NEEGAN BURNSIDE

National Assessment of First Nations Water and Wastewater Systems

Alberta Regional Roll-Up Report FINAL

Department of Indian Affairs and Northern Development

January 2011

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Alberta Regional Roll-Up Report Final

Department of Indian and Northern Affairs Canada

Prepared By:

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Prepared for:

Department of Indian and Northern Affairs Canada

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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.

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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 and its sub-consultants conducted an assessment for each of the eight regions. This report summarizes the findings for the Alberta region.

1.1 Site Visits

Site visits in the Alberta Region were undertaken by personnel from Neegan Burnside Ltd. and its sub-consultant, R.J. Burnside & Associates Limited, during September and October, 2009, and in May, June and July, 2010. Each visit included at least two team members. Additional participants including the Circuit Rider Trainer (CRT), an INAC Representative, an Environmental Health Officer (EHO) from Health Canada and a Tribal Council Representative were invited to attend. The additional participants that were able to attend are identified in each community report.

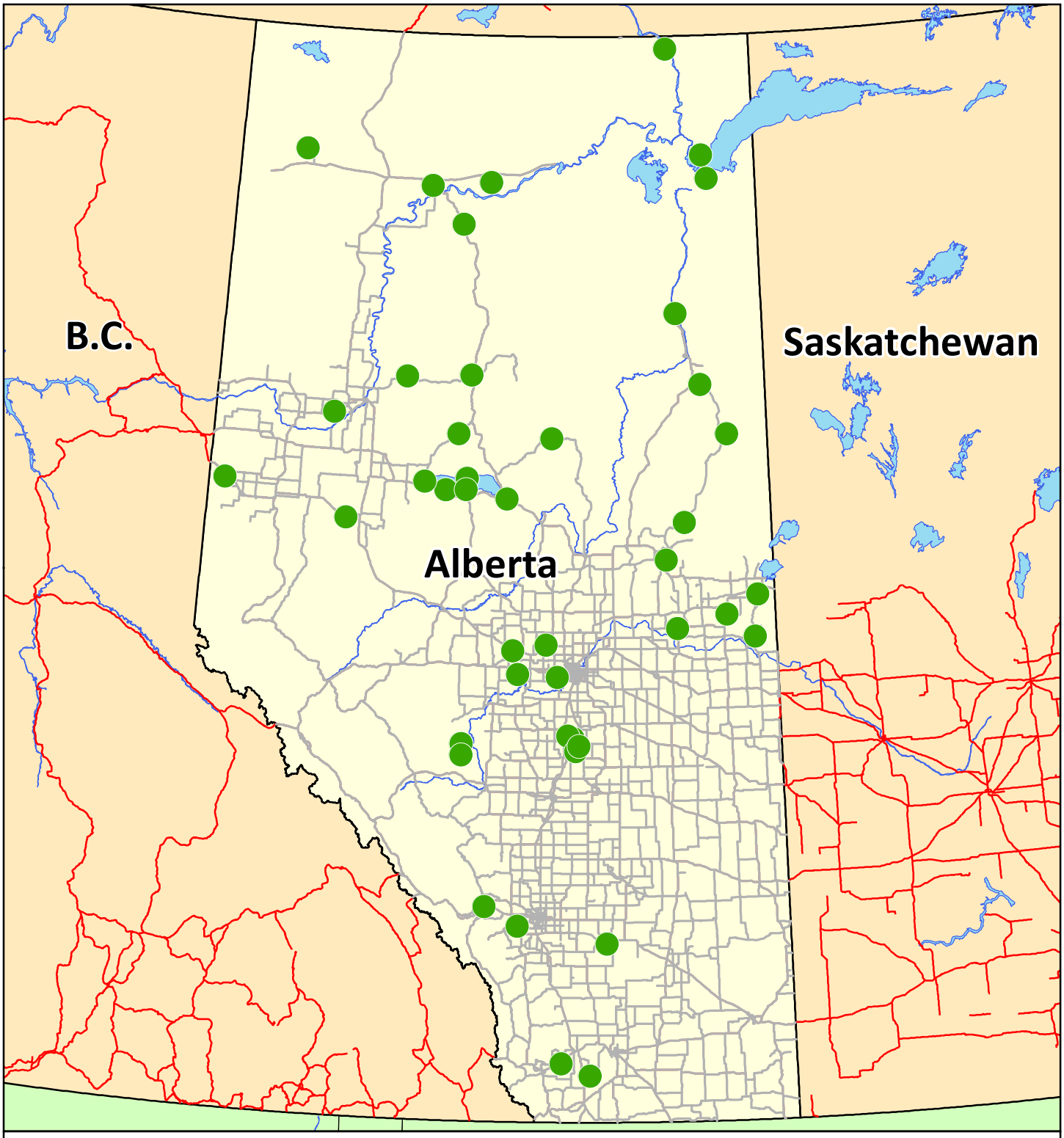
After confirming the number and type of systems that the First Nation uses to provide water and wastewater to the community, along with population and future servicing needs (planned development and population growth), an assessment was carried out of the water and wastewater systems, as well as 5% of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

1.2 Reporting

Individual Community Reports have been prepared for each First Nation. In cases where the First Nation consisted of more than one community located in geographically distinct areas, a separate report was prepared for each community. In the Alberta region, there was 100% participation from the 44 First Nations, which resulted in the preparation of 54 individual community reports. A report was not submitted for one First Nation, which did not have any members living on-site and had no assets. 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 systems and existing individual systems, identification of needs to meet Departmental, Federal and Provincial protocols and guidelines, and an assessment of existing servicing of the community along with projections of population and flows for future servicing for the 10 year period. Costing 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 are also included in each report.

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 - Alberta First Nations Visited

- Alberta First Nations (Visited)
- Alberta Roads
- Major National Roads
- 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.

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Projection: Geographic, Canada LCC

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2.0 Regional Overview

The Alberta Region includes 44 First Nations. There are 82 water systems (57 First Nation systems and 25 Municipal Type Agreements) and 73 wastewater systems (60 First Nation systems and 13 Municipal Type Agreements).

A First Nation water or wastewater system consists of INAC-funded assets, and serves five or more residences or public facilities. A Municipal Type Agreement, 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 communities' populations range from 50 to 8,840 people, and household sizes range from 2.5 to 7.9 people per unit (ppu). The total number of homes is 14,503, and the average household size in the Alberta region is 4.8 ppu.

2.1 Water Servicing

There are a total of 82 water systems serving 42 of the 44 First Nations. Of the final two First Nations, one is serviced solely by individual wells, and the other has no members living on-site and does not have any water or wastewater systems.

For water treatment, the 82 water systems include:

- 25 systems that receive their water supply through a Municipal Type Agreement (MTA)
- 29 groundwater systems
- 5 groundwater under the direct influence of surface water (GUDI) systems
- 23 surface water systems.

For water distribution, the 82 systems include:

- 10 distribution systems that are maintained through a Municipal Type Agreement (MTA)
- 72 distribution 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 Alberta region:

- 38% of the homes (5,490) are piped
- 31% of the homes (4,567) are on truck delivery
- 31% of the homes (4,433) are serviced by individual wells
- 13 homes reported to have no water service.

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’ and “None” typically represent systems with either disinfection only or no treatment. The classification used for the Alberta region follows the regulations for Alberta.

Table 2.1 - Water Overview

System Classification	No.	% of Total
None	2	2%
Small System	7	9%
Level I	18	22%
Level II	19	23%
Level III	11	14%
MTA	25	30%

Source Type	No.	% of Total
Groundwater	29	36%
Surface Water	23	28%
Groundwater GUDI	5	6%
MTA	25	30%

Storage	No.	% of Total
None	20	24%
Standpipe	3	4%
Grade level	5	6%
Underground	54	66%

Treatment Type	No.	% of Total
None - Direct Use	1	1%
Disinfection Only	17	21%
Greensand Filtration	8	10%
Slow Sand	1	1%
Conventional	24	29%
Membrane Filtration	6	7%
MTA	25	31%

2.2 Wastewater Servicing

There are a total of 73 wastewater systems that serve 39 First Nations. For the remaining five First Nations, three are serviced solely by individual septic systems, one is relying on privies and one has no members living on-site and has no system.

For wastewater treatment, the 73 systems include:

- 13 wastewater systems are provided treatment through a Municipal Type Agreement (MTA
- 60 First Nation wastewater treatment systems, consisting of 54 systems using either facultative or aerated lagoons, 3 systems using a mechanical plant, 1 communal septic system and 2 “other” treatment type systems.

For wastewater collection, the 73 systems include:

- 3 wastewater collection systems that are maintained through a Municipal Type Agreement (MTA)
- 70 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 Alberta region:

- 32% of the homes (4,689) are piped
- 11% of the homes (1,518) are on truck haul
- 57% of the homes (8,217) are serviced by shootouts and individual septics
- 79 homes reported to have no service.

The majority of the homes (63) without service are within one First Nation community.

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
None	1	1%
Small System	6	9%
Level I	51	70%
Level II	1	1%
Level III	1	1%
MTA	13	18%

Treatment Type	No.	% of Total
Aerated Lagoon	2	3%
Facultative Lagoon	52	71%
Mechanical Treatment	3	4%
MTA	13	18%
Other	2	3%
Septic System	1	1%

For the systems listed as “None” and “Other”:

- “None” refers to a community that has decommissioned an old mechanical treatment plant and is currently constructing a new sewage lagoon
- “Other” refers to one community that has a holding tank for ten homes and to another community that has a septic system with an unknown tile-field location.

3.0 Preliminary Results and Trends

3.1 Per Capita Consumption and Plant Capacity

Historical flow records were not available for the First Nations serviced by a Municipal Type Agreement or for approximately 35% of the First Nation communal water systems. For these First Nations, an average per capita demand of 325 L/c/d for piped and 90 L/c/d for trucked water were used. The average per capita demand for all systems ranged from 18 L/c/d to 842 L/c/d, with an average per capita demand of approximately 236 L/c/d.

For the 82 water systems, 31 are piped only, and the remaining 51 systems either have a combination of trucked and piped or they are all trucked. A per capita consumption of 90 L/c/d was used to calculate the demand for dwellings serviced by truck haul unless there was actual flow data available. This resulted in a lower per capita demand for these systems than for systems that were all piped.

For the 31 systems that were piped only, the average per capita demand ranged from 161 L/c/d to 842 L/c/d, with an average per capita demand of approximately 344 L/c/d.[1]

The range 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	42
250 L/c/d to 375 L/c/d	34
Greater than 375 L/c/d	6

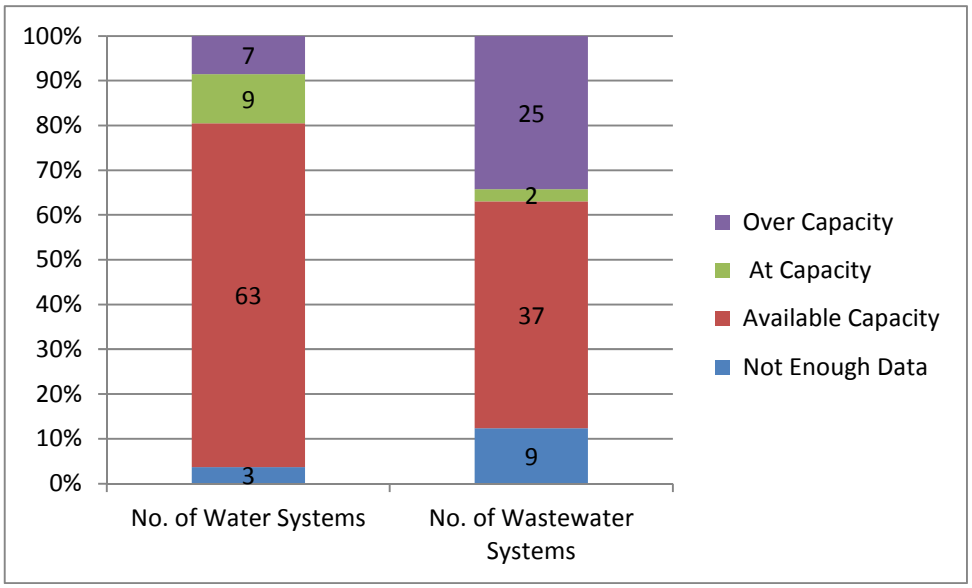
Historical flow data for wastewater was not available for most of the sewage systems. Therefore, to evaluate the ability of the existing infrastructure to meet current and projected needs, an average daily flow was calculated based on the actual or assumed per capita water consumption, plus an infiltration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

The following figure provides a summary of the plant capacities for the 44 First Nations:

- 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.

[1] By comparison, the average per capita consumption across Canada in 2004 was 329 L/c/d, according to Environment Canada data.

Figure 3.1 - Water and Wastewater Treatment Capacities



The data shows that 16 water systems and 27 wastewater systems are operating at or beyond their estimated capacities. For the plants identified as 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 44 First Nations ranges from 2.5 to 7.9 people per unit (ppu), with an average of 4.8 ppu.[2] The total number of piped connections in the region is 5,490 for water and 4,689 for wastewater. The average length of watermain per connection is approximately 136 m and the average length of sewermain per connection is approximately 54 m.

As the table and figures below illustrate, there is no real correlation between the size of the community and the length of pipe per connection. The length of the watermain per connection is much greater than the length of the sanitary main per connection. This difference is likely because some communities provide only piped water service, so the homes are further apart to allow for the installation of individual sewage systems. It should also be noted that, in some cases, the data provided for the watermain includes dedicated transmission main lengths (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 in 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.

[2] By comparison, according to Stats Canada, the average household size for Canada in 2009 was 2.5 ppu.

Table 3.2 - Average Water Distribution and Wastewater Collection Pipe Lengths

	Watermain	Sewer
Average m/connection	136	54
No. of systems with pipe lengths above 30 m/connection	65	52
No. of systems with pipe lengths below 30 m/connection	3	10

Figure 3.2 - Water Distribution: Average Pipe Length per Connection

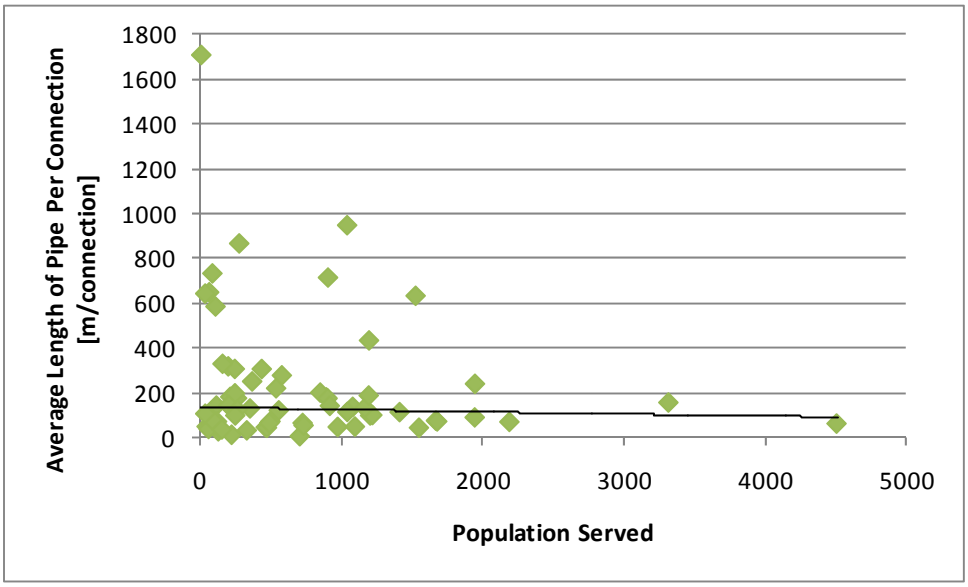
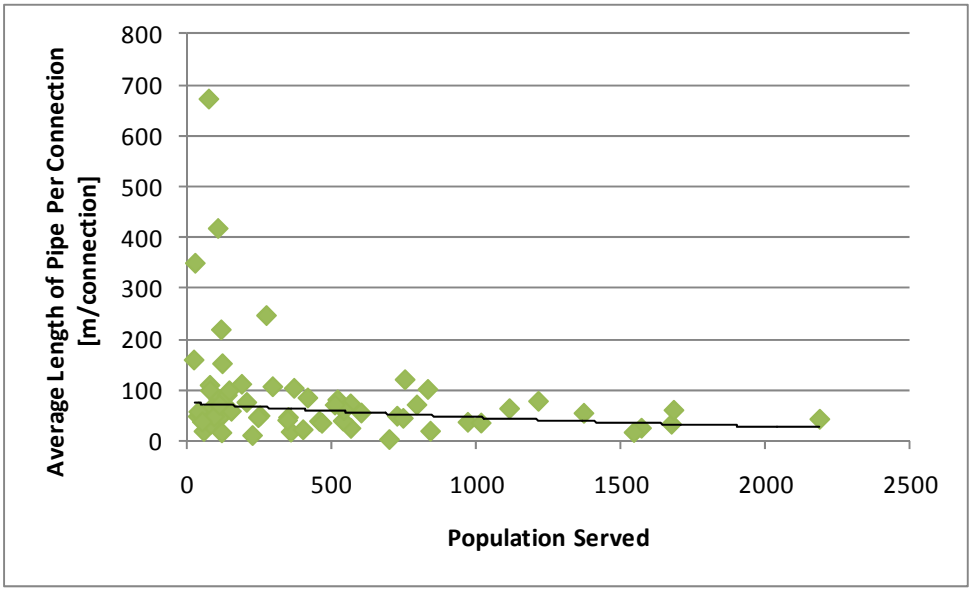


Figure 3.3 - Wastewater Collection: Average Pipe Length per Connection



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, 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 82 water systems inspected:

- 21 are categorized as high overall risk
- 48 are categorized as medium overall risk
- 13 are categorized as low overall risk.

The 13 low-risk systems include 11 Municipal Type Agreement systems, 1 surface water system and 1 GUDI system.

Neighbouring municipalities operate and maintain all of the Municipal Type Agreement (MTA) treatment systems and 10 of the 25 MTA distribution systems. The First Nations operate and maintain the distribution system of the remaining 15 MTA systems.

The table in Appendix E.1 summarizes the correlation between the component risk and the overall risk. In general, MTA systems have the lowest risk, followed by groundwater under the direct influence (GUDI) of surface water systems, then surface water systems, and, finally, groundwater systems.

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

3.3.1 Overall System Risk by Source

The following table summarizes the overall system risk by water source. 41% of groundwater systems, 30% of surface water systems and 8% of MTA's were high risk. None of the GUDI systems were classified as high risk. Typically for MTA's, it is assumed that the municipality is operating their system in accordance with provincial legislation and therefore would have a low risk water supply. For the Alberta Region, however, there were a number of MTA water supplies where the treated water did not meet the GCDWQ, which resulted in a higher risk score. 20% of GUDI systems, 44% of MTA's and 4% of surface water systems were low risk. None of the groundwater systems were classified as low risk.

Table 3.3 - Summary of Overall Risk Levels by Water Source

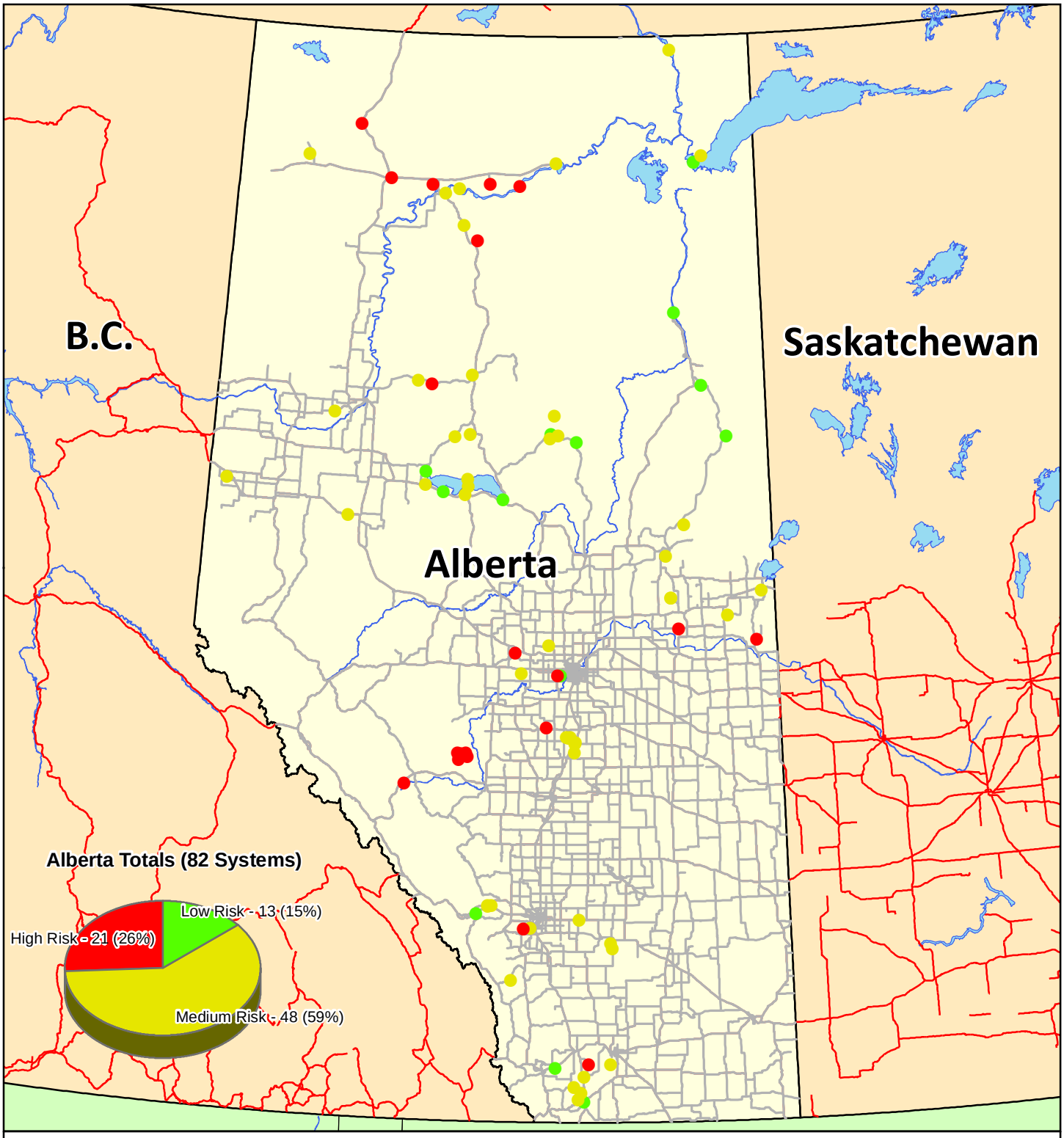
Overall Risk Level	Groundwater	GUDI	Surface Water	MTA	Total
High	12	0	7	2	**21**
Medium	17	4	15	12	**48**
Low	0	1	1	11	**13**
Total	**29**	**5**	**23**	**25**	**82**

3.3.2 Overall System Risk by Treatment Classification

The following table summarizes the overall system risk by the classification level of the treatment system. There is no clear pattern between the system classification level and the overall system risk, however, it is noted that Small and Level I systems have a medium and a high overall risk, whereas Level II and Level III systems have some low risk systems and some medium and high-risk systems.

