

**Assessment Studies of
Water and Wastewater Systems
and Associated Water Management Practices
at Glooscap First Nation
Horton, NS (Site #06036)
Atlantic Region**

For
Indian and Northern Affairs Canada
Atlantic Region

By
MGI Limited
Fredericton, NB

March 2002



A member of the  Family of Companies

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March 28, 2002

Public Works & Government Services Canada
1713 Bedford Row
Halifax, NS
B3J 3C9

MGI File 10294B

Attention: Shauna Pierce

Re: Assessment Study - Glooscap First Nation, Horton, NS (Site #06036)

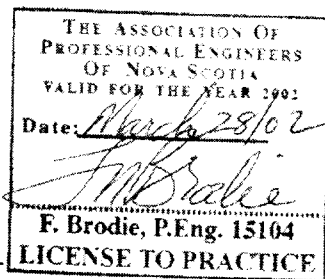
Dear Ms. Pierce:

Please find enclosed our report on the assessment of the water and wastewater systems at the Glooscap First Nation community located in Horton, NS.

We trust this report meets your requirements. If you have any questions, please call Neil Brodie at 506-458-1248.

Sincerely,
MGI LIMITED

F. Neil Brodie, P.Eng.
Senior Project Manager



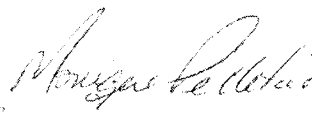

for Troy Small, M.Sc.
Project Hydrogeologist

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1.0 Overview

MGI Limited was retained by Public Works & Government Services Canada on behalf of Indian and Northern Affairs Canada to conduct an inspection of the water and wastewater system of the Glooscap First Nation community located in Horton, NS. As homes in the community obtain their potable water supply by private wells and individual septic systems for sewage services the following methodology was used:

- 1) Review of available data from Indian and Northern Affairs Canada and Health Canada;
- 2) Liaison with Glooscap First Nation community representative to schedule a site visit;
- 3) Site visit and interview with community representative (i.e. Chief, Community Health Representative, etc.);
- 4) Physical inspection of community infrastructure;
- 5) Discussion with local well driller and septic system installers on general bedrock conditions, water levels, where necessary to obtain supplementary information; and
- 6) Draft and final report preparation discussing risks and possible mitigation if necessary.

Provided below is background information on the Glooscap First Nation community.

Date of Visit:	January 16, 2002
Inspector(s)/Interviewer(s):	Troy Small
Site Address:	PO Box 449, Hantsport, NS, B0P 1P0
Phone #:	902-684-9788
Fax#:	902-684-9890
Tribal Council Affiliation:	Confederacy of Mainland Micmacs
Chief:	Shirley Clarke
Location:	Horton, NS
Population:	~100 (on-reserve)
# Housing Units:	~25

2.0 Water System Findings

During the site visit it was noted that INAC has granted approval for the Glooscap First Nation to connect with the Village of Hantsport water distribution system. The water system upgrade will reportedly include the installation of approximately eight kilometres of water distribution main to the community, extending the potable water intake pipe at the surface water source and the construction of a pumphouse/booster station/chlorination building at the base of the community (at the intersection of Smith Street and Bishopville Road). The water system design plans were reportedly completed by Hiltz and Simone Engineering with tendering scheduled for February 2002.

2.1 Water Source and Design

Approximately ten homes in the community receive their potable water from private on-site wells. The remaining 15 homes in the community receive their potable water from one of five community wells. Each community well only serves two or three homes. The majority of the potable water wells in the community are reportedly 150 to 200 mm in diameter, approximately 90 metres in depth with

approximately 18 metres of casing. There have been water shortages reported in the community as numerous wells in the community are known to only yield 0.25 - 0.5 IGPM. The Band Councillor/Manager (Mike Halladay) reported that wells in the community are generally less than 15 years of age and one to two new wells are being drilled yearly by Valley Well Drilling. There have been three wells in the community that have collapsed in the last two years requiring a new well to be drilled or the home connected to an adjacent residential well. All homes in the community have private on-site septic systems and approximately six homes in the community also have furnace oil tanks. There is no known industry, farming, or forestry in the immediate vicinity that is expected to impact the potable groundwater supply.

