
S E W A G E M A N A G E M E N T I N
N O R T H E A S T
B R I T I S H C O L U M B I A
C O M P L I A N C E A U D I T R E P O R T
2 0 1 7

Environmental Management Act



August 2017

Executive Summary

Domestic wastewater (sewage) generation is inevitable, and its treatment and disposal is considered to be an essential service. Although all sewage is eventually released into the environment, there are many options for treatment to reduce pollutant and pathogen loading prior to discharge. Sewage systems generally consist of infrastructure for collection, treatment, and/or conveyance and may be located onsite (e.g. composting toilets, septic tanks and septic fields, etc.) or conveyed offsite to facilities such as wastewater treatment plants by piping or septic haulers.

There have been several concerns raised on municipal sewage management practices in the northeast region of British Columbia (BC) which prompted the need for an audit on sewage operations in this region. These concerns include industrial contamination of incoming loads at authorized municipal wastewater treatment facilities, the establishment of unauthorized lagoons for commercial use, and illegal dumping of effluent.

The objectives of the Sewage Management in Northeast BC Compliance Audit include the following:

1. **Compliance Inspections:** Assess the compliance rate of select authorized sewerage systems against their regulatory or permit conditions for the 2015 or 2016 reporting year.
2. **Sewage Management Complaints:** Investigate the frequency of illegal dumping of effluent via complaints and reports submitted to the Ministry of Environment and Climate Change Strategy and the Conservation Officer Service.
3. **Unauthorized Lagoons:** Examine the establishment of unauthorized lagoons for commercial use.
4. **Effluent Load Contamination:** Conduct an inquiry into industrial contamination of incoming loads trucked to authorized municipal wastewater treatment facilities via interviews with representative facilities.
5. **Industry Feedback:** Solicit feedback from industry stakeholders.

Audit results include the following:

1. **Compliance Inspections:** 14 sewerage system authorizations were assessed for compliance. Of these, 14% were “In” compliance. In most cases, the observed non-compliances were minor administrative and environmental infractions.
2. **Sewage Management Complaints:** From January 2014 to April 10, 2017, there were a total of 50 complaints regarding 29 sewage management incidents originating in the northeast region of BC received via the Report all Poachers and Polluters tip-line. This comprises 13% of all northeast BC complaint submissions during that time period. The complaints were related to specific incidents of illegal dumping, operation of unauthorized lagoons, maintenance issues at authorized sewerage systems and contaminated loads at authorized wastewater treatment plants.
3. **Unauthorized Lagoons:** From January 2014 to April 10, 2017, there were a total of 21 complaints regarding five unauthorized lagoons that were being used for commercial use in the northeast region of BC. Since complaints data relies on the submission of reports and complaints by individuals, this is not likely an exhaustive list. Thus there are potentially multiple instances of unauthorized lagoons being utilized as commercial sewage disposal locations. In order to properly

address unauthorized lagoons, there is a need to clearly distinguish to clients the difference between the application of the Ministry of Health Sewerage System Regulation and the Ministry of Environment and Climate Change Strategy Municipal Wastewater Regulation.

4. **Effluent Load Contamination:** Of the four interviewed municipal wastewater treatment facilities, three have reported encountering incidents with contaminated incoming trucked loads; however, all have established measures to minimize future risk of industrial contamination in incoming sewage loads. These measures include identification of incoming load source through manifests, screening via random or regular sampling, site security, and testing equipment.
5. **Industry Feedback:** During the audit, industry stakeholders were consulted to identify areas of concern in the sewage management sector. Industry concerns are primarily related to confusion regarding the permit application process and the applicability of different pieces of sewage legislation (e.g. Municipal Wastewater Regulation, Sewerage System Regulation, etc.).

Based on the results of the audit, audit recommendations include the following:

For Industry

1. Promote familiarity with applicable legislation. Specifically, understand the difference between the Sewerage System Regulation (under the *Public Health Act* and administered by the Ministry of Health) and the Municipal Wastewater Regulation (under the *Environmental Management Act* and administered by the Ministry of Environment and Climate Change Strategy).
- o The recently developed document entitled *The Sewerage System Regulation and Municipal Wastewater Regulation: Jurisdictional Flow Divide for Onsite Sewerage Systems* jointly developed by the Ministry of Health and the Ministry of Environment and Climate Change Strategy provides a valuable source of guidance in interpreting the application of relevant regulations.
2. Ensure that sewage facilities and associated discharges are authorized.
 - o See the Ministry of Environment and Climate Change Strategy... [Sewage Website](#) for detailed information and guidance information on the Municipal Wastewater Regulation and requirements.
 - o Information on the waste discharge application process can be found on the [Waste Discharge Authorizations Website](#).
 - o Guidance for waste authorizations can also be found on the Ministry of Environment and Climate Change Strategy website (see [Municipal Wastewater Regulation Application Forms, Guidance and Fees](#)).
3. Direct Authorization holders to know the conditions of their authorization(s). It is recommended that they periodically review their authorization conditions to ensure that they stay in compliance. Specifically:
 - o Conduct effluent quality monitoring of specified analytes at specified frequencies.
 - o Maintain effluent quality within regulatory standards.

- o Ensure that data and reports include the required information.
- o Submit data and reports within specified deadlines.

For the Ministry of Environment and Climate Change Strategy

4. Provide information on applicable regulations, regulatory responsibilities, compliance and enforcement actions, and best practices to industry, namely:
 - o Provide information on new technologies and best practices to industry.
 - o Provide an information package on the Municipal Wastewater Regulation, what authorization holders can do to ensure compliance, and what to expect from the compliance and enforcement process.
 - o Identify authorization holders that were transferred from the historic Municipal Sewage Regulation to the Municipal Wastewater Regulation and ensure that they have up to date registration details and understand the requirements of the Municipal Wastewater Regulation.
 - o Provide guidance and education on the authorization application process.
5. Work with those repeatedly found out of compliance to identify and address barriers to compliance.
6. Participate in open communication and knowledge sharing with different government agencies.
7. Continue with the Permit Refresh Project to improve the clarity and enforceability of sewage permit requirements.¹
8. Increase compliance and enforcement scrutiny in Pink Mountain, Fort Nelson, and Chetwynd.

¹ The Ministry of Environment and Climate Change Strategy, in collaboration with the Ministry of Energy and Mines, Environmental Assessment Office and the Justice and Attorney General, is amending 1000 authorizations to standardize policy and permit conditions.

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Introduction

Domestic wastewater (sewage) generation is inevitable, and its treatment and disposal is considered to be an essential service. Sewage consists mostly of graywater (wastewater without fecal contamination, usually generated from domestic washing activities), and blackwater (wastewater containing human waste) (Lamb, 2008).

Untreated sewage may contain constituents of human health and environmental concern such as nutrients (ammonia derived nitrates, phosphorus), heavy metals, increased biochemical oxygen demand (BOD), total suspended solids (TSS), changes in pH, and pathogens (e.g. bacteria, viruses, protozoa, and helminths), among others (Westcot, 1997; Anderson and Sheffield, 2017). Raw sewage is also associated with additional concerns such as odour and aesthetic qualities such as algae growth and effluent appearance.

Although all sewage is eventually released into the environment, there are many options for treatment to reduce pollutant and pathogen loading prior to discharge. Sewage systems generally consist of infrastructure for collection, treatment, and/or conveyance and may be located onsite (e.g. composting toilets, septic tanks and septic fields, etc.) or conveyed offsite to facilities such as wastewater treatment plants by piping or septic haulers.