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

Overall Risk Level	None	Small System	Level I	Level II	Level III	MTA	Total
High	0	3	8	3	5	2	**21**
Medium	2	4	10	15	5	12	**48**
Low	0	0	0	1	1	11	**13**
Total	**2**	**7**	**18**	**19**	**11**	**25**	**82**



NATIONAL ASSESSMENT OF FIRST NATION WATER AND WASTEWATER SYSTEMS

Water System Risk Level

- High
- Medium
- Low
- Alberta Roads
- Major National Roads
- Major Lakes

Figure 3.4 - Alberta 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

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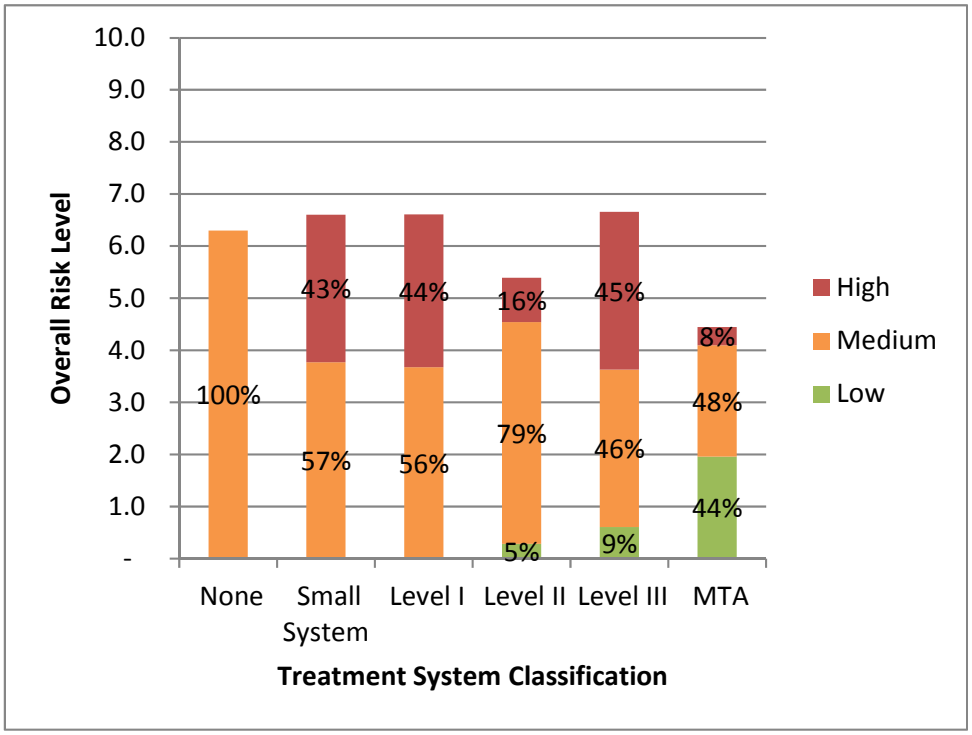
Figure 3.5 - Risk Profile Based on Water Treatment System Classification



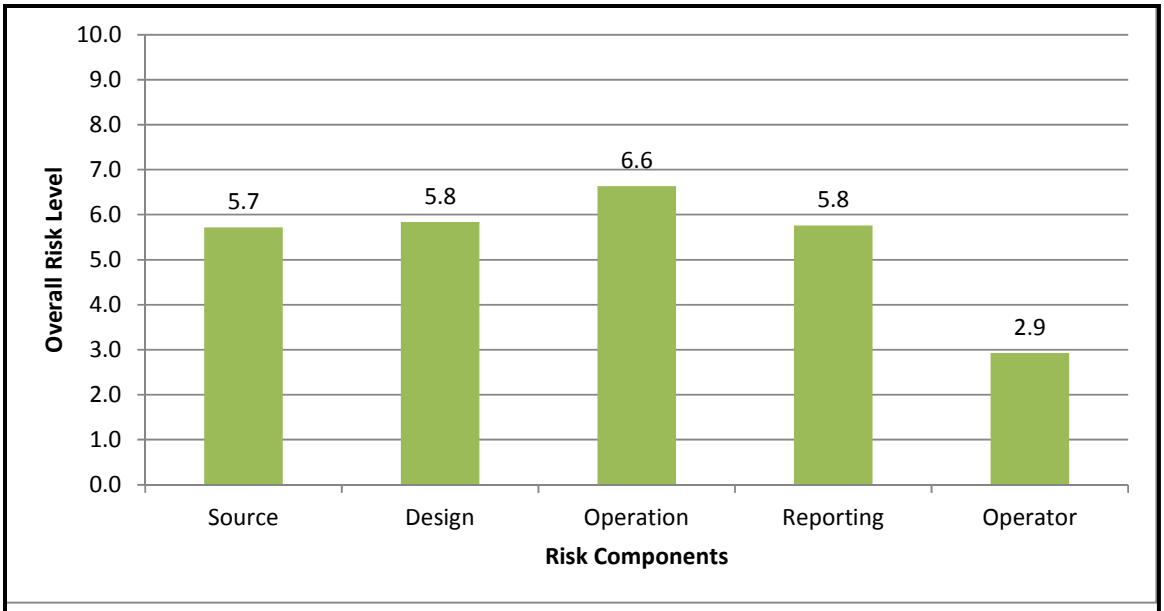
3.3.3 Overall Risk by Number of Connections

In the Alberta region, approximately 70% of systems serving more than 100 connections are medium-risk systems and the remaining systems are fairly evenly split between high and low risk. For systems serving less than 100 connections, 50% of the systems are medium risk, 35% of the systems are high risk with the remaining 15% are low 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	5.7	5.8	6.6	5.8	2.9
Minimum	1.0	1.0	1.0	1.0	1.0
Maximum	10.0	10.0	10.0	10.0	10.0
Std. Dev.	3.5	2.7	2.5	3.7	2.8

3.3.5 Component Risk - Water: Source

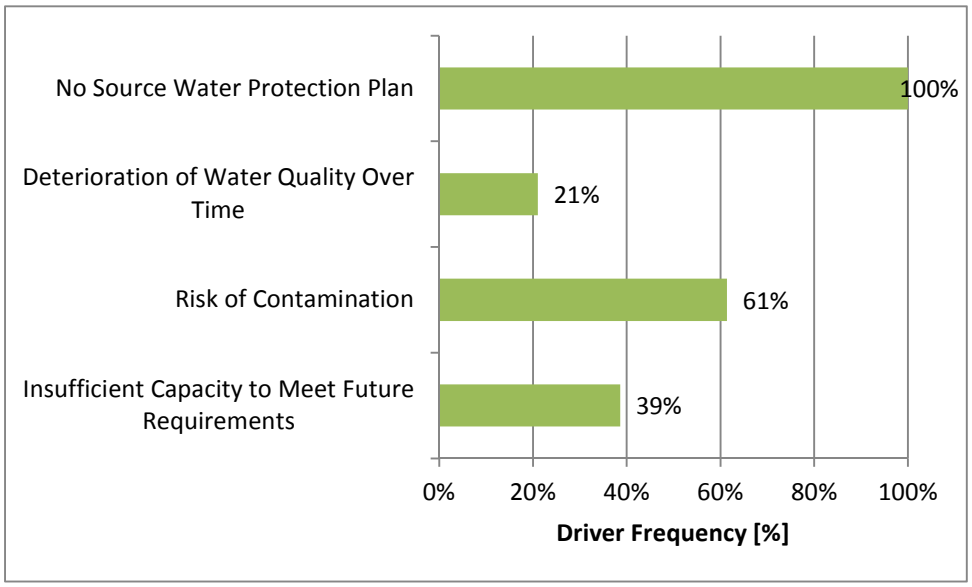
The risk associated with the source has a mean score of 5.7 overall. The mean source risk score by type of source is:

- groundwater at 5.9
- groundwater under the direct influence of surface water (GUDI) at 9.2
- surface water at 9.5
- Municipal Type Agreement at 1.3.

The data suggest that systems that rely on surface water or groundwater under the direct influence of surface water (GUDI) usually have a higher component risk score than systems that rely on groundwater. The risk formula automatically assigns a higher base risk to these types of systems.

The following figure identifies drivers contributing 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 5.8 overall. The mean design risk score by type of source is:

- Groundwater at 6.6
- groundwater under the direct influence of surface water (GUDI) at 3.8
- surface water at 6.2
- Municipal Type Agreement at 5.0.

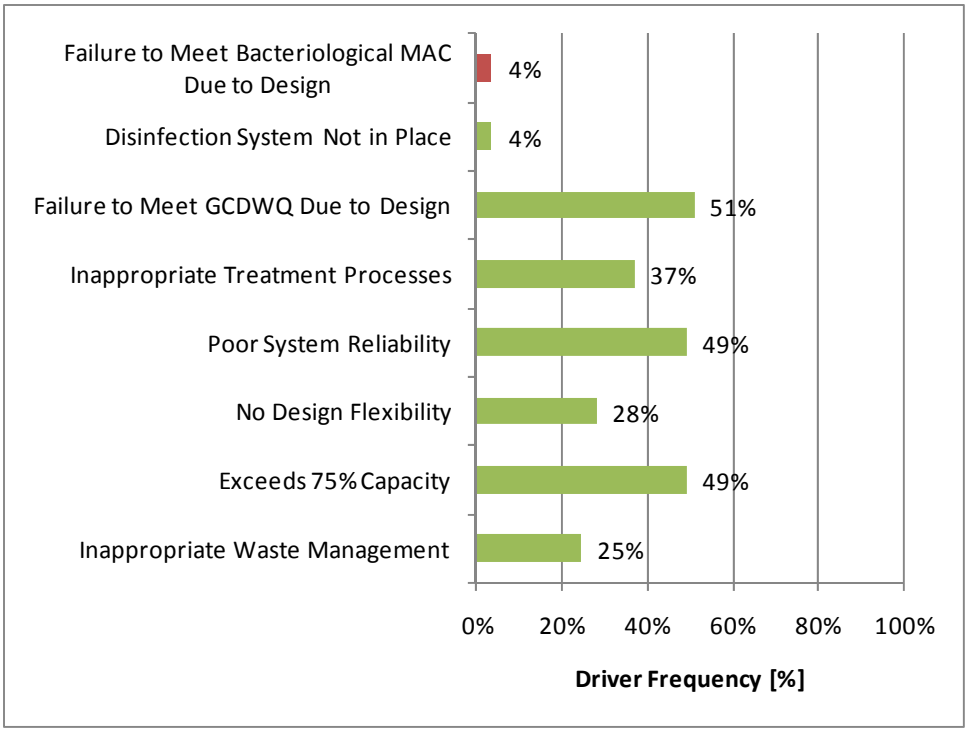
Groundwater systems have a higher design risk associated with them because they generally lack the proper treatment to meet aesthetic and operational guidelines. Generally, a groundwater system has an increased design risk if it does not have disinfection systems in place, or if there is insufficient contact time to ensure that the chlorination process is adequate. As part of the multi-barrier approach to water treatment, chlorination is now required for all water systems.

A higher risk for surface water sources and MTA's was typically due to MAC exceedances in the treated water or distribution system for disinfection by-products.

There are several key drivers of design risk in the region, 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.

Figure 3.8 - Design Risk Drivers



It should be noted that the 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 6.6 overall. The mean operation risk score by type of source is:

- groundwater at 7.5
- groundwater under the direct influence of surface water (GUDI) at 4.8
- surface water at 6.3
- Municipal Type Agreement at 6.3.

Areas that increased risk included operators not maintaining records, not having or not using approved Operation & Maintenance manuals, and not scheduling and performing maintenance activities. Increased effort focused on these areas would result in lowering both the component and the overall risk scores.

There are several key drivers of operation risk for water systems in the region, 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 or not in use
- Operation & Maintenance manual not available or not in use.

Figure 3.9 - Operations Risk Drivers

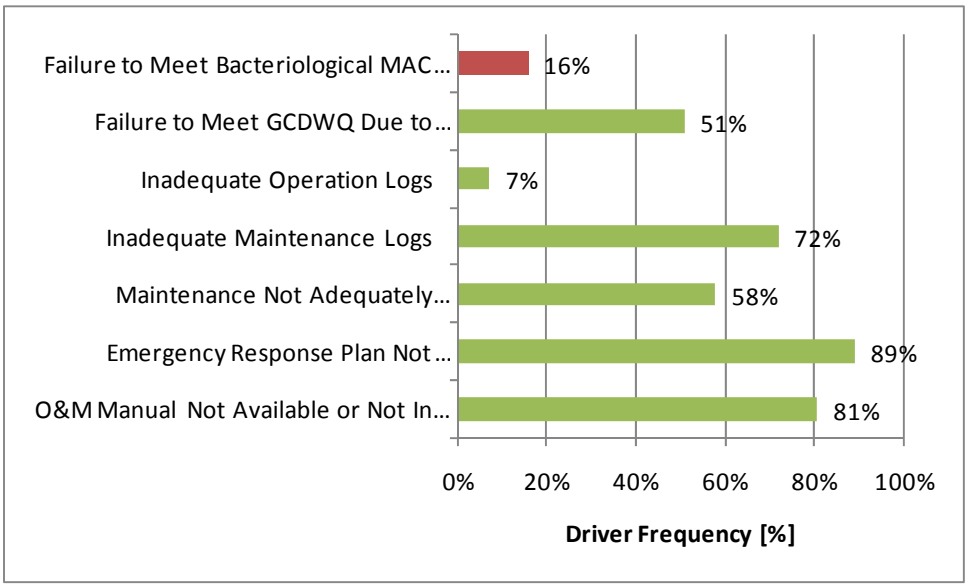
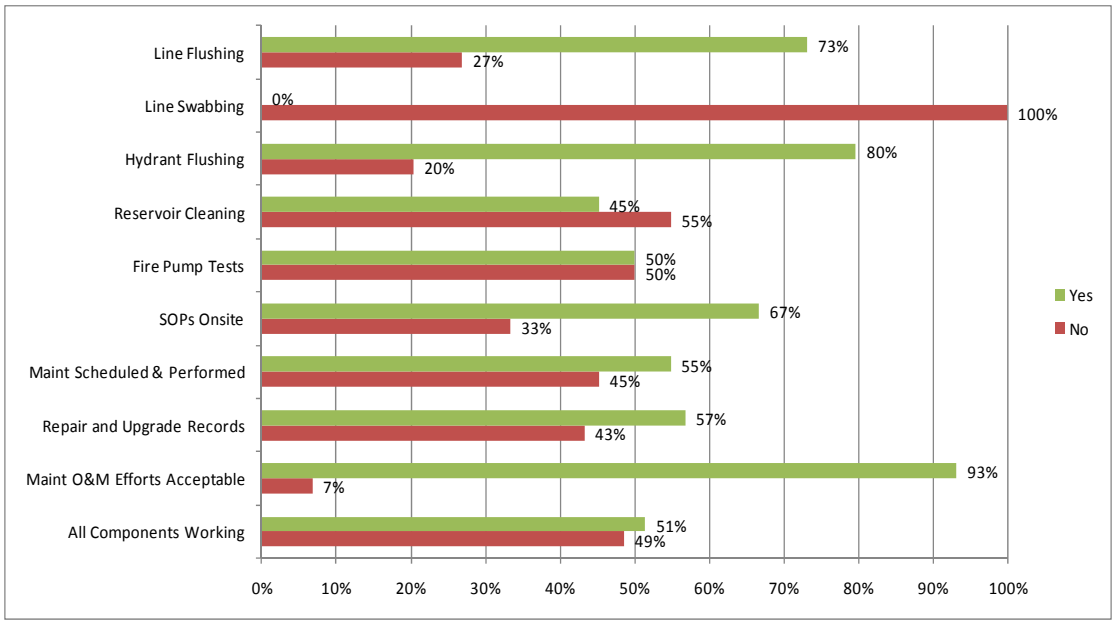


Figure 3.10 - Summary of Findings - Water Systems Operational Practices



One or more major components are not working for approximately 49% of the systems. Although the operators for approximately 80% of systems undertake line and hydrant flushing, none swab watermain, approximately 55% do not clean reservoirs and approximately 50% do not test fire pumps. Records of system maintenance and repairs were available for only 57% of the systems.

3.3.8 Component Risk - Water: Reporting

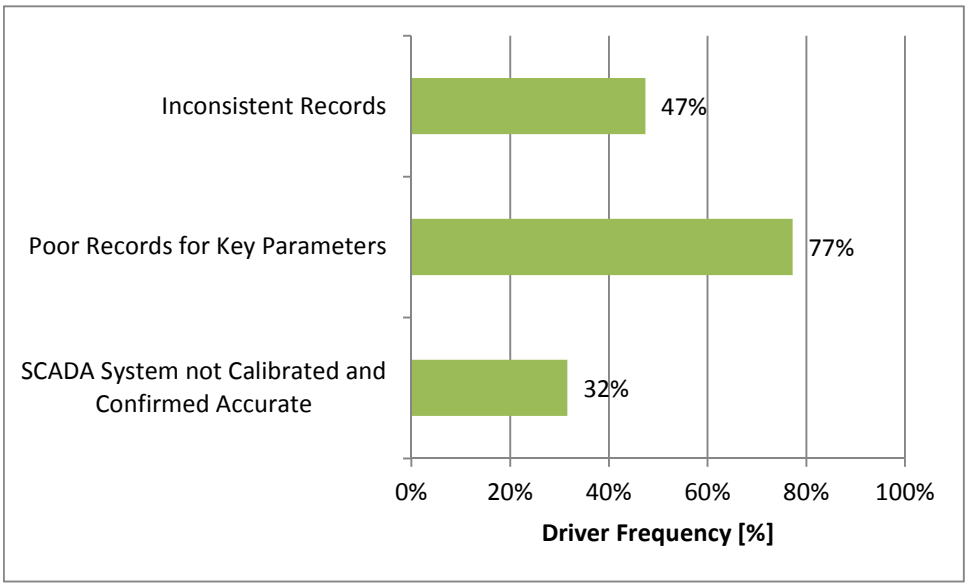
The risk associated with reporting has a mean score of 5.8 overall. The risk score of 3.5 for Municipal Type Agreement systems reflects the minimal reporting required for these type of systems. The mean reporting risk score by type of source is:

- groundwater at 7.9
- groundwater under the influence of surface water (GUDI) at 4.4
- surface water at 5.8
- Municipal Type Agreements at 3.5.

Poor record keeping and inconsistent records are the main drivers for reporting risk for all systems (77% and 47%). For systems with a Supervisory Data Acquisition (SCADA) system in place, an additional driver is that the instruments are not being calibrated to ensure that the information being recorded is accurate (32%).

An important consideration is that the systems were evaluated based on the requirements for monitoring and reporting as set out in INAC's Protocol. Typically, the monitoring and reporting being undertaken by the operators does not meet these requirements. Operator awareness and training could have a significant impact on these risk scores.

Figure 3.11 - Reporting Risk Drivers



3.3.9 Component Risk - Water: Operator

The risk associated with the operation has a mean score of 2.9 overall. Operator risk had the lowest overall component risk score for all types of systems. In the Alberta region, all but two of the systems have a primary operator and 75% of the systems have a secondary operator. Although more complicated systems (based on treatment classification) require an operator with a higher level of training, the risk associated with the operator is the highest for groundwater systems, which are not complicated systems. However, groundwater systems likely have the highest operator risk because operators are not being trained or certified. The mean operator risk score by type of source is:

- groundwater at 4.4
- groundwater under the direct influence of surface water (GUDI) at 1.4
- surface water at 2.7
- Municipal Type Agreement at 1.6.

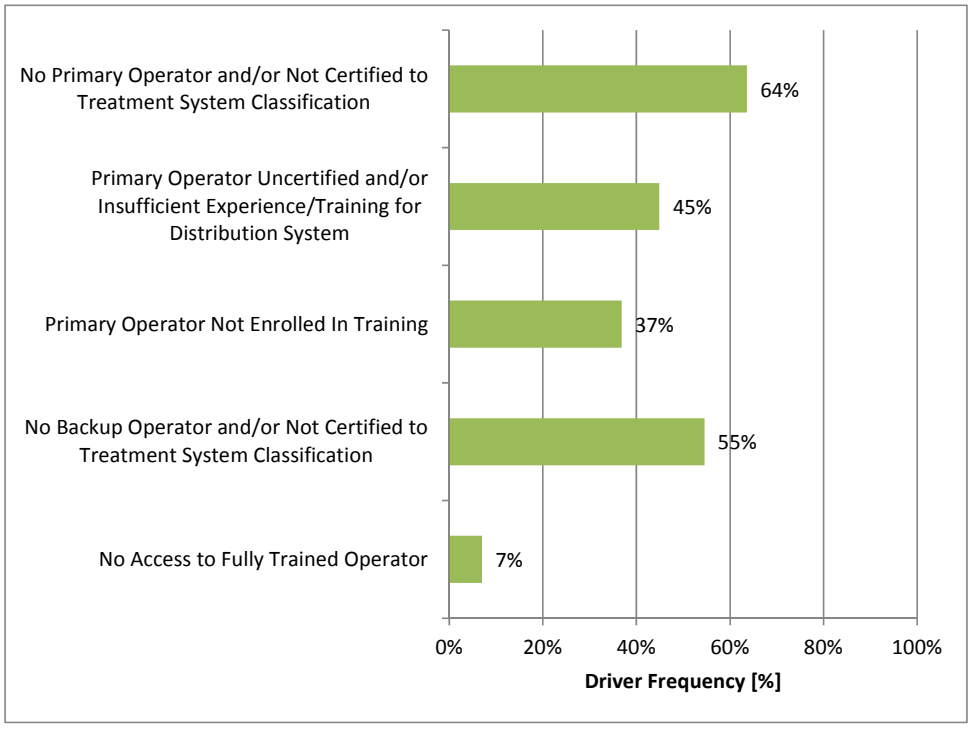
The extent to which existing systems have fully certified primary and backup operators is presented in Table 3.5. Of the 55 systems that require a certified operator for the water treatment system, 64% did not have a fully certified primary operator and 87% did not have a fully certified backup operator. Of the 69 systems that require a certified operator for the distribution system, 49% did not have a fully certified primary operator and 74% did not have a fully certified backup operator.

Table 3.5 - Water: Operator Status for Alberta Region

	Primary Operator		Backup Operator	
	Treatment	Distribution	Treatment	Distribution
No. of Systems Currently Without an Operator	2	3	14	20
No. of Systems with Operator with No Certification	17	27	16	20
No. of Systems with Operator Certified but not to the Required Level of the System	16	4	18	11
No. of Systems with Operator with Adequate Certification	20	35	7	18
No. of Systems Not Requiring Operators with Certification	27	13	27	13
Total No. of Systems	**82**	**82**	**82**	**82**

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 a risk assessment 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 operator. The overall risk score reflects a weighted average of risk scores under the individual categories.

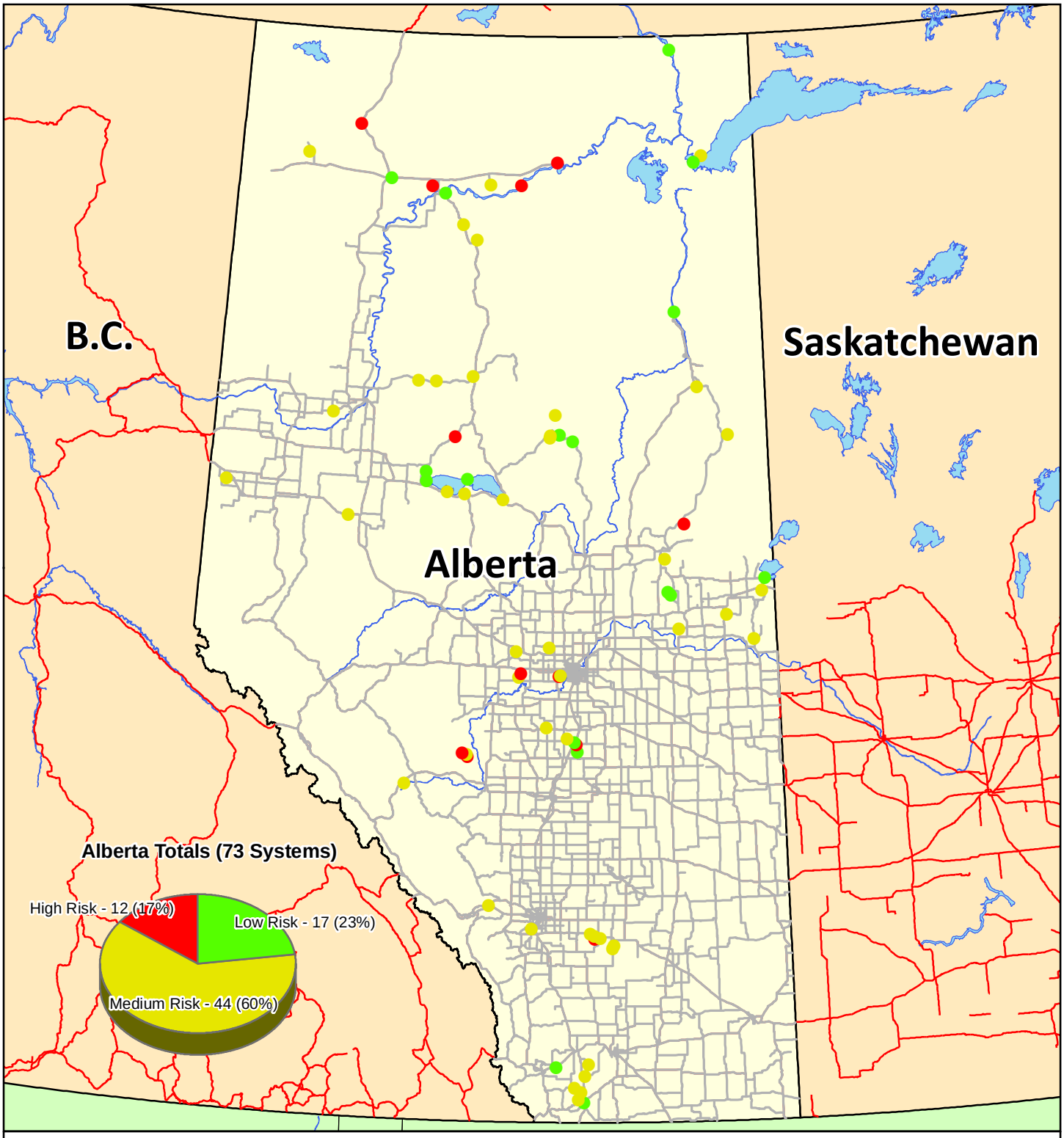
Each of the five risk categories is ranked numerically from 1 to 10, as is the overall risk level of the entire system. A risk ranking of 1.0 to 4.0 represents a low risk, a risk ranking of 4.1 to 7.0 represents a medium risk and a risk of 7.1 to 10.0 represents a high risk.

Of the 73 wastewater systems inspected:

- 12 are categorized as high overall risk
- 44 are categorized as medium overall risk
- 17 systems are categorized as low risk.

Appendix E.2 provides a table that summarizes 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
- Alberta Roads
- Major National Roads
- Major Lakes

Figure 3.13 - Alberta 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

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

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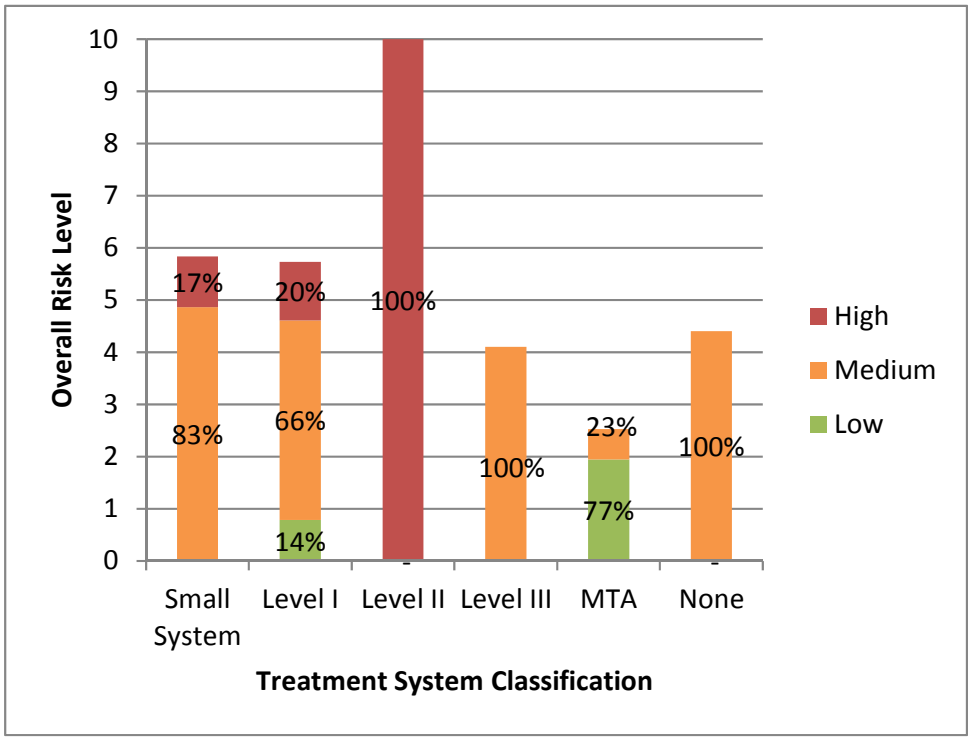
3.4.1 Overall System Risk by Treatment Classification

The following table demonstrates the correlation between the overall system risk and the classification level of the treatment system. In the Alberta region, the majority of the systems are Level I. There is only one Level II system and one Level III system, and there are six Small Systems. For Municipal Type Agreements, it is assumed that the municipality operates the system in accordance with provincial legislation, which results in a low-risk sewage receiver. 10 of the 13 Municipal Type Agreement systems are low risk.

There does not appear to be a correlation between the overall risk and the classification level in the Alberta region. Although treatment complexity increases from Small System to Level III, this increase does not appear to be a driver for overall system risk.

