NEEGAN BURNSIDE

National Assessment of First Nations Water and Wastewater Systems

Manitoba Regional Roll-Up Report FINAL

Department of Indian Affairs and Northern Development

January 2011

Neegan Burnside Ltd.
15 Townline
Orangeville, Ontario
L9W 3R4
1-800-595-9149
www.neeganburnside.com

National Assessment of First Nations Water and Wastewater Systems

Manitoba Regional Roll-Up Report
Final

Department of Indian and Northern Affairs Canada

Prepared By:

Neegan Burnside Ltd.
15 Townline Orangeville ON L9W 3R4

Prepared for:

Department of Indian and Northern Affairs Canada

January 2011

File No: FGY163080.4

Statement of Qualifications and Limitations for Regional Roll-Up Reports

This regional roll-up report has been prepared by Neegan Burnside Ltd. and a team of sub-consultants (Consultant) for the benefit of Indian and Northern Affairs Canada (Client). Regional summary reports have been prepared for the 8 regions, to facilitate planning and budgeting on both a regional and national level to address water and wastewater system deficiencies and needs.

The material contained in this Regional Roll-Up report is:

- preliminary in nature, to allow for high level budgetary and risk planning to be completed by the Client on a national level.
- based on a compilation of the data and findings from the individual community reports prepared and issued for a specific region.
- not proposing to identify the preferred solution to address deficiencies for each community. Rather this report will identify possible solution(s) and probable preliminary costs associated with solution(s) presented in greater detail in the community reports. Community specific studies including more detailed evaluation will be required to identify both preferred solutions and final costs.
- based on existing conditions observed by, or reported to the Consultant. This assessment does not wholly eliminate uncertainty regarding the potential for costs, hazards or losses in connection with a facility. Conditions existing but not recorded were not apparent given the level of study undertaken.
- to be read in the context of its entirety.
- not to be used for any purpose other than that agreed to with the Client. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. Any other user specifically denies any right to claims against the Consultant, Sub-Consultants, their Officers, Agents and Employees.

Risk as it pertains to health and safety issues and building code compliance is based upon hazards readily identifiable during a simple walk through of the water and wastewater facilities, and does not constitute a comprehensive assessment with regard to health and safety regulations and or building code regulations.

The Consultant accepts no responsibility for any decisions made or actions taken as a result of this report.

Table of Contents

Tables

Figures

Appendices

1.0 Introduction

The Government of Canada is committed to providing safe, clean drinking water in all First Nations communities, and to ensuring that wastewater services in all First Nations communities meet acceptable effluent quality standards. As part of this commitment, the Government announced the First Nations Water and Wastewater Action Plan (FNWWAP). The plan funds the construction and renovation of water and wastewater facilities, operator training, and public health activities related to water and wastewater on reserves. It also provided for a national, independent assessment – *The National Assessment of First Nations Water and Wastewater Systems* – which will inform the Government's future, long-term investment strategy. This assessment was also recommended by the Senate Standing Committee on Aboriginal Peoples.

The purpose of the *National Assessment* is to define the current deficiencies and the operational needs of water and wastewater systems, identify the long-term water and wastewater needs of each community and recommend sustainable, long-term infrastructure development strategies.

The objectives of the *National Assessment* are to:

- Identify which upgrades will be required for existing public systems to meet INAC's *Level of Service Standards*; INAC's *Protocol for Safe Drinking Water in First Nations Communities*; INAC's *Protocol for Wastewater Treatment and Disposal in First Nations Communities*; and applicable provincial regulations, codes, and standards

- Complete the Annual Inspection, Risk Assessment and Asset Condition Reporting Systems (ACRS) assessment for water and wastewater assets

- Conduct an overall community serviceability assessment of private, on-site communal and/or central systems

- Prepare Class "D" cost estimates for each of the communities visited. Class "D" estimates are preliminary, and are based on available site information. They indicate the approximate magnitude of the cost of the recommended actions, and they may be used to develop long-term capital plans. In addition, these estimates may be used in preliminary discussions of proposed capital projects.

This assessment involved collecting background data and information about each community, undertaking a site visit, and preparing individual community reports for each participating First Nation. Neegan Burnside Ltd. and its sub-consultants conducted an assessment for each of the eight regions. This report summarizes the findings for the Manitoba region.

1.1 Site Visits

Site visits in the Manitoba region were undertaken by personnel from Neegan Burnside Ltd. and its sub-consultants, KGS Group, during September and October of 2009, and May, June and July of 2010. Each visit included at least two team members. In addition to the consultant staff, additional participants included the Circuit Rider Trainer (CRT) and, in some cases, the Environmental Health Officer (EHO) from Health Canada. Each community report identifies the additional participants who were able to attend.

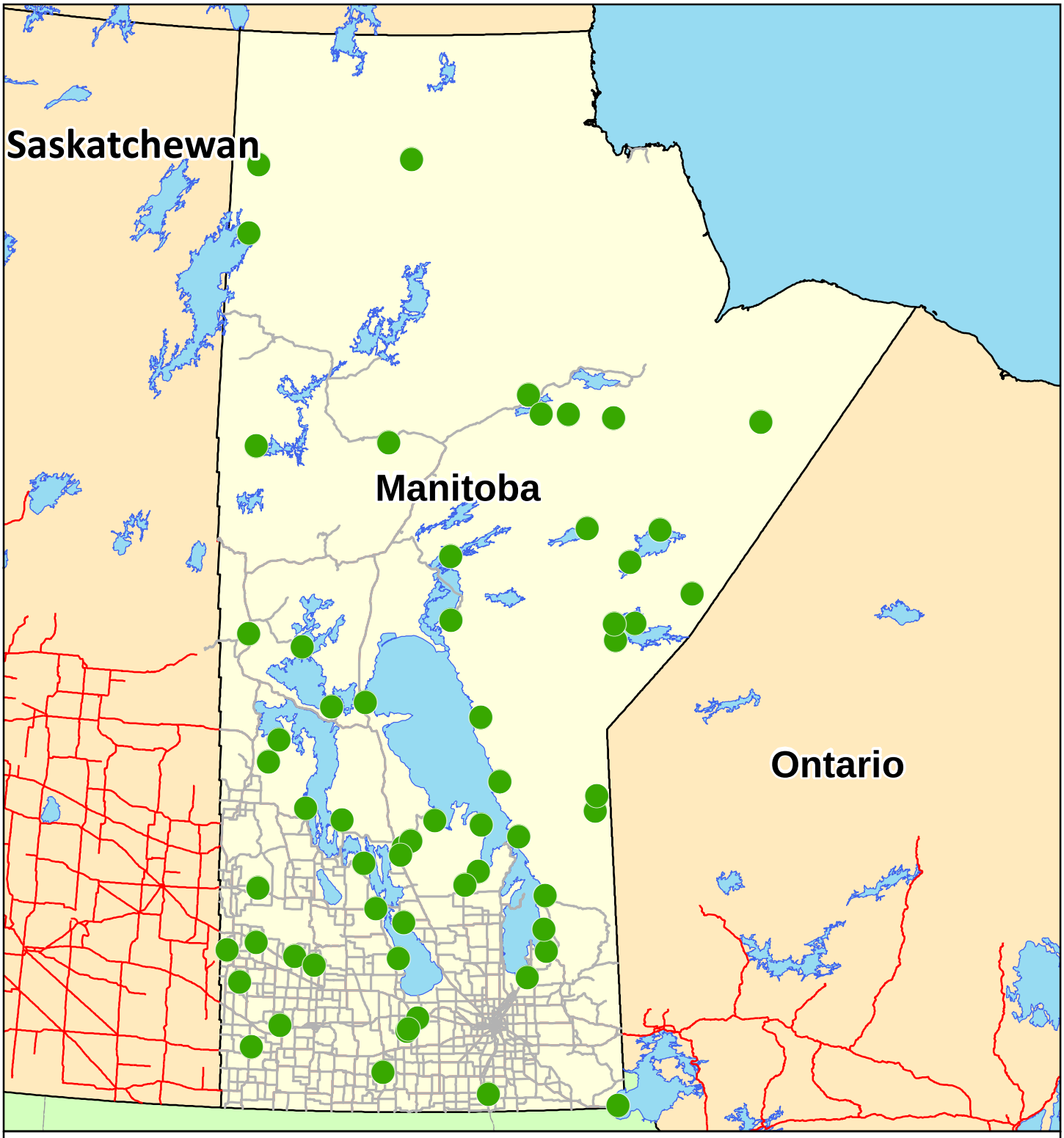
After confirming the various components that the First Nation uses to provide water and wastewater services to the community (i.e. number and types of systems, piping, individual systems, etc.) along with population and future servicing needs (planned development and population growth), an assessment was carried out of the water and wastewater systems, as well as 5% of the individual systems.

1.2 Reporting

Individual community reports were prepared for each First Nation. In the Manitoba region, there was 100% participation from the 62 First Nations. Figure 1.1 indicates the location of each First Nation visited as a part of this study.

The reports include an assessment of existing communal and individual systems, identification of required upgrades to meet departmental, federal and provincial protocols and guidelines, and an assessment of existing servicing of the community along with projections of population and water and wastewater flows for future servicing for the 10 year period. Each report includes the projected costs for the recommendations to meet departmental protocol, federal and provincial guidelines, and an evaluation of servicing alternatives along with life cycle costing for each feasible alternative.

An annual water inspection, risk evaluation and ACRS inspection was completed for each system and are included in the Appendices of each report.



NATIONAL ASSESSMENT OF FIRST NATION WATER AND WASTEWATER SYSTEMS

Figure 1.1 - Manitoba First Nations Visited

- Manitoba First Nations (Visited)
- Manitoba Roads
- National Roads Network
- Major Lakes

N

0 50 100 150 200 250

Kilometers

Indian and Northern Affairs Canada / Affaires indiennes et du Nord Canada

NOTES

This map has been compiled with data of varying scale and accuracy.This is not a plan of survey.

SOURCES

Roads, Water Bodies and Provinces © Department of Natural Resources Canada. All rights reserved.

United States Boundaries © ESRI

Geobase® Aboriginal Lands (First Nations) - Accessed from http://geobase.ca.

DISCLAIMER

Neegan Burnside Ltd. and the above mentioned sources and agencies are not responsible for the accuracy of the spatial, temporal, or other aspects of the data represented on this map. It is recommended that users confirm the accuracy of the information represented.

Project: FGY16308
Drawn By: B. Goll

Projection: Geographic, Canada LCC

NEEGAN BURNSIDE

P:_FGY16308\Maps\Manitoba\Manitoba_Reserve_Visits.mxd

2.0 Regional Overview

The Manitoba region includes 62 First Nations. There are 74 water systems (69 First Nation systems and 5 Municipal Type Agreements) and 61 wastewater systems (57 First Nation systems and 4 Municipal Type Agreements).

A water or wastewater system considered a First Nation system, consists of INAC-funded assets, and serves five or more residences or community buildings. A Municipal Type Agreement (MTA), on the other hand, is when First Nations are supplied with treated water from or send their wastewater to a nearby municipality or neighbouring First Nation or corporate entity as outlined in a formal agreement between the two parties.

The First Nation community population ranges from 43 to 5,869 people, and household sizes range from 2.0 to 8.8 people per unit (ppu). The total number of homes is 15,661, and the average household size is 5.4 ppu.

2.1 Water Servicing

There are a total of 74 water systems serving 60 First Nations. The remaining 2 First Nations are serviced solely by individual wells. For water treatment, the 74 water systems include:

- 5 systems that receive their water supply through a Municipal Type Agreement (MTA)
- 32 groundwater systems
- 37 surface water systems.

For water distribution, the 74 systems are all maintained by First Nations. The following is a summary of the level of service being provided to the homes within the Manitoba region:

- 51% of the homes (7,930) are piped
- 31% of the homes (4,777) are on truck delivery
- 13% of the homes (2,078) are serviced by individual wells
- 5% of the homes (876) have no water service.

The homes with no service are mostly located in some communities in the remote, northern part of the province. In general, these houses are not serviced because they do not have internal plumbing. There are some instances where the water distribution pipe runs in front of the house, but the house does not have service because it lacks indoor plumbing.

Table 2.1, below, provides an overview of the water systems by system classification, source type, treatment type and storage type. In general, the treatment system classification reflects the complexity of the treatment process and the distribution classification reflects the population of the community being serviced. Treatment systems labeled as "Small System" typically represent systems with either disinfection only or no treatment. The classification used for the Manitoba region follows the regulations for Manitoba.

Table 2.1 - Water Overview

System Classification	No.	% of Total
Small System	12	16%
Level I	7	10%
Level II	32	43%
Level III	18	24%
MTA	5	7%

Source Type	No.	% of Total
Groundwater	32	43%
Surface Water	37	50%
MTA	5	7%

Storage	No.	% of Total
None	11	15%
Grade level	3	4%
Underground	60	81%

Treatment Type	No.	% of Total
None - Direct Use	6	8%
Disinfection Only	8	11%
Greensand Filtration	5	7%
Activated Carbon Only	1	1%
Slow Sand	1	1%
Conventional	34	46%
Membrane Filtration	14	19%
MTA	5	7%

2.2 Wastewater Servicing

There are a total of 61 wastewater systems serving 55 First Nations. The remaining 7 First Nations are serviced solely by individual septic systems.

For wastewater treatment, the 61 systems include:

- 4 wastewater systems are provided treatment through a Municipal Type Agreement (MTA)
- 57 First Nation wastewater treatment systems consisting of 32 systems that use either facultative or aerated lagoons, 24 systems that use a mechanical plant, and 1 communal septic system.

For wastewater collection, the 61 systems include:

- 2 wastewater collection systems are operated and maintained through a Municipal Type Agreement (MTA)
- 59 wastewater collection systems that are maintained by the First Nation.

The following is a summary of the level of service being provided to the homes within the Manitoba region:

- 45% of the homes (7,075) are piped
- 28% of the homes (4,403) are on truck haul
- 22% of the homes (3,337) are serviced by individual septic systems
- 5% of the homes (846) are reported to have no service.

The following table provides an overview of the wastewater systems by system classification and treatment type.

Table 2.2 - Wastewater Overview

System Classification	No.	% of Total
Small System	4	7%
Level I	28	45%
Level II	20	33%
Level III	5	8%
MTA	4	7%

Treatment Type	No.	% of Total
Aerated Lagoon	10	16%
Facultative Lagoon	22	36%
Mechanical Treatment	24	39%
MTA	4	7%
Septic System	1	2%

3.0 Preliminary Results and Trends

3.1 Per Capita Consumption and Plant Capacity

Historical flow records were not available for two of the five First Nations serviced by a Municipal Type Agreement, or for 23 of the First Nations with communal water systems. For the remaining 49 communal water systems, the average per capita demand ranges from 10 L/p/d to 420 L/p/d, with an average per capita demand of approximately 176 L/p/d.

For the systems without flow data, an average per capita flow rate ranging from 225 L/p/d to 275 L/p/d for piped servicing and 90 L/p/d for truck haul was used to evaluate the water systems. The distribution of per capita flow is outlined in Table 3.1.

Table 3.1 - Range of Per Capita Water Usage Rates

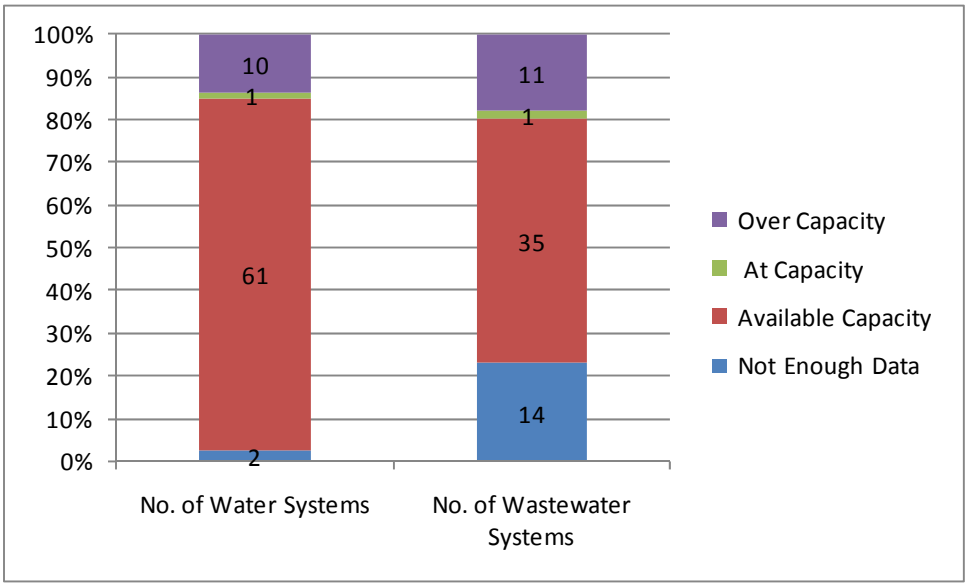
	No. of systems 2009
Less than 250 L/c/d	38
250 L/c/d to 375 L/c/d	34
Greater than 375 L/c/d	2

Historical flow data for wastewater was not available for most of the wastewater systems. Therefore, to evaluate the ability of the existing infrastructure to meet the current and projected needs, an average daily flow was calculated based on the actual or assumed per capita water consumption, plus an infiltration allowance of 90 L/c/d for piped servicing.

The following figure provides a summary of the plant capacity for the First Nation water and wastewater systems:

- over capacity: the existing system is unable to meet the current needs
- at capacity: the existing system is able to meet the current needs
- available capacity: the existing system has sufficient capacity to meet more than the current needs
- not enough data: insufficient data was available to determine the actual system capacity.

Figure 3.1 - Water and Wastewater Treatment Capacities



The data collected shows that 11 water systems and 12 wastewater systems are operating at or beyond their estimated capacities. For the plants identified as being over capacity, the per capita demand is within typical values for the region, according to available records.

3.2 Distribution and Collection

The household size for the 62 First Nations ranges from 2.0 to 8.8 people per unit (ppu), with an average of 5.4 ppu. The total number of piped connections in the region is 7,930 for water and 7,075 for wastewater. The average length per connection of watermain is 56 m and average length per connection of sewermain in the region is 33 m.

In some cases the data provided for watermains includes dedicated transmission main lengths with no service connections and non-distribution mains (i.e. intake pipes, raw water pipes). As a result, the average length per connection is inflated, particularly for smaller communities where the additional pipe length is spread over a smaller number of connections.

The table below indicates the number of water and wastewater systems that have pipe lengths above and below 30 m/connection. It should be noted that this information was not available for all of the systems.

Table 3.2 - Average Water Distribution and Wastewater Collection Pipe Lengths

	Watermain	Sewer
Average m/connection	56	33
No. of systems with pipe lengths above 30 m/connection	50	27
No. of systems with pipe lengths below 30 m/connection	9	24

Figure 3.2 - Water Distribution: Average Pipe Length per Connection

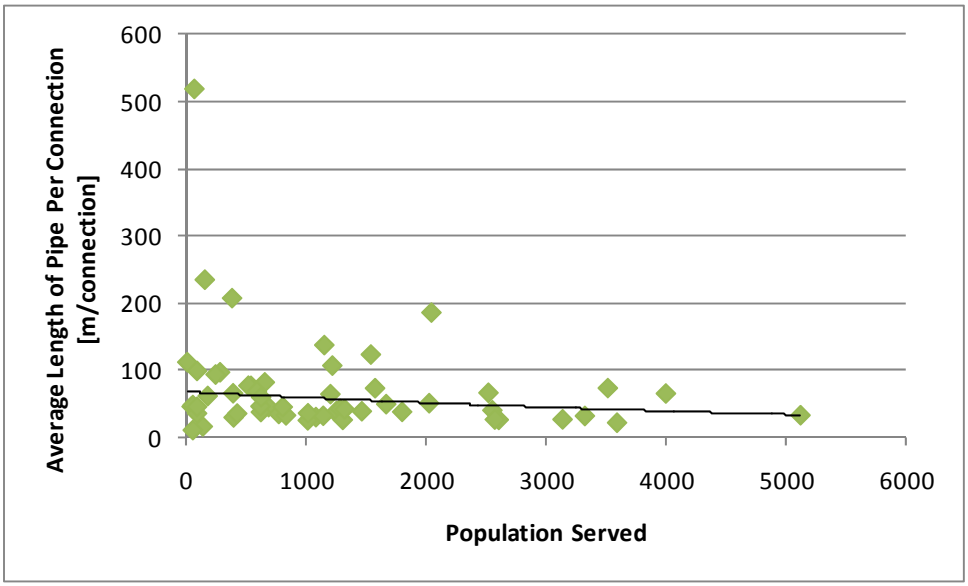
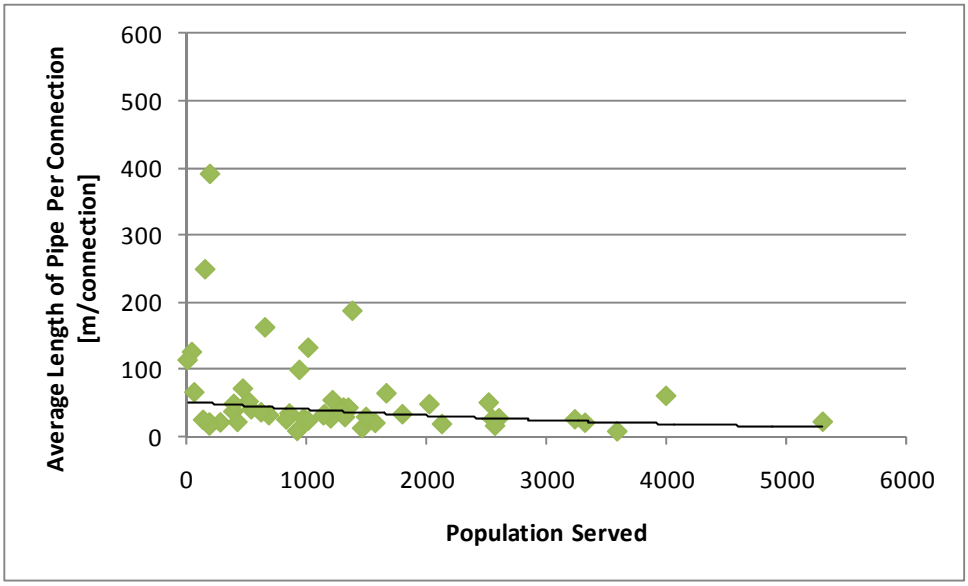


Figure 3.3 - Wastewater Collection: Average Pipe Length per Connection



3.3 Water Risk Evaluation

A risk assessment has been completed for each water system according to the INAC Risk Level Evaluation Guidelines. Each facility is ranked in risk according to the following categories: Water Source, Design, Operation (and Maintenance), Reporting and Operators. The risk levels of all five categories are then used to determine the overall risk for the system.

Each of the five risk categories, as well as the overall risk level of the entire system, is ranked numerically from 1 to 10. Low, medium and high risks are defined as follows:

- **Low Risk (1.0 to 4.0):** These are systems that operate with minor deficiencies. Low-risk systems usually meet the water quality parameters that are specified by the appropriate Canadian Guidelines for drinking water (in particular, the *Guidelines for Canadian Drinking Water Quality* (GCDWQ)).
- **Medium Risk (4.1 to 7.0):** These are systems with deficiencies, which—individually or combined— pose a medium risk to the quality of water and to human health. These systems do not generally require immediate action, but the deficiencies should be corrected to avoid future problems.
- **High Risk (7.1 to 10.0):** These are systems with major deficiencies, which—individually or combined—pose a high risk to the quality of water. These deficiencies may lead to potential health and safety or environmental concerns. They could also result in water quality advisories against drinking the water (such as, but not limited to, boil water advisories), repetitive non-compliance with guidelines, and inadequate water supplies. Once systems are classified under this category, regions and First Nations must take immediate corrective action to minimize or eliminate deficiencies.

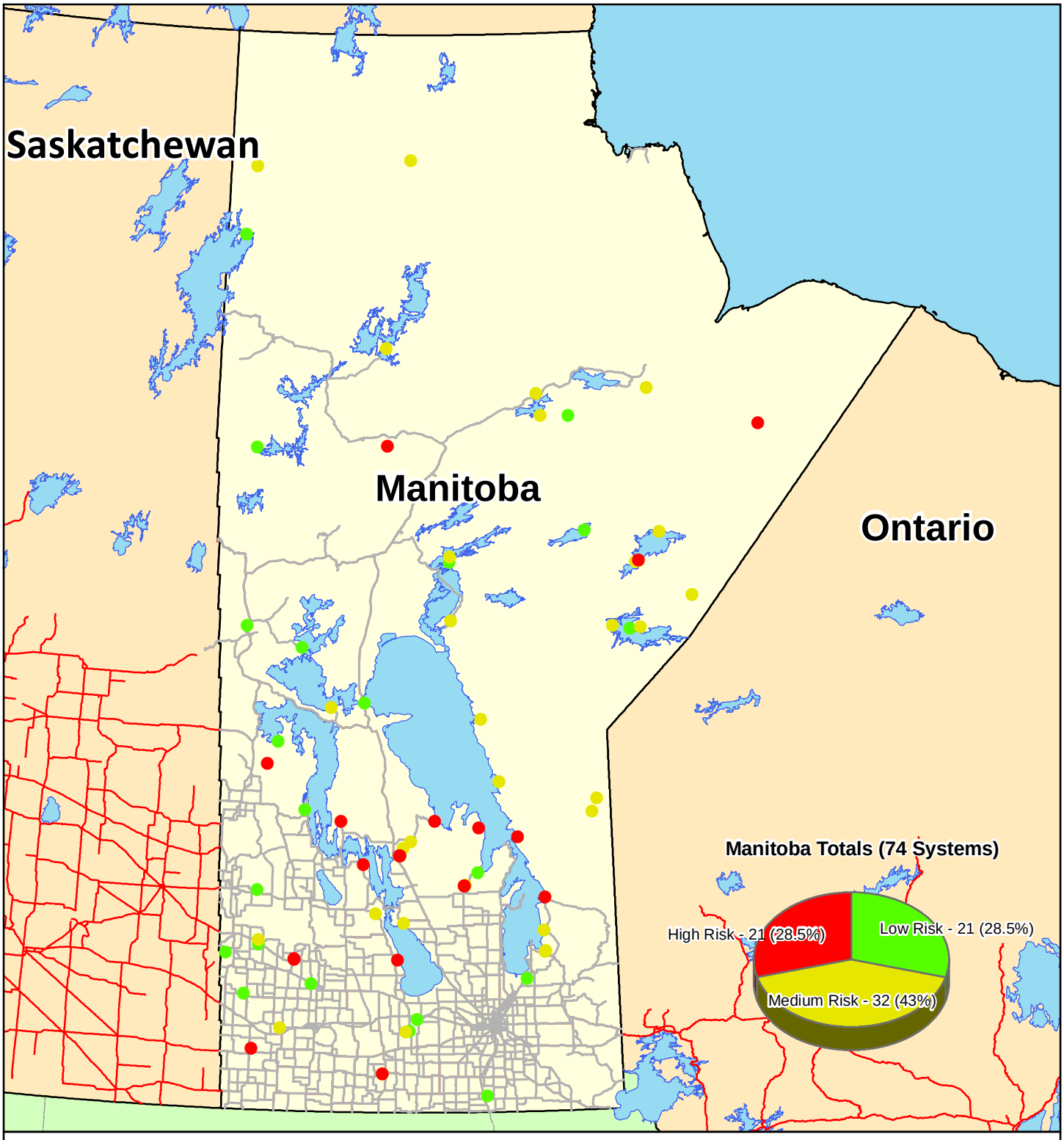
Regional Risk Summary:

Of the 74 water systems inspected:

- 21 are categorized as high overall risk
- 32 are categorized as medium overall risk
- 21 are categorized as low overall risk.

The table in Appendix E.1 summarizes the correlation between component risk and overall risk.

Figure 3.4 provides a geographical representation of the final risk for the water systems that were inspected.



NATIONAL ASSESSMENT OF FIRST NATION WATER AND WASTEWATER SYSTEMS

Water System Risk Level

- High
- Medium
- Low
- Manitoba Roads
- National Roads Network
- Major Lakes

Figure 3.4 - Manitoba Water System Risk

N

0 50 100 150 200 250

Kilometers

NOTES

This map has been compiled with data of varying scale and accuracy.This is not a plan of survey.

SOURCES

United States Boundaries © ESRI

Geobase® Aboriginal Lands (First Nations) - Accessed from http://geobase.ca.

DISCLAIMER

Neegan Burnside Ltd. and the above mentioned sources and agencies are not responsible for the accuracy of the spatial, temporal, or other aspects of the data represented on this map. It is recommended that users confirm the accuracy of the information represented.

Project: FGY16308
Drawn By: B. Goll

Projection: Geographic, Canada LCC

Indian and Northern Affairs Canada | Affaires indiennes et du Nord Canada

NEEGAN BURNSIDE

P:_FGY16308\Maps\Manitoba\Manitoba_Water_System_Risk.mxd

3.3.1 Overall System Risk by Source

The following table summarizes the overall system risk by water source. In general, Municipal Type Agreement systems have the lowest risk, followed by surface water systems and, finally, groundwater systems.

Table 3.3 - Summary of Overall Risk Levels by Water Source

Overall Risk Level	Groundwater	Surface Water	MTA	TOTAL
High	12	9	0	**21**
Medium	10	21	1	**32**
Low	10	7	4	**21**
Total	**32**	**37**	**5**	**74**

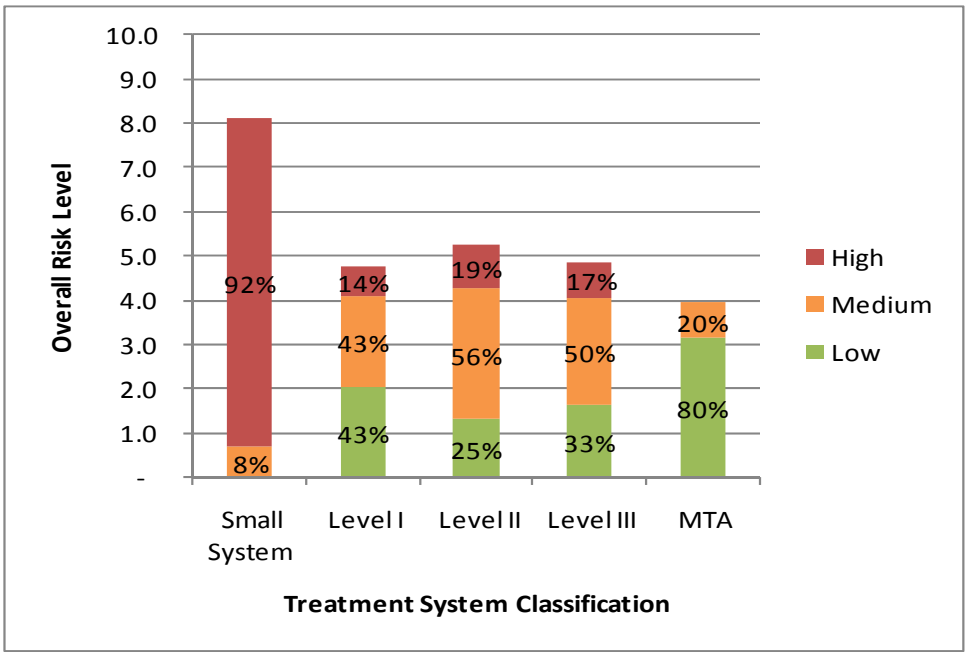
3.3.2 Overall System Risk by Treatment Classification

The following table summarizes the overall system risk by classification level of the treatment system. Although there is no clear pattern between the system classification level and overall system risk, 92% of the Small Systems are classified as high risk and 56% and 50% of the Level II and Level III systems are medium risk, respectively.