There have been several concerns raised on municipal sewage management practices in the northeast region of

British Columbia (BC) that prompted the need for the Sewage Management in Northeast BC Compliance Audit (the audit). These concerns include industrial contamination of incoming loads at authorized municipal wastewater treatment facilities, establishment of unauthorized lagoons for commercial use, and illegal dumping of effluent. Audit objectives include the following:

1. Assess the compliance rate of select authorized sewerage systems against their regulatory or permit conditions for the 2015 or 2016 reporting year ([Compliance Inspections](#) section);



Figure 1 - Cautionary sign at discharge point (ENV inspection files)



Figure 2 - Effluent sampling well (ENV inspection files)



Figure 3 - Air pipeline in aerobic cell (ENV inspection files)

2. Investigate the frequency of illegal dumping of effluent via complaints and reports submitted to the Ministry of Environment and Climate Change Strategy and the Conservation Officer Service ([Sewage Management Complaints](#) section);
3. Examine the establishment of unauthorized lagoons for commercial use ([Unauthorized Lagoons](#) section);
4. Conduct an inquiry into industrial contamination of incoming loads trucked to authorized municipal wastewater treatment facilities via interviews with representative facilities ([Effluent Load Contamination](#) section).
5. Attend the Western Canada Onsite Wastewater Management Association of BC's Annual Convention and Trade Show in order to solicit feedback from industry stakeholders ([Industry Feedback](#) section).

The findings of the audit shall inform future areas of improvement and provide information for further compliance efforts.

Regulatory Context

The Ministry of Environment and Climate Change Strategy is responsible for the protection, management and conservation of BC's water, land, air and living resources. In order to fulfil its mandate, the ministry issues authorizations under the *Environmental Management Act* (EMA). EMA contains the Waste Discharge Regulation (WDR) and the Municipal Wastewater Regulation (MWR). These are the principle legislative tools that the ministry uses for managing sewerage operations. See Table 1 for details.



Figure 4 - Sewage lagoon (ENV inspection files)

Table 1 – Legislation and regulations applicable to the Audit

Environmental Management Act (EMA)	The <i>Environmental Management Act</i> prohibits the introduction of waste into the environment in a way that will cause pollution, except in accordance with a regulation, authorization, approval or code of practice issued under the Act
Waste Discharge Regulation (WDR)	The Waste Discharge Regulation defines what industries, activities and operations require authorizations to discharge or release waste under the <i>Environmental Management Act</i> .
Municipal Wastewater Regulation	The Municipal Wastewater Regulation applies to all municipal wastewater discharges to water, and to ground if the discharge is equal to or exceeds maximum daily flows of 22.7 cubic metres per day (m ³ /d), and is from a sewerage system or combination of sewerage systems that serve structures on one or more parcels or strata lots, or on a shared interest (excluding single family residences and duplexes).

While larger sewage systems are regulated by the Municipal Wastewater Regulation, sewage systems with designed daily domestic sewage flows of less than 22.7 cubic meters per day are regulated by the

[Public Health Act](#) and its [Sewerage System Regulation](#) (administered by the Ministry of Health) (MoH and ENV, 2017). There are also various pieces of legislation that are administered by additional levels of government (i.e. federal, regional, and municipal authorities).

Furthermore, Canada and BC are currently working together on an [equivalency agreement](#) for federal Wastewater Systems Effluent Regulations. For further information on the federal regulations, please refer to the [Environment Canada website](#).

This audit only addresses legislation and regulations that are in the jurisdiction of the BC Ministry of Environment and Climate Change Strategy.

Compliance Inspections

The purpose of this section is to assess the compliance rate of select authorized sewerage systems against their regulatory requirements for the 2015 or 2016 reporting year.

The audit approach is described below while the results are summarized on page 13.

There are approximately 78 active sewage authorizations in northeast BC.² Of these, 14 authorizations were randomly selected and inspected as part of the audit.

The authorizations included in the audit encompass a combination of sectors including:

- Municipal sewage
- Private industry
- Work camps
- First Nations reserves

The authorizations also include a combination of authorization types including:

- Registrations under the Municipal Wastewater Regulation
- Permits under the *Environmental Management Act* or its *Waste Management Act* predecessor
- Operational certificates

Compliance inspections were conducted to verify whether authorization holders were in compliance with applicable regulatory requirements for the 2015 or 2016 reporting year.³ Compliance was determined through a thorough review of each authorization including:

1. Registration information
2. Data submissions
3. Annual reports
4. Compliance history



Figure 5 - Northeast region of BC

² Current to May 1, 2017.

³ Annual reporting due dates vary. Therefore, compliance was assessed for the most recent reporting due date; either in 2015 or 2016, as specified in each authorization.

Authorization requirements vary. In order to evaluate the compliance rate of authorization holders, similar authorization requirements were grouped by category and the inspection results were aggregated accordingly. The main requirements that were assessed for compliance are summarized in Table 2.

Table 2 - Requirements Assessed During the Audit

Requirement Type	Requirements Assessed
Administrative	• Whether operating and monitoring plans and security postings were provided as required. • Whether required monitoring data submissions and annual reports were complete and submitted within specified deadlines. • Whether non-compliance reports were submitted as required.
Environmental Operators Certification Program	• Facility classification and adequacy of operator certification.
Discharge specifications	• Whether effluent was discharged within authorized time periods. • Whether the discharge rates were monitored as required. • Whether the discharge rates were within authorized limits.
Effluent quality	• Whether required analytical parameters (chemical and physical) were monitored at the specified sampling frequencies. • Whether analyte levels were within authorized limits.

It is important to note that inspections are a “point-in-time” assessment of authorization requirements.

Please refer to [Appendix 1](#) for a list of authorizations included in the audit.

Compliance Determinations

Each inspection includes information on the following:

- The authorization requirements that were assessed for compliance;
- Compliance determinations;
- Compliance history; and
- Compliance and enforcement responses (if applicable).

A critical component of each inspection is its compliance determination. The four compliance determinations are outlined in Table 3.

WHAT IS A COMPLIANCE DETERMINATION?

A compliance determination indicates whether or not an authorization holder is fulfilling the requirements of their authorization.

Table 3 - Compliance Determinations

Compliance Determinations	
“In”	The authorization holder was determined to be in compliance with the requirements of Sections and/or Subsections of the authorization.
“Out”	The authorization holder did not meet all of the requirements of Sections and/or Subsections of the authorization.
“Not Determined”	The information necessary to determine compliance was missing.
Not Required/Not Assessed	The requirement type (see Table 2) is not required by the authorization and was therefore not assessed for compliance.

Compliance and Enforcement Response Determinations

After each authorization holder was assessed for compliance, a final decision on the appropriate compliance/enforcement response for each inspection was based on the Ministry of Environment and Climate Change Strategy’s [Compliance and Enforcement Policy and Procedure](#) and Non-Compliance Decision Matrix ([Appendix 2](#)). The Compliance and Enforcement Policy and Procedure sets out how ministry staff assesses and responds to non-compliance. It provides consistency, clarity and predictability regarding the consequences of non-compliance, and ensures that ministry resources are directed to the highest priorities.

Please refer to Table 4 for a list of compliance and enforcement response determinations used during the audit.