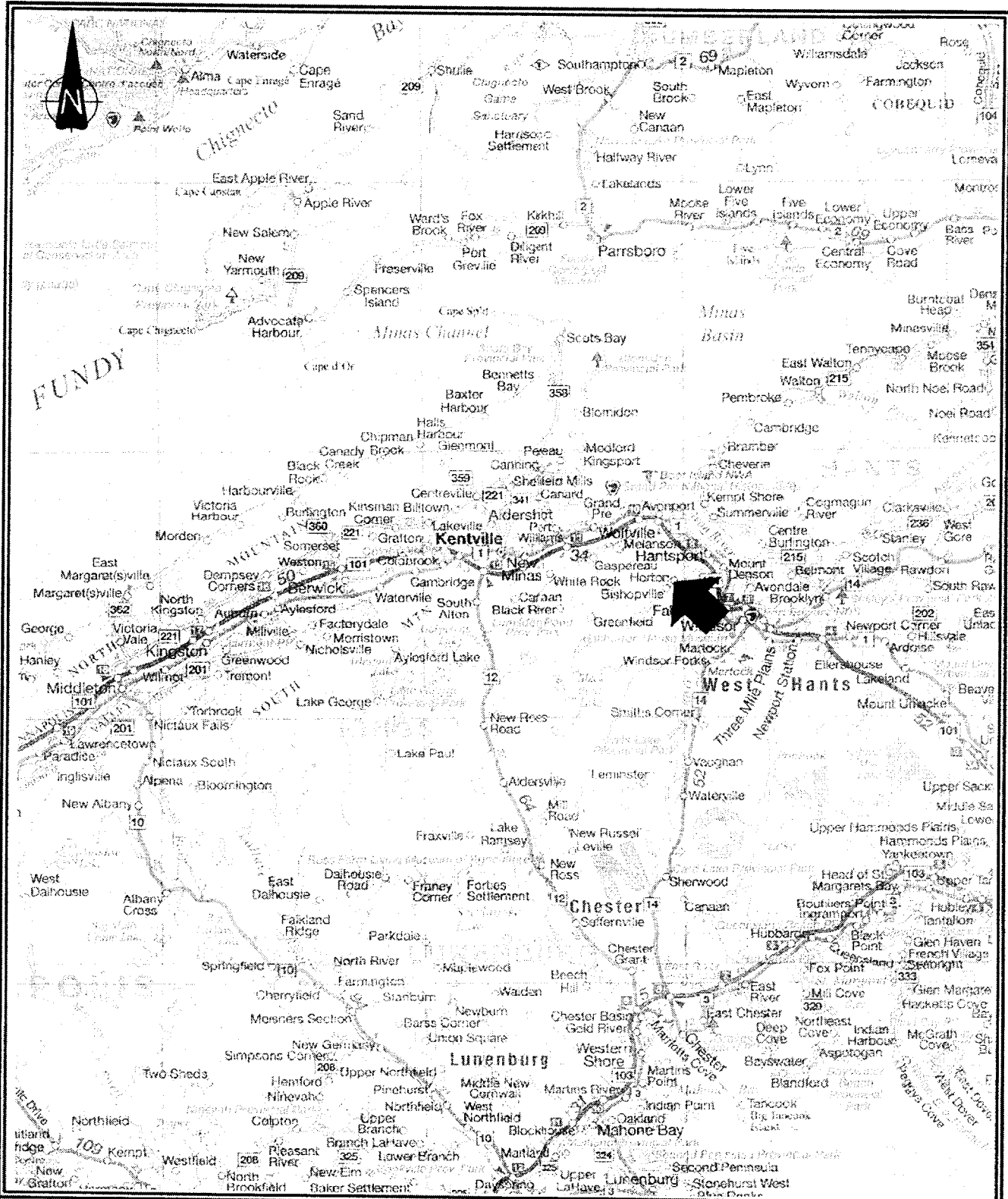
The Band Councillor/Manager noted the historical presence of coliform bacteria exceeding GCDWQ guidelines in the potable water wells at several residences in the community. He also noted that the fluoride level in the potable water supply regularly exceeds GCDWQ maximum allowable chemical concentration (MAC) guidelines in addition to the aesthetic complaints of objectionable odours (hydrogen sulphide) and water hardness. Available Health Canada data (1996 - 2001) identified the historical presence of total coliform bacteria at approximately ten residences but the presence of fecal coliform bacteria was not identified in the potable water supplies. The occurrence of total coliform bacteria above GCDWQ guidelines (>10 counts) was noted at four locations. As such, Health Canada recommended that the potable water wells at several residences be disinfected using sodium hypochlorite (regular household Javex) as per Health Canada protocols. The available Health Canada chemical water quality data (1991 - 2000) noted that several homes in the community have fluoride levels exceeding GCDWQ guidelines for maximum allowable chemical concentrations (MACs). In addition, the isolated occurrence of lead exceeding MACs was identified at the Health Center in 2000. Hardness, iron, manganese, sodium and pH were also noted to be routinely exceeding aesthetic objectives. There have been isolated occurrences of turbidity at three locations that exceed aesthetic objectives. The high risk rating is due to the recurring bacterial presence and chemical concentrations exceeding MACs at several potable water wells in the community.


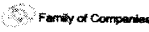
The Band Councillor/Manager noted that surface water infiltration into potable water wells is suspected to be causing the coliform bacteria contamination. He also noted bacteria presence in the water supplies is most prevalent during wet periods (spring and fall). Each home in the community is reportedly fitted with an in-line filter for sediment removal and three homes are equipped with water softeners. One community well (located in the basement of a private residence) is reportedly equipped with a combined water softener/chlorination unit that is operated and maintained by the home owners.

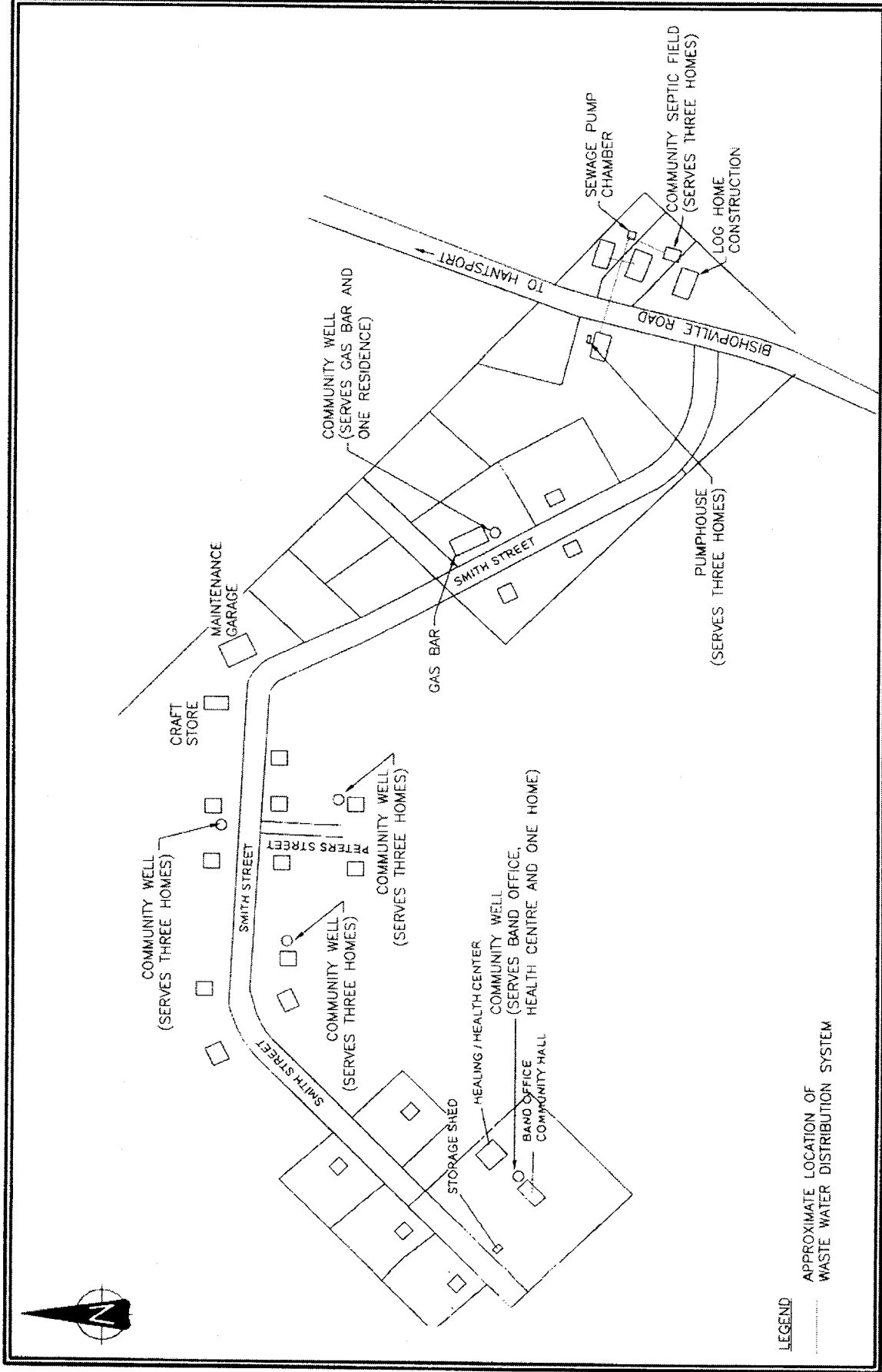
The community is not equipped with fire hydrants but the Village of Hantsport provides fire protection.