Table 3.4 - Summary of Overall Risk Levels by Treatment System Classification

Overall Risk Level	Small System	Level I	Level II	Level III	MTA	Total
High	11	1	6	3	0	**21**
Medium	1	3	18	9	1	**32**
Low	0	3	8	6	4	**21**
Total	**12**	**7**	**32**	**18**	**5**	**74**

Figure 3.5 - Risk Profile Based on Water Treatment System Classification



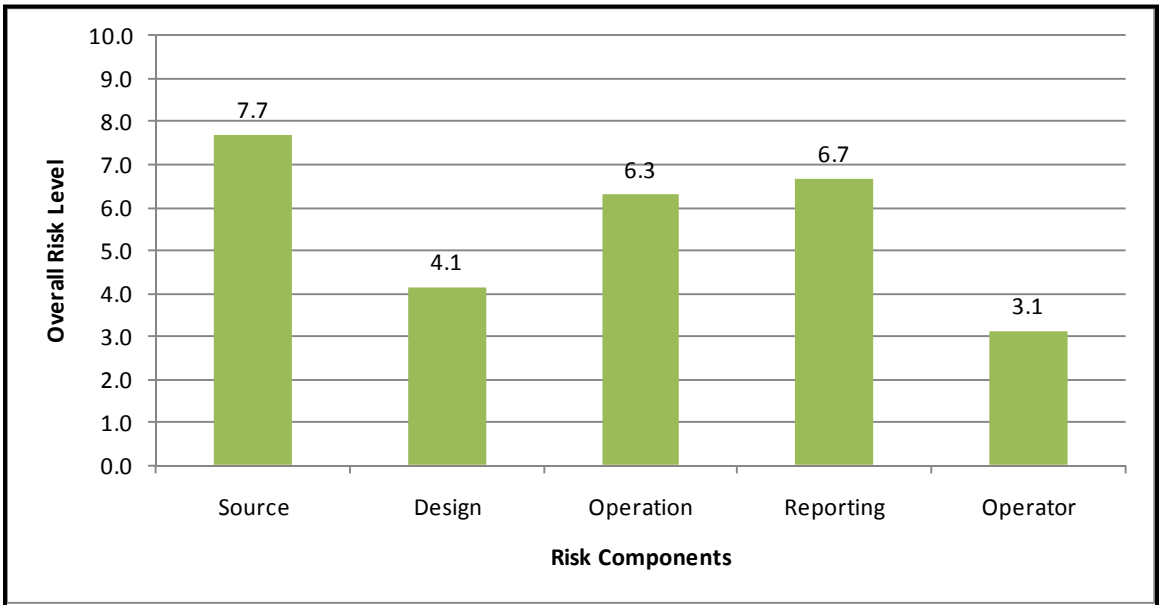
3.3.3 Overall Risk by Number of Connections

For the Manitoba region, approximately 81% of systems serving more than 100 connections are medium and low overall risk. For systems serving less than 100 connections, approximately 85% are medium or high risk.

3.3.4 Component Risks: Water

The overall risk is comprised of five component risks: water source, design, operation, reporting and operator. Each of these component risk factors is discussed below.

Figure 3.6 - Water: Risk Profile Based on Risk Components



	Source	Design	Operation	Reporting	Operator
Risk	7.7	4.1	6.3	6.7	3.1
Minimum	1.0	1.0	1.0	1.0	1.0
Maximum	10.0	8.0	10.0	10.0	10.0
Std. Dev.	2.1	2.3	2.3	3.4	3.3

3.3.5 Component Risk - Water: Source

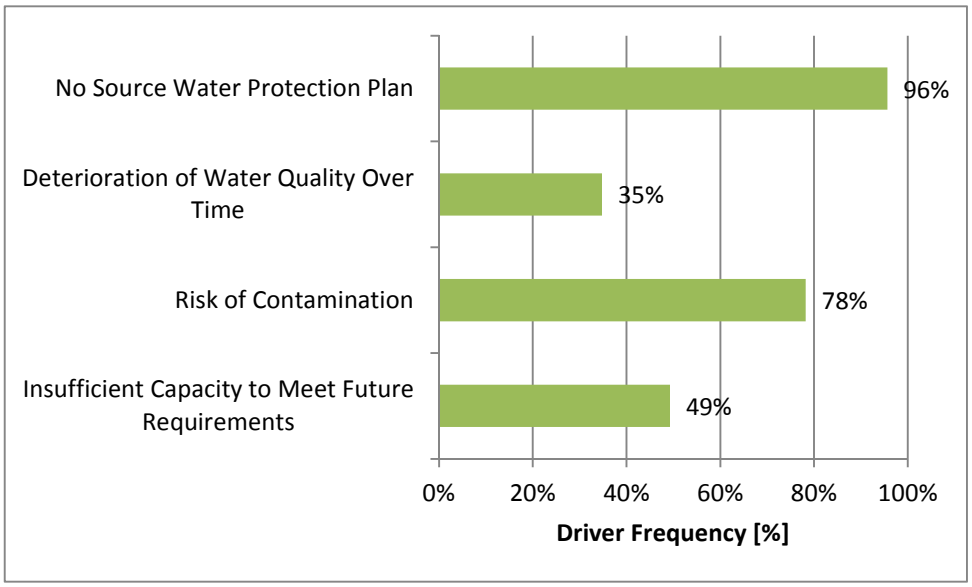
The risk associated with the water source has a mean score of 7.7 overall. The mean source risk by type is:

- groundwater at 7.4
- surface water at 8.7
- Municipal Type Agreement (MTA) at 2.4.

Systems that rely on surface water typically have a higher component risk score than systems that rely on groundwater. Consequently, the risk formula automatically assigns a higher base risk to these types of systems.

The following figure identifies the drivers that contribute to source risk scores.

Figure 3.7 - Source Risk Drivers



3.3.6 Component Risk - Water: Design

The risk associated with the design has a mean score of 4.1 overall. The mean design risk score by type of source is:

- groundwater at 4.5
- surface water at 4.0
- Municipal Type Agreement (MTA) at 2.8.

The higher design risk associated with groundwater was due to lack of treatment to ensure that the aesthetic and operational guidelines were being met. As part of the multi-barrier approach to water treatment, chlorination is now required for all water systems. A groundwater system with an increased design risk is typically associated with not having disinfection systems in place or not providing sufficient contact time to ensure that the chlorination process is adequate.

The higher risk for surface water sources and Municipal Type agreements is typically because the treated water system or distribution system exceeds the GCDWQ for disinfection by-products.

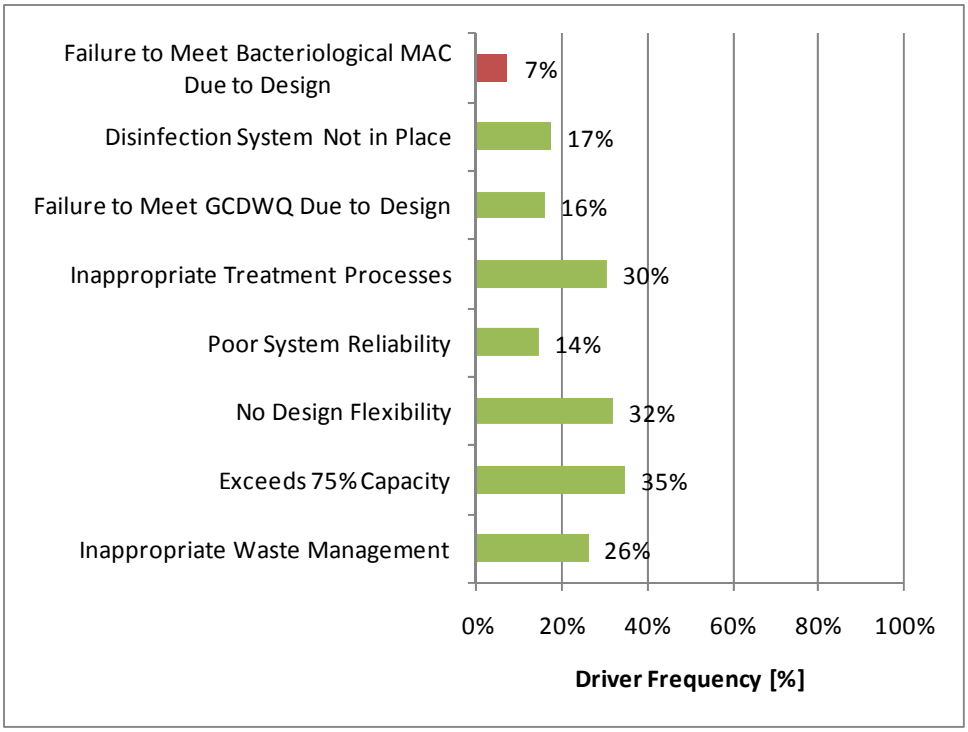
There are several key drivers that have a significant impact on the region's design risk scores, including:

- failure to meet the *Guidelines for Canadian Drinking Water Quality* (GCDWQ)
- exceeding the GCDWQ Maximum Acceptable Concentration (MAC) for bacteria
- no disinfection system in place or a disinfection system that is not being used
- no appropriate treatment in place to meet INAC's Protocol requirements
- problems with system reliability
- systems approaching or exceeding design capacity

- systems not having appropriate waste management.

The frequency of each design risk driver resulting is listed in the figure below.

Figure 3.8 - Design Risk Drivers



It should be noted that the design risk drivers in red result in the entire water system being given a high risk score, regardless of all of the other component risk scores.

3.3.7 Component Risk - Water: Operation

The risk associated with operation has a mean score of 6.3 overall. The mean operation risk score by type of source is:

- groundwater at 6.0
- surface water at 6.6
- Municipal Type Agreement (MTA) at 5.8.

Areas that increased risk include: operators not maintaining records, operators not having or not using approved Operation & Maintenance manuals, and operators not scheduling and performing maintenance activities. An increased effort in these areas would lower both the operation risk component and the overall risk scores.

There are several key drivers that have a significant impact on the region's operation risk scores, including:

- failure to meet the *Guidelines for Canadian Drinking Water Quality* (GCDWQ)
- exceeding the GCDWQ Maximum Acceptable Concentration (MAC) for bacteria
- maintenance logs being inadequately maintained
- lack of general system maintenance
- Emergency Response Plan not in place
- Operations & Maintenance manual not available or not in use.

Figure 3.9 - Operations Risk Drivers

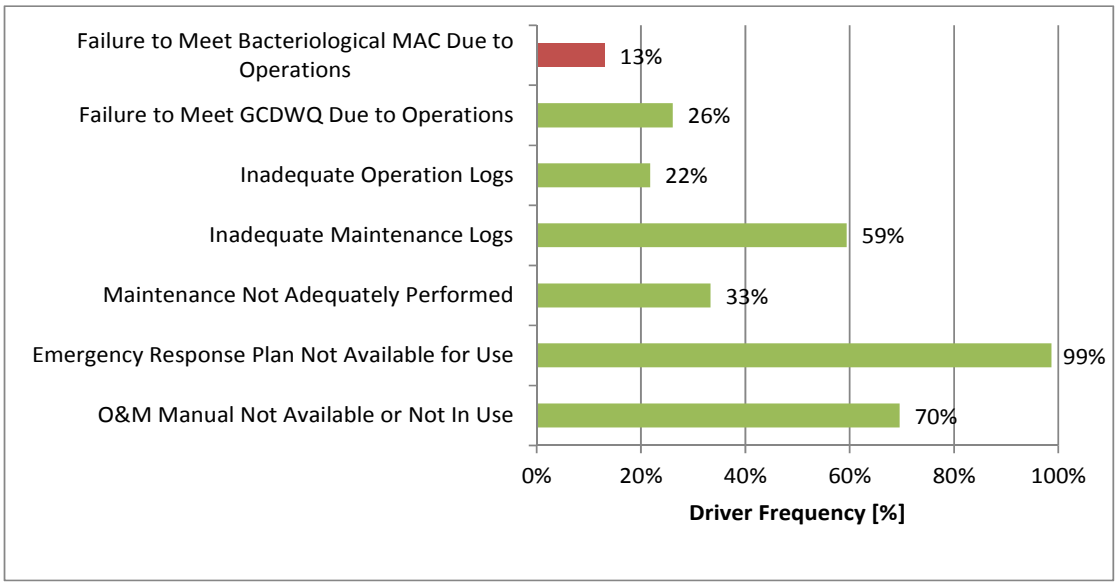
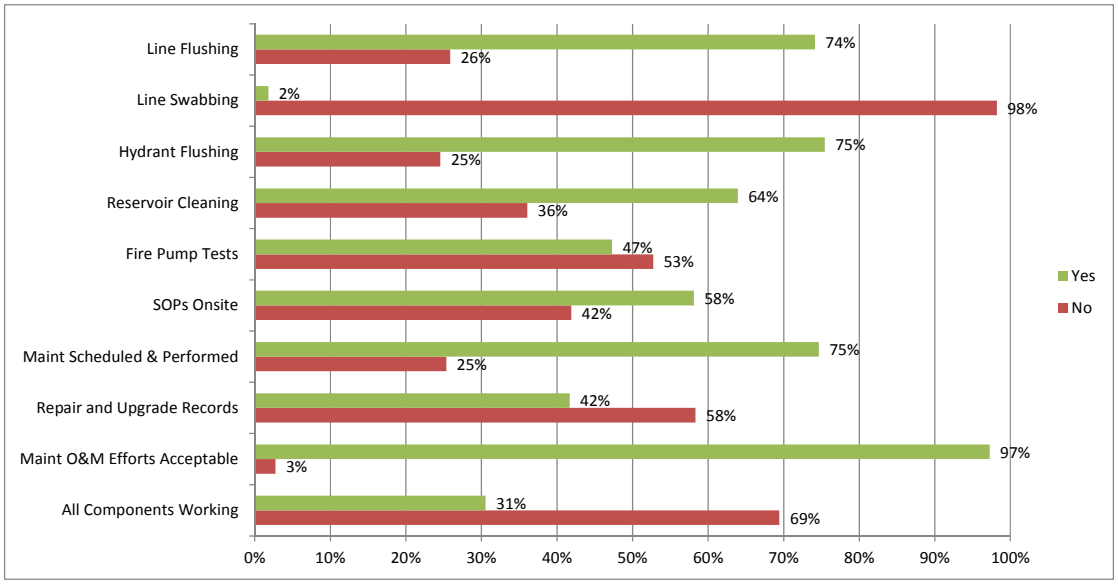


Figure 3.10 - Summary of Findings: Water Systems Operational Practices



One or more major components are not working for approximately 70% of the systems. Although the operators for approximately 75% of systems practice line and hydrant flushing, most do not regularly swab watermains. Approximately 36% do not clean reservoirs and 53% do not test fire pumps. Records of system maintenance and repairs were available for only 42% of the systems.

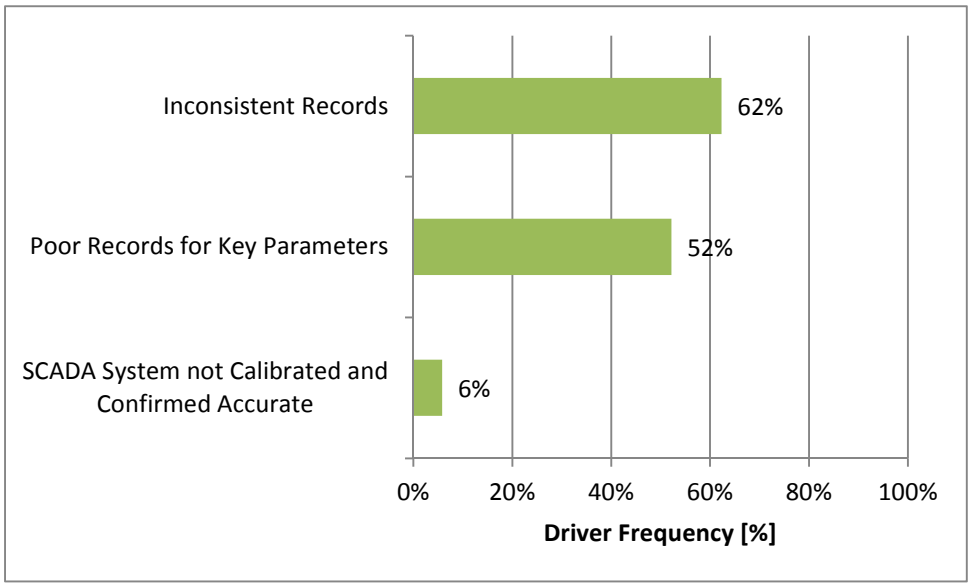
3.3.8 Component Risk - Water: Reporting

The risk associated with reporting has a mean score of 6.7 overall. Some of the Municipal Type Agreements include a reservoir and re-chlorination with highlift pumping to the distribution system. These facilities are generally not keeping records of chlorine residual and flow. This is reflected in the risk score of 9.2. The mean reporting risk score by type of source is:

- groundwater at 7.1
- surface water at 6.0
- Municipal Type Agreement (MTA) at 9.2.

Inconsistent record keeping and reporting are the main drivers for reporting risk for all systems (62%).

Figure 3.11 - Reporting Risk Drivers



3.3.9 Component Risk - Water: Operator

The risk associated with the operator has a mean score of 3.1 overall, which is the lowest overall component risk score for all types of systems. The majority of the systems have a primary operator, with the exception of a few small groundwater pumphouses. Although more complicated systems based on treatment classification require an operator with a higher level of training, the operator risk is highest for groundwater systems. The mean operator risk score by type of source is:

- groundwater at 4.3
- surface water at 2.5
- Municipal Type Agreement (MTA) at 1.0.

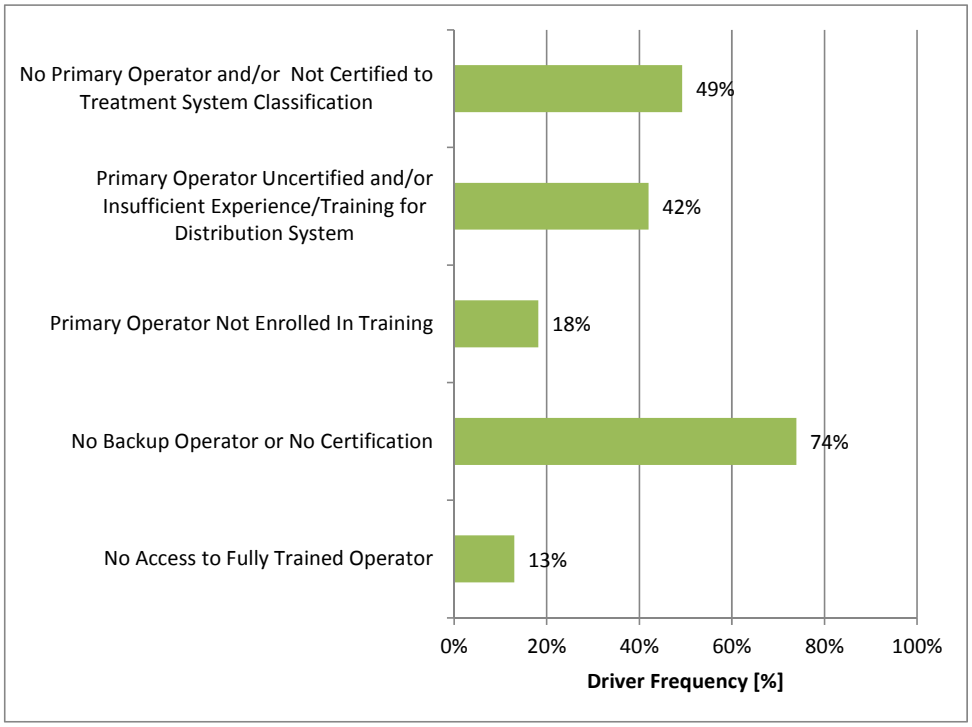
The extent to which existing systems have fully certified primary and backup operators is presented in Table 3.5. Of the 69 systems that require a certified operator for the water treatment system, 49% did not have a fully certified primary operator and 88% did not have a fully certified backup operator. Of the 69 systems that require a certified operator for the distribution system, 38% did not have a fully certified primary operator and 75% did not have a fully certified backup operator.

Table 3.5 - Water: Operator Status for Manitoba Region

	Primary Operator		Backup Operator	
	Treatment	**Distribution**	**Treatment**	**Distribution**
No. of Systems Currently Without an Operator	5	4	15	14
No. of Systems with Operator with No Certification	15	16	36	37
No. of Systems with Operator Certified but not to the Required Level of the System	14	6	10	1
No. of Systems with Operator with Adequate Certification	35	43	8	17
No. of Systems Not Requiring Operators with Certification	5	5	5	5
Total No. of Systems	**74**	**74**	**74**	**74**

Those factors which frequently contribute to increased operator risk are identified in Figure 3.12. A lack of certification, lack of training and the lack of primary or backup operator are common drivers that increase operator risk.

Figure 3.12 - Operator Risk Drivers



3.4 Wastewater Risk Evaluation

A risk assessment was completed for each wastewater system according to INAC's *Risk Level Evaluation Guidelines*. The risk of each wastewater facility is ranked according to the following categories: effluent receiver, design, operation and maintenance, reporting, and operators. The overall risk score is a weighted average of the component risk scores.

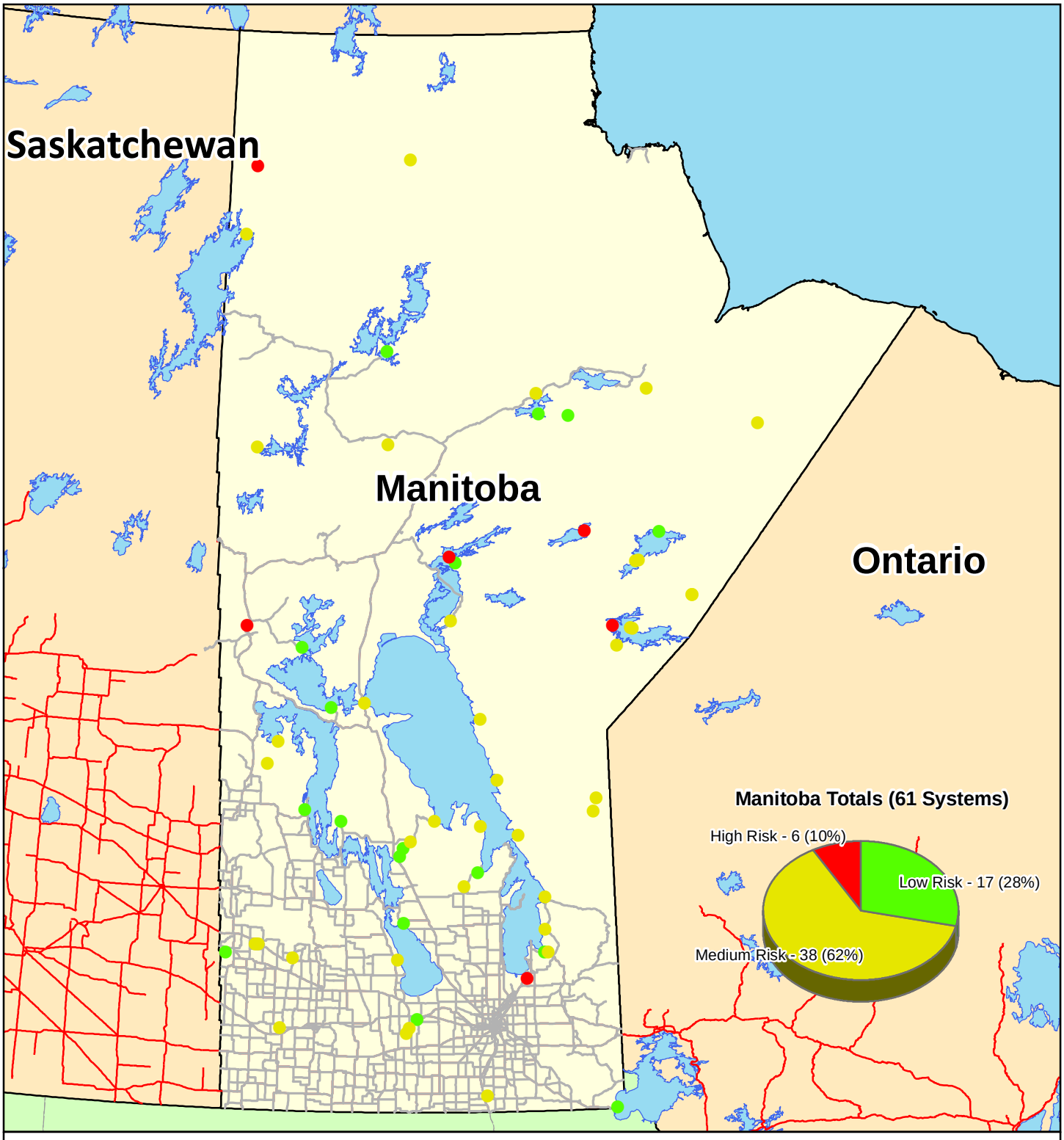
Each of the five risk categories, as well as the overall risk level of the entire system, is ranked numerically from 1 to 10. A risk ranking of 1.0 to 4.0 represents low risk, a risk ranking of 4.1 to 7.0 represents a medium risk, and a risk of 7.1 to 10.0 represents a high risk.

Of the 61 wastewater systems inspected:

- 6 are categorized as high overall risk
- 38 are categorized as medium overall risk
- 17 systems are categorized as low risk.

Appendix E.2 provides a table summarizing the correlation between component risk and overall risk.

Figure 3.13 provides a geographical representation of the final risk for the wastewater systems that were inspected.



NATIONAL ASSESSMENT OF FIRST NATION WATER AND WASTEWATER SYSTEMS

Wastewater System Risk Level

- High
- Medium
- Low
- Manitoba Roads
- National Roads Network
- Major Lakes

Figure 3.13 - Manitoba Wastewater System Risk

N

0 50 100 150 200 250

Kilometers

NOTES

This map has been compiled with data of varying scale and accuracy.This is not a plan of survey.

SOURCES

Roads, Water Bodies and Provinces © Department of Natural Resources Canada. All rights reserved.

United States Boundaries © ESRI

Geobase® Aboriginal Lands (First Nations) - Accessed from http://geobase.ca.

DISCLAIMER

Neegan Burnside Ltd. and the above mentioned sources and agencies are not responsible for the accuracy of the spatial, temporal, or other aspects of the data represented on this map. It is recommended that users confirm the accuracy of the information represented.

Project: FGY16308
Drawn By: B. Goll

Projection: Geographic, Canada LCC

Indian and Northern Affairs Canada | Affaires indiennes et du Nord Canada

NEEGAN BURNSIDE

P:_FGY16308\Maps\Manitoba\Manitoba_WW_System_Risk.mxd

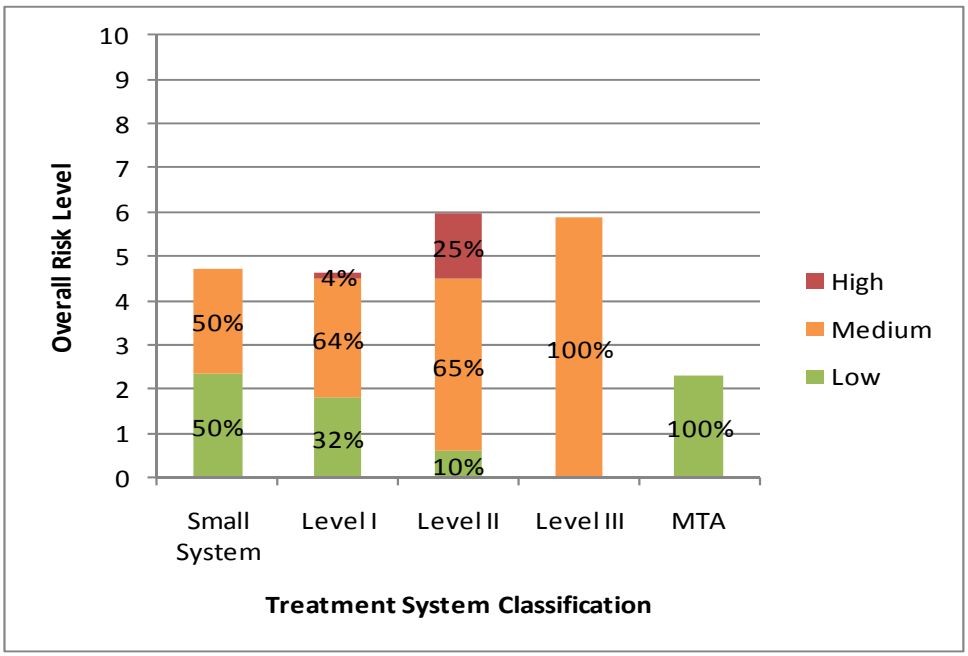
3.4.1 Overall System Risk by Treatment Classification

Figure 3.14 demonstrates the correlation between the overall system risk and the classification level of the treatment system. In the Manitoba region, the majority of the systems are Level I or Level II; there are only five Level III systems and four Small Systems. For Municipal Type Agreements, it is assumed that the municipality operates their system in accordance with provincial legislation, which results in a low-risk effluent receiver.

All four of the Municipal Type Agreement (MTA) systems are low risk. For the Manitoba region:

- all of the Small Systems are low to medium risk
- all of the Level I systems except one are categorized as low to medium risk
- 90% of the Level II systems are categorized as medium to high risk
- all five of the Level III systems are categorized as medium risk.

Figure 3.14 - Risk Profile Based on Wastewater Treatment System Classification



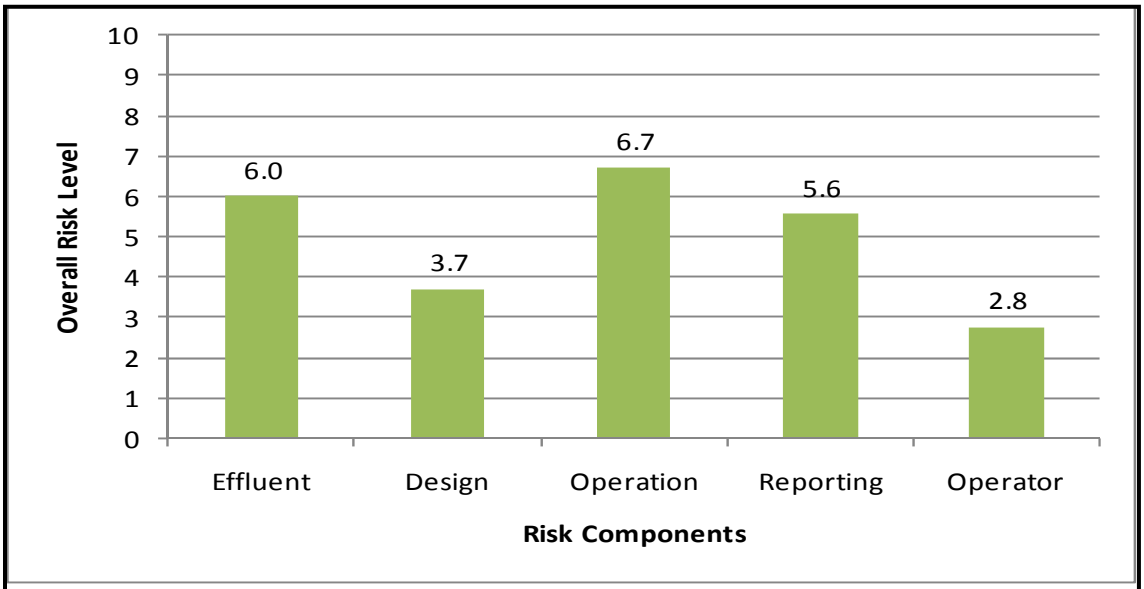
3.4.2 Overall System Risk by Number of Connections

For the Manitoba region, the overall system risk generally increased with the number of connections.

3.4.3 Component Risks: Wastewater

The overall risk is comprised of five component risks: effluent receiver, design, operation, reporting and operators. Each of these component risk factors are discussed below.

Figure 3.15 - Wastewater: Risk Profile Based on Risk Components



	Effluent	Design	Operation	Reporting	Operator
Risk	6.0	3.7	6.7	5.6	2.8
Minimum	1.0	1.0	3.0	1.0	1.0
Maximum	10.0	8.0	10.0	10.0	10.0
Std. Dev.	2.8	2.1	1.9	4.2	2.8

3.4.4 Component Risk - Wastewater: Effluent Receiver

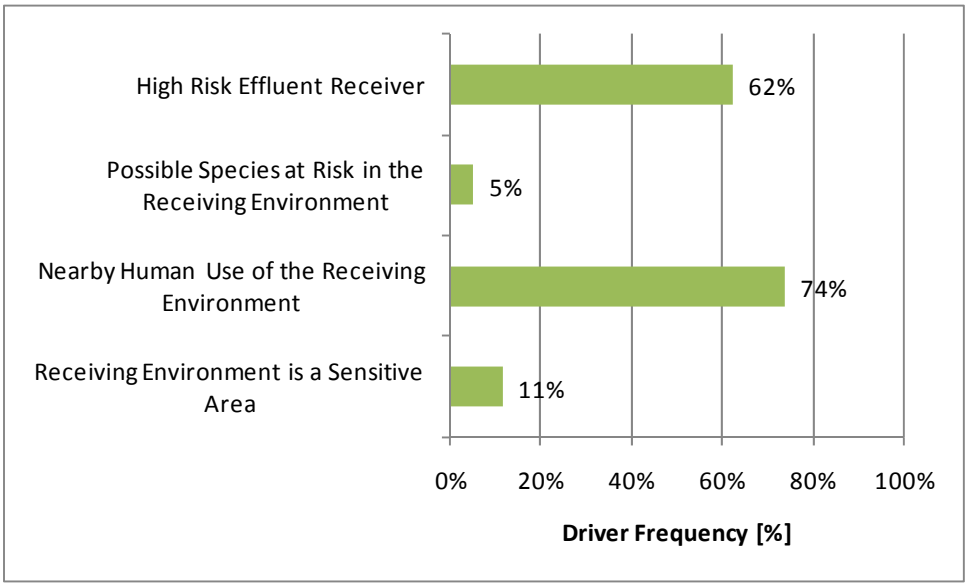
The effluent receiver has a mean risk score of 6.0. There are two key risk drivers of this component:

- the receiving environment
- the extent to which the receiver is required for other human uses, such as fishing, recreation or drinking water.