Table 4 - Compliance and Enforcement Response Determinations (ENV, 2014)

Compliance and Enforcement Response Determinations	
Notice	While not technically an enforcement response, notices are a valuable compliance tool that document compliance and inform authorization holders of the outcome of inspections. A notice is issued when an authorization holder is found to be “In” compliance with the authorization requirements assessed during the inspection.
Advisory	An advisory is often the first enforcement response taken in cases of minor to moderate non-compliance when there is a high likelihood of achieving compliance. An advisory notifies the authorization holder that they are “Out” of compliance with a specific regulatory requirement and often recommends a course of action that is expected to achieve compliance.
Investigation	An investigation is initiated when there are reasonable grounds to suspect that a breach of a requirement has taken place and evidence is required to confirm it and determine an appropriate response. The purpose of an investigation is to gather evidence to support enforcement proceedings in cases of suspected non-compliance.

Results

Overall Results

Inspection results (i.e. compliance determinations):

- 14 authorizations were inspected in the audit.
- 14% were “In” compliance.
- 86% were “Out” of compliance.

The following compliance/enforcement responses were issued in response to the inspection results:

- Two notices
- 11 advisories
- One referral to investigation



Figure 6 - Aquarium filled with reclaimed water (ENV inspection files)

In most cases, the observed non-compliances were minor administrative and environmental infractions.

The results of the compliance inspections are also broken down into four subsections:

- Administrative details and Environmental Operators Certification Program (EOCP)
- Discharging specifications
- Effluent quality
- Data and report submissions



Figure 7 - Effluent from a reclaimed water treatment facility (ENV inspection files)

It is important to note that the requirements assessed during each inspection vary according to the specific requirements of each authorization. For example, a total of 14 authorizations were inspected during the audit but only four authorizations were assessed for compliance with administrative details (i.e. whether operating and monitoring plans and security postings were provided as required). This is because only four authorizations included these requirements. Please refer to the following four subsections for details.

Administrative Details and EOCP

Requirements Assessed	Inspection Results
Whether operating and monitoring plans and security postings were provided as required (Administrative)	Four authorizations were assessed for compliance: - Two were "In" compliance. - Two were "Out" of compliance.
EOCP facility classification and adequacy of operator certification (EOCP)	Five authorizations were assessed for compliance: - Two were "In" compliance. - Two were "Out" of compliance. - One was "Not Determined" because the authorization's EOCP information was not available at the time of the inspection.

Please refer to Figure 8 for a visual representation of the results.

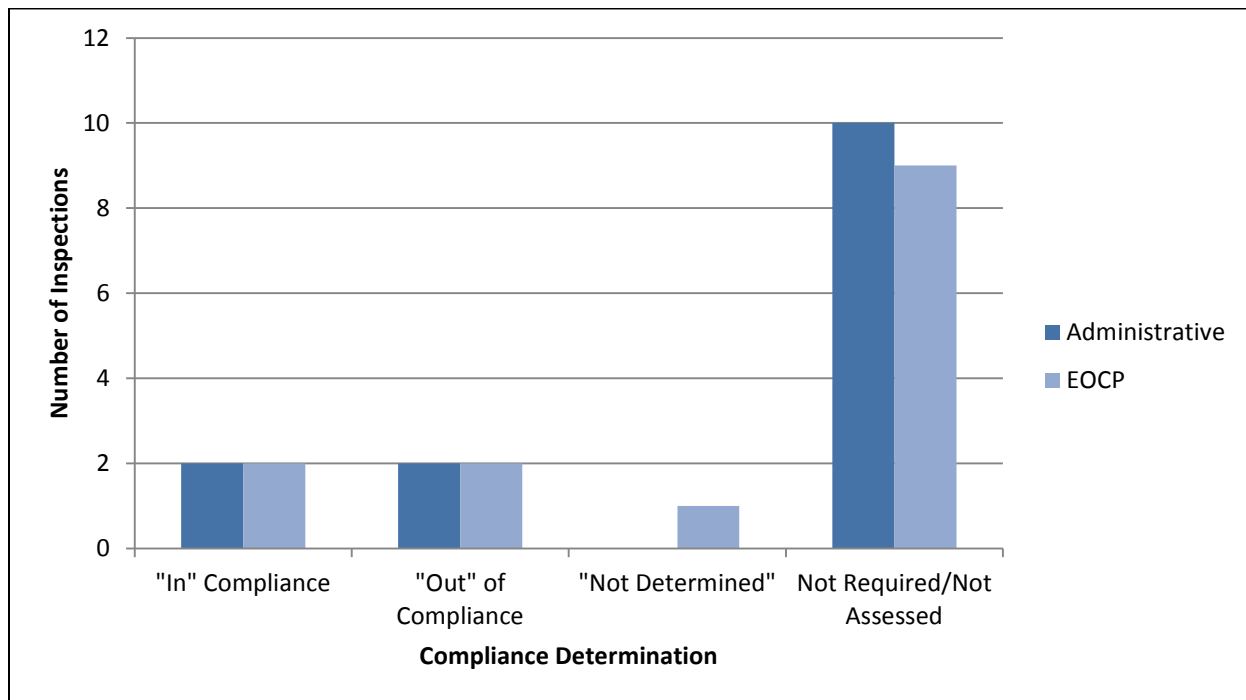


Figure 8 - Administrative and EOCP Compliance Results

Discharge Specifications

Requirements Assessed	Inspection Results
Whether effluent was discharged within authorized time periods (Discharge within Authorized Time Period)	Two authorizations were assessed for compliance: - One authorization was "In" compliance. - One authorization was "Out" of compliance.
Whether the discharge rates were monitored as required (Discharge Rate Monitoring)	Eleven authorizations were assessed for compliance: - Seven were "In" compliance. - Four were "Not Determined" due to either a lack of data submission or lack of discharge at the time of the inspection.
Whether the discharge rates were within authorized limits (Discharge Rate Limits)	Eight authorizations were assessed for compliance: - Three were "In" compliance. - Three were "Out" of compliance. - Two were "Not Determined" due to either a lack of data submission or lack of discharge at the time of the inspection.

Please refer to Figure 9 for a visual representation of the results.