2.2 Operation and Sample Collection

The band is responsible for the maintenance and operation of private wells and water conditioning units in the community. As noted in Section 2.1, following the presence of coliform bacteria in potable water wells the applicable community residents were instructed to disinfect their wells using sodium hypochlorite as per Health Canada protocols. The community does not have operation and maintenance manuals for the private wells or water conditioning units and there are no spare parts kept on-site. All residents in the community are currently being supplied with bottled water for consumption purposes until the upgrade to the water system is completed.



 <p>A member of the  Family of Companies</p>	<p>TITLE</p> <p>SITE LOCATION (SITE #06036)</p>	<p>DATE</p> <p>Feb. 2002</p>	<p>PROJECT NO.</p> <p>10294B</p>
	<p>PROJECT</p> <p>ASSESSMENT STUDIES OF WATER & WASTEWATER SYSTEMS ATLANTIC CANADA FIRST NATION COMMUNITIES GLOOSCAP FIRST NATION, HORTON, NS.</p>	<p>SCALE</p> <p>Unknown</p>	<p>FIGURE NO.</p>
	<p>DRAWN</p>	<p>1</p>	
	<p>GBS</p>		



TITLE SITE PLAN (SITE #06036) ASSESSMENT STUDIES OF WATER & WASTE WATER SYSTEMS ATLANTIC CANADA FIRST NATION COMMUNITIES GLOOSCAP FIRST NATION, HORTON, NS.	DATE Feb. 2002	PROJECT NO. 10294B
	SCALE NTS	FIGURE NO. 2
PROJECT	DRAWN CBS	



Appendix A
Water Testing Results

HEALTH CANADA DATABASE

Water Quality Data - Bacteriological Sampling
GLOOSCAP MICMAC FIRST NATION RESERVE

SAMPLE LOCATION	DATE	PARAMETERS TESTED:			
		TOTAL COLIFORM /100ml	FECAL COLIFORM / E.coli /100ml	Cl2 RESIDUAL	TURBIDITY 5 NTU
s.19(1)	09/11/1996	PRESENT	absent		
	11/19/1996	PRESENT	absent		
	12/16/1996	PRESENT	absent		
	02/18/1997	absent	absent		
	07/02/1997	absent	absent		
Band Office	02/21/1996	absent	absent		
Band Office	04/02/1996	absent	absent		
Band Office	06/07/1996	absent	absent		
Band Office	09/11/1996	absent	absent		
Band Office	10/18/1996	absent	absent		
Band Office	11/19/1996	absent	absent		
Band Office	12/16/1996	absent	absent		
Band Office	02/18/1997	absent	absent		
Band Office	04/29/1997	absent	absent		
Band Office	05/21/1997	absent	absent		
Band Office	07/02/1997	absent	absent		
Band Office	08/19/1997	absent	absent		
Band Office	10/06/1997	absent	absent		
Band Office	12/09/1997	absent	absent		
Band Office	01/22/1998	absent	absent		
Band Office	02/26/1998	absent	absent		
Band Office	04/02/1998	absent	absent		
Band Office	07/02/1998	absent	absent		
Band Office	09/29/1998	absent	absent		
Band Office	01/12/1999	absent	absent		
Band Office	02/10/1999	absent	absent		
Band Office	04/29/1999	absent	absent		
Band Office	07/06/1999	absent	absent		
Band Office	12/09/1999	absent	absent		
Band Office	07/11/2000	absent	absent		
Band Office	09/26/2000	2	0		
Band Office	11/29/2000	absent	absent		
Band Office	11/30/2000	0	0		
Band Office	03/10/2001	0	0		
Band Office	06/30/2001	6.4	0		
Band Office	07/02/2001	45.3	0		
Band Office	07/24/2001	0	0		
Band Office	07/31/2001	0	0		
Band Office (bottle water)	09/11/1996	absent	absent		
s.19(1)	06/08/2000	absent	absent		
	05/21/1997	absent	absent		
Day Care	02/28/2000	absent	absent		
Entertainment Centre	02/28/2000	absent	absent		
s.19(1)	12/09/1997	absent	absent		
	02/20/2001	0	0		
	10/11/2000	0	0		
	10/17/2000	0	0		
	02/20/2001	0	0		
	05/03/2001	0	0		
	10/16/1997	absent	absent		
	12/09/1997	absent	absent		
	10/11/2000	0	0		
05/03/2001	0	0			