The mean effluent receiver risk scores are:

- septic at 3.0
- aerated lagoon at 6.1
- facultative lagoon at 5.0
- mechanical sewage treatment plant at 7.7
- Municipal Type Agreement (MTA) at 1.8.

Figure 3.16 - Effluent Risk Drivers



3.4.5 Component Risk - Wastewater: Design

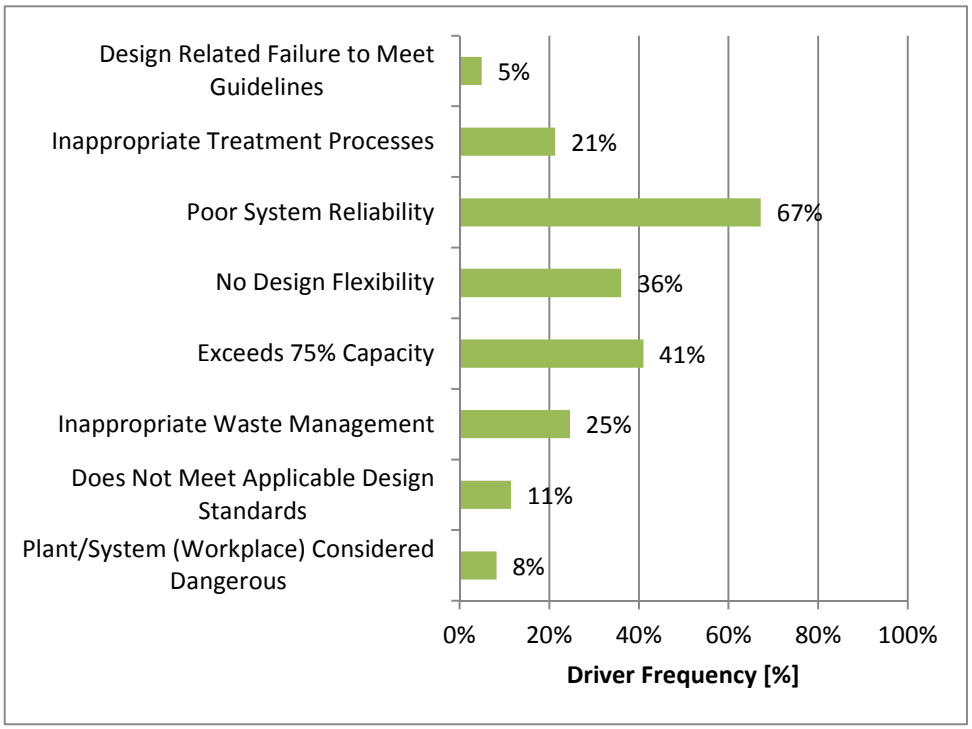
The risk associated with the design has a mean score of 3.7. The risk associated with the design has the second lowest mean component score; however, excluding Municipal Type Agreements, 18 of the systems have a high or medium component risk score, and 39 have a low risk score. The mean design risk scores are:

- septic at 3.0
- aerated lagoon at 2.8
- facultative lagoon at 3.2
- mechanical sewage treatment plant at 5.0
- Municipal Type Agreement (MTA) at 1.3.

There are several key drivers that have a significant impact on the design risk scores of wastewater systems in the region, including:

- inappropriate treatment processes
- poor system reliability
- system lacks the flexibility to meet future growth
- system has exceeded the design capacity
- inappropriate waste management.

Figure 3.17 - Design Risk Drivers



3.4.6 Component Risk - Wastewater: Operation

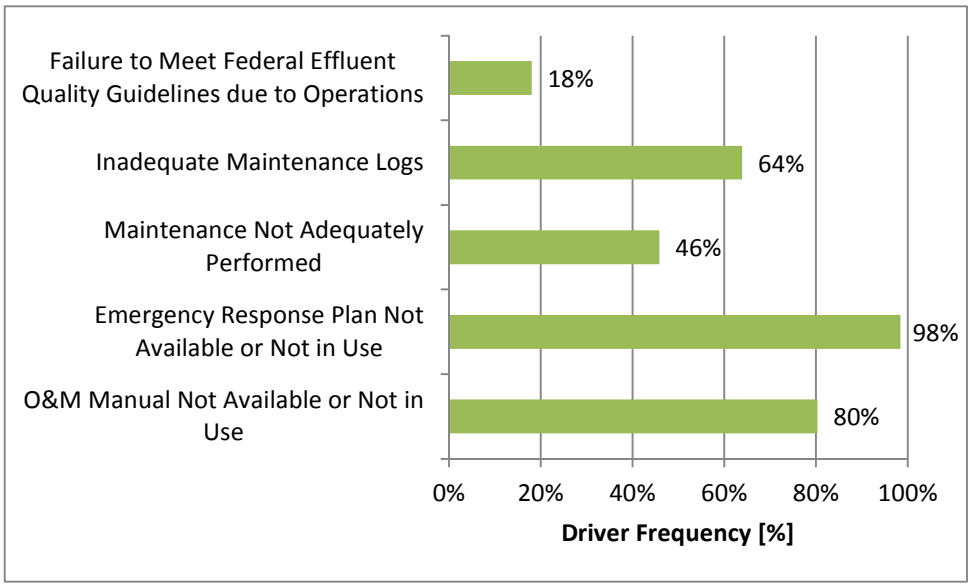
The risk associated with the operation has a mean score of 6.7. Most of the wastewater systems have a medium- or high-risk score. This is identified as an area of opportunity for increased risk-mitigation efforts.The mean operation risk scores are:

- septic at 8.0
- aerated lagoon at 5.5
- facultative lagoon at 7.1
- mechanical sewage treatment plant at 7.1
- Municipal Type Agreement (MTA) at 4.5.

There are several key drivers that have a significant impact on the operation risk scores of wastewater systems in the Manitoba Region:

- inadequate maintenance logs
- general maintenance not being performed adequately
- Emergency Response Plans not in place or not being used
- Operations & Maintenance manuals not available or not in use.

Figure 3.18 - Operation Risk Drivers

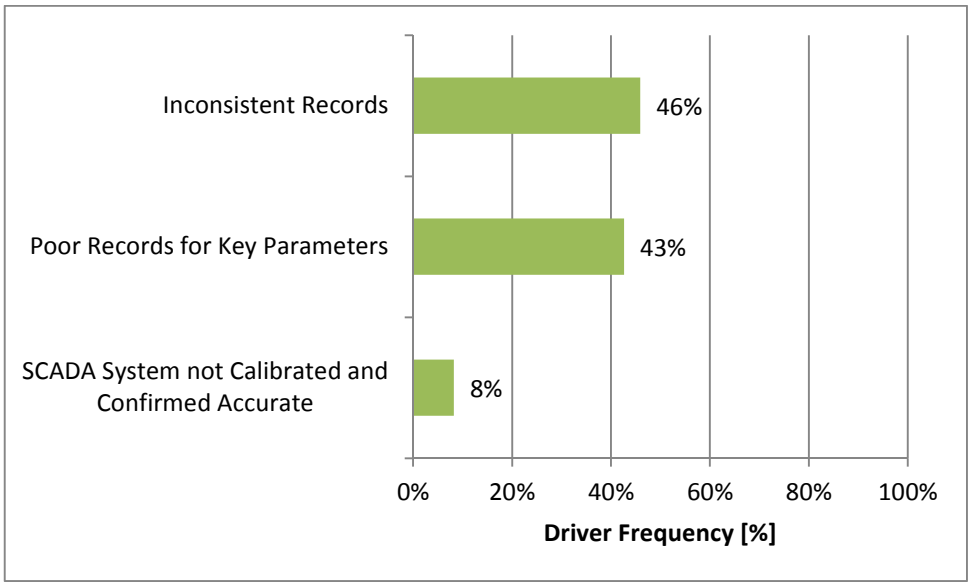


3.4.7 Component Risk - Wastewater: Reporting

The risk associated with reporting has a mean score of 5.6. The reporting risk evaluates the maintenance of effluent-testing and system-monitoring records. Little record keeping is required for septic systems and lagoons (other than keeping general maintenance logs of lagoons and septic systems, and sampling before discharge for lagoons). Inconsistent record keeping is a significant factor in raising the overall risk ranking for mechanical treatment plants with constant discharge. The mean reporting risk scores are:

- septic at 1.0
- aerated lagoon at 4.8
- facultative lagoon at 3.6
- mechanical sewage treatment plant at 8.3
- Municipal Type Agreements (MTA) at 3.3.

Figure 3.19 - Reporting Risk Drivers



3.4.8 Component Risk - Wastewater: Operator

The risk associated with the operator has a mean score of 2.8. Operator risk is determined by whether or not the operators have adequate certification. There are only six systems that have a high-risk system because operators do not have adequate certification and/or an available backup operator. Operator risk is categorized as medium for 10 of the systems and low for the remaining 45 systems.

The extent to which existing wastewater systems have fully certified primary and backup operators is presented in Table 3.6. Of the 57 systems which require a certified operator for the wastewater treatment system, 44% did not have a fully certified primary operator and 89% did not have a fully certified backup operator. Of the 58 systems which require a certified operator for the collection system, 41% did not have a fully certified primary operator and 88% did not have a fully certified backup operator.

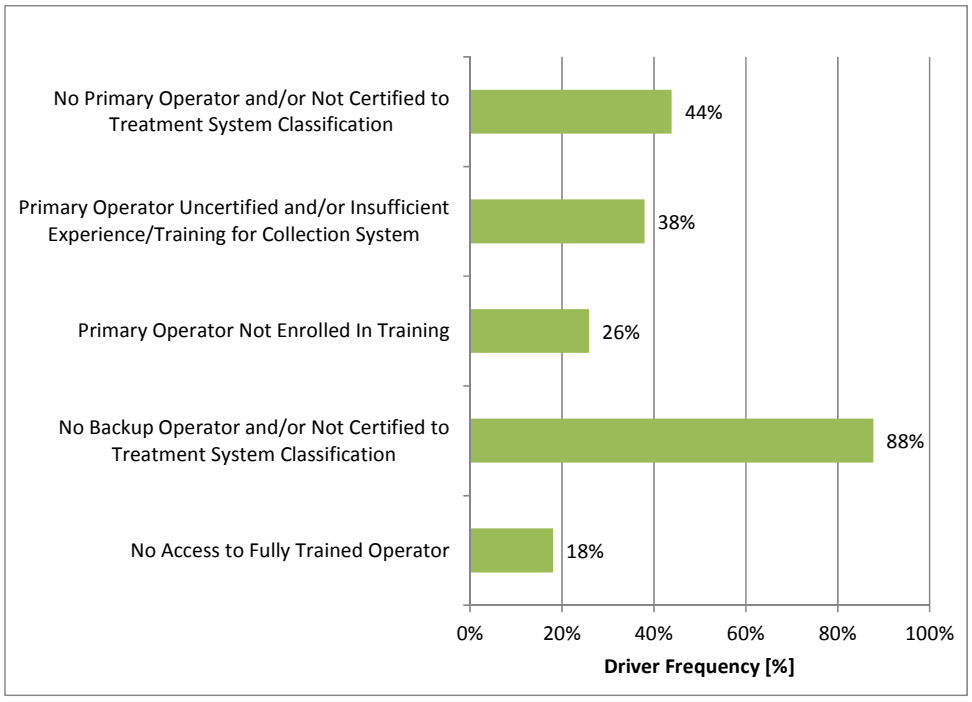
To ensure that the component risk remains low, it is important to ensure that all operators are enrolled in training and become certified to the level of their respective treatment systems.

Table 3.6 - Wastewater: Operator Status for Manitoba Region

	Primary Operator		Backup Operator	
	Treatment	Collection	Treatment	Collection
No. of Systems Currently Without an Operator	1	2	11	13
No. of Systems with Operator with No Certification	17	16	39	38
No. of Systems with Operator Certified but not to the Required Level of the System	7	6	1	0
No. of Systems with Operator with Adequate Certification	32	34	6	7
No. of Systems Not Requiring Operators with Certification	4	3	4	3
Total No. of Systems	**61**	**61**	**61**	**61**

Those factors which frequently contribute to increased wastewater operator risk are identified in Figure 3.20. A lack of certification, lack of training and the lack of primary or backup operator are common drivers that increase operator risk.

Figure 3.20 - Operators Risk Drivers



3.5 Plans

Information was collected regarding the availability of various documents, including Source Water Protection Plans (SWPP), Maintenance Management Plans (MMP), and Emergency Response Plans (ERP). The following tables provide a summary of the percentages of First Nations that have plans in place:

Table 3.7 - Plans Summary: Water

Source	*Percentage of Water Systems that have a (an)...*		
	Source Water Protection Plan	Maintenance Management Plan	Emergency Response Plan
Groundwater	6%	6%	3%
MTA	N/A	20%	0%
Surface Water	3%	5%	0%
Overall	**4%**	**7%**	**1%**

Table 3.8 - Plans Summary: Wastewater

Percentage of Wastewater Systems that have a (an)…	
Maintenance Management Plan	Emergency Response Plan
5%	2%

3.5.1 Source Water Protection Plan (SWPP)

Source water protection planning is one component of a multi-barrier approach to providing safe drinking water. Source Water Protection Plans seek to identify threats to the water source. They also establish policies and practices to prevent contamination of the water source and to ensure that the water service provider is equipped to take corrective action in the event of a contamination. Source water protection is appropriate for both groundwater and surface water sources.

Only 4% of the systems in the Manitoba region have a Source Water Protection Plan in place.

3.5.2 Maintenance Management Plans (MMP)

Maintenance Management Plans are intended to improve the effectiveness of maintenance activities. They focus on planning, scheduling and documenting preventative maintenance activities, and they document unscheduled maintenance efforts. The plans represent a change from reactive to proactive thinking, and when executed properly, they optimize maintenance spending, minimize service disruption, and extend asset life.

In the Manitoba region, 6% of groundwater systems, 5% of surface water systems and 20% of the Municipal Type Agreement systems have a Maintenance Management Plan in place. For wastewater systems, 5% of the systems have a Maintenance Management Plan in place.

3.5.3 Emergency Response Plans (ERP)

Emergency Response Plans are intended to be a quick reference to assist operators and other stakeholders in managing and responding to emergency situations. Emergency Response Plans should be in place for both water and wastewater systems. They include key contact information for those to be notified, and those who may be of assistance in case of emergency (agencies, contractors, suppliers, etc.), and they provide standard communication and response protocols. Emergency Response Plans identify recommended corrective actions for “foreseeable” emergencies, as well as methodologies for addressing unforeseen situations. They are essentially the last potential “barrier” in a multi-barrier approach to protecting the drinking water supply and the natural environment, and they provide the last opportunity to mitigate damages.

Only 1% of the water systems and 2% of the wastewater systems have an Emergency Response Plan in place.

4.0 Cost Analysis

4.1 Upgrade to Meet INAC's Protocols: Water

In 2006, INAC began to develop a series of Protocol documents for centralised and decentralised water and wastewater systems in First Nations communities. The Protocols contains standards for the design, construction, operation, maintenance, and monitoring of these systems.

One of the objectives of this study was to review the existing water and wastewater infrastructure and to identify the potential upgrade costs to meet INAC's Protocols, and federal and provincial guidelines, standards and regulations. The total estimated construction cost for water system upgrades to meet the INAC Protocol is $52.5 million.

Table 4.1 provides a breakdown of the estimated total capital costs that we have identified. A separate line item is included for engineering and contigency. Figure 4.1 provides a comparison graph of each of the categories.

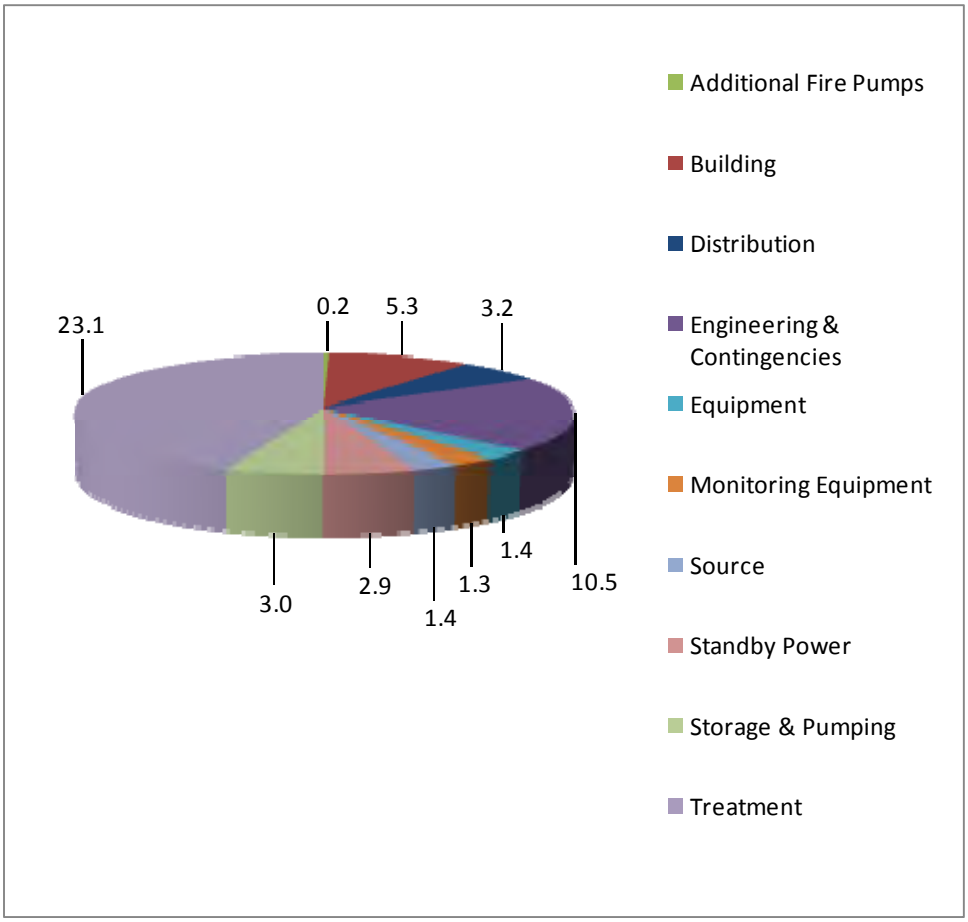
Table 4.1 - Estimated Total Construction Costs: Water

Description	Protocol - Estimated Cost	Federal - Estimated Cost	Provincial - Estimated Cost
Building	$5,286,450	$1,026,950	$1,495,950
Distribution	$3,244,000	$1,664,000	$1,664,000
Equipment	$1,436,000	$1,344,000	$11,000
Additional Fire Pumps	$210,000	$0	$165,000
Monitoring Equipment	$1,325,000	$1,220,000	$314,000
Source	$1,400,000	$50,000	$50,000
Storage & Pumping	$3,047,000	$2,070,000	$2,070,000
Treatment	$23,143,000	$7,406,500	$3,312,000
Standby Power	$2,865,000	$100,000	$30,000
Engineering & Contingencies	$10,511,000	$3,743,400	$2,298,000
Construction Total Estimate	**$52,467,450**	**$18,624,850**	**$11,409,950**

There are 21 water systems that may potentially have groundwater under the direct influence of surface water (GUDI) supplies. The upgrade costs for these systems have been estimated under the assumption that they will prove to be secure groundwater supplies, but further studies are recommended to confirm this assumption.

If the GUDI studies indicate that these supplies should be considered to be surface water rather than groundwater, then additional upgrade requirements will be necessary for these systems to meet INAC's Protocols. It is estimated that, depending on system capacity and site indices, an additional $1.0 to $2.5 million will be required for each system that needs to be upgraded to surface-water treatment.

Figure 4.1 - Breakdown of the Estimated Construction Costs to Meet INAC's Protocols: Water ($ - M)



The following lists provide a summary of the Protocol items for the two categories with the highest cumulative Protocol costs that are listed above.

Treatment

- Provide spare chemical feed equipment.
- Provide spare disinfection equipment.
- Provide additional filter train.
- Provide secondary containment for treatment chemicals.
- Provide specific treatment equipment (i.e. arsenic, manganese, etc.).
- Upgrade capacity of existing water treatment plant.

Building

- Expand facility to house redundant treatment equipment and/or provide adequate storage space.
- Provide proper ventilation.
- Provide additional building security.

Table 4.2 - Estimated Total Non- Construction Costs: Water

Description	Protocol - Estimated Cost	Federal - Estimated Cost	Provincial - Estimated Cost
Training	$590,000	$610,000	$610,000
GUDI Studies	$440,000	$0	$0
Plans/Documentation	$3,357,500	$2,792,500	$1,800,000
Studies	$95,000	$40,000	$40,000
Non-Construction Total Estimate	**$4,482,500**	**$3,442,500**	**$2,450,000**

Additional annual operations and maintenance costs, shown in Table 4.3, include costs that occur annually for items that are not currently being completed to meet protocols, such as calibrating monitoring equipment, additional sampling, cleaning the reservoir, and backup operator's salary.

Table 4.3 - Estimated Additional Annual Operation & Maintenance Costs: Water

Description	Estimated Cost
Sampling	$101,000
Operations	$131,500
Operator	$130,000
Water O&M Total Estimated Cost	**$362,500**

The total estimated cost, including construction and non-construction costs, for water system upgrades to meet the INAC Protocol is $57 million. This excludes costs associated with potentially GUDI systems, which prove to be GUDI systems as discussed previously.

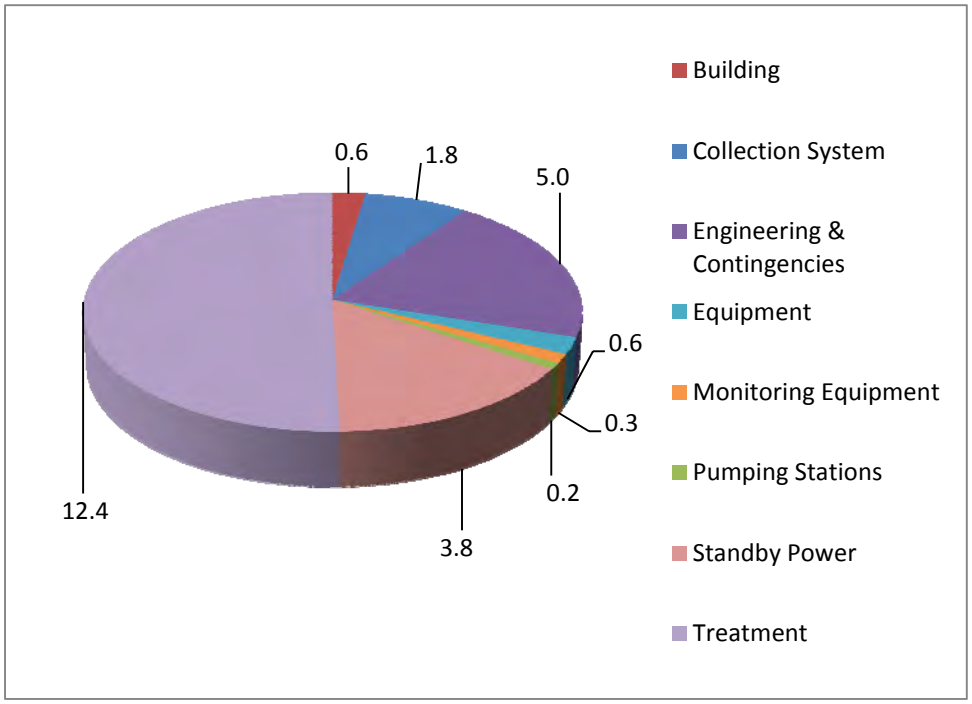
4.2 Upgrades to Meet INAC's Protocols: Wastewater

The total estimated construction cost for wastewater system upgrades to meet INAC Protocol is $24.6 million. A list of the specific needs, the number of systems impacted, and the total cost is provided below. Upgrading treatment capacity and providing standby power represent over 66% of the projected costs of meeting INAC's Protocols. Six systems require upgrading capacity, which is a high-cost upgrade.

Table 4.4 - Estimated Total Construction and Related Costs: Wastewater

Description	Protocol - Estimated Cost	Federal - Estimated Cost	Provincial - Estimated Cost
Building	$579,950	$278,950	$567,950
Collection System	$1,840,000	$1,840,000	$1,840,000
Equipment	$558,000	$302,000	$6,000
Monitoring Equipment	$304,000	$42,000	$5,000
Pumping Stations	$209,500	$198,500	$187,500
Treatment	$12,423,000	$11,343,000	$11,343,000
Standby Power	$3,755,000	$3,325,000	$3,205,000
Engineering & Contingencies	$4,965,500	$4,350,500	$4,317,000
Construction Total Estimate	**$24,634,950**	**$21,679,950**	**$21,471,450**

Figure 4.2 - Breakdown of the Estimated Construction Costs to Meet Protocol: Wastewater ($ - M)



Treatment and Standby Power are the two construction-cost categories with the highest cumulative costs to meet INAC Protocols.

Treatment costs include:

- Constructing additional lagoon cells.
- Providing fencing for security.
- Providing flow meters.
- Providing new pumping stations.

Standby Power costs include:

- Providing standby power for sewage pumping stations.

Table 4.5 - Estimated Total Non-Construction and Related Costs: Wastewater

Description	Protocol - Estimated Cost	Federal - Estimated Cost	Provincial - Estimated Cost
Training	$280,000	$280,000	$280,000
Plans/Documentation	$447,500	$217,500	$10,000
Non-Construction Total Estimate	**$727,500**	**$497,500**	**$290,000**

Additional annual operations and maintenance costs, as shown in Table 4.6, include costs that occur annually, for items that are not currently being completed to meet protocols, such as calibrating monitoring equipment, additional sampling, and backup operator's salary.

Table 4.6 - Estimated Additional Annual Operation & Maintenance Costs: Wastewater

Description	Estimated Cost
Sampling	$94,800
Operations	$3,000
Operator	$295,000
Wastewater O&M Total Estimated Cost	**$392,800**

The total estimated cost, including construction and non-construction costs, for wastewater system upgrades is $25.4 million.

4.3 Upgrade Cost Summary

Table 4.7 provides a summary of the upgrade costs to meet INAC's Protocols, and federal and provincial guidelines, standards, and regulations.

Table 4.7 - Summary and Comparison of Upgrade Costs

	Total Estimated Cost	
	Water	Wastewater
Upgrade to meet Protocol	$56,949,950	$25,362,450
Upgrade to meet Federal Guidelines	$22,067,350	$22,177,450
Upgrade to meet Provincial Guidelines	$13,859,950	$21,761,450

The following tables present a breakdown of the Protocol upgrade costs by risk level.

Table 4.8 - Breakdown of Protocol Estimated Costs by Risk Level: Water

Risk Level	Short Term	Long Term	Total
High	$14,259,884	$205,412	**$14,465,296**
Medium	$30,075,318	$0	**$30,075,318**
Low	$12,409,336	$0	**$12,409,336**
Total	**$56,744,538**	**$205,412**	**$56,949,950**

Table 4.9 - Breakdown of Protocol Estimated Costs by Risk Level: Wastewater

Risk Level	Short Term	Long Term	Total
High	$17,851,431	$1,482,184	**$20,273,658**
Medium	$2,593,201	$2,148,670	**$5,088,792**
Low	$0	$0	**$0**
Total	**$20,444,632**	**$3,630,854**	**$25,362,450**

4.4 Asset Condition and Reporting System Needs

ACRS (Asset Condition and Reporting System) inspections were completed for all water and wastewater related assets. For the purposes of this assessment, ACRS needs were limited to required repairs of existing facilities, and did not include any upgrade costs, in order to avoid duplication with the Upgrade to Protocol needs identified. The following two tables (Tables 4.10 and 4.11) provide a summary of the required operation & maintenance repairs broken down by the type of asset for both water and wastewater systems.

Table 4.10 - ACRS Identified Costs: Water

Asset Code	Description	Estimated Cost
A5A	Buildings	$422,150
B1B	Watermains	$152,100
B1C/B1D	Treatment	$908,550
B1E	Reservoirs	$64,800
B1G	Standpipe/Truckfill	$21,500
B1F	Community Wells	$21,950
B1I	Low Lift Pumping	$87,850
B1H	High Lift Pumping	$161,100
E4A	Trucks	$120,700
	Water ACRS Total Estimated Cost	**$1,960,700**

Table 4.11 - ACRS Identified Costs: Wastewater

Asset Code	Description	Estimated Cost
A5B	Buildings	$330,400
B2A	Sewers	$14,400
B2H/B2J	Lift Stations & Forcemains	$670,800
B2C/B2D	Treatment	$319,350
B2E/B2I	Lagoons	$482,350
B2F	Septic Systems	$35,750
E3A	Trucks	$67,150
	Wastewater ACRS Total Estimated Cost	**$1,920,200**

4.5 Community Servicing

An analysis was completed to evaluate future servicing alternatives for a 10-year design period. The analysis considers a variety of alternatives, including expanding existing systems, developing new systems, establishing local Municipal Type Agreements (if applicable), and using individual systems.

A theoretical operation and maintenance cost was developed for each alternative, along with a 30-year life-cycle cost. The cost of the upgrades that are necessary for systems to meet INAC's Protocol is included in the new servicing cost, if appropriate (i.e. for new servicing alternatives that include continued use of the existing system).

The following table summarizes the capital cost and the total estimated operation & maintenance cost for the recommended servicing alternatives:

Table 4.12 - Future Servicing Costs

	Total Estimated Cost		Cost Per Connection	
	Water	Wastewater	Water	Wastewater
Future Servicing Cost	$390,000,000	$300,000,000	$17,200	$13,200
Annual O&M to service future growth	$33,900,000	$22,600,000	$1,500	$1,000

The evaluation of future servicing included continuing to service the existing population with the same level of service that was currently in place and then evaluating the options for providing service to the future 10 year growth for the community. Where future servicing results in the ability to provide a higher level of service to some or all of the existing homes, this was also considered in the overall servicing strategy.

In some areas, particularly in the southwest part of the region, high water levels and floodplain conditions adversely impact individual wells and septic systems. Depending on the density of the housing, in some cases it might be possible to replace aging wells and septic systems with facilities constructed specifically for the conditions, or to replace the servicing with truck haul or extended pipe servicing.

It is assumed that houses without service will be retrofitted with indoor plumbing so that servicing can be extended to these houses. The cost for the housing retrofits has not been carried as part of this study.

For new growth, it was found that, for the most part, the life cycle costs for extending piped water and wastewater servicing for the future growth was the most cost effective solution. This assumes that future homes would be constructed in a more compact subdivision type setting adjacent to the existing serviced area. However, detailed studies for each community will be required to confirm this assumption.

In cases where residents may choose to build homes in outlying areas, individual or truck haul servicing may be more appropriate.

5.0 Regional Summary

All 62 First Nations in the Manitoba region were visited during the completion of this project. The 62 First Nations are serviced by 74 water systems (including 5 Municipal Type Agreement systems) and 61 wastewater systems (including 4 Municipal Type Agreement systems).

In the Manitoba region, 82% of the homes are serviced by communal water (51% piped and 31% trucked), 13% are serviced by individual wells, and the remaining 5% have no service.

The northern communities are largely serviced by surface water systems. The distribution is a combination of piped servicing and truck haul. The condition of the roads is a concern in terms of accessibility and wear and tear on the delivery trucks.

In the southern areas, the systems are mainly groundwater, and many of the houses are serviced by individual wells and septics. Six small pumphouses, with direct use of water and no disinfection, serve a small number of houses.

Many of these communities are located in floodplain conditions, and these conditions have a negative impact on the performance of the wells and septic systems. In some cases, these individual systems can be replaced with new wells to provide more secure supplies. In other cases, upgrading to provide piped or truck-haul service may be required.

Of the 61 wastewater systems:

- 32 are lagoons
- 24 are mechanical plants
- 4 are Municipal Type Agreement systems
- 1 is a communal septic system.

73% of the homes are serviced by communal wastewater (45% piped and 28% trucked), 22% are serviced by individual septic systems and the remaining 5% have no service.

There are 21 high-risk water systems and 6 high-risk wastewater systems in the Manitoba region. While there are multiple factors contributing to risk, operations and reporting were generally the highest component risks.

Based on the data collected, operator risk was the lowest of the component risks. In Manitoba Region, the Circuit Rider Training program appears to be very effective and responsive to community needs. It is important to provide ongoing training for operators to ensure that all systems are operated and maintained by trained/certified operators and that monitoring and record keeping is completed in accordance with INAC Protocols.

Another area that should be addressed is the lack of planning tools, including Source Water Protection Plans, Maintenance Management Plans, and Operations and Maintenance Manuals.