Figure 3.14 - Risk Profile Based on Wastewater Treatment System Classification



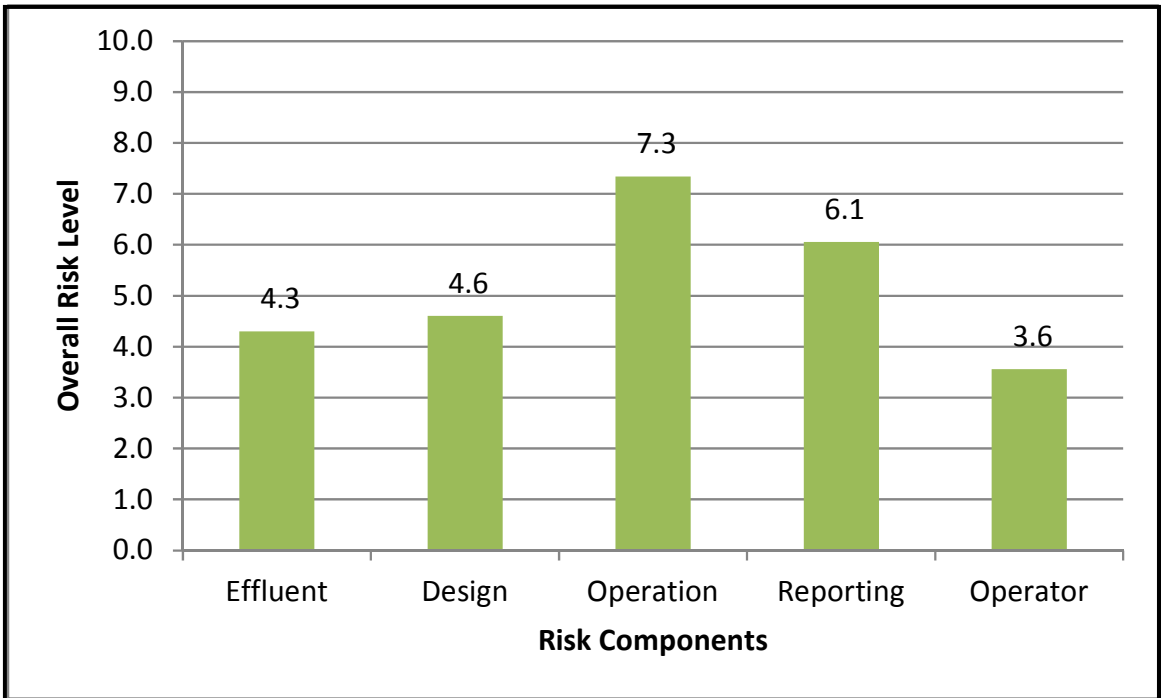
3.4.2 Overall System Risk by Number of Connections

In the Alberta region, there is no clear pattern between the overall system risk and 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	4.3	4.6	7.3	6.1	3.6
Minimum	1.0	1.0	1.0	1.0	1.0
Maximum	10.0	9.0	10.0	10.0	10.0
Std. Dev.	2.8	2.0	2.2	4.3	3.2

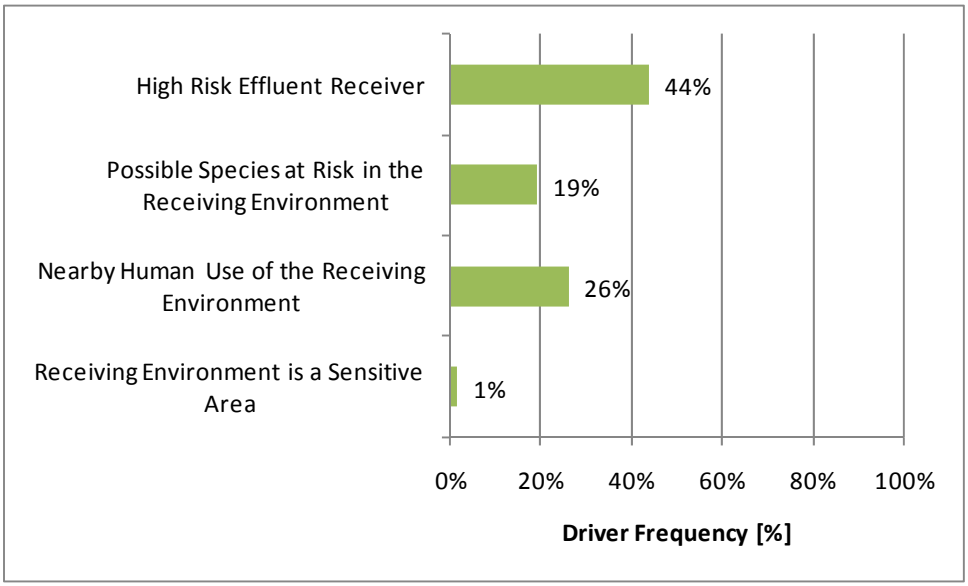
3.4.4 Component Risk - Wastewater: Effluent Receiver

The risk associated with the effluent receiver has a mean risk score of 4.3 and a fairly even distribution of the risk scores.

There are two key drivers of this risk component:

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

Figure 3.16 - Effluent Risk Drivers



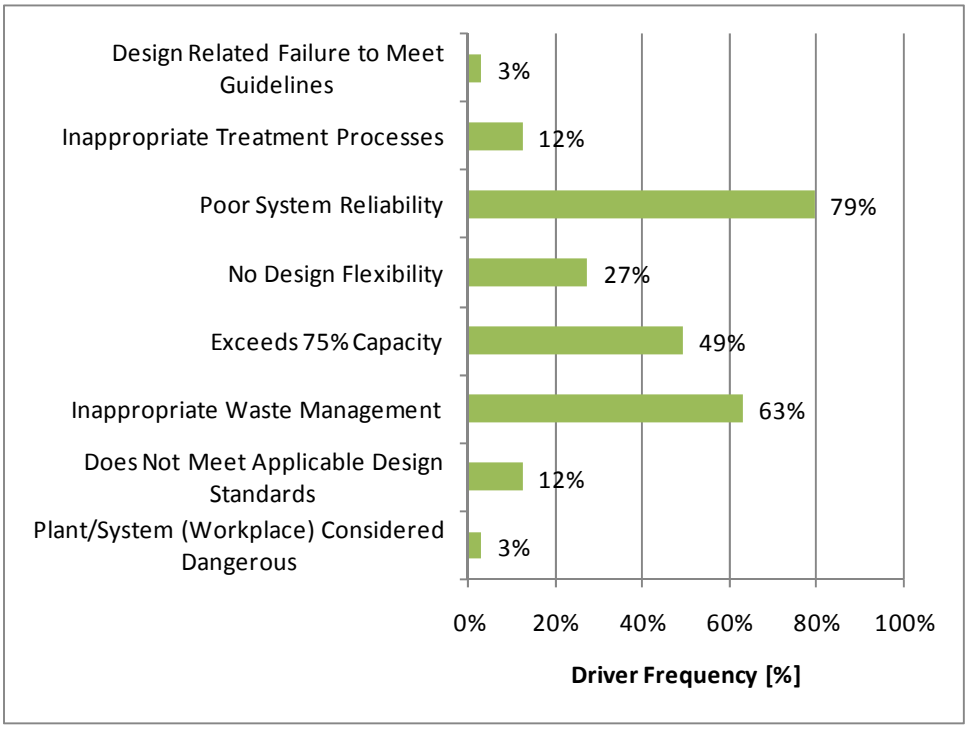
3.4.5 Component Risk - Wastewater: Design

The risk associated with the design has a mean score of 4.6. The design risk has the third lowest mean component score; however, excluding Municipal Type Agreement systems, 37 of the systems have a high- or medium-risk score and 23 have a low-risk score. In addition, all but one of the systems that have a high design risk also is a high overall risk system.

There are several key drivers of the design component risk scores in the region, including:

- inappropriate treatment processes
- problems with 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



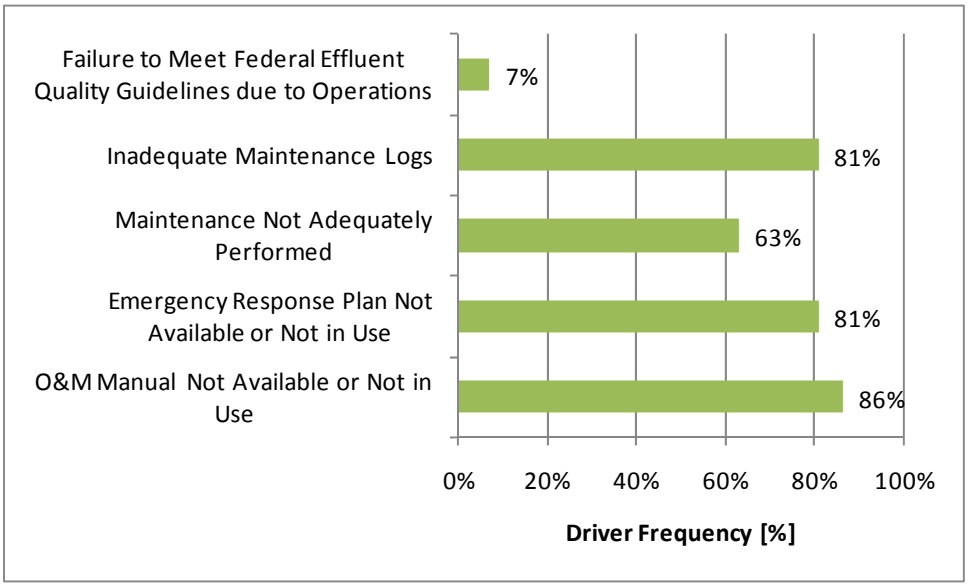
3.4.6 Component Risk - Wastewater: Operation

The risk associated with the operation has a mean score of 7.3. Most of the wastewater systems have a medium- or high-risk score. As a result, operation is identified as an area of opportunity for increased risk-mitigation efforts.

There are several key drivers of the operation risk in the region, including:

- failure to meet Federal Effluent Guidelines
- inadequate maintenance logs
- general maintenance not being adequately performed
- Emergency Response Plans not in place or not being used
- Operation & Maintenance manuals not available or not being used.

Figure 3.18 - Operation Risk Drivers



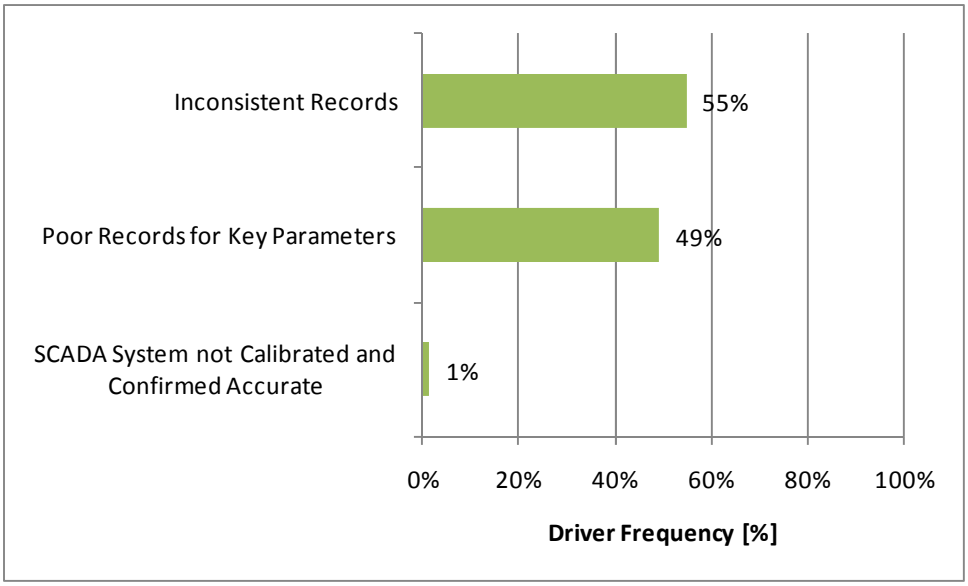
3.4.7 Component Risk - Wastewater: Reporting

The risk associated with reporting has a mean score of 6.1. This component score assesses the maintenance of effluent-testing and system-monitoring records. Poor record keeping is a significant factor in raising the overall risk ranking for many communities in this region. 32 systems have a low-risk score; 2 systems have a medium-risk score and 39 systems have a high-risk score.

The key drivers of the reporting risk in the region are:

- inconsistent record keeping
- inconsistent records for key parameters.

Figure 3.19 - Reporting Risk Drivers



3.4.8 Component Risk - Wastewater: Operator

The risk associated with the operator has a mean score of 3.6. Operator risk is determined by whether or not the operators have adequate certification. Only 12 systems have a high-risk level because operators are not certified adequately and/or because a backup operator is not available. All 13 of the Municipal Type Agreement systems have a low operator risk. Of the remaining 60 systems, 12 are high risk, 15 are medium risk and 33 are low risk.

The extent to which existing wastewater systems have fully certified primary and backup operators is presented in Table 3.6. Of the 59 systems which require a certified operator for the wastewater treatment system, 63% did not have a fully certified primary operator and 83% did not have a fully certified backup operator. Of the 66 systems which require a certified operator for the collection system, 61% did not have a fully certified primary operator and 73% did not have a fully certified backup operator.

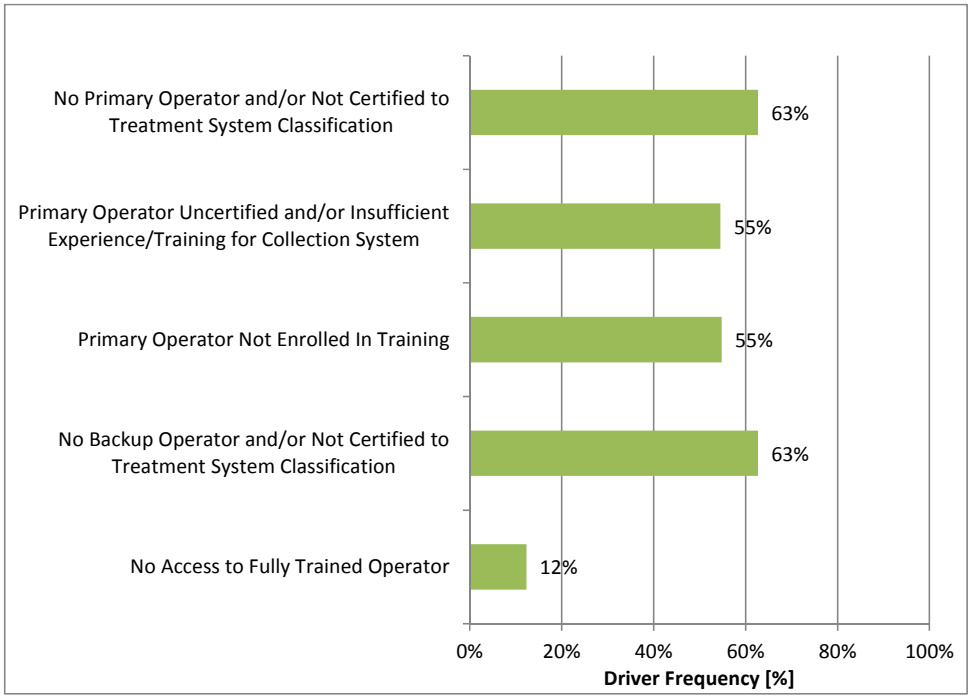
To ensure that the component risk remains low, it is important to ensure that all operators are enrolled in training and becoming certified to the level of their respective treatment systems.

Table 3.6 - Wastewater: Operator Status for Alberta Region

	Primary Operator		Backup Operator	
	Treatment	Collection	Treatment	Collection
No. of Systems Currently Without an Operator	3	4	22	25
No. of Systems with Operator with No Certification	28	30	15	18
No. of Systems with Operator Certified but not to the Required Level of the System	6	6	12	5
No. of Systems with Operator with Adequate Certification	22	26	10	18
No. of Systems Not Requiring Operators with Certification	14	7	14	7
Total No. of Systems	**73**	**73**	**73**	**73**

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	0%	24%	7%
Groundwater GUDI	0%	20%	20%
MTA	N/A	12%	12%
Surface Water	0%	35%	13%
Overall	**0%**	**23%**	**11%**

Table 3.8 - Plans Summary: Wastewater

Percentage of Wastewater Systems that have a (an)…	
Maintenance Management Plan	Emergency Response Plan
10%	19%

3.5.1 Source Water Protection Plan (SWPP)

Source water protection planning is one component in 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.

For the Alberta region, there are no Source Water Protection Plans in place.

3.5.2 Maintenance Management Plans (MMP)

Maintenance Management Plans are intended to improve the effectiveness of maintenance activities. They plan, schedule, and document preventative maintenance activities, and they document unscheduled maintenance. 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 Alberta region, 24% of groundwater systems, 20% of groundwater under the direct influence of surface water (GUDI) systems, and 35% of surface water systems have a Maintenance Management Plan in place. For wastewater systems, 10% of the systems have a Maintenance Management Plan in place. Please note: the above statistics do not include Municipal Type Agreements.

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 in responding to emergency situations. Emergency Response Plans should be in place for both water and wastewater systems. They include key contact information for those who should be notified and 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.

11% of the water systems and 19% of the wastewater systems have an Emergency Response Plan in place. The First Nations Technical Services Advisory Group’s Circuit Rider Trainers have been assisting communities by providing a generic template for an Emergency Response Plan that can be modified to suit the needs of individual communities.

4.0 Cost Analysis

4.1 Upgrade to Meet INAC's Protocol: 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 contain 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 $103.6 million.

Table 4.1 provides a breakdown of the estimated total capital costs. A separate line item is included for engineering and contigency.

Figure 4.1 provides a comparison graph of each of the categories.

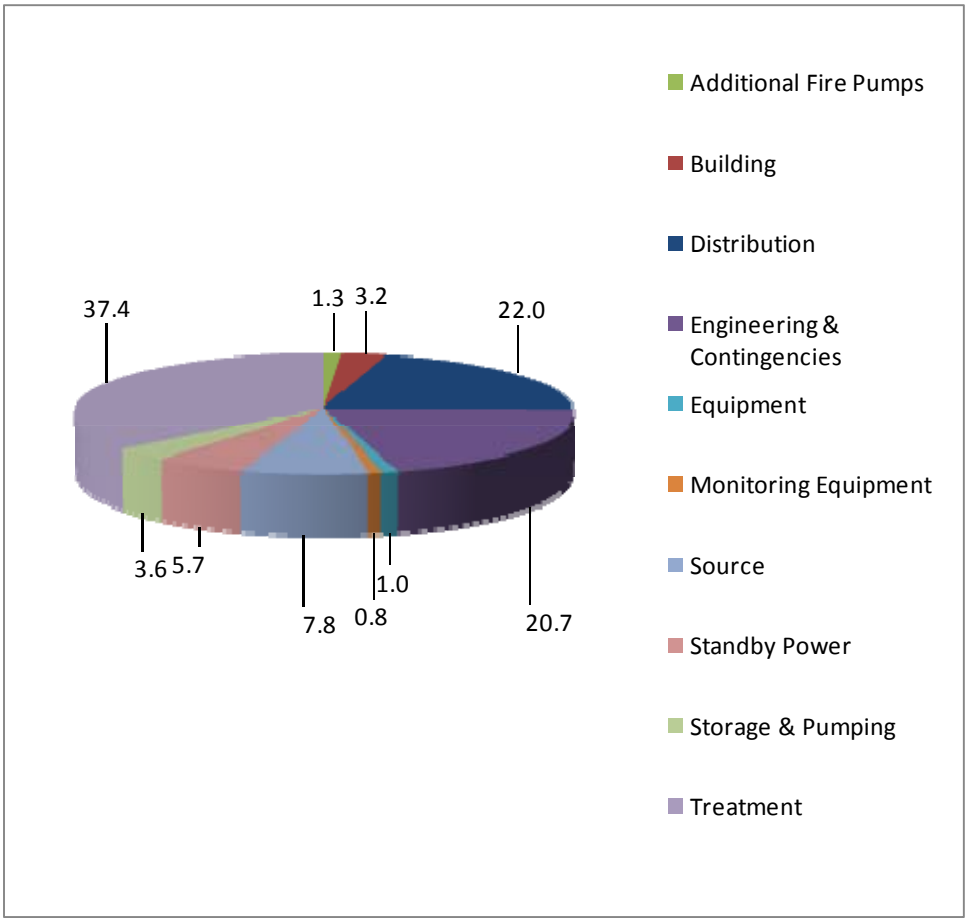
Table 4.1 - Estimated Total Construction Costs: Water

Description	Protocol - Estimated Cost	Federal - Estimated Cost	Provincial - Estimated Cost
Building	$3,239,500	$230,000	$1,968,500
Distribution	$22,020,000	$5,064,000	$6,300,000
Equipment	$997,900	$980,700	$994,600
Additional Fire Pumps	$1,340,000	$0	$1,340,000
Monitoring Equipment	$835,250	$512,750	$885,250
Source	$7,779,550	$3,473,000	$7,235,050
Storage & Pumping	$3,561,000	$2,847,500	$3,506,000
Treatment	$37,425,600	$24,273,500	$37,420,100
Standby Power	$5,695,000	$75,000	$5,505,000
Engineering & Contingencies	$20,735,000	$9,390,250	$16,287,000
Construction Total Estimate	**$103,628,800**	**$46,846,700**	**$81,441,500**

There are 9 water systems that may potentially have groundwater under the direct influence of surface water (GUDI) supplies. Upgrade costs for these systems are estimated assuming that they will prove to be secure groundwater supplies and recommendations for GUDI studies are identified to confirm this.

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 Protocol: Water ($ - M)



Treatment, Distribution and Source are the construction categories with the highest cumulative costs to meet upgrades.

Treatment costs include:

- Providing spare chemical feed equipment.
- Providing spare disinfection equipment.
- Providing additional filter trains.
- Providing secondary containment for treatment chemicals.
- Providing specific treatment equipment (i.e. arsenic, manganese, etc.).
- Providing contact piping.
- Providing surge suppression/uninterruptible power supplies for critical electronic equipment.
- Upgrading the capacity of existing water treatment plant.

Distribution costs include:

- Installing blow offs on dead ends.
- Installing isolation valves.
- Looping distribution systems.
- Installing additional fire hydrants.
- Providing additional water trucks.
- Replacing cisterns.
- Replacing pipeline.

Source costs include:

- Abandoning and decommissioning wells.
- Constructing raw water pipelines.
- Drilling, testing, developing and equipping new wells.
- Providing aeration systems for freeze protection.
- Providing wellhead protection.
- Providing standby power.

Table 4.2 - Estimated Total Non- Construction Costs: Water

Description	Protocol - Estimated Cost	Federal - Estimated Cost	Provincial - Estimated Cost
Training	$820,000	$820,000	$820,000
GUDI Studies	$410,000	$0	$410,000
Plans/Documentation	$4,245,000	$2,985,000	$4,245,000
Studies	$1,150,000	$585,000	$1,055,000
Non-Construction Total Estimate	**$6,625,000**	**$4,390,000**	**$6,530,000**

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	$1,392,350
Operations	$408,000
Operator	$920,000
Water O&M Total Estimated Cost	**$2,720,350**

The total estimated cost, inlcuding construction and non-construction costs, for water system upgrades to meet the INAC Protocol is $110 million. This excludes costs associated with potentially GUDI systems, which prove to be GUDI systems as discussed previously.

4.2 Upgrade to Meet INAC's Protocol: Wastewater

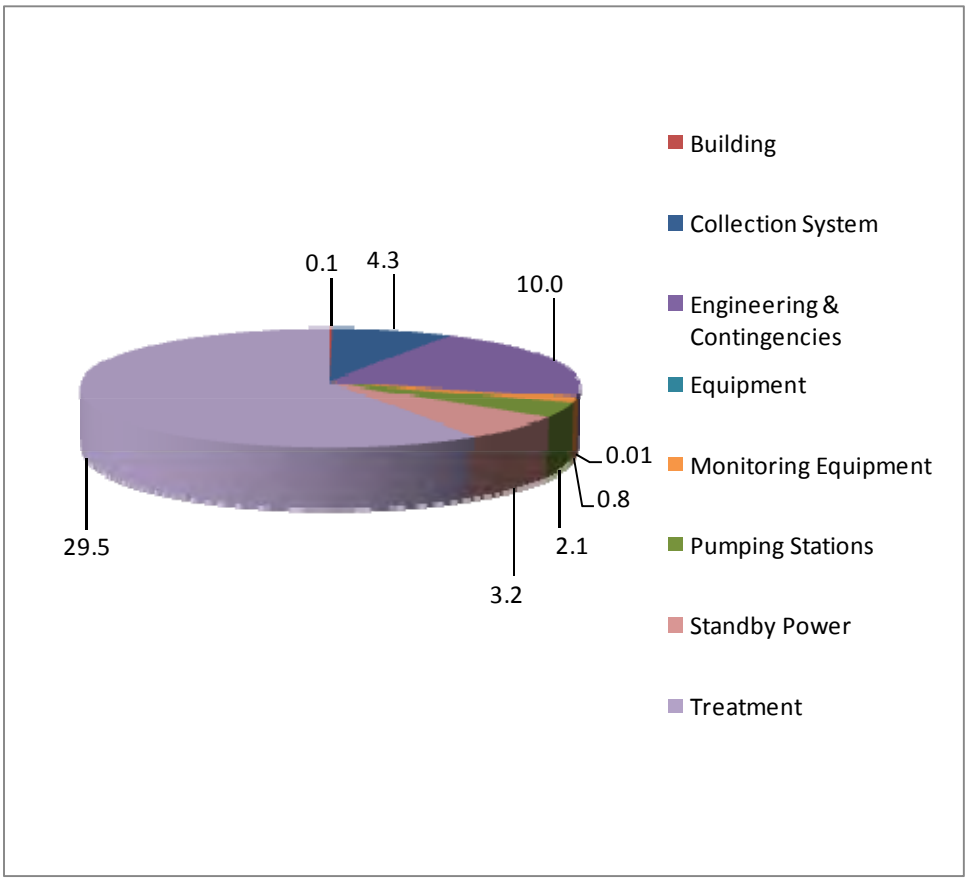
The total construction cost estimate for wastewater system upgrades to meet INAC Protocol is $50 million. Below is a list of the specific needs of the systems, the number of systems impacted by upgrades, and the total cost for each need.

Increasing treatment capacity, upgrading collection systems and providing standby power account for over 74% of the cost associated with necessary upgrades. 14 systems require increased 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	$100,000	$0	$0
Collection System	$4,260,000	$3,980,000	$4,260,000
Equipment	$5,000	$5,000	$5,000
Monitoring Equipment	$817,000	$19,500	$817,000
Pumping Stations	$2,056,000	$2,056,000	$2,056,000
Treatment	$29,466,500	$18,686,500	$29,466,500
Standby Power	$3,235,000	$3,235,000	$3,235,000
Engineering & Contingencies	$10,019,050	$7,012,650	$9,994,700
Construction Total Estimate	**$49,958,550**	**$34,994,650**	**$49,834,200**

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



Treatment, Collection System and Standby Power are the categories with the highest cumulative upgrade costs.

