



2018

COMPLIANCE AUDIT REPORT

LANDFILL GAS MANAGEMENT REGULATION

MUNICIPAL LANDFILL GAS MANAGEMENT



EXECUTIVE SUMMARY

The B.C. Ministry of Environment and Climate Change Strategy (ENV) conducted a sector-wide compliance audit between April 1, 2018 to March 31, 2019 on a select number of municipal solid waste landfills within the province of British Columbia (B.C.) to determine their level of compliance with the Landfill Gas Management Regulation (LGMR). The regulatory objective of LGMR is minimizing landfill gas (LG) emissions and identifying potential opportunities to increase LG recovery. Findings of the Municipal Landfill Gas Management Audit (MLGM Audit) will serve to identify compliance rates across the sector, guide strategies to improve compliance with legislative requirements, and inform regulatory improvement initiatives to ensure the protection of human health and the environment.

As of September 2019, there are approximately 158 active authorizations for municipal solid waste (MSW) landfill facilities authorized to discharge within B.C. The sample population for the MLGM Audit consists of 71 landfills. Following inspections, ENV determined the LGMR applies for 60 landfill sites since they accepted municipal solid waste for disposal on or after January 1, 2009; 45 are regulated landfill sites as defined in the LGMR.

49% of all landfill sites included in the MLGM Audit were issued notices of compliance with the LGMR. 11 out of the 35 notices of compliance were issued to the facilities determined to be outside the scope of the LGMR at the time of the inspection. Therefore, 34% of the inspected landfill sites within the scope of LGMR were compliant with the LGMR. ENV issued advisories for 34 facilities and warnings for two facilities for non-compliances that were administrative deficiencies or considered to pose, at most, minor temporary impacts to environment, human health, or safety.

The inspections of 71 landfill sites for the MGLM Audit comprised a total of 3,442 evaluations of individual LGMR clauses. In 1,104 of the 3,442 evaluations, the facility was determined to be complying with the evaluated LGMR requirement. Compliance with the evaluated LGMR requirement was deemed not applicable at the time of the inspection in 2,111 evaluations. Therefore, when facilities were evaluated for requirements for which compliance was applicable at the time of the inspection (1,331 evaluations), facilities were compliant in 83 percent of evaluations of applicable requirements.

Areas of notable non-compliance are highlighted below.

With regards to the initial LG generation assessment requirements of the LGMR, Sections 4(5)(a) and 4(5)(c) had a non-compliance rate of 19 percent for applicable facilities due to late report submissions. Two of the inspected sites failed to submit the reports.

With regards to preparation and submission of LG management facilities design plans, Sections 7(2)(b) and 7(3) had respective non-compliance rates of 15 and 58 percent for missing information (lack of contingency plan) as well as late submissions.

With regards to requirements for conducting and submitting the supplementary quinquennial LG generation assessments, the three areas with the highest rates of non-compliance (between 29 percent and 58 percent) are Sections 15(1)(a)(i), 15(1)(a)(ii), and 15(4) due to the lack of submissions or late submissions (one to four years overdue) of the supplementary LG generation assessment reports.

With regards to annual report requirements, Sections 14(1)(a), 14(2)(a), 14(2)(b), 14(2)(d), 14(3)(a) and 14(3)(b) had non-compliance frequencies ranging from 23 percent to 44 percent of inspections that evaluated for these

clauses and determined applicability. The non-compliances included failure to submit an annual report, failure to submit an annual report by the required deadline, and failure to include all information required in the LGMR in the annual report. The MLGM Audit inspections identified that five facilities failed to submit the 2017 annual report.

With regards to Section 10 requirements for providing notification of a temporary shutdown of LG management facilities to the director, compliance with the requirement was applicable for eight out of 40 inspections that evaluated this clause, and four facilities were found to be out of compliance for not providing timely notification of shutdowns to the director.

Findings from the MLGM Audit have highlighted the following opportunities of improvement for facility owner/operators and ENV:

Facility Owner/Operators

Facility owner/operators are reminded that the LGMR applies to all landfill sites in B.C. that accept MSW on or after January 1, 2009 and that the bulk of the requirements apply to all regulated landfill sites. Each facility owner/operator must ensure that deadlines for document submission and other actions required in the LGMR are met. Facility owner/operators are also reminded to ensure that all details for assessments and documents required by LGMR are included in submissions to the director.

Ministry of Environment and Climate Change Strategy

Although deadlines in LGMR requirements for document submissions are each landfill site's responsibilities, ENV may consider development of a system of notification that informs permit holders of any approaching deadlines so that those who have simply forgotten can be reminded and will proactively work to remain in compliance.

Based on permit holder feedback, the window of time allowed for conducting and submitting the supplementary assessment as defined in Sections 15(1)(a) and (b) may be too narrow. It is recommended that the requirements be modified to say that the supplementary assessment must be conducted and submitted prior to March 31 of the fifth calendar year.

With respect to references to the landfill gas assessment guidance document by Sections 4(3)(d), 7(2)(d), 12(1)(c), if there are specific parts of the guidance document that are not explicitly captured in the requirements of the LGMR but should be, then it is recommended that the LGMR be amended to include these requirements as compliance points to avoid including the whole guidance document as a compliance point.

Sections 12(1)(b), 14(1)(a), 14(1)(b) and 14(2)(g) require that information related to organics diversion programs and waste composition studies be maintained and included in annual reports, if available. Because the requirements add 'if available', it becomes very difficult for compliance inspectors to determine in the case where no information was included, whether this is a non-compliance for failing to report the information or simply a situation where there is no information.

It is recommended that the LGMR be amended to state that each report submitted under the LGMR should be submitted in a standalone document to ensure compliance with the requirements.

Sections 4(3) and 15(2) impose requirements on qualified professionals rather than the landfill site owner/operators being inspected; It is recommended that the LGMR be amended to state that the owner or operator of the landfill site must ensure that the qualified professional performs the requirement.

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LIST OF ABBREVIATIONS USED

Acronym	Definition
EMA	<i>Environmental Management Act</i>
ENV	B.C. Ministry of Environment and Climate Change Strategy
LG	Landfill gas
LGMR	Landfill Gas Management Regulation
MLGM	Municipal Landfill Gas Management
MSW	Municipal solid waste
WDR	Waste Discharge Regulation

INTRODUCTION

PURPOSE OF THIS REPORT

This report presents the findings of a sector-wide compliance audit conducted between April 1, 2018 and March 31, 2019 on a select number of municipal solid waste landfills within the province of British Columbia (B.C.) to determine their level of compliance with the Landfill Gas Management Regulation (LGMR) under the *Environmental Management Act* (EMA) administered by the Ministry of Environment and Climate Change Strategy (ENV).

Findings of the Municipal Landfill Gas Management Audit (MLGM Audit) will serve to identify compliance rates across the sector, guide strategies to improve compliance with legislative requirements, and inform regulatory improvement initiatives to ensure the protection of human health and the environment. ENV expects that the municipal solid waste landfill sector will use the report to identify and address areas of improvement to ensure compliance for not only individual operations, but also across the overall sector.

ABOUT THE INDUSTRY SECTOR

SELECTION

Industry sectors targeted by the ENV's annual audit program are selected based on their inclusion in the Waste Discharge Regulation (WDR), as well as existing policy and direction such as Environmental Protection Division's Inspection Policy and the 2018 Ministry Service Plan.