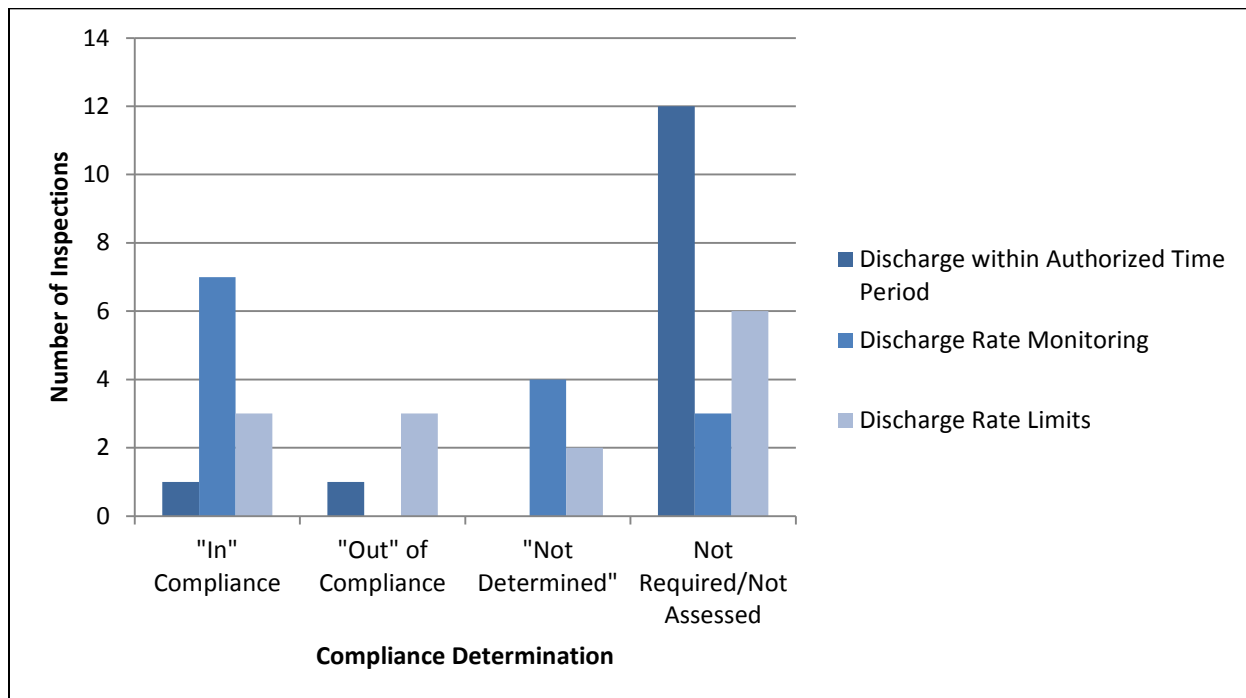


Figure 9 - Discharge Specifications Compliance Results

Effluent Quality

One or more of the following parameters were required to be monitored:

- Acute toxicity
- Ammonia
- ammonia nitrogen
- 5-day biological oxygen demand (BOD5)
- Carbonaceous 5-day biological oxygen demand (CBOD5)
- Dissolved oxygen
- Escherichia Coli (E. coli)
- Enterococcus
- Fecal coliforms
- Nitrate
- Nitrite
- Orth-phosphorus
- pH
- Specific conductivity
- Temperature
- Total ammonia
- Total chlorine residual
- Total phosphate
- Total phosphorus
- Total suspended solids (TSS)
- Turbidity
- Unionized ammonia

It should be specified that not all of these parameters were required in every inspected authorization (although BOD5 and TSS were the most commonly required).

Requirements Assessed	Inspection Results
Requirements for sampling and monitoring of analytical parameters (Analytical Parameter Monitoring)	Eight authorizations were assessed for compliance: • Two authorizations were "In" compliance. • Three authorizations were "Out" of compliance. • Three authorizations were "Not Determined" due to lack of data submission.
Regulatory standards for parameter limits (Analytical Parameter Limits)	Eight authorizations were assessed for compliance: • Six authorizations were "Out" of compliance. - o TSS exceeded regulatory standards in all six authorizations. - o Other parameters that exceeded regulatory standards in at least one inspection were: turbidity, pH and BOD5. • Two were "Not Determined" due lack of data submission.

Please refer to Figure 10 for a visual representation of the results.

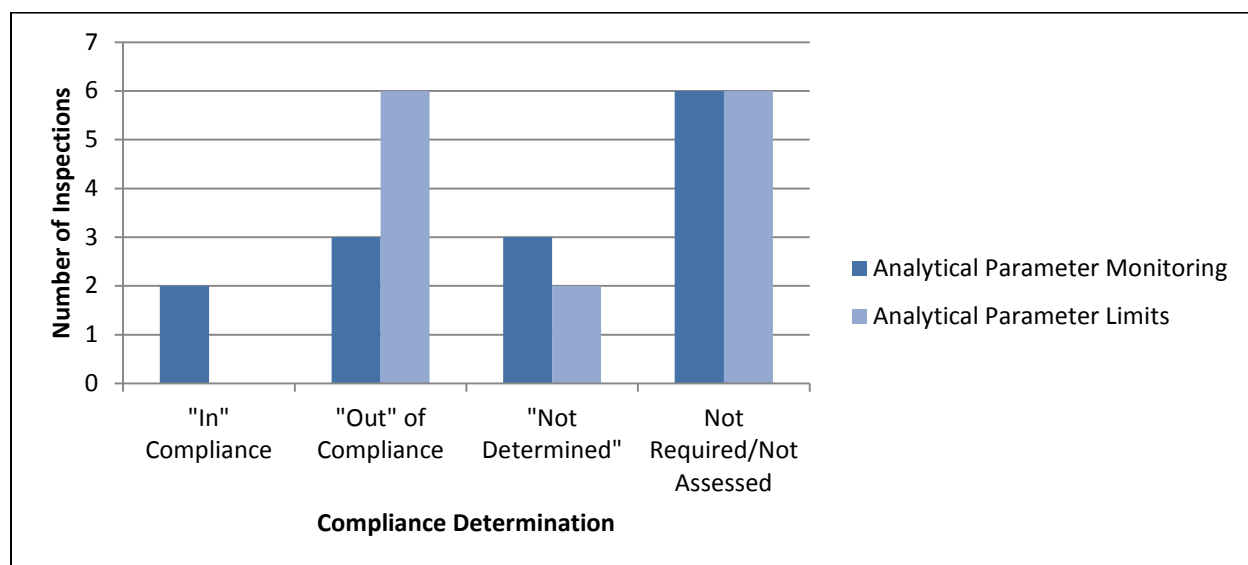


Figure 10 – Effluent Quality Compliance Results

Data and Report Submissions

Requirements Assessed	Inspection Results
Data and Report Submission	Fourteen authorizations were assessed for compliance: • Five authorizations were “In” compliance. • Nine authorizations were “Out” of compliance. ○ Two submitted data and/or reports within the required timelines but did not provide all of the required information. ○ Two were late in submitting data and/or reports. ○ Five failed to submit data and/or reports altogether.
Non-compliance Reporting	Two authorizations were required to submit non-compliance reports for incidents of compliance: • One authorization was “In” compliance. • One authorization was “Out” of compliance.

Please refer to Figure 11 for a visual representation of the results.