INAC supports the First Nations in doing annual or biannual wastewater sampling prior to effluent discharge, which is appropriate for lagoon systems. Additional onsite sampling and record keeping may be appropriate for the mechanical plants with continuous discharge.

In the Manitoba region, Health Canada is very active within the communities. Health Canada maintains Community Based Water Monitors (CBWM's) in most of the communities who undertake regular water quality sampling of the treated and distributed water.

NEEGAN BURNSIDE

Appendix A
Glossary

Appendix A: Glossary of Terms and Acronyms

Aeration (see also lagoon): The process of bringing air into contact with a liquid (typically water), usually by bubbling air through the liquid, spraying the liquid into the air, allowing the liquid to cascade down a waterfall, or by mechanical agitation. Aeration serves to (1) strip dissolved gases from solution, and/or (2) oxygenate the liquid. (Gowen Environmental)

Aesthetic Objective (AO): Aesthetic objectives are set for drinking water quality parameters such as colour or odour, where exceeding the objective may make the water less pleasant, but not unsafe. (INAC *Protocol for Decentralised Water and Wastewater*)

Ammonia (See also: Potable water; Effluent quality requirements): A pungent colorless gaseous alkaline compound of nitrogen and hydrogen (NH_3) that is very soluble in water and can easily be condensed to a liquid by cold and pressure (*Merriam-Webster*). Ammonia is used in several areas of water and wastewater treatment, such as pH control. It is also used in conjunction with chlorine to produce potable water. The existence of ammonia in wastewater is common in industrial sectors as a by-product of cleaning agents. This chemical impacts both human and environmental conditions. Treatment of ammonia can be completed in lagoon systems and mechanical plants.
(R.M. Technologies)

Arsenic: A metallic element that forms a number of compounds. It is found in nature at low levels, mostly in compounds with oxygen, chlorine, and sulphur; these are called inorganic arsenic compounds. Organic arsenic in plants and animals combines with carbon and hydrogen. Inorganic arsenic is a human poison. Organic arsenic is less harmful. High levels of inorganic arsenic in food or water can be fatal.
(Medicinenet.com)

Aquifer (confined): A layer of soil or rock below the land surface that is saturated with water. There are layers of impermeable material both above and below it, and it is under pressure so that when the aquifer is penetrated by a well, the water will rise above the top of the aquifer. (INAC *Protocol for Decentralised Water and Wastewater Systems*)

Aquifer (unconfined): An unconfined aquifer is one whose upper water surface (water table) is at atmospheric pressure, and thus is able to rise and fall. (INAC *Protocol for Decentralised Water and Wastewater Systems*)

As-built/record drawings: Revised set of drawing submitted by a contractor upon completion of a project or a particular job. They reflect all changes made in the specifications and working drawings during the construction process, and show the exact dimensions, geometry, and location of all elements of the work completed under the contract. Also called as-built drawings or just as-builts.

ACRS Inspection (Asset Condition Reporting System Inspection): For centralised water and wastewater systems, an ACRS (asset condition reporting system) inspection of the system is to be performed once every three (3) years by a qualified person (consulting engineer, Tribal Council engineer), who is not from the First Nation involved, to assess the condition of the asset, adequacy of maintenance efforts, and need for additional maintenance work. The ACRS inspection report will be discussed with, and submitted to, the First Nation council and the INAC regional office. Inspections will be conducted in accordance with the ACRS Manual, a copy of which can be obtained from the INAC regional office.

Bacteria (plural) bacterium (singular): Microscopic living organisms usually consisting of a single cell. Bacteria can aid in pollution control by consuming or breaking down organic matter in sewage and/or other water pollutants. Some bacteria may also cause human, animal, and plant health problems. Bacteria are predominantly found in the intestines and feces of humans and animals. The presence of *coliform* bacteria in water indicates the contamination of water by raw or partially treated sewage. (INAC *Protocol for Decentralised Water and Wastewater Systems*)

Baffle (concrete and/or curtain): Vertical/horizontal impermeable barriers in a pond or reservoir. Baffles direct the flow of water into the longest possible path through the reservoir in order to eliminate short-circuiting in the water treatment system. In potable water treatment, short-circuiting can reduce the effectiveness of disinfectants. In effluent treatment, short-circuiting may result in an increase of pollutants at the outlet. Short-circuiting occurs when water flows directly from the inlet to the outlet across a pond or reservoir. (Layfield)

BOD_5 (Biochemical Oxygen Demand): The most widely used parameter of organic pollution applied to both wastewater and surface water is the 5-day BOD (BOD_5). This determination involves the measurement of the dissolved oxygen used by microorganisms in the biochemical oxidation of organic matter. BOD test results are used to: determine the approximate quantity of oxygen that will be required to biologically stabilize the organic matter present; to determine the size of waste treatment facilities; to measure the efficiency of some treatment processes; and to determine compliance with wastewater discharge permits. (Metcalf & Eddy)

Capacity (actual vs. design): Refers to the capacity of the treatment system, with the "design capacity" being the flow rate proposed by the designer or manufacturer. If the system is not operating to design levels, the "actual capacity" could be limited by failing pumps, clogged filters or not meeting the Protocol (i.e. Protocol requires two filter trains such that one could operate while another is being cleaned/repaired and this was previously not explicitly required; therefore, the actual capacity is half of the design capacity).

Chemical feed equipment: All equipment associated with introducing chemicals to the raw water as part of the treatment process including coagulants, coagulant aids, disinfectants, etc.

Chlorine: A disinfectant used in either gas or liquid from gas that is added to water to protect the consumer from bacteria and other micro-organisms. It is widely used because it is inexpensive and easily injected into water. Because of its concentration, a gallon can treat a large amount of water. However, chlorine use does have drawbacks: when chlorine is used as a disinfectant it combines with naturally occurring decaying organic matter to form Trihalomethanes (THMs). (Vital Life Systems)

Chlorination: The application of chlorine to water, sewage or industrial wastes for disinfection (reduction of pathogens) or to oxidize undesirable compounds. (City of Toronto)

Chlorine Residual: The chlorine level in potable water immediately after it has been treated. (Ontario Ministry of the Environment)

Circuit Rider (see also Circuit Rider Training Program): Under the department's Circuit Rider Trainer Program (CRTP) INAC provides funds to engage circuit riders (third party water and wastewater system experts who provide water and wastewater system operators with on-site, mentoring, training, and emergency assistance). The third-party service providers that provide circuit rider services also provide operators with a 24/7 emergency hotline. (INAC *Protocol for Centralised Wastewater Systems in First Nations Communities*)

Circuit Rider Training Program: The main vehicle by which most First Nations operators receive the required training to operate their systems. This program provides qualified experts who rotate through a circuit of communities, providing hands-on training for the operators on their own system. Circuit rider trainers also help the First Nations with minor troubles and issues of operation and maintenance of their systems. (INAC *Plan of Action*)

Cistern: A tank for storing potable water or other liquids, usually placed above the ground. (Bow River Basin Council, cited in Alberta Environment *Glossary*)

Class "D" Cost Estimates: A preliminary estimate, for each community visited, based on available site information, which indicates the approximate magnitude (+/- 40%) of the cost of the actions recommended in the report, and which may be used in developing long-term capital plans and for a preliminary discussion of proposed capital projects.

Collection piping: Sanitary sewer collecting wastewater from individual buildings and homes, for treatment and disposal at a public facility.

Component risk / component risk factors: The overall risk is determined by five component risks: water source/effluent, design, operation, reporting, and operator.

Community Health Representatives (CHRs): Health Canada's local health representatives. They undertake bacteriological and chlorine residual sampling of distributed water within most First Nation communities.

Contact piping: Dedicated watermain to provide chlorine contact time before potable water is distributed to the first user.

Containment liners (for on-site fuel storage): A form of secondary containment used for diesel driven generators or fire pumps.

Continuous discharge to a receiving body: The release of treated wastewater effluent to a lake, river, stream, etc. where the rate of release is continuous (i.e. not batch discharge).

Conventional Wastewater Treatment: Consists of preliminary processes, primary settling to remove heavy solids and floatable materials, secondary biological aeration to metabolize and flocculate colloidal and dissolved organics, and secondary settling to remove additional solids. Tertiary treatment such as disinfection or filtration to further treat the wastewater depending on the level of treatment required for discharge. Waste sludge drawn from these operations is thickened and processed for ultimate disposal, usually either land application or landfilling. Preliminary treatment processes include coarse screening, medium screening, shredding of solids, flow measuring, pumping, grit removal, and pre-aeration. Chlorination of raw wastewater sometimes is used for odor control and to improve settling characteristics of the solids.

Conventional Water Treatment: Consists of a combination of coagulation (adding chemicals called coagulants), flocculation (particles binding together with coagulants) and sedimentation (settling of particles) to remove a large amount of organic compounds and suspended particles, filtration (water passing through porous media) to remove bacteria protozoa and viruses (slow sand filtration) or suspended particles (rapid sand filtration), and disinfection to ensure all the bacteria protozoa and viruses are removed, and provide safe drinking water.

Cross connections: A cross connection is a link between a possible source of pollution and a potable water supply. A pollutant may enter the potable water system when a) the pressure of the pollution source exceeds the pressure of the potable water source or b) when a sudden loss of pressure occurs in the water system and "backflow" occurs. The flow through a water treatment plant should have no instances of treated water coming into contact with raw or wastewater. Backflow preventers should be tested regularly and any actual physical links should be removed.

Decentralized System: A group or groups of communal (as opposed to private) on-site water or wastewater systems. (INAC *Protocol for Decentralised Water and Wastewater Systems*)

Dedicated transmission main: A length of watermain which has no service connections or hydrants; can refer to the length of raw watermain from a raw water source to the water treatment plant or in the distribution system where there are larger distances between homes.

Discharge Frequency: The frequency in which treated wastewater is discharged; could be continuous, seasonal, annual, etc.

Discharge quality data: Data acquired through the completion of a laboratory analysis of treated wastewater effluent prior to obtaining permission to discharge. Relevant parameters for testing include: 5 day Biochemical Oxygen Demand, Suspended Solids, Fecal Coliforms, pH, Phenols, Oils & Greases, Phosphorus and Temperature.

Disinfectant: A disinfectant is a chemical (commonly chlorine, chloramines, or ozone) or physical process (e.g., ultraviolet light) that inactivates or kills microorganisms such as bacteria, viruses, and protozoa. (INAC *Protocol for Decentralised Water and Wastewater Systems*)

Disinfection: A process that has as its objective destroying or inactivating pathogenic micro-organisms in water. (Government of Alberta, *Environmental Protection and Enhancement Act*, cited in Alberta Environment *Glossary*)

Disinfection By-products: Disinfection by-products are chemical, organic and inorganic substances that can form during a reaction of a disinfectant with naturally present organic or anthropogenic matter in the water. (Lenntech)

Distribution Classification > piped / trucked: Refers to the classification of the delivery of potable water leaving the water treatment plant. This can be either piped (via watermain) or trucked (via truck delivery to individual homes/cisterns). The level of classification involves the number of house connections (population served).

Domestic flows: All demands in the water system excluding fire flows.

Drinking Water: Water of sufficiently high quality that can be consumed or used without risk of immediate or long term harm.

Drinking Water Advisory (DWA): Drinking Water Advisories (DWAs) are preventive measures that are regularly issued in municipalities and communities across Canada; they protect public health from waterborne contaminants that can be present in drinking water. A DWA can be issued in any community and may include *boil water advisories, do not consume advisories* and *do not use advisories.* (INAC "Fact Sheet")

Effluent: 1. The liquid waste of municipalities/communities, industries, or agricultural operations. Usually the term refers to a treated liquid released from a wastewater treatment process. (Bow River) 2. The discharge from any *on-site sewage* treatment component. (Alberta Municipal Affairs; cited in Alberta Environment *Glossary*)

Effluent quality data: Any test results or monitoring data that describes the condition of treated wastewater effluent.

Effluent Quality Requirements: All effluents from wastewater systems in Canada must comply with all applicable federal legislation including the *Canadian Environmental Protection Act, 1999* and the *Fisheries Act,* as well as any other applicable legislation, including provincial, depending on the geographical location of the system.
In addition, all discharges from First Nations wastewater systems shall meet the quality requirements found in the *Guidelines for Effluent Quality and Wastewater Treatment at Federal Establishments* - EPS 1-EC-76-1 (1976 Guidelines).

For the purposes of determining effluent quality related to ammonia and chlorine, the *Notice Requiring the Preparation and Implementation of Pollution Prevention Plans for Inorganic Chloramines and Chlorinated Wastewater Effluents* and the *Guideline for the Release of Ammonia Dissolved in Water Found in Wastewater Effluents* contain additional and/or updated information to the requirements provided in the 1976 Guidelines.

A copy of the *Guideline for the Release of Ammonia Dissolved in Water Found in Wastewater Effluents* can be found at Environment Canada's website. (INAC *Protocol for Centralised Wastewater Systems in First Nations Communities*)

Effluent Receiver (also referred to as the receiving body; the receiving environment; the receiver) (see also Effluent and Component risks): The environment that receives treated wastewater, including lakes, rivers, wetlands, sub-surfaces, title fields, open marines, and enclosed bays. It may also refer to a community's method for dealing with wastewater (e.g. Municipal Type Agreements or evaporation).

Elevated Storage: A water tower, which is a reservoir or storage tank mounted on a tower-like structure at the summit of an area of high ground in a place where the water pressure would otherwise be inadequate for distribution at a uniform pressure. (Collins)

Emergency Response Plan (ERP): Emergency response plans for water and wastewater systems are intended to be a quick reference to assist operators and other stakeholders in managing and responding to emergency situations. They include key contact information for persons to be notified and for persons who may be of assistance (e.g. agencies, contractors, suppliers, etc.), as well as standard communication and response protocols. Emergency response plans identify recommended action for "foreseeable" emergencies, and provide methodologies for unforeseen situations.

Facultative Lagoon: The most common type of wastewater treatment lagoon used by small communities and individual households. Facultative lagoons rely on both aerobic and anaerobic decomposition of waste, can be adapted for use in most climates and require no machinery to treat wastewater.

Filter: A device used to remove solids from a mixture or to separate materials. Materials are frequently separated from water using filters. (Edwards Aquifier)

Filter train equipment: Includes all components that form part of the water filtration process from where the raw water enters the filter process to where the filtered water leaves the treatment unit. This does not refer to the disinfection equipment.

Filtration: The mechanical process which removes particulate matter by separating water from solid material, usually by passing it through sand. (Edwards Aquifier)

Fire pump tests: A monthly test for the basic operation and functionality of the fire pump.

Grade Level Storage: A treated water storage reservoir that is constructed at grade, typically with earth mounded on top to provide some frost protection.

GPS: Global Positioning System (GPS) - A navigational system involving satellites and computers that can determine the latitude and longitude of a receiver on Earth by computing the time difference for signals from different satellites to reach the receiver.

Groundwater: Groundwater is any water that is obtained from a subsurface water-bearing soil unit (called an aquifer). 1) Water that flows or seeps downward and saturates soil or rock, supplying springs and wells. The upper surface of the saturate zone is called the water table. 2) Water stored underground in rock crevices and in the pores of geologic materials that make up the Earth's crust. (INAC, *Protocol for Decentralised Water and Wastewater Systems*)

Groundwater, confined: Groundwater that is under pressure significantly greater than atmospheric, with its upper limit the bottom of a bed with hydraulic conductivity distinctly lower than that of the material in which the confined water occurs. (INAC, *Protocol for Decentralised Water and Wastewater Systems*)

Groundwater, unconfined: Water in an aquifer that has a water table that is exposed to the atmosphere. (INAC *Protocol for Decentralised Water and Wastewater Systems*)

Groundwater under the direct influence of surface water (GUDI): This term refers to groundwater sources (e.g., wells, springs, infiltration galleries, etc.) where microbial pathogens are able to travel from nearby surface water to the groundwater source. (Government of Nova Scotia)

Guidelines: Guidelines as referred to in this Assessment include all federal and provincial water and wastewater guidelines for domestic potable water and household sanitary waste. These guidelines include the "Guidelines for Canadian Drinking Water Quality" and all its recommended health and aesthetic guidelines for water quality.

Guidelines for Canadian Drinking Water Quality (GCDWQ): Water quality guidelines developed by the Federal-Provincial-Territorial Committee on Drinking Water and have been published by Health Canada since 1968.

Canadian drinking water supplies are generally of excellent quality. However, water in nature is never "pure." It picks up traces of everything it comes into contact with, including minerals, silt, vegetation, fertilizers, and agricultural run-off. While most of these substances are harmless, some may pose a health risk. To address this risk, Health Canada works with the provincial and territorial governments to develop guidelines that set out the maximum acceptable concentrations of these substances in drinking water. These drinking water guidelines are designed to protect the health of the most vulnerable members of society, such as children and the elderly. The guidelines set out the basic parameters that every water system should strive to achieve in order to provide the cleanest, safest and most reliable drinking water possible.

The Guidelines for Canadian Drinking Water Quality deal with microbiological, chemical and radiological contaminants. They also address concerns with physical and aesthetic characteristics of water, such as taste and odour. (Health Canada)

Guidelines for Effluent Quality and Wastewater Treatment at Federal Establishments, April 1976: The purpose of these guidelines is to indicate the degree of treatment and effluent quality that will be applicable to all wastewater discharged from existing and proposed Federal installations. Use of these guidelines is intended to promote a consistent wastewater approach towards the cleanup and prevention of water pollution and ensure that the best practicable control technologies used. (Government of Canada)

Highlift Pumping: Refers to pumps installed that provide treated water into the water distribution system at pressure; either directly or via water tower.

Hydrant Flushing (see line flushing and swabbing)

Influent: Water, wastewater, or other liquid flowing into a reservoir, basin or treatment plant. (Gowen)

Lagoon: A shallow pond where sunlight, bacterial action, and oxygen work to purify wastewater. Lagoons are typically used for the storage of wastewaters, sludges, liquid wastes, or spent nuclear fuel. (Edwards Aquifier)

Lagoon, aerated: See Aeration

Lagoon, facultative: See Facultative Lagoon.

L/c/d: Measurement of daily water usage as Litres per capita, per day.

Level of Service Standards (INAC): The Level of Service Standards (LOSS), 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.

The Level of Service Standards provide a description of criteria which will be used to establish the level of funding for safe, cost-effective, domestic water supply and wastewater disposal systems for on-reserve housing units and administrative, operative, institutional and recreational buildings. (INAC "Water and Sewage Systems")

Lift Station (also Pumping Station): A point in the sewer system where the wastewater needs to be pumped (lifted) to a higher elevation so that gravity can be used to bring the wastewater to the treatment plant. (Hailey City Hall Public Works)

Line flushing and swabbing (also referred to as watermain swabbing and flushing): Watermain swabbing entails inserting a soft material shaped like a bullet into the watermain through a fire hydrant. The diameter is slightly larger than the watermain and the bullet (swab) is pushed along the watermain by water pressure. As it passes through the watermain, the swab executes a scouring action on the sediment inside the watermain.

During watermain flushing, high velocity water flowing from hydrants is used to remove loose sediment from watermains. (City of Guelph)

L/p/d: Measurement of daily water usage as Litres per person, per day.

MAC (Maximum acceptable concentration): In the Guidelines for Canadian Drinking Water Quality (GCDWQ), Maximum Acceptable Concentrations (MACs) have been established for certain physical, chemical, radiological and microbiological parameters or substances that are known or suspected to cause adverse effects on health. For some parameters, Interim Maximum Acceptable Concentrations (IMACs) are also recommended in the guidelines.

Drinking water that continually has a substance at a greater concentration than the specified MACs will contribute significantly to consumer exposure to the substance and may, in some instances, produce harmful health effects. However, the short-term presence of substances above the MAC levels does not necessarily mean the water constitutes a risk to health. (INAC, *National Assessment Summary Report*)

Maintenance Management Plan (MMP): Maintenance management plans apply to both water and wastewater systems. They are intended to improve the effectiveness of maintenance activities and are focused on planning, scheduling, and documenting preventative maintenance activities and on documenting unscheduled maintenance.

Manganese: Manganese is a mineral that naturally occurs in rocks and soil and is a normal constituent of the human diet. In some places, it exists in well water as a naturally occurring groundwater mineral, but may also be present due to underground pollution sources. Manganese may become noticeable in tap water at concentrations greater than 0.05 milligrams per liter (mg/L) of water by imparting a colour, odour, or taste to the water. However, health effects from manganese are not a concern until concentrations are approximately 10 times higher. (Conneticut Dept. of Health)

Mechanical Plant/ Mechanical Treatment: Refers to any type of wastewater treatment plant including treatments systems consisting of rotating biological contactors (RBC), sequencing batch reactors (SBR), extended aeration (EA), etc. It does not include natural forms of wastewater treatment like lagoons or septic systems.

Metals Scan (Full): A full metal scan refers to what laboratories call Inductively Coupled Plasma Mass Spectrometry (ICP-MS) analysis for the evaluation of trace metals in water samples. This test covers a complete scan of over 20 trace metals in a single analysis.

Municipal Type Agreement (MTA): The situation where First Nations are supplied with treated water from or send their wastewater to a nearby municipality, as outlined in a formal agreement between the two parties. The term is also used in this report to describe a system where the First Nation is supplied with treated water or wastewater treatment services by another First Nation or other independent body such as a corporate entity such as a Casino etc.

Multi-Barrier Approach: Approach used to ensure that drinking water is safe. In the past, the term „multi-barrier' referred only to the barriers involved in the actual treatment of raw water to provide quality drinking water. This approach has now been expanded to include a number of key elements that are an integral part of a drinking water program to ensure delivery of safe, secure supplies of drinking water. Barriers may be physical (eg: filter) or administrative (eg: planning) in nature. (Alberta Environment, *Glossary & Alberta's Drinking Water Program*)

None: Indicates that the treatment and/or distribution/collection system has not been classified.

O & M: Operation and Maintenance.

Operational Plan (OP): An Operational Plan is the primary instrument for communicating the Community's quality management system (QMS) from the public works departments (water and wastewater) to Chief and Council, and from Council to INAC, Health Canada and the community members.

Phosphorus: A non-metallic element of the nitrogen family that occurs widely especially as phosphates (*Merriam-Webster*). Phosphorus occurs naturally in rocks, soil, animal waste, plant material, and even the atmosphere. In addition to these natural sources, phosphorus comes from human activities such as agriculture, discharge of industrial and municipal waste, and surface water runoff from residential and urban areas. Nutrients held in soil can be dissolved in water and carried off by leaching, tile drainage or surface runoff.

Phosphorus does not pose a direct threat to human health; it is an essential component of all cells and is present in bones and teeth. It does, however, pose an indirect threat to both aesthetics and to human health by affecting source waters used for drinking and recreation. For example, excessive nutrients can promote the growth of algal blooms, which can contribute to a wide range of water quality problems by affecting the potability, taste, odour, and colour of the water. (Canadian Council of Ministers of the Environment)

Piped Distribution System: A water distribution system which relies on pipes to convey water through pumping or elevated storage to the end user. Different from trucked distribution in that a trucked distribution system delivers water to end users in batch quantities to individual holding tanks (cisterns).

Potable water: Potable water is water that is destined for human consumption.
For the purposes of the *Protocol for Centralised Drinking Water Systems in First Nations Communities*, water destined for human consumption is water that is consumed directly as drinking water, water that is used in cooking, water that is used to wash food, and water that is used for bathing infants (individuals under 1 year in age). (INAC, *Protocol for Centralised Drinking Water Systems in First Nations Communities*)

PPU: People per unit. Measurement to describe housing density.

Primary Operator: The main operator of a water or wastewater system. The primary operator must be certified to the level of the treatment and distribution/collection system.

Primary Wastewater Treatment: Removal of particulate materials from domestic wastewater, usually done by allowing the solid materials to settle as a result of gravity. Typically, the first major stage of treatment encountered by domestic wastewater as it enters a treatment facility. Primary treatment plants generally remove 25 to 35 percent of the *Biological Oxygen Demand (BOD)* and 45 to 65 percent of the total suspended matter. Also, any process used for the decomposition, stabilization, or disposal of sludges produced by settling. (North American Lake Management Society; cited in Alberta Environment *Glossary*)

Protocol for Safe Drinking Water in First Nations Communities: Standards for design, construction, operation, maintenance, and monitoring of drinking water systems and is intended for use by First Nations staff responsible for water systems. It is also intended for use by Indian and Northern Affairs Canada (INAC) staff, Public Works and Government Services Canada (PWGSC) for INAC staff, and all others involved in providing advice or assistance to First Nations in the design, construction, operation, maintenance, and monitoring of their drinking water systems in their communities, in accordance with established federal or provincial standards, whichever are the most stringent.

Any water system that produces drinking water destined for human consumption, that is funded in whole or in part by INAC, and that serves five or more households or a public facility, must comply with the requirements of this protocol. (INAC *Protocol*)

Quality Assurance/Quality Control (QA/QC): A quality management system that focuses on fulfilling quality requirements and providing confidence that quality requirements will be fulfilled.

Reporting Risk: The Reporting risk level is the risk inherent with the operational method of recording data and providing the required reports. This would include both manual and automatic methods of record keeping. The reporting risk ranking is based on the adequacy of the operational records and the number of reports submitted during the year compared to the total number of records and reports required according to the appropriate legislation, standards, and operation procedures of the system in question.

Reservoir: A man-made lake that collects and stores water for future use. During periods of low river flow, reservoirs can release additional flow if water is available. (Government of Alberta, *Water for Life*, cited in Alberta *Glossary*)

Reservoir Cleaning: This involves the pump-down, clean-out, removal of settled material, disinfection and refill of a water storage reservoir. This activity requires confined space entry equipment and training.

Retrofit: 1. To furnish with new or modified parts or equipment not available or considered necessary at the time of manufacture; 2. To install (new or modified parts or equipment) in something previously manufactured or constructed; 3**.** To adapt to a new purpose or need**:** modify. (*Merriam-Webster*)

Rotating Biological Contactor (RBC): A technology used to treat wastewater classified as mechanical treatment.

Risk (Management Risk Level/Management Risk Score): Risk is defined in INAC's *Management Risk Level Evaluation Guidelines for Water and Wastewater Systems in First Nations Communities* (Revised 2010). These guidelines follow the Multi-Barrier Approach for water management. This approach, developed by the Federal-Provincial-Territorial Committee on Drinking Water and the Canadian Council of Ministers of the Environment (CCME) Water Quality Task Group, is intended to prevent the presence of water-borne contaminants in drinking water by ensuring effective safeguards are in place at each stage of a drinking water system.

Following that approach, INAC assesses five main components of a system to determine an overall system management risk score:
-Source Water (drinking water systems) or Effluent Receiver (wastewater systems)
-System Design
-Operation and Maintenance
-Records and Reporting
-Operator Training and Experience

Each of these components is assigned a risk score, which are then weighed to determine the overall management risk score of a system. The resulting score will then result in the management of the system as being classified as either high risk, medium risk, or low risk.

-High Risk: Major deficiencies in most of the components. Should a problem arise, the system and management as a whole is unlikely to be able to compensate, thus there is a high probability that any problem could result in unsafe water. Issues should be addressed as soon as possible.

-Medium Risk: Minor deficiencies in several components, or major deficiencies in one or two components. Should a problem arise, the system and management can probably compensate for the problem, but the noted deficiencies makes this uncertain, thus there is a medium probability that any problem could result in unsafe water. Issues need to be addressed.

-Low Risk: Minor or no deficiencies with the system or management. Should a problem occur, it is likely that the system and management as a whole will be able to compensate and continue to provide safe water while the issue is being resolved.

It is important to distinguish between INAC's system management risk level and drinking water quality. The actual quality of the water produced by a system is but one part of determining the overall system management risk level.

Unsafe drinking water is noted through the implementation of Drinking Water Advisories (DWA), not by the management risk level of the system. DWA come in multiple forms, the most common being the boil water advisory.

A system with a high-risk ranking under INAC's management evaluation is, because of its multiple deficiencies, likely to be unable to cope with problems that may occur in the system that result in a DWA. This means that DWA are likely to occur more frequently and to have a longer-term duration on a high-risk system. On the other hand, while problems can and do occur in low-risk systems, because of better overall risk management, these systems are more likely to address the problem in the short term, resulting in the rapid removal of problems and DWA.

This means that a high-risk drinking system can still produce perfectly safe and potable water. Deficiencies should be addressed as quickly as possible, however, before any issues arise with the water quality. (INAC, *Management Risk Level Evaluation Guidelines*)

SCADA (Supervisory Control and Data Acquisition) system: Refers to a control and/or computer system that can monitor, record and control infrastructure, or facility-based processes.

Screened reservoir vents: Reservoir vents should be screened to allow air movement and to prevent vermin from entering.

Seasonal discharge: Discharge of wastewater at times of maximum or substantial stream flow. This may vary from location to location.

Secondary containment for treatment chemicals: Secondary containment is required for the storage of all regulated hazardous materials. Secondary containment must be constructed using materials capable of containing a spill or leak for at least as long as the period between monitoring inspections. A means of providing overfill protection for any primary container may be required. This may be an overfill prevention device and/or an attention getting high level alarm. Materials that in combination may cause a fire or explosion, the production of a flammable, toxic, poisonous gas, or the deterioration of a primary or secondary container will be separated in both the primary and secondary treatment containment so as to avoid intermixing.

Secondary Treatment: involving the biological process of reducing suspended, colloidal, and dissolved organic/inorganic matter in effluent from primary treatment systems and which generally removes 80 to 95 percent of the *Biochemical Oxygen Demand (BOD)* and suspended matter. Secondary wastewater treatment may be accomplished by biological or chemical-physical methods. Activated sludge and trickling filters are two of the most common means of secondary treatment. (North American Lake Management Society, cited in Alberta *Glossary*)

Septic tank: A tank used to detain domestic wastes to allow the settling of solids prior to distribution to a leach field for soil absorption. Septic tanks are used when a piped wastewater collection system is not available to carry them to a treatment plant. A settling tank in which settled sludge is in immediate contact with sewage flowing through the tank, and wherein solids are decomposed by anaerobic bacterial action. (INAC *Protocol for Centralised Wastewater*)

Septic system: A combination of underground pipe(s) and holding tank(s) which are used to hold, decompose, and clean wastewater for subsurface disposal. (Bow River, cited in Alberta *Glossary*)

Sequencing Batch Reactor (SBR): A treatment technology used to treat wastewater classified as mechanical treatment.

Sewage treatment plant (STP) (also known as Wastewater Treatment Plant (WWTP) or Water Pollution Control Plant (WPCP)): Facility designed to treat wastewater (sewage) by removing materials that may damage water quality and threaten public health. (Ontario Ministry of Environment)

Sewage treatment systems: Facility or system designed to treat wastewater (sewage) by removing materials that may damage water quality and threaten public health. (Ontario Ministry of Environment)

Shoot-out: A septic system consisting of a septic tank with untreated wastewater effluent being discharged to the surface; this poses a health risk.

Sludge: The accumulated wet or dry solids that are separated from wastewater during treatment. This includes precipitates resulting from the chemical or biological treatment of wastewater. (Government of Alberta, *Activities*, cited in Alberta *Glossary*)

Source Classification: The determination of the water source classification in this assessment includes the options of: surface water, groundwater, GUDI or MTA. Surface water includes water from lakes or rivers; groundwater includes any well water that is not influenced by surface water infiltration; GUDI is any groundwater source under the direct influence of surface water; MTA as a source refers to the community acquiring the treated water from a municipality.

Source risk: The risk inherent in the quality and quantity of the raw source water prior to treatment.

Source Water Protection: 1. The prevention of pollution of the lakes, reservoirs, rivers, streams, and groundwater that serve as sources of drinking water. Wellhead protection would be an example of a source water protection approach that protects groundwater sources, whereas management of land around a lake or reservoir used for drinking water would be an example for surface water supplies. Source water protection programs typically include: delineating source water protection areas; identifying sources of

contamination; implementing measures to manage these changes; and planning for the future. (North American Lake Management Society, cited in Alberta *Glossary*)

2. Action taken to control or minimize the potential for introduction of chemicals or contaminants in source waters, including water used as a source of drinking water (Alberta Environment, *Standards and Guidelines*, cited in Alberta *Glossary*).

SPS: An abbreviation of the term sewage pumping station.

Standard Operating Procedures (SOPs): An SOP is a written document or instruction detailing all steps and activities of a process or procedure. This would include all procedures used in water/wastewater treatment processes that could affect the quality.

Standpipe Storage: An above-grade storage facility where the storage volume is contained within the entirety of the structure. This type of storage is most feasible for use where there is sufficient change in the topography to allow for maximum usable volume in the standpipe.

Storage Type: Refers to whether the community water storage is via grade-level, below-grade or elevated storage (including standpipes and towers). In some cases there is no storage thus the storage type would be considered "direct pump."

