 6.2, DIAND will fund water and sewage systems as outlined in Appendix A.
- 6.4 Funding is contingent on the existence of a First Nation's approved community physical development plan which is supported by the chief and council.
- 6.5 Proposals for new or upgraded water systems must satisfactorily address the disposal of the wastewater generated by such systems.
- 6.6 In all cases involving decisions on the level of service for community water and sewage systems, a complete analysis shall be made of the LCC, normally for a 20 year period, of all practical options which satisfy the basic health, safety and environmental concerns. Only the systems which satisfy the foregoing and which are the most cost-effective will be funded by DIAND.
- 6.7 Extensions to the existing piped systems shall not be funded until the First Nation's inventory of unused serviced lots is equal to or less than a two (2) year supply based on housing forecasts. In such cases, for calculation purposes, the existing supply of unused lots shall be considered part of the total lot requirement for system extension. After extension of the piped system, the total number of unused serviced lots, either residual inventory or new, shall not exceed the First Nation's eight (8) year projection of lot requirement.
- 6.8 Subject to approval and availability of funds, DIAND will provide First Nations with operation and maintenance funding assistance for community water and sewage systems in accordance with the departmental policy on operation and maintenance.
- 6.9 First Nations desiring a level of service which is higher than those provided for in Appendix A may provide such upgraded service with capital and related operational and maintenance funds obtained from their own or other sources.

6.10 This policy does not preclude more than one level of services in a community where some First Nation members choose to live in other than planned residential areas.

6.11 On-reserve commercial, including economic development residential subdivisions, industrial facilities, and off-reserve interests serviced by water and sewage systems financially supported by the department shall cost-share, when it is cost effective to implement, the additional capital and O&M cost to cover the expenses to provide these water and sewage services.

6.12 All proposed new water and sewage systems will be required to meet:

- (a) the relevant sections of the National Building Code standards (current edition);
- (b) the current edition of the Guidelines for Canadian Drinking Water Quality, Health Canada;
- (c) the current edition of the Guidelines for Effluent Quality and Wastewater Treatment at Federal Establishments, Environment Canada;
- (d) the Provincial/Territorial guidelines and regulations except where they are less stringent than those of the federal government.

7.0 Responsibilities

7.1 DIAND:

- (a) negotiates and administers or approves water and sewage funding agreements including municipal funding agreements with First Nations and other organizations;
- (b) ensures approved funding agreements contain the appropriate terms and conditions that establish adherence to the Health Canada guidelines for drinking water, the Environment Canada guidelines for wastewater effluent and other applicable codes, standards, and regulatory requirements;
- (c) ensures compliance by recipients with established funding agreements;
- (d) provides recipients with advice and assistance regarding funding criteria;

(e) establishes and provides the level of O&M funding for water and sewage systems which is based on criteria contained in the departmental policy on operation and maintenance;

(f) provides input and information into reports which are required by central agencies;

(g) cooperates with Health Canada (HC) and Environment Canada (EC) as per the terms specified in the memorandum of understanding in the provision of environmental facilities on Indian reserves and settlements.

7.2 Real Property Services for Indian and Northern Affairs Canada (RPS for INAC) : Subject to the terms specified in the Memorandum of Understanding (April 1, 1987) between DIAND and Public Works and Government Services Canada and subsequent regional and headquarters annual specific services agreements, RPS for INAC will provide knowledgeable advice on water and sewage systems to DIAND.

8.0 Enquiries

8.1 Matters related to the interpretation of this directive are to be referred to the Director, Community Development Directorate, at DIAND Headquarters.

8.2 Requests for additional copies should be addressed to the Corporate Information Management Directorate at Headquarters.

9.0 Appendices

A - Levels of Service Standard: Water and Sewage Systems

Appendix A

Levels of Service Standard: Water and Sewage Systems

1.0 Purpose

1.1 The levels of service standard, determined on a national basis, are the levels of service that the Department of Indian Affairs and Northern Development (DIAND) is prepared to financially support to assist First Nations in providing community services comparable to the levels of service that would generally be available in non-native communities of similar size and circumstances.

1.2 The levels of service standard provide a description of criteria which will be used to establish the level of funding for safe, cost-effective, domestic water supply and sewage disposal systems for on-reserve housing units and administrative, operative, institutional and recreational buildings.

2.0 Levels of Service Standard

2.1 The levels of service for water and sewage may consist of one or more of the typical following systems: piped water, intakes, sewers (gravity or low pressure), septic tanks and tile fields, community wells, trucked water, trucked sewage, and connections to adjacent communities via municipal type agreements (MTA's). The choice of combination shall be based on LCC for normally a 20 year period, engineering and planning, health, safety and environmental considerations.

2.2 Watering points will only be considered as an interim measure. A plan for servicing the houses with piped or truck haul water systems must be in place prior to installation of watering points.

2.3 **Fully Piped Water and Sewage Systems:** To be considered or qualified for conventional fully piped water and/or sewage systems, densities shall be a minimum of 7.5 dwelling units per net hectare (3 dwelling units per net acre) and lot frontages shall average no more than 30 metres. In cases where the dwelling units density deviates from this standard, alternative piped water and sewage systems (e.g. small diameter, low pressure water and sewage systems) may be considered if they achieve a LCC comparable to that of conventional fully piped systems designed according to the dwelling units density specified above.

3.0 Design Standards

3.1 The design period for water supply, treatment and distribution systems shall be to service the community for 10 years with provision for expansion to accommodate a 20 year design. The design period for wastewater collection facilities shall meet user requirements for 20 years. Wastewater treatment systems shall be designed and installed in phases. The design period for each phase shall not normally exceed 10 years. Variance in design period shall be justified by a LCC study.

3.2 The daily water quantities made available for design purposes, including adequate fire flows where applicable, shall be calculated and justified by a study of the community needs covered by this policy (see Policy, Section 6.1). Consideration should be given to water and energy conservation, and sustainable development in determining the needs. The minimum daily water quantities made available for design purposes, depending on the delivery method, shall be:

- (a) 90 litres per person for piped water system with watering points;
- (b) 90 litres per person for community truck haul water system to individual homes;
- (c) 180 litres per person for community piped domestic water supply and distribution.

3.3 Maximum peaking factor flow rates for the maximum day shall be 2.5 of the average day and the maximum peaking factor flow rates for the maximum hour shall be 4.0 unless studies show that higher figures are justified.

3.4 When considering the construction of a new water treatment system or the upgrading of an existing system, the design shall take into consideration the conventional water treatment processes of coagulation, flocculation, sand or multi-media filtration and disinfection to protect against the protozoans *Giardia* and *Cryptosporidium* and enteric viruses.

3.5 In the absence of established maximum acceptable concentrations for *Giardia* and *Cryptosporidium* in drinking water, the multiple-barrier approach to treatment including watershed or wellhead protection (where feasible), optimized filtration and disinfection, a well-maintained distribution system and routine monitoring is recommended to reduce the risk of illness. A well operated and maintained conventional treatment system is an effective means of protection against *Giardia* and *Cryptosporidium*. Any special treatment process beyond that provided by a conventional system must be substantiated by an engineering analysis that clearly demonstrates a higher level of treatment is required.

4.0 Environmental Assessment

4.1 An environmental assessment of any proposed water and sewer project, including mitigation measures and monitoring (before, during and after construction), is required in accordance with DIAND environmental guidelines based on the Canadian Environmental Assessment Act (CEAA), and compliance with all other relevant federal-provincial-territorial environmental statutes, such as the Canadian Environmental Protection Act (CEPA), Fisheries Act, etc., as applicable.