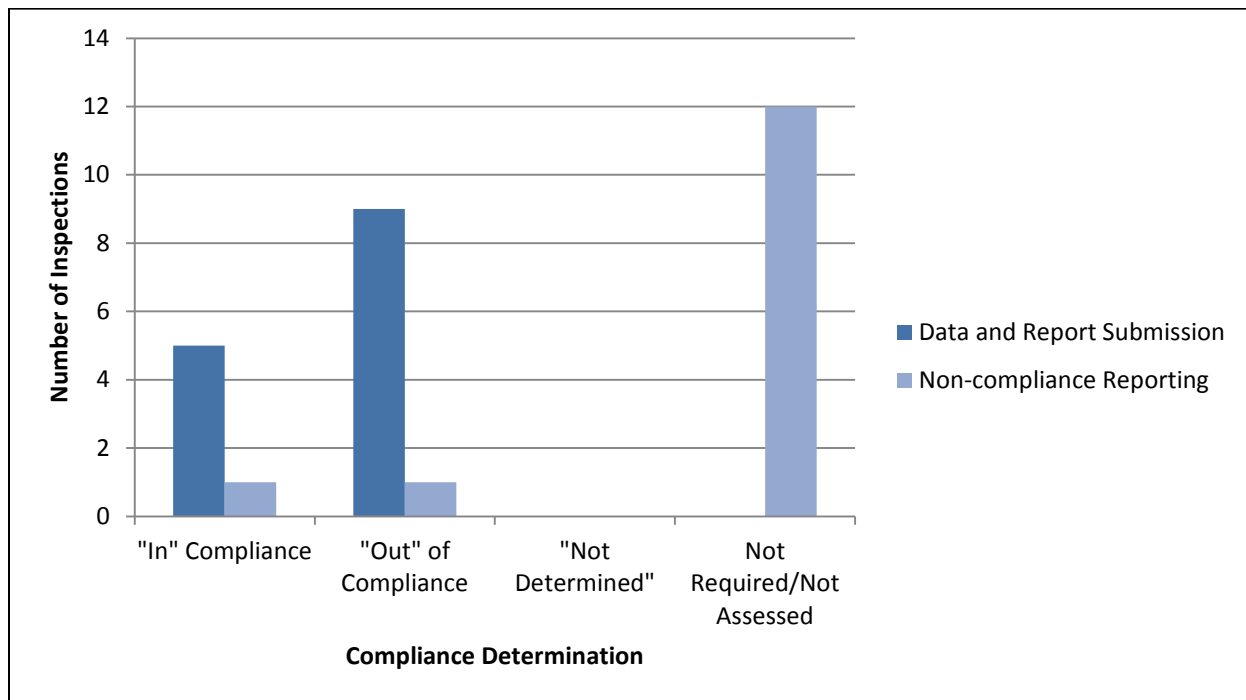


Figure 11 - Data and Report Submission Compliance Results

Sewage Management Complaints

The purpose of this section is to review sewage management complaints in northeast BC.

The second part of this audit consisted of an investigation of the frequency of sewage management incidents in northeast BC via complaints and reports submitted to the Ministry of Environment and Climate Change Strategy and the Conservation Officer Service.

A valuable source of information on unauthorized discharges are notifications provided by the general public. The Ministry of Environment and Climate Change Strategy maintains a record of any complaint submissions received at the Environmental Complaints inbox

(EnvironmentalComplaints@gov.bc.ca). Submissions may originate from the Report All Poachers and Polluters (RAPP) Line, Dangerous Goods Incident Report (DGIR) forwards, referrals from internal government staff, referrals from external agencies, and direct emails from the public, etc.

From January 2014 to April 10, 2017, there were a total of 50 complaints regarding 29 sewage management incidents originating in the northeast region of BC. This comprises 13% of all northeast BC complaint submissions during that time period.

Complaints of sewage management incidents were aggregated and analyzed according to the following:

Suspected offender	Sewage pump and hauler operations, work camps, wastewater treatment plants, residential sites and commercial operations
Unauthorized activity	Illegal dumping, unpermitted lagoons, maintenance issues with sewerage systems and wastewater treatment plant contaminated loads.
Year of occurrence and location	2014 – 2017 Fort St John (and surrounding communities), Chetwynd, Dawson Creek, Fort Nelson, Pink Mountain, Rose Prairie and Taylor

Limitations

It should be noted that submissions received at the Environmental Complaints inbox do not necessarily provide the actual frequency of unauthorized dumping incidents, but only an indication thereof. Submission frequency may reflect the vocalness and proactivity of the persons making the complaint; some correction to this has been attempted through providing data where multiple identical or repeat reports have been filtered out (i.e. number of reported incidents). The complaint submissions would also be inadequate at providing a measure of



Figure 12 - Reclaimed water truck filling station (ENV inspection files)



Figure 13 - Facultative cell (ENV inspection files)

environmental or human health impact, as data on severity of contamination or measureable effects are not usually provided with such submissions.

Results

Complaints by Suspected Offender Type

Sewage pump and haulers and other residential sites and commercial operations have the highest and second highest number of complaints received; however, when the number of complaint submissions is limited to specific incidents, work camps, in addition to sewage pump and haulers and other residential and commercial operations, received the highest number of complaints. Please refer to Table 5 for an overview).

Table 5 - Complaints by Suspected Offender Type

Suspected Offender Type	Number of Complaints Received	Number of Reported Incidents
Sewage pump and hauler operations	28	6
Work camps	7	6
Wastewater treatment plants	3	2
Residential sites and commercial operations	11	6
Unknown (not enough information provided)	1	1
Total	50	21

Complaints by Activity

Of the 50 sewage related complaint submissions in northeast BC, 29 are related to specific incidents of illegal dumping, operation of unpermitted lagoons, maintenance issues at authorized sewerage systems and contaminated loads at authorized wastewater treatment plants. Please refer to Table 6 for an overview.

Table 6 - Complaints by Activity Type

Suspected Activity Type	Number of Complaints Received	Number of Reported Incidents
Illegal dumping	20	15
Operation of unpermitted lagoons	21	5
Maintenance issues with authorized sewerage systems	8	8
Authorized wastewater treatment plant contaminated loads. ⁴	1	1
Total	50	29

⁴ Hydrocarbon contaminated incoming loads.

Complaints by Year of Occurrence and Location

Of the 50 sewage related complaint submissions in northeast BC, 13 were received in 2014, 16 were received in 2015, 19 were received in 2016, and two were received in 2017.⁵ See Table 7 on the following page for an overview.

Table 7 - Complaints by Year of Occurrence

Year of Occurrence	Number of Complaints Received
2014	13
2015	16
2016	19
2017	2
Total complaints	50

The complaint submissions were also reviewed by their location. Fort St John and surrounding communities had the highest associated sewage-related complaint submissions in the northeast BC region at 32 out of 50 complaints, 12 of which concern unique incidents. Please refer to Table 8 for an overview.

Table 8 - Complaints by Location

Location	Number of Complaints Received	Number of Reported Incidents
Fort St John and surrounding communities	32	12
Chetwynd	5	2
Dawson Creek	4	4
Fort Nelson	4	3
Pink Mountain	3	2
Rose Prairie	1	1
Taylor	1	1
Total	50	29

To remove the population influence, the number of reported sewage incidents per capita in each locality is provided in Table 9. The three locations with the greatest number of reported incidents per person were Pink Mountain, Fort Nelson and Chetwynd.

Table 9 - Reported Incidents per 1000 Capita per Location

Location	Population (Stats Canada, 2016)	Reported Incidents	Reported Incidents per 1000 persons
Fort St John	19,897	12	0.6
Chetwynd	2,633	2	0.8
Dawson Creek	11,574	4	0.3

⁵ This information is accurate as of April 10, 2017.

Fort Nelson	3,366	3	0.9
Pink Mountain	100 (Shangaan, 2017)	2	20
Rose Prairie	Unknown	1	-
Taylor	1,469	1	0.7

Unauthorized Lagoons

The purpose of this section is to examine the establishment of unauthorized lagoons for commercial use. The audit approach for this section involved a review of applicable complaints data, site history and legislation.

Results

From January 2014 to April 10, 2017, there were a total of 21 complaints regarding five unauthorized lagoons that were being used for commercial use in the northeast region of BC. Since the complaints data relies on the submission of complaints by members of the public, this is not likely an exhaustive list. Thus there are potentially multiple instances of unauthorized lagoons being utilized as commercial sewage disposal locations.