		06/07/1996	absent	absent		
		10/18/1996	PRESENT	absent		
		10/16/1997	PRESENT	absent		
		10/28/1997	absent	absent		
		02/26/1998	absent	absent		
		09/29/1998	PRESENT	absent		
	s.19(1)	10/13/1998	PRESENT	absent		
		01/12/2000	PRESENT	absent		
		02/02/2000	PRESENT	absent		
		09/26/2000	65.9	0		
		02/20/2001	0	0		
		04/14/2001	3.1	0		
		04/16/2001	1	0		
Health Centre		12/09/1999	PRESENT	absent		
Health Centre		01/12/2000	absent	absent		
Health Centre		02/28/2000	absent	absent		
Health Centre		06/08/2000	absent	absent		
Health Centre		07/11/2000	absent	absent		
Health Centre		10/04/2000	0	0		
Health Centre		11/29/2000	absent	absent		
Health Centre		11/30/2000	0	0		
Health Centre		03/10/2001	0	0		
Health Centre		06/30/2001	3.1	0		
Health Centre		07/02/2001	5.3	0		
Health Centre		07/24/2001	0	0		
	s.19(1)	04/02/1998	absent	absent		
		07/02/1997	absent	absent		
Kwik Way		02/21/1996	absent	absent		
Kwik Way		04/02/1996	absent	absent		
Kwik Way		06/07/1996	absent	absent		
Kwik Way		09/11/1996	absent	absent		
Kwik Way		11/19/1996	absent	absent		
Kwik Way		12/16/1996	absent	absent		
Kwik Way		02/18/1997	absent	absent		
Kwik Way		04/29/1997	absent	absent		
Kwik Way		08/19/1997	absent	absent		
Kwik Way		07/02/1997	absent	absent		
Kwik Way		10/06/1997	absent	absent		
Kwik Way		01/22/1998	absent	absent		
Kwik Way		02/26/1998	absent	absent		
Kwik Way		04/02/1998	absent	absent		
Kwik Way		07/02/1998	absent	absent		
Kwik Way		09/29/1998	absent	absent		
Kwik Way		01/12/1999	absent	absent		
Kwik Way		02/10/1999	absent	absent		
Kwik Way		04/29/1999	absent	absent		
Kwik Way		07/06/1999	absent	absent		
Kwik Way		12/09/1999	absent	absent		
Kwik Way		01/12/2000	absent	absent		
Kwik Way		03/08/2000	absent	absent		
Kwik Way		06/08/2000	absent	absent		
Kwik Way		09/26/2000	0	0		
Kwik Way		11/29/2000	1-10	0		
Kwik Way		11/30/2000	0	0		
Kwik Way		06/30/2001	1	0		
Kwik Way		07/02/2001	0	0		
		01/22/1998	absent	absent		
		04/29/1999	absent	absent		
	s.19(1)	10/11/2000	0	0		
		03/10/2001	0	0		
		05/03/2001	0	0		
		10/18/1996	PRESENT	absent		

	07/02/1997	absent	absent		
	06/30/2001	3.1	0		
	07/02/2001	36.4	0		
	10/18/1996	PRESENT	absent		
	12/16/1996	PRESENT	absent		
	02/18/1997	absent	absent		
	10/16/1997	absent	absent		
	12/09/1997	PRESENT	absent		
	01/12/1999	absent	absent		
	01/12/2000	absent	absent		
	10/04/2000	40.6	0		
s.19(1)	10/11/2000	>200.5	0		
	10/17/2000	28.8	0		
	11/29/2000	absent	absent		
	11/30/2000	4.2	0		
	04/14/2001	27.1	0		
	04/16/2001	3.1	0		
	07/24/2001	PRESENT	absent		
	07/31/2001	0	0		
	11/29/2000	absent	absent		
	11/30/2000	4.2	0		
	04/14/2001	19.2	0		
	04/16/2001	2	0		
s.19(1)	07/02/1997	absent	absent		
	07/02/1997	absent	absent		
	08/19/1997	absent	absent		
	10/16/1997	absent	absent		
	03/08/2000	PRESENT	absent		
	09/26/2000	0	0		
	01/18/2001	0	0		
	04/14/2001	4.2	0		
	04/16/2001	0	0		
	06/11/1996	absent	absent		
	04/02/1996	absent	absent		
	02/21/1996	absent	absent		
	10/04/2000	0	0		
	01/08/2001	0	0		
	07/11/2000	PRESENT	absent		
	02/20/2001	0	0		
	11/03/2000	0	0		
	02/10/1999	absent	absent		
	07/06/1999	absent	absent		
	03/08/2000	absent	absent		
	10/04/2000	0	0		
	01/18/2001	0	0		
School	02/28/2000	absent	absent		
	05/21/1997	absent	absent		
	02/18/1997	PRESENT	absent		
	07/02/1997	absent	absent		
	08/19/1997	absent	absent		
	01/22/1998	absent	absent		
s.19(1)	02/26/1998	PRESENT	absent		
	07/02/1998	absent	absent		
	09/29/1998	absent	absent		
	01/12/1999	absent	absent		
	04/29/1999	absent	absent		
	07/06/1999	absent	absent		
	01/12/2000	PRESENT	absent		
	07/11/2000	absent	absent		
	10/11/2000	0	0		
	01/18/2001	0	0		
	03/10/2001	0	0		

		05/03/2001	0	0		
		02/21/1996	absent	absent		
		04/02/1996	absent	absent		
		06/07/1996	absent	absent		
	s.19(1)	09/11/1996	PRESENT	absent		
		11/19/1996	PRESENT	absent		
		12/16/1996	absent	absent		
		10/28/1997	absent	absent		
		02/10/1999	absent	absent		
		05/21/1997	absent	absent		
		07/02/1997	absent	absent		
		07/02/1998	absent	absent		
		06/08/2000	absent	absent		
		04/29/1997	absent	absent		
		04/02/1998	absent	absent		
		10/17/2000	2	0		
		06/11/1996	absent	absent		
Well (drinking water)		06/08/2000	absent	absent		
	s.19(1)	07/02/1997	absent	absent		
			Craig	glooscapb		