Surface water: Surface water is any water that is obtained from sources, such as lakes, rivers, and reservoirs that are open to the atmosphere. (INAC, *Protocol for Centralised Drinking Water*)

System Designer: A system designer is a person, such as a professional engineer, who is qualified to design a water or wastewater systems. (INAC, *Protocol for Centralised Drinking Water*)

System Operator: A system operator is a First Nation employee or third party under contract to a First Nation who is tasked with managing a water or wastewater system. (INAC, *Protocol for Centralised Drinking Water*)

System Manager: A system manager is a First Nation employee or third party under contract to a First Nation who is tasked with managing a water or wastewater system. (INAC, *Protocol for Centralised Drinking Water*)

Tertiary Treatment: Selected biological, physical, and chemical separation processes to remove organic and inorganic substances that resist conventional treatment practices. *Tertiary Treatment* processes may consist of flocculation basins, clarifiers, filters, and chlorine basins or ozone or ultraviolet radiation processes. Tertiary techniques may also involve the application of wastewater to land to allow the growth of plants to remove plant nutrients. Can include advanced nutrient removal processes. (North American Lake Management Society, cited in Alberta *Glossary*)

Trihalomethanes (THMs): Chemical compounds that can be formed when water is disinfected using chlorine or bromine as the chemical disinfection agent. These chemical compounds are formed when organic material present in the raw source water reacts with chlorine or bromine. Therefore, THMs are classified as disinfection by-products (DBPs). The primary source of organic material comes from decaying vegetation found in lakes, rivers and streams and for this reason, THMs are more commonly observed in water systems that use a surface water source. The four chemical compounds that are measured and used to calculate total THMs are: chloroform, bromoform, bromodichloromethane (BDCM) and chlorodibromomethane (CDBM). THMs are a concern in potable water because there is scientific evidence that they may pose a risk in the development of cancer.

Treatment Certification: The treatment level to which an operator is certified for water treatment and distribution and wastewater treatment and collection systems (see Treatment Classification).

Treatment Classification: The size (flow) and complexity of a water or wastewater system is used to determine the Class of a system using a point template. The knowledge and experience it takes to operate a system is closely related to its classification and is reflected in the level of certification of the operator. Systems that are small and relatively simple, are classified as Small Water or Wastewater Systems. Larger or more complex systems are ranked as Class I, II, III, and IV with the highest being Class IV. Systems should be operated under the supervision of an operator certified to at least the same level of the facility.

TSS (Total Suspended Solids): Measure of the amount of non-dissolved solid material present in water or wastewater. Total suspended solids (TSS) can cause: a) interference with light penetration (in UV applications), b) build-up of sediment and c) can carry nutrients and other toxic pollutants that cause algal blooms and potential reduction in aquatic habitat (wastewater).

Underground Storage: A water storage facility (reservoir/clearwell) which is located 100% below-grade. Often located below the water treatment plant.

Waste: Any solid or liquid material, product, or combination of them that is intended to be treated or disposed of or that is intended to be stored and then treated or disposed. This does not include recyclables. (Government of Alberta, Activities Designation Regulation, cited in Alberta *Glossary*)

Waste management plan: A Waste Management Plan identifies and describes types of waste generated during operations and how they are managed and disposed of.

Wastewater (*Industrial Wastewater, Domestic Wastewater)*: A combination of liquid and water-carried pollutants from homes, businesses, industries, or farms; a mixture of water and dissolved or suspended solids. (North American Lake Management Society, cited in Alberta *Glossary*)

Wastewater System: an organized process and associated structures for collecting, treating, and disposing of wastewater. For the purposes of this report, it is a system serving five or more houses. It includes any or all of the following:
1. Sewers and pumping stations that make up a wastewater collection system.
2. Sewers and pumping stations that transport untreated wastewater from a wastewater collection system to a wastewater treatment plant.
3. Wastewater treatment plants.
4. Facilities that provide storage for treated wastewater.
5. Wastewater sludge treatment and disposal facilities.
6. Sewers that transport treated wastewater from a wastewater treatment plant to the place where it is disposed of.
7. Treated wastewater outfall facilities, including the outfall structures to a watercourse or any structures for disposal of treated wastewater to land or to wetlands. (Government of Alberta, *Environmental Protection and Enhancement Act*, cited in Alberta *Glossary*)

Wastewater Treatment: Any of the mechanical, chemical or biological processes used to modify the quality of wastewater (sewage) in order to make it more compatible or acceptable to man and his/her environment. (North American Lake Management System, cited in Alberta *Glossary*)

Wastewater Treatment Plant: Any structure, thing, or process used for the physical, chemical, biological, or radiological treatment of wastewater before it is returned to the environment. The term also includes any structure, thing, or process used for wastewater storage or disposal, or sludge treatment, storage, or disposal. (Government of Alberta, *Activities*, cited in Alberta *Glossary*)

Watermain: A principal pipe in a system of pipes for conveying water, especially one installed underground. (*American Heritage Dictionary*)

Water quality: The term used to describe the chemical, physical, and biological characteristics of water, usually with respect to its suitability for a particular purpose. (INAC, *Protocol for Centralised Drinking Water*)

Water use: The term water use refers to water that is used for a specific purpose, such as for domestic use, irrigation, or industrial processing. Water use pertains to human interaction with and influence on the hydrolic cycle, and includes elements, such as water withdrawal from surface- and ground-water sources, water delivery to homes and businesses, consumptive use of water, water released from wastewater-treatment plans, water returned to the environment, and in-stream uses, such as using water to produce hydroelectric power. (INAC, *Protocol for Centralised Drinking Water*)

Water Well: An opening in the ground, whether drilled or altered from its natural state, that is used for the production of groundwater, obtaining data on groundwater, or recharging an underground formation from which groundwater can be recovered. By definition in the provincial Water Act, a water well also includes any related equipment, buildings, and structures. (Government of Alberta, *Water for Life*, cited in Alberta, *Glossary*)

Wellhead Protection Area: A protected surface and subsurface zone surrounding a well or well field supplying a public water system to keep contaminants from reaching the well water. (Edwards Aquifier)

Wellhead Protection Plan: A wellhead protection plan defines the wellhead protection area, identifies potential sources of contamination, manages the potential contaminant sources including properly decommissioning abandoned wells, identifies emergency and contingency plans (i.e. what to do if the well becomes contaminated or requires additional capacity) and provides overall public awareness.

References

Alberta Environment. *Alberta's Drinking Water Program: A 'Source to Tap, Multi-barrier'* Approach, 2008. Unpublished

Alberta Environment, Partnerships and Strategies Section. *Glossary of Terms Related to Water and Watershed Management in Alberta.* 1st Edition. November 2008. http://environment.gov.ab.ca/info/library/8043.pdf

Alberta Environment. *Standards and Guidelines for Municipal Waterworks, Wastewater and Storm Drainage Systems*, 2006. http://environment.gov.ab.ca/info/library/6979.pdf

Alberta Municipal Affairs. *Alberta Private Sewage Systems Standard of Practice Handbook,* 2000. http://www.municipalaffairs.gov.ab.ca/Handbook_index.cfm

The American Heritage® Dictionary of the English Language, Fourth Edition copyright ©2000 by Houghton Mifflin Company. Updated in 2009.

Bow River Basin Council. *Guidebook to Water Management: Background Information on Organizations, Policies, Legislation, Programs, and Projects in the Bow River Basin*, 2002. http://www.brbc.ab.ca/pdfs/Guidebook.pdf

Canadian Council of Ministers of the Environment. "Phosphorous." http://www.ccme.ca/sourcetotap/phosphorus.html

City of Guelph. "Watermain Cleaning Program Frequently Asked Questions." http://guelph.ca/living.cfm?itemid=68203&smocid=1791#3.%20What%20is%20watermain%20swabbing%20and%20flushing

City of Toronto. *Biosolids and Residuals Masterplan.* http://www.toronto.ca/wes/techservices/involved/wws/biosolids/pdf/meeting_5_nov6_glossary.pdf

Collins English Dictionary - Complete & Unabridged 10th Edition
2009 © William Collins Sons & Co. Ltd. 1979, 1986 © HarperCollins Publishers 1998, 2000, 2003, 2005, 2006, 2007, 2009.

Conneticut Department of Health, Drinking Water Section. *Fact Sheet: Manganese in Drinking Water*. http://www.ct.gov/dph/lib/dph/drinking_water/pdf/manganese.pdf

Edwards Aquifier Website: Glossary of Water Resource Terms. http://www.edwardsaquifer.net/glossary.html

Government of Alberta. *Activities Designation Regulation*, 2003. http://www.qp.gov.ab.ca/documents/Regs/2003_276.cfm?frm_isbn=0779750616

Government of Alberta. *Environmental Protection and Enhancement Act*, 2000. http://www.qp.gov.ab.ca/documents/Acts/E12.cfm?frm_isbn=0779717287

Government of Alberta. *Water for Life: Alberta's Strategy for Sustainability.*, 2003. http://www.waterforlife.gov.ab.ca

Government of British Columbia, Environmental Protection Division. *Glossary of Water Terms*. http://www.env.gov.bc.ca/wat/wq/reference/glossary.html

Government of Canada. *Guidelines for Effluent Quality and Wastewater Treatment at Federal Establishments, April 1976*. http://www.ec.gc.ca/eu-ww/0FB32EFD-73F9-4360-95EE-CB856FB4D971/1976_Guidelines_En.pdf

Government of Nova Scotia. Government of Nova Scotia. "Protocol for Determining Groundwater Under the Direct Influence of Surface Water." http://www.gov.ns.ca/nse/water/docs/MunWaterGUDI.pdf

Gowen Environmental Ltd. "Contaminated and Hazardous Waste Site Management Glossary I." http://www.contaminatedsite.com/glossary/glossary%20-%20i.htm

Hailey City Hall, Public Works. http://www.haileycityhall.org/publicworks/wastewater/glossary.asp

Health Canada. *Canadian Drinking Water Guidelines*. http://www.hc-sc.gc.ca/ewh-semt/water-eau/drink-potab/guide/index-eng.php

INAC. "Fact Sheet: Water Quality." http://www.ainc-inac.gc.ca/enr/wtr/fs_wtr-eng.asp

—*Management Risk Level Evaluation Guidelines for Water and Wastewater Systems in First Nations Communities*. July 14, 2010.

—*National Assessment of Water and Wastewater Systems in First Nations Communities Summary Report.* http://www.ainc-inac.gc.ca/enr/wtr/pubs/watw/watw-eng.asp

—*Plan of Action for Drinking Water in First Nations Communities - Progress Report January 17, 2008*. http://www.aincinac.gc.ca/enr/wtr/pubs/prpf/pad08/pad08-eng.asp

—*Protocol for Centralised Drinking Water Systems in First Nations Communities*. April 2010. http://www.ainc-inac.gc.ca/enr/wtr/index-eng.asp

—*Protocol for Centralised Wastewater Systems in First Nations Communities*. April 2010. http://www.ainc-inac.gc.ca/enr/wtr/index-eng.asp

—*Protocol for Decentralised Water and Wastewater Systems in First Nations Communities*. April 2010. http://www.ainc-inac.gc.ca/enr/wtr/index-eng.asp

—"Water and Sewage Systems." http://www.ainc-inac.gc.ca/ih/ci/pubs/wat/wat-eng.asp#chp9

Layfield Environmental Systems. "AquaGuide Floating and Fixed Baffles." http://www.layfieldenvironmental.com/pages/Products/default.aspx?id=3094

Lenntech Water Treatment Solutions. "Disinfection By-Products." http://www.lenntech.com/processes/disinfection/byproducts/disinfection-byproducts.htm

Medicinenet.com. "Definition of Arsenic." http://www.medterms.com/script/main/art.asp?articlekey=14947

Merriam-Webster Dictionary. http://www.merriam-webster.com/dictionary/

Ontario Ministry of the Environment. Technical Report: Drinking Water System at the Kashechewan First Nation. November 10, 2005.

North American Lake Management Society. *Water Words Glossary*. http://www.nalms.org/Resources/Glossary.aspx

R.M. Technologies. "Water Treatment." http://www.rmtech.net/Water%20Treatment.htm

UNEP (2000) *International source book on environmentally sound technologies for wastewater and stormwater management*. http://www.unep.or.jp/ietc/Publications/TechPublications/TechPub-15/2-4/4-2-3.asp

Vital Life Systems. "Water Treatment Terminology." http://vital-lifesystems.com/sitebuildercontent/sitebuilderfiles/watertreatmentterm.pdf

Waterwiki http://waterwiki.net/index.php/Glossary/Facultative_lagoon

NEEGAN BURNSIDE

Appendix B

Water System Summary

NEEGAN BURNSIDE

Appendix B.1
Water System Summary

Regional Roll-Up Summary

Region: MANITOBA
Total No. of First Nations: 62
Participating No. of First Nations: 62
Participation Level: 100%
No. of Community Reports Issued: 62

Water

		Groundwater	GUDI	Surface	MTA	Totals
Total No. of Systems		**32**	**0**	**37**	**5**	**74**
System Age						
	0-5 years (2006 - 2010)	5	0	2	0	**7**
	6-10 years (2001 - 2005)	3	0	3	0	**6**
	10-15 years (1996 - 2000)	8	0	13	1	**22**
	15 -20 years (1991 - 1995)	6	0	10	1	**17**
	> 20 years (≤ 1990)	10	0	9	3	**22**
Treatment						
	None - Direct Use	5	0	1	0	**6**
	Disinfection only	7	0	0	1	**8**
	Conventional Filtration	20	0	36	0	**56**
	MTA	0	0	0	4	**4**
Classification - Treatment						
	Small system	11	0	1	0	**12**
	Level I	5	0	2	0	**7**
	Level II	12	0	20	0	**32**
	Level III	4	0	14	0	**18**
	MTA	0	0	0	5	**5**
Classification - Distribution						
	Small system	13	0	3	2	**18**
	Level I	13	0	21	2	**36**
	Level II	2	0	13	0	**15**
	None	4	0	0	1	**5**

				Groundwater	GUDI	Surface	MTA	Totals
Total No. of Systems				**32**	**0**	**37**	**5**	**74**
Distribution								
	Piped			17	0	7	3	**27**
	Trucked			4	0	1	1	**6**
	Self Haul			1	0	0	0	**1**
	Combined			10	0	29	1	**40**
Water Quality								
	Fails Health							
		Yes, fails health due to:		0	0	9	0	**9**
			Operation	0	0	5	0	**5**
			Combination	0	0	4	0	**4**
	Fails Aesthetic							
		Yes, fails aesthetic due to:		5	0	13	0	**18**
			Design	3	0	2	0	**5**
			Operation	1	0	8	0	**9**
			Combination	1	0	3	0	**4**
			Unknown	0	0	0	0	**0**
Primary Operator - Treatment								
	Not certified			8	0	7	0	**15**
	No operator			5	0	0	0	**5**
	Not required			0	0	0	5	**5**
	Certified to Level			14	0	21	0	**35**
	Certified			5	0	9	0	**14**
Back-up Operator - Treatment								
	Not certified			13	0	23	0	**36**
	No operator			13	0	2	0	**15**
	Not required			0	0	0	5	**5**
	Certified to Level			1	0	7	0	**8**
	Certified			5	0	5	0	**10**

		Groundwater	GUDI	Surface	MTA	Totals	
Total No. of Systems		**32**	**0**	**37**	**5**	**74**	
Primary Operator - Distribution							
	Not certified	8	0	6	2	**16**	
	No operator	4	0	0	0	**4**	
	Not required	4	0	0	1	**5**	
	Certified to Level	15	0	26	2	**43**	
	Certified	1	0	5	0	**6**	
Back-up Operator - Distribution							
	Not certified	13	0	22	2	**37**	
	No operator	11	0	2	1	**14**	
	Not required	4	0	0	1	**5**	
	Certified to Level	4	0	12	1	**17**	
	Certified	0	0	1	0	**1**	
Risk (mean)						**Mean**	**Mean excluding MTA**
	Final	5.7	0.0	5.5	3.9	**5.5**	**5.6**
	Source	7.4	0.0	8.7	2.4	**7.7**	**8.1**
	Design	4.5	0.0	4.0	2.8	**4.1**	**4.2**
	Operations	6.0	0.0	6.6	5.8	**6.3**	**6.3**
	Reporting	7.1	0.0	6.0	9.2	**6.7**	**6.5**
	Operator	4.3	0.0	2.5	1.0	**3.1**	**3.3**

NEEGAN BURNSIDE

Appendix B.2

Wastewater System Summary

Regional Roll-Up Summary

Region: MANITOBA
Total No. of First Nations: 62
Participating No. of First Nations: 62
Participation Level: 100%
No. of Community Reports Issued: 62

Wastewater

		Septic	Aerated Lagoon	Facultative Lagoon	Mechanical	Other	MTA	Totals
Total No. of Systems		**1**	**10**	**22**	**24**	**0**	**4**	**61**
System Age								
	0-5 years (2006 - 2010)	0	4	1	0	0	0	**5**
	6-10 years (2001 - 2005)	0	2	2	2	0	0	**6**
	10-15 years (1996 - 2000)	0	0	3	15	0	0	**18**
	15 -20 years (1991 - 1995)	0	1	7	6	0	1	**15**
	> 20 years (≤ 1990)	1	3	9	1	0	3	**17**
Classification - Treatment								
	Small System	1	0	3	0	0	0	**4**
	MTA	0	0	0	0	0	4	**4**
	Level I	0	7	18	3	0	0	**28**
	Level II	0	3	1	16	0	0	**20**
	Level III	0	0	0	5	0	0	**5**
Classification - Collection								
	Small System	1	0	4	6	0	2	**13**
	Level I	0	6	14	13	0	0	**33**
	Level II	0	3	4	5	0	0	**12**
	MTA	0	0	0	0	0	2	**2**
	None	0	1	0	0	0	0	**1**
Collection								
	Piped	1	2	5	7	0	1	**16**
	Low Pressure	0	0	0	1	0	0	**1**
	Combined	0	7	16	15	0	0	**38**
	Trucked	0	1	1	1	0	3	**6**
Effluent Quality								
	No data	1	0	3	5	0	1	**10**
	Meets	0	9	16	10	0	2	**37**
	Does not meet	0	1	3	9	0	1	**14**

		Septic	Aerated Lagoon	Facultative Lagoon	Mechanical	Other	MTA	Totals
Total No. of Systems		**1**	**10**	**22**	**24**	**0**	**4**	**61**
Primary Operator - Treatment								
	Not certified	0	7	6	4	0	0	**17**
	No operator	1	0	0	0	0	0	**1**
	Not required	0	0	0	0	0	4	**4**
	Certified to Level	0	2	16	14	0	0	**32**
	Certified	0	1	0	6	0	0	**7**
Back-Up Operator - Treatment								
	Not certified	0	5	15	19	0	0	**39**
	No operator	1	3	6	1	0	0	**11**
	Not required	0	0	0	0	0	4	**4**
	Certified to Level	0	2	1	3	0	0	**6**
	Certified	0	0	0	1	0	0	**1**
Primary Operator - Collection								
	Not certified	0	6	5	4	0	1	**16**
	No operator	1	0	0	0	0	1	**2**
	Not required	0	1	0	0	0	2	**3**
	Certified to Level	0	1	14	19	0	0	**34**
	Certified	0	2	3	1	0	0	**6**
Back-Up Operator - Collection								
	Not certified	0	4	15	19	0	0	**38**
	No operator	1	3	6	1	0	2	**13**
	Not required	0	1	0	0	0	2	**3**
	Certified to Level	0	2	1	4	0	0	**7**
	Certified	0	0	0	0	0	0	**0**
Receiver								
	Large river	0	0	0	1	0	0	**1**
	River	0	2	9	7	0	0	**18**
	Lake, reservoir	0	2	1	11	0	0	**14**
	Creek	0	1	2	2	0	0	**5**
	Open marine, enclosed bay	0	1	0	0	0	0	**1**
	Wetland	0	3	9	2	0	0	**14**
	Sub-surface / Ground	0	1	1	0	0	0	**2**
	Tile field	1	0	0	1	0	0	**2**
	MTA	0	0	0	0	0	4	**4**

		Septic	Aerated Lagoon	Facultative Lagoon	Mechanical	Other	MTA	Totals	
Total No. of Systems		**1**	**10**	**22**	**24**	**0**	**4**	**61**	
Risk (mean)								**Mean**	**Mean excluding MTA**
	Final	5.4	4.7	4.4	6.2	0.0	2.3	**5.0**	**5.2**
	Effluent Receiver	3.0	6.1	5.0	7.7	0.0	1.8	**6.0**	**6.3**
	Design	3.0	2.8	3.2	5.0	0.0	1.3	**3.7**	**3.9**
	Operations	8.0	5.5	7.1	7.1	0.0	4.5	**6.7**	**6.9**
	Reporting	1.0	4.8	3.6	8.3	0.0	3.3	**5.6**	**5.7**
	Operator	10.0	5.0	2.4	2.1	0.0	1.3	**2.8**	**2.9**

NEEGAN BURNSIDE

Appendix C
Site Visit Methodology

Site Visits

Typical Day

Arrive in Community – Lead/Senior Inspector & Technical Support

- Meet with Circuit Rider and/or DIAND representative and First Nation/Tribal Council Representatives to undergo introductions and provide a brief synopsis of the activities to be undertaken for the day. This is based on the assumption that the First Nation has been fully briefed by DIAND on the purpose, process and benefits for the First Nation to cooperate and collaborate with the project.
- Confirm the various components that the First Nation uses to provide water to the entire community (i.e. number and types of distribution systems, source types, private wells, etc.) to help build assessment form for the community.
- Pre-select areas to undertake private system evaluations on community map.
- Confirm any missing background data that may be available allowing the First Nation time during the day to have Public Works Director/Supervisor/Secretary/etc to locate such materials.

Lead/Senior – Inspector

- Meet with Chief/Housing Manager/Band Manager/Finance Manager, to identify:
    - future servicing needs (planned development and population growth)
    - servicing constraints (source availability, soils, groundwater, bedrock, topography, etc.)
    - identify the extent to which non structural solutions or optimization strategies (water conservation, leak reduction, etc) have been previously investigated or implemented
    - confirm current population and housing numbers
    - obtain financial information not previously provided
    - note community concerns related to future servicing.
- Complete a walk through of the water plant from source to storage.
- Prepare a flow schematic (internal use).
- Complete the assessment questionnaire on treatment/storage/operations/operator(s) etc. with Operator/Circuit Rider.
- Take photographs.
- Travel to main sewage pumping station and wastewater treatment facility.
- Complete a walk through of the plant from influent to effluent.
- Prepare a flow schematic (internal use).
- Complete assessment questionnaire.
- Take photographs.
- Complete ACRS update.
- Repeat for additional water or wastewater facilities.
- Review information collected by Technical Support
- Gather all background/operational data gathered by First Nation.
- Complete overall notes.

Technical Support

- Gather any relevant operational data (water and wastewater), if not already provided and arrange with the First Nation to have copied/scanned that day.
- Obtain GPS coordinates of source(s) and treatment.
- Complete the source questions on the assessment questionnaire.
- Undertake sampling of the raw and/or treated water, if necessary.
- Take photographs.
- Complete ACRS update.
- Travel around community with First Nation representative and undertake private system assessments for water and/or septic including GPS coordinates, photographs, assessment forms and sampling.
- Meet back with Lead/Senior Inspector at wastewater location and assist with sampling, if required.

Sampling Requirements

Water Sampling

The terms of reference state, *"The sampling program for public water systems should reflect the requirements of the most stringent regulations applicable in the Province in which the community is located. However, should an adequate sampling program already be in place, then existing data may be used. Bidders should assume sampling and testing will be required for 5% of total wells, septics, and cisterns identified in SW5. Septics and cisterns only require a visual inspection. All bidders are required to carry a $500,000 allowance for this purpose. Any variances should be identified in the Inception Report."*

Health Canada data is anticipated to be available for the majority of the water systems. Where data is not available, sampling will be conducted as part of the inspection.

Minimum existing data required will include:

Community systems
- bacteriological – monthly available for previous year
- general chemistry – annually (treated)
- full Volatile Organic Compound analysis – within 5 years

Private wells
- bacteriological – one sample within past year
- basic chemistry – one sample within past year

For public systems where data is not available, treated water samples will be obtained and submitted to a laboratory for testing that would include; Basic Chemistry, Full Metals Scan, Bacteria and Volatile Organic Compounds.

For public systems that include a piped distribution system and where distributed water quality data is not available, a sample will be taken from the most remote point in the distribution system and sampled for Disinfection By-Products.

For individual wells, samples will be obtained from a representative number of wells (5% of total wells) in the community. The testing will include; Basic Chemistry, Full Metals Scan and Bacteria.

Wastewater Sampling

For systems lacking existing discharge quality data, and that will be discharging at the time of the site visit, representative samples will be obtained and submitted to a laboratory for testing. This would include seasonal discharges at the time of the site visit and from plants with continuous discharge to a receiving body. Sewage treatment systems providing an equivalent to secondary treatment (lagoons, and mechanical facilities) for which effluent quality data does not include the parameters of BOD_5, TSS, and E.Coli, will be sampled in the field, if they are in fact discharging at the time of site visit. Similarly, sewage treatment systems providing an equivalent to tertiary treatment for which effluent quality data does not include BOD_5, TSS, Ammonia, Total Phosphorous and E.Coli, will be sampled in the field, if they are in fact discharging at the time of the site visit.

NEEGAN BURNSIDE

Appendix D

First Nation Water Summaries

NEEGAN BURNSIDE

Appendix D.1

Individual First Nation Water Summary

Table D.1 - 1: Water System Regional Summary of Water Treatment, Storage and Distribution Systems

First Nation Information		Water System Information									Storage Information		Distribution System Information						
Band #	Band Name	System #	System Name	Water Source	Treatment Class	Const Year	Design Capacity [m3/d]	Actual Capacity [m3/d]	Max Daily Volume [m3/d]	Disinfection	Storage Type	Storage Capacity	Distribution Class	Population Served	Homes Piped	Homes Trucked	Number of Trucks in Service	Pipe Length	Pipe Length / Connection
308	Barren Lands	6599	BROCHET NO. 197	Surface Water	Level III	2005	829	829	1301	Yes	Underground	539	Level I	535	83	0	0	6460	77
266	Berens River	6553	BERENS RIVER WTP	Surface Water	Level III	1999	1123	820.8	753	Yes	Underground	702	Level II	2125	120	175	2		
284	Birdtail Sioux	6574	BIRDTAIL CREEK NO. 57	Groundwater	Level III	2005	856	856	752	Yes	Underground	367.5	Level I	377	120	0	0	24979	208
267	Bloodvein	6554	BLOODVEIN WTP	Surface Water	Level II	1995	545	545	578	Yes	Underground	662	Level I	1076	142	52	1	4449	31
261	Brokenhead Ojibway Nation	6547	BROKENHEAD WTP	Groundwater	Level III	1993	327	327	459	Yes	Underground	415	Level I	513	137	0	0	10698	78
301	Bunibonibee Cree Nation	6595	Bunibonibee WTP	Surface Water	Level III	2005	1104	1104	1335	Yes	Underground	1000	Level II	2514	129	278	4	8704	67
289	Canupawakpa Dakota First Nation	6582	CANUPAWAKPA DAKOTA FIRST NATION	Groundwater	Small System	0				No	None		NA	23	0	7	1		
309	Chemawawin Cree Nation	6607	CHEMAWAWIN COMMUNITY WATER TREATMENT PLANT	Groundwater	Level II	1996	1944	1503.4	527.9	Yes	Underground	538	Level I	1242	148	130	2	5641	38
276	Cross Lake First Nation	6564	CROSS LAKE COMMUNITY WATER TREATMENT PLANT SAGIHWAK	Surface Water	Level III	1992	683	683	297	Yes	Underground	726	Level II	3318	161	94	0	5314.1	33
276	Cross Lake First Nation	6565	CROSS LAKE EDUCATION WATER TREATMENT PLANT NATIMEK	Surface Water	Level II	1983	821	821	480	Yes	Underground	1404	Level II	1795	230	290	0	9009	39
288	Dakota Plains	6581	DAKOTA PLAINS INDIAN RESERVE NO. 6A	MTA	MTA	1993	1102.2	123.8	123.8	MTA	Underground	MTA	Small System	150	38	0	0	8952	235
295	Dakota Tipi	6593	DAKOTA TIPI NO. 1	MTA	MTA	1998	953	953	144	MTA	Underground	MTA	Level I	174	52	0	0	3260	62
316	Dauphin River	6590	DAUPHIN RIVER NO. 48A	Groundwater	Small System	1980				No	None	0	Small System	4	1	0	0	113	113
280	Ebb and Flow	6570	EBB AND FLOW WTP	Groundwater	Level III	2004	1458	1458	1135.5	Yes	Underground	596	Level I	1534	300	75	2	37299	124
264	Fisher River	6551	FISHER RIVER WTP	Groundwater	Level II	2009	1624	1624	146	Yes	Underground	755	Level II	390	49	12	1	1512	30
262	Fort Alexander	6549	FORT ALEXANDER NORTH SHORE WTP	Surface Water	Level II	1970	504	504	500	Yes	Underground	685.5	Level II	1146	136	108	1	18821	138
262	Fort Alexander	6548	FORT ALEXANDER SOUTH SHORE WTP	Surface Water	Level II	1970	1417	1382	1019	Yes	Underground	790	Level II	2020	291	121	0	15137	52
305	Fox Lake	6609	FOX LAKE WTP	Surface Water	Level III	2006	360	360	225	Yes	Underground	420	Level I	277	60	0	0	5878	97
294	Gamblers	6575	GAMBLER NO. 63	MTA	MTA	0				MTA	None	MTA	NA	0	0	21	1		
297	Garden Hill First Nation	7101	16448 - GARDEN HILL WTP	Surface Water	Level III	1997	1915	1915	1227	Yes	Underground	1300	Level II	3993	151	69	1	10028	66
296	Gods Lake First Nation	6594	MAIN LAND WATER TREATMENT PLANT	Surface Water	Level II	1999	1349	1349	1308	Yes	Underground	844	Level I	1247	202	10	1	8106.9	40
296	Gods Lake First Nation	NEW001	NAZZIE POINT	Surface Water	Small System	1993				No	None		Small System	70	12	0	0		
296	Gods Lake First Nation	15959	WEST SIDE WATER TREATMENT PLANT GOD'S LAKE	Surface Water	Level II	2007	272.16	272.16		Yes	Underground	225.33	Level I	240	20	20	1	1892	94
310	Grand Rapids First Nation	6589	GRAND RAPIDS NO. 33	Groundwater	Level I	1996	544	544	432.6	Yes	Underground	313	Level I	767	185	0	0	6670	36
263	Hollow Water	6550	HOLLOW WATER WTP	Surface Water	Level III	1992	544	544		Yes	Underground	257	Level I	1197	131	37	1	8576	65
286	Keeseekoowenin	6579	KEESEEKOOWENIN COMMUNITY	Groundwater	Level II	2000	13.6	13.6	7.6	Yes	None		NA	440	0	150	1		
286	Keeseekoowenin	6578	KEESEEKOOWENIN EDUCATION AUTHORITY	Groundwater	Level II	1993				No	Underground		Small System	0	0	0	0		
268	Kinonjeoshtegon First Nation	6555	KINONJEOSHTEGON WATER SYSTEM	Groundwater	Small System	1989			45	Yes	Underground	28	Small System	79	0	0	0		
271	Lake Manitoba Treaty 2 First Nation	6559	LAKE MANITOBA School	Groundwater	Small System	1975				Yes	Underground	0	Small System	50	12	0	0	591	49
275	Lake St. Martin	6563	LAKE ST. MARTIN WTP	Groundwater	Level II	1997	93.6	93.6	121	Yes	Underground	387	Level I	1393	0	120	2		
260	Little Black River	6546	LITTLE BLACK RIVER WTP	Surface Water	Level II	1992	544.8	544.8	569	Yes	Underground	311	Level I	827	200	0	0	6788	33
270	Little Grand Rapids	6557	LITTLE GRAND RAPIDS WATER TREATMENT PLANT	Surface Water	Level II	1995	492	492	537	Yes	Underground	325	Level I	1213	97	113	2	10465.4	107
274	Little Saskatchewan	6562	LITTLE SASKATCHEWAN WATER TREATMENT PLANT	Groundwater	Level II	1994	18	18		Yes	Underground	450	Level I	650	5	0	0	415	83
287	Long Plain	6580	LONG PLAIN WATER TREATMENT PLANT	Groundwater	Level II	1993	2184	2184	1331	Yes	Underground	582	Level I	2039	224	46	2	41822	186
302	Manto Sipi Cree Nation	6596	GOD'S RIVER NO. 86A	Surface Water	Level III	1999	933	933	610	Yes	Underground	620.07	Level I	682	128	0	1	5910	46
311	Mathias Colomb	6598	MATHIAS COLOMB WATER TRETAMENT PLANT	Surface Water	Level II	1998	2180.4	2180.4	1961.2	Yes	Underground	1300	Level II	2547	307	18	1	12698	41
312	Mosakahiken Cree Nation	NEW001	NEW WATER PLANT	Groundwater	Level I	2009	1752	1728	778	Yes	Underground	777	Level I	1008	134	66	1	3552	26
313	Nisichawayasihk Cree Nation	6597	NISICHAWAYASIHK WATER TREATMENT PLANT	Surface Water	Level II	1987	1636	1636		Yes	Underground	2200	Level II	2600	319	137	4	8710	27
317	Northlands	6606	NORTHLAND WATER TREATMENT PLANT	Surface Water	Level I	1996	818	409	631	Yes	Underground	350	Level I	800	141	0	0	6536	46
278	Norway House Cree Nation	6567	NORWAY HOUSE COMMUNITY WATER TREATMENT PLANT	Surface Water	Level III	1987	3504	1752	1737	Yes	Underground	1100	Level II	5115	376	766	10	12822	34
279	O-Chi-Chak-Ko-Sipi First Nation	6569	CRANE RIVER NO. 51	Surface Water	Level II	1991	655.2	655.2	210	Yes	Underground	200	Level I	647	112	12	2	5427	48
315	Opaskwayak Cree Nation	6588	OPASKWAYAK CREE WATER TREATMENT PLANT	Groundwater	Level II	1991	3090.5	3090.5	2149	Yes	Underground	740	Level II	3132	675	16	0	18873	27
318	O-Pipon-Na-Piwin Cree Nation		Water Treatment/Distribution	Surface Water	Level III	0	845	422	209	Yes	Underground	715	Level I	1010	35	170	3	1300	37
327	Pauingassi First Nation	6558	PAUINGASSI WATER TREATMENT PLANT	Surface Water	Level II	1995	467	467	295	Yes	Underground	329.0	Level I	617	62	26	1	2410	38
269	Peguis	NEW002	CORE SITE WELL	Groundwater	Small System	0				No	None		Small System	56	14	0	0		
269	Peguis	NEW001	OLD SCHOOL SYSTEM	Groundwater	Small System	0				No	None		Small System	0	15	0	0		
269	Peguis	6556	PEGUIS WATER TREATMENT PLANT	Groundwater	Level I	1996	1090	1090	199	Yes	Underground	520	Level I	614	26	0	0	1230	47
272	Pinaymootang First Nation	15979	PINAYMOOTANG BOTTLING PLANT	Groundwater	Level II	2005	0.4	0.4		Yes		0	NA	1531	0	0	0		
272	Pinaymootang First Nation	6560	PINAYMOOTANG SCHOOL PLANT	Groundwater	Small System	1971	40			Yes	None	0	Small System	0	4	0	0		
272	Pinaymootang First Nation	NEW002	PUMP HOUSE 1	Groundwater	Small System	2008				No	Grade level	10	Small System	85	19	0	0	700	36
272	Pinaymootang First Nation	NEW003	PUMP HOUSE 2	Groundwater	Small System	2008				Yes	Grade level	10	Small System	85	15	0	0	700	46
272	Pinaymootang First Nation	NEW004	PUMP HOUSE 3	Groundwater	Small System	1990				No	None		Small System	85	7	0	0	700	100
282	Pine Creek	6572	PINE CREEK NO. 66A	Surface Water	Level III	2003	66			Yes	Underground	1532	Level I	1569	60	151	2	4459	74
277	Poplar River First Nation	6566	POPLAR RIVER WATER TREATMENT PLANT	Surface Water	Level II	1999	1090	1090	636	Yes	Underground	743.8	Level I	1459	128	104	2	5124	40
300	Red Sucker Lake	6605	RED SUCKER LAKE WATER TREATMENT PLANT	Surface Water	Level II	1993	1036	1019	61	Yes	Underground	1013.2	Level I	958	0	100	1		
291	Rolling River	6584	ROLLING RIVER WTP	Groundwater	Level III	2007	654	654	84	Yes	Underground	370.4	NA	664	0	130	3		
273	Roseau River Anishinabe First Nation C	6561	ROSEAU RIVER WTP	MTA	MTA	1989			322	MTA	Grade level	MTA	Level I	1279	164	32	1	7140	43
283	Sandy Bay	6573	SANDY BAY WATER TREATMENT PLANT	Surface Water	Level III	1996	1656	1656	1208	Yes	Underground	1705	Level II	3586	435	102	4	9994	22
314	Sapotaweyak Cree Nation	6591	SAPOTAWEYAK WATER TREATMENT PLANT	Surface Water	Level II	1996	360	288	390	Yes	Underground	330	Level I	1137	170	34	1	5662	33
303	Sayisi Dene First Nation	6603	Sayisi Dene Water Treatment Plant	Surface Water	Level II	1996	371.5	261.6	169.6	Yes	Underground	132.3	Small System	386	90	32	1	6008	66
307	Shamattawa First Nation	6601	SHAMATTAWA WATER TREATMENT PLANT	Surface Water	Level III	1999	1200	1200		Yes	Underground	455	Level I	1300	160	10	1	4347	27
290	Sioux Valley Dakota Nation	6583	SIOUX VALLEY DAKOTA NATION WATER TREATMENT PLANT	Groundwater	Level II	1990	519	327		Yes	Underground	285	Level I	1316	192	92	2	8268.1	43