DESCRIPTION

Landfills are a component of integrated solid waste management systems. Disposal of solid waste via burial in a landfill is the least preferred waste management option in the pollution prevention hierarchy – to be utilized only after waste reduction, reuse, recycling and recovery options have been exhausted. Nonetheless, even with high waste diversion rates, landfills will continue to remain an essential feature of solid waste management systems to deal with the wastes that cannot practically be removed from the waste stream.

Municipal solid waste (MSW) is defined in Part 3, Section 23 of the EMA as:

- (a) refuse that originates from residential, commercial, institutional, demolition, land clearing, or construction sources, or
- (b) refuse specified by a director to be included in a waste management plan.

Approximately 2.45 million tonnes of municipal solid waste were disposed of in B.C. in 2017, translating to an average of 506 kg of municipal solid waste per British Columbian.¹

As of September 2019, there are approximately 158 active authorizations for municipal solid waste landfill facilities authorized to discharge within B.C. This estimate does not include landfills for which authorizations have been cancelled, expired, or abandoned, or industry-associated landfills such as those serving logging or mining camps.

REGULATORY OVERSIGHT

The EMA and the WDR are the principal pieces of legislation that protect soil, air and water quality in B.C. Under this legislation, the introduction of waste into the environment from identified “prescribed” industries, trades, businesses, operations, and activities requires authorization from ENV. **Municipal solid waste management** is a prescribed activity/operation listed under Schedule 1 of the WDR and included in Section 6(3) of EMA. Therefore, municipal landfills require a site-specific authorization under a permit, municipal solid waste management plan, or operational certificate to discharge waste into the environment. The Landfill Criteria for Municipal Solid Waste (second edition, June 2016) produced by ENV provides guidance for environmentally sound landfilling practices and procedures that are consistent with legislated requirements and desirable environmental outcomes. The Landfill Criteria for Municipal Solid Waste includes performance, design and operation criteria for the management of landfill gas.

The Landfill Gas Management Regulation (LGMR) came into force in 2009, to support fulfillment of the provincial government’s commitment to reduce B.C.’s greenhouse gases (by at least 40 percent reduction of 2007 levels by 2030 as outlined in the Climate Change Accountability Act). The LGMR sets out requirements for the capture of landfill gas and constituent greenhouse gases at applicable municipal solid waste landfills under provincial jurisdiction based on solid waste discharge volumes and greenhouse gas generation thresholds. The regulatory objective of the LGMR is minimizing landfill gas emissions and identifying potential opportunities to increase landfill gas recovery. As specified in Section 2 of the LGMR, the LGMR applies to landfill sites that accept municipal solid waste for disposal into the landfill site on or after January 1, 2009.

According to Section 76.2 of EMA and Section 3 of the LGMR, the owner or operator of regulated landfill sites must manage, in accordance with the regulations, specified greenhouse gases produced from wastes handled at the waste management facility. As defined in the LGMR, landfill gas management includes landfill gas migration management, and collection, storing, and flaring of landfill gases.

It should also be noted that a regulated landfill site is defined in Section 1 of the LGMR as

a landfill site that

¹ Environmental Reporting BC. 2019. Municipal Solid Waste Disposal in B.C. (1990-2017). State of Environment Reporting, Ministry of Environment and Climate Change Strategy, British Columbia, Canada. Accessed at < <http://www.env.gov.bc.ca/soe/indicators/sustainability/municipal-solid-waste.html>>

(a) has 100,000 tonnes or more of municipal solid waste in place, or

(b) receives 10,000 or more tonnes of municipal solid waste for disposal into the landfill site in any calendar year after 2008.

Therefore, the LGMR applies to all landfill sites that accept municipal solid waste for disposal into the landfill site on or after January 1, 2009; however, the bulk of requirements under the LGMR and EMA's mandate for landfill greenhouse gas management apply to landfill sites that either have at least 100,000 tonnes of municipal solid waste in place or have received at least 10,000 tonnes of municipal solid waste for disposal at the landfill site in any year since 2009.

The scope of the MLGM Audit is limited to landfill sites that have accepted municipal solid waste for disposal into the landfill at any time on or after January 1, 2009 – i.e., landfill sites for which the LGMR applies.

DESCRIPTION OF THE AUDITED PREMISES

The MLGM Audit consisted of compliance inspections conducted for 71 municipal solid waste landfills authorized to discharge refuse in B.C.

The landfill sites included in this MLGM Audit, their LGMR inspection record numbers, their respective waste discharge authorization numbers, and their locations are as listed below in Table 1.

Table 1. Landfill Sites Inspected for the MGLM Audit

LGMR Inspection Record	Landfill Site	Location	Permit or Operational Certificate (OC) for Waste Discharge
INSPECTED SITES FOR WHICH THE LGMR APPLIES			
114361	Spruce Wilderness Resort Ltd.	Barriere	Permit 2918
101889	Alberni-Clayoquot Regional District: West Coast Landfill	Ucluelet	OC 5634
118103	Bulkley Nechako Regional District: Clearview Landfill	Vanderhoof	OC 17686
120441	Capital Regional District: Hartland Landfill	Saanichton	OC 12659
116026	Cariboo Regional District	Kleena Kleene Landfill	OC 6313
116027	Cariboo Regional District: Gibraltar Mine Landfill	McLeese Lake	OC 16556
115984	Cariboo Regional District: Puntzi Lake Landfill	Chilanko Forks, Puntzi Lake	OC 4536
116040	Cariboo Regional District: West Chilcotin Landfill	West Chilcotin	OC 17920
116030	Cariboo Regional District: Williams Lake Landfill	Williams Lake	OC 103019
115819	City of Kamloops: Barnhartvale Landfill	Kamloops	Permit 4778
84521	City of Kamloops: Mission Flats Landfill	Kamloops	OC MR-3328(7)
115990	City of Kamloops: Owl Road Landfill	Kamloops	Permit 5910