HEALTH CANADA DATABASE
 DRINKING WATER QUALITY (CHEMICAL) DATA
 GLOOSCAP MICMAC FIRST NATION RESERVE

Parameters Sampled	aluminum	arsenic	barium	boron	cadmium	chloride	chromium	colour	copper	hardness	fluoride	iron	L. I.	lead	manganese	mercury	nitrate	pH	selenium	sodium	sulphate	turbidity	zinc	
Health or Aesthetic Limit	0.025	1.000	5.000	0.005	<250	0.05	<15 TCU	<1.0	80 - 100	1.5	<0.3	0.01	<0.05	0.001	45,000	6.5 to 8.5	0.010	<200	<500	5 NTU	<5.0			
LOCATION	Date:	IMAC	MAC	IMAC	MAC	AO	MAC	AO	AO	MAC	MAC	AO		MAC	AO	MAC	MAC	AO	MAC	AO	AO	MAC & AO	AO	
s.19(1)	11/19/1996		0.0020			5.7		<5	<0.01	3.9	2.90	0.080		<0.002	0.010		<0.05	8.90		167.0	61.0	0.30	<0.01	
	12/16/1996										2.10													
	02/18/1997										1.90	<0.02			<0.01					166.0				
	07/02/1997		<0.002			6.0		<5	<0.01	3.2	1.90	<0.02	-0.6	<0.002	<0.01		<0.05	8.90		173.0	88.0	0.20	<0.01	
Band Office	03/26/1993	0.015	<0.002	0.053	0.920	<0.0005	8.2	<0.002	11.0	<0.01	7.7	2.20	0.020	0.0020	<0.01	<0.00005	<0.05	8.90	<0.002	184.0	56.0	0.23	<0.01	
Band Office	06/08/1995	0.011	<0.002	0.100	1.000	<0.0005	6.5	<0.002	<3	<0.01	16.1	2.76	<0.02	0.0020	0.010		<0.05	8.70	<0.002	170.0	23.0	0.24	<0.01	
Band Office	09/22/1995										2.80													
Band Office	11/15/1995										2.50													
Band Office	04/02/1998										3.40				<0.01									
Band Office	02/18/1997										2.80	<0.02			<0.01					169.0				
Band Office	05/21/1997	<0.10		0.082	0.400	<0.01		<0.02		<0.01	139.0		<0.02	<0.002	<0.01				<0.10				<0.01	
Band Office	07/02/1997		<0.002			8.4				0.020	97.3	1.30	<0.02	0.0	<0.002	<0.01	0.06	8.20		90.3	26.0	0.20	<0.01	
Band Office	02/19/1999		<0.002			6.5		2.5	<0.01	97.2	1.10	<0.02	-0.1	<0.002	0.120		<0.05	8.20		62.7	21.8	0.05	0.010	
Band Office (F.R Tap)	02/25/1992										0.20													
Band Office (F.R Tap)	09/10/1992										0.10	<0.02			<0.01									
Band Office (F.R Tap)	10/21/1992										<0.1													
Band Office (kitchen tap)	05/29/1992										2.40													
Band Office (kitchen tap)	10/21/1992										2.00													
Band Office (kitchen tap)	12/01/1992										2.20	<0.02			<0.01								0.36	
Band Office (kitchen tap)	01/12/1993										2.80	<0.02			<0.01								0.09	
Band Office (reverse osmosis tap)	10/21/1991										<0.1													
Band Office (reverse osmosis tap)	12/01/1992										0.10	0.020												
Band Office (reverse osmosis tap)	01/12/1993										0.20	<0.02			<0.01								0.08	
Band Office (reverse osmosis tap)	03/25/1993										0.20												0.35	
Band Office (reverse osmosis tap)	08/01/1993										0.20													
Band Office (reverse osmosis tap)	08/20/1993										0.20													
Band Office (reverse osmosis tap)	11/02/1993										<0.1													
Band Office (treated tap)	05/29/1992										0.10												14.2	
Band Office (untreated)	10/21/1991										2.40													
Band Office (untreated)	02/25/1992										2.70													
Band Office (new)	08/07/1995		<0.002			6.5	<0.002	<3	<0.01		2.76	<0.02		0.0020	0.010								0.24	
Band Office (new)	08/22/1995										2.80												<0.01	
s.19(1)	05/21/1997	<0.10		0.111	0.530	<0.01		<0.02		<0.01	48.4		0.090	0.0050	0.020				<0.10					0.090
	12/09/1997		<0.002			8.0		<5	<0.01	31.9	1.50	0.020	-0.4	<0.002	0.010		<0.05	8.30		112.0	41.0	0.30	<0.05	
	01/12/1992		<0.002			4.2		<3	<0.01	49.7	0.90	0.040		<0.002	0.020		<0.05	7.10		85.5		0.75	<0.01	
	11/15/1995					6.7		<3	<0.01	32.1	1.80	<0.02			<0.01		<0.05	8.30		127.0		0.29	<0.01	
Band Office	01/12/1999		<0.002			8.0		<2.5	0.010	66.8	1.30	<0.02	-0.1	<0.002	<0.01		0.08	8.20		78.2	21.7	<0.05	0.010	

HEALTH CANADA DATABASE
 DRINKING WATER QUALITY (CHEMICAL) DATA
 GLOOSCAP MICMAC FIRST NATION RESERVE

s.19(1)

s.19(1)

s.19(1)