Treatment costs include:

- Constructing additional lagoon cells.
- Constructing new mechanical treatment facilities.
- Providing fences for security.
- Providing flow meters.
- Providing new pumping stations.

Collection System costs include:

- Installing cleanouts.
- Providing new sewage trucks.
- Retrofitting sewage 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	$310,000	$310,000	$310,000
Plans/Documentation	$1,277,500	$917,500	$1,277,500
Studies	$245,000	$205,000	$245,000
Non-Construction Total Estimate	**$1,832,500**	**$1,432,500**	**$1,832,500**

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	$92,500
Operations	$6,000
Operator	$280,000
Wastewater O&M Total Estimated Cost	**$378,500**

The total estimated cost, including construction and non-construction costs, for wastewater system upgrades is $51.8 million.

4.3 Upgrade Cost Summary

Table 4.7 provides a summary of the upgrade costs to meet INAC's Protocol, 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	$110,253,800	$51,791,050
Upgrade to meet Federal Guidelines	$51,236,700	$36,427,150
Upgrade to meet Provincial Guidelines	$87,971,500	$51,666,700

The following tables present a breakdown of the estimated upgrade costs to meet INAC's Protocols by overall risk level.

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

Risk Level	Short Term	Long Term	Total
High	$39,776,944	$0	**$39,776,944**
Medium	$67,708,774	$0	**$67,708,774**
Low	$2,768,082	$0	**$2,768,082**
Total	**$110,253,800**	**$0**	**$110,253,800**

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

Risk Level	Short Term	Long Term	Total
High	$15,674,195	$0	**$15,674,195**
Medium	$33,876,445	$0	**$33,876,445**
Low	$2,240,410	$0	**$2,240,410**
Total	**$51,791,050**	**$0**	**$51,791,050**

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 Needs: Water

Asset Code	Description	Estimated Cost
A5A	Buildings	$831,386
B1B	Watermains	$449,430
B1C/B1D	Treatment	$1,115,250
B1E	Reservoirs	$1,902,850
B1G	Standpipe/Truckfill	$1,385,450
B1F	Community Wells	$162,850
B1I	Low Lift Pumping	$106,500
B1H	High Lift Pumping	$322,150
E4A	Trucks	$357,450
B1Z	Other	$285,600
	Water ACRS Total Estimated Cost	**$6,918,916**

Table 4.11 - ACRS Identified Needs: Wastewater

Asset Code	Description	Estimated Cost
A5B	Buildings	$183,800
B2A	Sewers	$141,542
B2H/B2J	Lift Stations & Forcemains	$1,679,451
B2C/B2D	Treatment	$37,500
B2E/B2I	Lagoons	$3,131,750
B2F	Septic Systems	$64,950
E3A	Trucks	$234,800
	Wastewater ACRS Total Estimated Cost	**$5,473,793**

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 of the recommended servicing alternatives.

Table 4.12 - Future Servicing Costs

	Total Estimated Cost		Cost Per Connection	
	Water	Wastewater	Water	Wastewater
Future Servicing Cost	$410,000,000	$390,000,000	$19,600	$18,500
Annual O&M to service future growth	$50,300,000	$26,300,000	$2,400	$1,300

The evaluation of future servicing included continuing to service the existing population with the same level of service that was currently in place and evaluating the options for providing service to the future 10 year growth for the community. Existing servicing included piped, trucked and individual servicing. In some cases, for example, the use of shootouts, the option of providing a higher level of service to some or all of the existing homes was also considered in the overall servicing strategy.

Predominantly, it was found that 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 compact subdivision setting adjacent to the existing serviced area. This however will need to be confirmed through detailed studies for each community.

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

In several areas of Alberta, regional pipelines are in consideration or development. It is strongly worthwhile First Nations located adjacent to these areas, to consider joining the pipeline, which would mean, in effect, they would receive water through a Municipal Type Agreement.

5.0 Regional Summary

All 44 First Nations in the Alberta Region were visited during the completion of this project. The 44 First Nations are serviced by 82 water systems (including 25 Municipal Type Agreement systems) and 73 wastewater systems (including 13 Municipal Type Agreement systems). Several of the First Nations include multiple communities that are located far from each other.

The types of systems vary not only from First Nation to First Nation, but also from community to community within one First Nation. In the Alberta region, 69% of the homes are serviced by communal water (38% piped and 31% trucked), 31% are serviced by individual wells and less than 1% have no water service.

There are 23 surface water systems in the Alberta region. One of the common concerns for systems using lake water was that the water levels appear to be dropping. Lower lake-water levels appear to be affecting the quality of the raw water, which has reportedly changed over the last five years. Lower water levels are also having an impact on the intake location: some First Nations have had to extend their intake lines into deeper water. Because the raw water quality is poorer than it used to be, the cost of treatment is higher, and this will have a significant impact on future servicing costs.

There are 29 groundwater systems and 5 groundwater under the direct influence of surface water (GUDI) systems. It is recommended that communities that have a proven groundwater source continue to use groundwater to meet their needs for future growth.

There are 25 First Nations serviced by Municipal Type Agreements. With the expansion of regional pipelines, Municipal Type Agreements may become available to other First Nations as a servicing option.

There are a total of 73 wastewater systems: 54 lagoons, 13 Municipal Type Agreement systems, 3 mechanical sewage treatment systems, 1 communal septic system and 2 other treatment type systems. This is a cost- effective solution to providing wastewater servicing. It should be noted, however, that only 43% of the homes are serviced by communal wastewater, and the remaining 57% are serviced by individual septic systems or shootouts, or have no service. Shoot-outs are considered to be a major environmental and health concern because they discharge raw sewage in close proximity to the dwellings.

There are 21 water systems and 12 wastewater systems in the Alberta region identified as high-risk systems. Although there are multiple factors contributing to risk, design and operational concerns are given the most weight, particularly when the concern is related to the protection of public health or the environment. The high risk systems in the region typically require system upgrades or improved operational procedures to meet the guidelines for treated water quality or sewage effluent quality.

The data suggests that operator risk is the lowest of the component risks. However, it is important to provide ongoing training for operators to ensure that all systems are operated and maintained by trained/certified operators, and to ensure that operators complete monitoring and record keeping in accordance with INAC's Protocols.

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

Various individual First Nations commented that current Operation & Maintenance budgets are often insufficient to retain operators, to provide ongoing component replacement, and to perform all of the monitoring and recording requirements.

Wastewater sampling prior to effluent discharge appears to be another area that could be addressed in order to reduce the overall risk significantly. Sampling, testing and recording the effluent quality prior to discharge would reduce the reporting risk for these systems.

In the Alberta region, both Health Canada and the First Nations Technical Services Advisory Group (TSAG) are very active within the communities. In most communities, Health Canada provides Community Health Representatives, who regularly sample the water quality of treated and distributed water. TSAG provides the Circuit Rider Training Program to train and certify operators.

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.

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NEEGAN BURNSIDE

Appendix B

Water System Summary

NEEGAN BURNSIDE

Appendix B.1
Water System Summary

Regional Roll-Up Summary

Region: ALBERTA
Total No. of First Nations: 44
Participating No. of First Nations: 44
Participation Level: 100%
No. of Community Reports Issued: 54

Water

		Groundwater	GUDI	Surface	MTA	Totals
Total No. of Systems		**29**	**5**	**23**	**25**	**82**
System Age						
	0-5 years (2006 - 2010)	2	0	3	3	**8**
	6-10 years (2001 - 2005)	3	3	3	2	**11**
	10-15 years (1996 - 2000)	7	1	3	4	**15**
	15 -20 years (1991 - 1995)	5	0	4	1	**10**
	> 20 years (≤ 1990)	12	1	10	15	**38**
Treatment						
	None - Direct Use	1	0	0	0	**1**
	Disinfection only	17	0	0	0	**17**
	Conventional Filtration	11	5	23	1	**40**
	MTA	0	0	0	24	**24**
Classification - Treatment						
	Small system	7	0	0	0	**7**
	Level I	18	0	0	0	**18**
	Level II	2	5	12	0	**19**
	Level III	0	0	11	0	**11**
	MTA	0	0	0	25	**25**
	None	2	0	0	0	**2**

				Groundwater	GUDI	Surface	MTA	Totals
Total No. of Systems				**29**	**5**	**23**	**25**	**82**
Classification - Distribution								
	Small system			20	1	10	4	**35**
	Level I			8	2	12	8	**30**
	Level II			1	2	1	0	**4**
	MTA			0	0	0	10	**10**
	None			0	0	0	3	**3**
Distribution								
	Piped			17	2	5	7	**31**
	Trucked			1	0	1	8	**10**
	Self Haul			0	0	0	0	**0**
	Combined			11	3	17	10	**41**
Water Quality								
	Fails Health							
		Yes, fails health due to:		15	0	18	12	**45**
			Design	4	0	6	3	**13**
			Operation	6	0	5	0	**11**
			Combination	4	0	7	5	**16**
			Unknown	1	0	0	4	**5**
	Fails Aesthetic							
		Yes, fails aesthetic due to:		20	1	11	0	**32**
			Design	9	0	2	0	**11**
			Operation	6	1	3	0	**10**
			Combination	4	0	6	0	**10**
			Unknown	1	0	0	0	**1**
Primary Operator - Treatment								
	Not certified			12	0	5	0	**17**
	No operator			2	0	0	0	**2**
	Not required			2	0	0	25	**27**
	Certified to Level			12	3	5	0	**20**
	Certified			1	2	13	0	**16**

		Groundwater	GUDI	Surface	MTA	Totals	
Total No. of Systems		**29**	**5**	**23**	**25**	**82**	
Back-up Operator - Treatment							
	Not certified	8	0	8	0	**16**	
	No operator	10	0	4	0	**14**	
	Not required	2	0	0	25	**27**	
	Certified to Level	4	1	2	0	**7**	
	Certified	5	4	9	0	**18**	
Primary Operator - Distribution							
	Not certified	14	0	6	7	**27**	
	No operator	2	0	0	1	**3**	
	Not required	0	0	0	13	**13**	
	Certified to Level	13	5	13	4	**35**	
	Certified	0	0	4	0	**4**	
Back-up Operator - Distribution							
	Not certified	8	0	8	4	**20**	
	No operator	12	0	4	4	**20**	
	Not required	0	0	0	13	**13**	
	Certified to Level	4	2	8	4	**18**	
	Certified	5	3	3	0	**11**	
Risk (mean)						**Mean**	**Mean excluding MTA**
	Final	6.6	4.2	6.1	4.4	**5.7**	**6.2**
	Source	5.9	9.2	9.5	1.3	**5.7**	**7.6**
	Design	6.6	3.8	6.2	5.0	**5.8**	**6.2**
	Operations	7.5	4.8	6.3	6.3	**6.6**	**6.8**
	Reporting	7.9	4.4	5.8	3.5	**5.8**	**6.8**
	Operator	4.4	1.4	2.7	1.6	**2.9**	**3.5**

NEEGAN BURNSIDE

Appendix B.2

Wastewater System Summary

Regional Roll-Up Summary

Region: ALBERTA
Total No. of First Nations: 44
Participating No. of First Nations: 44
Participation Level: 100%
No. of Community Reports Issued: 54

Wastewater

		Septic	Aerated Lagoon	Facultative Lagoon	Mechanical	Other	MTA	Totals
Total No. of Systems		**1**	**2**	**52**	**3**	**2**	**13**	**73**
System Age								
	0-5 years (2006 - 2010)	0	0	3	2	0	0	**5**
	6-10 years (2001 - 2005)	0	1	8	0	2	1	**12**
	10-15 years (1996 - 2000)	0	0	13	0	0	1	**14**
	15 -20 years (1991 - 1995)	0	0	11	0	0	2	**13**
	> 20 years (≤ 1990)	1	1	17	1	0	9	**29**
Classification - Treatment								
	Small System	1	0	5	0	0	0	**6**
	MTA	0	0	0	0	0	13	**13**
	Level I	0	2	47	1	1	0	**51**
	Level II	0	0	0	1	0	0	**1**
	Level III	0	0	0	1	0	0	**1**
	None	0	0	0	0	1	0	**1**
Classification - Collection								
	Small System	1	1	31	3	2	4	**42**
	Level I	0	1	19	0	0	3	**23**
	Level II	0	0	1	0	0	0	**1**
	MTA	0	0	0	0	0	3	**3**
	None	0	0	1	0	0	3	**4**
Collection								
	Piped	1	1	32	2	1	7	**44**
	Trucked	0	0	3	0	0	4	**7**
	Combined	0	1	17	1	1	2	**22**
Effluent Quality								
	No data	1	2	45	1	2	13	**64**
	Meets	0	0	2	1	0	0	**3**
	Does not meet	0	0	5	1	0	0	**6**

	Septic	Aerated Lagoon	Facultative Lagoon	Mechanical	Other	MTA	Totals
Total No. of Systems	**1**	**2**	**52**	**3**	**2**	**13**	**73**
Primary Operator - Treatment							
Not certified	1	0	25	2	0	0	**28**
No operator	0	0	3	0	0	0	**3**
Not required	0	0	0	0	1	13	**14**
Certified to Level	0	2	18	1	1	0	**22**
Certified	0	0	6	0	0	0	**6**
Back-Up Operator - Treatment							
Not certified	0	1	13	1	0	0	**15**
No operator	1	0	19	1	1	0	**22**
Not required	0	0	0	0	1	13	**14**
Certified to Level	0	1	9	0	0	0	**10**
Certified	0	0	11	1	0	0	**12**
Primary Operator - Collection							
Not certified	1	0	24	2	1	2	**30**
No operator	0	0	3	0	0	1	**4**
Not required	0	0	1	0	0	6	**7**
Certified to Level	0	2	19	1	1	3	**26**
Certified	0	0	5	0	0	1	**6**
Back-Up Operator - Collection							
Not certified	0	1	14	1	0	2	**18**
No operator	1	0	18	1	2	3	**25**
Not required	0	0	1	0	0	6	**7**
Certified to Level	0	1	15	1	0	1	**18**
Certified	0	0	4	0	0	1	**5**
Receiver							
Large river	0	0	1	1	0	0	**2**
River	0	0	12	1	0	0	**13**
Lake, reservoir	0	0	3	0	0	0	**3**
Creek	0	1	11	0	0	0	**12**
Wetland	0	1	13	0	0	0	**14**
Sub-surface / Ground	0	0	5	0	1	0	**6**
Tile field	1	0	0	1	0	0	**2**
Evaporation	0	0	4	0	0	0	**4**
Other	0	0	3	0	1	0	**4**
MTA	0	0	0	0	0	13	**13**

	Septic	Aerated Lagoon	Facultative Lagoon	Mechanical	Other	MTA	Totals	
Total No. of Systems	**1**	**2**	**52**	**3**	**2**	**13**	**73**	
Risk (mean)							**Mean**	**Mean excluding MTA**
Final	7.4	6.0	5.7	6.6	4.0	2.5	**5.2**	**5.8**
Effluent Receiver	3.0	4.0	5.0	5.7	4.5	1.5	**4.3**	**4.9**
Design	7.0	7.0	5.0	4.3	5.5	2.2	**4.6**	**5.1**
Operations	10.0	9.0	8.0	5.7	7.0	4.8	**7.3**	**7.9**
Reporting	10.0	10.0	6.7	7.7	1.0	3.1	**6.1**	**6.7**
Operator	8.0	1.0	4.2	5.7	1.0	1.0	**3.6**	**4.1**

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.

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Appendix D

First Nation Water Summaries

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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
438	Alexander	6731	ALEXANDER NO. 134 (6650)	MTA	MTA	1989				MTA	Underground	MTA	Level I	888	83	111	2	14895.8	179
437	Alexis Nakota Sioux Nation	6730	ALEXIS INDIAN RESERVE NO. 133 (6649)	Surface Water	Level II	1997	821	450	450	Yes	Underground	720	Level I	551	95	0	0	11549	121
445	Beaver First Nation	6739	BEAVER - BOYER NO. 164 (6661)	Surface Water	Level III	1995	233	233	164	Yes	Underground	409	Small System	521	0	132	2		
460	Beaver Lake Cree Nation	6764	BEAVER LAKE NO. 131 (6701)	Surface Water	Level II	1982	259.2	181.4	216.72	Yes	Underground	365	Small System	430	34	68	1	10417	306
458	Bigstone Cree Nation	6757	BIGSTONE - WABASCA NO. 166 (6691)	MTA	MTA	0			62	MTA	None	MTA	MTA	492	0	78	3		
458	Bigstone Cree Nation	6758	BIGSTONE - WABASCA NO. 166A (6692)	MTA	MTA	0			757	MTA		MTA	Level I	1091	143	30	3	7003.5	48
458	Bigstone Cree Nation	6759	BIGSTONE - WABASCA NO. 166B (6693)	MTA	MTA	0			14.4	MTA	None	MTA	Small System	328	0	52	2		
458	Bigstone Cree Nation	6760	BIGSTONE - WABASCA NO. 166C (6694)	Surface Water	Level II	2001	254	254	183	Yes	Underground	460	Small System	347	26	29	2	3383	130
458	Bigstone Cree Nation	6761	BIGSTONE - WABASCA NO. 166D (6695)	MTA	MTA	1999			1130.6	MTA	Underground	MTA	Level I	1666	203	61	3	15330	75
435	Blood Tribe (Kainai)	6725	BLOOD NO. 148 - LEVERN (6645)	Groundwater	Level I	2004	450	450	351	Yes	Underground	1018	Level I	1199	75	147	4	7399	98
435	Blood Tribe (Kainai)	6728	BLOOD NO. 148 - MOSES LAKE (6645)	MTA	MTA	1968	Unknown	Unknown	552	MTA	None	MTA	MTA	1075	69	130	4	9465.2	137
435	Blood Tribe (Kainai)	6726	BLOOD NO. 148 - OLD AGENCY (6645)	Groundwater	Level I	2006	916	916	68	Yes	Underground	220	Level I	270	11	39	4	9544.34	867
435	Blood Tribe (Kainai)	6723	BLOOD NO. 148 - ST. MARY (6645)	Groundwater	Level I	1995	Unknown	Unknown	183	Yes	Underground	1010	Level I	108	20	0	0	2859	142
435	Blood Tribe (Kainai)	6724	BLOOD NO. 148 - ST. PAUL (6645)	Groundwater	Level I	1996	240	240	212	Yes	Underground	350	Level I	216	40	0	0	500.2	12
435	Blood Tribe (Kainai)	6722	BLOOD NO. 148 - STANDOFF (UPPER/LOWER) (6645)	Groundwater	Level I	1997	3456	3456	1334	Yes	Underground	3636	Level I	3315	376	238	4	58904	156
435	Blood Tribe (Kainai)	6727	BLOOD NO. 148 - WHOOP UP (6645)	Groundwater GUDI	Level II	2001	262	262	96	Yes	Underground	96	Small System	102	11	8	4	6441	585
470	Chipewyan Prairie First Nation	6776	CHIPEWYAN PRAIRIE - JANVIER NO. 194 (6726)	MTA	MTA	1997			402	MTA		MTA	Level I	458	115	15	1	5305	46
464	Cold Lake First Nations	6768	COLD LAKE NO. 149 (6712)	MTA	MTA	1973	314	273	273	MTA	Underground	MTA	Level I	1191	29	209	2	12591	434
448	Dene Tha'	6745	DENE THA' - BUSHE RIVER NO. 207 (6670)	MTA	MTA	0				MTA	None	MTA	NA	511	0	142	1		
448	Dene Tha'	6746	DENE THA' - HAY LAKE NO. 209 CHATEH (6671)	Surface Water	Level III	1967	538	538	462	Yes	Underground	2394	Level I	1215	86	206	1	8642	100
448	Dene Tha'	6747	DENE THA' - UPPER HAY RIVER NO. 212 MEANDER (6673)	Groundwater	Level I	1984	622	622	405	Yes	Underground	1040	Small System	467	120	10	1	5271	43
450	Driftpile First Nation	6749	DRIFTPILE RIVER NO. 150 (6677)	Surface Water	Level III	2006	600	600	595	Yes	Underground	1650	Level I	1037	166	89	2	18987.95	114
451	Duncan's First Nation	6750	DUNCANS NO. 151A (6678)	Groundwater	Small System	1993	330	330	150	Yes	Underground	374	Small System	195	35	14	1	5028	143
440	Enoch Cree Nation	6733	ENOCH - STONY PLAIN NO. 135 (6652)	Groundwater	Level I	1972	1032	1032	507	Yes	Underground	275	Level I	969	88	100	3	4178	47
440	Enoch Cree Nation	NEW001	MILLENIUM (NE SUBDIVISION) WATER SYSTEM	MTA	MTA	2005	51	51	51	MTA	Standpipe	MTA	Level I	52	10	0	0	500	50
443	Ermineskin Tribe	6736	ERMINESKIN NO. 138 (6657)	Groundwater	Level I	1970	1296	862	903	Yes	Underground	1892	Level I	1162	130	41	3	17318	133
467	Fort McKay First Nation	6773	FORT MCKAY NO. 174 (6718)	MTA	MTA	2004	900	900	672	MTA		MTA	MTA	700	183	0	0	1130	6
468	Fort McMurray First Nation	6774	FORT MCMURRAY - GREGOIRE LAKE NO. 176 (6722)	MTA	MTA	1985	185	185	185	MTA	Underground	MTA	MTA	331	0	78	1		
465	Frog Lake	6771	FROG LAKE - UNIPOUHEOS NO. 121 (6715)	Surface Water	Level II	1994	1227	984	873	Yes	Underground	800	Level II	900	28	233	7	20026.5	715
469	Heart Lake	6775	HEART LAKE NO. 167 (6725)	Surface Water	Level II	1986	238	238	175	Yes	Underground	1245	Small System	255	17	30	1	2991	175
449	Horse Lake First Nation	6748	HORSE LAKES NO. 152B (6676)	Groundwater	Small System	1985	907	690	480	Yes	Underground	324	Small System	492	91	0	0	6549	71
452	Kapawe'no First Nation	6751	KAPAWE'NO FIRST NATION NO. 150B (6680)	MTA	MTA	1984	114	114	114	MTA	None	MTA	MTA	126	40	4	0	1827	45
452	Kapawe'no First Nation	7099	KAPAWE'NO FIRST NATION NO. 231 NARROWS (9092)	Surface Water	Level II	2001	138	138	20	Yes	Standpipe	48	Small System	1	0	0	0		
466	Kehewin Cree Nation	6772	KEHEWIN NO. 123 (6717)	Surface Water	Level II	1993	838	518	478	Yes	Underground	105	Level I	1189	98	204	3	18399	187
447	Little Red River Cree Nation	6743	LRRCN - FOX LAKE NO. 162 (6666)	Surface Water	Level III	1988	1088	1088	1018	Yes	Underground	528	Level I	2187	183	106	2	12789	69
447	Little Red River Cree Nation	6778	LRRCN - GARDEN CREEK INDIAN SETTL. (6736)	Surface Water	Level III	1987	563	563	546	Yes	Underground	510	Level I	727	97	0	0	5277	54
447	Little Red River Cree Nation	6744	LRRCN - JOHN D'OR PRAIRIE NO. 215 (6667)	Surface Water	Level III	1987	760	760	687	Yes	Underground	880	Level I	1545	195	87	2	8562	43
476	Loon River Cree	6464	LOON RIVER NO. 235 (9389)	MTA	MTA	1999	388	388	388	MTA	Underground	MTA	Level I	573	90	49	0	25002	277
439	Louis Bull Tribe	6738	LOUIS BULL - PIGEON LAKE NO. 138A (6660)	Groundwater	Level I	2006	5.52	5.52	3	Yes	Underground	137	Small System	95	0	0	0		
439	Louis Bull Tribe	NEW002	LOUIS BULL NO. 138B (6651) - Pumphouse #1	Groundwater	None	1980	230	230	234	Yes	Underground	114	Small System	240	34	0	0	6719	197
439	Louis Bull Tribe	6732	LOUIS BULL NO. 138B (6651) - Pumphouse #2	Groundwater	Level I	1994	655	655	585	Yes	Underground	1138	Level I	720	94	8	0	6130	65
439	Louis Bull Tribe	NEW001	LOUIS BULL NO. 138B (6651) - Pumphouse #3	Groundwater	None	2004	262	262	56	Yes	Grade level	2.2	Small System	57	8	0	0	5195	649
453	Lubicon Lake	NEW001	LUBICON LAKE COMMUNITY WATER SYSTEM	MTA	MTA	0				MTA		MTA	NA	309	0	63	1		
461	Mikisew Cree First Nation	7097	MIKISEW - DOG HEAD NO. 218 (8495)	MTA	MTA	0				MTA	None	MTA	NA	101	0	39	2		
461	Mikisew Cree First Nation	6777	MIKISEW CREE - ALLISON BAY NO. 219 (6734)	Groundwater	Small System	1998	118	118	102	Yes	Underground	249	Small System	82	33	0	0	1982	60
442	Montana	6735	MONTANA NO. 139 (6656)	Groundwater	Level II	1996	327	327	332	Yes	Underground	624	Small System	483	73	25	1	4727	64
431	O'Chiese First Nation	NEW001	BREMNERVILLE WATER TREATMENT PLANT	Groundwater	Small System	1988	112	112	38	Yes			Small System	39	11	0	0	540	49
431	O'Chiese First Nation	6714	TOWNSITE WATER TREATMENT PLANT	Groundwater	Small System	1996	199	199	79	Yes	Underground	480	Small System	81	23	0	0	1796	78
441	Paul	6734	PAUL - WABAMUN NO. 133A (6653)	Groundwater	Level I	1982	795	795	246	Yes	Underground	636	Small System	362	47	25	1	11785	250
436	Piikani Nation	6729	PIIKANI RESERVE (6647)	Groundwater GUDI	Level II	1987	2200	1581	1070	Yes	Underground	1258	Level I	1522	188	40	2	119122.5	633
462	Saddle Lake First Nation	6765	SADDLE LAKE NO. 125 (6702)	Surface Water	Level III	1987	1382	1382	1271	Yes	Underground	650	Level I	4508	178	449	5	11125	62
462	Saddle Lake First Nation	6766	WHITEFISH LAKE NO. 128 - GOODFISH (6703)	Surface Water	Level II	1981	786	786	421	Yes	Underground	1450	Level I	1943	29	241	4	6960.5	240
462	Saddle Lake First Nation	NEW001	WHITEFISH WATER TREATMENT PLANT	Surface Water	Level II	1997	190	190	117	Yes	Underground	475	Small System	284	0	40	1		
444	Samson	6737	SAMSON NO. 137 (6658)	Groundwater	Level I	1978	2780	2780	1591	Yes	Underground	1136	Level II	1675	313	0	0	22532.5	71
454	Sawridge	6752	SAWRIDGE NO. 150G (6683)	MTA	MTA	0			41.3	MTA	None	MTA	MTA	51	16	4	1	1556	97
430	Siksika Nation	6712	SIKSIKA INDIAN RESERVE NO. 146 - EAST SIKSIKA (6636)	Groundwater GUDI	Level II	2000	528	528	602	Yes	Underground	345	Level II	532	131	0	0	28832	220
430	Siksika Nation	6708	SIKSIKA INDIAN RESERVE NO. 146 - SHOULDICE (6636)	Groundwater	Small System	1989	240	240	52	Yes	Underground	38	Small System	53	13	0	0	500	38
430	Siksika Nation	NEW001	WEST SIKSIKA (ARTHUR AYOUNGMAN) WATER SYSTEM	Groundwater GUDI	Level II	2002	1210	1210	970	Yes	Underground	650	Level II	1941	478	0	0	42997	89
477	Smith's Landing First Nation	NEW001	SMITH'S LANDING FIRST NATION MTA	MTA	MTA	0				MTA	None	MTA	MTA	50	0	17	0		
433	Stoney Nakoda Tribal Nation	NEW001	NAKODA RESORT (CASINO) WATER SYSTEM	MTA	MTA	2008	Unknown	Unknown	23	MTA		MTA	MTA	24	5	0	0		
433	Stoney Nakoda Tribal Nation	6716	STONEY - BIG HORN NO. 144A (6640)	Groundwater	Level II	2000	544	544	78	Yes	Underground	910	Small System	80	16	0	0	11736	733
433	Stoney Nakoda Tribal Nation	6717	STONEY - EDEN VALLEY NO. 216 (6641)	Surface Water	Level II	2006	504	504	229	Yes	ade level, Undergrou	1040	Small System	192	13	27	0	4136	318