For example, one of the complaints was about a sewage pump and hauler operation that had recently started using lagoons on their private property to dispose of the commercial effluent that they had collected from surrounding residential and commercial lots. In the past, the property was authorized by the Ministry of Health to dispose of sewage from a school that previously occupied the site; however, the current use of the site does not fit this purpose and the site is no longer authorized by the Ministry of Health. Additionally, the facility does not meet the maximum daily flow threshold that would require registration under the Municipal Wastewater Regulation. Therefore, the lagoon is currently unauthorized. As municipal sewage management is a prescribed activity under Section 2(2) and Schedule 1 of the Waste Discharge Regulation, the operation was therefore in violation of the *Environmental Management Act* Section 6(3), which states:

Subject to subsection (5), a person must not introduce or cause or allow to be introduced into the environment, waste produced by a prescribed activity or operation.

In order to properly address the operation of unauthorized sewage lagoons, there is a need to clearly distinguish between the jurisdiction of the Ministry of Health (*Public Health Act* and its Sewerage System Regulation) and the Ministry of Environment and Climate Change Strategy (*Environmental Management Act* and its Municipal Wastewater Regulation). The recently developed document entitled: “The Sewerage System Regulation and Municipal Wastewater Regulation: Jurisdictional Flow Divide for Onsite



Figure 14 - Anaerobic cell (ENV inspection files)

Sewerage Systems” should provide a valuable source of guidance in interpreting the application of relevant regulations (MoH and ENV, 2017).

Effluent Load Contamination

The purpose of this section is to inquire into the industrial contamination of incoming loads trucked to authorized municipal wastewater treatment facilities via interviews with representative facilities.

Due to the prevalence of industrial activities (e.g. activities related to the oil and gas sector) in northeast BC, industrial contamination of raw municipal wastewater is a possible concern. To that end, the Ministry of Environment and Climate Change Strategy interviewed the following four authorization holders with municipal wastewater treatment systems in the region:

- City of Fort St John (Waste Water Transfer Station).
- Peace River Regional District (Charlie Lake Sewer Lagoons).
- City of Dawson Creek (Waste Water Treatment System).
- District of Chetwynd (Sewage Treatment Plant).

Queries posed include the source of influent to the system, the frequency and severity of contaminated load incidents, and measures to minimize the risk posed by contamination in loads to the facility and environment.

Results

Of the four interviewed municipal wastewater treatment facilities, three have reported encountering incidents with contaminated incoming trucked loads; however, all have established measures to minimize future risk of industrial contamination in incoming sewage loads. These measures include identification of incoming load source through manifests, screening via random or regular sampling, site security, and testing equipment.

Please refer to [Appendix 3](#) for an overview of the interview results, specific to each authorization holder interviewed.

Industry Feedback

Industry feedback is extremely valuable for providing different perspectives and perceptions on regulatory efforts, identifying barriers to compliance, and providing a realistic assessment of the success of current regulatory models.

During the recent Western Canada Onsite Wastewater Management Association of BC’s Annual Convention and



Figure 15 - Enhanced berms slope next to aerobic cells (ENV inspection files)



Figure 16 - Internal view of microfiltration discs in a disc filter (ENV inspection files)

Trade Show in March 2017, several areas of concern were brought forward by industry members and are discussed below.

1. **Permit application process:** Industry would like more guidance and education on the permit application process; i.e. what is required from their end, how applications get processed, expected process times, etc.
2. **Replacement of the historic Municipal Sewage Regulation with the current Municipal Wastewater Regulation:** There is a lack of awareness of the new requirements following the replacement of the Municipal Sewage Regulation with the Municipal Wastewater Regulation in 2012; particularly, the submission of additional registration details that facilities that were already registered under Municipal Sewage Regulation may have to submit to be compliant with the requirements of the Municipal Wastewater Regulation, and differences between the two regulations in general.
3. **Applicable regulations:** There has been confusion between the applicability of the Sewerage System Regulation (under the *Public Health Act*, administered by the Ministry of Health) and the Municipal Wastewater Regulation (under the *Environmental Management Act*, administered by the Ministry of Environment and Climate Change Strategy). However, the newly developed [The Sewerage System Regulation and Municipal Wastewater Regulation: Jurisdictional Flow Divide for Onsite Sewerage Systems](#) document should serve as a valuable source of guidance in interpreting the application of relevant regulations.
4. **Legislative gap in environmental protection between the Sewerage System Regulation and Municipal Wastewater Regulation:** There are concerns with the possible cumulative effects on the environment from sewerage systems that are regulated under the Sewerage System Regulation. The Municipal Wastewater Regulation Section 19(2) considers the cumulative effects of the discharge to the receiving environment; however, the primary aim of the Sewerage System Regulation is human health rather than environmental protection, therefore there are concerns include the possibility of the cumulative effects on aquatic ecosystems from high densities of small sewer systems located near water bodies.



Figure 17 - Disc filters in a filtration/disinfection facility (ENV inspection files)

Conclusion and Recommendations

The objectives of the audit include the following:

1. **Compliance Inspections:** Assess the compliance rate of select authorized sewerage systems against their regulatory or permit conditions for the 2015 or 2016 reporting year.
2. **Sewage Management Complaints:** Investigate the frequency of illegal dumping of effluent via complaints and reports submitted to the Ministry of Environment and Climate Change Strategy and the Conservation Officer Service.
3. **Unauthorized Lagoons:** Examine the establishment of unauthorized lagoons for commercial use.
4. **Effluent Load Contamination:** Conduct an inquiry into industrial contamination of incoming loads trucked to authorized municipal wastewater treatment facilities via interviews with representative facilities.
5. **Industry Feedback:** Solicit feedback from industry stakeholders.

Audit results include the following:

1. **Compliance Inspections:** 14 sewerage system authorizations were assessed for compliance. Of these, 14% were “In” compliance. In most cases, the observed non-compliances were minor administrative and environmental infractions.
2. **Sewage Management Complaints:** From January 2014 to April 10, 2017, there were a total of 50 complaints regarding 29 sewage management incidents originating in the northeast region of BC. This comprises 13% of all northeast BC complaint submissions during that time period. The complaints were related to specific incidents of illegal dumping, operation of unpermitted lagoons, maintenance issues at authorized sewerage systems and contaminated loads at authorized wastewater treatment plants.
3. **Unauthorized Lagoons:** From January 2014 to April 10, 2017, there were a total of 21 complaints regarding five unpermitted lagoons that were being used for commercial use in the northeast region of BC. Since the complaints data relies on the submission of reports and complaints by individuals, this is not likely an exhaustive list. Thus there are potentially multiple instances of unauthorized lagoons being utilized as commercial sewage disposal locations. In order to properly address unauthorized lagoons, there is a need to clearly distinguish between the Sewerage System Regulation and the Municipal Wastewater Regulation.
4. **Effluent Load Contamination:** Of the four interviewed municipal wastewater treatment facilities, three have reported encountering incidents with contaminated incoming trucked loads; however, all have established measures to minimize future risk of industrial contamination in incoming sewage loads. These measures include identification of incoming load source through manifests, screening via random or regular sampling, site security, and testing equipment.
5. **Industry Feedback:** During the audit, industry stakeholders were consulted to identify areas of concern in the sewage management sector. Industry concerns are primarily related to confusion

regarding the permit application process and the applicability of different pieces of sewage legislation (e.g. Municipal Wastewater Regulation, Sewerage System Regulation, etc.).