REGION: MANITOBA
January 2011

First Nation Information		Water System Information									Storage Information		Distribution System Information						
Band #	Band Name	System #	System Name	Water Source	Treatment Class	Const Year	Design Capacity [m3/d]	Actual Capacity [m3/d]	Max Daily Volume [m3/d]	Disinfection	Storage Type	Storage Capacity	Distribution Class	Population Served	Homes Piped	Homes Trucked	Number of Trucks in Service	Pipe Length	Pipe Length / Connection
281	Skownan First Nation	6571	SKOWNAN WATER TREATMENT PLANT	Surface Water	Level I	1988	561		210.4	Yes	Underground	880	Level I	813	0	110	2		
298	St. Theresa Point	7102	26447 - ST THERESA POINT WATER TREATMENT PLANT	Surface Water	Level II	1999	1716	1716	1099	Yes	Underground	1429	Level II	3509	161	57	1	11985.4	74
293	Swan Lake	NEW001	Administration Area System	Groundwater	Small System	1975	453.6	453.6		No	None		Small System	40	10	0	0	470	47
293	Swan Lake	6586	SWAN LAKE WATER TREATMENT PLANT	Groundwater	Level I	1996	324	324		Yes	Underground	397	Level I	584	51	64	1	3557	69
306	Tataskweyak Cree Nation	6602	TATASKWEYAK WATER TREATMENT PLANT	Surface Water	Level II	1987	1814	1248		Yes	Underground	992	Level II	2567	270	92	1	7493.1	27
292	Tootinaowaziibeeng Treaty Reserve	6585	TOOTINAOWAZIIBEENG WATER TREATMENT PLANT	Groundwater	Level II	1997	454	454	104	Yes	Underground	360	Level I	619	5	109	2	305	61
323	War Lake First Nation	6604	06466 - War Lake provincial plant	MTA	MTA	1990				MTA	Underground	MTA	Small System	133	23	0	0	400	17
299	Wasagamack First Nation	7104	WASAGAMACK WATER TREATMENT PLANT	Surface Water	Level II	1997	1788	890	450	Yes	Underground	820	Level I	1662	56	34	1	2833.6	50
285	Waywayseecappo First Nation	6577	WAYWAYSEECAPPO Education Authority	Groundwater	Level I	1991	192.3	192.3	110.3	Yes	Underground	168.6	Small System	963	3	209	4	7625	2541
285	Waywayseecappo First Nation	6576	WAYWAYSEECAPPO Lizard Point	Groundwater	Level II	1999	899.3	118.8	81.5	Yes	Underground	205.2	Small System	50	6	135	2	72	12
324	Wuskwi Sipihk First Nation	6592	SWAN LAKE NO. 65C	Surface Water	Level II	1991		87	76	Yes	Underground	146	Small System	63	7	41	1	3634	519
304	York Factory First Nation	6600	YORK FACTORY Water treatment plant	Surface Water	Level III	1986	224	224	347	Yes	Underground	736	Level I	420	114	0	0	4179.3	36

Table D.1 - 2: Regional Summary of Water Quality Information

First Nation Information		Water System Information			Water Quality Information							
Band #	Band Name	System #	System Name	Water Source	Meets/Does Not Meet GCDWQ	Cause of Failure	Fails Health Guidelines	Fails Aesthetic Guidelines	Fails MAC by Design	Fails MAC by Operation	DWA In Effect	DWA Count
308	Barren Lands	6599	BROCHET NO. 197	Surface Water	Meets Requirements	N/A	N/A	N/A	No	No	No	0
266	Berens River	6553	BERENS RIVER WTP	Surface Water	Low Freq, Low Mag	Operation	Yes	Yes	No	No	No	0
284	Birdtail Sioux	6574	BIRDTAIL CREEK NO. 57	Groundwater	Meets Requirements	N/A	N/A	N/A	No	No	No	0
267	Bloodvein	6554	BLOODVEIN WTP	Surface Water	High Freq OR High Mag	Operation	Yes	Yes	No	Yes	Yes	1
261	Brokenhead Ojibway Nation	6547	BROKENHEAD WTP	Groundwater	Meets Requirements	N/A	N/A	N/A	No	No	No	0
301	Bunibonibee Cree Nation	6595	Bunibonibee WTP	Surface Water	Meets Requirements	N/A	N/A	N/A	No	No	No	0
289	Canupawakpa Dakota First Nation	6582	CANUPAWAKPA DAKOTA FIRST NATION	Groundwater	Meets Requirements	N/A	N/A	N/A	No	No	No	0
309	Chemawawin Cree Nation	6607	CHEMAWAWIN COMMUNITY WATER TREATMENT PLANT	Groundwater	Meets Requirements	N/A	N/A	N/A	No	No	No	0
276	Cross Lake First Nation	6564	CROSS LAKE COMMUNITY WATER TREATMENT PLANT SAGIHWAK	Surface Water	High Freq, Low Mag	Operation	No	Yes	No	No	No	0
276	Cross Lake First Nation	6565	CROSS LAKE EDUCATION WATER TREATMENT PLANT NATIMEK	Surface Water	Meets Requirements	N/A	N/A	N/A	No	No	No	0
288	Dakota Plains	6581	DAKOTA PLAINS INDIAN RESERVE NO. 6A	MTA	Meets Requirements	N/A	N/A	N/A	No	No	No	0
295	Dakota Tipi	6593	DAKOTA TIPI NO. 1	MTA	Meets Requirements	N/A	N/A	N/A	No	No	No	0
316	Dauphin River	6590	DAUPHIN RIVER NO. 48A	Groundwater	Low Freq, Low Mag	Both	N/A	Yes	No	No	No	0
280	Ebb and Flow	6570	EBB AND FLOW WTP	Groundwater	Meets Requirements	N/A	N/A	N/A	No	No	No	0
264	Fisher River	6551	FISHER RIVER WTP	Groundwater	Meets Requirements	N/A	N/A	N/A	No	No	No	0
262	Fort Alexander	6549	FORT ALEXANDER NORTH SHORE WTP	Surface Water	Low Freq, Low Mag	Operation	No	Yes	No	No	No	0
262	Fort Alexander	6548	FORT ALEXANDER SOUTH SHORE WTP	Surface Water	Meets Requirements	N/A	No	No	No	No	No	0
305	Fox Lake	6609	FOX LAKE WTP	Surface Water	High Freq, Low Mag	Design	No	Yes	No	No	Yes	1
294	Gamblers	6575	GAMBLER NO. 63	MTA	Meets Requirements	N/A	N/A	N/A	No	No	No	0
297	Garden Hill First Nation	7101	16448 - GARDEN HILL WTP	Surface Water	High Freq, Low Mag	Operation	Yes	No	No	No	No	0
296	Gods Lake First Nation	6594	MAIN LAND WATER TREATMENT PLANT	Surface Water	Meets Requirements	N/A	N/A	N/A	No	No	No	0
296	Gods Lake First Nation	NEW001	NAZZIE POINT	Surface Water	High Freq OR High Mag	Both	Yes	Yes	No	No	Yes	1
296	Gods Lake First Nation	15959	WEST SIDE WATER TREATMENT PLANT GOD'S LAKE	Surface Water	Meets Requirements	N/A	N/A	N/A	No	No	No	0
310	Grand Rapids First Nation	6589	GRAND RAPIDS NO. 33	Groundwater	Meets Requirements	N/A	No	No	No	No	No	0
263	Hollow Water	6550	HOLLOW WATER WTP	Surface Water	Low Freq, Low Mag	Both	N/A	N/A	Yes	Yes		2
286	Keeseekoowenin	6579	KEESEEKOOWENIN COMMUNITY	Groundwater	Meets Requirements	N/A	N/A	N/A	No	No	No	0
286	Keeseekoowenin	6578	KEESEEKOOWENIN EDUCATION AUTHORITY	Groundwater	Meets Requirements	N/A	N/A	N/A	No	No	No	0
268	Kinonjeoshtegon First Nation	6555	KINONJEOSHTEGON WATER SYSTEM	Groundwater	Meets Requirements	N/A	N/A	N/A	No	No	No	0
271	Lake Manitoba Treaty 2 First Nation	6559	LAKE MANITOBA School	Groundwater	Meets Requirements	N/A	N/A	N/A	No	No	No	0
275	Lake St. Martin	6563	LAKE ST. MARTIN WTP	Groundwater	Meets Requirements	N/A	N/A	N/A	No	No	Yes	1
260	Little Black River	6546	LITTLE BLACK RIVER WTP	Surface Water	Low Freq, Low Mag	Operation	Yes	Yes	No	No	Yes	1
270	Little Grand Rapids	6557	LITTLE GRAND RAPIDS WATER TREATMENT PLANT	Surface Water	Low Freq, Low Mag	Design	No	Yes	No	No	No	0
274	Little Saskatchewan	6562	LITTLE SASKATCHEWAN WATER TREATMENT PLANT	Groundwater	Low Freq, Low Mag	Operation	No	Yes	No	No	No	0
287	Long Plain	6580	LONG PLAIN WATER TREATMENT PLANT	Groundwater	Meets Requirements	N/A	N/A	N/A	No	No	No	0
302	Manto Sipi Cree Nation	6596	GOD'S RIVER NO. 86A	Surface Water	Meets Requirements	N/A	N/A	N/A	No	No	No	0
311	Mathias Colomb	6598	MATHIAS COLOMB WATER TRETAMENT PLANT	Surface Water	Meets Requirements	N/A	N/A	N/A	No	No	No	0
312	Mosakahiken Cree Nation	NEW001	NEW WATER PLANT	Groundwater	Meets Requirements	N/A	N/A	N/A	No	No	No	0
313	Nisichawayasihk Cree Nation	6597	NISICHAWAYASIHK WATER TREATMENT PLANT	Surface Water	High Freq OR High Mag	Operation	No	N/A	No	No	No	0
317	Northlands	6606	NORTHLAND WATER TREATMENT PLANT	Surface Water	Meets Requirements	N/A	N/A	N/A	No	No	No	0
278	Norway House Cree Nation	6567	NORWAY HOUSE COMMUNITY WATER TREATMENT PLANT	Surface Water	Meets Requirements	N/A	N/A	N/A	No	No	No	0
279	O-Chi-Chak-Ko-Sipi First Nation	6569	CRANE RIVER NO. 51	Surface Water	Meets Requirements	N/A	N/A	N/A	No	No	No	0
315	Opaskwayak Cree Nation	6588	OPASKWAYAK CREE WATER TREATMENT PLANT	Groundwater	Meets Requirements	N/A	N/A	N/A	No	No	No	0
318	O-Pipon-Na-Piwin Cree Nation		Water Treatment/Distribution	Surface Water	Meets Requirements	N/A	N/A	N/A	No	No	No	0
327	Pauingassi First Nation	6558	PAUINGASSI WATER TREATMENT PLANT	Surface Water	High Freq, Low Mag	Operation	No	Yes	No	No	No	0
269	Peguis	NEW002	CORE SITE WELL	Groundwater	Low Freq, Low Mag	Design	No	Yes	Yes	No	No	0
269	Peguis	NEW001	OLD SCHOOL SYSTEM	Groundwater	Low Freq, Low Mag	Design	No	Yes	Yes	Yes	No	0
269	Peguis	6556	PEGUIS WATER TREATMENT PLANT	Groundwater	Meets Requirements	N/A	N/A	N/A	No	No	No	0
272	Pinaymootang First Nation	15979	PINAYMOOTANG BOTTLING PLANT	Groundwater	Meets Requirements	N/A	N/A	N/A	No	No	No	0
272	Pinaymootang First Nation	6560	PINAYMOOTANG SCHOOL PLANT	Groundwater	Meets Requirements	N/A	N/A	N/A	No	No	No	0
272	Pinaymootang First Nation	NEW002	PUMP HOUSE 1	Groundwater	Meets Requirements	N/A	N/A	N/A	No	Yes	No	0

REGION: MANITOBA
January 2011

First Nation Information		Water System Information			Water Quality Information							
Band #	Band Name	System #	System Name	Water Source	Meets/Does Not Meet GCDWQ	Cause of Failure	Fails Health Guidelines	Fails Aesthetic Guidelines	Fails MAC by Design	Fails MAC by Operation	DWA In Effect	DWA Count
272	Pinaymootang First Nation	NEW003	PUMP HOUSE 2	Groundwater	Meets Requirements	N/A	N/A	N/A	No	Yes	No	0
272	Pinaymootang First Nation	NEW004	PUMP HOUSE 3	Groundwater	Meets Requirements	N/A	N/A	N/A	No	Yes	No	0
282	Pine Creek	6572	PINE CREEK NO. 66A	Surface Water	Meets Requirements	N/A	N/A	N/A	No	No	No	0
277	Poplar River First Nation	6566	POPLAR RIVER WATER TREATMENT PLANT	Surface Water	Low Freq, Low Mag	Operation	Yes	Yes	No	No		10
300	Red Sucker Lake	6605	RED SUCKER LAKE WATER TREATMENT PLANT	Surface Water	Meets Requirements	Both	Yes	No	No	No	No	0
291	Rolling River	6584	ROLLING RIVER WTP	Groundwater	Meets Requirements	N/A	N/A	N/A	No	No	No	0
273	Roseau River Anishinabe First Nation Gover	6561	ROSEAU RIVER WTP	MTA	Meets Requirements	N/A	N/A	N/A	No	No	No	0
283	Sandy Bay	6573	SANDY BAY WATER TREATMENT PLANT	Surface Water	Meets Requirements	N/A	N/A	N/A	No	Yes	No	0
314	Sapotaweyak Cree Nation	6591	SAPOTAWEYAK WATER TREATMENT PLANT	Surface Water	Meets Requirements	N/A	N/A	N/A	No	No	No	0
303	Sayisi Dene First Nation	6603	Sayisi Dene Water Treatment Plant	Surface Water	Meets Requirements	N/A	N/A	N/A	No	No	No	0
307	Shamattawa First Nation	6601	SHAMATTAWA WATER TREATMENT PLANT	Surface Water	High Freq AND High Mag	Both	Yes	No	Yes	Yes	No	0
290	Sioux Valley Dakota Nation	6583	SIOUX VALLEY DAKOTA NATION WATER TREATMENT PLANT	Groundwater	Meets Requirements	N/A	N/A	N/A	No	No	No	0
281	Skownan First Nation	6571	SKOWNAN WATER TREATMENT PLANT	Surface Water	High Freq, Low Mag	Both	No	Yes	No	No	No	0
298	St. Theresa Point	7102	26447 - ST THERESA POINT WATER TREATMENT PLANT	Surface Water	Meets Requirements	N/A	N/A	N/A	No	No	No	0
293	Swan Lake	NEW001	Administration Area System	Groundwater	Low Freq, Low Mag	Design	N/A	Yes	No	No	No	0
293	Swan Lake	6586	SWAN LAKE WATER TREATMENT PLANT	Groundwater	Meets Requirements	N/A	N/A	N/A	No	No	No	0
306	Tataskweyak Cree Nation	6602	TATASKWEYAK WATER TREATMENT PLANT	Surface Water	Low Freq, Low Mag	Operation	No	Yes	No	No	No	0
292	Tootinaowaziibeeng Treaty Reserve	6585	TOOTINAOWAZIIBEENG WATER TREATMENT PLANT	Groundwater	Meets Requirements	N/A	N/A	N/A	No	No	No	0
323	War Lake First Nation	6604	06466 - War Lake provincial plant	MTA	Meets Requirements	N/A	N/A	N/A	No	No	No	0
299	Wasagamack First Nation	7104	WASAGAMACK WATER TREATMENT PLANT	Surface Water	Low Freq, Low Mag	Operation	N/A	N/A	No	No	No	0
285	Waywayseecappo First Nation	6577	WAYWAYSEECAPPO Education Authority	Groundwater	Meets Requirements	N/A	N/A	N/A	No	No	No	0
285	Waywayseecappo First Nation	6576	WAYWAYSEECAPPO Lizard Point	Groundwater	Meets Requirements	N/A	N/A	N/A	No	No	No	0
324	Wuskwi Sipihk First Nation	6592	SWAN LAKE NO. 65C	Surface Water	High Freq, Low Mag	Both	Yes	Yes	Yes	Yes	No	0
304	York Factory First Nation	6600	YORK FACTORY Water treatment plant	Surface Water	Meets Requirements	N/A	N/A	N/A	No	No	Yes	1

Table D.1 - 3: Regional Summary of Water Operator Information

First Nation Information		Water System Information			Operator Information					
Band #	Band Name	System #	System Name	Water Source	Primary Operator Exists	Primary Operator Treatment Class	Primary Operator Distribution Class	Secondary Operator Exists	Secondary Operator Treatment Class	Secondary Operator Distribution Class
308	Barren Lands	6599	BROCHET NO. 197	Surface Water	Yes	No Certification	Level II	Yes	No Certification	Level II
266	Berens River	6553	BERENS RIVER WTP	Surface Water	Yes	No Certification	No Certification	Yes	No Certification	No Certification
284	Birdtail Sioux	6574	BIRDTAIL CREEK NO. 57	Groundwater	Yes	Level III	Level I	Yes	No Certification	No Certification
267	Bloodvein	6554	BLOODVEIN WTP	Surface Water	Yes	Level II	Level I	Yes	No Certification	No Certification
261	Brokenhead Ojibway Nation	6547	BROKENHEAD WTP	Groundwater	Yes	Level III	Level I	Yes	Level I	Level I
301	Bunibonibee Cree Nation	6595	Bunibonibee WTP	Surface Water	Yes	Level II	Level I	Yes	No Certification	Level I
289	Canupawakpa Dakota First Nation	6582	CANUPAWAKPA DAKOTA FIRST NATION	Groundwater	No	Not Required	No Operator	No	Not Required	No Operator
309	Chemawawin Cree Nation	6607	CHEMAWAWIN COMMUNITY WATER TREATMENT PLANT	Groundwater	Yes	Level I	Level I	No	Not Required	No Operator
276	Cross Lake First Nation	6564	CROSS LAKE COMMUNITY WATER TREATMENT PLANT SAGIHWAK	Surface Water	Yes	Level II	Level II	Yes	Level II	Level II
276	Cross Lake First Nation	6565	CROSS LAKE EDUCATION WATER TREATMENT PLANT NATIMEK	Surface Water	Yes	Level II	Level II	Yes	Level II	Level II
288	Dakota Plains	6581	DAKOTA PLAINS INDIAN RESERVE NO. 6A	MTA	Yes	Not Required	No Certification	Yes	No Certification	No Certification
295	Dakota Tipi	6593	DAKOTA TIPI NO. 1	MTA	Yes	Not Required	Level I	Yes	Not Required	No Certification
316	Dauphin River	6590	DAUPHIN RIVER NO. 48A	Groundwater	No	No Certification	No Certification	No	Not Required	No Operator
280	Ebb and Flow	6570	EBB AND FLOW WTP	Groundwater	Yes	Level II	Level I	Yes	Level I	Level I
264	Fisher River	6551	FISHER RIVER WTP	Groundwater	Yes	No Certification	No Certification	Yes	No Certification	No Certification
262	Fort Alexander	6549	FORT ALEXANDER NORTH SHORE WTP	Surface Water	Yes	Level II	Level I	Yes	No Certification	No Certification
262	Fort Alexander	6548	FORT ALEXANDER SOUTH SHORE WTP	Surface Water	Yes	Level II	Level I	Yes	No Certification	No Certification
305	Fox Lake	6609	FOX LAKE WTP	Surface Water	Yes	Level III	Level I	Yes	Level III	Level I
294	Gamblers	6575	GAMBLER NO. 63	MTA	Yes	Not Required	No Certification	No	Not Required	No Certification
297	Garden Hill First Nation	7101	16448 - GARDEN HILL WTP	Surface Water	Yes	Level III	Level II	Yes	No Certification	No Certification
296	Gods Lake First Nation	6594	MAIN LAND WATER TREATMENT PLANT	Surface Water	Yes	Level II	Level I	Yes	Level II	Level II
296	Gods Lake First Nation	NEW001	NAZZIE POINT	Surface Water	Yes	Level II	Level I	Yes	Level II	Level II
296	Gods Lake First Nation	15959	WEST SIDE WATER TREATMENT PLANT GOD'S LAKE	Surface Water	Yes	No Certification	No Certification	No	Not Required	No Operator
310	Grand Rapids First Nation	6589	GRAND RAPIDS NO. 33	Groundwater	Yes	Level I	Level I	Yes	No Certification	No Certification
263	Hollow Water	6550	HOLLOW WATER WTP	Surface Water	Yes	Level III	Level I	Yes	Level II	Level I
286	Keeseekoowenin	6579	KEESEEKOOWENIN COMMUNITY	Groundwater	Yes	Level II	Level II	Yes	Level II	Level I
286	Keeseekoowenin	6578	KEESEEKOOWENIN EDUCATION AUTHORITY	Groundwater	Yes	Level III	Level I	No	Not Required	No Operator
268	Kinonjeoshtegon First Nation	6555	KINONJEOSHTEGON WATER SYSTEM	Groundwater	Yes	No Certification	No Certification	Yes	No Certification	No Certification
271	Lake Manitoba Treaty 2 First Nation	6559	LAKE MANITOBA School	Groundwater	Yes	Level I	Level I	No	Not Required	No Operator
275	Lake St. Martin	6563	LAKE ST. MARTIN WTP	Groundwater	Yes	Level II	Level I	Yes	Level I	No Certification
260	Little Black River	6546	LITTLE BLACK RIVER WTP	Surface Water	Yes	Level III	Level I	Yes	Level II	Level I
270	Little Grand Rapids	6557	LITTLE GRAND RAPIDS WATER TREATMENT PLANT	Surface Water	Yes	Level I	Level I	Yes	No Certification	No Certification
274	Little Saskatchewan	6562	LITTLE SASKATCHEWAN WATER TREATMENT PLANT	Groundwater	Yes	Level I	Level I	Yes	No Certification	No Certification
287	Long Plain	6580	LONG PLAIN WATER TREATMENT PLANT	Groundwater	Yes	Level II	Level I	Yes	Level I	Level I
302	Manto Sipi Cree Nation	6596	GOD'S RIVER NO. 86A	Surface Water	Yes	Level II	Level I	Yes	No Certification	No Certification
311	Mathias Colomb	6598	MATHIAS COLOMB WATER TRETAMENT PLANT	Surface Water	Yes	Level I	Level I	Yes	No Certification	No Certification
312	Mosakahiken Cree Nation	NEW001	NEW WATER PLANT	Groundwater	Yes	No Certification	No Certification	Yes	No Certification	No Certification
313	Nisichawayasihk Cree Nation	6597	NISICHAWAYASIHK WATER TREATMENT PLANT	Surface Water	Yes	Level I	No Certification	Yes	No Certification	No Certification
317	Northlands	6606	NORTHLAND WATER TREATMENT PLANT	Surface Water	Yes	No Certification	No Certification	Yes	No Certification	No Certification
278	Norway House Cree Nation	6567	NORWAY HOUSE COMMUNITY WATER TREATMENT PLANT	Surface Water	Yes	Level II	Level I	Yes	Level II	No Certification
279	O-Chi-Chak-Ko-Sipi First Nation	6569	CRANE RIVER NO. 51	Surface Water	Yes	Level II	Level I	Yes	No Certification	No Certification
315	Opaskwayak Cree Nation	6588	OPASKWAYAK CREE WATER TREATMENT PLANT	Groundwater	Yes	Level II	Level I	Yes	No Certification	No Certification
318	O-Pipon-Na-Piwin Cree Nation		Water Treatment/Distribution	Surface Water	Yes	Level II	Level II	Yes	No Certification	No Certification
327	Pauingassi First Nation	6558	PAUINGASSI WATER TREATMENT PLANT	Surface Water	Yes	Level II	Level II	Yes	No Certification	No Certification
269	Peguis	NEW002	CORE SITE WELL	Groundwater	NR	Not Required	No Operator	No	Not Required	No Operator
269	Peguis	NEW001	OLD SCHOOL SYSTEM	Groundwater	NR	Not Required	No Operator	No	Not Required	No Operator
269	Peguis	6556	PEGUIS WATER TREATMENT PLANT	Groundwater	Yes	No Certification	No Certification	Yes	No Certification	No Certification
272	Pinaymootang First Nation	15979	PINAYMOOTANG BOTTLING PLANT	Groundwater	Yes	Level II	No Operator	Yes	No Certification	No Operator
272	Pinaymootang First Nation	6560	PINAYMOOTANG SCHOOL PLANT	Groundwater	Yes	No Certification	No Certification	No	Not Required	No Operator
272	Pinaymootang First Nation	NEW002	PUMP HOUSE 1	Groundwater	Yes	No Certification	No Certification	No	Not Required	No Operator

REGION: MANITOBA
January 2011

First Nation Information		Water System Information			Operator Information					
Band #	Band Name	System #	System Name	Water Source	Primary Operator Exists	Primary Operator Treatment Class	Primary Operator Distribution Class	Secondary Operator Exists	Secondary Operator Treatment Class	Secondary Operator Distribution Class
272	Pinaymootang First Nation	NEW003	PUMP HOUSE 2	Groundwater	Yes	No Certification	No Certification	No	Not Required	No Operator
272	Pinaymootang First Nation	NEW004	PUMP HOUSE 3	Groundwater	Yes	No Certification	No Certification	No	Not Required	No Operator
282	Pine Creek	6572	PINE CREEK NO. 66A	Surface Water	Yes	Level I	Level I	Yes	Level II	Level I
277	Poplar River First Nation	6566	POPLAR RIVER WATER TREATMENT PLANT	Surface Water	Yes	Level II	Level I	Yes	No Certification	No Certification
300	Red Sucker Lake	6605	RED SUCKER LAKE WATER TREATMENT PLANT	Surface Water	Yes	No Certification	Level I	Yes	No Certification	No Certification
291	Rolling River	6584	ROLLING RIVER WTP	Groundwater	Yes	Level II	Level I	No	Not Required	No Operator
273	Roseau River Anishinabe First Nation Gover	6561	ROSEAU RIVER WTP	MTA	Yes	Not Required	Level I	No	Not Required	
283	Sandy Bay	6573	SANDY BAY WATER TREATMENT PLANT	Surface Water	Yes	Level III	Level II	Yes	Level III	Level II
314	Sapotaweyak Cree Nation	6591	SAPOTAWEYAK WATER TREATMENT PLANT	Surface Water	Yes	Level II	Level I	Yes	Level I	Level I
303	Sayisi Dene First Nation	6603	Sayisi Dene Water Treatment Plant	Surface Water	Yes	No Certification	No Certification	Yes	No Certification	No Certification
307	Shamattawa First Nation	6601	SHAMATTAWA WATER TREATMENT PLANT	Surface Water	Yes	No Certification	No Certification	No	Not Required	No Operator
290	Sioux Valley Dakota Nation	6583	SIOUX VALLEY DAKOTA NATION WATER TREATMENT PLANT	Groundwater	Yes	Level I	Level I	Yes	No Certification	No Certification
281	Skownan First Nation	6571	SKOWNAN WATER TREATMENT PLANT	Surface Water	Yes	Level I	Level I	Yes	No Certification	No Certification
298	St. Theresa Point	7102	26447 - ST THERESA POINT WATER TREATMENT PLANT	Surface Water	Yes	Level II	Level II	Yes	No Certification	No Certification
293	Swan Lake	NEW001	Administration Area System	Groundwater	No	Not Required	No Operator	No	Not Required	No Operator
293	Swan Lake	6586	SWAN LAKE WATER TREATMENT PLANT	Groundwater	Yes	Level I	Level I	Yes	No Certification	No Certification
306	Tataskweyak Cree Nation	6602	TATASKWEYAK WATER TREATMENT PLANT	Surface Water	Yes	Level II	Level II	Yes	No Certification	No Certification
292	Tootinaowaziibeeng Treaty Reserve	6585	TOOTINAOWAZIIBEENG WATER TREATMENT PLANT	Groundwater	Yes	Level II	Level I	Yes	Level I	Level I
323	War Lake First Nation	6604	06466 - War Lake provincial plant	MTA	Yes	Not Required	No Certification	Yes	Not Required	
299	Wasagamack First Nation	7104	WASAGAMACK WATER TREATMENT PLANT	Surface Water	Yes	Level II	Level I	Yes	No Certification	No Certification
285	Waywayseecappo First Nation	6577	WAYWAYSEECAPPO Education Authority	Groundwater	Yes	Level II	Level I	Yes	No Certification	No Certification
285	Waywayseecappo First Nation	6576	WAYWAYSEECAPPO Lizard Point	Groundwater	Yes	Level II	Level I	Yes	No Certification	No Certification
324	Wuskwi Sipihk First Nation	6592	SWAN LAKE NO. 65C	Surface Water	Yes	Level II	Level I	Yes	Level II	Level I
304	York Factory First Nation	6600	YORK FACTORY Water treatment plant	Surface Water	Yes	Level III	Level III	Yes	No Certification	No Certification