REGION: ALBERTA
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
433	Stoney Nakoda Tribal Nation	6719	STONEY NO. 142-143-144 EAST MORLEY (6642)	Surface Water	Level II	1999	14.4	14.4	14	Yes	Underground	45	Small System	29	6	0	0	3860	643
433	Stoney Nakoda Tribal Nation	6718	STONEY NO. 142-143-144 MORLEY TOWNSITE (6642)	Groundwater GUDI	Level II	2001	761	761	269	Yes	ade level, Undergrou	1390	Level I	1036	10	207	6	9491	949
433	Stoney Nakoda Tribal Nation	6720	STONEY NO. 142-143-144 NORTH SIDE (6642)	Groundwater	Level I	1978	1503	1503	233	Yes	Standpipe	640	Small System	239	50	0	0	15333	306
455	Sturgeon Lake Cree Nation	6754	STURGEON LAKE NO. 154 (6685)	Surface Water	Level III	1994	1200	1200	571	Yes	Underground	717	Level I	1408	116	170	3	13190	113
456	Sucker Creek	6755	SUCKER CREEK NO. 150A (6688)	Surface Water	Level III	2004	864	864	280	Yes	Underground	800	Level I	845	55	174	3	11060	201
434	Sunchild First Nation	NEW001	BLUE PUMPHOUSE	Groundwater	Level I	1993	173	173	173	No	None		Small System	122	25	0	0	700	28
434	Sunchild First Nation	6721	SUNCHILD NO. 202 (6644)	Groundwater	Level I	1985	483	272	191	Yes	Underground	760	Small System	196	40	0	0	5766	144
434	Sunchild First Nation	NEW003	WEST PUMPHOUSE (Westend Pumphouse)	Groundwater	Level I	1995	129.6	130	84.8	Yes	Grade level	5	Small System	29	6	0	0	640	106
434	Sunchild First Nation	NEW002	WEST WATER TREATMENT PLANT (New Subdivision WTP)	Groundwater	Level I	2001	164	164	143	Yes	Underground	480	Small System	147	30	0	0	1085	36
457	Swan River First Nation	6756	SWAN RIVER NO. 150E (6690)	MTA	MTA	2007	500	500	226.2	MTA	Underground	MTA	Small System	324	66	0	0	2118	32
457	Swan River First Nation	NEW001	SWAN RIVER NO. 150E (6690) - Rural Water System	MTA	MTA	1990	114.3	38.1	114.3	MTA	None	MTA	MTA	127	26	0	0		
446	Tallcree		Beaver Ranch Truck Haul System	MTA	MTA	1990				MTA	None	MTA	MTA	31	0	6	0		
446	Tallcree	6741	TALL CREE NO. 173 - SOUTH (6664)	Surface Water	Level III	1989	120	120	262	Yes	Underground	590	Small System	257	49	1	0	6064	123
446	Tallcree	6742	TALL CREE NO. 173A NORTH (6665)	Surface Water	Level III	2008	348	348	320	Yes	Underground	700	Small System	242	40	1	0	3956	98
446	Tallcree	7100	TALLCREE - FORT VERMILION NO. 173B (9142)	MTA	MTA	1994				MTA	None	MTA	Small System	113	22	0	0	1569	71
432	Tsuu T'ina Nation		Business Park MTA Water System	MTA	MTA	2007			169	MTA	None	MTA	Small System	207	50	0	0	9093	181
432	Tsuu T'ina Nation	6715	TSUU T'INA NATION NO. 145 (6639)	Groundwater	Small System	1989	233	233	89	Yes	Grade level	46	Small System	152	7	30	1	2307	329
459	Whitefish Lake	6762	WHITEFISH LAKE #459 - UTIKOOMAK LAKE NO. 155 (Atikameg) (6696)	Surface Water	Level II	1989	544.8	346	344	Yes	Underground	360	Level I	897	138	104	2	24197.2	175
459	Whitefish Lake	6763	WHITEFISH LAKE #459 - UTIKOOMAK LAKE NO. 155A (6697)	Groundwater	Level I	1997	138	22	15	Yes	Underground	255	Small System	119	0	30	1		
474	Woodland Cree First Nation	6462	WOODLAND CREE NO. 226 - CADOTTE LAKE (9067)	MTA	MTA	1999	377	377	377	MTA	None	MTA	Level I	913	64	126	0	9081	141

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
438	Alexander	6731	ALEXANDER NO. 134 (6650)	MTA	Meets Requirements	N/A	N/A	N/A	No	No	No	0
437	Alexis Nakota Sioux Nation	6730	ALEXIS INDIAN RESERVE NO. 133 (6649)	Surface Water	High Freq AND High Mag	Operation	Yes	Yes	Yes	Yes		2
445	Beaver First Nation	6739	BEAVER - BOYER NO. 164 (6661)	Surface Water	High Freq OR High Mag	Both	Yes	Yes	No	No	Yes	1
460	Beaver Lake Cree Nation	6764	BEAVER LAKE NO. 131 (6701)	Surface Water	High Freq OR High Mag	Design	Yes	No	No	No	No	0
458	Bigstone Cree Nation	6757	BIGSTONE - WABASCA NO. 166 (6691)	MTA	Meets Requirements	N/A	N/A	N/A	No	No	No	0
458	Bigstone Cree Nation	6758	BIGSTONE - WABASCA NO. 166A (6692)	MTA	Low Freq, Low Mag	Both	Yes	No	No	No	No	0
458	Bigstone Cree Nation	6759	BIGSTONE - WABASCA NO. 166B (6693)	MTA	Meets Requirements	N/A	N/A	N/A	N/A	No	No	0
458	Bigstone Cree Nation	6760	BIGSTONE - WABASCA NO. 166C (6694)	Surface Water	Meets Requirements	N/A	N/A	N/A	No	No	No	0
458	Bigstone Cree Nation	6761	BIGSTONE - WABASCA NO. 166D (6695)	MTA	Low Freq, Low Mag	Both	Yes	No	No	No	No	0
435	Blood Tribe (Kainai)	6725	BLOOD NO. 148 - LEVERN (6645)	Groundwater	Meets Requirements	N/A	N/A	N/A	No	No	No	0
435	Blood Tribe (Kainai)	6728	BLOOD NO. 148 - MOSES LAKE (6645)	MTA	Meets Requirements	N/A	N/A	N/A	No	No	No	0
435	Blood Tribe (Kainai)	6726	BLOOD NO. 148 - OLD AGENCY (6645)	Groundwater	Low Freq, Low Mag	Unknown	Yes	Yes	Yes	Yes	No	0
435	Blood Tribe (Kainai)	6723	BLOOD NO. 148 - ST. MARY (6645)	Groundwater	High Freq OR High Mag	Design	No	Yes	No	No	No	0
435	Blood Tribe (Kainai)	6724	BLOOD NO. 148 - ST. PAUL (6645)	Groundwater	High Freq OR High Mag	Design	Yes	Yes	No	No	Yes	1
435	Blood Tribe (Kainai)	6722	BLOOD NO. 148 - STANDOFF (UPPER/LOWER) (6645)	Groundwater	High Freq, Low Mag	Design	No	Yes	No	No	No	0
435	Blood Tribe (Kainai)	6727	BLOOD NO. 148 - WHOOP UP (6645)	Groundwater GUDI	Meets Requirements	N/A	N/A	N/A	No	No	No	0
470	Chipewyan Prairie First Nation	6776	CHIPEWYAN PRAIRIE - JANVIER NO. 194 (6726)	MTA	Meets Requirements	N/A	N/A	N/A	No	No	Yes	1
464	Cold Lake First Nations	6768	COLD LAKE NO. 149 (6712)	MTA	High Freq OR High Mag	Design	Yes	No	No	No	No	0
448	Dene Tha'	6745	DENE THA' - BUSHE RIVER NO. 207 (6670)	MTA	High Freq AND High Mag	Both	Yes	No	Yes	Yes	No	0
448	Dene Tha'	6746	DENE THA' - HAY LAKE NO. 209 CHATEH (6671)	Surface Water	High Freq OR High Mag	Both	Yes	Yes	No	No	Yes	1
448	Dene Tha'	6747	DENE THA' - UPPER HAY RIVER NO. 212 MEANDER (6673)	Groundwater	High Freq AND High Mag	Design	No	Yes	No	No	No	0
450	Driftpile First Nation	6749	DRIFTPILE RIVER NO. 150 (6677)	Surface Water	Meets Requirements	N/A	No	No	No	No	No	0
451	Duncan's First Nation	6750	DUNCANS NO. 151A (6678)	Groundwater	Meets Requirements	N/A	N/A	N/A	No	No	No	0
440	Enoch Cree Nation	6733	ENOCH - STONY PLAIN NO. 135 (6652)	Groundwater	Low Freq, Low Mag	Design	Yes	Yes	No	Yes	No	0
440	Enoch Cree Nation	NEW001	MILLENIUM (NE SUBDIVISION) WATER SYSTEM	MTA	Meets Requirements	N/A	N/A	N/A	No	No	No	0
443	Ermineskin Tribe	6736	ERMINESKIN NO. 138 (6657)	Groundwater	High Freq, Low Mag	Both	Yes	Yes	No	No	No	0
467	Fort McKay First Nation	6773	FORT MCKAY NO. 174 (6718)	MTA	Meets Requirements	N/A	N/A	N/A	No	No	No	0
468	Fort McMurray First Nation	6774	FORT MCMURRAY - GREGOIRE LAKE NO. 176 (6722)	MTA	Meets Requirements	N/A	N/A	N/A	No	No	No	0
465	Frog Lake	6771	FROG LAKE - UNIPOUHEOS NO. 121 (6715)	Surface Water	High Freq OR High Mag	Both	Yes	No	No	Yes	Yes	1
469	Heart Lake	6775	HEART LAKE NO. 167 (6725)	Surface Water	High Freq OR High Mag	Design	Yes	No	No	No		2
449	Horse Lake First Nation	6748	HORSE LAKES NO. 152B (6676)	Groundwater	High Freq OR High Mag	Design	Yes	Yes	No	No	Yes	1
452	Kapawe'no First Nation	6751	KAPAWE'NO FIRST NATION NO. 150B (6680)	MTA	Meets Requirements	N/A	N/A	N/A	No	No	No	0
452	Kapawe'no First Nation	7099	KAPAWE'NO FIRST NATION NO. 231 NARROWS (9092)	Surface Water	High Freq, Low Mag	Operation	Yes	No	No	No	Yes	1
466	Kehewin Cree Nation	6772	KEHEWIN NO. 123 (6717)	Surface Water	Meets Requirements	N/A	N/A	N/A	No	No	No	0
447	Little Red River Cree Nation	6743	LRRCN - FOX LAKE NO. 162 (6666)	Surface Water	High Freq OR High Mag	Both	Yes	Yes	No	No	No	0
447	Little Red River Cree Nation	6778	LRRCN - GARDEN CREEK INDIAN SETTL. (6736)	Surface Water	High Freq OR High Mag	Operation	Yes	Yes	No	No	Yes	1
447	Little Red River Cree Nation	6744	LRRCN - JOHN D'OR PRAIRIE NO. 215 (6667)	Surface Water	High Freq OR High Mag	Both	Yes	Yes	No	No		2
476	Loon River Cree	6464	LOON RIVER NO. 235 (9389)	MTA	Low Freq, Low Mag	Unknown	Yes	No	No	No	No	0
439	Louis Bull Tribe	6738	LOUIS BULL - PIGEON LAKE NO. 138A (6660)	Groundwater	High Freq, Low Mag	Both	Yes	Yes	No	No	No	0
439	Louis Bull Tribe	NEW002	LOUIS BULL NO. 138B (6651) - Pumphouse #1	Groundwater	High Freq, Low Mag	Design	No	Yes	No	No	No	0
439	Louis Bull Tribe	6732	LOUIS BULL NO. 138B (6651) - Pumphouse #2	Groundwater	Low Freq, Low Mag	Operation	No	Yes	No	No	No	0
439	Louis Bull Tribe	NEW001	LOUIS BULL NO. 138B (6651) - Pumphouse #3	Groundwater	High Freq, Low Mag	Design	No	Yes	No	No	No	0
453	Lubicon Lake	NEW001	LUBICON LAKE COMMUNITY WATER SYSTEM	MTA	High Freq AND High Mag	Both	Yes	No	Yes	Yes	No	0
461	Mikisew Cree First Nation	7097	MIKISEW - DOG HEAD NO. 218 (8495)	MTA	Meets Requirements	N/A	N/A	N/A	No	No	No	0
461	Mikisew Cree First Nation	6777	MIKISEW CREE - ALLISON BAY NO. 219 (6734)	Groundwater	Meets Requirements	N/A	N/A	N/A	No	No	No	0
442	Montana	6735	MONTANA NO. 139 (6656)	Groundwater	High Freq OR High Mag	Both	Yes	Yes	No	No	No	0
431	O'Chiese First Nation	NEW001	BREMNERVILLE WATER TREATMENT PLANT	Groundwater	High Freq AND High Mag	Both	Yes	No	No	No	Yes	1
431	O'Chiese First Nation	6714	TOWNSITE WATER TREATMENT PLANT	Groundwater	High Freq OR High Mag	Operation	N/A	N/A	No	No		2
441	Paul	6734	PAUL - WABAMUN NO. 133A (6653)	Groundwater	High Freq OR High Mag	Operation	Yes	Yes	No	No	No	0
436	Piikani Nation	6729	PIIKANI RESERVE (6647)	Groundwater GUDI	Meets Requirements	N/A	N/A	N/A	No	No	No	0

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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
462	Saddle Lake First Nation	6765	SADDLE LAKE NO. 125 (6702)	Surface Water	Low Freq, Low Mag	Both	Yes	Yes	No	Yes	No	0
462	Saddle Lake First Nation	6766	WHITEFISH LAKE NO. 128 - GOODFISH (6703)	Surface Water	High Freq OR High Mag	Design	Yes	Yes	No	No	No	0
462	Saddle Lake First Nation	NEW001	WHITEFISH WATER TREATMENT PLANT	Surface Water	High Freq OR High Mag	Design	Yes	Yes	No	No	No	0
444	Samson	6737	SAMSON NO. 137 (6658)	Groundwater	High Freq, Low Mag	Design	No	Yes	No	No	Yes	1
454	Sawridge	6752	SAWRIDGE NO. 150G (6683)	MTA	Low Freq, Low Mag	Design	Yes	No	No	No	No	0
430	Siksika Nation	6712	SIKSIKA INDIAN RESERVE NO. 146 - EAST SIKSIKA (6636)	Groundwater GUDI	Meets Requirements	N/A	N/A	N/A	No	No	No	0
430	Siksika Nation	6708	SIKSIKA INDIAN RESERVE NO. 146 - SHOULDICE (6636)	Groundwater	High Freq, Low Mag	Operation	No	Yes	No	No	No	0
430	Siksika Nation	NEW001	WEST SIKSIKA (ARTHUR AYOUNGMAN) WATER SYSTEM	Groundwater GUDI	Low Freq, Low Mag	Operation	No	Yes	No	No	No	0
477	Smith's Landing First Nation	NEW001	SMITH'S LANDING FIRST NATION MTA	MTA	High Freq AND High Mag	Unknown	N/A	N/A	No	No	No	0
433	Stoney Nakoda Tribal Nation	NEW001	NAKODA RESORT (CASINO) WATER SYSTEM	MTA	Meets Requirements	N/A	N/A	N/A	No	No	No	0
433	Stoney Nakoda Tribal Nation	6716	STONEY - BIG HORN NO. 144A (6640)	Groundwater	Low Freq, Low Mag	Operation	Yes	Yes	No	Yes	Yes	1
433	Stoney Nakoda Tribal Nation	6717	STONEY - EDEN VALLEY NO. 216 (6641)	Surface Water	Low Freq, Low Mag	Operation	No	Yes	No	No	No	0
433	Stoney Nakoda Tribal Nation	6719	STONEY NO. 142-143-144 EAST MORLEY (6642)	Surface Water	Meets Requirements	N/A	N/A	N/A	No	No	Yes	1
433	Stoney Nakoda Tribal Nation	6718	STONEY NO. 142-143-144 MORLEY TOWNSITE (6642)	Groundwater GUDI	Meets Requirements	N/A	N/A	N/A	No	No	No	0
433	Stoney Nakoda Tribal Nation	6720	STONEY NO. 142-143-144 NORTH SIDE (6642)	Groundwater	Meets Requirements	N/A	N/A	N/A	No	No	No	0
455	Sturgeon Lake Cree Nation	6754	STURGEON LAKE NO. 154 (6685)	Surface Water	High Freq OR High Mag	Design	Yes	No	No	No	Yes	1
456	Sucker Creek	6755	SUCKER CREEK NO. 150A (6688)	Surface Water	High Freq OR High Mag	Design	Yes	No	No	No	No	0
434	Sunchild First Nation	NEW001	BLUE PUMPHOUSE	Groundwater	High Freq AND High Mag	Design	Yes	No	No	No	No	0
434	Sunchild First Nation	6721	SUNCHILD NO. 202 (6644)	Groundwater	High Freq AND High Mag	Operation	Yes	No	No	No	No	0
434	Sunchild First Nation	NEW003	WEST PUMPHOUSE (Westend Pumphouse)	Groundwater	High Freq AND High Mag	Operation	Yes	Yes	No	Yes	Yes	1
434	Sunchild First Nation	NEW002	WEST WATER TREATMENT PLANT (New Subdivision WTP)	Groundwater	High Freq AND High Mag	Operation	Yes	No	No	Yes	No	0
457	Swan River First Nation	6756	SWAN RIVER NO. 150E (6690)	MTA	High Freq OR High Mag	Unknown	Yes	No	No	No	No	0
457	Swan River First Nation	NEW001	SWAN RIVER NO. 150E (6690) - Rural Water System	MTA	High Freq OR High Mag	Unknown	Yes	No	No	No	No	0
446	Tallcree		Beaver Ranch Truck Haul System	MTA	High Freq, Low Mag	Both	Yes	No	N/A	No	No	0
446	Tallcree	6741	TALL CREE NO. 173 - SOUTH (6664)	Surface Water	High Freq OR High Mag	Both	Yes	Yes	No	Yes	Yes	1
446	Tallcree	6742	TALL CREE NO. 173A NORTH (6665)	Surface Water	Low Freq, Low Mag	Operation	Yes	No	No	No	Yes	1
446	Tallcree	7100	TALLCREE - FORT VERMILION NO. 173B (9142)	MTA	Low Freq, Low Mag	Design	Yes	No	No	No	No	0
432	Tsuu T'ina Nation		Business Park MTA Water System	MTA	Meets Requirements	N/A	N/A	N/A	No	No	No	0
432	Tsuu T'ina Nation	6715	TSUU T'INA NATION NO. 145 (6639)	Groundwater	High Freq, Low Mag	Both	No	Yes	No	No	No	0
459	Whitefish Lake	6762	WHITEFISH LAKE #459 - UTIKOOMAK LAKE NO. 155 (Atikameg) (6696)	Surface Water	Low Freq, Low Mag	Operation	Yes	No	No	No	No	0
459	Whitefish Lake	6763	WHITEFISH LAKE #459 - UTIKOOMAK LAKE NO. 155A (6697)	Groundwater	High Freq, Low Mag	Operation	Yes	Yes	No	No	Yes	1
474	Woodland Cree First Nation	6462	WOODLAND CREE NO. 226 - CADOTTE LAKE (9067)	MTA	High Freq OR High Mag	Unknown	Yes	No	No	No	No	0

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
438	Alexander	6731	ALEXANDER NO. 134 (6650)	MTA	Yes	Not Required	No Certification	No	Not Required	
437	Alexis Nakota Sioux Nation	6730	ALEXIS INDIAN RESERVE NO. 133 (6649)	Surface Water	Yes	Level II	No Certification	Yes	Not Required	No Certification
445	Beaver First Nation	6739	BEAVER - BOYER NO. 164 (6661)	Surface Water	Yes	No Certification	No Certification	No	Not Required	No Operator
460	Beaver Lake Cree Nation	6764	BEAVER LAKE NO. 131 (6701)	Surface Water	Yes	Level I	Level I	Yes	No Certification	No Certification
458	Bigstone Cree Nation	6757	BIGSTONE - WABASCA NO. 166 (6691)	MTA	NR	Not Required	Not Required	No	Not Required	Not Required
458	Bigstone Cree Nation	6758	BIGSTONE - WABASCA NO. 166A (6692)	MTA	Yes	Not Required	No Certification	Yes	Not Required	Level I
458	Bigstone Cree Nation	6759	BIGSTONE - WABASCA NO. 166B (6693)	MTA	NR	Not Required	Not Required	No	Not Required	Not Required
458	Bigstone Cree Nation	6760	BIGSTONE - WABASCA NO. 166C (6694)	Surface Water	Yes	No Certification	No Certification	Yes	Level II	Level II
458	Bigstone Cree Nation	6761	BIGSTONE - WABASCA NO. 166D (6695)	MTA	Yes	Not Required	No Certification	Yes	Not Required	Level II
435	Blood Tribe (Kainai)	6725	BLOOD NO. 148 - LEVERN (6645)	Groundwater	Yes	Level I	Level I	Yes	Not Required	No Operator
435	Blood Tribe (Kainai)	6728	BLOOD NO. 148 - MOSES LAKE (6645)	MTA	Yes	Not Required	No Certification	Yes	Not Required	No Certification
435	Blood Tribe (Kainai)	6726	BLOOD NO. 148 - OLD AGENCY (6645)	Groundwater	Yes	Level I	Level I	Yes	Not Required	No Operator
435	Blood Tribe (Kainai)	6723	BLOOD NO. 148 - ST. MARY (6645)	Groundwater	Yes	Level I	Level I	Yes	Not Required	No Operator
435	Blood Tribe (Kainai)	6724	BLOOD NO. 148 - ST. PAUL (6645)	Groundwater	Yes	Level I	Level I	Yes	Not Required	No Operator
435	Blood Tribe (Kainai)	6722	BLOOD NO. 148 - STANDOFF (UPPER/LOWER) (6645)	Groundwater	Yes	Level I	Level I	Yes	Not Required	No Operator
435	Blood Tribe (Kainai)	6727	BLOOD NO. 148 - WHOOP UP (6645)	Groundwater GUDI	Yes	Level I	Level I	Yes	Not Required	No Operator
470	Chipewyan Prairie First Nation	6776	CHIPEWYAN PRAIRIE - JANVIER NO. 194 (6726)	MTA	Yes	Not Required	No Certification	No	Not Required	
464	Cold Lake First Nations	6768	COLD LAKE NO. 149 (6712)	MTA	Yes	Not Required	No Certification	Yes	Not Required	No Certification
448	Dene Tha'	6745	DENE THA' - BUSHE RIVER NO. 207 (6670)	MTA	NR	Not Required	Not Required	No	Not Required	Not Required
448	Dene Tha'	6746	DENE THA' - HAY LAKE NO. 209 CHATEH (6671)	Surface Water	Yes	Level II	Level I	Yes	No Certification	Level I
448	Dene Tha'	6747	DENE THA' - UPPER HAY RIVER NO. 212 MEANDER (6673)	Groundwater	Yes	No Certification	No Certification	Yes	No Certification	No Certification
450	Driftpile First Nation	6749	DRIFTPILE RIVER NO. 150 (6677)	Surface Water	Yes	Level II	Level II	Yes	No Certification	No Certification
451	Duncan's First Nation	6750	DUNCANS NO. 151A (6678)	Groundwater	Yes	Not Required	No Operator	Yes	No Certification	No Certification
440	Enoch Cree Nation	6733	ENOCH - STONY PLAIN NO. 135 (6652)	Groundwater	Yes	No Certification	No Certification	No	Not Required	No Operator
440	Enoch Cree Nation	NEW001	MILLENIUM (NE SUBDIVISION) WATER SYSTEM	MTA	Yes	Not Required	No Certification	No	Not Required	
443	Ermineskin Tribe	6736	ERMINESKIN NO. 138 (6657)	Groundwater	Yes	Level I	Level I	Yes	Level I	Level I
467	Fort McKay First Nation	6773	FORT MCKAY NO. 174 (6718)	MTA	NR	Not Required	Not Required	No	Not Required	Not Required
468	Fort McMurray First Nation	6774	FORT MCMURRAY - GREGOIRE LAKE NO. 176 (6722)	MTA	NR	Not Required	Not Required	No	Not Required	Not Required
465	Frog Lake	6771	FROG LAKE - UNIPOUHEOS NO. 121 (6715)	Surface Water	Yes	Level I	Level I	Yes	Level I	Level I
469	Heart Lake	6775	HEART LAKE NO. 167 (6725)	Surface Water	Yes	Not Required	No Operator	Yes	Not Required	No Operator
449	Horse Lake First Nation	6748	HORSE LAKES NO. 152B (6676)	Groundwater	Yes	Not Required	No Operator	Yes	No Certification	No Certification
452	Kapawe'no First Nation	6751	KAPAWE'NO FIRST NATION NO. 150B (6680)	MTA	NR	Not Required	Not Required	No	Not Required	Not Required
452	Kapawe'no First Nation	7099	KAPAWE'NO FIRST NATION NO. 231 NARROWS (9092)	Surface Water	Yes	Level III	Level I	No	Not Required	No Operator
466	Kehewin Cree Nation	6772	KEHEWIN NO. 123 (6717)	Surface Water	Yes	No Certification	No Certification	No	Not Required	No Operator
447	Little Red River Cree Nation	6743	LRRCN - FOX LAKE NO. 162 (6666)	Surface Water	Yes	Not Required	No Operator	Yes	No Certification	No Certification
447	Little Red River Cree Nation	6778	LRRCN - GARDEN CREEK INDIAN SETTL. (6736)	Surface Water	Yes	No Certification	No Certification	Yes	No Certification	No Certification
447	Little Red River Cree Nation	6744	LRRCN - JOHN D'OR PRAIRIE NO. 215 (6667)	Surface Water	Yes	Not Required	No Operator	Yes	No Certification	No Certification
476	Loon River Cree	6464	LOON RIVER NO. 235 (9389)	MTA	Yes	Not Required	Level I	Yes	Not Required	No Certification
439	Louis Bull Tribe	6738	LOUIS BULL - PIGEON LAKE NO. 138A (6660)	Groundwater	Yes	No Certification	No Certification	No	Not Required	No Operator
439	Louis Bull Tribe	NEW002	LOUIS BULL NO. 138B (6651) - Pumphouse #1	Groundwater	Yes	No Certification	No Certification	No	Not Required	No Operator
439	Louis Bull Tribe	6732	LOUIS BULL NO. 138B (6651) - Pumphouse #2	Groundwater	Yes	No Certification	No Certification	No	Not Required	No Operator
439	Louis Bull Tribe	NEW001	LOUIS BULL NO. 138B (6651) - Pumphouse #3	Groundwater	Yes	No Certification	No Certification	No	Not Required	No Operator
453	Lubicon Lake	NEW001	LUBICON LAKE COMMUNITY WATER SYSTEM	MTA	No	Not Required		No	Not Required	
461	Mikisew Cree First Nation	7097	MIKISEW - DOG HEAD NO. 218 (8495)	MTA	Yes	Not Required	No Certification	Yes	Not Required	No Certification
461	Mikisew Cree First Nation	6777	MIKISEW CREE - ALLISON BAY NO. 219 (6734)	Groundwater	Yes	No Certification	No Certification	Yes	No Certification	No Certification
442	Montana	6735	MONTANA NO. 139 (6656)	Groundwater	Yes	Level II	Level II	Yes	No Certification	No Certification
431	O'Chiese First Nation	NEW001	BREMNERVILLE WATER TREATMENT PLANT	Groundwater	Yes	No Certification	No Certification	Yes	No Certification	No Certification
431	O'Chiese First Nation	6714	TOWNSITE WATER TREATMENT PLANT	Groundwater	Yes	No Certification	No Certification	Yes	No Certification	No Certification
441	Paul	6734	PAUL - WABAMUN NO. 133A (6653)	Groundwater	Yes	Level I	Level I	No	Not Required	No Operator
436	Piikani Nation	6729	PIIKANI RESERVE (6647)	Groundwater GUDI	Yes	Level I	Level I	Yes	Not Required	No Operator