LGMR Inspection Record	Landfill Site	Location	Permit or Operational Certificate (OC) for Waste Discharge
117461	City of Kelowna: Glenmore Landfill	Kelowna	OC 12218
114439	City of Quesnel: Quesnel Municipal Landfill	Quesnel	OC 3132
100884	City of Vancouver: Vancouver Landfill	Delta	OC 1611
117700	City of Vernon: Hesperia Landfill	Vernon	OC 15288
118121	Columbia Shuswap Regional District: Golden Refuse Disposal Site	Golden	OC 17006
119082	Columbia Shuswap Regional District: Revelstoke Landfill	Revelstoke	OC 15821
115088	Columbia Shuswap Regional District: Salmon Arm Landfill	Salmon Arm	OC 5479
115164	Comox Valley Regional District: Campbell River Waste Management Centre	Campbell River	OC 2401
115525	Comox Valley Regional District: Comox Valley Waste Management Centre	Cumberland	OC 5050
115527	Comox Valley Regional District: Zeballos Landfill	Zeballos	Permit 7496
115520	Corporation of the District of Squamish: Squamish Landfill	Squamish	Permit 5261
118821	District of Hope: Hope Landfill	Hope	OC 15675
114363	District of Mission: Mission Landfill (Minnie's Pit)	Mission	OC 105058
91781	District of Summerland: Summerland Sanitary Landfill	Summerland	OC 15275
87826	Ecowaste Industries Ltd.: Ecowaste Landfill	Richmond	OC 4922
99604	Fraser Valley Regional District: Chaumox Municipal Sanitary Landfill	Boston Bar	OC 101804
118101	Minister of Transportation and Infrastructure: Beta Landfill	Delta	Permit 104110
114491	Peace River Regional District: Chetwynd Landfill	Chetwynd	Permit 2896
118686	Peace River Regional District: North Peace Regional Landfill	Fort. St John	OC 106160
89427	Regional District of Bulkley-Nechako: Knockholt Landfill	Houston	Permit 8856
116283	Regional District of Bulkley-Nechako: Manson Creek Landfill	Manson Creek	Permit 7912
99425	Regional District of Central Kootenay: Central (Salmo) Transfer Station, formerly Central Landfill	Salmo	OC 16519
117783	Regional District of Central Kootenay: Nakusp Landfill	Nakusp	OC 16521
117259	Regional District of Central Kootenay: Ootischenia Landfill	Castlegar	OC 17126
117659	Regional District of Central Okanagan: Westside Landfill	West Kelowna	OC 12217
117126	Regional District of East Kootenay: Central Subregional Landfill	Cranbrook	OC 15962
117441	Regional District of East Kootenay: Columbia Valley Subregional Landfill	Windermere	OC 100134
83358	Regional District of Fraser-Fort George: Foothills Boulevard Landfill	Prince George	OC 1697
116481	Regional District of Kitimat-Stikine: Hazelton Regional Landfill	Hazelton	OC 17226
114445	Regional District of Kitimat-Stikine: Iskut Landfill	Dease Lake	OC 4612
115732	Regional District of Kitimat-Stikine: Kitwanga Landfill	Kitwanga	OC 5767
115619	Regional District of Kootenay Boundary: McKelvey Creek Regional Landfill	Trail	Permit 1917
116430	Regional District of Mount Waddington: 7 Mile Landfill	Port McNeill	OC 8490
90125	Regional District of Nanaimo: Nanaimo Regional Landfill	Nanaimo	OC 1714
89740	Regional District of North Okanagan: Armstrong/Spallumcheen Recycling and Disposal Facility	Armstrong	OC 15284

LGMR Inspection Record	Landfill Site	Location	Permit or Operational Certificate (OC) for Waste Discharge
117379	Regional District of North Okanagan: Greater Vernon Recycling and Disposal Facility	Vernon	OC 15286
89579	Regional District of North Okanagan: Okanagan Falls Landfill	Okanagan Falls	OC 15279
116659	Regional District of Okanagan Similkameen: Oliver Landfill	Oliver	OC 15280
114446	Rock Bay Transport Inc.: Highwest Landfill	Victoria	OC 100193
114486	Squamish-Lillooet Regional District: Lillooet Municipal Landfill	Lillooet	Permit 5042
115982	Sunshine Coast Regional District: Sechelt Landfill	Sechelt	OC 106060
94748	Thompson-Nicola Regional District: Barrier Municipal Landfill	Little Fort	Permit 2749
96679	Thompson-Nicola Regional District: Chase Landfill	Chase	Permit 2911
84889	Thompson-Nicola Regional District: Heffley Creek Landfill	Thompson-Nicola P	Permit 3447
84840	Thompson-Nicola Regional District: Lower Nicola Landfill	Merritt	Permit 4465
89224	Town of Osoyoos: Osoyoos & District Sanitary Landfill	Osoyoos	OC 15273
89432	Town of Princeton: Princeton & District Landfill	Princeton	OC 15276
115940	Wastech Services Ltd. and the Village of Cache Creek: Cache Creek Landfill	Cache Creek	OC 7577
INSPECTED SITES FOR WHICH THE LGMR DID NOT APPLY AT THE TIME OF THE AUDIT			
114399	Belcorp Environmental Services Inc. and Village of Cache Creek: Cache Creek Solid Waste Facility	Cache Creek	OC 107189
114945	City of Abbotsford: Trethewey Street Landfill	Abbotsford	Permit 1504
114805	City of Abbotsford: Valley Road Landfill	Abbotsford	Permit 7232
115419	Comox Valley Regional District	Gold River Landfill	Permit 3825
117362	Cultus Lake Park Board: Cultus Lake Landfill	Cultus Lake	Permit 5984
118100	Mounce Construction Ltd: Mounce Construction Landfill	Salmon Arm	Permit 11191
115760	Regional District of Bulkley-Nechako: Grassy Plains Landfill	Grassy Plains	Permit 6105
90135	Regional District of Central Okanagan: Bouleau Lake Landfill	Kelowna	OC 12606
115762	Regional District of Fraser-Fort George: Aleza Lake	Aleza Lake	Permit 6756
89721	Regional District of North Okanagan: Ashton Creek Closed Landfill	Ashton Creek	OC 15287
89575	Regional District of North Okanagan: Kingfisher Transfer Station, formerly Kingfisher Recycling and Disposal Facility	Regional District of North Okanagan	OC 15281

POTENTIAL ENVIRONMENTAL ISSUES AND KEY METHODS OF POLLUTION CONTROL

The typical non-point source discharges originating from municipal solid waste landfills as a result of the discharge of refuse include air emissions such as landfill gas and fugitive dust, effluent such as leachate and surface water run-off, and solid wastes such as litter. There may also be odour issues. The scope of this MLGM Audit is limited to landfill gas discharge and management.

Municipal landfill gas (LG) is mainly generated from the anaerobic bacterial decomposition of organic material (e.g. yard trimmings, food waste, wood waste, paper, etc.) buried in landfills, and generation

volumes and rates are impacted by environmental conditions such as moisture content, temperature, waste composition, available oxygen, and landfill age. Other processes leading to landfill gas generation include volatilization and chemical reactions from the mixture of various wastes. Landfill gas consists of methane (45 to 60 percent by volume) and carbon dioxide (40 to 60 percent by volume), as well as trace amounts of nitrogen, oxygen, ammonia, sulfides, hydrogen, carbon monoxide, and non-methane organic compounds (NMOCs) such as acrylonitrile, benzene, 1,1-dichloroethane, 1,2-cis dichloroethylene, dichloromethane, carbonyl sulfide, ethyl-benzene, hexane, methyl ethyl ketone, tetrachloroethylene, toluene, trichloroethylene, vinyl chloride, and xylenes.²

As methane is a much more potent greenhouse gas than carbon dioxide, methane-rich landfill gas generation contributes to overall greenhouse gas emissions responsible for global warming and climate change. Additionally, landfill gas generation poses an explosion and fire hazard, human health risks due to exposure from landfill gas migration, and groundwater contamination.

Mitigation of landfill gas issues involve minimizing the amount of gas generation, as well as collection and processing of generated gases, specifically methane. Best management practices for minimizing landfill gas generation include diversion of source-separated organic waste to a composting or biogas facility, selection and design of landfill intermediate and final covers to prevent rainfall infiltration and reduce gas emissions, implementation of a biofilter to convert methane to carbon dioxide, and minimization of the surface area of the tipping face.³ Extraction and collection of landfill gas from landfills is achieved using a series of wells and a blower/flare or vacuum system. The collected LG can be flared (burnt off), converted into beneficial energy (electricity, renewal natural gas, or direct fuel usage), or other applications such as landfill leachate evaporation.⁴

MLGM AUDIT METHODOLOGY

PRE-AUDIT ACTIVITIES

ENV regional compliance officers were responsible for scheduling and coordinating the on-site inspections.