NEEGAN BURNSIDE

Appendix D.2

Individual First Nation Wastewater Summary

Table D.2 - 1: Regional Summary of Wastewater Treatment

First Nation Information				Wastewater System Information										
Band #	Band Name	System #	System Name	Const Year	Receiver Name	Treatment Class	Design Capacity [m3/d]	Max Daily Volume [m3/d]	Wastewater System Type	Wastewater Treatment Level	Wastewater Disinfection Chlorine	Wastewater Disinfection UV	Discharge Frequency	Wastewater Sludge Treatment
308	Barren Lands	12439	BROCHET NO. 197 - sewage lagoon	2005	Lake, Reservoir	Level I			Aerated lagoon	Secondary	No	No	Other	No
266	Berens River	7305	BERENS RIVER NO. 13	1997	River	Level II	420	429	Faculative lagoon	Secondary	No	No	Fall	No
267	Bloodvein	7306	BLOODVEIN NO. 12	1992	River	Level I	159	314	Faculative lagoon	Secondary	No	No	Spring, fall	No
261	Brokenhead Ojibway Nation	7299	BROKENHEAD NO. 4	2000	River	Level I	803	239	TricklingFilterPlant	Tertiary	No	Yes	Spring, fall	No
265	Buffalo Point First Nation	7304	BUFFALO POINT NO. 36	1970	Sub-Surface/Ground	Small System			Faculative lagoon	Secondary	No	No	Spring, fall	No
301	Bunibonibee Cree Nation	7346	OXFORD HOUSE NO. 24	1998	River	Level II	2744	546	SBR	Tertiary	No	Yes	Continuous	No
309	Chemawawin Cree Nation	9756	COMMUNITY LAGOON CHEMAWAWIN	2002	Creek	Level I	514.6	301	Faculative lagoon	Secondary	No	No	Spring, fall	No
276	Cross Lake First Nation	7316	COMMUNITY AREATED LAGOON SAGIHWAK	1996	River	Level II			Mechanical	Tertiary	Yes	No	Continuous	Yes
276	Cross Lake First Nation	7317	EDUCATION AREATED LAGOON NATIMEK	2002	Wetland	Level I	550	550	Aerated lagoon	Secondary	Yes	No	Continuous	No
288	Dakota Plains	7332	DAKOTA PLAIN SBR WASTEWATER TREATMENT PLANT	1998	Creek	Level II	62.2	54.8	SBR	Secondary	No	Yes	Continuous	No
295	Dakota Tipi	7344	DAKOTA TIPI NO. 1	0	MTA	MTA		47.9	MTA	MTA	MTA	MTA	MTA	MTA
316	Dauphin River	7341	DAUPHIN RIVER NO. 48A	1980	Tile Field	Small System			Septic	Primary	No	No	Continuous	No
264	Fisher River	NEW001	NEW LAGOON	2009	Sub-Surface/Ground	Level II	618	88	Aerated lagoon	Tertiary	No	Yes	Continuous	No
262	Fort Alexander	7300	FORT ALEXANDER SOUTH SHORE LAGOON	1993	River	Level I	863	556	Faculative lagoon	Secondary	No	No	Fall	No
262	Fort Alexander	7301	NORTH SHORE LAGOON	1994	River	Level I	330	277	Faculative lagoon	Secondary	No	No	Fall	No
305	Fox Lake	7361	FOX LAKE NO. 1	1995	Creek	Level II		115	Mechanical	Secondary	No	Yes	Continuous	Yes
294	Gamblers	7327	GAMBLER NO. 63	0	MTA	MTA			MTA	MTA	MTA	MTA	MTA	MTA
297	Garden Hill First Nation	8116	Garden Hill First Nation Sewage Treatment Plant	2001	Lake, Reservoir	Level II	1600	300	SBR	Secondary	No	Yes	Continuous	Yes
296	Gods Lake First Nation	7345	MAIN LAND WASTEWATER TREATMENT PLANT	1996	Lake, Reservoir	Level III	292	690	SBR	Tertiary			Continuous	Yes
296	Gods Lake First Nation	15960	WEST SIDE WASTEWATER TREATMENT PLANT	2005	Lake, Reservoir	Level III	128		Mechanical	Secondary	No	No	Continuous	Yes
310	Grand Rapids First Nation	7340	GRAND RAPIDS NO. 33	1996	Creek	Level I	205	288	Faculative lagoon	Secondary	No	No	Spring, fall	No
263	Hollow Water	7302	HOLE OR HOLLOW WATER NO. 10	1992	Wetland	Level I	176	437	Faculative lagoon	Secondary	No	No	Spring, fall	Yes
286	Keeseekoowenin		LAGOON	2006	River	Level II	251	25	Aerated lagoon	Tertiary		Yes	Continuous	No
268	Kinonjeoshtegon First Nation	7307	JACKHEAD NO. 43	1981	River	Small System			Faculative lagoon	Secondary			Spring, fall	Yes
271	Lake Manitoba Treaty 2 First Nation	7311	DOG CREEK NO. 46	1975	Wetland	Small System	53	22	Faculative lagoon	Secondary	No	No	Spring, fall	No
275	Lake St. Martin	7315	LAKE ST. MARTIN WWT	1978	Wetland	Level I			Faculative lagoon	Secondary	No	No	Spring, fall	No
260	Little Black River		LBR LAGOON	1992	River	Level I	164	302	Faculative lagoon	Secondary	No	No	Spring, fall	No
270	Little Grand Rapids	7309	LITTLE GRAND RAPIDS WASTEWATER TREATMENT PLANT	1994	Lake, Reservoir	Level II	492	263	Aerated lagoon	Secondary	Yes	No	Continuous	No
274	Little Saskatchewan	7314	LITTLE SASKATCHEWAN LAGOON	1994	Wetland	Level I			Faculative lagoon	Secondary	No	No	Spring, fall	No
287	Long Plain	7331	LONG PLAIN SBR WASTEWATER TREATMENT PLANT	1993	River	Level II		450	SBR	Secondary	No	Yes	Continuous	Yes
302	Manto Sipi Cree Nation	7347	GOD'S RIVER NO. 86A	1995	Wetland	Level II	186	320	SBR	Secondary	No	Yes	Continuous	Yes
311	Mathias Colomb	7349	MATHIAS COLOMB WASTEWATER TREATMENT PLANT	1997	River	Level II		1013.7	SBR	Secondary	No	Yes	Continuous	Yes
312	Mosakahiken Cree Nation	NEW002	NEW LAGOON	2009	Wetland	Level I	486	311	Aerated lagoon	Secondary		Yes	Other	No
313	Nisichawayasihk Cree Nation	7348	NISICHAWAYASIHK LAGOON	1987	Wetland	Level I	1079	825	Aerated lagoon	Secondary			Spring, fall	No
317	Northlands	NEW001	COMMUNITY SBR	0	Lake, Reservoir	Level II	220	335	SBR	Tertiary	Yes	No	Continuous	No
278	Norway House Cree Nation	7319	NORWAY HOUSE COMMUNITY LAGOON	1988	Creek	Level I	2971	995	Aerated lagoon	Secondary	No	No	Seasonal	No
315	Opaskwayak Cree Nation	7339	OPASKWAYAK CREE WASTEWATER TREATMENT PLANT	1996	Large River	Level II	1665.6	1166.8	SBR	Tertiary	Yes	No	Continuous	Yes
318	O-Pipon-Na-Piwin Cree Nation		LAGOON	0	Wetland	Level I	627	132	Faculative lagoon	Secondary	No	No	Spring, fall	No
327	Pauingassi First Nation	7310	PAUINGASSI WASTEWATER TREATMENT PLANT	1994	Lake, Reservoir	Level II	134	164	SBR	Secondary	Yes	No	Other	Yes
269	Peguis	7308	PEGUIS NO. 1B	1980	River	Level I	478	215	Faculative lagoon	Secondary	No	No	Spring, fall	No
272	Pinaymootang First Nation	NEW001	NEW LAGOON	2009	Wetland	Level I	467		Faculative lagoon	Secondary			Spring	No
282	Pine Creek	7324	PINE CREEK LAGOON	2003	Wetland	Level I	71		Faculative lagoon	Secondary	No	No	Spring	No
277	Poplar River First Nation	7318	POPLAR RIVER NO. 16	1999	River	Level I	964	353	Faculative lagoon	Secondary	No	No	Spring, fall	No
300	Red Sucker Lake	7357	RED SUCKER LAKE SCHOOL WASTEWATER TREATMENT PLANT	1994	Lake, Reservoir	Level I	24	8	SBR	Secondary	Yes	No	Continuous	No
300	Red Sucker Lake	7356	RED SUCKER LAKE WASTEWATER TREATMENT PLANT	2000	Lake, Reservoir	Level III	185	48	SBR	Secondary	No	Yes	Continuous	Yes
273	Roseau River Anishinabe First Nation Gover	7313	ROSEAU RIVER NO. 2	1988	River	Level I	331		Faculative lagoon	Secondary	No	No	Spring, fall	No
283	Sandy Bay	7325	SANDY BAY LAGOON	1988	Wetland	Level I	2242	1599	Faculative lagoon	Secondary			Spring, fall	No
314	Sapotaweyak Cree Nation	7342	SAPOTAWEYAK WASTEWATER TREATMENT PLANT	1997	Lake, Reservoir	Level III	500	380	SBR	Tertiary	No	Yes	Continuous	No
303	Sayisi Dene First Nation	7354	Sayisi Dene Wastewater Treatment Plant	1998	Wetland	Level II	157	113	Mechanical	Secondary	No	Yes	Continuous	Yes
307	Shamattawa First Nation	7352	SHAMATTAWA WASTEWATER TREATMENT PLANT	1996	River	Level III	363	520	SBR	Tertiary		Yes	Continuous	Yes
290	Sioux Valley Dakota Nation	7334	SIOUX VALLEY DAKOTA NATION LAGOON	2007	River	Level I	540	283	Aerated lagoon	Tertiary	Yes		Continuous	No
281	Skownan First Nation	7323	SKOWNAN	0	MTA	MTA			MTA	MTA	MTA	MTA	MTA	MTA
298	St. Theresa Point	7643	ST. THERESA POINT 1996 SBR WASTEWATER TREATMENT PLANT	1996	Lake, Reservoir	Level II	410	72	SBR	Tertiary	No	Yes	Continuous	Yes
298	St. Theresa Point	7642	ST. THERESA POINT SBR 1999 WASTEWATER TREATMENT PLANT	1999	Lake, Reservoir	Level II	1570	378	SBR	Tertiary	No	Yes	Continuous	Yes
306	Tataskweyak Cree Nation	7353	TATASKWEYAK LAGOON	1988	Enclosed Bay, Estuary	Level I	218	688	Aerated lagoon	Secondary	No	No	Other	No
323	War Lake First Nation	7355	War Lake SBR Manitoba provincial	1994	MTA	MTA			MTA	MTA	MTA	MTA	MTA	MTA
299	Wasagamack First Nation	7645	WASAGAMACK WASTEWATER TREATMENT PLANT	1996	Lake, Reservoir	Level II	205	165	SBR	Secondary	No	Yes	Continuous	Yes
285	Waywayseecappo First Nation	7329	WAYWAYSEECAPPO Education Authority	1992	Lake, Reservoir	Level I	28.9	4.0	Faculative lagoon	Secondary			Fall	No
285	Waywayseecappo First Nation	7328	WAYWAYSEECAPPO Lizard Point	1999	Tile Field	Level I	90.8	33.4	SBR	Tertiary			Continuous	Yes
324	Wuskwi Sipihk First Nation	7343	WUSKWI SIPIHK WASTEWATER TREATMENT PLANT	1992	River	Level II	45	24	Mechanical	Primary	No	Yes	Continuous	Yes
304	York Factory First Nation	7351	York Factory Lagoon	1987	Wetland	Level I	364	153	Faculative lagoon	Secondary	No	No	Spring, fall	No

Table D.2 - 2: Regional Summary of Wastewater Collection Systems, Effluent Quality and Operators

First Nation Information				Collection System Information										Effluent Quality		Operator Information					
Band #	Band Name	System #	System Name	Collection Type	Collection Class	Pop. Served	Homes Piped	Homes Trucked	No. of Trucks in Service	Pipe Length	Pipe Length / Connection	Low Pressure Sewer	No. of Pumping Stations	Meets Federal Guidelines (1976)	Cause of Failure	Primary Operator Exists	Primary Operator Treatment Class	Primary Operator Collection Class	Secondary Operator Exists	Secondary Operator Treatment Class	Secondary Operator Collection Class
308	Barren Lands	12439	BROCHET NO. 197 - sewage lagoon	Piped	Level I	535	83	0	0	3258	39	No	5	Meets Requirements	Unknown	Yes	No Certification	No Certification	Yes	Level I	Level I
266	Berens River	7305	BERENS RIVER NO. 13	Piped, Low Pressure, Trucked	Level II	2125	120	175	2	2073	17	Yes	3	Unknown	Unknown	Yes	No Certification	No Certification	Yes	No Certification	No Certification
267	Bloodvein	7306	BLOODVEIN NO. 12	Piped, Trucked	Level I	972	142	52	1	3672	25	No	3	Low Freq, Low Mag	ign & Opera	Yes	Level II	Level I	Yes	No Certification	No Certification
261	Brokenhead Ojibway Nation	7299	BROKENHEAD NO. 4	Piped	Level I	513	137	0	0	6980	50	No	4	Meets Requirements	Unknown	Yes	Level I	Level I	Yes	No Certification	No Certification
265	Buffalo Point First Nation	7304	BUFFALO POINT NO. 36	Piped, Trucked	Small System	40	2	5	1	250	125	No	3	Meets Requirements	Unknown	Yes	No Certification	No Certification	No	No Operator	No Operator
301	Bunibonibee Cree Nation	7346	OXFORD HOUSE NO. 24	Piped, Trucked	Level II	2514	129	278	3	6381	49	No	3	Meets Requirements	Unknown	Yes	Level I	Level I	Yes	No Certification	No Certification
309	Chemawawin Cree Nation	9756	COMMUNITY LAGOON CHEMAWAWIN	Piped, Trucked	Level I	1305	149	143	1	6250	41	No	1	Meets Requirements	Unknown	Yes	Level I	Level I	No	No Operator	No Operator
276	Cross Lake First Nation	7316	COMMUNITY AREATED LAGOON SAGIHWAK	Piped, Trucked	Level II	3318	161	94	0	3089	19	No	2	High Freq AND High Mag	Operation	Yes	Level II	Level II	Yes	Level II	Level II
276	Cross Lake First Nation	7317	EDUCATION AREATED LAGOON NATIMEK	Piped	Level I	1795	230	290	0	7355	31	No	7	Meets Requirements	Unknown	Yes	Level II	Level II	Yes	Level II	Level II
288	Dakota Plains	7332	DAKOTA PLAIN SBR WASTEWATER TREATMENT PLANT	Piped, Low Pressure	Small System	150	38	0	0	9461	248	Yes	0	Unknown	Unknown	Yes	No Certification	No Certification	Yes	No Certification	No Certification
295	Dakota Tipi	7344	DAKOTA TIPI NO. 1	Trucked	MTA	174	0	52	0			No		MTA	MTA	No	Not Required	Not Required	No	Not Required	Not Required
316	Dauphin River	7341	DAUPHIN RIVER NO. 48A	Piped	Small System	4	1	0	0	113	113	No	0	Unknown	Unknown	No	No Operator	No Operator	No	No Operator	No Operator
264	Fisher River	NEW001	NEW LAGOON	Piped, Low Pressure, Trucked	Level I	390	49	30	2	2326	47	Yes	2	Meets Requirements	Unknown	Yes	No Certification	No Certification	Yes	No Certification	No Certification
262	Fort Alexander	7300	FORT ALEXANDER SOUTH SHORE LAGOON	Piped, Trucked	Level II	2020	136	108	0	6378	46	No	2	Meets Requirements	Unknown	Yes	Level I	Level I	Yes	No Certification	No Certification
262	Fort Alexander	7301	NORTH SHORE LAGOON	Piped, Low Pressure, Trucked	Level II	1146	291	121	1	9361	32	Yes	2	Meets Requirements	Unknown	Yes	Level I	Level I	Yes	No Certification	No Certification
305	Fox Lake	7361	FOX LAKE NO. 1	Piped	Level I	277	60	0	0	1180	19	No	2	Meets Requirements	Unknown	Yes	Level II	Level I	Yes	Level II	Level I
294	Gamblers	7327	GAMBLER NO. 63	Trucked	MTA	0	0	30	0			No		MTA	MTA	NR	Not Required	Not Required	No	Not Required	Not Required
297	Garden Hill First Nation	8116	Garden Hill First Nation Sewage Treatment Plant	Piped, Trucked	Level II	3993	152	68	3	9033	59	No	6	Meets Requirements	Unknown	Yes	Level II	Level II	No	No Operator	No Operator
296	Gods Lake First Nation	7345	MAIN LAND WASTEWATER TREATMENT PLANT	Piped, Trucked	Level I	1317	140	84	3	4689	33	No	3	Unknown	Unknown	Yes	Level I	Level I	Yes	No Certification	No Certification
296	Gods Lake First Nation	15960	WEST SIDE WASTEWATER TREATMENT PLANT	Piped, Trucked	Level I	240	20	20	1			No	1	Meets Requirements	Unknown	Yes	Level I	Level I	Yes	No Certification	No Certification
310	Grand Rapids First Nation	7340	GRAND RAPIDS NO. 33	Piped, Trucked	Level I	853	184	1	0	6112	33	No	4	Meets Requirements	Unknown	Yes	Level I	Level I	Yes	No Certification	No Certification
263	Hollow Water	7302	HOLE OR HOLLOW WATER NO. 10	Piped, Low Pressure, Trucked	Level I	1197	131	37	1	3349	25	Yes	3	Meets Requirements	Unknown	Yes	Level I	Level I	Yes	Level I	Level I
286	Keeseekoowenin		LAGOON	Trucked	NA	490	0	148	1			No	1	Meets Requirements	Unknown	Yes	No Certification	No Operator	Yes	No Certification	No Operator
268	Kinonjeoshtegon First Nation	7307	JACKHEAD NO. 43	Piped, Trucked	Small System	0	0	36	1			No	2	High Freq OR High Mag	Unknown	Yes	No Certification	No Certification	Yes	No Certification	No Certification
271	Lake Manitoba Treaty 2 First Nation	7311	DOG CREEK NO. 46	Piped	Small System	60	12	0	0	778	64	No	1	Meets Requirements	Unknown	Yes	Level I	Level I	No	No Operator	No Operator
275	Lake St. Martin	7315	LAKE ST. MARTIN WWT	Trucked	Level I	1393	0	125	1			No		High Freq AND High Mag	Operation	Yes	Level I	Level I	Yes	No Certification	No Certification
260	Little Black River		LBR LAGOON	Piped	Level I	827	200	0	0	4804	24	No	4	Meets Requirements	Unknown	Yes	Level I	Level I	Yes	No Certification	No Certification
270	Little Grand Rapids	7309	LITTLE GRAND RAPIDS WASTEWATER TREATMENT PLANT	Piped, Trucked	Level I	1213	97	113	2	5146.4	53	No	7	Low Freq, Low Mag	ign & Opera	Yes	Level I	Small System	Yes	No Certification	No Certification
274	Little Saskatchewan	7314	LITTLE SASKATCHEWAN LAGOON	Piped	Level I	650	5	0	0	810	162	No	1	Meets Requirements	Unknown	Yes	Level I	Level I	Yes	No Certification	No Certification
287	Long Plain	7331	LONG PLAIN SBR WASTEWATER TREATMENT PLANT	Piped, Low Pressure	Level I	1378	163	0	0	30436	186	Yes	1	High Freq OR High Mag	Operation	Yes	Level II	Level I	Yes	Level I	Level I
302	Manto Sipi Cree Nation	7347	GOD'S RIVER NO. 86A	Piped, Trucked	Level I	682	127	1	1	3866	30	No	3	Meets Requirements	Unknown	Yes	Level I	Level I	Yes	No Certification	No Certification
311	Mathias Colomb	7349	MATHIAS COLOMB WASTEWATER TREATMENT PLANT	Piped, Low Pressure, Trucked	Level II	2547	303	22	2	7428.8	24	Yes	7	High Freq AND High Mag	Design	Yes	Level II	Level II	Yes	No Certification	No Certification
312	Mosakahiken Cree Nation	NEW002	NEW LAGOON	Piped, Trucked	Level I	1008	134	68	2	2947	21	No	4	Meets Requirements	Unknown	Yes	No Certification	No Certification	Yes	No Certification	No Certification
313	Nisichawayasihk Cree Nation	7348	NISICHAWAYASIHK LAGOON	Piped, Trucked	Level II	2600	319	137	3	8266.5	25	No	5	Meets Requirements	Unknown	Yes	No Certification	No Certification	No	No Operator	No Operator
317	Northlands	NEW001	COMMUNITY SBR	Piped	Level I	918	141	0	0	974	6	No	3	Unknown	Unknown	Yes	No Certification	No Certification	Yes	No Certification	No Certification
278	Norway House Cree Nation	7319	NORWAY HOUSE COMMUNITY LAGOON	Piped, Trucked	Level II	5300	376	766	12	7777	20	No	5	Meets Requirements	Unknown	Yes	Level I	Level I	No	No Operator	No Operator
315	Opaskwayak Cree Nation	7339	OPASKWAYAK CREE WASTEWATER TREATMENT PLANT	Piped, Trucked	Level II	3233	679	12	1	16539	24	No	4	Meets Requirements	Unknown	Yes	Level II	Level II	Yes	No Certification	No Certification
318	O-Pipon-Na-Piwin Cree Nation		LAGOON	Piped, Trucked	Level I	1010	35	170	2	4600	131	No	2	Meets Requirements	Unknown	Yes	No Certification	No Certification	Yes	No Certification	No Certification
327	Pauingassi First Nation	7310	PAUINGASSI WASTEWATER TREATMENT PLANT	Piped, Trucked	Level I	617	62	26	1	2162	34	No	1	High Freq, Low Mag	Operation	Yes	Level II	Level II	Yes	No Certification	No Certification
269	Peguis	7308	PEGUIS NO. 1B	Piped, Trucked	Level I	465	55	59	1	3869	70	No	3	Meets Requirements	Unknown	Yes	No Certification	No Certification	Yes	No Certification	No Certification
272	Pinaymootang First Nation	NEW001	NEW LAGOON	Piped, Trucked	Level I	1345	38	200	4	1584	41	No	1	Meets Requirements	Unknown	Yes	Level I	Level I	No	No Operator	No Operator
282	Pine Creek	7324	PINE CREEK LAGOON	Piped, Trucked	Level I	1569	60	47	1	1130	18	No	1	Unknown	Unknown	Yes	Level I	Level I	Yes	No Certification	No Certification
277	Poplar River First Nation	7318	POPLAR RIVER NO. 16	Piped, Trucked	Level I	1459	128	104	2	1417	11	No	2	Unknown	Unknown	Yes	Level I	Level I	Yes	No Certification	No Certification
300	Red Sucker Lake	7357	RED SUCKER LAKE SCHOOL WASTEWATER TREATMENT PLANT	Piped	Small System	22	0	0	0			No	1	Unknown	Unknown	Yes	No Certification	No Certification	Yes	No Certification	No Certification
300	Red Sucker Lake	7356	RED SUCKER LAKE WASTEWATER TREATMENT PLANT	Piped, Trucked	Level I	936	3	100	1	295	98	No	0	Meets Requirements	Unknown	Yes	No Certification	No Certification	Yes	No Certification	No Certification
273	Roseau River Anishinabe First Nation Governmen	7313	ROSEAU RIVER NO. 2	Piped, Low Pressure, Trucked	Level I	1279	164	33	0	5977	36	Yes	2	Meets Requirements	Unknown	Yes	Level I	Level I	No	No Operator	No Operator
283	Sandy Bay	7325	SANDY BAY LAGOON	Piped, Trucked	Level II	3586	395	82	3	2515	6	No	2	Meets Requirements	Unknown	Yes	No Certification	Level I	No	No Operator	No Operator
314	Sapotaweyak Cree Nation	7342	SAPOTAWEYAK WASTEWATER TREATMENT PLANT	Low Pressure, Trucked	Level I	1137	170	34	1	5144	30	Yes	0	Low Freq, Low Mag	Operation	Yes	Level III	Level I	Yes	No Certification	No Certification
303	Sayisi Dene First Nation	7354	Sayisi Dene Wastewater Treatment Plant	Piped, Trucked	Small System	386	90	32	2	3241	36	No	2	High Freq OR High Mag	Operation	Yes	Level I	Level I	Yes	No Certification	No Certification
307	Shamattawa First Nation	7352	SHAMATTAWA WASTEWATER TREATMENT PLANT	Piped, Trucked	Level I	1493	160	10	1	4463	27	No	4	Meets Requirements	Unknown	Yes	Level I	Level I	Yes	No Certification	No Certification
290	Sioux Valley Dakota Nation	7334	SIOUX VALLEY DAKOTA NATION LAGOON	Piped, Trucked	Level I	1316	192	92	1	5305	27	No	3	Meets Requirements	Unknown	Yes	No Certification	No Certification	Yes	No Certification	No Certification
281	Skownan First Nation	7323	SKOWNAN	Trucked	Small System	0	0	100	1			No		MTA	MTA	No	Not Required	Not Required	No	Not Required	Not Required
298	St. Theresa Point	7643	ST. THERESA POINT 1996 SBR WASTEWATER TREATMENT PLAI	Piped, Trucked	Small System	186	30	0	2	588.5	19	No	3	High Freq, Low Mag	Operation	Yes	Level II	Level I	Yes	No Certification	No Certification
298	St. Theresa Point	7642	ST. THERESA POINT SBR 1999 WASTEWATER TREATMENT PLAI	Piped, Trucked	Small System	186	138	77	0	2055	14	No	4	High Freq OR High Mag	Operation	Yes	Level II	Level I	Yes	No Certification	No Certification
306	Tataskweyak Cree Nation	7353	TATASKWEYAK LAGOON	Piped, Trucked	Level II	2567	258	104	1	3753	14	No	4	Meets Requirements	Unknown	Yes	No Certification	No Certification	No	No Operator	No Operator
323	War Lake First Nation	7355	War Lake SBR Manitoba provincial	Piped, Low Pressure	Small System	133	23	0	0	540	23	Yes	0	MTA	MTA	Yes	Not Required	Not Required	No	Not Required	Not Required
299	Wasagamack First Nation	7645	WASAGAMACK WASTEWATER TREATMENT PLANT	Piped, Trucked	Level I	1662	14	76	1	886.9	63	No	3	High Freq AND High Mag	Operation	Yes	Level II	Level I	Yes	No Certification	No Certification
285	Waywayseecappo First Nation	7329	WAYWAYSEECAPPO Education Authority	Piped	Small System	963	3	0	0			No	1	Meets Requirements	Unknown	Yes	Level II	Level I	Yes	No Certification	No Certification
285	Waywayseecappo First Nation	7328	WAYWAYSEECAPPO Lizard Point	Piped	Small System	92	25	0	0			No	1	Unknown	Unknown	Yes	Level I	Level I	Yes	No Certification	No Certification
324	Wuskwi Sipihk First Nation	7343	WUSKWI SIPIHK WASTEWATER TREATMENT PLANT	Low Pressure	Level I	191	7	41	0	2741	391	Yes	0	Meets Requirements	Unknown	Yes	Level II	Level I	Yes	Level II	Level I
304	York Factory First Nation	7351	York Factory Lagoon	Piped	Level I	420	114	0	0	2313.3	20	No	4	Meets Requirements	Unknown	Yes	Level I	Level I	Yes	No Certification	No Certification