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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
462	Saddle Lake First Nation	6765	SADDLE LAKE NO. 125 (6702)	Surface Water	Yes	Level II	Level I	Yes	Not Required	No Operator
462	Saddle Lake First Nation	6766	WHITEFISH LAKE NO. 128 - GOODFISH (6703)	Surface Water	Yes	Level II	Level II	Yes	Not Required	No Operator
462	Saddle Lake First Nation	NEW001	WHITEFISH WATER TREATMENT PLANT	Surface Water	Yes	Level II	Level II	Yes	Not Required	No Operator
444	Samson	6737	SAMSON NO. 137 (6658)	Groundwater	Yes	No Certification	No Certification	Yes	Level II	Level II
454	Sawridge	6752	SAWRIDGE NO. 150G (6683)	MTA	Yes	Not Required	No Certification	Yes	Not Required	No Certification
430	Siksika Nation	6712	SIKSIKA INDIAN RESERVE NO. 146 - EAST SIKSIKA (6636)	Groundwater GUDI	Yes	Level II	Level II	Yes	Level I	Level I
430	Siksika Nation	6708	SIKSIKA INDIAN RESERVE NO. 146 - SHOULDICE (6636)	Groundwater	Yes	Level II	Level II	Yes	Level I	Level I
430	Siksika Nation	NEW001	WEST SIKSIKA (ARTHUR AYOUNGMAN) WATER SYSTEM	Groundwater GUDI	Yes	Level II	Level II	Yes	Level I	Level I
477	Smith's Landing First Nation	NEW001	SMITH'S LANDING FIRST NATION MTA	MTA	NR	Not Required	Not Required	No	Not Required	Not Required
433	Stoney Nakoda Tribal Nation	NEW001	NAKODA RESORT (CASINO) WATER SYSTEM	MTA	NR	Not Required	Not Required	No	Not Required	Not Required
433	Stoney Nakoda Tribal Nation	6716	STONEY - BIG HORN NO. 144A (6640)	Groundwater	Yes	No Certification	No Certification	No	Not Required	No Operator
433	Stoney Nakoda Tribal Nation	6717	STONEY - EDEN VALLEY NO. 216 (6641)	Surface Water	Yes	Level I	Level I	Yes	Level I	Level I
433	Stoney Nakoda Tribal Nation	6719	STONEY NO. 142-143-144 EAST MORLEY (6642)	Surface Water	Yes	Level II	Level I	Yes	Level II	Level I
433	Stoney Nakoda Tribal Nation	6718	STONEY NO. 142-143-144 MORLEY TOWNSITE (6642)	Groundwater GUDI	Yes	Level II	Level II	Yes	Level II	Level I
433	Stoney Nakoda Tribal Nation	6720	STONEY NO. 142-143-144 NORTH SIDE (6642)	Groundwater	Yes	Level II	Level I	Yes	Level II	Level I
455	Sturgeon Lake Cree Nation	6754	STURGEON LAKE NO. 154 (6685)	Surface Water	Yes	No Certification	No Certification	Yes	No Certification	No Certification
456	Sucker Creek	6755	SUCKER CREEK NO. 150A (6688)	Surface Water	Yes	Level II	Level I	Yes	No Certification	No Certification
434	Sunchild First Nation	NEW001	BLUE PUMPHOUSE	Groundwater	No	No Certification	No Certification	No	Not Required	No Operator
434	Sunchild First Nation	6721	SUNCHILD NO. 202 (6644)	Groundwater	Yes	No Certification	No Certification	No	Not Required	No Operator
434	Sunchild First Nation	NEW003	WEST PUMPHOUSE (Westend Pumphouse)	Groundwater	No	Not Required	No Operator	No	Not Required	No Operator
434	Sunchild First Nation	NEW002	WEST WATER TREATMENT PLANT (New Subdivision WTP)	Groundwater	Yes	No Certification	No Certification	No	Not Required	No Operator
457	Swan River First Nation	6756	SWAN RIVER NO. 150E (6690)	MTA	Yes	Not Required	No Certification	Yes	Not Required	No Certification
457	Swan River First Nation	NEW001	SWAN RIVER NO. 150E (6690) - Rural Water System	MTA	NR	Not Required	Not Required	No	Not Required	Not Required
446	Tallcree		Beaver Ranch Truck Haul System	MTA	NR	Not Required	Not Required	No	Not Required	Not Required
446	Tallcree	6741	TALL CREE NO. 173 - SOUTH (6664)	Surface Water	Yes	Not Required	Level I	Yes	Level II	Level I
446	Tallcree	6742	TALL CREE NO. 173A NORTH (6665)	Surface Water	Yes	Level II	Level I	Yes	Not Required	Level I
446	Tallcree	7100	TALLCREE - FORT VERMILION NO. 173B (9142)	MTA	Yes	Not Required	Level I	Yes	Not Required	
432	Tsuu T'ina Nation		Business Park MTA Water System	MTA	Yes	Not Required	No Certification	Yes	Not Required	No Certification
432	Tsuu T'ina Nation	6715	TSUU T'INA NATION NO. 145 (6639)	Groundwater	Yes	No Certification	No Certification	Yes	No Certification	No Certification
459	Whitefish Lake	6762	WHITEFISH LAKE #459 - UTIKOOMAK LAKE NO. 155 (Atikameg) (6696)	Surface Water	Yes	Not Required	No Operator	No	Not Required	No Operator
459	Whitefish Lake	6763	WHITEFISH LAKE #459 - UTIKOOMAK LAKE NO. 155A (6697)	Groundwater	Yes	Not Required	No Operator	No	Not Required	No Operator
474	Woodland Cree First Nation	6462	WOODLAND CREE NO. 226 - CADOTTE LAKE (9067)	MTA	Yes	No Certification	No Certification	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
438	Alexander	7483	ALEXANDER NO. 134 (6650)	1989	River	Level I	180	105	Faculative lagoon	Secondary	No	No	Fall	No
437	Alexis Nakota Sioux Nation	7482	ALEXIS INDIAN RESERVE NO. 133 (6649)	2006	Creek	Level I	617	233	Faculative lagoon	Secondary	No	No	Other	No
445	Beaver First Nation	7492	BEAVER - BOYER NO. 164 (6661)	2000	River	Level I	57	77	Faculative lagoon	Secondary	No	No	Other	No
460	Beaver Lake Cree Nation	7514	BEAVER LAKE NO. 131 (6701)	1983	Wetland	Level I	12.3	50	Aerated lagoon	Secondary			Continuous	No
458	Bigstone Cree Nation	7507	BIGSTONE - WABASCA NO. 166 (6691)	0	MTA	MTA		8.1	MTA	MTA	MTA	MTA	MTA	MTA
458	Bigstone Cree Nation	7508	BIGSTONE - WABASCA NO. 166A (6692)	0	MTA	MTA		380.5	MTA	MTA	MTA	MTA	MTA	MTA
458	Bigstone Cree Nation	7509	BIGSTONE - WABASCA NO. 166B (6693)	2000	Wetland	Level I	177	186.5	Faculative lagoon	Secondary	No	No	Fall	No
458	Bigstone Cree Nation	7510	BIGSTONE - WABASCA NO. 166C (6694)	1991	River	Small System	47	59	Faculative lagoon	Secondary	No	No	Other	No
458	Bigstone Cree Nation	7511	BIGSTONE - WABASCA NO. 166D (6695)	1999	MTA	MTA		176.2	MTA	MTA	MTA	MTA	MTA	MTA
435	Blood Tribe (Kainai)	7477	BLOOD NO. 148 - LEVERN (6645)	1990	Other	Level I	42	99	Faculative lagoon	Secondary	No	No	Spring, fall	No
435	Blood Tribe (Kainai)	7480	BLOOD NO. 148 - MOSES LAKE (6645)	1975	MTA	MTA	Unknown	123	MTA	MTA	MTA	MTA	MTA	MTA
435	Blood Tribe (Kainai)	7478	BLOOD NO. 148 - OLD AGENCY (6645)	1980	Other	Level I	5	22	Faculative lagoon	Primary	No	No	Spring, fall	No
435	Blood Tribe (Kainai)	7475	BLOOD NO. 148 - ST. MARY (6645)	1994	Creek	Level I	84	38	Faculative lagoon	Secondary	No	No	Fall	No
435	Blood Tribe (Kainai)	7476	BLOOD NO. 148 - ST. PAUL (6645)	1998	Other	Level I	52	53	Faculative lagoon	Secondary	No	No	Other	Yes
435	Blood Tribe (Kainai)	7474	BLOOD NO. 148 - STANDOFF (6645)	1990	Wetland	Level I	760	642	Faculative lagoon	Secondary	No	No	Spring, fall	No
470	Chipewyan Prairie First Nation	7526	CHIPEWYAN PRAIRIE - JANVIER NO. 194 (6726)	1993	Wetland	Level I	200	155	Faculative lagoon	Secondary	No	No	Fall	No
464	Cold Lake First Nations	7518	COLD LAKE NO. 149 (6712)	1985	River	Level I	54	46	Faculative lagoon	Secondary			Fall	No
464	Cold Lake First Nations	7519	COLD LAKE NO. 149A (6713)	2002	MTA	MTA	Unknown	10	MTA	MTA	MTA	MTA	MTA	MTA
448	Dene Tha'	7498	DENE THA' - BUSHE RIVER NO. 207 (6670)	0	MTA	MTA			MTA	MTA	MTA	MTA	MTA	MTA
448	Dene Tha'	7499	DENE THA' - HAY LAKE NO. 209 CHATEH (6671)	2002	Creek	Level I	492	278	Faculative lagoon	Secondary	No	No	Fall	No
448	Dene Tha'	7500	DENE THA' - UPPER HAY RIVER NO. 212 MEANDER (6673)	1985	River	Level II	168.5	189.5	RBC	Secondary	No	No	Continuous	No
450	Driftpile First Nation	7502	DRIFTPILE RIVER NO. 150 (6677)	2004	Creek	Level I	600	493	Faculative lagoon	Secondary	No	No	Fall	No
451	Duncan's First Nation	7503	DUNCANS NO. 151A (6678)	1992	Wetland	Small System	73	58	Faculative lagoon	Secondary	No	No	Other	No
440	Enoch Cree Nation	7485	ENOCH - STONY PLAIN NO. 135 (6652)	1992	Lake, Reservoir	Level I	121	235	Faculative lagoon	Secondary	No	No	Continuous	No
440	Enoch Cree Nation		MILLENIUM (NE SUBDIVISION) WASTEWATER HOLDING TANK	2005	Other	None	3.2	21.6	Other		No	No	Other	Yes
443	Ermineskin Tribe	7489	ERMINESKIN NO. 138 (6657)	1992	Sub-Surface/Ground	Level I	663	327	Faculative lagoon	Secondary	No	No	Other	No
467	Fort McKay First Nation	7523	FORT MCKAY NO. 174 (6718)	0	MTA	MTA	656	314	MTA	MTA	MTA	MTA	MTA	MTA
468	Fort McMurray First Nation	7524	FT. MCMURRAY - GREGOIRE LAKE NO. 176 (6722)	1995	Sub-Surface/Ground	Small System	81	31	Faculative lagoon	Secondary	No	No	Fall	No
465	Frog Lake	7521	FROG LAKE - UNIPOUHEOS NO. 121(6715)	1993	Wetland	Level I	183	27	Faculative lagoon	Secondary	No	No	Fall	No
469	Heart Lake	7525	HEART LAKE NO. 167 (6725)	1984	Creek	Level I	14.4		Faculative lagoon	Secondary	No	No	Other	No
449	Horse Lake First Nation	7501	HORSE LAKES NO. 152B (6676)	2003	River	Level I	165	224	Faculative lagoon	Secondary	No	No	Spring, fall	No
452	Kapawe'no First Nation	NEW001	KAPAWE'NO FIRST NATION NO. 150B (6680)	1984	MTA	MTA	48	48	MTA	MTA	MTA	MTA	MTA	MTA
452	Kapawe'no First Nation	7639	KAPAWE'NO FIRST NATION NO. 231 (9092)	2002	Sub-Surface/Ground	Level I	6	6	Other	Secondary	No	No	Continuous	No
466	Kehewin Cree Nation	7522	KEHEWIN NO. 123 (6717)	2003	Wetland	Level I	277	35	Faculative lagoon	Secondary			Other	No
447	Little Red River Cree Nation	7496	LRRCN - FOX LAKE NO. 162 (6666)	1989	River	Level I	220	519	Faculative lagoon	Secondary	No	No	Other	Yes
447	Little Red River Cree Nation	7528	LRRCN - GARDEN CREEK INDIAN SETTLEMENT (6736)	1989	River	Level I	130	262	Faculative lagoon	Secondary	No	No	Other	No
447	Little Red River Cree Nation	7497	LRRCN - JOHN D'OR PRAIRIE NO. 215 (6667)	1996	Sub-Surface/Ground	Level I	145	374	Faculative lagoon	Secondary	No	No	Fall	No
476	Loon River Cree	7239	LOON LAKE NO. 235 (9389)	2000	Creek	Level I	115	154	Faculative lagoon	Secondary	No	No	Fall	No
439	Louis Bull Tribe	7491	LOUIS BULL - PIGEON LAKE NO. 138A (6660)	2006	Evapouration	Level I	106	3	Faculative lagoon	Secondary	No	No	Other	No
439	Louis Bull Tribe	7484	LOUIS BULL NO. 138B (6651)	1997	Creek	Level I	468	422	Faculative lagoon	Secondary	No	No	Other	Yes
461	Mikisew Cree First Nation	7527	MIKISEW CREE - ALLISON BAY NO. 219 (6734)	1998	Evapouration	Small System	96	34	Faculative lagoon	Secondary	No	No	Other	No
461	Mikisew Cree First Nation	7637	MIKISEW CREE - DOG HEAD NO. 218 (8495)	0	MTA	MTA			MTA	MTA	MTA	MTA	MTA	MTA
442	Montana	7488	MONTANA NO. 139 (6656)	1996	Wetland	Level I	398	149	Faculative lagoon	Secondary	No	No	Other	No
431	O'Chiese First Nation	NEW002	BREMNERVILLE SEPTIC SYSTEM	1988	Tile Field	Small System	Unknown	16	Septic	Primary	No	No	Continuous	No
431	O'Chiese First Nation	7466	TOWNSITE COMMUNITY LAGOON SYSTEM	1995	Wetland	Level I	96	38	Faculative lagoon	Secondary	No	No	Other	No
441	Paul	7487	PAUL - WABAMUN NO. 133A (6653)	1984	Creek	Level I	96	45	Faculative lagoon	Secondary	No	No	Continuous	No
441	Paul		WABAMUN 133A SUBDIVISION LAGOON	1997	Wetland	Level I	77	50	Faculative lagoon	Secondary	No	No	Other	No
436	Piikani Nation	7481	PIIKANI RESERVE (6647)	1990	Sub-Surface/Ground	Level I	1282	558	Faculative lagoon	Secondary	No	No	Other	Yes
462	Saddle Lake First Nation	7515	SADDLE LAKE NO. 125 (6702)	1975	River	Level I	89	267	Faculative lagoon	Secondary	No	No	Fall	No
462	Saddle Lake First Nation	7516	WHITE FISH LAKE NO. 128 - GOODFISH (6703)	2010	Wetland	Level I	381	257	Faculative lagoon	Secondary	No	No	Other	No
462	Saddle Lake First Nation	NEW002	WHITEFISH WASTEWATER SYSTEM	1996	Evapouration	Level I	13.8	14.8	Faculative lagoon	Secondary	No	No	Other	No
444	Samson	7490	SAMSON NO. 137 (6659)	1972	River	Level I	848	786	Faculative lagoon	Secondary	No	No	Other	No
454	Sawridge	NEW001	SAWRIDGE NO. 150G (6683)	0	MTA	MTA			MTA	MTA	MTA	MTA	MTA	MTA
430	Siksika Nation	7461	SIKSIKA INDIAN RESERVE NO. 146 - LITTLE WASHINGTON (6636)	1989	River	Level I	142.5	173	Faculative lagoon	Secondary	No	No	Other	No
430	Siksika Nation	7460	SIKSIKA INDIAN RESERVE NO. 146 - SHOULDICE (6636)	1990	Evapouration	Level I	14.5	22	Faculative lagoon	Secondary	No	No	Other	No
430	Siksika Nation	7463	SIKSIKA INDIAN RESERVE NO. 146 - STOBART (6636)	1998	Creek	Level I	51.5	64	Faculative lagoon	Secondary	No	No	Other	No
430	Siksika Nation	7457	SIKSIKA INDIAN RESERVE NO. 146 - TOWNSITE (6636)	2001	Creek	Level I	666	569	Aerated lagoon	Secondary	No	No	Other	Yes
430	Siksika Nation	7462	SIKSIKA INDIAN RESERVE NO. 146 - WEST END (6636)	1987	Lake, Reservoir	Level I	50	167	Faculative lagoon	Secondary	No	No	Other	No
477	Smith's Landing First Nation	NEW002	Smith's Landing First Nation MTA	0	MTA	MTA			MTA	MTA	MTA	MTA	MTA	MTA
433	Stoney Nakoda Tribal Nation	7468	STONEY - BIG HORN NO. 144A (6640)	2008	Tile Field	Level I	24	5	TricklingFilterPlant	Secondary	No	No	Continuous	No
433	Stoney Nakoda Tribal Nation	7470	STONEY NO. 142-143-144 MORLEY TOWNSITE (6642)	2009	Large River	Level III	500	50	SBR	Tertiary	No	Yes	Continuous	Yes