² Agency for Toxic Substances and Disease Registry (ATSDR). November 2001. Landfill Gas Primer: An Overview for Environmental Health Professionals: Chapter 2: Landfill Gas Basics
<<https://www.atsdr.cdc.gov/HAC/landfill/html/ch2.html>>

³ Conestoga-Rovers & Associates. June 2011. Prepared for the B.C. Ministry of Environment. Technologies and Best Management Practices for Reducing GHG Emissions from Landfills Guidelines. Accessed at
<<https://www2.gov.bc.ca/assets/gov/environment/waste-management/garbage/ghgreducingguidelines.pdf>>

⁴ United States Environmental Protection Agency. Landfill Methane Outreach Program: Basic Information About Landfill Gas. <<https://www.epa.gov/lmop/basic-information-about-landfill-gas>>

INSPECTIONS

Inspections were conducted as office reviews, on-site visits, or a combination of both.

OFFICE REVIEW / DESKTOP INSPECTION

ENV reviewed office records for each facility that was inspected in the MLGM Audit. The office review included authorization information within ENV's Authorization Management System (AMS) database and any other required documents, reports, or data submissions. The office review inspection may also have included direct communication with the authorization holder to ask questions as needed to gather additional information necessary to complete the inspection.

Sixty-two of the 71 total inspections conducted for the MLGM Audit were limited to office reviews due to time constraints and the administrative nature of the majority of LGMR requirements.

ON-SITE INSPECTION

ENV conducted on-site inspections at nine of the 71 facilities inspected in the MLGM Audit. During each on-site inspection, ENV conducted a walkthrough of the site to verify facility and operational details and review maintenance logs. Site personnel were questioned on site history and operation details as necessary. Photographs of the authorized works and discharges were taken as necessary.

INSPECTION RESULTS REPORTING

Inspections consisted of evaluating whether the authorization holder was compliant with the LGMR on a section-by-section basis. Compliance findings for each section were one of four outcomes:

In	ENV determined that the authorization holder is in compliance (compliant) with the regulatory requirement at the time of the inspection
Out	ENV determined that the authorization holder is out of compliance with the regulatory requirement at the time of the inspection
Not determined	There was not enough information for ENV to determine whether the authorization holder is in compliance (compliant) with the regulatory requirement at the time of the inspection
Not applicable	Compliance with the regulatory requirement did not apply to the authorization holder at the time of the inspection

ENV determined the appropriate administrative response based on the compliance verification findings of the inspection using the non-compliance decision matrix contained in ENV's Compliance and Enforcement Policy and Procedure⁵. A detailed description of some common administrative responses is included below:

⁵ B.C. Ministry of Environment and Climate Change Strategy. May 2014. Compliance and Enforcement Policy and Procedure, Version 3. Accessed at <https://www2.gov.bc.ca/assets/gov/environment/research-monitoring-and-reporting/reporting/reporting-documents/environmental-enforcement-docs/ce_policy_and_procedure_2018.pdf>.

Notice	A notice of compliance is a written confirmation that ENV determined that the authorization holder is in compliance (compliant) with all of the regulatory requirements evaluated at the time of the inspection
Advisory	An advisory notifies the non-compliant party in writing that they are not in compliance with a specific regulatory requirement and often recommends a course of action that is expected to achieve compliance. 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.
Warning	Like an advisory, a warning notifies the non-compliant party in writing that they are not in compliance with a specific regulatory requirement; however, the warning differs from an advisory in that it warns of the possibility of an escalating response should non-compliance continue. Warnings are generally used when it is determined that an exchange of information alone would not be sufficient in achieving compliance.

The response of a notice of compliance is only issued if none of the assessed sections are found to be out of compliance. If a single non-compliance was found during an inspection, the minimum compliance response is an advisory, regardless of how many sections were compliant or how minor the non-compliance.

Both advisories and warnings serve as a formal record of the alleged non-compliance and form an important element of the compliance history of the party in question. Other responses such as orders, administrative monetary penalties, etc., within ENV's enforcement toolkit can be found in ENV's Compliance and Enforcement Policy and Procedure.

The results of each inspection, along with the administrative responses, were summarized in an inspection record, a copy of which was provided to the authorization holder.

DATA ANALYSIS

ENV compiled the results of the inspections for each of the 71 facilities included in the MGLM Audit to determine compliance rates with the requirements of the LGMR and identify opportunities for improvement.

SUMMARY OF FINDINGS

Following the inspections, ENV determined that the LGMR did not apply for 11 out of the 71 inspected landfill sites at this time because they have not accepted municipal solid waste for disposal since January 1, 2009, as per Section 2 of the LGMR.

Out of the remaining 60 landfill sites for which the LGMR applies, 15 are not considered regulated landfill sites as defined in the LGMR; i.e., they have less than 100,000 tonnes of municipal solid waste in

place and have been receiving less than 10,000 annual tonnes of municipal solid waste for disposal since 2008. Table 2 details the compliance responses of the inspections conducted for the MGLM Audit.

Table 2. Compliance Outcomes for MGLM Audit Inspections

Compliance Response	LGMR Was Applicable to Inspected Site	LGMR Was Not Applicable to Inspected Site	Total
Notice of Compliance	24	11	35
Advisory	34	0	34
Warning	2	0	2
Total	60	11	71

49 percent of all landfill sites included in the MLGM Audit were found to be compliant with the assessed requirements of the LGMR and were issued notices of compliance. Eleven out of the 35 notices of compliance were issued to facilities determined to be excluded from the scope of the LGMR at the time of the inspection. Therefore, of the inspected landfill sites included under the LGMR, 34 percent were compliant with the assessed requirements of the LGMR.

ENV issued advisories for 34 facilities and warnings for two facilities for non-compliances that were administrative deficiencies or considered to pose, at most, minor temporary impacts to the environment, human health, or safety (Levels 1 or 2 ratings of impact based on ENV's Non-Compliance Decision Matrix in ENV's Compliance and Enforcement Policy and Procedure).

The inspections of 71 landfill sites for the MGLM Audit comprised a total of 3,442 evaluations of individual LGMR clauses. In 1,104 of the 3,442 evaluations (32 percent), the facility was determined to be complying with the evaluated LGMR requirement. Facilities were determined to be non-compliant in four percent of clause evaluations. Compliance could not be determined in three percent of overall evaluations, and compliance with the evaluated LGMR requirement was deemed not applicable at the time of the inspection in 61 percent of evaluations (2,111 evaluations).

It is noteworthy that when facilities were evaluated for requirements for which compliance was applicable at the time of the inspection (1,331 evaluations), facilities were compliant in 83 percent of evaluations of applicable requirements. Table 3 illustrates the overall compliance findings for overall aggregated clause evaluations in the MLGM Audit.

Table 3. Overall Compliance with Clauses Evaluated in the MLGM Audit

Compliance Findings		Tally of All Evaluations of Clauses in the Audit	Percentage of All Evaluations of Clauses in the Audit	Percentage of All Evaluations of Applicable Clauses in the Audit
Compliance with clause is applicable at the time of inspection	In Compliance	1104	32 %	83 %
	Out of Compliance	136	4 %	10 %
	Compliance Not Determined	91	3 %	7 %
	Subtotal	1331	39 %	100 %
Compliance with clause not applicable at the time of inspection		2111	61 %	-
Total		3442	-	-

The following sections present the inspection results grouped together by similar clauses and evaluated together to assess compliance based on like requirements of the LGMR. Note that not every clause of the LGMR was evaluated during every inspection of the 71 registered facilities. This was usually due to lack of applicability/relevance of the clause; for example, the regulated landfill requirements would generally only have been evaluated for the 45 inspected regulated landfill sites. Thus, the data analysis excludes the statistics on clauses that were not evaluated.

