A. GENERAL

A.1 Location

Igloolik is situated on Igloolik Island at 69°22'N latitude and 81°46'W longitude. The island is located in the Foxe Basin Lowlands. It is bounded in the north by the Fury and Hecla Strait and is separated from the mainland (Melville Peninsula) to the south by Hooper Inlet.

Igloolik is approximately 360 km northeast of Repulse Bay and 1632 km northeast of Yellowknife.

A.2 History

In 1823 Captain W.E. Parry spent the winter at Igloolik. During the second half of the 19th century, whalers occasionally penetrated into Foxe Basin. In 1937 the Roman Catholic Mission was established. The Hudson's Bay Trading Post followed in 1939. During the 1940's trapping became a major economic activity. By 1959, the addition of a school and new government building led to Igloolik emerging as a settlement of major status in the Baffin region.

A.3 Community Information

Igloolik achieved hamlet status on July 1, 1976. Between 1978 and 1981 the population remained fairly stable with populations of 753 and 746. The economy of the community is based on employment with the Co-op, Hudson's Bay Company, government and hunting. A 1067 m sand runway at an elevation of 51 m ASL is located southwest of the community.

A.4 Geology and Terrain

The island of Igloolik is located in the Foxe Basin region. The glaciers retreated from this region about 5000 years ago.

The island is composed of dolomitic conglomerate with sandstones, dolostone and siltstone occasionally interspersed throughout. The most predominant features on the island are the east and west ridges.

Igloolik is very low, heavily ponded and has extensive tidal foreshore flats. Most surficial deposits are only a veneer on the Palaeozoic beds with raised beached being the most common features. Any drift deposits are subject to extensive frost action. Permafrost is present throughout with the active layer averaging 0.7 m.

A.5 Vegetation

Typical tundra vegetation such as mosses and lichens exist in the region.

A.6 Climate

The climate of Igloolik is distinctly Arctic with January mean high and low temperatures of -23.3°C and -32.8°C. The July mean high and low temperatures are 7.8°C and 3.3°C respectively. The total annual precipitation consists of 190.5 mm of snowfall. The prevailing winds are northeasterly and average 21 km/h. These winds contribute to heavy drifting during the winter.

B. MUNICIPAL SERVICES

B.1 Water Supply

B.1.1 General

Prior to the construction of the new reservoir, the three following sources of water were utilized through the year:

- Airstrip Lake from late May to July after the spring thaw. Its recharge is not sufficient to supply the community year round. In addition, the lake freezes to the bottom in the winter.

- North Lake was the source from July to September. However, it was only used to a limited extent mainly due to its shallow water depth.

- During the winter, East Lake was used. It is 3 m to 6 m deep, and 2.4 km long and has a large capacity. However, it is only accessible by a winter road across Turton Bay.

B.1.2 Source

The source of water for Igloolik is essentially from surface run-off entering South Lake and Airport Lake* located about 4 km from the community. The watersheds are relatively small in area, however, sufficient annual recharge is available to supply the Hamlet over a 20 year design life. Water is pumped from South Lake to the reservoir located near the airstrip where it mixes with the water from Airport Lake. A typical chemical analysis is as follows: (NOTE: All values in mg/L unless otherwise noted.)

Parameters	Values
pH	7.8
Total Hardness (as $CaCO_3$)	244.4
Total Alkalinity (as $CaCO_3$)	179.0
Apparent Colour (HU)	7.1
Turbidity (FTU)	0.60
Calcium (as Ca)	63.0
Chloride (as Cl)	174.0
Sulphate (as SO_4)	91.5
Nitrate (as NO_3)	---
Total Iron (as Fe)	0.003

(Sample taken March 17, 1983 for Environmental Health Officer, Health & Welfare Canada, from pumphouse.)

* NOTE AIRPORT LAKE IS THE PRESENT RESERVOIR
THE CAPACITY OF THE LAKE HAS BEEN MODIFIED TWICE THROUGH BLAST/EXCAVATE

B.1.3 Intake Facilities

An intake facility extends out into South Lake from the South Lake pumping station. Details are as follows:

Length: 30 m
Diameter: 160 mm
Material: HDPE Type III, Class C pipe

The intake pipe is anchored by 16 kg concrete weights placed at 3 m centres. The intake screen is positioned approximately 2 m below the surface. The intake screen is all welded stainless steel with continuous slot construction. Screen slot openings are 1.5 mm with an open area of about 35%. The intake system is only used during the summer months to fill the reservoir by Airport Lake.

A skid mounted portable pumphouse unit is used to pump water to the reservoir. The unit consists of a pump and diesel engine complete with all internal piping and storage tank. The stations are connected to the intake and supply lines with the use of 'Quick Couplers'. The pump specifications are as follows:

Type: Centrifugal
Capacity: 27 L/s @ 523 kPa TDh (350 lgpm @ 175' TDH)
Motor Drive: Diesel engine - 2000 RPM

B.1.4 Supply and Storage

Water is pumped to the reservoir from the South Lake pumphouse via a graded supply line. The specifications are as follows:

Length: 2000 m
Diameter: 160 mm
Material: HDPE Type III, Class C pipe

The storage facilities were constructed in 1979-80 beside Airport Lake. The reservoir consists of a rock excavation with the dimensions 73.7 m x 34.5 m x 10 m deep and a capacity of approximately 30,000 m^3. It was designed to provide an accessible year-round water supply. If the watershed of Airport Lake is also used then the water supply requirements for the next 20 years can be met. The elevation of the site is approximately 52 m, allowing for a future gravity fed piped distribution system. The depth of the reservoir and vertical sides ensure that a minimum amount of water is lost due to ice formation. Seepage problems are minimized since the the surrounding bedrock is constantly frozen.

B.1.6 Pumping Station and Truck Fill Point

A pumping station and a truck fill point are located at the reservoir. A single intake system is provided, equipped with a screen and submersible pump. The intakes are approximately 46 m in length and rest on an incline extending to within 2 m of the reservoir bottom. The pump discharge line is 89 mm diameter polyethylene and is situated within a 250 mm diameter insulated polyethylene pipe. A 16 gauge CMP casing pipe 600 mm in diameter surrounds the intake. A heat trace cable within a 22 mm pipe embedded in the insulation is used as freezing protection. Broken rock surrounds and covers the casing. Steel and concrete anchors secure the pipe in place.

Pumping Facilities:

Pump Type, Make & Type:	Jacuzzi Submersible Turbine
Capacity:	7.6 L/s @ 180 kPa TDH (100 Igpm @ 60'TKh)
Motor:	single phase - 3500 RPM, 5 hP
Screen:	250 mm diameter

Since the water is of good chemical quality only chlorination is provided. The hypochlorinator is a Wallace and Tiernan Series A-745.

The truck fill station contains the chlorinator and other equipment. The water truck is filled outside via an overhead pipe assembly.