Parameters Sampled		aluminum	arsenic	barium	boron	cadmium	chloride	chromium	colour	copper	hardness	fluoride	iron	L.L.	lead	manganese	mercury	nitrate	pH	selenium	sodium	sulphate	turbidity	zinc
Health or Aesthetic Limit	mg/l →	0.0250	1.000	5.000	0.0050	<250	0.050	< 15 TCU	< 1.0	80 - 100	1.50	< 0.3			0.0100	< 0.05	0.00100	45.00	6.5 to 8.5	0.0100	< 200	< 500	5 NTU	< 5.0
LOCATION	Date:	IMAC	MAC	IMAC	MAC	AO	MAC	AO	AO	MAC	MAC	AO			MAC	AO	MAC	MAC	AO	MAC	AO	AO	MAC & AO	AO
	01/12/1993	<0.002				4.0		<3	<0.01	116.0	0.40	<0.02		<0.002	<0.01		<0.05	6.40			14.7		0.14	<0.01
	03/04/1994	<0.002									<0.1	0.130			0.060		0.18	7.71			25.2			
	10/21/1992										0.20							9.11			17.9			
	10/18/1997					4.7		<5	0.030	88.5		0.040	-0.1		0.010		0.19	8.30			52.9	29.0	0.70	<0.01
	12/01/1992										0.40							9.30			23.0			
	01/12/1993										0.40	<0.02			<0.01			9.24			19.2		0.10	
	03/17/1994										0.30													
	06/07/1996	<0.002				4.3		<5	0.010	97.5	0.40	<0.02		<0.002	0.020		0.17	8.30			68.4	35.0		<0.01
	10/18/1997	<0.002				5.0		<5	<0.01	240.0	0.20	0.02	0.0	<0.002	<0.01		0.05	7.90			18.8	61.0	0.30	<0.01
	02/26/1998	<0.002				6.5		<5	0.010	304.0	0.20	0.080	0.1	<0.002	0.020		0.09	7.80			17.4	99.0	0.20	<0.05
	09/29/1998	<0.002				6.8		<2.5	<0.01	280.0	0.20	<0.02	-0.2	<0.002	<0.01		0.11	7.60			18.6	67.8	0.05	<0.01
	10/21/1992										0.10							9.19			16.2			
	11/04/1991										0.40													
	12/01/1992										0.20	<0.02						8.95			16.2			
	03/17/1994										0.30													
Health Centre	12/09/1999	<0.002				8.5		10.0	<0.01	8.1	3.40	6.440	-0.3	0.0020	0.010			<0.05	8.60		234.0	8.7	6.80	0.010
Health Centre	03/08/2000	<0.002				8.8		20.0	0.030	7.7	3.30	1.050	-0.4	0.0330	0.030			<0.05	8.50		250.0	7.9	24.00	0.050
Health Centre	06/08/2000	<0.002				8.2		2.5	<0.01	7.0	3.80	0.020	-0.4	<0.002	<0.01			<0.05	8.60		208.0	8.9	0.06	<0.01
Health Centre	07/11/2000	<0.002				9.6		2.5	<0.01	7.4	3.60	<0.02	-0.4	<0.002	<0.01			<0.05	8.60		276.0	9.3	0.59	<0.01
	12/11/1995					8.0		<3	<0.01	24.6		0.020		<0.002	<0.01			<0.05	8.60		157.0	42.0	0.29	<0.01
	12/11/1995					8.5		5.0	0.080	27.2		0.360		<0.002	0.010			<0.05	8.40		182.0	42.0	1.90	0.060
Kwik Way	07/02/1997	<0.002				5.6		6.0	<0.01	39.0	1.30	0.030	-0.2	<0.002	0.010			<0.05	8.40		107.0	34.0	0.40	<0.01
	11/10/1993	<0.002				126.0		0.40	<0.02		0.40	<0.02		<0.002	<0.01			<0.05	7.89		19.0		0.05	
Kwik Way	06/07/1995					4.5		<3	0.010	134.0		<0.02			<0.01			<0.05	7.60		18.4	27.0	0.12	<0.01
Kwik Way	08/22/1995										0.30													
Kwik Way	11/15/1995					4.3		<3	0.020	132.0	0.30	0.030			<0.01			<0.05	8.00		19.8		0.38	<0.01
Kwik Way	02/18/1997										0.30	<0.02			<0.01						16.5			
Kwik Way	07/02/1997	<0.002				4.7		<5	0.010	130.0	0.30	<0.02	-0.4	<0.002	<0.01			<0.05	7.90		19.2	27.0	< 0.1	<0.01
	01/22/1998	<0.002				9.0		<5	<0.01	50.3	1.90	<0.02	-0.1	<0.002	<0.01			<0.05	8.20		166.0	41.0	0.20	<0.05
	07/02/1997	<0.002				10.2		<5	<0.01	14.5	3.10	0.020	-0.1	<0.002	<0.01			<0.05	8.60		217.0	21.0	0.20	<0.01
	08/22/1995										0.50													
	12/16/1995	<0.002				9.7		<5	<0.01	14.5	2.70	0.020		<0.002	<0.01			<0.05	8.60		211.0	17.0	0.30	<0.01
	10/18/1996	<0.002				10.7		<5	<0.01	19.4	3.00	<0.02		<0.002	0.010			<0.05	8.70		221.0	19.0	0.80	<0.01
	02/18/1997										3.00	<0.02			<0.01						210.0			
	10/16/1997					12.2		<5	<0.01	11.7		0.020	-0.3		<0.01			<0.05	8.50		231.0	18.0	0.30	<0.01
	12/09/1997	0.0030				11.5		<5	<0.01	13.1	3.20	0.020	-0.3	<0.002	<0.01			1.07	8.50		214.0	19.0	0.30	<0.01
	01/12/1999	<0.002				12.0		<3	<0.01	9.3	3.90	<0.02	-0.2	<0.002	<0.01			0.20	8.70		218.0	24.6	0.26	<0.01
	07/09/1992	<0.002							<0.01		0.30	<0.02		<0.002	<0.01			<0.05	7.71		20.6		0.20	<0.01