QUALIFIED PROFESSIONAL CERTIFICATION

Sections 4(3)(e), 5(2), 5(3)(b), 7(2)(f), 7(4), 8(4)(a), 11(2), and 15(3) of the LGMR detail requirements for services that must be conducted by qualified professionals. While there are other clauses in the LGMR that require qualified professional services, the abovementioned clauses specifically require that the qualified professionals provide their certification that these requirements of the LGMR are met.

The aggregated compliance findings of all the qualified professional clauses inspected for LGMR facilities in this MLGM Audit are as follows:

- 23% of qualified professional clause evaluations resulted in an “In Compliance” finding
- 1% of qualified professional clause evaluations resulted in an “Out of Compliance” finding
- 2% of qualified professional clause evaluations resulted in a “Compliance Not Determined” finding
- 74% of qualified professional clause evaluations resulted in a “Compliance with Clause Not Applicable” finding

Table 4 details the findings of the inspections that evaluated the qualified professional clauses of the LGMR.

Table 4. Tally of Inspection Findings for Evaluated LGMR Qualified Professional Clauses

LGMR Section	Tally of Inspection Findings For Evaluated Clauses				Total number of inspections evaluating clause
	In	Out	Not Determined	Not Applicable	
4(3)(e)	42	1	0	1	44
5(2)	0	0	0	40	40
5(3)(b)	0	0	0	40	40
7(2)(f)	12	0	1	28	41
7(4)	0	0	0	40	40
8(4)(a)	7	1	3	29	40
11(2)	0	0	0	31	31
15(3)(a)	18	1	2	17	38
15(3)(b)	1	0	2	31	34
Total	80	3	8	257	639

Since it can be more useful to look at only cases where the clauses were applicable, Table 5 shows the percentage of inspection findings that evaluated the qualified professional clauses of the LGMR and were applicable to the facility during the inspection periods.

Table 5. Percentage of Inspection Findings for Evaluated and Applicable LGMR Qualified Professional Clauses

LGMR Section	Percentage of Inspection Findings for Evaluated and Applicable Clauses		
	In	Out	Not Determined
4(3)(e)	98%	2%	0%
7(2)(f)	92%	0%	8%
8(4)(a)	64%	9%	27%
15(3)(a)	86%	5%	10%
15(3)(b)	33%	0%	67%

Overall, inspected landfill operations had low frequencies (less than 10%) of non-compliance with the qualified professional requirements of the LGMR.

INITIAL LANDFILL GAS GENERATION ASSESSMENT AND REPORTING

LGMR Section 4 mandates that regulated landfill sites undergo an initial LG generation assessment by a qualified professional, and the findings compiled in a report to be submitted to the director under specified timelines. The assessment must determine current and projected annual MSW tonnages, MSW in place, and estimate current and projected quantities of generated methane.

The aggregated compliance findings of all the initial LG generation assessment clauses inspected for LGMR facilities in this MLGM Audit are as follows:

- 72% of initial assessment clause evaluations resulted in an “In Compliance” finding
- 3% of initial assessment clause evaluations resulted in an “Out of Compliance” finding
- 1% of initial assessment clause evaluations resulted in a “Compliance Not Determined” finding
- 24% of initial assessment clause evaluations resulted in a “Compliance with Clause Not Applicable” finding

Table 6 details the findings of the inspections that evaluated the initial LG generation assessment clauses of the LGMR.

Table 6. Tally of Inspection Findings for Evaluated Initial LG Generation Assessment Clauses

LGMR Section	Tally of Inspection Findings For Evaluated Clauses				Total number of inspections evaluating clause
	In	Out	Not Determined	Not Applicable	
4(1)	44	1	0	12	57
4(2)(a)	44	1	0	0	45

LGMR Section	Tally of Inspection Findings For Evaluated Clauses				Total number of inspections evaluating clause
	In	Out	Not Determined	Not Applicable	
4(2)(b)	44	1	0	0	45
4(2)(c)	44	1	0	0	45
4(2)(d)	44	1	0	0	45
4(2)(e)	43	2	0	0	45
4(3)(a)	41	1	1	1	44
4(3)(b)(i)	42	0	1	1	44
4(3)(b)(ii)	43	0	0	1	44
4(3)(c)	1	0	1	41	43
4(3)(d)	40	1	0	1	42
4(3)(e)	42	1	0	1	44
4(4)	4	0	0	38	42
4(5)(a)	25	7	5	7	44
4(5)(b)(i)	5	0	0	36	41
4(5)(b)(ii)	0	0	0	9	9
4(5)(c)(i)	11	3	2	22	38
4(5)(c)(ii)	0	0	0	5	5
Total	517	20	10	175	722

Table 7 shows the percentage of inspection findings for each initial LG generation assessment clause that was evaluated and were applicable to the facility during the inspection periods.

Table 7. Percentage of Inspection Findings for Evaluated and Applicable Initial LG Generation Assessment Clauses

LGMR Section	Percentage of Inspection Findings for Evaluated and Applicable Clauses		
	In	Out	Not Determined
4(1)	98%	2%	0%
4(2)(a)	98%	2%	0%
4(2)(b)	98%	2%	0%
4(2)(c)	98%	2%	0%
4(2)(d)	98%	2%	0%
4(2)(e)	96%	4%	0%
4(3)(a)	95%	2%	2%
4(3)(b)(i)	98%	0%	2%
4(3)(b)(ii)	100%	0%	0%
4(3)(c)	50%	0%	50%
4(3)(d)	98%	2%	0%
4(3)(e)	98%	2%	0%
4(4)	100%	0%	0%
4(5)(a)	68%	19%	14%

4(5)(b)(i)	100%	0%	0%
4(5)(c)(i)	69%	19%	13%

Overall, inspected landfill operations had high levels of compliance with the initial LG generation assessment requirements of the LGMR, with the highest levels of non-compliance (19% of inspections that were evaluated for the clause and determined applicability) observed for sections 4(5)(a) and 4(5)(c) which require meeting the report submission date of January 1, 2011. Two of the inspected sites did not submit the initial LG generation assessment report as required by the LGMR.

ADDITIONAL LANDFILL GAS GENERATION ASSESSMENT AND REPORTING

LGMR Section 5 specifies that the director, after receiving the initial LG generation assessment report, may request additional LG generation assessments of the landfill site; the additional assessment must be conducted by a qualified professional and the resulting report submitted to the director.

LGMR Section 6 specifies that at any time, the director may request a LG generation assessment of any landfill site to which the LGMR applies, in accordance with the same requirements for the initial landfill site assessment and report submission.

During the 41 inspections that evaluated Section 5 and 6 clauses, ENV officers did not identify any related director requests, and therefore determined that compliance with the clauses were not applicable to the sites at the time of the inspections.

LANDFILL GAS MANAGEMENT FACILITIES DESIGN PLAN

LGMR Section 7 mandates that regulated landfill sites estimated (via LG generation assessments) to generate at least 1,000 tonnes of methane annually must have a LG management facilities design plan prepared for the site by a qualified professional and submitted to the director by a specified time. The design plan must include details such as LG management methods, practices, and processes, and LG management facility installation, operation and maintenance, and contingency plans.

The aggregated compliance findings of all the LG management facilities design plan clauses inspected for LGMR facilities in this MLGM Audit are as follows:

- 18% of design plan clause evaluations resulted in an “In Compliance” finding
- 2% of design plan clause evaluations resulted in an “Out of Compliance” finding
- 2% of design plan clause evaluations resulted in a “Compliance Not Determined” finding
- 77% of design plan clause evaluations resulted in a “Compliance with Clause Not Applicable” finding

Table 8 details the findings of the inspections that evaluated the LG management facilities design plan clauses of the LGMR.