REGION: ALBERTA
January 2011

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
455	Sturgeon Lake Cree Nation	7504	STURGEON LAKE NO. 154 (6685)	2001	Lake, Reservoir	Level I	795	314	Faculative lagoon	Secondary	No	No	Fall	No
456	Sucker Creek	7505	SUCKER CREEK NO. 150A (6688)	2001	Sub-Surface/Ground	Level I	226	135	Faculative lagoon	Secondary	No	No	Fall	No
434	Sunchild First Nation	7473	SUNCHILD NO. 202 (6644)	1978	Creek	Level I	114	82	Faculative lagoon	Secondary	No	No	Continuous	No
457	Swan River First Nation	7506	SWAN RIVER NO. 150E (6690)	2002	River	Level I	243	212	Faculative lagoon	Secondary	No	No	Other	No
446	Tallcree	7494	TALL CREE NO. 173 - SOUTH (6664)	1998	Large River	Level I	40	85	Faculative lagoon	Secondary			Other	No
446	Tallcree	7495	TALL CREE NO. 173A NORTH (6665)	1985	Wetland	Level I	61	103	Faculative lagoon	Secondary	No	No	Other	No
446	Tallcree	7640	TALLCREE - FORT VERMILION NO. 173B (9142)	1994	MTA	MTA			MTA	MTA	MTA	MTA	MTA	MTA
432	Tsuu T'ina Nation	NEW001	BUSINESS PARK MTA SEWAGE	1992	MTA	MTA		215	MTA	MTA	MTA	MTA	MTA	MTA
432	Tsuu T'ina Nation	7467	TSUU T'INA NATION NO. 145 (6639)	1993	Creek	Level I	26.3	63	Faculative lagoon	Secondary	No	No	Spring, fall	No
459	Whitefish Lake	7512	WHITEFISH LAKE #459 - UTIKOOMAK LAKE NO. 155 (Atikameg) (6696)	1997	River	Level I	351	214	Faculative lagoon	Secondary	No	No	Other	No
474	Woodland Cree First Nation	7237	WOODLAND CREE NO. 226 - CADOTTE LAKE (9067)	1991	Wetland	Level I	164	168	Faculative lagoon	Secondary	No	No	Fall	No
474	Woodland Cree First Nation	7238	WOODLAND CREE NO. 228 - MARTEN LAKE (9069)	2001	Wetland	Small System	25	13	Faculative lagoon	Secondary	No	No	Other	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
438	Alexander	7483	ALEXANDER NO. 134 (6650)	Piped	Small System	253	55	2	0	2776	50	No	2	Unknown	Unknown	Yes	No Certification	No Certification	No	No Operator	No Operator
437	Alexis Nakota Sioux Nation	7482	ALEXIS INDIAN RESERVE NO. 133 (6649)	Piped, Trucked	Level I	603	95	9	1	5309	55	No	2	Unknown	Unknown	Yes	Level I	No Certification	Yes	Small System	No Certification
445	Beaver First Nation	7492	BEAVER - BOYER NO. 164 (6661)	Piped, Trucked	Level I	521	20	57	1	1633	81	No	0	Unknown	Unknown	Yes	No Certification	No Certification	No	No Operator	No Operator
460	Beaver Lake Cree Nation	7514	BEAVER LAKE NO. 131 (6701)	Piped, Trucked	Small System	80	19	0	1	2095	110	No	1	Unknown	Unknown	Yes	Level I	Level I	Yes	No Certification	No Certification
458	Bigstone Cree Nation	7507	BIGSTONE - WABASCA NO. 166 (6691)	Trucked	NA	170	0	27	1			No		MTA	MTA	NR	Not Required	Not Required	No	Not Required	Not Required
458	Bigstone Cree Nation	7508	BIGSTONE - WABASCA NO. 166A (6692)	Piped, Trucked	Level I	971	143	11	2	5399.8	37	No	1	MTA	MTA	Yes	Not Required	Not Required	Yes	Not Required	Not Required
458	Bigstone Cree Nation	7509	BIGSTONE - WABASCA NO. 166B (6693)	Trucked	Small System	114	0	18	2			No		Unknown	Unknown	Yes	No Certification	No Certification	Yes	Level I	Level I
458	Bigstone Cree Nation	7510	BIGSTONE - WABASCA NO. 166C (6694)	Piped, Low Pressure, Trucked	Small System	227	26	10	2	306	11	Yes	0	Unknown	Unknown	Yes	No Certification	No Certification	Yes	Level I	Level I
458	Bigstone Cree Nation	7511	BIGSTONE - WABASCA NO. 166D (6695)	Piped, Trucked	Level I	795	51	75	2	3665	71	No	1	MTA	MTA	Yes	Not Required	Not Required	No	Not Required	Not Required
435	Blood Tribe (Kainai)	7477	BLOOD NO. 148 - LEVERN (6645)	Piped	Small System	351	65	0	0	2252.6	34	No	2	Unknown	Unknown	Yes	Level I	Level I	Yes	Small System	Small System
435	Blood Tribe (Kainai)	7480	BLOOD NO. 148 - MOSES LAKE (6645)	Piped	MTA	297	55	0	0	5915.2	107	No	0	MTA	MTA	NR	Not Required	Not Required	No	Not Required	Not Required
435	Blood Tribe (Kainai)	7478	BLOOD NO. 148 - OLD AGENCY (6645)	Piped	Small System	59	11	0	0	220	20	No	0	Unknown	Unknown	Yes	Level I	Level I	Yes	Small System	Small System
435	Blood Tribe (Kainai)	7475	BLOOD NO. 148 - ST. MARY (6645)	Piped	Small System	81	15	0	0	1497	99	No	2	Unknown	Unknown	Yes	Level I	Level I	Yes	Small System	Small System
435	Blood Tribe (Kainai)	7476	BLOOD NO. 148 - ST. PAUL (6645)	Piped	Small System	108	20	0	0	600	30	No	0	Unknown	Unknown	Yes	Level I	Level I	Yes	Small System	Small System
435	Blood Tribe (Kainai)	7474	BLOOD NO. 148 - STANDOFF (6645)	Piped	Level I	1571	291	0	0	7622.8	26	No	1	Unknown	Unknown	Yes	Level I	Level I	Yes	Small System	Small System
470	Chipewyan Prairie First Nation	7526	CHIPEWYAN PRAIRIE - JANVIER NO. 194 (6726)	Piped, Trucked	Small System	458	51	79	1	2020	39	No	1	Unknown	Unknown	Yes	No Certification	No Certification	No	No Operator	No Operator
464	Cold Lake First Nations	7518	COLD LAKE NO. 149 (6712)	Piped	Small System	110	22	0	0	1802	81	No	2	Unknown	Unknown	Yes	No Certification	No Certification	No	No Operator	No Operator
464	Cold Lake First Nations	7519	COLD LAKE NO. 149A (6713)	Piped	Level I	25	5	0	0			No	1	MTA	MTA	Yes	Not Required	Not Required	No	Not Required	Not Required
448	Dene Tha'	7498	DENE THA' - BUSHE RIVER NO. 207 (6670)	Trucked	NA	511	0	142	2			No		MTA	MTA	NR	Not Required	Not Required	No	Not Required	Not Required
448	Dene Tha'	7499	DENE THA' - HAY LAKE NO. 209 CHATEH (6671)	Piped, Trucked	Level I	1215	86	206	2	6799	79	No	5	Unknown	Unknown	Yes	Level I	Level I	Yes	Level I	Level I
448	Dene Tha'	7500	DENE THA' - UPPER HAY RIVER NO. 212 MEANDER (6673)	Piped, Trucked	Small System	467	120	10	0	4304	35	No	1	High Freq AND High Mag	Design	Yes	No Certification	No Certification	Yes	No Certification	No Certification
450	Driftpile First Nation	7502	DRIFTPILE RIVER NO. 150 (6677)	Piped, Trucked	Level I	566	124	15	2	9151	73	No	3	Unknown	Unknown	Yes	No Certification	No Certification	No	No Operator	No Operator
451	Duncan's First Nation	7503	DUNCANS NO. 151A (6678)	Piped	Small System	140	35	0	0	3175	90	No	1	Unknown	Unknown	Yes	No Certification	No Certification	No	No Operator	No Operator
440	Enoch Cree Nation	7485	ENOCH - STONY PLAIN NO. 135 (6652)	Piped	Level I	567	100	0	1	2573	25	No	1	Unknown	Unknown	Yes	No Certification	No Certification	No	No Operator	No Operator
440	Enoch Cree Nation		MILLENIUM (NE SUBDIVISION) WASTEWATER HOLDING TANK	Piped, Trucked	Small System	52	10	0	0	500	50	No	0	Unknown	Unknown	Yes	No Operator	No Certification	No	No Operator	No Operator
443	Ermineskin Tribe	7489	ERMINESKIN NO. 138 (6657)	Piped	Level I	833	130	0	1	13285.1	102	No	2	Meets Requirements	Unknown	Yes	Small System	Small System	Yes	Small System	Small System
467	Fort McKay First Nation	7523	FORT MCKAY NO. 174 (6718)	Piped	MTA	700	183	0	0	710	3	No	1	MTA	MTA	NR	Not Required	Not Required	No	Not Required	Not Required
468	Fort McMurray First Nation	7524	FT. MCMURRAY - GREGOIRE LAKE NO. 176 (6722)	Trucked	NA	339	0	80	1			No	2	Unknown	Unknown	Yes	No Certification	No Operator	No	No Operator	No Operator
465	Frog Lake	7521	FROG LAKE - UNIPOUHEOS NO. 121(6715)	Piped, Trucked	Small System	76	4	18	2	2688	672	No	1	Unknown	Unknown	Yes	Level I	Level I	Yes	No Certification	No Certification
469	Heart Lake	7525	HEART LAKE NO. 167 (6725)	Piped, Low Pressure, Trucked	Small System	87	6	10	0	397	66	Yes	1	Unknown	Unknown	No	No Operator	No Operator	No	No Operator	No Operator
449	Horse Lake First Nation	7501	HORSE LAKES NO. 152B (6676)	Piped, Low Pressure	Level I	540	100	0	0	4045	40	Yes	1	Unknown	Unknown	Yes	Small System	Small System	Yes	No Certification	No Certification
452	Kapawe'no First Nation	NEW001	KAPAWE'NO FIRST NATION NO. 150B (6680)	Piped	Small System	115	40	0	0	1879	46	No	0	MTA	MTA	NR	Not Required	Not Required	No	Not Required	Not Required
452	Kapawe'no First Nation	7639	KAPAWE'NO FIRST NATION NO. 231 (9092)	Piped	Small System	1	0	0	0			No	0	Unknown	Unknown	Yes	Level I	Level I	No	No Operator	No Operator
466	Kehewin Cree Nation	7522	KEHEWIN NO. 123 (6717)	Piped, Trucked	Small System	275	8	62	0	1977	247	No	1	Unknown	Unknown	Yes	No Certification	No Certification	No	No Operator	No Operator
447	Little Red River Cree Nation	7496	LRRCN - FOX LAKE NO. 162 (6666)	Piped, Trucked	Level I	2187	155	134	2	6769	43	No	1	High Freq OR High Mag	ign & Opera	Yes	Small System	Small System	Yes	No Certification	No Certification
447	Little Red River Cree Nation	7528	LRRCN - GARDEN CREEK INDIAN SETTLEMENT (6736)	Piped	Level I	727	97	0	0	4812	49	No	2	Unknown	Unknown	Yes	No Certification	No Certification	Yes	No Certification	No Certification
447	Little Red River Cree Nation	7497	LRRCN - JOHN D'OR PRAIRIE NO. 215 (6667)	Piped, Low Pressure, Trucked	Level I	1545	194	86	2	3440	17	Yes	2	Unknown	Unknown	Yes	Small System	Small System	Yes	No Certification	No Certification
476	Loon River Cree	7239	LOON LAKE NO. 235 (9389)	Piped	Small System	371	90	0	0	9396	104	No	3	Unknown	Unknown	Yes	Level I	Level I	Yes	No Certification	No Certification
439	Louis Bull Tribe	7491	LOUIS BULL - PIGEON LAKE NO. 138A (6660)	Piped	Small System	95	0	0	0			No	1	Unknown	Unknown	Yes	No Certification	No Certification	No	No Operator	No Operator
439	Louis Bull Tribe	7484	LOUIS BULL NO. 138B (6651)	Piped, Low Pressure	Level I	1017	142	0	0	5150	36	Yes	0	Meets Requirements	Unknown	Yes	No Certification	No Certification	No	No Operator	No Operator
461	Mikisew Cree First Nation	7527	MIKISEW CREE - ALLISON BAY NO. 219 (6734)	Piped	Small System	82	33	0	0	1105	33	No	1	Unknown	Unknown	Yes	No Certification	No Certification	Yes	No Certification	No Certification
461	Mikisew Cree First Nation	7637	MIKISEW CREE - DOG HEAD NO. 218 (8495)	Trucked	NA	101	0	39	2			No		MTA	MTA	NR	Not Required	Not Required	No	Not Required	Not Required
442	Montana	7488	MONTANA NO. 139 (6656)	Piped	Small System	360	73	0	0	1357	18	No	1	Unknown	Unknown	Yes	Level I	Level II	Yes	No Certification	No Certification
431	O'Chiese First Nation	NEW002	BREMNERVILLE SEPTIC SYSTEM	Piped	Small System	39	11	0	0	540	49	No	0	Unknown	Unknown	Yes	No Certification	No Certification	No	No Operator	No Operator
431	O'Chiese First Nation	7466	TOWNSITE COMMUNITY LAGOON SYSTEM	Piped, Trucked	Small System	123	23	12	1	3509	152	No	0	High Freq OR High Mag	Operation	Yes	No Certification	No Certification	No	No Operator	No Operator
441	Paul	7487	PAUL - WABAMUN NO. 133A (6653)	Piped, Low Pressure, Trucked	Small System	95	5	14	1	244	48	Yes	0	High Freq OR High Mag	Operation	Yes	No Certification	No Certification	No	No Operator	No Operator
441	Paul		WABAMUN 133A SUBDIVISION LAGOON	Piped	Small System	121	24	0	0	410	17	No	1	Unknown	Unknown	Yes	No Certification	No Certification	No	No Operator	No Operator
436	Piikani Nation	7481	PIIKANI RESERVE (6647)	Piped	Level I	1115	167	0	1	10753.8	64	No	2	Unknown	Unknown	Yes	Level I	Level I	Yes	Small System	Small System
462	Saddle Lake First Nation	7515	SADDLE LAKE NO. 125 (6702)	Piped, Trucked	Level I	748	103	1	1	4685	45	No	2	Unknown	Unknown	Yes	Small System	Small System	Yes	Small System	Small System
462	Saddle Lake First Nation	7516	WHITE FISH LAKE NO. 128 - GOODFISH (6703)	Piped	Level I	842	117	0	0	2376	20	No	1	Unknown	Unknown	NR	No Operator	No Operator	No	No Operator	No Operator
462	Saddle Lake First Nation	NEW002	WHITEFISH WASTEWATER SYSTEM	Piped	Small System	1	0	0	0			No	0	Low Freq, Low Mag	Operation	Yes	Level I	Level II	Yes	Small System	Small System
444	Samson	7490	SAMSON NO. 137 (6659)	Piped	Level II	1675	313	0	0	10623	33	No	1	Unknown	Unknown	Yes	No Certification	No Certification	Yes	Level II	Level II
454	Sawridge	NEW001	SAWRIDGE NO. 150G (6683)	Piped	Small System	41	16	0	0	930	58	No	2	MTA	MTA	Yes	Not Required	Not Required	Yes	Not Required	Not Required
430	Siksika Nation	7461	SIKSIKA INDIAN RESERVE NO. 146 - LITTLE WASHINGTON (6636)	Piped	Small System	418	103	0	0	8797	85	No	3	Unknown	Unknown	Yes	Level II	Level II	Yes	Level I	Level I
430	Siksika Nation	7460	SIKSIKA INDIAN RESERVE NO. 146 - SHOULDICE (6636)	Piped	Small System	53	13	0	0	500	38	No	1	Unknown	Unknown	Yes	Level II	Level II	Yes	Level I	Level I
430	Siksika Nation	7463	SIKSIKA INDIAN RESERVE NO. 146 - STOBART (6636)	Piped	Small System	154	38	0	0	2255	59	No	2	Unknown	Unknown	Yes	Level II	Level II	Yes	Level I	Level I
430	Siksika Nation	7457	SIKSIKA INDIAN RESERVE NO. 146 - TOWNSITE (6636)	Piped	Level I	1372	338	0	0	18738	55	No	6	Unknown	Unknown	Yes	Level II	Level II	Yes	Level I	Level I
430	Siksika Nation	7462	SIKSIKA INDIAN RESERVE NO. 146 - WEST END (6636)	Piped	Small System	402	99	0	0	2286	23	No	2	Unknown	Unknown	Yes	Level II	Level II	Yes	Level I	Level I
477	Smith's Landing First Nation	NEW002	Smith's Landing First Nation MTA	Trucked	MTA	9	0	3	0			No		MTA	MTA	NR	Not Required	Not Required	No	Not Required	Not Required
433	Stoney Nakoda Tribal Nation	7468	STONEY - BIG HORN NO. 144A (6640)	Piped	Small System	25	5	0	0	800	160	No	0	Unknown	Unknown	Yes	No Certification	No Certification	No	No Operator	No Operator
433	Stoney Nakoda Tribal Nation	7470	STONEY NO. 142-143-144 MORLEY TOWNSITE (6642)	Piped	Small System	119	25	0	0	5481	219	No	2	Meets Requirements	Unknown	Yes	Level III	Level II	Yes	Level I	Level I
455	Sturgeon Lake Cree Nation	7504	STURGEON LAKE NO. 154 (6685)	Piped, Trucked	Level I	1683	109	233	2	6677	61	No	2	Unknown	Unknown	Yes	No Certification	No Certification	Yes	No Certification	No Certification
456	Sucker Creek	7505	SUCKER CREEK NO. 150A (6688)	Piped, Low Pressure, Trucked	Small System	348	52	42	1	2156	41	Yes	1	Unknown	Unknown	Yes	Level I	Level I	Yes	No Certification	No Certification
434	Sunchild First Nation	7473	SUNCHILD NO. 202 (6644)	Piped	Small System	147	30	0	0	2985	99	No	1	High Freq AND High Mag	Operation	Yes	No Certification	No Certification	No	No Operator	No Operator
457	Swan River First Nation	7506	SWAN RIVER NO. 150E (6690)	Piped	Level I	543	66	0	0	4019	60	No	3	Unknown	Unknown	Yes	No Certification	No Certification	Yes	No Certification	No Certification
446	Tallcree	7494	TALL CREE NO. 173 - SOUTH (6664)	Piped	Small System	190	37	0	0	4157	112	No	1	Unknown	Unknown	Yes	Small System	Small System	Yes	Level I	Level I
446	Tallcree	7495	TALL CREE NO. 173A NORTH (6665)	Piped	Small System	247	40	0	0	1877	46	No	1	Unknown	Unknown	Yes	Level I	Level I	Yes	Small System	Small System
446	Tallcree	7640	TALLCREE - FORT VERMILION NO. 173B (9142)	Piped	Small System	113	22	0	0	1569	71	No	0	MTA	MTA	Yes	Not Required	Not Required	Yes	Not Required	Not Required
432	Tsuu T'ina Nation	NEW001	BUSINESS PARK MTA SEWAGE	Piped	Small System	207	50	0	0	3836.5	76	No	2	MTA	MTA	Yes	Not Required	Not Required	Yes	Not Required	Not Required
432	Tsuu T'ina Nation	7467	TSUU T'INA NATION NO. 145 (6639)	Piped	Small System	29	7	0	0	2448	349	No	2	Unknown	Unknown	Yes	No Certification	Level I	Yes	No Certification	No Certification
459	Whitefish Lake	7512	WHITEFISH LAKE #459 - UTIKOOMAK LAKE NO. 155 (Atikameg) (6696)	Piped	Level I	512	138	0	1	9874.6	71	No	4	Unknown	Unknown	Yes	No Certification	No Certification	No	No Operator	No Operator
474	Woodland Cree First Nation	7237	WOODLAND CREE NO. 226 - CADOTTE LAKE (9067)	Piped, Trucked	Level I	754	64	93	0	7755	121	No	2	Unknown	Unknown	Yes	No Certification	No Certification	Yes	No Certification	No Certification
474	Woodland Cree First Nation	7238	WOODLAND CREE NO. 228 - MARTEN LAKE (9069)	Trucked	Small System	144	0	30	0			No	0	Unknown	Unknown	No	No Operator	No Operator	No	No Operator	No Operator

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
435	Blood Tribe (Kainai)	6725	BLOOD NO. 148 - LEVERN (6645)	Groundwater	Level I	4.0	6.0	5.0	6.0	1.0	4.5
435	Blood Tribe (Kainai)	6726	BLOOD NO. 148 - OLD AGENCY (6645)	Groundwater	Level I	6.0	8.0	8.0	6.0	1.0	8.0
435	Blood Tribe (Kainai)	6723	BLOOD NO. 148 - ST. MARY (6645)	Groundwater	Level I	5.0	8.0	5.0	6.0	1.0	5.2
435	Blood Tribe (Kainai)	6724	BLOOD NO. 148 - ST. PAUL (6645)	Groundwater	Level I	8.0	8.0	5.0	6.0	1.0	5.5
435	Blood Tribe (Kainai)	6722	BLOOD NO. 148 - STANDOFF (UPPER/LOWER) (6645)	Groundwater	Level I	10.0	8.0	5.0	6.0	1.0	5.7
448	Dene Tha'	6747	DENE THA' - UPPER HAY RIVER NO. 212 MEANDER (6673)	Groundwater	Level I	7.0	9.0	6.0	8.0	6.0	7.2
451	Duncan's First Nation	6750	DUNCANS NO. 151A (6678)	Groundwater	Small System	4.0	2.0	7.0	10.0	2.0	4.5
440	Enoch Cree Nation	6733	ENOCH - STONY PLAIN NO. 135 (6652)	Groundwater	Level I	10.0	8.0	8.0	10.0	2.0	8.0
443	Ermineskin Tribe	6736	ERMINESKIN NO. 138 (6657)	Groundwater	Level I	8.0	8.0	8.0	6.0	1.0	6.4
449	Horse Lake First Nation	6748	HORSE LAKES NO. 152B (6676)	Groundwater	Small System	8.0	8.0	5.0	9.0	1.0	5.8
439	Louis Bull Tribe	6738	LOUIS BULL - PIGEON LAKE NO. 138A (6660)	Groundwater	Level I	5.0	8.0	10.0	10.0	10.0	8.9
439	Louis Bull Tribe	NEW002	LOUIS BULL NO. 138B (6651) - Pumphouse #1	Groundwater	None	8.0	8.0	6.0	4.0	6.0	6.6
439	Louis Bull Tribe	6732	LOUIS BULL NO. 138B (6651) - Pumphouse #2	Groundwater	Level I	6.0	5.0	8.0	7.0	6.0	6.4
439	Louis Bull Tribe	NEW001	LOUIS BULL NO. 138B (6651) - Pumphouse #3	Groundwater	None	5.0	8.0	5.0	4.0	6.0	6.0
461	Mikisew Cree First Nation	6777	MIKISEW CREE - ALLISON BAY NO. 219 (6734)	Groundwater	Small System	6.0	5.0	4.0	7.0	7.0	5.4
442	Montana	6735	MONTANA NO. 139 (6656)	Groundwater	Level II	6.0	8.0	8.0	6.0	1.0	6.2
431	O'Chiese First Nation	NEW001	BREMNERVILLE WATER TREATMENT PLANT	Groundwater	Small System	4.0	8.0	10.0	10.0	9.0	8.6
431	O'Chiese First Nation	6714	TOWNSITE WATER TREATMENT PLANT	Groundwater	Small System	4.0	4.0	10.0	10.0	9.0	7.4
441	Paul	6734	PAUL - WABAMUN NO. 133A (6653)	Groundwater	Level I	6.0	4.0	9.0	10.0	1.0	5.7
444	Samson	6737	SAMSON NO. 137 (6658)	Groundwater	Level I	6.0	8.0	5.0	1.0	4.0	5.4
430	Siksika Nation	6708	SIKSIKA INDIAN RESERVE NO. 146 - SHOULDICE (6636)	Groundwater	Small System	6.0	5.0	9.0	10.0	1.0	6.0
433	Stoney Nakoda Tribal Nation	6716	STONEY - BIG HORN NO. 144A (6640)	Groundwater	Level II	6.0	5.0	8.0	10.0	9.0	8.0
433	Stoney Nakoda Tribal Nation	6720	STONEY NO. 142-143-144 NORTH SIDE (6642)	Groundwater	Level I	4.0	4.0	6.0	8.0	1.0	4.4
434	Sunchild First Nation	NEW001	BLUE PUMPHOUSE	Groundwater	Level I	5.0	10.0	9.0	10.0	7.0	8.6
434	Sunchild First Nation	6721	SUNCHILD NO. 202 (6644)	Groundwater	Level I	4.0	4.0	10.0	10.0	9.0	7.4
434	Sunchild First Nation	NEW003	WEST PUMPHOUSE (Westend Pumphouse)	Groundwater	Level I	4.0	9.0	10.0	10.0	7.0	8.5
434	Sunchild First Nation	NEW002	WEST WATER TREATMENT PLANT (New Subdivision WTP)	Groundwater	Level I	6.0	5.0	10.0	10.0	9.0	8.0
432	Tsuu T'ina Nation	6715	TSUU T'INA NATION NO. 145 (6639)	Groundwater	Small System	5.0	8.0	10.0	10.0	8.0	8.5
459	Whitefish Lake	6763	WHITEFISH LAKE #459 - UTIKOOMAK LAKE NO. 155A (6697)	Groundwater	Level I	5.0	2.0	9.0	10.0	2.0	5.2
435	Blood Tribe (Kainai)	6727	BLOOD NO. 148 - WHOOP UP (6645)	Groundwater GUDI	Level II	9.0	3.0	6.0	6.0	3.0	4.8
436	Piikani Nation	6729	PIIKANI RESERVE (6647)	Groundwater GUDI	Level II	9.0	3.0	1.0	1.0	1.0	2.4
430	Siksika Nation	6712	SIKSIKA INDIAN RESERVE NO. 146 - EAST SIKSIKA (6636)	Groundwater GUDI	Level II	10.0	5.0	4.0	5.0	1.0	4.4
430	Siksika Nation	NEW001	WEST SIKSIKA (ARTHUR AYOUNGMAN) WATER SYSTEM	Groundwater GUDI	Level II	10.0	4.0	8.0	5.0	1.0	5.3
433	Stoney Nakoda Tribal Nation	6718	STONEY NO. 142-143-144 MORLEY TOWNSITE (6642)	Groundwater GUDI	Level II	8.0	4.0	5.0	5.0	1.0	4.2
438	Alexander	6731	ALEXANDER NO. 134 (6650)	MTA	MTA	1.0	3.0	7.0	10.0	9.0	5.9
458	Bigstone Cree Nation	6757	BIGSTONE - WABASCA NO. 166 (6691)	MTA	MTA	2.0	3.0	3.0	1.0	1.0	2.3
458	Bigstone Cree Nation	6758	BIGSTONE - WABASCA NO. 166A (6692)	MTA	MTA	1.0	8.0	8.0	7.0	1.0	5.8
458	Bigstone Cree Nation	6759	BIGSTONE - WABASCA NO. 166B (6693)	MTA	MTA	1.0	3.0	5.0	3.0	1.0	3.0
458	Bigstone Cree Nation	6761	BIGSTONE - WABASCA NO. 166D (6695)	MTA	MTA	1.0	8.0	8.0	1.0	1.0	5.2
435	Blood Tribe (Kainai)	6728	BLOOD NO. 148 - MOSES LAKE (6645)	MTA	MTA	1.0	1.0	5.0	1.0	1.0	2.2
470	Chipewyan Prairie First Nation	6776	CHIPEWYAN PRAIRIE - JANVIER NO. 194 (6726)	MTA	MTA	1.0	2.0	3.0	1.0	5.0	2.7
464	Cold Lake First Nations	6768	COLD LAKE NO. 149 (6712)	MTA	MTA	1.0	8.0	8.0	10.0	1.0	6.1
448	Dene Tha'	6745	DENE THA' - BUSHE RIVER NO. 207 (6670)	MTA	MTA	1.0	8.0	8.0	10.0	1.0	8.0
440	Enoch Cree Nation	NEW001	MILLENIUM (NE SUBDIVISION) WATER SYSTEM	MTA	MTA	1.0	3.0	6.0	10.0	1.0	4.0
467	Fort McKay First Nation	6773	FORT MCKAY NO. 174 (6718)	MTA	MTA	1.0	1.0	1.0	1.0	1.0	1.0
468	Fort McMurray First Nation	6774	FORT MCMURRAY - GREGOIRE LAKE NO. 176 (6722)	MTA	MTA	1.0	1.0	3.0	1.0	1.0	1.6
452	Kapawe'no First Nation	6751	KAPAWE'NO FIRST NATION NO. 150B (6680)	MTA	MTA	1.0	1.0	7.0	1.0	1.0	2.8
476	Loon River Cree	6464	LOON RIVER NO. 235 (9389)	MTA	MTA	3.0	8.0	8.0	1.0	1.0	5.4
453	Lubicon Lake	NEW001	LUBICON LAKE COMMUNITY WATER SYSTEM	MTA	MTA	1.0	8.0	10.0	1.0	1.0	10.0
461	Mikisew Cree First Nation	7097	MIKISEW - DOG HEAD NO. 218 (8495)	MTA	MTA	1.0	2.0	3.0	1.0	1.0	1.9
454	Sawridge	6752	SAWRIDGE NO. 150G (6683)	MTA	MTA	1.0	8.0	3.0	1.0	1.0	3.7
477	Smith's Landing First Nation	NEW001	SMITH'S LANDING FIRST NATION MTA	MTA	MTA	1.0	8.0	9.0	1.0	1.0	5.5

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						High Risk		Medium Risk		Low Risk	
					Legend:						
Band #	**Band Name**	**System #**	**System Name**	**Water Source**	**Treatment Class**	**Source Risk**	**Design Risk**	**Operations Risk**	**Report Risk**	**Operator Risk**	**Final Risk Score**
433	Stoney Nakoda Tribal Nation	NEW001	NAKODA RESORT (CASINO) WATER SYSTEM	MTA	MTA	4.0	1.0	3.0	1.0	1.0	1.9
457	Swan River First Nation	6756	SWAN RIVER NO. 150E (6690)	MTA	MTA	1.0	8.0	8.0	1.0	1.0	5.2
457	Swan River First Nation	NEW001	SWAN RIVER NO. 150E (6690) - Rural Water System	MTA	MTA	1.0	8.0	8.0	1.0	1.0	5.2
446	Tallcree		Beaver Ranch Truck Haul System	MTA	MTA	1.0	8.0	8.0	1.0	1.0	5.2
446	Tallcree	7100	TALLCREE - FORT VERMILION NO. 173B (9142)	MTA	MTA	1.0	8.0	6.0	10.0	1.0	5.5
432	Tsuu T'ina Nation		Business Park MTA Water System	MTA	MTA	1.0	1.0	9.0	10.0	1.0	4.3
474	Woodland Cree First Nation	6462	WOODLAND CREE NO. 226 - CADOTTE LAKE (9067)	MTA	MTA	3.0	8.0	10.0	1.0	5.0	6.8
437	Alexis Nakota Sioux Nation	6730	ALEXIS INDIAN RESERVE NO. 133 (6649)	Surface Water	Level II	10.0	8.0	8.0	2.0	1.0	8.0
445	Beaver First Nation	6739	BEAVER - BOYER NO. 164 (6661)	Surface Water	Level III	10.0	8.0	8.0	10.0	9.0	8.6
460	Beaver Lake Cree Nation	6764	BEAVER LAKE NO. 131 (6701)	Surface Water	Level II	10.0	8.0	1.0	1.0	2.0	4.2
458	Bigstone Cree Nation	6760	BIGSTONE - WABASCA NO. 166C (6694)	Surface Water	Level II	10.0	3.0	6.0	4.0	3.0	4.7
448	Dene Tha'	6746	DENE THA' - HAY LAKE NO. 209 CHATEH (6671)	Surface Water	Level III	9.0	8.0	8.0	7.0	2.0	6.8
450	Driftpile First Nation	6749	DRIFTPILE RIVER NO. 150 (6677)	Surface Water	Level III	9.0	2.0	1.0	3.0	1.0	2.3
465	Frog Lake	6771	FROG LAKE - UNIPOUHEOS NO. 121 (6715)	Surface Water	Level II	10.0	8.0	8.0	3.0	1.0	8.0
469	Heart Lake	6775	HEART LAKE NO. 167 (6725)	Surface Water	Level II	10.0	8.0	6.0	7.0	2.0	6.3
452	Kapawe'no First Nation	7099	KAPAWE'NO FIRST NATION NO. 231 NARROWS (9092)	Surface Water	Level II	8.0	3.0	9.0	10.0	1.0	5.6
466	Kehewin Cree Nation	6772	KEHEWIN NO. 123 (6717)	Surface Water	Level II	10.0	3.0	5.0	3.0	5.0	4.7
447	Little Red River Cree Nation	6743	LRRCN - FOX LAKE NO. 162 (6666)	Surface Water	Level III	10.0	8.0	9.0	10.0	5.0	8.1
447	Little Red River Cree Nation	6778	LRRCN - GARDEN CREEK INDIAN SETTL. (6736)	Surface Water	Level III	9.0	5.0	8.0	9.0	5.0	6.7
447	Little Red River Cree Nation	6744	LRRCN - JOHN D'OR PRAIRIE NO. 215 (6667)	Surface Water	Level III	9.0	8.0	8.0	10.0	6.0	7.9
462	Saddle Lake First Nation	6765	SADDLE LAKE NO. 125 (6702)	Surface Water	Level III	10.0	8.0	8.0	1.0	1.0	8.0
462	Saddle Lake First Nation	6766	WHITEFISH LAKE NO. 128 - GOODFISH (6703)	Surface Water	Level II	10.0	8.0	2.0	1.0	1.0	4.3
462	Saddle Lake First Nation	NEW001	WHITEFISH WATER TREATMENT PLANT	Surface Water	Level II	10.0	8.0	2.0	3.0	1.0	4.5
433	Stoney Nakoda Tribal Nation	6717	STONEY - EDEN VALLEY NO. 216 (6641)	Surface Water	Level II	9.0	3.0	8.0	10.0	1.0	5.4
433	Stoney Nakoda Tribal Nation	6719	STONEY NO. 142-143-144 EAST MORLEY (6642)	Surface Water	Level II	10.0	7.0	6.0	8.0	1.0	5.9
455	Sturgeon Lake Cree Nation	6754	STURGEON LAKE NO. 154 (6685)	Surface Water	Level III	9.0	8.0	4.0	2.0	4.0	5.5
456	Sucker Creek	6755	SUCKER CREEK NO. 150A (6688)	Surface Water	Level III	9.0	8.0	5.0	10.0	2.0	6.2
446	Tallcree	6741	TALL CREE NO. 173 - SOUTH (6664)	Surface Water	Level III	9.0	8.0	9.0	5.0	4.0	8.0
446	Tallcree	6742	TALL CREE NO. 173A NORTH (6665)	Surface Water	Level III	9.0	3.0	8.0	7.0	1.0	5.1
459	Whitefish Lake	6762	WHITEFISH LAKE #459 - UTIKOOMAK LAKE NO. 155 (Atikameg) (6696)	Surface Water	Level II	10.0	2.0	8.0	7.0	4.0	5.5