Based on the results of the audit, audit recommendations include the following:

For Industry

1. Ensure familiarity with applicable legislation. Specifically, understand the difference between the Sewerage System Regulation (under the *Public Health Act* and administered by the Ministry of Health) and the Municipal Wastewater Regulation (under the *Environmental Management Act* and administered by the Ministry of Environment and Climate Change Strategy).
 - o The recently developed document, *The Sewerage System Regulation and Municipal Wastewater Regulation: Jurisdictional Flow Divide for Onsite Sewerage Systems* document jointly developed by the Ministry of Health and the Ministry of Environment and Climate Change Strategy provides a valuable source of guidance in interpreting the application of relevant regulations.
2. Ensure that sewage facilities and associated discharges are authorized.
 - o See the [Sewage Website](#) for detailed information and guidance information on the Municipal Wastewater Regulation and requirements.
 - o Information on the waste discharge application process can be found on the [Waste Discharge Authorizations Website](#).
 - o Guidance for waste authorizations can also be found on the Ministry of Environment and Climate Change Strategy website (see [Municipal Wastewater Regulation Application Forms, Guidance and Fees](#)).
3. Ensure Authorization holders know the conditions of their authorization(s). It is recommended that they periodically review their authorization conditions to ensure that they stay in compliance. Specifically:
 - o Conduct effluent quality monitoring of specified analytes at specified frequencies.
 - o Maintain effluent quality within regulatory standards.
 - o Ensure that data and reports include the required information.
 - o Submit data and reports within specified deadlines.

For the Ministry of Environment and Climate Change Strategy

4. Provide information on applicable regulations, regulatory responsibilities, compliance and enforcement actions, and best practices to industry, namely:
 - o Provide information on new technologies and best practices to industry.
 - o Provide an information package on the Municipal Wastewater Regulation, what authorization holders can do to ensure compliance, and what to expect from the compliance and enforcement process.

- o Identify authorization holders that were transferred from the Municipal Sewage Regulation to the Municipal Wastewater Regulation and ensure they have up to date registration details and understand the new requirements of the Municipal Wastewater Regulation.
 - o Provide guidance and education on the permit application process.
5. Work with repeat offenders to identify and address barriers to compliance.
 6. Participate in open communication and knowledge sharing with different government agencies; including:
 - o Between divisions within the Ministry of Environment and Climate Change Strategy, such as Authorizations and Policy.
 - o Ministry of Forests, Lands and Natural Resource Operations and Rural Development.
 - o Ministry of Energy, Mines and Petroleum Resources.
 - o Ministry of Health and their regional authority, Northern Health.
 - o Regional districts, namely, Peace River Regional District and Northern Rockies Regional Municipality.
 - o Municipalities.
 - o Conservation Officer Service.
 7. Continue with the Permit Refresh Project to improve the clarity and enforceability of sewage permit requirements.⁶
 8. Increase compliance and enforcement scrutiny in Pink Mountain, Fort Nelson, and Chetwynd.

⁶ The Ministry of Environment and Climate Change Strategy, in collaboration with the Ministry of Energy and Mines and Petroleum Resources, Environmental Assessment Office and the Attorney General, intends to amend 1000 authorizations to standardize policy and permit conditions.

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Appendix 1 –Authorizations Included in the Audit

Appendix 1 – Authorizations Included in the Audit

Please refer to Table 10 for a list of municipal sewage management authorizations included in the audit.

For your information, publicly viewable authorizations can be found [here](#).

Table 10 - Authorizations Included in the Audit

Authorization Number	Authorization Holder	Type of Authorization	Date of Inspection	Inspection
311	City of Dawson Creek	Permit	December 15 2016	Onsite
1167	District of Chetwynd	Permit	February 9 2017	File Review
1777	0849226 B.C. LTD.	Permit	August 11 2016	Onsite
1836	District of Taylor	Permit	January 11 2017	File Review
4277	Klahannie Trailer Park (Fort Nelson)	Permit	November 24 2016	File Review
5240	British Columbia Hydro and Power Authority	Permit	February 7 2017	File Review
5323	The Shepherd's Inn Ltd.	Permit	February 24 2017	File Review
5585	Ho Jun and Myong Hui Lee	Permit	November 10 2016	File Review
12768	Fort Nelson Indian Band	Permit	May 3 2017	File Review
15612	School District No. 60 (Fort St. John)	Permit	February 2 2017	File Review
17063	Kledo Construction Ltd. (Fort Nelson)	Municipal Wastewater Regulation	January 19 2017	File Review
17748	City Of Fort St. John	Operational Certificate	April 14 2016	File Review
18354	District of Taylor	Permit	January 11 2017	File Review
100257	Peace River Coal Inc.	Municipal Wastewater Regulation	October 18 2016	Onsite

Appendix 2 – Non-Compliance Decision Matrix

Appendix 2 – Non-Compliance Decision Matrix

The Non-Compliance Decision Matrix is a risk-based guidance tool for assessing the variability and severity of factors influencing the selection of compliance tools (Figure 18). These factors include:

- Escalating levels of environmental, human health or safety impacts (Figure 19).
- Diminishing likelihood of achieving compliance (Figure 20).

The Non-Compliance Decision Matrix helps to ensure a consistent and principled approach to assessing and responding to regulatory non-compliance; it is to be used with discretion by Ministry of Environment and Climate Change Strategy staff when considering the context and specifics of individual cases of non-compliance.

		ESCALATING ENVIRONMENTAL, HUMAN HEALTH OR SAFETY (ACTUAL OR POTENTIAL)				
		LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
DIMINISHING LIKELIHOOD OF COMPLIANCE (COMPLIANCE HISTORY/WILLINGNESS AND CAPACITY TO COMPLY)	CATEGORY A (HIGH)	ADVISORY	ADVISORY - WARNING	WARNING - ORDER - ADMIN SANCTION - AP	ORDER - ADMIN SANCTION - AP - INVESTIGATION	INVESTIGATION
	CATEGORY B	ADVISORY - WARNING	WARNING - AP	INVESTIGATION		
	CATEGORY C	WARNING - AP	WARNING - ORDER			
	CATEGORY D	WARNING - ORDER - ADMIN SANCTION - AP	ADMIN SANCTION - AP - INVESTIGATION			
	CATEGORY E (LOW)	ORDER - ADMIN SANCTION - AP - INVESTIGATION				

Note: An investigation is always necessary prior to issuance of a **ticket**, recommendation of **formal charges** or use of **restorative justice** therefore these tools are not shown on the matrix. Depending on the outcome, an investigation could also culminate in the issuance of a warning, administrative sanction or penalty, or an order.

Figure 18 - Non-Compliance Decision Matrix

LEVEL 1 • Non-compliance that does not result or is unlikely to result in any environmental, human health or safety impact; or • Minor administrative non-compliance.
LEVEL 2 • Non-compliance resulting in a minor, temporary impact to the environment or minor, temporary threat to human health or safety; or • Significant administrative non-compliance.
LEVEL 3 • Non-compliance resulting in a moderate, temporary impact to the environment or moderate, temporary threat to human health or safety.
LEVEL 4 • Non-compliance resulting in a significant impact to the environment or significant threat to human health or safety (may be temporary or permanent).
LEVEL 5 • Known or likely human health impact that is severe in effect, i.e. resulting in hospitalization and/or long term human health consequences.