Table 8. Tally of Inspection Findings for LG Management Facilities Design Plan Clauses

LGMR Section	Tally of Inspection Findings For Evaluated Clauses				Total number of inspections evaluating clause
	In	Out	Not Determined	Not Applicable	
7(1)	12	0	1	32	45
7(2)(a)	12	0	1	28	41
7(2)(b)	10	2	1	28	41
7(2)(c)	12	0	1	28	41
7(2)(d)	12	0	1	28	41
7(2)(e)	3	0	2	36	41
7(2)(f)	12	0	1	28	41
7(3)	3	7	2	28	40
7(4)	0	0	0	40	40
7(5)	0	0	0	40	40
Total	76	9	10	316	411

Compliance with the requirements to prepare a LG management facilities design plan for the site was not applicable at the time of the inspections for 32 of the 45 regulated landfill sites because the landfill sites were not estimated to generate greater than 1,000 tonnes of methane annually. Table 9 shows the percentage of inspection findings for each clause to prepare a LG management facilities design plan that was evaluated and determined to be applicable to the facility.

Table 9. Percentage of Inspection Findings for Evaluated and Applicable LG Management Facility Design Plan Clauses

LGMR Section	Percentage of Inspection Findings for Evaluated and Applicable Clauses		
	In	Out	Not Determined
7(1)	92%	0%	8%
7(2)(a)	92%	0%	8%
7(2)(b)	77%	15%	8%
7(2)(c)	92%	0%	8%
7(2)(d)	92%	0%	8%
7(2)(e)	60%	0%	40%
7(2)(f)	92%	0%	8%
7(3)	25%	58%	17%

Section 7(2)(b) and Section 7(3) were the only sections where instances of non-compliance were observed at 15% and 58% of facilities, respectively.

The two instances of non-compliance with Section 7(2)(b) were attributed to failure to include a contingency plan for disruption in LG management during scheduled or emergency maintenance or replacement of LG management facilities.

The seven instances of non-compliance with Section 7(3) were due to failure to submit the LG management facilities design plan within one year of the submission date of the LG generation assessment report; these facilities submitted their plan up to 2 years after.

LANDFILL GAS MANAGEMENT FACILITIES

LGMR Section 8 mandates that owners or operators of landfill sites for which there is an accepted LG management facilities design plan must install LG management facilities and implement LG management practices, processes and methods in accordance with the design plan and applicable guidelines within a specified timeline. The installations must be certified by a qualified professional.

The aggregated compliance findings of all the LG management facility clauses inspected for LGMR facilities in this MLFM Audit are as follows:

- 24% of LG management facility clause evaluations resulted in an “In Compliance” finding
- 2% of LG management facility clause evaluations resulted in an “Out of Compliance” finding
- 1% of LG management facility clause evaluations resulted in a “Compliance Not Determined” finding
- 73% of LG management facility clause evaluations resulted in a “Compliance with Clause Not Applicable” finding

Table 10 details the findings of the inspections that evaluated the LG management facility clauses of LGMR.

Table 10. Tally of Inspection Findings for LG Management Facility Clauses

LGMR Section	Tally of Inspection Findings For Evaluated Clauses				Total number of inspections evaluating clause
	In	Out	Not Determined	Not Applicable	
8(1)	2	0	0	29	31
8(2)(a)	10	1	1	28	40
8(2)(b)(i)	10	1	0	28	39
8(2)(b)(ii)	10	1	0	28	39
8(2)(b)(iii)	10	1	0	28	39
8(2)(b)(iv)	10	1	0	28	39
8(2)(b)(v)	10	1	0	28	39
8(2)(b)(vi)	10	1	0	28	39
8(3)	10	1	0	29	40
8(4)(a)	7	1	3	29	40
8(4)(b)	11	0	0	29	40
Total	100	9	4	312	425

Compliance with the requirements to install LG management facilities was not applicable at the time of the inspections for 29 of the 40 regulated landfill sites assessed because the landfill sites were not

initially estimated to generate greater than 1,000 tonnes of methane annually and therefore, not required to prepare LG management facilities design plans or install LG management facilities. Table 11 shows the percentage of inspection findings for each clause to install LG management facilities that were evaluated and determined to be applicable to the facility.

Table 11. Percentage of Inspection Findings for Evaluated and Applicable LG Management Facility Clauses

LGMR Section	Percentage of Inspection Findings for Evaluated and Applicable Clauses		
	In	Out	Not Determined
8(1)	100%	0%	0%
8(2)(a)	83%	8%	8%
8(2)(b)(i)	91%	9%	0%
8(2)(b)(ii)	91%	9%	0%
8(2)(b)(iii)	91%	9%	0%
8(2)(b)(iv)	91%	9%	0%
8(2)(b)(v)	91%	9%	0%
8(2)(b)(vi)	91%	9%	0%
8(3)	91%	9%	0%
8(4)(a)	64%	9%	27%
8(4)(b)	100%	0%	0%

Overall, compliance rates for Section 8 of the LGMR were high; only two sites were out of compliance with one or more of the Section 8 requirements.

LANDFILL GAS MANAGEMENT

LGMR Section 9 mandates that collected LG must be flared in accordance with the guidelines or otherwise utilized to achieve an equivalent reduction in methane emissions.

The aggregated compliance findings of all the LG management clauses inspected for LGMR facilities in this Audit are as follows:

- 14% of LG management clause evaluations resulted in an “In Compliance” finding
- 0% of LG management clause evaluations resulted in an “Out of Compliance” finding
- 1% of LG management clause evaluations resulted in a “Compliance Not Determined” finding
- 84% of LG management clause evaluations resulted in a “Compliance with Clause Not Applicable” finding

Table 12 details the findings of the inspections that evaluated the LG management clauses of the LGMR.

Table 12. Tally of Inspection Findings for LG Management Clauses

LGMR Section	Tally of Inspection Findings For Evaluated Clauses				Total number of inspections evaluating clause
	In	Out	Not Determined	Not Applicable	
9(1)	10	0	1	29	40
9(2)	0	0	0	29	29
Total	10	0	1	58	69

No non-compliances were identified during the inspections that evaluated LGMR Section 9.

QUINQUENNIAL LANDFILL GAS GENERATION ASSESSMENTS

LGMR Section 15 mandates that even if a LG generation assessment estimates that less than 1,000 tonnes of methane will be generated annually, a qualified professional must still conduct and report on a supplementary LG generation assessment every five years unless, as stated in Section 16, a LG management facilities design plan has been submitted to and accepted by the director.

The aggregated compliance findings of all the quinquennial LG generation assessment clauses inspected for LGMR facilities in this MGLM Audit are as follows:

- 24% of quinquennial assessment clause evaluations resulted in an “In Compliance” finding
- 10% of quinquennial assessment clause evaluations resulted in an “Out of Compliance” finding
- 7% of quinquennial assessment clause evaluations resulted in a “Compliance Not Determined” finding
- 59% of quinquennial assessment clause evaluations resulted in a “Compliance with Clause Not Applicable” finding

Table 13 details the findings of the inspections that evaluated the quinquennial supplementary LG generation assessment clauses of the LGMR.