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**
437	Alexis Nakota Sioux Nation	7482	ALEXIS INDIAN RESERVE NO. 133 (6649)	Creek	Level I	7.0	4.0	7.0	10.0	1.0	5.3
435	Blood Tribe (Kainai)	7475	BLOOD NO. 148 - ST. MARY (6645)	Creek	Level I	9.0	3.0	7.0	10.0	1.0	5.5
448	Dene Tha'	7499	DENE THA' - HAY LAKE NO. 209 CHATEH (6671)	Creek	Level I	7.0	5.0	8.0	10.0	1.0	5.8
450	Driftpile First Nation	7502	DRIFTPILE RIVER NO. 150 (6677)	Creek	Level I	7.0	5.0	5.0	1.0	6.0	5.2
469	Heart Lake	7525	HEART LAKE NO. 167 (6725)	Creek	Level I	6.0	7.0	10.0	10.0	10.0	8.4
476	Loon River Cree	7239	LOON LAKE NO. 235 (9389)	Creek	Level I	6.0	5.0	8.0	1.0	1.0	4.7
439	Louis Bull Tribe	7484	LOUIS BULL NO. 138B (6651)	Creek	Level I	7.0	2.0	5.0	1.0	6.0	4.4
441	Paul	7487	PAUL - WABAMUN NO. 133A (6653)	Creek	Level I	8.0	6.0	10.0	10.0	5.0	7.6
430	Siksika Nation	7463	SIKSIKA INDIAN RESERVE NO. 146 - STOBART (6636)	Creek	Level I	6.0	6.0	9.0	10.0	1.0	6.1
430	Siksika Nation	7457	SIKSIKA INDIAN RESERVE NO. 146 - TOWNSITE (6636)	Creek	Level I	6.0	7.0	9.0	10.0	1.0	6.4
434	Sunchild First Nation	7473	SUNCHILD NO. 202 (6644)	Creek	Level I	6.0	5.0	10.0	10.0	9.0	7.7
432	Tsuu T'ina Nation	7467	TSUU T'INA NATION NO. 145 (6639)	Creek	Level I	8.0	6.0	9.0	10.0	8.0	7.9
439	Louis Bull Tribe	7491	LOUIS BULL - PIGEON LAKE NO. 138A (6660)	Evapouration	Level I	2.0	4.0	9.0	4.0	10.0	6.0
461	Mikisew Cree First Nation	7527	MIKISEW CREE - ALLISON BAY NO. 219 (6734)	Evapouration	Small System	2.0	4.0	8.0	5.0	7.0	5.3
462	Saddle Lake First Nation	NEW002	WHITEFISH WASTEWATER SYSTEM	Evapouration	Level I	2.0	4.0	8.0	1.0	1.0	3.7
430	Siksika Nation	7460	SIKSIKA INDIAN RESERVE NO. 146 - SHOULDICE (6636)	Evapouration	Level I	2.0	6.0	9.0	10.0	1.0	5.3
440	Enoch Cree Nation	7485	ENOCH - STONY PLAIN NO. 135 (6652)	Lake, reservoir	Level I	8.0	9.0	7.0	10.0	6.0	7.8
430	Siksika Nation	7462	SIKSIKA INDIAN RESERVE NO. 146 - WEST END (6636)	Lake, reservoir	Level I	9.0	7.0	9.0	10.0	1.0	7.0
455	Sturgeon Lake Cree Nation	7504	STURGEON LAKE NO. 154 (6685)	Lake, reservoir	Level I	10.0	6.0	9.0	1.0	5.0	6.8
433	Stoney Nakoda Tribal Nation	7470	STONEY NO. 142-143-144 MORLEY TOWNSITE (6642)	Large river	Level III	7.0	2.0	6.0	5.0	1.0	4.1
446	Tallcree	7494	TALL CREE NO. 173 - SOUTH (6664)	Large river	Level I	5.0	7.0	7.0	4.0	1.0	5.1
458	Bigstone Cree Nation	7507	BIGSTONE - WABASCA NO. 166 (6691)	MTA	MTA	1.0	3.0	4.0	1.0	1.0	2.2
458	Bigstone Cree Nation	7508	BIGSTONE - WABASCA NO. 166A (6692)	MTA	MTA	1.0	2.0	5.0	1.0	1.0	2.2
458	Bigstone Cree Nation	7511	BIGSTONE - WABASCA NO. 166D (6695)	MTA	MTA	5.0	4.0	8.0	1.0	1.0	4.3
435	Blood Tribe (Kainai)	7480	BLOOD NO. 148 - MOSES LAKE (6645)	MTA	MTA	1.0	1.0	1.0	1.0	1.0	1.0
464	Cold Lake First Nations	7519	COLD LAKE NO. 149A (6713)	MTA	MTA	1.0	2.0	7.0	10.0	1.0	3.6
448	Dene Tha'	7498	DENE THA' - BUSHE RIVER NO. 207 (6670)	MTA	MTA	1.0	2.0	2.0	1.0	1.0	1.5
467	Fort McKay First Nation	7523	FORT MCKAY NO. 174 (6718)	MTA	MTA	3.0	2.0	2.0	1.0	1.0	1.9
452	Kapawe'no First Nation	NEW001	KAPAWE'NO FIRST NATION NO. 150B (6680)	MTA	MTA	1.0	1.0	3.0	1.0	1.0	1.5
461	Mikisew Cree First Nation	7637	MIKISEW CREE - DOG HEAD NO. 218 (8495)	MTA	MTA	1.0	1.0	3.0	1.0	1.0	1.5
454	Sawridge	NEW001	SAWRIDGE NO. 150G (6683)	MTA	MTA	1.0	4.0	7.0	10.0	1.0	4.1
477	Smith's Landing First Nation	NEW002	Smith's Landing First Nation MTA	MTA	MTA	1.0	1.0	6.0	1.0	1.0	2.2
446	Tallcree	7640	TALLCREE - FORT VERMILION NO. 173B (9142)	MTA	MTA	1.0	1.0	6.0	1.0	1.0	2.2
432	Tsuu T'ina Nation	NEW001	BUSINESS PARK MTA SEWAGE	MTA	MTA	1.0	5.0	8.0	10.0	1.0	4.6
435	Blood Tribe (Kainai)	7477	BLOOD NO. 148 - LEVERN (6645)	Other	Level I	10.0	5.0	7.0	10.0	1.0	6.2
435	Blood Tribe (Kainai)	7478	BLOOD NO. 148 - OLD AGENCY (6645)	Other	Level I	10.0	5.0	7.0	10.0	1.0	6.2
435	Blood Tribe (Kainai)	7476	BLOOD NO. 148 - ST. PAUL (6645)	Other	Level I	10.0	4.0	7.0	10.0	1.0	5.9
440	Enoch Cree Nation	0	MILLENIUM (NE SUBDIVISION) WASTEWATER HOLDING TANK	Other	None	8.0	8.0	5.0	1.0	1.0	4.4
438	Alexander	7483	ALEXANDER NO. 134 (6650)	River	Level I	6.0	5.0	8.0	10.0	6.0	6.6
445	Beaver First Nation	7492	BEAVER - BOYER NO. 164 (6661)	River	Level I	5.0	5.0	9.0	10.0	10.0	7.5
458	Bigstone Cree Nation	7510	BIGSTONE - WABASCA NO. 166C (6694)	River	Small System	5.0	4.0	10.0	4.0	3.0	5.5
464	Cold Lake First Nations	7518	COLD LAKE NO. 149 (6712)	River	Level I	5.0	5.0	9.0	10.0	6.0	6.7
448	Dene Tha'	7500	DENE THA' - UPPER HAY RIVER NO. 212 MEANDER (6673)	River	Level II	7.0	8.0	5.0	8.0	6.0	10.0
449	Horse Lake First Nation	7501	HORSE LAKES NO. 152B (6676)	River	Level I	5.0	4.0	9.0	4.0	3.0	5.2
447	Little Red River Cree Nation	7496	LRRCN - FOX LAKE NO. 162 (6666)	River	Level I	5.0	8.0	10.0	10.0	3.0	7.1
447	Little Red River Cree Nation	7528	LRRCN - GARDEN CREEK INDIAN SETTLEMENT (6736)	River	Level I	7.0	8.0	9.0	10.0	3.0	7.2
462	Saddle Lake First Nation	7515	SADDLE LAKE NO. 125 (6702)	River	Level I	5.0	5.0	8.0	1.0	1.0	4.5
444	Samson	7490	SAMSON NO. 137 (6659)	River	Level I	6.0	8.0	9.0	10.0	4.0	8.0
430	Siksika Nation	7461	SIKSIKA INDIAN RESERVE NO. 146 - LITTLE WASHINGTON (6636)	River	Level I	5.0	6.0	9.0	10.0	1.0	5.9
457	Swan River First Nation	7506	SWAN RIVER NO. 150E (6690)	River	Level I	5.0	7.0	8.0	10.0	6.0	6.9
459	Whitefish Lake	7512	WHITEFISH LAKE #459 - UTIKOOMAK LAKE NO. 155 (Atikameg) (6696)	River	Level I	7.0	5.0	10.0	1.0	10.0	7.2

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					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**
443	Ermineskin Tribe	7489	ERMINESKIN NO. 138 (6657)	Sub-surface / Ground	Level I	2.0	2.0	4.0	1.0	2.0	2.4
468	Fort McMurray First Nation	7524	FT. MCMURRAY - GREGOIRE LAKE NO. 176 (6722)	Sub-surface / Ground	Small System	1.0	4.0	9.0	1.0	9.0	5.3
452	Kapawe'no First Nation	7639	KAPAWE'NO FIRST NATION NO. 231 (9092)	Sub-surface / Ground	Level I	1.0	3.0	9.0	1.0	1.0	3.5
447	Little Red River Cree Nation	7497	LRRCN - JOHN D'OR PRAIRIE NO. 215 (6667)	Sub-surface / Ground	Level I	3.0	4.0	7.0	10.0	5.0	5.3
436	Piikani Nation	7481	PIIKANI RESERVE (6647)	Sub-surface / Ground	Level I	5.0	3.0	3.0	1.0	1.0	2.8
456	Sucker Creek	7505	SUCKER CREEK NO. 150A (6688)	Sub-surface / Ground	Level I	1.0	4.0	8.0	1.0	1.0	3.5
431	O'Chiese First Nation	NEW002	BREMNERVILLE SEPTIC SYSTEM	Tile field	Small System	3.0	7.0	10.0	10.0	8.0	7.4
433	Stoney Nakoda Tribal Nation	7468	STONEY - BIG HORN NO. 144A (6640)	Tile field	Level I	3.0	3.0	6.0	10.0	10.0	5.8
460	Beaver Lake Cree Nation	7514	BEAVER LAKE NO. 131 (6701)	Wetland	Level I	2.0	7.0	9.0	10.0	1.0	5.6
458	Bigstone Cree Nation	7509	BIGSTONE - WABASCA NO. 166B (6693)	Wetland	Level I	2.0	5.0	8.0	1.0	3.0	4.3
435	Blood Tribe (Kainai)	7474	BLOOD NO. 148 - STANDOFF (6645)	Wetland	Level I	6.0	5.0	8.0	10.0	1.0	5.6
470	Chipewyan Prairie First Nation	7526	CHIPEWYAN PRAIRIE - JANVIER NO. 194 (6726)	Wetland	Level I	2.0	7.0	6.0	1.0	9.0	5.5
451	Duncan's First Nation	7503	DUNCANS NO. 151A (6678)	Wetland	Small System	2.0	5.0	7.0	10.0	8.0	6.0
465	Frog Lake	7521	FROG LAKE - UNIPOUHEOS NO. 121(6715)	Wetland	Level I	2.0	4.0	9.0	10.0	1.0	4.8
466	Kehewin Cree Nation	7522	KEHEWIN NO. 123 (6717)	Wetland	Level I	2.0	4.0	9.0	10.0	6.0	5.8
442	Montana	7488	MONTANA NO. 139 (6656)	Wetland	Level I	3.0	4.0	5.0	10.0	1.0	4.0
431	O'Chiese First Nation	7466	TOWNSITE COMMUNITY LAGOON SYSTEM	Wetland	Level I	3.0	3.0	10.0	10.0	7.0	6.2
441	Paul	0	WABAMUN 133A SUBDIVISION LAGOON	Wetland	Level I	3.0	5.0	9.0	10.0	5.0	6.1
462	Saddle Lake First Nation	7516	WHITE FISH LAKE NO. 128 - GOODFISH (6703)	Wetland	Level I	2.0	2.0	4.0	1.0	1.0	2.2
446	Tallcree	7495	TALL CREE NO. 173A NORTH (6665)	Wetland	Level I	2.0	7.0	8.0	10.0	1.0	5.3
474	Woodland Cree First Nation	7237	WOODLAND CREE NO. 226 - CADOTTE LAKE (9067)	Wetland	Level I	2.0	6.0	9.0	1.0	7.0	5.6
474	Woodland Cree First Nation	7238	WOODLAND CREE NO. 228 - MARTEN LAKE (9069)	Wetland	Small System	2.0	3.0	9.0	1.0	10.0	5.5

NEEGAN BURNSIDE

Appendix F

Protocol and Servicing Costs

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

Band #	Band Name	Community Name	Current 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)
438	Alexander	Alexander	1186	259	1563	353	0.997	$ 807,000	$ 3,100	$ 20,460,000	$ 58,000	$ 1,350,000	$ 3,800
437	Alexis Nakota Sioux Nation	Alexis Nakota Sioux Nation	1143	197	1533	294	1.086	$ 3,809,500	$ 19,300	$ 10,470,000	$ 35,600	$ 960,000	$ 3,300
445	Beaver First Nation	Beaver First Nation	521	132	716	197	1.287	$ 1,106,800	$ 8,400	$ 13,400,000	$ 68,000	$ 1,050,000	$ 5,300
460	Beaver Lake Cree Nation	Beaver Lake No. 131	430	103	556	134	0.997	$ 2,170,000	$ 21,100	$ 5,290,000	$ 39,500	$ 1,000,000	$ 7,500
458	Bigstone Cree Nation	Bigstone Cree Nation	3924	622	5411	993	1.157	$ 4,549,000	$ 7,300	$ 47,390,000	$ 47,700	$ 4,730,000	$ 4,800
435	Blood Tribe (Kainai)	Blood Tribe (Kainai)	8840	1637	11436	2286	1.074	$ 11,649,000	$ 7,100	$ 44,090,000	$ 19,300	$ 7,575,000	$ 3,300
470	Chipewyan Prairie First Nation	Janvier No. 194	458	130	675	202	1.326	$ 195,000	$ 1,500	$ 9,730,000	$ 48,200	$ 780,000	$ 3,900
464	Cold Lake First Nations	Cold Lake First Nations No. 149	1191	238	1898	414	0.997	$ 710,000	$ 3,000	$ 15,550,000	$ 37,600	$ 2,020,000	$ 4,900
448	Dene Tha'	Bushe River No. 207	511	142	638	184	1.287	$ 1,310,000	$ 9,200	$ 27,680,000	$ 150,400	$ 1,040,000	$ 5,700
448	Dene Tha'	Hay Lake No. 209	1224	294	1530	370	1.287	$ 2,263,000	$ 7,700	$ 13,720,000	$ 37,100	$ 2,040,000	$ 5,500
448	Dene Tha'	Upper Hay River No. 212	467	130	583	168	1.287	$ 9,629,400	$ 74,100	$ 11,720,000	$ 69,800	$ 600,000	$ 3,600
450	Driftpile First Nation	Driftpile First Nation No. 150	1037	255	1430	353	1.157	$ 1,240,500	$ 4,900	$ 15,290,000	$ 43,300	$ 1,340,000	$ 3,800
451	Duncan's First Nation	Duncan's No. 151A	195	49	308	86	1.157	$ 662,200	$ 13,500	$ 3,480,000	$ 40,500	$ 380,000	$ 4,400
440	Enoch Cree Nation	Stony Plain No. 135	1494	291	1987	414	0.997	$ 8,279,500	$ 28,500	$ 18,440,000	$ 44,500	$ 1,780,000	$ 4,300
443	Ermineskin Tribe	Ermineskin No. 138	3411	502	4489	771	0.997	$ 1,363,000	$ 2,700	$ 27,550,000	$ 35,700	$ 2,440,000	$ 3,200
467	Fort McKay First Nation	Fort McKay No. 174	546	183	689	254	1.326	$ 491,500	$ 2,700	$ 2,470,000	$ 9,700	$ 36,000	$ 100
468	Fort McMurray First Nation	Gregoire Lake No. 176	339	80	495	119	1.326	$ 525,000	$ 6,600	$ 2,140,000	$ 18,000	$ 760,000	$ 6,400
465	Frog Lake	Frog Lake First Nation	900	261	1202	361	1.086	$ 4,203,000	$ 16,100	$ 11,110,000	$ 30,800	$ 2,270,000	$ 6,300
469	Heart Lake	Heart Lake No. 167	255	47	353	71	1.157	$ 956,500	$ 20,400	$ 7,790,000	$ 109,700	$ 580,000	$ 8,200
449	Horse Lake First Nation	Horse Lake No. 152B	600	111	835	169	1.157	$ 1,321,000	$ 11,900	$ 4,410,000	$ 26,100	$ 610,000	$ 3,600
452	Kapawe'no First Nation	Kapawe'no First Nation	127	44	191	76	1.068	$ 278,500	$ 6,300	$ 1,850,000	$ 24,300	$ 370,000	$ 4,900
466	Kehewin Cree Nation	Kehewin Cree Nation	1189	302	1476	397	0.997	$ 4,741,500	$ 15,700	$ 9,470,000	$ 23,900	$ 1,780,000	$ 4,500
447	Little Red River Cree Nation	Fox Lake No. 162	2272	289	3194	519	1.723	$ 13,685,000	$ 47,400	$ 47,850,000	$ 92,200	$ 1,500,000	$ 2,900
447	Little Red River Cree Nation	Garden River	727	97	1022	170	1.723	$ 6,006,500	$ 61,900	$ 34,200,000	$ 201,200	$ 540,000	$ 3,200
447	Little Red River Cree Nation	John D'or Prairie No. 215	1545	282	2172	438	1.723	$ 9,510,000	$ 33,700	$ 35,530,000	$ 81,100	$ 1,100,000	$ 2,500
476	Loon River Cree	Loon Lake No. 235	573	139	984	241	1.157	$ 2,173,500	$ 15,600	$ 16,320,000	$ 67,700	$ 820,000	$ 3,400
439	Louis Bull Tribe	Louis Bull Tribe No. 138B	1793	254	2365	397	0.997	$ 1,727,000	$ 6,800	$ 13,680,000	$ 34,500	$ 1,420,000	$ 3,600
439	Louis Bull Tribe	Pigeon Lake No. 138A	425	123	561	168	0.997	$ 1,176,300	$ 9,600	$ 4,840,000	$ 28,800	$ 890,000	$ 5,300
453	Lubicon Lake	Little Buffalo Indian Settlement	309	63	444	96	1.157	$ 615,000	$ 9,800	$ 14,240,000	$ 148,300	$ 270,000	$ 2,800
461	Mikisew Cree First Nation	Mikisew Cree First Nation	183	72	405	183	1.989	$ 1,690,000	$ 23,500	$ 10,490,000	$ 57,300	$ 855,000	$ 4,700
442	Montana	Montana No. 139	856	174	1169	252	0.997	$ 1,001,000	$ 5,800	$ 5,770,000	$ 22,900	$ 920,000	$ 3,700
431	O'Chiese First Nation	O'Chiese First Nation	799	227	1081	321	1.086	$ 1,371,200	$ 6,000	$ 9,920,000	$ 30,900	$ 1,210,000	$ 3,800
441	Paul	Wabamun No. 133A	1100	219	1423	299	1.086	$ 1,488,500	$ 6,800	$ 9,240,000	$ 30,900	$ 1,170,000	$ 3,900
436	Piikani Nation	Piikani No. 147	2811	421	3574	611	0.983	$ 310,000	$ 700	$ 8,930,000	$ 14,600	$ 2,290,000	$ 3,700
462	Saddle Lake First Nation	Saddle Lake No. 125	4968	691	6342	1034	0.997	$ 9,643,000	$ 14,000	$ 30,450,000	$ 29,400	$ 3,610,000	$ 3,500
462	Saddle Lake First Nation	Whitefish (Goodfish) Lake No. 128	2227	310	2843	464	0.997	$ 4,765,000	$ 15,400	$ 18,810,000	$ 40,500	$ 2,200,000	$ 4,700
444	Samson	Samson	6628	1239	8705	1758	0.997	$ 17,227,300	$ 13,900	$ 57,360,000	$ 32,600	$ 4,150,000	$ 2,400
454	Sawridge	Sawridge 150G	51	20	74	31	1.068	$ 231,000	$ 11,600	$ 1,330,000	$ 42,900	$ 340,000	$ 11,000
430	Siksika Nation	Siksika No. 146	4077	1004	5030	1242	1.019	$ 4,183,000	$ 4,200	$ 41,060,000	$ 33,100	$ 3,360,000	$ 2,700
477	Smith's Landing First Nation	Smith's Landing First Nation	50	17	85	34	1.688	$ 15,000	$ 900	$ 670,000	$ 19,700	$ 225,000	$ 6,600
433	Stoney Nakoda Tribal Nation	Big Horn No. 144A	205	41	226	46	1.019	$ 690,000	$ 16,800	$ 790,000	$ 17,200	$ 365,000	$ 7,900
433	Stoney Nakoda Tribal Nation	Eden Valley No. 216	504	105	556	118	1.019	$ 280,000	$ 2,700	$ 2,660,000	$ 22,500	$ 760,000	$ 6,400
433	Stoney Nakoda Tribal Nation	Stoney No. 142-143-144	3996	837	4414	941	1.019	$ 2,705,000	$ 3,200	$ 2,660,000	$ 2,800	$ 760,000	$ 800
455	Sturgeon Lake Cree Nation	Sturgeon Lake No. 154	1767	359	2619	572	1.068	$ 5,528,000	$ 15,400	$ 16,150,000	$ 28,200	$ 2,300,000	$ 4,000
456	Sucker Creek	Sucker Creek No. 150A	845	229	1160	334	1.068	$ 868,100	$ 3,800	$ 5,970,000	$ 17,900	$ 1,700,000	$ 5,100
434	Sunchild First Nation	Sunchild First Nation	1037	212	1551	340	1.086	$ 1,395,400	$ 6,600	$ 11,400,000	$ 33,500	$ 1,090,000	$ 3,200
457	Swan River First Nation	Swan River	451	92	648	141	1.157	$ 684,500	$ 7,400	$ 4,110,000	$ 29,100	$ 520,000	$ 3,700
446	Tallcree	Fort Vermilion & Beaver Ranch	144	28	166	33	1.287	$ 129,000	$ 4,600	$ 785,000	$ 23,800	$ 280,000	$ 8,500
446	Tallcree	North Tallcree No. 173A	247	41	338	63	1.287	$ 978,500	$ 23,900	$ 5,660,000	$ 89,800	$ 410,000	$ 6,500
446	Tallcree	South Tallcree No. 173	257	50	351	73	1.287	$ 1,530,000	$ 30,600	$ 16,900,000	$ 231,500	$ 500,000	$ 6,800
432	Tsuu T'ina Nation	Tsuu T'ina Nation No. 145	1647	397	2233	543	1.019	$ 5,591,800	$ 14,100	$ 13,200,000	$ 24,300	$ 1,880,000	$ 3,500
459	Whitefish Lake	Whitefish (Atikameg) Lake No. 155	897	242	1692	507	1.157	$ 2,018,500	$ 8,300	$ 18,340,000	$ 36,200	$ 1,540,000	$ 3,000
459	Whitefish Lake	Whitefish River (Utikoomak Lake No. 155A)	119	30	224	65	1.157	$ 350,000	$ 11,700	$ 3,910,000	$ 60,200	$ 410,000	$ 6,300
474	Woodland Cree First Nation	Woodland Cree First Nation	913	190	1232	269	1.157	$ 217,000	$ 1,100	$ 10,500,000	$ 39,000	$ 1,760,000	$ 6,500