HEALTH CANADA DATABASE
 DRINKING WATER QUALITY (CHEMICAL) DATA
 GLOOSCAP MICMAC FIRST NATION RESERVE

Parameters Sampled		aluminum	arsenic	barium	boron	cadmium	chloride	chromium	colour	copper	hardness	fluoride	iron	L. I.	lead	manganese	mercury	nitrate	pH	selenium	sodium	sulphate	turbidity	zinc		
Health or Aesthetic Limit	mg/l --->	0.0250	1.000	1.000	5.000	0.0050	<250	0.050	<15 TCU	<1.0	80 - 100	1.50	<0.3		0.0100	<0.05	0.00100	45.00	6.5 to 8.5	0.0100	<200	<500	5 NTU	<5.0		
LOCATION	Date:	IMAC	MAC	IMAC	MAC	MAC	AO	MAG	AO	AO	MAC	MAC	AO		MAC	AO	MAC	MAC	AO	MAC	AO	AO	MAC & AO	AO		
s.19(1)	12/11/1995						8.3		<3	<0.01	8.8		0.020			<0.01		<0.05	8.80		168.0	66.0	0.28	<0.01		
	07/02/1997	<0.002					4.8		<5	0.010	92.9	0.40	0.030	-0.1	<0.002	0.010		0.13	8.20		49.2	31.0	0.30	<0.01		
	03/17/1994											0.40														
	07/02/1997	<0.002					7.1		<5	<0.01	11.1	1.80	<0.02	-0.2	<0.002	<0.01		<0.05	8.80		168.0	59.0	0.20	<0.01		
	08/18/1997	0.0020					1.1		7.0	<0.01	0.0	0.20	<0.02		<0.002	<0.01		<0.05	8.80		18.6	<2	<0.1	<0.01		
	10/16/1997	0.0020										0.020				0.010										
	08/20/1993											0.50	0.060			0.020										
	11/10/1993							4.2					0.020			0.030								0.91		
	09/21/1994	<0.002									<0.01	39.8	1.80	<0.02		<0.002	0.010		<0.05	8.27		122.0		0.39	<0.01	
	06/11/1996	<0.002						8.9		<5	<0.01	13.3	1.80	0.030		<0.002	<0.01		<0.05	8.60		173.0	59.0	0.30	<0.01	
	08/08/1991	<0.005						5.2		<3	<0.01	220.0	0.20	0.330		<0.002	0.100		0.20	8.40		23.7	71.0	1.60	0.010	
	04/02/1996											1.80				<0.01										
	02/21/1996	0.0030						7.7		4.0	0.010		1.80	0.020		<0.002	<0.01			8.90		166.0	66.0	0.30	<0.01	
	07/11/2000	<0.002						5.2		2.5	<0.01	82.7	0.40	<0.02	-0.3	<0.002	<0.01		0.09	8.10		57.7	32.0	0.26	<0.01	
	05/13/1992	<0.002						5.2			8.0	<0.01	22.8	1.10	0.380		<0.002	0.010		<0.05	8.40		118.0	40.0	1.30	<0.01
	06/11/1992												0.050			<0.01							120.0			
	10/21/1992												0.50	0.040		<0.01							107.0			
	01/12/1993												0.30	0.260		<0.01							111.0		0.46	
	11/10/1993												0.50	0.170		<0.01							120.0			
	02/10/1999	<0.002						7.8		2.5	<0.01	3.8	1.80	<0.02	-0.5	<0.002	<0.01		<0.05	9.00		167.0	65.0	0.07	<0.01	
	11/04/1991												0.30													
	02/25/1992												0.20													
	05/21/1997	<0.10			0.021	0.110	<0.01		<0.02		<0.01	286.0		<0.02		<0.002	<0.01			9.16		18.6			<0.01	
	08/22/1995												0.80													
	02/18/1997												0.90	0.040		<0.01							144.0			
	07/02/1997	<0.002						17.7		9.0	<0.01	104.0	0.90	0.360	-1.0	<0.002	0.080		<0.05	8.30		97.0	17.7	0.70	<0.01	
	07/02/1998	<0.002						18.0		<2.5	<0.01	0.6	1.10	<0.02	-1.7	<0.002	<0.01		<0.05	8.40		168.0	22.0	0.07	<0.01	
	09/29/1998	<0.002						23.0		<2.5	<0.01	2.4	1.20	0.020	-1.2	<0.002	<0.01		<0.05	8.40		181.0	22.2	0.10	<0.01	
	01/12/1992												1.30	<0.02		<0.01							176.0			
	02/25/1992	<0.002						17.5		<3	<0.01	2.1	1.10	0.020		<0.002	<0.01		<0.05	8.00		168.0	18.0	0.20	<0.01	
	03/25/1993							16.3					26.1	0.90									134.0			
	06/08/1993												0.20	<0.02		<0.002	<0.01						150.0			
	10/28/1993												0.80	0.040		<0.01							150.0			
06/07/1995							12.0		<3	<0.01	0.0		<0.02		0.010			<0.05	8.20		122.0	22.0	0.19	<0.01		
04/02/1996	<0.002						11.7		<3	<0.01	0.8	0.80	<0.02		0.0030	<0.01		0.05	8.40		129.0	21.0	0.12	<0.01		
11/19/1996																						152.0				
10/28/1998	<0.002						2.1		<5	<0.01	0.9	0.50	<0.02	-2.1	<0.002	<0.01		<0.05	8.60		36.4	<2	0.10	<0.01		
05/21/1997	0.0020						3.9		<5	<0.01	107.0	0.20	1.020	-1.2	<0.002	0.910		<0.05	7.30		4.5	6.0		<0.01		
07/02/1997	<0.002						4.2		5.0	<0.01	192.0	0.30	0.850	-0.9	<0.002	0.920		<0.05	7.50		3.7		9.10	<0.01		
06/08/2000	<0.002						5.0		2.5	<0.01	0.6	0.20	<0.02	-3.4	<0.002	<0.01		<0.05	7.30		2.1	5.1	0.06	<0.01		
07/02/1997	<0.002						5.3		<5	<0.01	243.0	0.10	0.050	0.1	<0.002	0.050		0.16	8.00		23.3	5.3	0.20	<0.01		

BACTERIOLOGICAL WATER QUALITY MONITORING COLILERT - MPN (MOST PROBABLE NUMBER)

COMMUNITY : HORTON

QUALITY CONTROL

DATE	AGENT	COLOUR
	E. Coli	— / —
	K. Pneumoniae	— / —
	P. Aeruginosa	— / —

LOCATION SAMPLING:

DATE	LOCATION	RESULT		SAMPLED BY:
		Total Coliform	E. Coli	
SEPT 26/2000	PAND OFFICE	2.0	0	R. LABRADORE
SEPT 26/2000		1) 0.0	0	R. LABRADORE
SEPT 26/2000	STORE	0.0	0	R. LABRADORE
SEPT 26/2000		65.9	0	R. LABRADORE
OCT 4/2000				R. LABRADORE
OCT 4/2000		0.0	0	R. LABRADORE
OCT 4/2000	HEALTH CENTRE	0.0	0	R. LABRADORE
OCT 4/2000		0.0	0	R. LABRADORE
OCT 4/2000		40.6	0	R. LABRADORE
OCT 11/2000		200.5	0	R. LABRADORE
OCT 11/2000		0.0	0	R. LABRADORE
OCT 11/2000		0.0	0	R. LABRADORE
OCT 11/2000		0.0	0	R. LABRADORE
OCT 11/2000		0.0	0	R. LABRADORE
OCT 17/2000		2.0	0	R. LABRADORE
OCT 17/2000		0.0	0	R. LABRADORE
OCT 17/2000		28.8	0	R. LABRADORE
NOV 3/2000		0.0	0	R. LABRADORE
NOV 30/2000		0.0	0	R. LABRADORE
NOV 30/2000	BAND HALL	0.0	0	R. LABRADORE
NOV 30/2000	STORE	0.0	0	R. LABRADORE
NOV 30/2000		4.2	0	R. LABRADORE
NOV 30/2000		4.2	0	R. LABRADORE

BACTERIOLOGICAL WATER QUALITY MONITORING COLILERT - MPN (MOST PROBABLE NUMBER)

COMMUNITY : **HORTON**

QUALITY CONTROL

DATE	AGENT	COLOUR
	E. Coli	— / —
	K. Pneumoniae	— / —
	P. Aeruginosa	— / —

LOCATION SAMPLING:

DATE	LOCATION s.19(1)	RESULT		SAMPLED BY:
		Total Coliform	E. Coli	
JAN 18 / 2001		0.0	0	R.L
JAN 18 / 2001		0.0	0	R.L
JAN 18 / 2001		0.0	0	R.L
JAN 18 / 2001		0.0	0	R.L
FEB 20 / 2001		0.0	0	R.L
FEB 20 / 2001		0.0	0	R.L
FEB 20 / 2001		0.0	0	R.L
FEB 20 / 2001		0.0	0	R.L
MARCH 10 / 2001	HEALTH CENTRE	0.0	0	R.L
MARCH 10 / 2001	BAWN HALL	0.0	0	R.L
MARCH 10 / 2001		0.0	0	R.L
MARCH 10 / 2001		0.0	0	R.L
APRIL 14 / 2001		27.1	0	R.L
APRIL 14 / 2001		3.1	0	R.L
APRIL 17 / 2001		4.2	0	R.L
APRIL 17 / 2001		19.2	0	R.L
APRIL 16 / 2001		3.1	0	R.L
APRIL 16 / 2001		2.0	0	RL
APRIL 16 / 2001		1.0	0	RL
APRIL 16 / 2001		0.0	0	RL
MAY 3 / 2001		0.0	0	RL
MAY 3 / 2001		0.0	0	RL
MAY 3 / 2001		0.0	0	RL
MAY 3 / 2001		0.0	0	RL

10000

BACTERIOLOGICAL WATER QUALITY MONITORING COLILERT - MPN (MOST PROBABLE NUMBER)

COMMUNITY : **HORTON**

QUALITY CONTROL

DATE	AGENT	COLOUR
	E. Coli	— / —
	K. Pneumoniae	— / —
	P. Aeruginosa	— / —

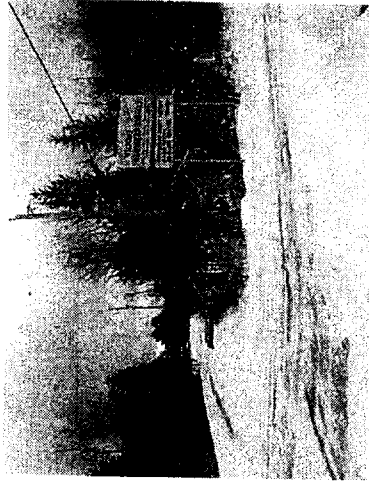
LOCATION SAMPLING:

DATE	LOCATION	RESULT		SAMPLED BY:
		Total Coliform	E. Coli	
JUNE 30 2001	BAND HALL	6.4	0	RL
JUNE 30 2001	HEALTH CENTRE	3.1	0	RL
JUNE 30 2001	STORE	1.0	0	RL
JUNE 30 2001		3.1	0	RL
July 2 / 2001	BAND HALL	45.3	0	RL
July 2 2001	STORE	0.0	0	RL
July 2 2001	HEALTH CENTRE	5.3	0	RL
July 2 2001		36.4	0	RL
July 26 2001	BAND HALL	>200.5	0	RL
July 26 2001	HEALTH CENTRE	0.0	0	RL
July 26 2001		>200.5	0	RL
July 30 2001		>200.5	0	RL
July 30 2001	BAND HALL	56.0	0	RL
July 30 2001		0.0	0	RL
July 30 2001				RL
July 31 2001	BAND HALL	0.0	0	RL
July 31 2001		0.0	0	RL
SEPT 5 / 2001		0.0	0	RL
SEPT 5 / 2001		0.0	0	RL
SEPT 5 / 2001		0.0	0	RL
SEPT 5 / 2001		0.0	0	RL
NOV 21 2001		0.0	0	RL
NOV 21 2001		0.0	0	RL
NOV 21 2001		0.0	0	RL

Appendix B
Photographs of Infrastructure



Bishopville Road looking south.



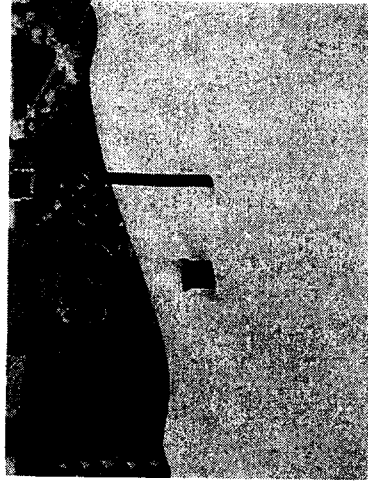
Intersection of Bishopville Road and Smith Street.



Smith Street at gas bar.



Smith Street looking west.



Typical private well.



Coli-lert unit at band office.