Table 13. Tally of Inspection Findings for Quinquennial Supplementary LG Generation Assessment Clauses

LGMR Section	Tally of Inspection Findings For Evaluated Clauses				Total number of inspections evaluating clause
	In	Out	Not Determined	Not Applicable	
15(1)(a)(i)	7	15	4	14	40
15(1)(a)(ii)	14	7	3	16	40
15(1)(b)	2	1	3	32	38
15(2)(a)(i)	20	0	2	18	40
15(2)(a)(ii)	16	2	3	16	37
15(2)(b)(i)	1	0	3	31	35
15(2)(b)(ii)	0	0	3	21	24

LGMR Section	Tally of Inspection Findings For Evaluated Clauses				Total number of inspections evaluating clause
	In	Out	Not Determined	Not Applicable	
15(3)(a)	18	1	2	17	38
15(3)(b)	1	0	2	31	34
15(4)	10	13	0	15	38
16	1	0	0	15	16
Total	90	39	25	226	380

The requirement to conduct a quinquennial supplementary LG assessment was not applicable for all regulated landfill sites because as stated in Section 16 of the LGMR, if a landfill gas management facilities design plan has been submitted and accepted by the director, then Section 15 does not apply. Table 14 shows the percentage of inspection findings for each clause for a quinquennial supplementary LG generation assessment that was evaluated where these requirements were applicable to the facility.

Table 14. Percentage of Inspection Findings for Evaluated and Applicable Quinquennial Supplementary LG Generation Assessment Clauses

LGMR Section	Percentage of Inspection Findings for Evaluated and Applicable Clauses		
	In	Out	Not Determined
15(1)(a)(i)	27%	58%	15%
15(1)(a)(ii)	58%	29%	13%
15(1)(b)	33%	17%	50%
15(2)(a)(i)	91%	0%	9%
15(2)(a)(ii)	76%	10%	14%
15(2)(b)(i)	25%	0%	75%
15(2)(b)(ii)	0%	0%	100%
15(3)(a)	86%	5%	10%
15(3)(b)	33%	0%	67%
15(4)	43%	57%	0%
16	100%	0%	0%

The three areas with the highest rates of non-compliance are Sections 15(1)(a)(i), 15(1)(a)(ii), and 15(4), at between 29 percent and 58 percent.

Nine of the 15 instances of non-compliance with Section 15(1)(a)(i) were due to late submissions (one to four years overdue) of the supplementary LG generation assessment reports, while the remaining six instances were failures to submit the supplementary assessment reports.

Late submissions or failure to submit the supplementary assessment reports were also responsible for the non-compliances identified for Section 15(1)(a)(ii) and Section 15(4). It is worth mentioning that during the inspections, several LGMR facilities indicated that they had simply forgotten or were not aware of these requirements in the LGMR and that they would now conduct the supplementary assessments as soon as possible.

RECORD KEEPING

LGMR Sections 12 and 13 mandate that owners/operators of regulated landfill sites must conduct monitoring and record keeping of their operations and provide these records to the director for inspection. The required records to be kept include quantity and sources of MSW received for disposal into the landfill site and MSW composition for all regulated landfill sites. In addition, for landfill sites where landfill gas management facilities are required, records must be kept for maintenance and shutdown of the facilities and the quantity and composition of gases collected and flared.

The aggregated compliance findings of all the record keeping clauses inspected for LGMR facilities in this MLGM Audit are as follows:

- 50% of record keeping clause evaluations resulted in an “In Compliance” finding
- 1% of record keeping clause evaluations resulted in an “Out of Compliance” finding
- 6% of record keeping clause evaluations resulted in a “Compliance Not Determined” finding
- 44% of record keeping clause evaluations resulted in a “Compliance with Clause Not Applicable” finding

Table 15 details the findings of the inspections that evaluated the record keeping clauses of the LGMR.

Table 15. Tally of Inspection Findings for Record Keeping Clauses

LGMR Section	Tally of Inspection Findings For Evaluated Clauses				Total number of inspections evaluating clause
	In	Out	Not Determined	Not Applicable	
12(1)(a)	41	0	1	2	44
12(1)(b)	31	1	1	9	42
12(1)(c)	31	0	2	6	39
12(2)(a)	9	0	3	30	42
12(2)(b)	7	0	5	29	41
12(2)(c)	9	0	3	29	41
12(3)	36	0	5	0	41
13	0	1	0	40	41
Total	164	2	20	145	331

Again, the findings of the inspections against the LGMR were further distilled to only sites for which the record keeping clauses were applicable.

Table 16 shows the percentage of inspection findings for each clause that was evaluated and determined to be applicable to the facility.

Table 16. Percentage of Inspection Findings for Evaluated and Applicable Record Keeping Clauses

LGMR Section	Percentage of Inspection Findings for Evaluated and Applicable Clauses		
	In	Out	Not Determined
12(1)(a)	98%	0%	2%
12(1)(b)	94%	3%	3%
12(1)(c)	94%	0%	6%
12(2)(a)	75%	0%	25%
12(2)(b)	58%	0%	42%
12(2)(c)	75%	0%	25%
12(3)	88%	0%	12%
13	0%	100%	0%

The frequency of non-compliance with Sections 12 and 13 were low overall. With the exception of singular non-compliances identified for two sites evaluated for Sections 12(1)(b) and 13, no other non-compliances with the applicable record keeping clauses of the LGMR Sections 12 and 13 were identified during inspections.

ANNUAL REPORTS

LGMR Section 14 mandates that owners/operators of regulated landfill sites must file an annual report with the director by a specific deadline, containing details such as all monitoring records required in Section 12 and an organics diversion program description. In addition, for landfill sites where LG management facilities are required, the annual report must contain details on landfill gas collection, flaring, shut down periods, maintenance, efficiency and plans to be implemented in the next year.

The aggregated compliance findings of all the annual report clauses inspected for LGMR facilities in this MLGM Audit are as follows:

- 22% of annual report clause evaluations resulted in an “In Compliance” finding
- 8% of annual report clause evaluations resulted in an “Out of Compliance” finding
- 3% of annual report clause evaluations resulted in a “Compliance Not Determined” finding
- 67% of annual report clause evaluations resulted in a “Compliance with Clause Not Applicable” finding

Table 17 details the findings of the inspections that evaluated the annual report clauses of the LGMR.

Table 17. Tally of Inspection Findings for Annual Report Clauses

LGMR Section	Tally of Inspection Findings For Evaluated Clauses				Total number of inspections evaluating clause
	In	Out	Not Determined	Not Applicable	
14(1)(a)	33	10	0	1	44
14(1)(b)	24	5	1	13	43
14(1)(c)	2	1	1	37	41
14(2)(a)	7	4	1	30	42
14(2)(b)	8	3	1	30	42
14(2)(c)	5	0	1	36	42
14(2)(d)	7	4	1	30	42
14(2)(e)	8	1	2	31	42
14(2)(f)	8	2	1	30	41
14(2)(g)	4	1	3	33	41
14(2)(h)(i)	5	1	2	33	41
14(2)(h)(ii)	2	3	2	34	41
14(2)(i)	0	0	1	40	41
14(3)(a)	18	16	2	6	42
14(3)(b)	5	2	0	36	43
Total	136	53	19	420	628

Once again, many of the inspection findings for Section 14 of the LGMR were not applicable because most of the inspection landfill sites were not required to install LG management facilities. Table 18 shows the percentage of inspection findings for each clause in Section 14 of the LGMR that was evaluated and determined to be applicable to the facility.