NEEGAN BURNSIDE

Appendix E
Risk Summary

NEEGAN BURNSIDE

Appendix E.1

Individual First Nation Water Risk Summary

Table E.1: Individual First Nation Water Risk Summary

Legend: High Risk | Medium Risk | Low Risk

Band #	Band Name	System #	System Name	Water Source	Treatment Class	Source Risk	Design Risk	Operations Risk	Report Risk	Operator Risk	Final Risk Score
284	Birdtail Sioux	6574	BIRDTAIL CREEK NO. 57	Groundwater	Level III	6.0	3.0	3.0	1.0	1.0	2.7
261	Brokenhead Ojibway Nation	6547	BROKENHEAD WTP	Groundwater	Level III	8.0	3.0	1.0	1.0	1.0	2.3
289	Canupawakpa Dakota First Nation	6582	CANUPAWAKPA DAKOTA FIRST NATION	Groundwater	Small System	10.0	8.0	8.0	10.0	10.0	8.8
309	Chemawawin Cree Nation	6607	CHEMAWAWIN COMMUNITY WATER TREATMENT PLANT	Groundwater	Level II	7.0	4.0	5.0	8.0	3.0	4.8
316	Dauphin River	6590	DAUPHIN RIVER NO. 48A	Groundwater	Small System	10.0	8.0	8.0	10.0	10.0	8.8
280	Ebb and Flow	6570	EBB AND FLOW WTP	Groundwater	Level III	8.0	3.0	7.0	10.0	1.0	5.0
264	Fisher River	6551	FISHER RIVER WTP	Groundwater	Level II	5.0	1.0	3.0	1.0	6.0	3.0
310	Grand Rapids First Nation	6589	GRAND RAPIDS NO. 33	Groundwater	Level I	6.0	4.0	2.0	5.0	1.0	3.1
286	Keeseekoowenin	6579	KEESEEKOOWENIN COMMUNITY	Groundwater	Level II	6.0	1.0	8.0	1.0	1.0	8.0
286	Keeseekoowenin	6578	KEESEEKOOWENIN EDUCATION AUTHORITY	Groundwater	Level II	9.0	2.0	8.0	5.0	1.0	8.0
268	Kinonjeoshtegon First Nation	6555	KINONJEOSHTEGON WATER SYSTEM	Groundwater	Small System	6.0	5.0	8.0	10.0	7.0	8.0
271	Lake Manitoba Treaty 2 First Nation	6559	LAKE MANITOBA School	Groundwater	Small System	7.0	3.0	7.0	10.0	1.0	4.9
275	Lake St. Martin	6563	LAKE ST. MARTIN WTP	Groundwater	Level II	9.0	3.0	7.0	10.0	1.0	5.1
274	Little Saskatchewan	6562	LITTLE SASKATCHEWAN WATER TREATMENT PLANT	Groundwater	Level II	10.0	5.0	8.0	10.0	2.0	6.3
287	Long Plain	6580	LONG PLAIN WATER TREATMENT PLANT	Groundwater	Level II	9.0	2.0	4.0	10.0	1.0	3.9
312	Mosakahiken Cree Nation	NEW001	NEW WATER PLANT	Groundwater	Level I	5.0	4.0	3.0	1.0	4.0	3.5
315	Opaskwayak Cree Nation	6588	OPASKWAYAK CREE WATER TREATMENT PLANT	Groundwater	Level II	7.0	4.0	2.0	2.0	1.0	2.9
269	Peguis	NEW002	CORE SITE WELL	Groundwater	Small System	9.0	8.0	8.0	10.0	9.0	8.5
269	Peguis	NEW001	OLD SCHOOL SYSTEM	Groundwater	Small System	9.0	8.0	8.0	10.0	9.0	8.5
269	Peguis	6556	PEGUIS WATER TREATMENT PLANT	Groundwater	Level I	5.0	2.0	5.0	4.0	10.0	5.0
272	Pinaymootang First Nation	15979	PINAYMOOTANG BOTTLING PLANT	Groundwater	Level II	9.0	4.0	5.0	10.0	1.0	4.8
272	Pinaymootang First Nation	6560	PINAYMOOTANG SCHOOL PLANT	Groundwater	Small System	7.0	5.0	8.0	10.0	9.0	8.0
272	Pinaymootang First Nation	NEW002	PUMP HOUSE 1	Groundwater	Small System	6.0	8.0	8.0	10.0	9.0	8.2
272	Pinaymootang First Nation	NEW003	PUMP HOUSE 2	Groundwater	Small System	6.0	8.0	8.0	10.0	10.0	8.4
272	Pinaymootang First Nation	NEW004	PUMP HOUSE 3	Groundwater	Small System	5.0	8.0	9.0	10.0	10.0	8.6
291	Rolling River	6584	ROLLING RIVER WTP	Groundwater	Level III	7.0	2.0	3.0	10.0	2.0	3.6
290	Sioux Valley Dakota Nation	6583	SIOUX VALLEY DAKOTA NATION WATER TREATMENT PLANT	Groundwater	Level II	9.0	6.0	6.0	3.0	1.0	5.0
293	Swan Lake	NEW001	Administration Area System	Groundwater	Small System	6.0	8.0	9.0	10.0	10.0	8.7
293	Swan Lake	6586	SWAN LAKE WATER TREATMENT PLANT	Groundwater	Level I	6.0	8.0	3.0	5.0	1.0	4.6
292	Tootinaowaziibeeng Treaty Reserve	6585	TOOTINAOWAZIIBEENG WATER TREATMENT PLANT	Groundwater	Level II	8.0	1.0	7.0	6.0	1.0	4.0
285	Waywayseecappo First Nation	6577	WAYWAYSEECAPPO Education Authority	Groundwater	Level I	7.0	2.0	5.0	8.0	1.0	3.8
285	Waywayseecappo First Nation	6576	WAYWAYSEECAPPO Lizard Point	Groundwater	Level II	9.0	4.0	7.0	5.0	1.0	4.9
288	Dakota Plains	6581	DAKOTA PLAINS INDIAN RESERVE NO. 6A	MTA	MTA	5.0	3.0	8.0	10.0	1.0	5.0
295	Dakota Tipi	6593	DAKOTA TIPI NO. 1	MTA	MTA	1.0	3.0	5.0	10.0	1.0	3.7
294	Gamblers	6575	GAMBLER NO. 63	MTA	MTA	1.0	2.0	6.0	10.0	1.0	3.7
273	Roseau River Anishinabe First Nation Governm	6561	ROSEAU RIVER WTP	MTA	MTA	4.0	3.0	4.0	6.0	1.0	3.3
323	War Lake First Nation	6604	06466 - War Lake provincial plant	MTA	MTA	1.0	3.0	6.0	10.0	1.0	4.0
308	Barren Lands	6599	BROCHET NO. 197	Surface Water	Level III	7.0	2.0	3.0	4.0	3.0	3.2
266	Berens River	6553	BERENS RIVER WTP	Surface Water	Level III	8.0	4.0	8.0	10.0	4.0	6.2
267	Bloodvein	6554	BLOODVEIN WTP	Surface Water	Level II	8.0	4.0	10.0	10.0	1.0	8.0
301	Bunibonibee Cree Nation	6595	Bunibonibee WTP	Surface Water	Level III	8.0	2.0	4.0	1.0	3.0	3.3
276	Cross Lake First Nation	6564	CROSS LAKE COMMUNITY WATER TREATMENT PLANT SAGIHWAK	Surface Water	Level III	10.0	4.0	8.0	1.0	1.0	4.9
276	Cross Lake First Nation	6565	CROSS LAKE EDUCATION WATER TREATMENT PLANT NATIMEK	Surface Water	Level II	8.0	2.0	5.0	1.0	1.0	3.2
262	Fort Alexander	6549	FORT ALEXANDER NORTH SHORE WTP	Surface Water	Level II	8.0	5.0	8.0	5.0	1.0	5.4
262	Fort Alexander	6548	FORT ALEXANDER SOUTH SHORE WTP	Surface Water	Level II	8.0	3.0	6.0	10.0	1.0	4.7
305	Fox Lake	6609	FOX LAKE WTP	Surface Water	Level III	9.0	8.0	4.0	1.0	1.0	4.8
297	Garden Hill First Nation	7101	16448 - GARDEN HILL WTP	Surface Water	Level III	8.0	2.0	8.0	7.0	1.0	4.7
296	Gods Lake First Nation	6594	MAIN LAND WATER TREATMENT PLANT	Surface Water	Level II	10.0	4.0	6.0	8.0	1.0	5.0
296	Gods Lake First Nation	NEW001	NAZZIE POINT	Surface Water	Small System	10.0	8.0	10.0	10.0	1.0	8.0
296	Gods Lake First Nation	15959	WEST SIDE WATER TREATMENT PLANT GOD'S LAKE	Surface Water	Level II	6.0	2.0	4.0	8.0	9.0	5.0
263	Hollow Water	6550	HOLLOW WATER WTP	Surface Water	Level III	8.0	8.0	8.0	5.0	1.0	8.0
260	Little Black River	6546	LITTLE BLACK RIVER WTP	Surface Water	Level II	10.0	5.0	8.0	10.0	1.0	6.1

REGION: MANITOBA
January 2011

Legend: High Risk | Medium Risk | Low Risk

Band #	Band Name	System #	System Name	Water Source	Treatment Class	Source Risk	Design Risk	Operations Risk	Report Risk	Operator Risk	Final Risk Score
270	Little Grand Rapids	6557	LITTLE GRAND RAPIDS WATER TREATMENT PLANT	Surface Water	Level II	7.0	8.0	7.0	5.0	1.0	5.9
302	Manto Sipi Cree Nation	6596	GOD'S RIVER NO. 86A	Surface Water	Level III	9.0	3.0	5.0	3.0	3.0	4.2
311	Mathias Colomb	6598	MATHIAS COLOMB WATER TRETAMENT PLANT	Surface Water	Level II	8.0	4.0	3.0	2.0	1.0	3.3
313	Nisichawayasihk Cree Nation	6597	NISICHAWAYASIHK WATER TREATMENT PLANT	Surface Water	Level II	9.0	5.0	9.0	10.0	6.0	7.3
317	Northlands	6606	NORTHLAND WATER TREATMENT PLANT	Surface Water	Level I	8.0	2.0	5.0	10.0	9.0	5.7
278	Norway House Cree Nation	6567	NORWAY HOUSE COMMUNITY WATER TREATMENT PLANT	Surface Water	Level III	10.0	2.0	6.0	4.0	2.0	4.2
279	O-Chi-Chak-Ko-Sipi First Nation	6569	CRANE RIVER NO. 51	Surface Water	Level II	10.0	4.0	8.0	4.0	1.0	8.0
318	O-Pipon-Na-Piwin Cree Nation		Water Treatment/Distribution	Surface Water	Level III	9.0	3.0	6.0	5.0	1.0	4.3
327	Pauingassi First Nation	6558	PAUINGASSI WATER TREATMENT PLANT	Surface Water	Level II	8.0	3.0	10.0	10.0	1.0	5.9
282	Pine Creek	6572	PINE CREEK NO. 66A	Surface Water	Level III	10.0	2.0	3.0	8.0	2.0	3.7
277	Poplar River First Nation	6566	POPLAR RIVER WATER TREATMENT PLANT	Surface Water	Level II	8.0	3.0	8.0	3.0	1.0	4.6
300	Red Sucker Lake	6605	RED SUCKER LAKE WATER TREATMENT PLANT	Surface Water	Level II	7.0	2.0	7.0	8.0	4.0	5.0
283	Sandy Bay	6573	SANDY BAY WATER TREATMENT PLANT	Surface Water	Level III	8.0	4.0	8.0	3.0	1.0	8.0
314	Sapotaweyak Cree Nation	6591	SAPOTAWEYAK WATER TREATMENT PLANT	Surface Water	Level II	10.0	2.0	4.0	3.0	1.0	3.3
303	Sayisi Dene First Nation	6603	Sayisi Dene Water Treatment Plant	Surface Water	Level II	8.0	2.0	3.0	5.0	8.0	4.4
307	Shamattawa First Nation	6601	SHAMATTAWA WATER TREATMENT PLANT	Surface Water	Level III	10.0	8.0	10.0	8.0	10.0	9.2
281	Skownan First Nation	6571	SKOWNAN WATER TREATMENT PLANT	Surface Water	Level I	10.0	8.0	10.0	10.0	1.0	7.6
298	St. Theresa Point	7102	26447 - ST THERESA POINT WATER TREATMENT PLANT	Surface Water	Level II	9.0	2.0	4.0	5.0	1.0	3.4
306	Tataskweyak Cree Nation	6602	TATASKWEYAK WATER TREATMENT PLANT	Surface Water	Level II	9.0	3.0	8.0	8.0	1.0	5.2
299	Wasagamack First Nation	7104	WASAGAMACK WATER TREATMENT PLANT	Surface Water	Level II	8.0	3.0	8.0	10.0	1.0	5.3
324	Wuskwi Sipihk First Nation	6592	SWAN LAKE NO. 65C	Surface Water	Level II	10.0	8.0	8.0	1.0	1.0	8.0
304	York Factory First Nation	6600	YORK FACTORY Water treatment plant	Surface Water	Level III	10.0	4.0	6.0	5.0	4.0	5.3

NEEGAN BURNSIDE

Appendix E.2

Individual First Nation Wastewater Risk Summary

Table E.2: Individual First Nation Wastewater Risk Summary

Legend: High Risk | Medium Risk | Low Risk

Band #	Band Name	System #	System Name	Receiver Type	Treatment Class	Effluent Risk	Design Risk	Operations Risk	Report Risk	Operator Risk	Final Risk Score
309	Chemawawin Cree Nation	9756	COMMUNITY LAGOON CHEMAWAWIN	Creek	Level I	7.0	2.0	6.0	1.0	1.0	3.7
288	Dakota Plains	7332	DAKOTA PLAIN SBR WASTEWATER TREATMENT PLANT	Creek	Level II	8.0	4.0	9.0	10.0	5.0	6.8
305	Fox Lake	7361	FOX LAKE NO. 1	Creek	Level II	6.0	5.0	6.0	7.0	1.0	4.8
310	Grand Rapids First Nation	7340	GRAND RAPIDS NO. 33	Creek	Level I	7.0	4.0	3.0	10.0	1.0	4.3
278	Norway House Cree Nation	7319	NORWAY HOUSE COMMUNITY LAGOON	Creek	Level I	8.0	3.0	6.0	4.0	1.0	4.4
306	Tataskweyak Cree Nation	7353	TATASKWEYAK LAGOON	Enclosed bay	Level I	8.0	3.0	8.0	10.0	8.0	6.9
308	Barren Lands	12439	BROCHET NO. 197 - sewage lagoon	Lake, reservoir	Level I	9.0	1.0	3.0	1.0	6.0	4.1
297	Garden Hill First Nation	8116	Garden Hill First Nation Sewage Treatment Plant	Lake, reservoir	Level II	10.0	2.0	4.0	10.0	1.0	4.7
296	Gods Lake First Nation	7345	MAIN LAND WASTEWATER TREATMENT PLANT	Lake, reservoir	Level III	10.0	5.0	6.0	10.0	2.0	6.1
296	Gods Lake First Nation	15960	WEST SIDE WASTEWATER TREATMENT PLANT	Lake, reservoir	Level III	9.0	6.0	8.0	10.0	1.0	6.5
270	Little Grand Rapids	7309	LITTLE GRAND RAPIDS WASTEWATER TREATMENT PLANT	Lake, reservoir	Level II	10.0	8.0	8.0	4.0	1.0	6.6
317	Northlands	NEW001	COMMUNITY SBR	Lake, reservoir	Level II	9.0	6.0	8.0	10.0	10.0	8.3
327	Pauingassi First Nation	7310	PAUINGASSI WASTEWATER TREATMENT PLANT	Lake, reservoir	Level II	9.0	4.0	9.0	10.0	1.0	6.2
300	Red Sucker Lake	7357	RED SUCKER LAKE SCHOOL WASTEWATER TREATMENT PLANT	Lake, reservoir	Level I	10.0	3.0	8.0	10.0	6.0	6.9
300	Red Sucker Lake	7356	RED SUCKER LAKE WASTEWATER TREATMENT PLANT	Lake, reservoir	Level III	10.0	3.0	7.0	10.0	6.0	6.7
314	Sapotaweyak Cree Nation	7342	SAPOTAWEYAK WASTEWATER TREATMENT PLANT	Lake, reservoir	Level III	10.0	3.0	8.0	4.0	1.0	5.3
298	St. Theresa Point	7643	ST. THERESA POINT 1996 SBR WASTEWATER TREATMENT PLAN	Lake, reservoir	Level II	9.0	2.0	10.0	10.0	1.0	6.0
298	St. Theresa Point	7642	ST. THERESA POINT SBR 1999 WASTEWATER TREATMENT PLAN	Lake, reservoir	Level II	9.0	3.0	10.0	10.0	1.0	6.2
299	Wasagamack First Nation	7645	WASAGAMACK WASTEWATER TREATMENT PLANT	Lake, reservoir	Level II	10.0	8.0	10.0	10.0	1.0	8.0
285	Waywayseecappo First Nation	7329	WAYWAYSEECAPPO Education Authority	Lake, reservoir	Level I	8.0	2.0	7.0	1.0	2.0	4.3
315	Opaskwayak Cree Nation	7339	OPASKWAYAK CREE WASTEWATER TREATMENT PLANT	Large river	Level II	8.0	8.0	3.0	10.0	1.0	8.0
295	Dakota Tipi	7344	DAKOTA TIPI NO. 1	MTA	MTA	1.0	1.0	4.0	1.0	1.0	1.7
294	Gamblers	7327	GAMBLER NO. 63	MTA	MTA	1.0	1.0	6.0	1.0	1.0	2.2
281	Skownan First Nation	7323	SKOWNAN	MTA	MTA	4.0	2.0	3.0	10.0	2.0	3.4
323	War Lake First Nation	7355	War Lake SBR Manitoba provincial	MTA	MTA	1.0	1.0	5.0	1.0	1.0	2.0
266	Berens River	7305	BERENS RIVER NO. 13	River	Level II	6.0	5.0	8.0	1.0	5.0	5.5
267	Bloodvein	7306	BLOODVEIN NO. 12	River	Level I	6.0	8.0	8.0	1.0	1.0	5.5
261	Brokenhead Ojibway Nation	7299	BROKENHEAD NO. 4	River	Level I	8.0	8.0	5.0	1.0	1.0	8.0
301	Bunibonibee Cree Nation	7346	OXFORD HOUSE NO. 24	River	Level II	5.0	8.0	5.0	10.0	2.0	8.0
276	Cross Lake First Nation	7316	COMMUNITY AREATED LAGOON SAGIHWAK	River	Level II	7.0	8.0	9.0	1.0	1.0	8.0
262	Fort Alexander	7300	FORT ALEXANDER SOUTH SHORE LAGOON	River	Level I	6.0	2.0	7.0	1.0	1.0	3.7
262	Fort Alexander	7301	NORTH SHORE LAGOON	River	Level I	6.0	4.0	8.0	1.0	1.0	4.5
286	Keeseekoowenin	0	LAGOON	River	Level II	6.0	1.0	5.0	5.0	7.0	4.6
268	Kinonjeoshtegon First Nation	7307	JACKHEAD NO. 43	River	Small System	7.0	6.0	7.0	10.0	6.0	6.8
260	Little Black River	0	LBR LAGOON	River	Level I	6.0	3.0	8.0	1.0	1.0	4.2
287	Long Plain	7331	LONG PLAIN SBR WASTEWATER TREATMENT PLANT	River	Level II	7.0	5.0	8.0	10.0	1.0	5.8
311	Mathias Colomb	7349	MATHIAS COLOMB WASTEWATER TREATMENT PLANT	River	Level II	6.0	8.0	5.0	4.0	1.0	5.0
269	Peguis	7308	PEGUIS NO. 1B	River	Level I	7.0	2.0	7.0	1.0	9.0	5.0
277	Poplar River First Nation	7318	POPLAR RIVER NO. 16	River	Level I	8.0	3.0	8.0	4.0	1.0	4.9
273	Roseau River Anishinabe First Nation Government	7313	ROSEAU RIVER NO. 2	River	Level I	7.0	2.0	8.0	10.0	1.0	5.1
307	Shamattawa First Nation	7352	SHAMATTAWA WASTEWATER TREATMENT PLANT	River	Level III	8.0	2.0	5.0	10.0	2.0	4.7
290	Sioux Valley Dakota Nation	7334	SIOUX VALLEY DAKOTA NATION LAGOON	River	Level I	6.0	3.0	5.0	10.0	6.0	5.4
324	Wuskwi Sipihk First Nation	7343	WUSKWI SIPIHK WASTEWATER TREATMENT PLANT	River	Level II	9.0	3.0	6.0	10.0	1.0	5.2
265	Buffalo Point First Nation	7304	BUFFALO POINT NO. 36	Sub-surface / Ground	Small System	2.0	2.0	5.0	1.0	6.0	3.4
264	Fisher River	NEW001	NEW LAGOON	Sub-surface / Ground	Level II	2.0	1.0	6.0	1.0	8.0	3.3
316	Dauphin River	7341	DAUPHIN RIVER NO. 48A	Tile field	Small System	3.0	3.0	8.0	1.0	10.0	5.4
285	Waywayseecappo First Nation	7328	WAYWAYSEECAPPO Lizard Point	Tile field	Level I	1.0	6.0	9.0	10.0	1.0	5.1
276	Cross Lake First Nation	7317	EDUCATION AREATED LAGOON NATIMEK	Wetland	Level I	4.0	3.0	4.0	1.0	1.0	2.8
263	Hollow Water	7302	HOLE OR HOLLOW WATER NO. 10	Wetland	Level I	3.0	5.0	8.0	1.0	1.0	4.1

REGION: MANITOBA
January 2011

					Legend:	High Risk		Medium Risk		Low Risk	
Band #	**Band Name**	**System #**	**System Name**	**Receiver Type**	**Treatment Class**	**Effluent Risk**	**Design Risk**	**Operations Risk**	**Report Risk**	**Operator Risk**	**Final Risk Score**
271	Lake Manitoba Treaty 2 First Nation	7311	DOG CREEK NO. 46	Wetland	Small System	4.0	2.0	7.0	1.0	1.0	3.3
275	Lake St. Martin	7315	LAKE ST. MARTIN WWT	Wetland	Level I	2.0	3.0	10.0	10.0	1.0	4.8
274	Little Saskatchewan	7314	LITTLE SASKATCHEWAN LAGOON	Wetland	Level I	4.0	3.0	7.0	1.0	1.0	3.6
302	Manto Sipi Cree Nation	7347	GOD'S RIVER NO. 86A	Wetland	Level II	2.0	5.0	5.0	7.0	1.0	3.8
312	Mosakahiken Cree Nation	NEW002	NEW LAGOON	Wetland	Level I	5.0	1.0	4.0	2.0	4.0	3.2
313	Nisichawayasihk Cree Nation	7348	NISICHAWAYASIHK LAGOON	Wetland	Level I	3.0	4.0	6.0	10.0	8.0	5.7
318	O-Pipon-Na-Piwin Cree Nation	0	LAGOON	Wetland	Level I	2.0	3.0	8.0	1.0	3.0	3.8
272	Pinaymootang First Nation	NEW001	NEW LAGOON	Wetland	Level I	3.0	2.0	7.0	1.0	1.0	3.1
282	Pine Creek	7324	PINE CREEK LAGOON	Wetland	Level I	4.0	3.0	5.0	10.0	1.0	4.0
283	Sandy Bay	7325	SANDY BAY LAGOON	Wetland	Level I	3.0	2.0	8.0	10.0	7.0	5.5
303	Sayisi Dene First Nation	7354	Sayisi Dene Wastewater Treatment Plant	Wetland	Level II	4.0	4.0	8.0	4.0	2.0	4.6
304	York Factory First Nation	7351	York Factory Lagoon	Wetland	Level I	3.0	3.0	7.0	1.0	1.0	3.4

NEEGAN BURNSIDE

Appendix F

Protocol and Servicing Costs

REGION: MANITOBA
January 2011

Table F: Protocol and Servicing Costs *(Water & Wastewater Combined)*

Band #	Band Name	Community Name	Population	Current Homes	Forecast Population	Forecast Homes	Zone Markup	Upgrade To Protocol	Per Lot Upgrades to Protocol (Current Homes)	Recommended Servicing	Per Lot Reccomended Servicing (Forecast Homes)	Recommended O&M	Per Lot O&M (Forecast Homes)
308	Barren Lands	Brochet	535	83	668	116	1.938	$ 144,500	$ 1,700	$ 4,300,000	$ 37,100	$ 470,000	$ 4,100
266	Berens River	Berens River	2125	295	3082	534	1.547	$ 2,708,500	$ 9,200	$ 20,270,000	$ 38,000	$ 1,850,000	$ 3,500
284	Birdtail Sioux	Birdtail Creek 57	377	120	510	164	1.049	$ 125,000	$ 1,000	$ 790,000	$ 4,800	$ 500,000	$ 3,000
267	Bloodvein	Bloodvein	1076	194	1505	301	1.386	$ 3,862,000	$ 19,900	$ 12,160,000	$ 40,400	$ 950,000	$ 3,200
261	Brokenhead Ojibway Nation	Brokenhead 4	587	157	804	229	1.037	$ 334,000	$ 2,100	$ 5,700,000	$ 24,900	$ 580,000	$ 2,500
265	Buffalo Point First Nation	Buffalo Point First Nation	43	21	56	27	1.003	$ 37,500	$ 1,800	$ 125,000	$ 4,600	$ 190,000	$ 7,000
301	Bunibonibee Cree Nation	Oxford House	2514	407	3301	603	2.232	$ 504,500	$ 1,200	$ 37,910,000	$ 62,900	$ 860,000	$ 1,400
289	Canupawakpa Dakota First Nation	Canupawakpa Dakota First Nation	343	107	357	111	1.049	$ 1,200,000	$ 11,200	$ 2,540,000	$ 22,900	$ 330,000	$ 3,000
309	Chemawawin Cree Nation	Chemawawin	1305	292	1754	404	1.147	$ 896,500	$ 3,100	$ 6,370,000	$ 15,800	$ 1,040,000	$ 2,600
276	Cross Lake First Nation	Cross Lake 19	5869	775	8115	1336	1.159	$ 2,120,000	$ 2,700	$ 39,350,000	$ 29,500	$ 2,010,000	$ 1,500
288	Dakota Plains	Dakota Plains	150	38	188	50	0.952	$ 755,900	$ 19,900	$ 1,330,000	$ 26,600	$ 300,000	$ 6,000
295	Dakota Tipi	Dakota Tipi	174	52	199	60	0.952	$ 244,000	$ 4,700	$ 475,000	$ 7,900	$ 290,000	$ 4,800
316	Dauphin River	Dauphin River	201	47	245	58	1.037	$ 170,000	$ 3,600	$ 3,610,000	$ 62,200	$ 170,000	$ 2,900
280	Ebb and Flow	Ebb And Flow 52	1534	375	2190	539	1.049	$ 95,000	$ 300	$ 7,990,000	$ 14,800	$ 1,070,000	$ 2,000
264	Fisher River	Fisher River	1875	452	2350	570	1.037	$ 55,000	$ 100	$ 5,190,000	$ 9,100	$ 1,110,000	$ 1,900
262	Fort Alexander	Sagkeeng	3216	656	3494	725	1.037	$ 4,297,000	$ 6,600	$ 9,250,000	$ 12,800	$ 1,980,000	$ 2,700
305	Fox Lake	Fox Lake	277	60	290	63	1.235	$ 475,000	$ 7,900	$ 545,000	$ 8,700	$ 410,000	$ 6,500
294	Gamblers	Gamblers	73	34	110	52	1.049	$ -	$ -	$ 930,000	$ 17,900	$ 300,000	$ 5,800
297	Garden Hill First Nation	Garden Hill First Nation	3993	518	5141	805	2.071	$ 933,500	$ 1,800	$ 21,940,000	$ 27,300	$ 1,630,000	$ 2,000
296	Gods Lake First Nation	God's Lake	1557	264	1796	323	2.232	$ 3,056,000	$ 11,600	$ 23,930,000	$ 74,100	$ 1,020,000	$ 3,200
310	Grand Rapids First Nation	Grand Rapids	767	187	1099	270	1.147	$ 1,910,500	$ 10,200	$ 9,030,000	$ 33,400	$ 460,000	$ 1,700
263	Hollow Water	Hollow Water	1197	168	1717	298	1.037	$ 3,074,500	$ 18,300	$ 15,210,000	$ 51,000	$ 730,000	$ 2,400
286	Keeseekoowenin	Keeseekoowenin 61	497	150	531	161	1.049	$ 765,000	$ 5,100	$ 8,590,000	$ 53,400	$ 810,000	$ 5,000
268	Kinonjeoshtegon First Nation	Jackhead 43	406	76	555	113	1.037	$ 366,000	$ 4,800	$ 9,550,000	$ 84,500	$ 450,000	$ 4,000
271	Lake Manitoba Treaty 2 First Nation	Dog Creek	1007	207	1250	267	1.037	$ 345,000	$ 1,700	$ 12,140,000	$ 45,500	$ 630,000	$ 2,400
275	Lake St. Martin	Lake St. Martin	1393	174	2015	329	1.037	$ 1,478,000	$ 8,500	$ 19,330,000	$ 58,800	$ 920,000	$ 2,800
260	Little Black River	Black River	827	200	1182	288	1.037	$ 5,028,500	$ 25,100	$ 13,620,000	$ 47,300	$ 520,000	$ 1,800
270	Little Grand Rapids	Little Grand Rapids	1213	210	1522	287	1.700	$ 2,365,000	$ 11,300	$ 11,660,000	$ 40,600	$ 1,310,000	$ 4,600
274	Little Saskatchewan	Little Saskatchewan 48	650	112	898	174	1.037	$ 815,000	$ 7,300	$ 7,860,000	$ 45,200	$ 515,000	$ 3,000
287	Long Plain	Long Plain	2039	270	2858	474	0.952	$ 602,000	$ 2,200	$ 8,680,000	$ 18,300	$ 700,000	$ 1,500
302	Manto Sipi Cree Nation	God's River	682	128	880	177	2.232	$ 943,500	$ 7,400	$ 7,670,000	$ 43,300	$ 600,000	$ 3,400
311	Mathias Colomb	Pukatawagan	2547	325	3084	459	1.653	$ 5,253,500	$ 16,200	$ 17,390,000	$ 37,900	$ 890,000	$ 1,900
312	Mosakahiken Cree Nation	Moose Lake 31A	1683	202	2043	292	1.147	$ -	$ -	$ 10,030,000	$ 34,300	$ 700,000	$ 2,400
313	Nisichawayasihk Cree Nation	Nelson House	2600	456	3495	679	1.235	$ 738,000	$ 1,600	$ 18,640,000	$ 27,500	$ 1,670,000	$ 2,500
317	Northlands	Lac Brochet 197A	918	141	1179	206	1.938	$ 1,715,500	$ 12,200	$ 14,530,000	$ 70,500	$ 590,000	$ 2,900
278	Norway House Cree Nation	Norway House	5441	1153	7160	1582	1.159	$ 194,000	$ 200	$ 14,200,000	$ 9,000	$ 4,520,000	$ 2,900
279	O-Chi-Chak-Ko-Sipi First Nation	Crane River	647	134	965	213	1.037	$ 641,000	$ 4,800	$ 7,770,000	$ 36,500	$ 540,000	$ 2,500
315	Opaskwayak Cree Nation	Opaskwayak Cree Nation	3233	701	4358	982	1.053	$ 126,500	$ 200	$ 11,640,000	$ 11,900	$ 1,230,000	$ 1,300
318	O-Pipon-Na-Piwin Cree Nation	South Indian Lake Settlement	1010	205	1620	357	1.235	$ 557,500	$ 2,700	$ 6,890,000	$ 19,300	$ 1,160,000	$ 3,200
327	Pauingassi First Nation	Pauingassi First Nation	617	88	784	129	1.700	$ 5,486,000	$ 62,300	$ 8,830,000	$ 68,400	$ 760,000	$ 5,900
269	Peguis	Peguis 1B	3997	756	5247	1068	1.037	$ 955,000	$ 1,300	$ 9,350,000	$ 8,800	$ 1,760,000	$ 1,600
272	Pinaymootang First Nation	Fairford	1531	271	1908	365	1.037	$ 945,000	$ 3,500	$ 8,530,000	$ 23,400	$ 840,000	$ 2,300
282	Pine Creek	Pine Creek	1569	211	2278	388	1.049	$ 91,000	$ 400	$ 16,340,000	$ 42,100	$ 840,000	$ 2,200
277	Poplar River First Nation	Poplar River	1459	232	1734	300	1.700	$ 2,301,500	$ 9,900	$ 6,350,000	$ 21,200	$ 1,130,000	$ 3,800
300	Red Sucker Lake	Red Sucker Lake	958	199	1280	279	2.232	$ 1,925,000	$ 9,700	$ 25,410,000	$ 91,100	$ 780,000	$ 2,800
291	Rolling River	Rolling River 67	664	130	897	188	1.049	$ 275,000	$ 2,100	$ 5,690,000	$ 30,300	$ 990,000	$ 5,300
273	Roseau River Anishinabe First Nation Gover	Roseau River Anishinabe First Nation Government	1279	197	1597	276	1.003	$ 109,000	$ 600	$ 5,560,000	$ 20,100	$ 1,010,000	$ 3,700
283	Sandy Bay	Sandy Bay	3586	537	4688	812	1.037	$ 89,000	$ 200	$ 23,060,000	$ 28,400	$ 1,150,000	$ 1,400
314	Sapotaweyak Cree Nation	Shoal River 65A	1137	204	1513	298	1.147	$ 3,266,000	$ 16,000	$ 6,870,000	$ 23,100	$ 860,000	$ 2,900
303	Sayisi Dene First Nation	Churchill 1	386	122	478	152	1.938	$ 302,000	$ 2,500	$ 3,140,000	$ 20,700	$ 650,000	$ 4,300
307	Shamattawa First Nation	Shamattawa First Nation	1493	170	2014	300	1.938	$ 1,924,500	$ 11,300	$ 18,680,000	$ 62,300	$ 390,000	$ 1,300
290	Sioux Valley Dakota Nation	Sioux Valley Dakota Nation	1316	364	1539	438	0.929	$ 220,000	$ 600	$ 8,060,000	$ 18,400	$ 590,000	$ 1,300

REGION: MANITOBA
January 2011

Band #	Band Name	Community Name	Population	Current Homes	Forecast Population	Forecast Homes	Zone Markup	Upgrade To Protocol	Per Lot Upgrades to Protocol (Current Homes)	Recommended Servicing	Per Lot Reccomended Servicing (Forecast Homes)	Recommended O&M	Per Lot O&M (Forecast Homes)
281	Skownan First Nation	Waterhen 45	813	110	1112	184	1.049	$ 1,491,500	$ 13,600	$ 12,590,000	$ 68,400	$ 560,000	$ 3,000
298	St. Theresa Point	St. Theresa Point	3509	532	4536	788	2.071	$ 2,821,500	$ 5,300	$ 39,900,000	$ 50,600	$ 2,010,000	$ 2,600
293	Swan Lake	SWAN LAKE	624	133	764	168	1.049	$ 712,000	$ 5,400	$ 1,820,000	$ 10,800	$ 570,000	$ 3,400
306	Tataskweyak Cree Nation	Split Lake	2567	362	3428	577	1.235	$ 3,845,000	$ 10,600	$ 10,420,000	$ 18,100	$ 1,050,000	$ 1,800
292	Tootinaowaziibeeng Treaty Reserve	Valley River 63A	690	114	861	156	1.049	$ 712,000	$ 6,200	$ 2,270,000	$ 14,600	$ 870,000	$ 5,600
323	War Lake First Nation	Ilford Indian Settlement	133	23	145	26	1.520	$ -	$ -	$ -	$ -	$ 43,000	$ 1,700
299	Wasagamack First Nation	WASAGAMACK	1662	244	2119	358	2.232	$ 410,000	$ 1,700	$ 23,280,000	$ 65,000	$ 1,370,000	$ 3,800
285	Waywayseecappo First Nation	Waywayseecappo First Nation	1296	354	1559	441	1.049	$ 1,153,000	$ 3,300	$ 10,550,000	$ 23,900	$ 1,420,000	$ 3,200
324	Wuskwi Sipihk First Nation	Wuskwi Sipihk First Nation	191	48	215	56	1.147	$ 2,349,000	$ 48,900	$ 5,610,000	$ 100,200	$ 380,000	$ 6,800
304	York Factory First Nation	York Landing Settlement	420	114	684	202	1.520	$ 1,996,500	$ 17,500	$ 7,880,000	$ 39,000	$ 470,000	$ 2,300