Figure 19 - Levels of Escalating Environmental, Human Health or Safety Impacts (Actual or Potential)

CATEGORY A - Indications of future and ongoing compliance are very high • No previous occurrences of non-compliance; • Good demonstrated awareness of and/or capacity to meet regulatory requirement; and/or • Offender has a reasonable and cooperative attitude.
CATEGORY B - Indications of future and ongoing compliance are uncertain • Few previous occurrences of non-compliance; and/or • Questionable awareness of and/or capacity to meet regulatory requirement.
CATEGORY C - Indications of future and ongoing compliance are unlikely • Numerous previous occurrences of non-compliance; and/or • Little or no awareness of and/or capacity to meet regulatory requirement.
CATEGORY D - No indication of future and ongoing compliance • Wilful violation of ministry regulatory requirement; and/or • Little or no demonstrated willingness or capacity to meet regulatory requirement.
CATEGORY E - No indication of future and ongoing compliance • Hindering or obstructing a ministry official; • Refusing to furnish required information; and/or • Intentionally including false or misleading information in any required document.

Figure 20 - Categories of Likelihood of Compliance (Compliance History/Willingness and Capacity to Comply

Appendix 3 – Effluent Load Contamination Interview Results

Appendix 3 – Effluent Load Contamination Interview Results

During the audit, the Ministry of Environment and Climate Change Strategy interviewed the following four authorization holders with municipal wastewater treatment systems in the northeast region of British Columbia:

- City of Fort St John (Waste Water Transfer Station);
- Peace River Regional District (Charlie Lake Sewer Lagoons);
- City of Dawson Creek (Waste Water Treatment System);
- District of Chetwynd (Sewage Treatment Plant).

Please refer to Table 11 for the interview results.

Table 11 - Effluent Load Contamination Interview Results

Authorization Holder (Interviewee)	Influent Source	Contamination Incidents	Contamination Prevention Measures
City of Fort St John – Waste Water Transfer Station	The City of Fort St John waste facility only accepts sewer generated within the city boundary. City residents that are not connected to the waste water system must have their sewer hauled to the Waste Water Transfer Station via a trucking company.	The City of Fort St John has stated that they have not encountered any issues with contaminated loads.	Sewage hauler trucks must provide the city with a manifest before the effluent load is accepted. In accordance with the City of Fort St John Sewer Use Regulation and Charges Bylaw No. 2031, 2010, the carrier manifest identifies the waste in the load. Additionally, carriers are reminded that the combination of domestic and non-domestic wastes in the same load is prohibited and the carrier will be subject to random sampling by the City of Fort St John.
Peace River Regional District – Charlie Lake Sewer Lagoons	The Peace River Regional District’s Charlie Lake Sewer Lagoons receive domestic sewage from local residents and rural waste haulers who are “no longer permitted to use the city of Fort St John’s	The Peace River Regional District has stated they have received minimal contaminated loads at their site. The district reported a couple recent incidents concerning loads with elevated conductivity; however, once further testing had been completed, the loads were deemed to be acceptable for release, as it appeared that the elevated conductivity was a factor of	Incoming loads are monitored in order to provide a safeguard against contamination with industrial wastewater. The facility requires testing for a series of trigger parameters prior to being offloaded into the treatment facility. Trigger parameters for incoming loads were developed based on the ability for rapid on-site results; incoming effluent is initially screened and accepted only if pH levels are between 5 to 9, conductivity levels are less than or equal to a

Authorization Holder (Interviewee)	Influent Source	Contamination Incidents	Contamination Prevention Measures
	treatment facility”. Currently, the trucked waste facility receives approximately 5600 cubic metres per month from waste haulers servicing local area residents as well as commercial businesses operating work camps in the area. The incoming loads are intended to originate from holding tank and septic tank wastewater from domestic sources.	the wastes being from domestic septic tanks. The district has implemented contamination prevention measures for these events. The Peace River Regional District also reported an incident with the prohibited discharge of sewage into their sewer system, which became a subject of a 2016 Regional Board meeting and is a matter of public record (PRRD, 2016).	maximum of 3,000 µS/cm, and hydrocarbon concentrations are less than or equal to a maximum of 50 mg/L. If the results from a load indicate that any of the three parameters are outside the acceptable range, the load is held and release is not permitted until further testing indicates that there is a low risk of contamination from an industrial source. With regards to protocol in the event that only the conductivity is elevated, the source of the load, approximate volume of each source, and whether this is a first time occurrence, is confirmed and recorded. In the event that this is the first elevated load from the hauler, the waste is held and sampled for a full spectrum laboratory analysis, as with the standard approach for a possible unsuitable load. The load will only be released once the data have been received from the laboratory and reviewed. In the event that the load contains septage from a domestic septic tank (not a holding tank), the address(es) of the property/properties are noted and the load is released to the trucked waste facility. As a precaution, a sample is to be taken for a partial or full spectrum analysis. Where the partial spectrum analysis includes total suspended solids (TSS), carbonaceous 5-day biochemical oxygen demand (CBOD5), ammonia, and total phosphorus, the sample can either be discarded or sent to the laboratory for analysis. The decision for laboratory analysis can either be random or if the operator has concerns that a load is not representative of typical wastewater received at the facility (as may be indicated by odours or colour changes).
City of Dawson Creek – Waste Water Treatment System	The City of Dawson Creek Waste Water Treatment System mainly receives wastewater	The City of Dawson Creek reported several events where users of the truck dump station deposited materials in varying quantities. From September 2004 to	The sewer system is currently protected by the City of Dawson Creek Sewer Rates and Regulations Bylaw No. 4088, 2010 which outlines regulated substances and their maximum concentrations allowed to be deposited to city’s system, such as metals, oil and grease (hydrocarbons

Authorization Holder (Interviewee)	Influent Source	Contamination Incidents	Contamination Prevention Measures
	from municipal sources; however, the collection system is equipped with a sanitary truck dump station (Sani Dump) which allows for deposits of waste water from the oil and gas sector as well as other industrial areas.	August 2015, there were three instances of drilling mud discovered in the Sani Dump sumps (addressed through cleanout via vacuum truck and increased security monitoring), two events of a hydrocarbon-contaminated load being discharged, three instances of strong hydrocarbon odours in the Sani Dump sumps (addressed through a security review and sample analysis), one instance of plastic beads in the sumps which were cleaned out and two sanitary spills of no greater than 20 liters in volume on-site which were cleaned up.	only), oil and grease (total), benzene, total benzene/toluene/ethylbenzene/xylene (BTEX), total petroleum hydrocarbons, and polycyclic aromatic hydrocarbons (PAHs). The truck dump station is also monitored via security camera.
District of Chetwynd – Sewage Treatment Plant	The District of Chetwynd stated that they only accept domestic sewage from Chetwynd and surrounding Regional District residents.	The District of Chetwynd has reported experience with a few haulers dumping hydrocarbons.	During the recent rebuild of the District of Chetwynd’s sewage treatment system, several haulers were suspended from using the system; some will not be allowed back because of past history. The upgrade to the lagoons included installation of a new dump station with very sophisticated testing equipment. If the alarm is triggered by hydrocarbons and a few other parameters, an alarm will sound and an actuator valve closes. The hauler has 30 seconds to disconnect or risk hose rupture. The portion of the contaminated load that was dumped will be in a chamber prior to the closed valve and the haul will be charged to recover this portion of the load.