Table 18. Percentage of Inspection Findings for Annual Report Clauses

LGMR Section	Percentage of Inspection Findings for Evaluated and Applicable Clauses		
	In	Out	Not Determined
14(1)(a)	77%	23%	0%
14(1)(b)	80%	17%	3%
14(1)(c)	50%	25%	25%
14(2)(a)	58%	33%	8%
14(2)(b)	67%	25%	8%
14(2)(c)	83%	0%	17%
14(2)(d)	58%	33%	8%
14(2)(e)	73%	9%	18%
14(2)(f)	73%	18%	9%
14(2)(g)	50%	13%	38%
14(2)(h)(i)	63%	13%	25%
14(2)(h)(ii)	29%	43%	29%

LGMR Section	Percentage of Inspection Findings for Evaluated and Applicable Clauses		
	In	Out	Not Determined
14(2)(i)	0%	0%	100%
14(3)(a)	50%	44%	6%
14(3)(b)	71%	29%	0%

For clauses in Section 14 of the LGMR that were evaluated at a minimum of five separate sites, Sections 14(1)(a), 14(2)(a), 14(2)(b), 14(2)(d), 14(3)(a) and 14(3)(b) had the highest non-compliance frequencies ranging from 23 percent to 44 percent of inspections that evaluated for these clauses and determined applicability. The non-compliances included failure to submit an annual report, failure to submit an annual report by the required deadline, and failure to include all information required in the LGMR in the annual report. The MLGM Audit inspections identified that five facilities failed to submit the 2017 annual report.

NOTICE OF EMERGENCY SHUTDOWN

Section 10 of the LGMR mandates that notification of a temporary shutdown of LG management facilities for emergency maintenance or replacement must be provided to the director within 24 hours. Forty inspections evaluated this clause, 32 of which determined that compliance with this clause was not applicable to the facility at the time of the inspection. Of the remaining eight facilities for which this clause was applicable, half of them were found to be out of compliance for not providing timely notification of shutdowns to the director.

ADDITIONAL SECTIONS

LGMR Sections 11, 17, 18, 19, and 20 were not evaluated or compliance was deemed not applicable at the time of the inspection in the inspections for this MLGM Audit.

RECOMMENDATIONS AND CONCLUSIONS

Findings from the MLGM Audit conducted on 71 landfill sites in B.C. have highlighted the following opportunities of improvement for facility owner/operators and ENV:

Facility Owner/Operators

- Facility owner/operators are reminded that the LGMR applies to all landfill sites in B.C. that accept MSW on or after January 1, 2009 and that the bulk of the requirements apply to all regulated landfill sites, which are defined as those that have 100,000 tonnes or more of MSW in place, or receive 10,000 or more tonnes of MSW for disposal in any calendar year after 2008.

- The LGMR does not require registration or notification and therefore, it is the responsibility of the facility owner/operators to adhere to the requirements of the LGMR even in the absence of reminders and communication from the Ministry. This means that each facility owner/operator must ensure that deadlines for document submission and other actions required in the LGMR are met. Notable examples include the initial LG generation assessment completion and report submission, the LG management facilities design plan, the quinquennial LG generation assessment completion and report submission, annual report submission, and notification of temporary shutdown of landfill gas management facilities for emergency maintenance or replacement.
- Facility owner/operators are also reminded to ensure that all details for assessments and documents required by LGMR are included in submissions to the director, such as the contingency plan portion of the LG management facilities design plan, annual report information requirements such as maintenance/shut down records, quantity and composition of LG collected and/or flared, and quantity/composition estimates of gas generation.

Ministry of Environment and Climate Change Strategy

As stated above, the responsibility of adhering to the LGMR lies with the owner or operators of each landfill site; however, the highest percentage of non-compliances were found for Sections 15(1)(a) and 15(4) for either not conducting and submitting supplementary assessments or for conducting and/or submitting the supplementary assessments late. These requirements generally apply to landfill sites that have greater than 100,000 tonnes of MSW in place or receive greater than 10,000 tonnes of MSW in a single year but were estimated to generate less than 1,000 tonnes of methane per year. These supplementary assessments were required to be conducted during a specific period in the fifth calendar year following the previous assessment. During the five-year period following the submission of the initial landfill gas assessments, no compliance verification with respect to the initial landfill gas assessment or the LGMR was conducted, nor was there any communication from the Ministry related to the requirements of the LGMR. During the inspections, several landfill sites stated that they had simply forgotten or were not aware that there was a requirement to conduct a supplementary assessment in the fifth calendar year. The landfill sites further indicated that they would now conduct the supplementary assessment as soon as possible. It is acknowledged that the deadlines in these requirements are each landfill site's responsibilities, but it was also apparent that much higher levels of compliance would be expected if the Ministry had done some earlier compliance and promotional activities with the LGMR prior to this audit. Earlier compliance verification with new or amended legislation under EMA could prove especially effective for a regulation like the LGMR where there is little direct communication from ENV, and industry is more likely to not be aware of their responsibility to adhere to its requirements. This recommendation does not have to be specific to the LGMR but could apply to all legislation under EMA.

Expanding on the deadlines to conduct and submit the supplementary assessment, Sections 15(1)(a) and (b) require that the supplementary assessment be conducted between January 1 and March 31 of the

fifth calendar year following the calendar year of the previous assessment. In addition, the supplementary assessment must be submitted by March 31 of the fifth calendar year. Several landfill sites indicated that the January 1 to March 31 window to hire a qualified professional to conduct the assessment and prepare the report, while allowing time for the owner/operator to review and submit the report was too small. In more than one instance, the supplementary assessment was prepared prior to the fifth calendar year outside the January 1 to March 31 window to avoid being late with submission of the supplementary assessment report. Technically, each of these landfill sites would be out of compliance with the LGMR; however, each of the sites were trying to be more proactive in conducting supplementary assessments than required by the LGMR and it would seem to be unfair that these actions would not be compliant with the overall purpose of the LGMR. It is recommended that the requirements be modified to say that the supplementary assessment must be conducted and submitted prior to March 31 of the fifth calendar year.

During the inspections, it proved difficult to assess compliance with Sections 4(3)(d), 7(2)(d), 12(1)(c) because these requirements state that reports must include 'any other information required by the guidelines.' These requirements now potentially make the entire landfill gas assessment guidance document a compliance point. This becomes a far too cumbersome and complicated compliance point for inspectors to conduct a thorough compliance assessment. If there are specific parts of the guidance document that are not captured in the requirements of the LGMR but should be, then the LGMR should be amended to include these requirements as compliance points.

Sections 12(1)(b), 14(1)(a), 14(1)(b) and 14(2)(g) require that information related to an organics diversion program and waste composition studies be maintained and included in annual reports, if available. Because the requirements add 'if available', it becomes very difficult for compliance inspectors to determine in the case where no information was included, whether this is a non-compliance for failing to report the information or simply a situation where there is no information. This is complicated by the fact that the waste composition studies are not always submitted to or even required to be submitted to ENV.

During several inspections, no supplementary assessment report could be located by the compliance inspector and when the landfill sites were contacted, their consultants indicated that the supplementary assessments were included in other annual reports and design operation and closure plans. It is recommended that the LGMR be amended to state that each report submitted under the LGMR should be submitted in a standalone document in order to verify compliance of the requirements. It is acknowledged that many landfill sites combine the annual reporting requirements in Section 14 of the LGMR with the submission of their annual reports required in their permits or operational certificates and that this might result in some redundancy.

Sections 4(3) and 15(2) impose requirements on qualified professionals rather than the landfill site owner/operators being inspected; therefore, the LGMR should be amended to state that the owner or operator of the landfill site must ensure that the qualified professional performs the requirement.